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TYING, BUNDLED DISCOUNTS, AND THE DEATH OF THE SINGLE MONOPOLY PROFIT THEORY

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Chicago School theorists have argued that tying cannot create anticompetitive effects because there is only a single monopoly profit. Some Harvard School theorists have argued that tying doctrine’s quasi-per se rule is misguided because tying cannot create anticompetitive effects without foreclosing a substantial share of the tied market. This article shows both positions are mistaken. Even without substantial tied foreclosure, tying by a firm with market power generally increases monopoly profits and harms consumer welfare, absent offsetting efficiencies. Current doctrine is thus correct to require tying market power and a lack of offsetting efficiencies, but not substantial tied foreclosure. Doing so does not really apply a quasi-per se rule, but rather correctly identifies the conditions for the relevant anticompetitive effects. However, there should be an exception to this rule when the products are used or bundled in a fixed ratio and lack separate utility, because those conditions negate anticompetitive effects absent substantial tied foreclosure.

Bundled discounts can produce the same anticompetitive effects as tying without substantial tied foreclosure, but only when the unbundled price exceeds the but-for price. Thus, when the unbundled price exceeds the but-for price, bundled discounts should be condemned based on market power and a lack of offsetting efficiencies, absent the conditions that negate nonforeclosure effects. When the unbundled price is lower than the but-for price, bundled discounts should be condemned only when there is substantial foreclosure or direct proof of anticompetitive effects. Alternative tests for judging bundled discounts, such as comparing incremental prices to costs, are not only underinclusive, but perversely exempt the bundled discounts with the worst anticompetitive effects.

JEL Codes: C72, K21, L12, L40, L41, L42.

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I. OVERVIEW

Tying law has for too long been in the thrall of the single monopoly profit theory. This theory helped talk generations of students and judges out of the usual intuition that tying can be anticompetitive. Using simple examples, like a monopolist in nuts who tied bolts to them, the theory showed that such tying could not increase any monopoly profits the firm already earned in nuts, and thus suggested tying must reflect real efficiencies. Its analysis was powerful and influential, but turns out to be wrong in most cases.

The single monopoly theory is valid only when, as in the nuts and bolts example, five restrictive assumptions hold. (1) The products are used in a fixed ratio. (2) Buyer demand for them has a strong positive correlation. (3) Each purchaser buys at most a single unit of the tying product. (4) The competitiveness of the tied market is fixed. (5) The competitiveness of the tying market is fixed.

Relaxing those assumptions invalidates the theory. Indeed, as detailed below, each relaxation of an assumption reveals a distinctive way in which tying can increase monopoly profits. (1) With variable ratios, tying can profitably allow price discrimination among buyers of the tying product. (2) Without strong positive demand correlation, tying can profitably permit price discrimination across buyers of both products. (3) If buyers purchase varying amounts of the tying product, tying can profitably squeeze out consumer surplus from individual buyers. (4) Without fixed tied market competitiveness, tying can impair tied rival competitiveness in ways that increases tied product prices and profits. (5) Without fixed tying market competitiveness, tying can increase the degree of tying market power. Because the first three effects require no substantial foreclosure share in the tied market, let’s call them the non-foreclosure effects. Because the last two effects do, let’s call them the foreclosure effects.

Understanding these five monopoly-profit-increasing effects solves many longstanding doctrinal puzzles. One basic puzzle has been why tying doctrine requires proving market power in the tying product, rather than proving a substantial foreclosure share or effect in the tied market. Some Harvard School theorists have thought this doctrine was misguided because they only recognized the
anticompetitiveness of the two foreclosure effects. However, Supreme Court caselaw explicitly holds that the three non-foreclosure effects are anticompetitive. Given that premise, tying doctrine has the elements precisely right because the three non-foreclosure effects require tying market power, but not a substantial tied foreclosure share or effect. So understood, tying doctrine is not a quasi-per se rule at all, but rather a doctrine that correctly states the elements necessary to prove the first three anticompetitive effects under standard rule of reason analysis. The significance of tying doctrine is instead the holding that those three non-foreclosure effects count as anticompetitive.

Critics of tying doctrine thus ultimately must rely on a claim that the Supreme Court has been wrong to hold that these three non-foreclosure effects are anticompetitive. On the first effect, they argue that price discrimination among tying product buyers should not count as an anticompetitive effect because (1) without tying, firms can just use direct price discrimination, (2) imperfect price discrimination has ambiguous effects on consumer welfare but is likely to increase total welfare. But such direct price discrimination is often not feasible, and firms would not use tying to achieve price discrimination unless it were more effective at doing so. As for welfare effects, critics reason by analogy that because perfect price discrimination increases total welfare, tying that leads to imperfect price discrimination is likely to do so as well. But that analogical claim finds little support in the economic literature, which proves that imperfect price discrimination decreases total and consumer welfare if the buyers are intermediaries or one makes a balanced assumption about the shape of demand curves. Further, to the extent the analogical claim were valid, the same logic indicates that imperfect price discrimination likely decreases consumer welfare. Thus, even if the analogical claim were right, this critique ultimately rests on a claim that total welfare should be favored over consumer welfare, a claim that conflicts with current antitrust policy and would require sweeping changes to antitrust law far beyond changing tying doctrine.

As to the second and third non-foreclosure effects, tying doctrine critics simply assume without analysis that the above arguments extend to them because they can be understood as forms of inter-buyer or intra-buyer price discrimination. However, notwithstanding this conceptual similarity, the effects and policy implications are quite different. For price discrimination across buyers with different demand, direct price discrimination is generally impossible because the whole purpose of bundling in such cases is to exploit the lack of strong positive demand correlation to allow price discrimination even when firms can neither assess buyer valuations nor prevent
arbitrage. Further, tying that achieves such price discrimination across products clearly reduces consumer welfare and has ambiguous effects on total welfare. Likewise, squeezing out individual consumer surplus (1) is less likely to be achievable through direct discrimination, (2) has unambiguously negative effects on consumer welfare; (3) lowers total welfare in the typical tying case; and (4) has worse distributive effects.

These are contestable policy issues, but Supreme Court caselaw can be understood as resolving them in favor of the conclusions that these three non-foreclosure effects are anticompetitive. This explains why tying doctrine requires tying power but not a substantial tied foreclosure share or effect. However, a rule that focuses on tying power rather than tied foreclosure should be limited to cases where the assumptions necessary for the three non-foreclosure effects hold. In cases where the tied items are used or tied in fixed ratios and lack separate utility, then the three non-foreclosure effects are not possible and there should be an exception to the quasi-per se rule. As I will show, this exception helps explain why the factual premises of certain justices led them to be skeptical of the tying claims in Jefferson Parish and Kodak. It also explains the Microsoft holding that substantial tied foreclosure had to be shown for the tying claim there. However, my recommended exception differs from deeming products meeting these two conditions to be a single product, because finding a single product can also oust rule of reason review. It also differs from an exception for technological tying, whose fit with the relevant conditions is both overinclusive and underinclusive. Understanding the effects that animate tying doctrine also, I will demonstrate, clarifies various issues about damages, market definition, foreclosure, and antitrust injury in tying cases.

Bundled discounts have the same non-foreclosure effects as tying when the unbundled price exceeds the but-for price for the product over which the firm has market power. The terminology bundled “discounts” is actually misleading in these situations because it wrongly implies there is a true discount from the but-for price that would have been charged without bundling. Instead, a bundled “discount” really just means there is a price difference between what is charged buyers who comply with the bundling condition and those who do not. If the unbundled price exceeds the but-for level, then the bundled pricing really reflects penalties on those who refuse to accept a bundle, rather than discounts for those who accept.

Whether or not the unbundled price exceeds but-for price, bundled discounts can also have the same foreclosure effects as tying when a substantial market share is
foreclosed. Bundled loyalty discounts can also produce an anticompetitive effect that tying doesn’t product – affirmatively discouraging discounting even when rival efficiency is not impaired – though this effect generally also requires proof of substantial foreclosure or impact in the affected market.

Thus, the appropriate test would treat bundled discounts like tying, condemnable based on market power and a lack of offsetting efficiencies, when the unbundled price exceeds the but-for price. Otherwise, bundled discounts should be condemned only if substantial foreclosure or effects are proven. I show below that this test is preferable to alternative tests that are based on either (1) whether the incremental bundled price exceeds cost, (2) the proportion of buyers who accept the bundle, or (3) whether the unbundled price exceeds the pre-bundle price.

II. THE DEATH OF THE SINGLE MONOPOLY PROFIT THEORY

The single monopoly profit theory is that a firm that has a monopoly in one product cannot increase its monopoly profits by using tying to leveraging itself into a second monopoly in another product.1 The classic example was a monopolist in nuts who tried to tie nuts to bolts. Suppose nuts and bolts each cost 10 cents to make, and thus would be priced at 10 cents each if the market for both was competitive. Suppose further that the profit-maximizing price for a combined monopolist in both nuts and bolts would be 40 cents for the nut-bolt set that consumers need. If we have a nut monopolist and a competitive market in bolts, then the nut monopolist would simply charge 30 cents for nuts, with the customers paying 10 cents for bolts on a competitive market to arrive at 40 cents for the nut-bolt set. The nut monopolist would earn monopoly profits of 20 cents per set used. It would earn no additional monopoly profits by tying its sale of nuts to bolts, because if it did so the monopoly price for the nut-bolt set would be 40 cents and the cost 20 cents, leaving it with profits of 20 cents

It might try to charge a supracompetitive price of 11 cents for the tied bolts, but if it did so it would have to offer a corresponding 1 cent discount from the nut monopoly price of 30 cents, charging 29 cents for nuts, because the profit-maximizing price of 40 cents for the set is not altered by the tie. In fact, if a competitive market were more efficient and would lower the price of bolts down to 5 cents, the monopolist in nuts would prefer that, because then it could sell nuts for 35 cents and earn 25 cents a set.

Where it holds true, this single monopoly profit theory indicates that a firm would use tying only if there were some efficiency to doing so. It also suggests that a buyer would accept a tie only if the discount on the tying product was at least equal to the supracompetitive price on the tied product, so the tie cannot injure buyers. This implies that, where the single monopoly profit theory holds, the correct legal standard should be a rule of per se legality.

However, the model indicating a single monopoly profit depended on several key assumptions: (1) fixed product ratio; (2) strong positive demand correlation; (3) single tying unit buyers; (4) fixed tied market competitiveness; and (5) fixed tying market competitiveness. As the economic literature shows, different results are reached if one relaxes these narrow assumptions. Indeed, each relaxation of one of these assumptions produces a distinctive profit-increasing effect.

Further, these effects are in an important respect mutually reinforcing. In particular, the first three effects mean that tying can be profitable without substantial foreclosure of the tied market. This means that tying that does cause foreclosure effects need not require (as is often assumed) any short-term sacrifice of profits nor any commitment to engage in unprofitable conduct to achieve the foreclosure.

A. Price Discrimination Among Buyers of Tying Product

As Professor Bowman first demonstrated, tying can profitably allow price discrimination among buyers of the tying product if the tied product is a complement that is used with the tying product in a variable ratio. Suppose a firm has market power over some capital product that is used with a consumable product: for example,
printers that are used with ink cartridges. Suppose further that usage of the consumable varies for different buyers in a way that positively correlates to the value of the capital product to each buyer. For example, buyers who use more cartridges use their printers more often, and thus usually derive more value from their printers. If so, the firm could lower the price for its printer down to marginal cost, contingent on buyers taking all their cartridges from the seller, with the cartridge price set well above marginal cost. Then buyers who use more cartridges will pay more, allowing the firm to price discriminate among buyers of printers. This may be more effective than direct price discrimination if the firm could not otherwise tell how much buyers likely value their printers or could not prevent any low-value buyers who bought printers cheap from reselling them to the high-value buyers. It could also be more feasible than metering usage if printer use is harder to monitor than cartridge purchases. If so, this form of tying would increase monopoly profits, even if it results in no significant foreclosure of the cartridge market.

Although Professor Bowman’s theory assumed the tied products were complements used with the tying product, the theory is equally applicable whenever tied product demand is positively correlated with tying product demand. Being complements is just one possible way to have positively correlated demand. For example, suppose that buyers who most value luxury cars also tend to have the greatest desire for cappuccinos. Then a firm with market power in luxury cars could price discriminate by tying luxury cars to the purchase of cappuccinos at an above-market price. Those who drink more cappuccinos would effectively pay more, and they would be willing to do so because they are the same buyers who value the luxury car more. It is not necessary that they use their cappuccinos with their luxury cars.

**B. Price Discrimination Across Buyers of Both Products**

Tying can also profitably permit price discrimination across buyers of both products. This is true even if the products are used or bundled in a fixed ratio. Indeed, Professor Stigler first suggested the theory to explain the Supreme Court’s decision in *Loew’s*, which banned fixed bundles of movies.³ Although Professor Stigler assumed demand for the two products was negatively correlated, later work has shown the theory also

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applies when demand is positively correlated unless the correlation is strong. The theory does, however, require some degree of market power in both products.

To illustrate, consider the following situation. A firm has market power in both products $A$ and $B$, each of which has a constant marginal cost of $0$. There are 200 buyers whose reservation price for $A$ ranges from $0$ to $200$, as does their reservation price for $B$. But their demands for $A$ and $B$ are negatively correlated, so that a buyer who values $A$ at $200$ values $B$ at $0$, and vice versa, and the sum of each buyers’ valuation of $A$ and $B$ always equals $200$. Without bundling, the firm would maximize profits by pricing $A$ and $B$ each at $100$, and 100 buyers would buy each. The monopoly profits would be a total of $20,000$. All the buyers who value the products above the monopoly prices get positive consumer surplus. For each product, the aggregate consumer surplus would be $\frac{1}{2}(100)(100) = 5,000$, for a combined consumer surplus of $10,000$.

Now suppose the firm instead ties $A$ and $B$ by selling them only in a bundle for $200$. All 200 buyers would buy the bundle, and monopoly profits would increase to $40,000$. Now no buyer would enjoy any consumer surplus, so the tie results in a consumer welfare loss of $10,000$. In effect, the tie allows the firm to exploit the lack of strong positive demand correlation to price discriminate among buyers even when it doesn’t know the individual buyer valuations and cannot prevent resales among them. Such tying can clearly both increase monopoly profits and harm consumer welfare.

More generally, assuming a normal distribution of buyer valuations, tying always decreases consumer welfare absent perfect positive demand correlation. Such tying also decreases total welfare (i.e., efficiency) if the strength of demand relative to cost

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4 See Adams & Yellen, Commodity Bundling and the Burden of Monopoly, 90 Q.J. ECON. 475, 485 (1976); R. Preston McAfee et al., Multiproduct Monopoly, Commodity Bundling, and Correlation of Values, 104 Q.J. ECON. 371, 372-373, 377 (1989); Richard Schmalensee, Pricing of Product Bundles, 57 J. BUSINESS S211, S220 (1984). If the strength of demand relative to cost is high enough, then bundling can increase monopoly profits for anything other than a perfect positive correlation. Id. at S215, S220. For lower demand to cost ratios, strong but imperfect positive correlations may defeat this strategy.


6 Schmalensee, supra note , at S221-222, S229.
is not high, but increases it otherwise. The mixed efficiency effects result because such tying can increase efficiency by increasing total output, but can also increase inefficiency misallocating products to buyers who value them less than they cost.

C. Squeezing Out Individual Consumer Surplus

As Professor Burstein first pointed out, if buyers buy varying amounts of the tying product, tying can squeeze out individual consumer surplus. The basic reason is that, even at a monopoly price for the tying product, each multi-unit buyer enjoys some consumer surplus. A tying firm can expropriate that consumer surplus by allowing buyers to purchase the tying product at the monopoly price only if buyers agree to purchase their needs of some tied product at supracompetitive prices. Each buyer will agree as long as the burden of paying supracompetitive prices on the tied product is less than the consumer surplus enjoyed by buying the tying product at the monopoly price.

The reason each buyer enjoys consumer surplus even at the monopoly price is as follows. Generally, buyers who buy multiple units of a product value the first unit they purchase more than the second unit, which they value more than the third, and so forth, because they use the first units to meet their greatest needs first. In other words, buyers who buy multiple units generally get declining marginal utility from additional units, giving each individual buyer a downward sloping demand curve. Thus, at the monopoly price, each buyer will value the last (marginal) unit it purchases at that monopoly price, but will value all the other (inframarginal) units more than that monopoly price. The difference between how much it values those inframarginal units and the

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7 Id. at S221-S222, S229.
8 Adams & Yellen, supra note , at 482-483, 491-492.
monopoly price will be the consumer surplus enjoyed by each buyer.

Suppose, for example, the buyers are all businesses that buy printers they use in the conduct of their business. Each business values the first printer at $1000, but values each subsequent printer $1 less than the prior one because the convenience of having an additional printer diminishes the more printers it already has. The printers cost $200 each to make. A monopolist in printers will thus maximize profits by charging a monopoly price of $600. At that price, each buyer will buy 400 printers and still enjoy a consumer surplus at the monopoly price (CSM in Figure 1) equal to the area of the triangle, which is \( \frac{1}{2}(1000-600)(400) \) = $80,000. Trying to charge any higher price for printers would lower the monopolist’s profits. Yet the monopolist is leaving money on the table because each buyer enjoys some consumer surplus at the monopoly price. Nor can the monopolist obtain this consumer surplus by price discriminating between buyers because all the buyers are the same.

Suppose, however, that the printer monopolist engages in requirements tying by refusing to sell its printers at the monopoly price to buyers who do not agree to buy all their scanner requirements from the printer monopolist. To illustrate, take a case where each buyer values the first scanner it buys at $600, values each subsequent scanner $1 less, and scanners cost $200 to make. Assume also that scanners are a competitive market and that the foreclosure of the scanner market is small enough that rival competitiveness is not affected in the scanner market. Thus, buyers who reject the tie will buy scanners for the competitive price of $200. The consumer surplus at the competitive price for the tied product (CSC\textsubscript{tied} in Figure 2) would be the area of that triangle, which is \( \frac{1}{2}(600-200)(400) \) = $80,000. Without any tying, then, each buyer would enjoy a total of $160,000 in consumer surplus, $80,000 from buying the tying product at its monopoly price and $80,000 from buying the tied product at its competitive price.

With tying, the printer monopolist refuses to sell its printers even at the monopoly price unless buyers agree to buy scanners from it at the monopoly price of $400. Buyers who reject the tie would thus get $80,000 in consumer surplus from buying scanners at the competitive price, but would lose all consumer surplus in the printer

![Figure 2. Consumer Surplus in Tied Market Without Tying.](image)
market. Buyers who accept the tie would instead get consumer surplus from buying printers at the monopoly price ($80,000) plus the consumer surplus from buying scanners at the monopoly price (CSMtied in Figure 3), which is equal to the area of the triangle, or \( \frac{1}{2}(600-400)(200) = 20,000 \). Thus, buyers would accept the tie because they enjoy more consumer surplus from buying both products at their respective monopoly prices ($100,000), than they would from just buying the tied product at its competitive price ($80,000). To put it another way, they accept the tie because the consumer surplus lost (CSL in Figure 3) in the tied market is less than the consumer surplus they would lose (CSM in Figure 1) by being unable to buy the tying product at its monopoly price. Thus each buyer accepts, but each buyer is also worse off than it would be if the tie were prohibited, because without tying buyers would each enjoy a consumer surplus of $160,000. Thus, tying in this example harms each buyer by $60,000.

These results depend on buyers purchasing varying amounts of the tying product. Tying cannot squeeze out individual consumer surplus if buyers purchase only one tying unit or if the products are used or tied in fixed ratios, because then buyers would experience any increase in the tied product price as an increase in the marginal price of buying the tying product. However, squeezing out individual consumer surplus does not necessitate a requirements tie that forbids buying the tied product from rivals, as Burstein seemed to suppose. A firm could achieve the same effect by requiring buyers to buy some fixed quantity of the tied product at a supracompetitive price (say 200 scanners at $400) if they want to make purchases of the tying product at the monopoly price. Such a buyer would then be free to buy 200 more scanners from rivals at $200 and thus would not have to purchase its requirements from the tying firm. But its consumer surplus would be squeezed out just the same. Indeed, it would

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be squeezed out more efficiently because it would not require the deadweight loss from being unable to buy 200 more scanners whose cost is lower than buyer value.

The relationship between prices with and without tying will depend on the relative magnitudes of the respective consumer surpluses. Take first cases where, as in my printer-scanner hypothetical, the sum of the consumer surpluses from buying both products at the monopoly price \( \text{CSM}_{\text{tying}} + \text{CSM}_{\text{tied}} \) exceeds the consumer surplus from buying only the tied product at competitive prices \( \text{CSC}_{\text{tied}} \). Then, even without any substantial foreclosure, buyers would accept a requirements tie even if both products were priced at monopoly levels.\(^{12}\) The tying firm could not extract any more profit by trying to price the products above monopoly levels, so would choose monopoly prices for both products. In such cases, tying does not result in any discount on the tying product, but does elevate tied prices to monopoly levels. In short, such tying produces precisely the leveraging of one monopoly profit into two monopoly profits that the single monopoly profit theory said was impossible. Consumer welfare suffers, as does total welfare because allocative efficiency is unchanged in the tying market but reduced in the tied market.

Assuming linear demand, consumer surplus for any product is four times greater at the competitive price than at the monopoly price.\(^{13}\) Thus, the condition \( \text{CSM}_{\text{tying}} + \text{CSM}_{\text{tied}} > \text{CSC}_{\text{tied}} \) is the same as saying \( \text{CSM}_{\text{tying}} + \text{CSM}_{\text{tied}} > 4\text{CSM}_{\text{tied}} \). Accordingly, this condition is met when \( \text{CSM}_{\text{tying}} > 3\text{CSM}_{\text{tied}} \) or, equivalently, when \( \text{CSC}_{\text{tying}} > 3\text{CSC}_{\text{tied}} \).\(^{14}\) In other words, a firm will be able to impose a requirements tie that leverages one monopoly profit on the tying product into two monopoly profits on the tying and tied products whenever the buyers covered by the tie get consumer surplus from the tying product that is more than three times what they get from the tied product (when both are priced at either monopoly or competitive levels). If, as in the hypotheticals, the two linear demands have the same slope, this condition will hold

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\(^{13}\) For any linear demand function \( Q = A - P \) and a product with constant marginal cost \( C \), the competitive price will be \( C \) resulting in a consumer surplus of \( (A-C)^2/2 \), and the monopoly price will be \( (A+C)/2 \), resulting in a consumer surplus of \( (A-C)^2/8 \). Thus, \( \text{CSC} = 4\text{CSM} \). (The analysis extends to any linear demand \( Q = A - sP \) because one could convert that into an equation that takes the form \( Q = A - P \) by using a measure of units that makes the slope \( s = 1 \).)

when the difference between the cost and value of the first unit of the tying product is at least 73% higher than the same difference for tied product.\textsuperscript{15} Because typical tying cases involve buyers who value or spend far more on the tying product than on the tied product, it seems likely that this condition is often met.

Now suppose this condition is not met. Then, a tying firm could still impose a requirements tie that maintained the tying product at its monopoly price and required purchasing the tied product from it at some supracompetitive price, as long as \( C_{SM_{tying}} \) plus the consumer surplus at the supracompetitive tied price (\( CSS_{tied} \)) exceeded \( CSC_{tied} \). In other words, it just has to make sure to pick a low enough supracompetitive tied price that \( CSL_{tied} < CSM_{tying} \).\textsuperscript{16} For example, suppose that the highest price that buyers would pay for scanners were instead $700. Then the firm could not impose a requirements tie with a monopoly price for both products because \( CSM_{tying} + CSC_{tied} = 80,000 + \frac{1}{2}(700-450)(250) = 111,250 \), which is less than \( CSC_{tied} = \frac{1}{2}(700-200)(500) = 125,000 \). However, the tying firm could impose a requirements tie that sold the tying product at its monopoly price and the tied product at up to $400, because at that price \( CSM_{tying} + CSS_{tied} = 80,000 + \frac{1}{2}(700-400)(300) = 125,000 = CSC_{tied} \). Without the tie, buyers would have enjoyed \( CSM_{tying} + CSC_{tied} = 80,000 + 125,000 \). Thus, this tie leaves each buyer $80,000 worse off, totally squeezing out individual consumer surplus in the tying product.

Although a firm could maintain a requirements tie that prices the tying product at monopoly levels even in cases where both products cannot be priced at monopoly levels, such a firm would make even more money if it lowered the tying product price below the monopoly level and raised the tied product price further. The reason is that the monopoly price is the price at which further price increases would produce no marginal gain. Thus, a reduction in the monopoly price on the tying good produces a relatively small loss of profits, whereas increasing the lower price on the tied product produces a relatively large gain in profits.\textsuperscript{17} Thus, a firm using a requirements

\textsuperscript{15} This is because consumer surplus varies with the square of the difference between the highest buyer value and cost. See supra note \( n \). Thus, \( CSM_{tying} > 3CSM_{tied} \) is equivalent to \( (A_{tying}-C_{tying})^2 > 3(A_{tied}-C_{tied})^2 \), which is true when \( A_{tying}-C_{tying} > \sqrt[3]{3}(A_{tied}-C_{tied}) \), which with rounding means \( A_{tying}-C_{tying} > 1.73(A_{tied}-C_{tied}) \).

\textsuperscript{16} See Carbajo, supra note \( n \), at 284.

\textsuperscript{17} Using more technical language, the discount on the tying monopoly price produces second-order profit losses for the firm and first-order consumer surplus gains for buyers, whereas the increase in the tied product price produces first-order profit gains for the firm and second-order
In this hypothetical, the firm using a requirements tie will maximize profits if it prices printers at $576 and scanners at $435.\textsuperscript{18} The consumer surplus of buyers who accept the tie will be $\frac{1}{2} (1000 - 576)^2 + \frac{1}{2} (700 - 435)^2 = 125,000.50. Thus, all buyers will accept the tie and be $80,000 worse off, the same as if the tying firm used a tie that kept the tying product at its monopoly price. However, the tying firm will reap more monopoly profits because at these prices its profits will be $(576 - 200)(1000 - 576) + (435 - 200)(700 - 435) = 221,699. In contrast, if it priced the tying product at the monopoly price of $600, it would have had to price the tied product at $400 to get buyers to accept the tie, and it would have earned profits of $(600 - 200)(1000 - 600) + (400 - 200)(700 - 400) = 220,000. As this example illustrates, even though the tying price may sometimes be discounted from monopoly levels, that is only to allow an even greater supracompetitive increase in the tied product price, and the combined net effect is still to squeeze out consumer surplus and harm consumer welfare.

Indeed, the existence of a discount on the tying product actually implies a \textit{greater} loss of consumer welfare. When both products are priced at monopoly levels, consumers will get consumer welfare of $\text{CS}_{\text{tying}} + \text{CS}_{\text{tied}}$ which may be significantly greater than $\text{CS}_{\text{tied}}$. The loss of consumer welfare, $\text{CS}_{\text{tied}} - \text{CS}_{\text{tied}}$ may thus be significantly less than $\text{CS}_{\text{tying}}$, which means that not all the consumer surplus in the tying product was squeezed out. This consumer welfare cannot profitably be lowered further with tying because both products are sold at their profit-maximizing level. In effect, the monopoly price level for the tied product in such cases imposes a constraint on the ability of the monopolist to full expropriate all the consumer surplus in the tying product. In contrast, when both products are being sold below their monopoly level, there is no monopoly price constraint on the tying firm further increasing the tied product price to squeeze out a little more consumer surplus. Thus, the tying firm

\begin{equation}
\text{CS}_{\text{tying}} + \text{CS}_{\text{tied}} > \text{CS}_{\text{tied}}
\end{equation}

consumer surplus losses for buyers. See Greenlee, et al., supra note , at 1136; Nalebuff, \textit{Bundling as a Way to Leverage Monopoly}, supra note , at 8, 10-11.

\textsuperscript{18} More generally, if the demand for the tying product $= A - P$, demand for the tied product $= B - P$, and both have constant marginal costs of $C_A$ and $C_B$ respectively, then the profit maximizing prices when using a requirements tie are $A - (A - C_A)(B - C_B)\sqrt{(A - C_A)^2 + (B - C_B)^2}$ for the tying product and $B - (B - C_B)^2/\sqrt{(A - C_A)^2 + (B - C_B)^2}$ for the tied product. See Greenlee, et al., supra note , at 1151.
can pick prices so that CSS_{tying} + CSS_{tied} is barely greater than CSC_{tied}, effectively squeezing out all of CSM_{tying}. The above examples illustrate this, because when the tie allowed monopoly pricing in both the tying and tied markets, the consumer surplus loss was $60,000, whereas when monopoly pricing was not possible in the tied market, the consumer surplus loss was the full $80,000.

In short, there are two possibilities when tying squeezes out consumer surplus without a significant foreclosure share. Either both the tying and tied products will be sold at monopoly price levels, and thus one monopoly really will be leveraged into two monopolies. Or the tying price will be discounted somewhat from monopoly levels, but the loss in consumer welfare will be even greater.

Requirements tying that results in both products being sold at monopoly prices also lowers efficiency even without a significant foreclosure share because it reduces allocative efficiency in the tied market without any increased allocative efficiency in the tying market.\(^{19}\) When requirements tying results in both products being sold at submonopoly levels without significant foreclosure, the efficiency effect depends on the relative size of the covered buyers’ consumer surplus for the tying and tied products. With linear demand, the economic literature shows that requirements tying with submonopoly prices will reduce total welfare whenever CSC_{tying} \geq (16/9)CSC_{tied}, or equivalently when CSM_{tying} > (16/9)CSM_{tied} and increase it when that condition does not hold.\(^{20}\) If, for example, the two linear demands have the same slope, this condition will hold when the difference between the cost and value of the first unit of the tying product is at least 33% higher than the same difference for tied product.\(^{21}\)

To summarize, in all cases, tying without significant foreclosure reduces consumer welfare if the tying firm chooses profit-maximizing prices. The total welfare effects will turn on the extent to which consumer surplus is higher for the tying product than the tied product, when both are priced at monopoly or competitive levels. This can be a hard to establish in particular cases. But we can roughly say that if, for buyers

\(^{19}\) Tying that merely requires buying a certain volume of the tied product may not reduce allocative efficiency in the tied market without a significant foreclosure share because such tying leaves buyers free to buy more of the tied product at competitive prices.

\(^{20}\) See Greenlee, et al., supra note , at 1137, 1151.

\(^{21}\) CSM_{tying} > (16/9)CSM_{tied} means \((A_{tying} - C_{tying})^2 > (16/9)(A_{tied} - C_{tied})^2\), see supra note , which is true when \(A_{tying} - C_{tying} > 1.33(A_{tied} - C_{tied})\).
subject to the tie, spending or valuation is significantly higher for the tying product than the tied product, then total welfare will be reduced by requirements tying. And if those buyers’ spending or valuation for the tying product is sharply higher for the tying product than the tied product, then tying will leverage one monopoly profit into two monopoly profits.

The relevant comparison depends on spending and value for the buyers subject to the tie, not for the tying and tied markets in general. For example, if there are many buyers who buy only the tied product and would continue to do so at competitive prices despite the tie, spending on the tied product may be much higher than on the tying market. Nonetheless, if the buyers who are subject to the tie spend far more on the tying product, the tie will still inflict allocative inefficiency on their purchases.

While I have used the monopoly case for simplicity, the same analysis will hold as long as the tying firm has some market power in the tying product. The reason is that all this theory requires is a declining individual demand curve for that firm’s tying good, so that there is some individual consumer surplus at the tying product’s profit-maximizing price to squeeze out.

**D. Reducing Rival Competitiveness in the Tied Market**

The single monopoly profit theory also assumed that the tied market was perfectly competitive in a way that tying could not alter. It did so with various sub-assumptions: namely that tied market rivals face no entry or fixed costs, have constant marginal costs that do not vary with output, have incentives to always price at cost, and can expand instantaneously to supply the whole market. Suppose we relax any or all of those sub-assumptions to consider more realistic cases. Then the economic literature shows a tie that forecloses enough of the tied market can reduce rival competitiveness by impairing rival efficiency, entry, existence, aggressiveness, or expandability. Any one of those adverse effects on rival competitiveness can in turn anticompetitively increase the tying firm’s market power in the tied market, thus raising prices and harming consumers.

Consider first situations where tying can reduce tied rival efficiency. If there are costs to entering the tied market, tying can profitably deter entry by an equally efficient rival by foreclosing enough of the tied market to make entry profits lower than entry
costs. Likewise, if there are fixed costs to operating in the tied market, tying can cause equally efficient rivals in the tied market to exit (or deter their entry), and thus enable the tying firm to obtain a monopoly in the tied market. Other articles generalize the point to show that foreclosing a market can create anticompetitive effects by depriving rivals of economies of scale, scope, distribution, supply, research, learning, and/or network effects. If foreclosure decreases rival efficiency in any of those ways, it will worsen the market options available to buyers and lessen the constraint on the tying firm’s market power in the tied market, thus enabling it to raise prices in the tied market even though rivals are not completely eliminated.

Even if tying does not impair rival efficiency, foreclosure can also impair rival competitiveness by decreasing rival aggressiveness or expandability. Tying can decrease rival aggressiveness in at least two scenarios. First, if firms engage in Cournot competition on the tied market, then tying can encourage rivals to charge higher prices in the tied market. Second, if the tied market is concentrated and would (absent tying) engage in Bertrand competition that drives prices down to cost, tying can effectively differentiate the tied market and increase tied product prices. Tying in both scenarios will increase profits for the tying firm (even without any non-foreclosure effects) if, absent tying, tying product revenue would exceed tied product revenue.
revenue, which is typical of most tying cases. Tying in both scenarios will also harm consumer welfare.

Tying can also decrease rival expandability and increase tied prices if the tying firm has market power in the tied market. Standard economic models calculate market power to be directly proportional to a firm’s market share and inversely proportional to its rivals’ supply elasticity, which is the percentage increase in rival supply that would result from a one percent increase in market price. These standard models reasonably assume rivals’ ability to expand depends on how large they already are. Thus, if a tying firm can through foreclosure obtain a higher share of the tied market for reasons unrelated to product merits, it will lower rivals’ share of the tied market and thus lessen rival expandability and the constraint on tied product prices.

Under any of the above theories, tying can impair rival competitiveness only if it helps foreclose a substantial share of the tied market. However, the anticompetitive effects from impairing tied rival competitiveness are independent of whether tying increases inter-buyer price discrimination or squeezes out individual consumer surplus. Indeed, the models proving the anticompetitive effects from impairing rival competitiveness excluded these non-foreclosure effects by assuming single unit tying among buyers whose valuations were either uniform or had perfect positive correlation. Nonetheless, the theories on non-foreclosure effects help reinforce the rival impairment theory because they prove that adopting a foreclosing tie need not require the defendant to incur any short-term profit sacrifice. Likewise, any anticompetitive

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28 The models state tying would increase profits in this situation if the tying product price exceeds the tied product price. Id. at 288, 291. Given that the models assume a set of buyers with equal reservation prices in both products, id. at 286-87, this is the equivalent to saying tying product revenue exceeds tied product revenue.

29 Id. at 289, 292.

30 Define $P$ as price, $C$ as marginal cost, $S$ as the firm’s market share, $\epsilon_m$ as the rival supply elasticity, and $\epsilon_m$ as the market demand elasticity (the percentage reduction in market output that would result from a one percent increase in market price). Then the firm’s degree of market power (as measured its ability to raise prices above cost) is determined by the equation $(P-C)/P = S/[(\epsilon_m + \epsilon_m(1-S))]$. See William M. Landes & Richard A. Posner, Market Power in Antitrust Cases, 94 Harv. L. Rev. 937, 945 (1981).

31 See Whinston, supra note , at 841-42; Carbajo, supra note , at 286-87.

32 Because the assumptions in Whinston’s initial model excluded non-foreclosure effects, he not surprisingly concluded that, under those assumptions, any tying that could cause rivals to exit would be unprofitable, and thus could be maintained only if the firm could commit to maintain tying.
benefit from impairing rival competitiveness makes the non-foreclosure effects all the more attractive to firms with tying market power, and exacerbates the anticompetitive effects. The theories thus are mutually reinforcing and should be assessed in combination.

To illustrate, suppose we have tying that not only squeezes out consumer surplus but also impairs rival competitiveness in the tied market. Then buyers deciding whether to accept a tie would no longer be comparing consumer surplus with the tie to the consumer surplus they would have enjoyed in the tied market at competitive prices. Instead, they would compare consumer surplus with the tie to the consumer surplus they would have enjoyed in the tied market at prices inflated by the rival impairment. In other words, instead of accepting the tie only if $C_{SM_{tying}} + C_{SM_{tied}}$ exceeded $C_{CSR_{tied}}$, they will accept it whenever it exceeds the consumer welfare they would enjoy in the tied market if they rejected the tie ($C_{CSR_{tied}}$) and purchased the tied product at inflated prices. Because a substantial foreclosure share that impairs rival competitiveness lowers $C_{CSR_{tied}}$, it increases buyer willingness to accept an anticompetitive tie.

For example, take our hypothetical above about printers and scanners with the alteration that the highest price buyers would pay for scanners was $1000, so that both demand curves are identical. Because the consumer surplus for printers and scanners would thus equal each other, a tie that does not foreclose a substantial share of the tied market would squeeze out consumer surplus and lower consumer welfare but would not reduce total welfare. But suppose the tie does impair rival competitiveness by foreclosing a large enough share of the tied market that rivals cannot achieve economies of scale and will have their costs increased from $200 to $500. Then, buyers will accept a tie even if the tying firm charges a monopoly price for both the tying and tied products because the consumer surplus if buyers accept will be $C_{SM_{tying}} + C_{SM_{tied}} = \frac{1}{2}($1000-$600)^2 + \frac{1}{2}($1000-$600)^2 = $160,000, whereas if they reject the

See id. at 839-40, 842-46. While such a commitment strategy might be well be possible – for example, by making binding contracts – it is not necessary under more realistic assumptions. First, with varying buyer valuations, inter-buyer price discrimination effects can make tying profitable even if it doesn’t affect rivals, and thus eliminates the need for commitment, as Whinston himself for price discrimination among buyers of the tying product and Nalebuff showed for price discrimination across both products. See id. at 840, 846, 848-50; Nalebuff, Bundling as an Entry Barrier, supra note , at 162-63. Second, with buyers who purchase varying amounts of the tying product, tying can increase profits by squeezing out individual consumer surplus even if it has no effect on rivals, thus again eliminating any need for commitment.
tie, the consumer surplus they enjoy will be \( \frac{1}{2} (1000-500)^2 = \$125,000. \)

In this case, the tie once again succeeds in leveraging a single monopoly profit into two monopoly profits. Further, it does so even though equal amounts are spent on both products, and each is priced well above costs. Thus, no short-term profit sacrifice is ever required, which is one more nail in the coffin of the claim that a profit-sacrifice should be required for monopolization claims.\(^{33}\) Both consumer welfare and total welfare decrease because allocative efficiency (and rival productive efficiency) is reduced in the tied market with no benefit in the tying market.

Unless it also alters the degree of tying market power, tying to impair tied rival competitiveness cannot increase monopoly profits if (1) the products are used or bundled in a fixed ratio and (2) the tied product is useless without the tying product.\(^{34}\) The reason is that buyers of the tying product would interpret any burden in the tied product as a marginal price increase for the tying unit. Thus, the firm could not reap any additional profits from those buyers with a tie that it could not have achieved by simply exercising its power to increase the price of the tying product, which is by hypothesis fixed.

However, even without affecting tying market power, tying to impair tied market rivals can increase monopoly profits if only one of those two conditions holds. If the products are used or bundled in a fixed ratio but the tied product also has separate uses, then additional profits can be made because the firm can (given diminished rival competitiveness) charge higher than but-for prices on purchases of the tied product that are not used with the tying product. Likewise, even if all buyers always use the products together, if the ratios vary, then tying that impairs rival competitiveness can increase monopoly profits, as in the above example of the printer-scanner tie where both are used to run a business.

Finally, even if the products are used or bundled in fixed ratios and lack separate utility, foreclosing the tied market might still create anticompetitive effects if it alters

\(^{33}\) For other arguments against the profit-sacrifice theory, see Elhauge, Defining Better, supra note, at 268-294; Steven C. Salop, Exclusionary Conduct, Effect on Consumers, and the Flawed Profit-Sacrifice Standard, 73 ANTITRUST L.J. 311 (2006); Elhauge, How Loyalty Discounts Can Perversely Discourage Discounting, 5 J. COMPETITION LAW & ECONOMICS (forthcoming issue 1, March 2009).

\(^{34}\) See Whinston, supra note , at 840, 850.
the degree of tying market power, as the next theory demonstrates.

E. Protecting The Degree of Tying Market Power

Modern economics literature has shown that bundling can create additional anticompetitive effects if one relaxes the assumption that the degree of tying market power is fixed and absolute. Tying can do so by either (1) foreclosing enough of the tied market to deter or delay later entry into the tying market, (2) raising the costs of a partial substitute that constrains tying market power, or (3) transferring market power from a technology that is waning to the next generation technology. Let’s take each theory in turn.

1. Impairing Entry into Tying Market. Suppose that, instead of being fixed, a firm's current tying market power is vulnerable to an increased threat of future entry if successful rival producers exist in the tied market. If so, then the firm has incentives to engage in defensive leveraging, foreclosing the tied market in order to deter or delay later entry into the tying market, thus maintaining its tying market power for longer or at a higher degree than it otherwise would have.

For example, if successful tied product makers are more likely to evolve into tying product makers in future periods, then modern literature shows it can be profit-maximizing for a firm to foreclose rivals in the tied market in order to prevent or reduce the erosion of its tying market power over time. Tying can produce this anticompetitive effect even though the rival is not just equally efficient, but more

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35 See, e.g., Dennis W. Carlton & Michael Waldman, The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries, 33 RAND J. ECON. 194, 194–96, 198–212 (2002); Dennis W. Carlton, A General Analysis of Exclusionary Conduct and Refusal to Deal, 68 ANTITRUST L.J. 659, 668–70 (2001); Feldman, Defensive Leveraging in Antitrust, 87 GEO. L.J. 2079 (1999); IX PHILIP AREEDA, ANTITRUST LAW ¶ 1705 (1991). Firms that succeed in the tied market can be more likely to enter the tying market because becoming established in that market gives them the scale, expertise, distribution network, or brand reputation to enter the tying market more successfully and/or at lower cost. Or they might be more likely to enter the tying market if they have successfully entered the tied market because the tied and tying products are both necessary to create value for buyers, the rivals' tied product has a superior value that they would have to share with the tying product maker unless they make their own tying product, and either entering two markets is more costly than entering just the tied market or there are network effects that make the rivals' tying product more valuable the more numerous the users of their complementary product.
efficient than the tying firm in that the rival can produce a higher quality product at the same cost.\textsuperscript{36}

Alternatively, a firm's current tying market power might be vulnerable to future entry or expansion by a single market rival that is more likely to enter the tying market if buyers have attractive rival options in the tied market because both products are essential inputs into some larger operation.\textsuperscript{37} For example, suppose each buyer is a business that needs both product $A$ and product $B$ to stay in business. If a monopolist in $A$ could use tying to eliminate rival makers of $B$ or to render the rival options in $B$ less attractive to buyers, then entrants will have a harder time entering market $A$ because buyers would have to combine any entrant's $A$ with either no $B$ or a less attractive $B$ option. Again, this anticompetitive effect holds even though the tied market rival is equally efficient, or at least was so before the tie or would have been without it.

**Second,** defense leveraging has even stronger—and more immediate—anticompetitive effects if a firm's tying market power is constrained by the fact that the tied product is a partial substitute for it. Then foreclosing the market for the partial substitute can immediately protect or enhance the firm's tying market power, even if such foreclosure does not deter or delay later entry into the tying market.\textsuperscript{38} Such suppression of competition from partial substitutes is one of the most anticompetitive effects of tying agreements.\textsuperscript{39}

Being partial substitutes does not mean that the tying and tied products are in the same product market, unless the existence of the tied product would constrain a tying product monopolist to price at no more than 5% above the competitive level.\textsuperscript{40} Suppose, for example, that product $A$ costs $1000 to make and product $B$ costs $2000.

\begin{footnotes}
\item[36] See Carlton & Waldman, supra note, at 198, 203; Carlton, supra note, at 669.
\item[38] See Ordover & Willig, An Economic Definition of Predation, 91 Yale L.J. 8, 38–41 (1981); Whinston, supra note, at 852–54.
\item[40] See Elhauge, U.S. Antitrust Law & Economics 207-208 (Foundation Press 2008).
\end{footnotes}
Suppose further that some buyers find $A$ and $B$ fungible and worth $3000$, whereas other buyers have special needs that make them value only product $B$. Then product $B$ would not be in the same market as product $A$, because product $B$ would not suffice to constrain a monopolist in $A$ from charging more than 5% over the competitive price, which would be $1050$. But a competitive market in product $B$ does constrain the monopolist in $A$ from charging more than $2000$. Thus, if a monopolist could foreclose the market in $B$ enough to raise the costs of rival $B$ producers to $2500$, it could increase its $A$ prices to $2500$, and if it could eliminate rival $B$ makers or raise their costs to over $3000$, then the $A$ maker could raise its prices to the full $3000$ that reflects its maximum monopoly price.

Third, defensive leveraging also has even stronger—and more permanent—anticompetitive effects if the technological trend is from the market where the firm has market power to the market where the foreclosure is occurring. In such a case, a firm can use foreclosure not just to delay the erosion of its current market power over a waning technology, but to shift to having market power over the technology of the future.\(^{41}\) This can have long-lasting adverse effects by creating market power in the new technology that otherwise might not have existed or (even if market power in the new market were somehow inevitable) by preventing the most efficient firm from winning the new market.

In all these possibilities, tying makes the degree of tying market power higher than it would have been in the but-for world without tying. It thus lowers consumer welfare and allocative efficiency, unless there is some offsetting efficiency.

\section*{F. Summary}

In short, the single monopoly profit theory depended on five highly constricting assumptions. These assumptions frequently do not hold, and probably rarely hold in combination. Relaxing each of these assumptions produces a distinctive profit-increasing effect, as the following table summarizes.

\footnote{\textit{See} Carlton & Waldman, supra note , at 194, 196–97, 212–15; Carlton, supra note , at 670–71.}
Absent offsetting efficiencies, any one of these effects is likely to harm consumer welfare, though the first three effects may sometimes enhance total welfare. The question remains: are all these profit-increasing effects deemed anticompetitive under antitrust law? It is to that question that we turn next.

### III. Supreme Court Case Law Deems All Five Profit-Increasing Effects To Be Anticompetitive

I begin with the question of positive law, leaving till the next section the policy question about whether the law is correct. On the question of positive law, the answer seems resoundingly clear. The doctrinal structure makes sense only if one deems the non-foreclosure effects to be anticompetitive. Further, the Supreme Court has explicitly embraced the proposition that all three non-foreclosure effects justify its tying doctrine.

Unless a defendant can prove that a tie has offsetting efficiencies, Supreme Court doctrine makes it illegal to tie together the sale of separate products when a firm (1) has market power in the tying market, and (2) forecloses a nontrivial dollar amount of
sales in the tied market. The fact that tying doctrine focuses on tying market power rather than on a substantial tied foreclosure share or effect has been roundly condemned, even by some Harvard School scholars who accept the existence of foreclosure effects and thus reject the single monopoly profit theory. But those who condemn current tying doctrine assume that the non-foreclosure effects should not be deemed anticompetitive. Once one dismisses all the non-foreclosure effects, it is not surprising that one would conclude that a substantial tied foreclosure share or effect should be required, because that is (by definition) necessary for the remaining theories.

If one instead assumes that the non-foreclosure effects are anticompetitive, then the structure of current tying doctrine fits quite nicely the requirements for proving anticompetitive effects under those theories. After all, those non-foreclosure effects do not require, as we saw above, foreclosing a substantial share of the tied market. But they do require tying market power. And the extent to which they harm consumer welfare by increasing price discrimination or squeezing out consumer welfare does turn on the dollar amount of the tied market covered, rather than on tied market foreclosure shares or effects.

Thus, the structure of current tying doctrine makes perfect sense if the non-foreclosure effects are deemed anticompetitive, but no sense if they are not. Thus, if we restrict ourselves to the traditional legal question of figuring out which normative theory best fits the legal doctrine, treating U.S. Supreme Court caselaw as authoritative, then the clear answer is that the doctrine must embrace the proposition that the non-foreclosure effects are anticompetitive. Nor is this structure unique to U.S. tying law, because EC tying law has the same focus on tying market power rather than tied foreclosure shares.

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44 See IX AREEDA & HOVENKAMP, ANTITRUST LAW ¶¶1703e, ¶¶1710-1711 (2d ed. 2004); Bush DOJ Single Firm Conduct Report, supra note, at 85-87.

45 See, e.g., RONALD DWORFIN, LAW’S EMPIRE (Harvard University Press 1986).
This suggests the appeal of this conclusion about what counts as an anticompetitive effect is not idiosyncratic to these U.S. cases, but has some more universal appeal.

But we need not limit ourselves to inferences from doctrinal structure, because Supreme Court caselaw has explicitly relied on the three non-foreclosure effects to justify its tying doctrine. The proposition was first stated in a dissent by Justices White and Harlan, which later cases incorporated into Supreme Court majority opinions. In *Fortner I*, the White-Harlan dissent stated “the Court should have in mind the rationale on which the illegality of tying arrangements is based,” and then stressed that the rationale included not only concerns about foreclosing competition in the tied market, but

“[i]n addition to these anticompetitive effects in the tied product, tying arrangements may be used . . . as a counting device to effect price discrimination; and they may be used to force a full line of products on the customer so as to extract more easily from him a monopoly return on one unique product in the line.”

The dissent separately cited the Bowman and Burstein articles noted above for, respectively, the points on price discrimination by counting and full-line extraction of consumer surplus, thus making clear that the dissent embraced both points and understood their differences. Further, the dissent made clear it understood that it was rejecting the single monopoly profit theory by doing so, stating that although “theoretically” a tie could not increase monopoly profits under certain assumptions, “difficulty in extracting the full monopoly profit without the tie, Burstein, A Theory of Full-Line Forcing, 55 Nw.U.L.Rev. 62 (1960), . . . or other advantages mentioned in the text, may make the tie beneficial to its originator.”

This analysis did not remain buried in a dissent. In *Jefferson Parish*, the Supreme Court justified its doctrinal focus on tying market power rather than on tied foreclosure share by quoting extensively from this *Fortner I* dissent, including its

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48 *Id.* at 513-14& n.8.

49 *Id.* at 513 n.3.
proposition that “‘In addition to these anticompetitive effects in the tied product, tying arrangements may be used . . . as a counting device to effect price discrimination; and they may be used to force a full line of products on the customer so as to extract more easily from him a monopoly return on one unique product in the line.’”\textsuperscript{50} The Jefferson Parish Court thus incorporated by reference the Fortner I reliance on price discrimination by counting and full-line extraction of consumer surplus as anticompetitive effects justifying current tying doctrine.

The Jefferson Parish Court went on to explicitly state that a focus on tying market power was justified because “the law draws a distinction between the exploitation of market power by merely enhancing the price of the tying product, on the one hand, and by attempting to impose restraints on competition in the market for a tied product, on the other.”\textsuperscript{51} While merely increasing the tying price was not necessarily anticompetitive, the Court indicated that tying was because in that case “that power is used to impair competition on the merits in another market . . . This impairment . . . can increase the social costs of market power by facilitating price discrimination, thereby increasing monopoly profits over what they would be absent the tie.”\textsuperscript{52} In support of this last proposition, the Court cited not only Bowman and Burstein, but also Stigler’s article explaining Loew’s as a ban on using tying to price discriminate across buyers of two products.\textsuperscript{53} This suggests that the Court not only embraced the proposition that all three non-foreclosure effects were anticompetitive, but shared Professor Stigler’s understanding of the rationale for Loew’s, another decision that condemned a tie based on market power and a lack of justification without requiring proof of a substantial foreclosure share.\textsuperscript{54}

Jefferson Parish’s market definition analysis likewise confirms its doctrinal reliance on non-foreclosure effects. If foreclosure effects were the only ones that mattered, then the correct way to define the geographic market would have been by looking at the alternatives to which tied rivals (here anesthesiologists) could reasonably turn. This is likely to be a much larger geographic market than the local hospital area. But if non-foreclosure effects matter, then the correct way to define the market would be

\textsuperscript{50}Jefferson Parish, 466 U.S. at 13 n.19.
\textsuperscript{51}Id. at 14.
\textsuperscript{52}Id. 15.
\textsuperscript{53}Id. 15 n.23.
by assessing the alternatives to which buyers (here patients) could reasonably turn, because that would determine whether the defendant had the market power over those buyers to inflict non-foreclosure effects through tying. The Court did precisely that when applying its tying doctrine that focuses on tying power rather than tied foreclosure share.\(^{55}\) Only when it concluded that such tying power over buyers was absent, so that substantial foreclosure would have to be proven, did it adopt the alternative market definition that focused on the alternatives reasonably available to rival anesthesiologists.\(^{56}\)

Even relatively conservative judges on the Supreme Court have embraced the non-foreclosure effects as anticompetitive effects justifying current tying doctrine. In *Kodak*, Justices Scalia, O’Connor and Thomas dissented, in as skeptical an opinion on tying doctrine as we have had in recent years. But they too quoted *Fortner I* for the proposition that price discrimination and squeezing out surplus justified the focus of tying doctrine on tying market power, stating:

> Despite intense criticism of the tying doctrine in academic circles, see, e.g., R. Bork, The Antitrust Paradox 365-381 (1978), the stated rationale for our per se rule has varied little over the years. When the defendant has genuine “market power” in the tying product – the power to raise price by reducing output – the tie potentially enables him to extend that power into a second distinct market, enhancing barriers to entry in each. In addition: “[T]ying arrangements may be used . . . as a counting device to effect price discrimination; and they may be used to force a full line of products on the customer so as to extract more easily from him a monopoly return on one unique product in the line.”\(^{57}\)

Thus, they also subscribed to the proposition that price discrimination by counting and full-line extraction of consumer surplus are separate anticompetitive effects that justify having tying doctrine focus on tying market power rather than on tied foreclosure share.

The *Kodak* dissenters went on to acknowledge that “leveraging and price discrimination concerns [are] behind the per se tying prohibition.”\(^{58}\) Further, the

\(^{55}\) *Id.* at 26-29.

\(^{56}\) *Id.* at 29 & n.48.


\(^{58}\) *Id.* at 494 (emphasis added).
Kodak dissenters pointed out that tying doctrine prohibited ties: when the manufacturer's monopoly power in the equipment, coupled with the use of derivative sales as "counting devices" to measure the intensity of customer equipment usage, enabled the manufacturer to engage in price discrimination, and thereby more fully exploit its interbrand power.59

These justices thus clearly concluded that Supreme Court caselaw embraces the view that enhancing price discrimination and increasing the exploitation of tying power are anticompetitive effects that justify current tying doctrine.

Given the premise that these non-foreclosure effects are anticompetitive, it is actually a misnomer to refer to current tying doctrine as a per se rule, or even a quasi-per se rule. For given that premise, the focus on tying market power and tied dollar amount does not mean that the doctrine fails to require evidence of anticompetitive effects. That focus instead means that tying doctrine correctly focuses on the elements necessary to achieve the anticompetitive effects at issue. Perhaps references to a per se or quasi-per se rule instead meant to reflect a notion in older cases that justifications might not be admissible in a tying case. But that notion seems rejected by more recent caselaw.60

Thus, today it seems more accurate to read Supreme Court caselaw on tying as embracing a rule of reason, where anticompetitive effects must be shown and procompetitive justifications are admissible. The significance of this caselaw is instead in its holding that non-foreclosure effects like enhancing inter-buyer price discrimination and squeezing out individual consumer surplus count as anticompetitive effects that must be considered in the rule of reason, and are properly provable by tying market power rather than tied foreclosure share or effects.

But is the caselaw correct to hold that such non-foreclosure effects should be deemed anticompetitive? That is the issue that we cover next.

59 Id. at 499.
IV. SHOULD THE NON-FORECLOSING EFFECTS BE DEEMED ANTICOMPETITIVE?

Chicago school theorists who promoted the single monopoly profit theory have long conceded that it did not apply when tying increased price discrimination, but they generally argued that such price discrimination should not be deemed anticompetitive.\textsuperscript{61} So have some Harvard School scholars.\textsuperscript{62} They essentially argued that trying to ban the first non-foreclosure effect (increased price discrimination among buyers of the tying product) was futile and likely to have harmful effects. They simply assumed that this same analysis applied to the other non-foreclosure effects because they also involved forms of price discrimination. Even as to the first non-foreclosure effect, their arguments were wrong on both scores, and certainly no more reasonable than the Supreme Court’s opposite policy conclusion. Further, those arguments are even weaker as applied to the other two non-foreclosure effects.

A. Should Price Discrimination Among Buyers of the Tying Product Be Deemed Anticompetitive?

Critics of tying doctrine have argued that prohibiting tying because it produces price discrimination among buyers of the tying product is generally futile because firms will instead just engage in direct price discrimination.\textsuperscript{63} But the Supreme Court’s contrary premise that firms generally cannot achieve the same results with direct price discrimination seems at least equally plausible. After all, a firm would not engage in tying in order to price discriminate unless tying offered some advantages over other means of price discrimination. Indeed, if direct price discrimination were equally feasible, sellers would do it because it is usually more profitable, given that tying inefficiently reduces usage of the tying product by inflating the marginal cost of usage.

\textsuperscript{61} See Bork, supra note , at 376-378; Posner, supra note , at 199-207; Bowman, supra note , at 23-24, 33; Director & Levi, supra note , at 291-92, 294; Klein, supra note , at 632-34; Posner, supra note , at 926; see also Posner & Easterbrook, supra note , at 803-808 (finding it more ambiguous whether such price discrimination should be deemed anticompetitive). The Chicago school theorists also conceded tying might be used to evade price regulation, but for this article I will assume no such price regulation exists.

\textsuperscript{62} IX Areeda & Hovenkamp, Antitrust Law ¶1710c4, ¶1711b & e (2d ed. 2004).

\textsuperscript{63} See Posner, supra note , at 203-204; IX Areeda & Hovenkamp, Antitrust Law ¶1710c4, ¶1711b & e (2d ed. 2004).
Direct price discrimination may not be feasible because it is too hard either to tell which buyers are more likely to use the product or to prevent resale from buyers who buy at lower prices to high-demand buyers.\(^6^4\) Tying the product to a consumable sold at a supracompetitive profit neatly avoids these problems. Charging per use could conceivably accomplish similar price discrimination, but it may be much harder to monitor actual usage than to monitor purchases of some consumable. Usage fees may also be less profitable than tying because the market rate for the tied product might itself be supracompetitive. Moreover, some forms of price discrimination are in fact illegal under the Robinson-Patman Act.

A related argument is that it would be arbitrary to condemn tying that produces price discrimination because direct price discrimination is not prohibited unless the conditions of the Robinson-Patman Act are met.\(^6^5\) But there are all sorts of reasons not to want to review simple price differences that do not apply to condemning tying that achieves price discrimination. Among other things, setting prices (unlike tying) is unavoidable, so that a general review of all price discrimination would raise serious administrability problems and impede routine procompetitive price changes, especially because it can be difficult to determine when price differences reflect real price discrimination. Moreover, when firms lack market power in the antitrust sense, price discrimination can efficiently increase output without increasing supracompetitive profits or harming consumer welfare.\(^6^6\) Further, the fact that the law allows direct pricing that achieves price discrimination does not imply approval of agreements in restraint of trade that enhance price discrimination. Indeed, the law might permit most direct price discrimination precisely because it is usually hard to maintain given difficulties in distinguishing among buyers or preventing resales among them. Tying that enhances price discrimination might evade those ordinary limits and justify a different result.

A more substantive argument claims that tying that achieves imperfect price discrimination among buyers should be allowed because it has ambiguous effects on

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\(^6^4\) Direct price discrimination requires market power, ascertaining buyer valuation, and preventing resale. See Kathleen Carroll and Dennis Coates, Teaching Price Discrimination: Some Clarification, 66 SOUTHERN ECON. J. 466, 471 (1999).

\(^6^5\) See Bowman, supra note, at 33.

consumer welfare and likely increases total welfare. The claim about total welfare is based on an argument by analogy: that because perfect price discrimination increases total welfare, imperfect price discrimination is likely to do so as well.

However, this analogical claim finds little support in the economic literature. Because tying to price discriminate among tying product buyers effectively charges a per-use surcharge, some argue that is effects are the same as those from second-degree price discrimination. But this categorization is debatable. When tying is used to price discriminate among buyers of the tying product, it effectively charges likely high-demand buyers of that product more than likely low-demand buyers, so is actually a form of third-degree price discrimination, where the number of tied products purchased is just the mechanism used to approximate buyer valuation for the tying product. Second-degree price discrimination would instead charge all buyers of the tying product the same price, but vary that price with the quantity of the tying product that was purchased.

In any event, either categorization undermines the analogical claim. Second-degree price discrimination will decrease total welfare if the demand curves of the high and low demand buyers do not cross. Otherwise, the effects on output and total welfare are ambiguous, so overall the likely effect is to decrease total welfare. Because total welfare includes the increased producer profits, this suggests a likely decrease in consumer welfare.

To the extent tying is better categorized as third-degree price discrimination, the welfare effects are even worse. In the typical tying case, the buyers are intermediaries who resell to consumers. In such cases, the economic literature shows that imperfect

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67 See IX AREEDA & HOVENKAMP, ANTITRUST LAW ¶¶1710a & c4, 1711, 1729i1 (2d ed. 2004); BORK, supra note , at 381, 395-401; Klein, supra note , at 633-34.
68 See IX AREEDA & HOVENKAMP, supra note , ¶1711b4(B).
69 Id. at 600.
71 See Michael L. Katz, Non-Uniform Pricing, Output and Welfare under Monopoly, 50 REV. ECON. STUD. 37, 51 (1983); Varian, supra note , at 617.
price discrimination reduces output and total welfare, other than in the extreme case when it induces inefficient integration.\textsuperscript{73} Again, this necessarily reduces consumer welfare.

Even if the relevant buyers are consumers, the economic literature shows that imperfect price discrimination decreases total welfare under balanced assumptions about the shapes of the demand curves. Given the linear demand commonly assumed in antitrust economics, the literature proves that imperfect price discrimination definitely lowers total welfare.\textsuperscript{74} The reason is that such imperfect price-discrimination does not alter the profit-maximizing output, but simply reallocates it from high value buyers to low value buyers. The deadweight loss from having a subcompetitive output thus remains the same, but the reallocation of output from high to low value buyers produces an additional decrease in consumer surplus on the purchases that are made.\textsuperscript{75}

If one does not assume linear demand, but instead simply adopts the balanced assumption that demand curves are as likely to be concave as convex, then imperfect price discrimination still decreases total welfare.\textsuperscript{76} Imperfect price discrimination among final consumers is likely to increase total welfare only if we make the unbalanced assumption that high demand buyers have more concave curves and low


\textsuperscript{75} Because of this misallocation of output, it is not the case (as is often mistakenly supposed), that price discrimination increases total welfare whenever it increases output. Increasing output is \textit{necessary} for price discrimination to increase total welfare, so that total welfare declines if price discrimination decreases output or leaves it unchanged. \textit{See} Schmalensee, \textit{Output and Welfare, supra note , at 241-42, 245; Varian, supra note , at 621. Price discrimination that increases output increases total welfare only if the welfare gains from the output increase exceed the welfare loss from the output misallocation caused by price discrimination.

\textsuperscript{76} Schmalensee, \textit{Output and Welfare, supra note , at 246. See also} Posner, \textit{Vertical Restraints, supra note , at 235-236 (2005) (acknowledging that third-degree price discrimination generally has negative effects on total welfare).
demand buyers have more convex curves.77 Because total welfare includes the additional monopoly profits earned by price discrimination, this means a balanced assumption on demand curves will produce an even sharper decrease in consumer welfare.

Moreover, even if the analogical claim were valid, the same analogical logic means that because perfect price discrimination definitely decreases consumer welfare, tying that achieves imperfect price discrimination is likely to decrease consumer welfare as well. Perhaps not in any way that can definitely be proven in individual cases. But that is a reason to have a categorical rule treating such tying as anticompetitive rather than requiring that the decreased consumer welfare be established in each case. Certainly if we assume critics of current tying doctrine bear the burden of proof, they have done nothing to disprove the premise that consumer welfare is likely to decrease when tying achieves imperfect price discrimination. Even if we ignore the problem that their argument fails under a balanced assumption about the shape of demand curves, the logic of their argument instead implies that imperfect price discrimination is likely to both increase total welfare and decrease consumer welfare.

Thus, even if their analogical reasoning were correct, the critics must ultimately rest on the claim that antitrust law does or should protect total welfare rather than consumer welfare. In my view, antitrust law clearly protects the latter. The best reading of the legislative history supports a consumer welfare reading.78 To be sure, Judge Bork argued that this legislative history supported a total welfare standard. But what he actually showed for the first 109 pages of his famous book was that the antitrust laws embodied a “consumer welfare” standard, which on page 110 he converted into a total welfare standard with the logic that “the monopoly and its owners . . . are also consumers,” so that conduct that provides benefits to a monopolist that exceed the harm to traditional consumers is “merely a shift in income between two classes of consumer.”79 He offered no evidence to suggest that Congress ever shared Bork’s understanding of what a “consumer” meant.

Nor has the Supreme Court ever embraced a total welfare standard. Instead, it has repeatedly stressed that “Congress designed the Sherman Act as a ‘consumer welfare standard,”77 supra note, at 512, 522-23; Varian, supra note, at 621-623.

78 Lande, Wealth Transfers as the Original and Primary Concern of Antitrust: The Efficiency Interpretation Challenged, 34 HASTINGS L.J. 65, 74-77, 82-106, 142-51 (1982).

79 See BORK, supra note, at 110.
In *Brooke* and *Weyerhaeuser*, the Court expressly held that below-cost pricing or overbidding should be legal when no long-term recoupment is possible because, although such pricing is inefficient (and thus reduces total welfare), it enhances “consumer welfare.” Likewise, the merger guidelines do not allow efficiencies to justify a merger that would increase prices, even if the merger would increase total welfare by creating cost-savings for the merging firm that exceed the price increase to consumers. Instead, the merger guidelines require proof that any cost-savings would be sufficiently passed on to consumers that the merger would result in a net price reduction that benefits consumer welfare. Merger caselaw requires the same.

Sound policy reasons counsel against replacing the current consumer welfare standard with a total welfare standard. First, if conduct really enhances total welfare, a firm should usually be able to structure that conduct in a way that passes on enough of its gain to convert a total welfare gain into a consumer welfare gain. Because efficiency claims are often speculative, a consumer welfare standard can force firms to put their money where their mouth is. If a firm really believes that it will reap the size of efficiency gains that it claims, it can generally use those gains to fund a consumer welfare trust or some other mechanism for lowering prices enough to give consumers a net benefit.

Second, the additional monopoly profits enjoyed by a firm tend to be dissipated by the rent-seeking costs of obtaining them or by managerial inefficiency. Because a total

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85 See Richard A. Posner, *The Social Costs of Monopoly and Regulation*, in James M. Buchanan, Robert D. Tollison, and Gordon Tullock, eds., *TOWARD A THEORY OF THE RENT–SEEKING SOCIETY* 71 (Texas A & M 1980) (arguing that the cost of competing to become a monopolist increases the deadweight loss of monopoly by eating up even the monopolist’s surplus); Elhauge,
welfare standard does not discount the additional monopoly profits, it can thus lead to inefficient results compared to a consumer welfare standard.

Third, it is much easier to coordinate international antitrust regulation around a consumer welfare standard.\textsuperscript{86} In a world of concurrent antitrust jurisdiction, the decisive regulator will be the most aggressive nation, and the nations most likely to be aggressive are net importing nations that are harmed by the conduct. Under a consumer welfare standard, this effective allocation of adjudicatory authority works well because net importing nations have incentives to apply a consumer welfare standard correctly. If nations tried to apply a total welfare standard, the decisive net importing nations would instead have incentives to misapply the standard by underweighing benefits to producers and overweighing harms to consumers.

Fourth, the redistributive effects of allowing conduct that increases monopoly profits more than it harms consumer welfare are likely to be undesirable because shareholders of monopoly firms generally have higher income than consumers. In other sorts of cases, one might argue that efficient conduct should be allowed because one can tax the profits and redistribute them to those who are harmed. But that argument depends on the premise that the tax system would be a more efficient means of redistribution. That is unclear here because taxes clearly deter efficient behavior, whereas tying that achieves imperfect price discrimination among buyers of the tying product has at best mixed efficiency effects. Further, such tying can be hard to disentangle from tying which has the other four effects that decrease total welfare.

In short, tying that leads to imperfect price discrimination among buyers of the tying product probably decreases total welfare, and even if one thought otherwise, powerful policy arguments favor consumer welfare. Further, the claim that antitrust law should embrace total welfare rather than consumer welfare would require a far more wholesale change in antitrust law than just changing tying law. One thus cannot say that current tying doctrine does not reflect a reasonable policy choice. If we start with the premise that the burden of proof is on those who would change current tying doctrine, then it seems clear that the burden has not been met.

\textsuperscript{86} \textit{Elhauge & Geradin, supra} note, at 1102-1103.
B. Should the Other Non-Foreclosure Effects Be Deemed Anticompetitive?

Critics of current tying doctrine have not really grappled with the two other non-foreclosure effects. Instead, they simply categorize them both as forms of price-discrimination, and then simply assume that the same arguments addressed in the last section apply equally to them.\(^{87}\) One can understand the temptation to do so. The second non-foreclosure effect does achieve a form of inter-buyer price discrimination, and the third non-foreclosure effect could be thought of as a form of intra-buyer price discrimination across units bought by a single buyer. But notwithstanding their conceptual similarity, their effects differ in ways that have important policy implications and that greatly weaken the critics’ arguments.

First, these two non-foreclosure effects are less likely to be achievable without tying. Consider tying that achieves price discrimination across buyers of both products. As long as the products lack strong positive demand correlation, tying will neatly achieve price discrimination even when it is difficult to observe individual buyer demand or avoid resales among buyers.\(^{88}\) Indeed, that is its whole point: it avoids any need to know buyer valuation or prevent resale. Nor need firms know the precise degree of demand correlation; they can simply experiment with bundling to see whether it increases profits, which will mean the demand correlation was not too positive. Thus, tying to price discrimination across buyers will clearly be feasible in many cases where direct price discrimination is not.

Likewise, squeezing out individual consumer surplus is less likely to be achievable through direct discrimination. Here the closest direct discrimination alternative would be two-tier pricing: charging a lump sum for the right to buy the tying good at some per unit price. Where available, this could squeeze out individual consumer welfare. However, we cannot justifiably assume that direct two-tier pricing can always squeeze out all individual consumer surplus. It may be difficult to get buyers to pay the lump sum because of financing costs or because of the risk that market conditions may change in a way that makes them want to buy less of the tying product. Tying agreements can avoid this problem because sellers would have to adjust future prices if, say, their market power in the tying product declines. Or two-tier pricing may be difficult to maintain if the firm cannot prevent resale of the tying product from a buyer

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\(^{87}\) See Bork, supra note , at 375-378; Posner, Antitrust Law, supra note , at 200 n.15, 235; IX Areeda & Hovenkamp, Antitrust Law ¶1711 & n.2 (2d ed. 2004).

\(^{88}\) Adams & Yellen, supra note, at 476.
paying the fee to another buyer who doesn’t. Demand uncertainty may also make two-part tariffs less effective than bundling at squeezing out individual consumer surplus.\textsuperscript{89} In at least some cases, tying will be a feasible strategy for squeezing out individual consumer surplus that two-tier pricing cannot reach.

Indeed, although two-tier pricing is available in theory, it is less prevalent in actual practice than charging different prices to buyers of the same product.\textsuperscript{90} It also seems to be a feasible substitute less often. One often observes a tying firm charging different prices to different buyers before it starts to tie. It is rarer to see a firm engage in two-tier pricing before it begins to tie. Further, if two-tier pricing were feasible, firms are likely to use it rather than tying to squeeze out individual consumer surplus because two-tier pricing would be more profitable, for two reasons. One is that the lump sum charged would not be restricted by the monopoly price for the tied good, and thus can fully extract the consumer surplus at the tying monopoly price. The other is that the marginal price for the tying good could be lowered to marginal cost, thus allowing the firm to extract the larger consumer surplus that would have existed at competitive tying prices.

**Second**, the claim that price discrimination has ambiguous effects on consumer welfare but likely increases total welfare is even more clearly wrong for the other two non-foreclosure effects. For tying that price discriminates across both products, this claim has matters precisely backwards. There consumer welfare clearly is harmed, and it is the effects on total welfare that are ambiguous.\textsuperscript{91}

Likewise, using tying to squeeze out individual consumer welfare has unambiguously negative effects on consumer welfare. When two-tier pricing is not a feasible alternative, requirements tying where buyers purchase multiple units of the tying product will definitely harm consumer welfare by squeezing out individual consumer surplus.\textsuperscript{92} The effects are less ambiguous than with enhancing inter-buyer price discrimination because squeezing out individual buyer consumer surplus does not harm some consumers and benefit others. Further, unlike with inter-buyer price

\textsuperscript{89} See Greenlee, et al., supra note , at 1136, 1138, 1143-44.

\textsuperscript{90} See Varian, supra note , at 600, 617 (noting that third-degree price discrimination is probably the most common form of price discrimination).

\textsuperscript{91} See supra II.B.

\textsuperscript{92} See Burststein, supra note , at 68–69; Mathewson & Winter, supra note , at 567–69; discussion above at ____.
discrimination, the effects do not depend on buyers differing in their preferences. Tying to squeeze out individual consumer surplus will also decrease total welfare whenever the tied buyers’ purchases or valuation of the tying product are significantly larger than their purchases of the tied product. That condition generally seems to hold in most actual tying cases.

Finally, tying to squeeze out individual consumer surplus also has more negative distributive effects. Squeezing out individual consumer surplus transfers wealth from buyers to the tying producer. This is likely to be unattractive on distributive grounds because the average buyer generally has less income than the average shareholder. In contrast, inter-buyer price discrimination tends to make prices higher for buyers who are not price sensitive and lower for buyers who are. Because the latter will tend to have lower income, this is more likely to have desirable distributive effects.

V. HOW THIS ANALYSIS HELPS LIMIT AND ILLUMINATE THE CASES AND DOCTRINE

The analysis thus far indicates that the focus of current tying doctrine on tying power rather than tied foreclosure share can reasonably be defended given the relevant non-foreclosure effects. We can use this analysis to define the proper limits to this doctrine and to illuminate the cases and various doctrinal issues.

A. The Cases and Proper Limits to the Quasi-Per Se Rule

While the relevant non-foreclosure effects explain why it generally makes sense to have a tying doctrine that focuses on tying power rather than tied foreclosure share, that does not mean it makes sense to do so in cases where market conditions negate the possibility of non-foreclosure effects do not hold. In such cases, a substantial tied foreclosure share or effect is necessary for anticompetitive effects, which would seem to justify an exception to the so-called quasi-per se rule. Such an exception would be warranted when the products (1) are used or bundled in a fixed ratio and (2) lack separate utility, because those conditions negate all three non-foreclosure effects. Indeed, we will see that Supreme Court tying opinions have been most divided when some justices held empirical premises that matched those two conditions. Thus, understanding the non-foreclosure effects not only helps to explain the doctrine, but to predict its fault lines.
Jefferson Parish involved a tie of anesthesiology to hospital services.\(^9^3\) Obviously, these are services that are far more useful with each other, so it seems likely that demand for them would be positively correlated. If we also assume that medical need fixes the ratio of anesthesiology to hospital services, then this could well represent the atypical case where the conditions for non-foreclosure effects fail to hold. Indeed, the Court and concurrence assumed that at least one part of the ratio was fixed, concluding that medical need dictates the amount of anesthesiology services for each surgery, making the use of tying to enhance inter-buyer price discrimination implausible.\(^9^4\) This factual premise is actually debatable,\(^9^5\) but even if it were true it would not mean that the ratio was fixed because the number of hospital days and intensity of hospital services probably do vary, especially in the modern era of managed care where insurers are active decisionmakers about consumption decisions. Thus, the amount of the tying hospital services purchased probably could vary from the amount of tied anesthesiology used, which could permit squeezing out individual consumer surplus.

However, the Court and concurrence did not focus on whether fixed ratios and positively correlated demand negated non-foreclosure effects in a way that justified an exception to the quasi-per se rule. Instead, the issues were framed around whether, as the concurring justices argued: (1) the Court should completely repeal the quasi-per se rule that focused on tying market power rather than tied foreclosure share, and (2) two items should be deemed a single product, incapable of being tied, whenever the tied product is useless without the tying one.\(^9^6\)

Because concurring claim (1) was generalized to all tying cases, the Court focused on the fact that the quasi-per se rule made sense in cases where market conditions did not negate non-foreclosure effects.\(^9^7\) Given the generality of the claim, the Court thus had little trouble rejecting it. But the fact that claim (1) was plausible on the facts of the


\(^{9^4}\) Id. at 28 n.47; id. at 36 n.4, 43 (Justice O'Connor, joined by Burger, C.J., and Powell & Rehnquist, JJ, concurring in the judgment.)

\(^{9^5}\) For example, anesthesiologists might vary in how often they visit a pregnant woman in labor, how much they monitor post-operation recovery, whether they provide 24-hour coverage, or the extent to which they use highly-trained anesthesiologists for particular procedures.

\(^{9^6}\) Id. at 35, 38-40, 43, 46 (Justice O'Connor, joined by Burger, C.J., and Powell & Rehnquist, JJ, concurring in the judgment.)

\(^{9^7}\) Id. at 12-18.
particular case probably fueled the concurrence’s skepticism and helps explain why this case produced such a divided opinion.

Concurring claim (2) came closer to the relevant issue, but was overbroad in two ways. First, without fixed ratios, a lack of separate utility would not alone rebut the possibility of non-foreclosure effects. In rejecting this claim, the Court explicitly recognized this point, pointing out that: “In fact, in some situations the functional link between the two items may enable the seller to maximize its monopoly return on the tying item as a means of charging a higher rent or purchase price to a larger user of the tying item.” See n. 23, supra.”98 And the note 23 to which the Court referred was precisely the footnote pointing out that scholarship by Bowman, Burstein, and Stigler showed that tying can allow a tying firm to extract greater monopoly profits.99 Thus, standing alone, a lack of separate utility cannot negate non-foreclosure effects, and thus cannot justify an exception to standard tying doctrine.

Second, deeming the two items a single product would in many cases oust not only the quasi-per se rule, but also ordinary rule of reason inquiry even when substantial tied foreclosure did exist, because it would mean the case just involves the sale of a single product.100 This would be unjustified because a lack of separate utility does not eliminate the possibility that foreclosing the tied market might preserve the degree of tying market power. Nor would a lack of separate utility eliminate the plausibility of adverse foreclosure effects within the tied market absent the additional factor of fixed ratios. To the contrary, the absence of alternative uses for the tied product would indicate that the tie is more likely to achieve a substantial tied foreclosure share that could lead to the two foreclosure effects. Thus, the Court was right to reject the argument that two items should be considered a single product when they are functionally related or separately useless.101

The Kodak dissenters came much closer to the mark. There the dissenters argued that the tied parts and service should be deemed either a single product or outside the scope of the quasi-per se rule because parts and service were (1) used in fixed ratios

98 Id. at
99 Id. at 15 n.23.
100 In the actual case, there was an exclusive dealing agreement that made the arrangement independently reviewable, but that will not always be the case.
101 Jefferson Parish, 466 U.S. at 19 & n.30.
and (2) useful only with each other. This, the dissenters argued, meant that no incremental monopoly profit could be gained from a tie of parts to service that could not have been achieved by simply raising parts prices. Leaving aside possible price discrimination between those subject to the tie and those not, those factors would (if true) indeed negate non-foreclosure effects from tying. The fixed ratios would eliminate the possibility that tying might achieve price discrimination among buyers of the tying product or squeeze out individual consumer surplus. The lack of separate utility would establish the sort of strong positive correlation that would negate price discrimination across both products. Those two factors would also eliminate the possibility that foreclosing a substantial share of the tied service market would create tied market power that the defendant could exploit against purchases that otherwise would not have been subject to its tying market power in parts.

Those two factors thus (if true) would come close to knocking out four of the five possible anticompetitive effects from tying. However, they would not eliminate the fifth possibility: that foreclosing the tied market might enhance tying market power. Suppose, though, we add a third premise, which was probably implicitly assumed by the dissent: that Kodak had patents over parts for its own machines, which presumably is how it prevented others from making those parts. If so, then it is likely that rivals could not enter the parts market with or without the tie, so that deterring rival entry into the tying parts market was unlikely to increase the degree of tying market power, at least during the patent term. True, if service were a partial substitute for parts, then foreclosing service might enhance tying market power over parts by raising prices for this partial substitute. But this would be inconsistent with the Kodak dissenters’ factual premise that parts and services are used in fixed ratios because partial substitutes by definition can be used in varying ratios. Thus, given the dissenter’s factual premises, it is not surprising that the facts of this case produced a divided opinion.

However, there was reason to doubt the validity of the dissent’s factual premise on separate utility and fixed ratios. As the Court pointed out, in fact service is sometimes purchased without parts, and those who self-service buy parts without buying service. Thus, the ratio of usage also varies. This reintroduces all the possible anticompetitive effects. Further, it seems quite likely that service is a partial substitute

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103 Kodak, 504 U.S. at 483 & n.7.
for parts. After all, firms that use more service to maintain their machines tend to have them break down less often, and thus need fewer parts. Further, firms can sometimes use additional service to repair existing parts without replacing them. This means that foreclosing this partial substitute could increase the degree of tying power over parts.

Moreover, while the usual price discrimination issue with tying involves price discrimination among buyers subject to the tie, this case raised the distinct issue of discrimination between those buyers and buyers who were not subject to the tie. The reason is that the tie did not apply to buyers who supplied their own service, which the Court noted could permit a form of price discrimination between self-service buyers and buyers who buy service.104 If the need to buy service is a good proxy for buyer unsophistication or willingness to pay more for parts, then a tie can aid price discrimination in parts by helping to sort out buyers even if the ratios are fixed. The Kodak dissenters dismissed this claim with the observation that Kodak could have achieved the same price discrimination by simply charging more for parts sold to those who buy service.105 But such direct price discrimination might have been hard to maintain because those who do self-service may resell parts or misrepresent who the buyer is. These problems are avoided by charging all buyers the same price for parts, but tying those parts to high service prices, which would naturally affect only buyers who could not self-service. A tie here might thus have allowed price discrimination that was not otherwise possible.

In short, the cases where many justices have expressed skepticism about applying the quasi-per se rule map well onto cases where it was plausible that fixed ratios plus a lack of separate utility negated likely non-foreclosure effects. Thus, non-foreclosure effects not only explain the quasi-per se rule, but also help explain fault lines in the doctrine by predicting when its applicability is most likely to be contested. The Court has never quite directly confronted the issue whether fixed ratios plus a lack of separate utility should (at least presumptively) make the quasi-per se rule inapplicable. Either the legal argument was not quite raised in that fashion, as in Jefferson Parish, or the factual premise for that argument was dubious, as in Kodak. But the analyses in the majority and non-majority opinions suggest that, in a proper case, such an argument for cabining the quasi-per se rule might well be received favorably.

104 Kodak, 504 U.S. at 475-76.
105 Id. at 499 n.3 (Scalia, J., joined by O'Connor & Thomas, JJ., dissenting).
Although there has been an unfortunate tendency to instead discuss this issue under the rubric of whether the two items should be considered a single product, it is more appropriate to consider it a reason not to apply the quasi-per se rule because that makes it clearer that rule of reason review would remain available in cases where the tie does contribute to substantial market foreclosure.

The above analysis also helps explain the D.C. Circuit’s en banc decision in Microsoft. In that case, the court upheld the tying claim under a monopolization rule-of-reason standard, but held that the quasi-per se rule was inapplicable.\textsuperscript{106} The court reasoned that the tie there was unlike the ones considered in past cases that invoked the quasi-per se rule because the case involved physical integration and claimed justifications. The existence of justifications seems irrelevant if, as now seems clear, justifications are admissible under the current quasi-per se rule.\textsuperscript{107} But the physical integration indicated a fixed ratio, and at the time a browser was clearly useless without a operating system on which to run. Those two factors suggested that none of the three non-foreclosure effects could apply, making the quasi-per se rule inappropriate. Indeed, those same factors also suggested that the tie was unlikely to create additional market power against buyers of the tied product. This left the fifth possibility, that the tie might help preserve tying market power. This was the one the court relied upon for its monopolization rule-of-reason holding, reasoning that Microsoft feared that browsers would in the future be able to run applications in competition with the operating system.

Interestingly, the European Commission, in its own claim that Microsoft tied its media player to its operating system, also declined to rely on the EC’s own quasi-per se tying rule, and instead required evidence of substantial tied foreclosure.\textsuperscript{108} This tribunals on both sides of the Atlantic share the intuition that the quasi-per se rule should not apply in cases where market conditions negate the non-foreclosure effects.

My recommended exception correlates with, but differs from, the claim that technological tying should not be treated like contractual tying.\textsuperscript{109} Most technological ties involve fixed ratios and tied products that are useless without the tied product, and

\begin{itemize}
\item \textsuperscript{106} United States v. Microsoft Corp., 253 F.3d 34, 84 (D.C. Cir. 2001) (en banc).
\item \textsuperscript{107} See supra Part III.
\item \textsuperscript{108} Case T-201/04, Microsoft Corp. v. Commission ¶¶977-984, 1031-1036 (CFI 2007).
\item \textsuperscript{109} See Bush DOJ Single Firm Conduct Report, supra note 8, at 87-89 (collecting sources).
\end{itemize}
to the extent they do, an exception for them would be consistent with the claim here that such ties should not be covered by the quasi-per se rule. But sometimes a technological tie may permit the tying product to work with only one consumable whose usage is variable. Other times the ratio may be fixed, but the tied product may also have other uses. A technological tying exception to the quasi-per se rule would thus be over-inclusive. It would also be under-inclusive because there are many non-technological ties that involves fixed ratios and a lack of separate utility.

To be sure, technological tying may often involve procompetitive justifications. However, one cannot assume that is so because firms may integrate technologies in order to achieve anticompetitive effects. Indeed, adopting a legal exception for technological tying would predictably induce more anticompetitive technological integration. This is particularly true for technologies like software, because their plasticity makes the costs of integration low. So one should not judge the desirability of a technological tying exception by looking at how often technological integration today is procompetitive, because current practices reflect the lack of such an exception. Further, many nontechnological ties involve procompetitive justifications. Thus, a technological tying exception is both overinclusive and underinclusive if it is meant to target cases where procompetitive justifications exist. It is better to focus directly on the elements that do bear on the existence of both procompetitive justifications and anticompetitive effects.

B. Other Doctrinal Issues

Understanding the four theories of anticompetitive effects that animate current tying law also illuminates other doctrinal issues. First, it shows that damages should generally be available to buyers in tying cases. Some have mistakenly stated that “a buyer can be forced to pay an above-market price for the tied product only if the seller reduces the price of the tying product by the same amount.”110 But this statement clearly reflects an application of the mistaken single monopoly profit theory, which unfortunately has persuaded some courts to presumptively hold that buyers cannot prove damages.111 As shown in Part II, even without a substantial tied foreclosure share, tying by a firm with market power generally harms buyers absent offsetting

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111 Id. at 464-465.
efficiencies. If tying causes substantial tied market foreclosure, it can also make tied or tying market power higher than it would be in the but-for world, which also injures consumers. Absent efficiencies, it is the unusual case when tying does not harm buyers, and those unusual cases are likely cases where tying liability (or at least the quasi-per se rule) should not apply at all.

The same logic disproves the related claim that buyers who reject a tie cannot be harmed because they “cannot be made to pay more than the market price for the combination.”112 Even without substantial tied foreclosure, buyers who reject a tie can be relegated to just the consumer surplus they get from buying the tied product at market prices, when absent the tie they would have enjoyed that plus the additional consumer surplus they get from buying the tying product at monopoly prices. If the tie does cause substantial tied foreclosure, it can also elevate tied and tying market prices above but-for levels, thus forcing buyers to pay more than they would have paid without the tie.

Another frequent claim is that “any time there is an overcharge on the tied good, there must be an undercharge on the tying good.”113 This claim is more modest because it does not assert that the overcharge must equal the undercharge. However, it is also incorrect because Section II.C shows that, even without substantial foreclosure, tying can create an overcharge in the tied product without any undercharge in the tying product, and in fact generally does so if covered buyers’ spending or valuation for the tying product is sharply higher than for the tied product. Further, Sections II.D-E show that, if there is substantial foreclosure, it can increase both tied and tying market power, and thus create overcharges in both the tying and tied markets.

Second, the relevant effects explain why, although the Supreme Court has talked about the “forcing” effect that tying has, it has rejected the argument that tying should not be condemned if buyers would have bought the tied product from the defendant anyway.114 This rejection makes sense because the fact that a buyer would have bought the tied product from the defendant even without a tie would not prevent any of the non-foreclosure effects from increasing the prices at which buyers would buy the combination of tying and tied products. Buyers who would have bought the same

112 Id. at 465.
113 Id. ¶394, at 549.
product from the defendant would also still suffer from any foreclosure effects because, absent that foreclosure, they would have been able to buy the defendant product at lower prices. The rejection also makes factual sense because rational firms would not bother having a tying agreement unless it were expected to alter buyer choices.

Third, the relevant effects have implications for what should count as antitrust injury. Some have argued that tying that covers a small share of an intermediary market does not create antitrust injury because raising prices or price discrimination to intermediary buyers does not lessen competition unless it is passed on to downstream consumers. But increased prices or price discrimination are precisely the non-foreclosure effects deemed anticompetitive under Supreme Court case law. Antitrust injury doctrine should not be manipulated to circumvent substantive antitrust law about what constitutes an anticompetitive effect, nor to effectively impose a substantial foreclosure share requirement that substantive tying doctrine has rejected. Nor is it true that conduct that raises prices to intermediaries must be passed on to downstream consumers to constitute antitrust injury, as one can readily see by considering how courts would treat horizontal price-fixing to intermediaries. Requiring affirmative proof of such a pass-through also seems inconsistent with the Illinois Brick rule that concentrates antitrust claims in direct purchasers to avoid difficult inquires into the degree of pass-through.

Fourth, as noted above, the relevant market definition differs for non-foreclosure and foreclosure effects. To the extent the claimed injury involves non-foreclosure effects, the relevant market is the market to which buyers of the tying product reasonably can turn. To the extent the claimed injury involves foreclosure effects, the relevant market is the market to which tied product rivals could reasonably turn.

Finally, understanding the relevant anticompetitive effects clarifies the issue of bundled discounts, which is the topic of our next section.

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115 *See II Areeda, Blair & Hovenkamp, Antitrust Law ¶358b, at 465-466 (2d ed. 2000).*


117 *See supra Part ___.*
VI. BUNDLED DISCOUNTS

The most important thing to get straight about bundled discounts is that they need not reflect true discounts at all. Unfortunately, the rhetoric of the word “discounts” has beguiled many into mistakenly assuming that bundled discounts must lower prices to buyers and thus should be considered presumptively procompetitive. However, all a bundled “discount” means is that the defendant charges higher prices to buyers who won’t comply with a bundling condition than to buyers who will. Because the defendant is free to set the noncompliant prices at whatever level it wishes, it can set them above the but-for levels that would have prevailed without the tie. There is thus no warrant for presuming that noncompliant prices equal but-for prices, and thus no justifiable grounds for assuming that “discounts” from noncompliant prices reflect a true discount from but-for levels. If the unbundled price charged to noncompliant buyers exceeds the but-for level, then the program in fact imposes a price penalty.

Proper analysis must thus not pre-judge the merits by assuming that bundled discounts reflect real discounts from but-for prices. Instead, we need to assess whether unbundled prices are greater or lower than but-for levels, and then analyze the effects under both possibilities. Because part of the question will be when bundled discounts have similar effects to tying, I will refer to the products not as tying or tied, but as “linking” and “linked,” where the linking product means the one over which the defendant has market power.

As the analysis will show, if the unbundled price for the linking product exceeds its but-for price, then bundled discounts can produce all the same non-foreclosure effects as tying. Indeed, one can think of tying as simply a special case of bundled discounts, where the unbundled price on the linking product is set at infinity. Thus, if those non-foreclosure effects merit condemnation, as Supreme Court tying cases clearly hold, then so do bundled discounts whenever the unbundled linking price exceeds but-for levels. When the unbundled price for the linking product is set to equal but-for levels,

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118 See Daniel A. Crane, Mixed Bundling, Profit Sacrifice, and Consumer Welfare, 55 EMORY L.J. 423, 465 (2006); Hovenkamp, Discounts and Exclusion, 2006 UTAH L. REV. 841, 844; Thomas A. Lambert, Evaluating Bundled Discounts, 89 MINN. L. REV. 1688, 1726 (2005). All the points made in Professor Hovenkamp’s article about bundled and loyalty discounts reappear in IIIA AREEDA & HOVENKAMP, ANTITRUST LAW ¶749 (2008), but none of these points can fairly be attributed to Professor Areeda given that they were written over a decade after his unfortunate demise. I will thus cite only to Professor Hovenkamp’s article for these points.
then the same non-foreclosure effects are not possible.

Whether or not the unbundled price on the linking product exceeds the but-for price, bundled discounts that cover a substantial share of the linked market can also produce adverse foreclosure effects. Bundled loyalty discounts can also produce a distinctive anticompetitive effect that tying does not produce – discouraging price competition – which also generally requires substantial foreclosure.\(^{119}\)

This analysis thus supports the following legal test. When the unbundled price for the linking product exceeds its but-for price, bundled discounts should be equated with tying. In such cases, bundled discounts should be condemned based on linking market power and an absence of procompetitive justification, with (as argued for tying) an exception when market conditions negate non-foreclosure effects. When the unbundled price does not exceed the but-for price, then bundled discounts should not be equated with tying, but rather should be condemned only when a substantial foreclosure share or effect is proven and offsetting efficiencies are not shown.

The analysis below also shows that bundled discounts can raise prices even if the bundled or incremental price is above cost. Thus, the cost-based tests adopted by some courts and commissions are not only mistaken, but perversely immunize the most anticompetitive form of bundled discounts, as does the general equally efficient rival test that has been proposed by Judge Posner and other commentators. I also show that the relevant anticompetitive effects are not well-captured by alternative tests that focus on the proportion of buyers who accept the bundle or on whether the unbundled price exceeds the pre-bundle price.

\section*{A. The Same Non-Foreclosure Effects as Tying Are Possible If and Only If the Unbundled Price For the Linking Product Exceeds the But-For Level}

The analysis below will generally assume bundled loyalty discounts, that is discounts on the linking product that require buyers to buy all or a high share of the linked product from the defendant. Like unit-to-unit tying, unit-to-unit bundled discounts cannot squeeze out individual consumer surplus or price discriminate among buyers if preferences for the two products are positively correlated. However, even unit-to-
unit bundled discounts (like its tying parallel) can aid inter-buyer price discrimination when buyer valuations of the two products lack strong positive correlation.

1. Squeezing Out Individual Consumer Surplus. Take first the case where the bundle does not cover a substantial share of the linked market, but buyers buy multiple units of the linking product and the two products are not used or bundled in a fixed ratio. Then the economic literature clearly proves that bundled loyalty discounts produce precisely the same squeezing out of individual consumer surplus as requirements tying. In fact, it proves that the bundling firm would maximize profits by setting an unbundled price for the linking product that chokes off unbundled purchases. To illustrate, consider the hypotheticals discussed in Section II.C, only now assume that, instead of tying, the defendant offers an unbundled printer price that equals the Y-intercept of $1000, with its price discounted to a lower level for buyers who agree to buy scanners from the defendant. Then precisely the same conclusions that were elaborated in Section II.C would still follow.

If the sum of the consumer surpluses at monopoly prices in the linking and linked markets (CSM_{linking} + CSM_{linked}) exceeds the consumer surplus at competitive prices in the linked market (CSC_{linked}), then the defendant will maximize profits by setting the “discounted” prices for both the linking and linked products to equal their monopoly prices. When demand is linear, this will be true whenever the covered buyers’ consumer surplus at monopoly or competitive prices would be more than three times larger for the linking product than for the linked product. Clearly in this case the nominal bundled “discounts” do not reflect any discount from but-for prices at all. To the contrary, the “discounted” linking price equals its but-for price and the “discounted” linked price exceeds it, so that the overall bundled discount price clearly exceeds but-for levels. The bundled discount here also clearly worsens allocative efficiency by resulting in monopoly prices in both markets rather than just one, and excludes equally efficient rivals in the linked market who price at cost.

If instead CSM_{linking} + CSM_{linked} < CSC_{linked}, then the bundled price for the linking

\[120\] See Greenlee, et al., supra note , at 1137; Nalebuff, Bundling as a Way to Leverage Monopoly, supra note , at 2-4.

\[121\] See Greenlee, et al., supra note , at 1137.

\[122\] Id.; see supra Section II.C.

\[123\] See Greenlee, et al., supra note , at 1137.
product will be lower than the but-for monopoly price.\textsuperscript{124} However, the price for the linked product will exceed its but-for price, and the combined bundled price will result in lower consumer welfare than in the but-for world without bundled discounts, where buyers would have bought the linking product at the monopoly price and the linked product at the competitive price.\textsuperscript{125} Thus, here again, the overall bundled discount price leaves buyers worse off than but-for prices and excludes equally efficient rivals pricing at cost. It also worsens allocative efficiency whenever the covered buyers’ consumer surplus at monopoly or competitive prices for the linking product would be more than $16/9$th of the same surplus for the linked product.\textsuperscript{126} Thus, as with requirements tying, bundled loyalty discounts are (when the unbundled linked price exceeds the but-for price) likely to harm total welfare in the typical case where the covered buyers purchase or value the linking product at significantly higher levels than the linked product.

The same effects would not follow if the unbundled price for the linking product equaled its but-for price. Then the price with the bundled discount on the linking product must necessarily be lower than its but-for price. Further, because the alternative to accepting the bundled discount would be buying both products at but-for prices (given that here we assume no substantial foreclosure affecting market prices in the linked market), consumer welfare cannot be lowered. Instead, the economic literature shows that a bundling firm will set prices so that consumer welfare with the bundled discount equals the consumer welfare without it.\textsuperscript{127} Total welfare would increase (because the bundling firm earns higher prices), but the bundled discount would still exclude an equally efficient producer of the linked product who was pricing at cost.\textsuperscript{128}

However, unless antitrust law requires bundling firms to set unbundled prices equal to but-for levels, then it would not be profit-maximizing for firms to do so. Instead, they would always make more profits by setting unbundled prices that exceed but-for levels, and maximize profits by setting the unbundled price for the linking product to

\textsuperscript{124} Id.
\textsuperscript{125} Id.
\textsuperscript{126} Id.; see supra Section II.C.
\textsuperscript{127} Id. at 1136.
\textsuperscript{128} Id.
equal the price that chokes off unbundled purchases. The latter would thus be the predictable result in a regime that allowed bundled discounts that were above cost. Such a regime would thus produce bundled discounts that clearly harmed consumer welfare, and also harmed total welfare in the typical case where the covered buyers purchase or value the linking product at significantly higher levels than the linked product.

A firm might also set the unbundled price for the linking product above but-for levels but not quite at the choke price that eliminates all demand. Such a bundled discount could not squeeze out all the consumer surplus that buyers would get at the monopoly price for the linking product, because buyers could always get some of that consumer surplus by rejecting the bundle. However, such a bundled discount could squeeze out all of the difference between the consumer surplus obtainable by buying the linking product at monopoly prices and the consumer surplus obtainable by buying the linking product at the higher unbundled price. As long as that consumer surplus difference exceeds the consumer surplus buyers would lose from buying the linked product at an elevated price, buyers will accept the bundled discount. The linking firm thus would set the bundled price for the linked product to squeeze out the whole difference, and all buyers would suffer lower consumer welfare.

Finally, all the same effects follow even if the bundled discounts demand less than 100% loyalty in the linked product. With a lower loyalty percentage, the defendant would simply set a higher linked price to squeeze out the same consumer surplus on the linking product.

2. Price Discrimination Among Tying Good Buyers. Now consider a case where the bundled items are used in variable ratios and demand for them is positively correlated. For example, suppose buyers each buy one printer which they use with cartridges, and the amount of cartridges they use correlates well with how much they value the printer. Suppose further that (if tying were legal) a firm with monopoly power over printers could price discriminate by tying it to cartridges, with the printer sold at marginal cost and the cartridges sold at a supracompetitive price. Then (if bundled discounts were legal) a firm could achieve precisely the same effect by setting the

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129 See Greenlee, et al., supra note , at 1137. In actual cases, there will likely be enough variation in buyer demand that we see them make some unbundled purchases from the defendant even when it tries to maximize profits in this way.

130 Id. at 1135 n.18.
unbundled price for printers to equal the choke price, but offering printers at a bundled discount that makes the printer price equal marginal cost to buyers who agree to buy their cartridge needs from the firm at elevated prices.

Notice that the firm could not achieve the same effect if the unbundled printer price equaled its but-for monopoly price, because then all the buyers who value the printer at more than its monopoly price would reject the bundled discount. However, the firm could still price discriminate by setting an unbundled price for the linking product that exceeded the but-for monopoly price but was not quite as high as the choke price. Such a bundled discount would not price discriminate as perfectly as setting unbundled prices to equal the choke price, but it would improve price discrimination. Thus, this non-foreclosure effect also requires an unbundled price that exceeds the but-for price.

The same price discrimination effects could be achieved even if the loyalty condition were less than 100%. The linking firm would just have to increase the linked price to compensate for the fact that increased usage of the linked product produces somewhat fewer purchases of the linked product. Suppose, for example, a printer monopolist bundled a discount on the printer to buying 90% of cartridges from the monopolist. Then the monopolist can accomplish the same price discrimination as with a 100% loyalty condition by simply raising the cartridge price by 11% above the price it would have charged with a 100% condition.

3. Price Discrimination Across Buyers of Both Products. Consider next a case where buyer demand for the linking and linked products has no strong positive correlation. Then, bundled discounts could achieve price discrimination across buyers of both products for the same reasons that tying can.\textsuperscript{131} Indeed, bundled discounts are more profitable than tying as a means of achieving such inter-buyer price discrimination.\textsuperscript{132} The reason is that the bundled discount could offer each product separately for the bundled price minus the cost of making the other product. With that pricing, the firm will make as much money whether buyers take the bundle or just one of the products. But it would sell to more buyers than with tying because it will add sales of one product to some buyers who valued the other product at less than its cost. Further, although using tying to achieve price discrimination across buyers of both products

\textsuperscript{131} See McAfee, supra note, at 374, 377; Adams & Yellen, supra note, at 478-488.

\textsuperscript{132} See McAfee, supra note, at 374; Adams & Yellen, supra note, at 483 & n.12.
requires market power in both products, bundled discounts can achieve the same effect with market power in only one product.  

With market power in both products, the firm would maximize profits by setting unbundled prices for both products that exceed the but-for price. With market power in only one product, the firm would maximize profits by setting the unbundled price for that product above the but-for price. If a firm were constrained not to charge unbundled prices that exceeded but-for levels, the firm might still be able to make (somewhat less) profits by using bundled discounts to price discriminate across buyers of both products. But in that case the firm would be offering buyers a Pareto improvement because buyers would take the bundle only if they preferred the bundle to unbundled prices that (by hypothesis) equaled but-for prices. Thus, under this theory, non-foreclosure effects harmful to consumer welfare are possible only when unbundled prices exceed but-for prices.

**B. Foreclosure Effects Are Possible Whether or Not If the Unbundled Price For Linking Product Exceeds the But-For Level**

1. **Impairing Linked Rival Competitiveness.** Bundled discounts that foreclose a substantial share of the linked market can impair rival competitiveness in that market. This is trivially true when the unbundled price for the linking price equals the choke price, for then bundled discounts are economically indistinguishable from tying. But it is equally true when the unbundled price for the linking product is only slightly above the but-for price, and even when the unbundled price equals the but-for price so that the bundled discount gives some real discount on the linking product.

The reason is that externality problems give buyers an incentive to agree to anticompetitive foreclosing agreements that produce large marketwide price increases in exchange for a nominal individual discount, even though the result of all them agreeing is that they exclude the monopolist's rivals and then pay higher prices than

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137 See *id*.  

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they otherwise would have paid. For example, if there are 10,000 consumers of a product, any individual agreement to an exclusionary commitment that contributes to a marketwide price increase externalizes 99.99% of the harm caused by that increase in market prices. Each consumer would thus agree in exchange for any individual discount (or avoided price penalty) as long as it exceeded more than 0.01% of the marketwide price increase.

One can analogize the externality problem to the problem of why drivers change lanes to try to get ahead in traffic even though the practice of all of them doing so slows down traffic. The problem is that it is individually rational for each driver to change lanes when it sees one lane moving faster to get a slight individual edge, but that driver’s lane change slows down many other drivers. And that driver is in turn slowed down when all the other drivers do the same. Thus, frequent lane changes that are individually rational can, because of the externality problem, collectively harm all drivers. Similarly, agreeing to exclusionary commitments to earn small nominal “discounts” is individually rational even though it is collectively harmful to all buyers.

The externality problems are even worse when the relevant buyers are not consumers, but rather are intermediaries who resell to others. Such intermediate buyers externalize an even higher percentage of the harm by passing much or all of the price increase on to downstream buyers. Intermediary buyers are thus even more likely to agree to anticompetitive foreclosing commitments.

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138 See Farrell, Deconstructing Chicago on Exclusive Dealing, 50 ANTITRUST BULLETIN 465, 476 (2005); Elhauge, How Loyalty Discounts, supra note ; Elhauge, Defining Better, supra note, at 284-92; Segal & Whinston, Naked Exclusion: Comment, 90 AM. ECON. REV. 296 (2000); Michael D. Whinston, Lectures on Antitrust Economics 144-47, 166 (2006); Kaplow & Shapiro, Antitrust, in 2 Handbook of Law & Economics 1073, 1203-1210 (eds. Polinsky & Shavell, 2007); Rasmusen, et al., supra note ; Elhauge, U.S. Antitrust, supra note , at 406-410. Although many of these models focus on the simple case of excluding an entrant, the results are equally applicable when the exclusionary commitments prevent small rivals from achieving economies of scale. Whinston, supra, at 147; Kaplow & Shapiro, supra, at 1206; Elhauge Defining Better, supra, at 320-23; Elhauge, U.S. Antitrust, supra, at 316-17, 408.

Although the above-noted literature has focused on single product loyalty commitments given in exchange for discounts on that product, it is equally applicable to loyalty commitments on a linked product made in exchange for discounts (or avoided penalties) on a linking product. If anything, the bundled discount (or avoided penalty) makes it easier to enforce the loyalty commitment.  

Unlike with squeezing out individual consumer surplus, the threatened consumer surplus loss for non-agreeing buyers need not exceed the consumer welfare loss created by agreeing, because most of the consumer welfare loss from any individual agreement to the bundled discount is suffered by other buyers.

However, the same limitations applicable to tying that causes foreclosure apply to bundled discounts. In particular, bundled discounts cannot increase monopoly profits by diminishing the linked market competitiveness if the products are used or bundled in fixed ratios and the linked product is useless without the linking product. When those conditions are met, though, bundled discounts might increase the degree of market power in the linking product, for reasons discussed in the next section.

It does not matter if the bundled discount contracts periodically come up for termination, because the same externalities that give buyers incentives to agree despite the collective marketwide harm also give buyers incentives not to terminate the contracts. Nor does it matter whether buyers agreed to the bundled discounts voluntarily – or even initiated a request for a bundled discount agreement – because agreeing to anticompetitive bundled discounts is individually profit-maximizing for buyers even though it collectively harms all buyers in the market. Buyers face a collective action problem that requires a collective action solution through antitrust law.

Bundled loyalty discounts can also create foreclosure effects even if the loyalty commitment in the linked product is less than 100%. The reason is that the anticompetitive effects flow from the share of the linked market foreclosed, not from the share of individual buyer purchases foreclosed. For example, if bundled loyalty

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140 See Elhauge, How Loyalty Discounts, supra note , at .
141 See supra II.D, IV.
142 See Kaplow & Shapiro, Antitrust, supra note 2, at 1203 n.198 (stating that “the economic principles and analysis are similar” for “exclusive dealing” and “discounts to buyers that purchase a large fraction of their needs from the incumbent supplier”); id. at 1206 n.207 (stating that "formal exclusivity contracts are not necessary for this result [that rivals can be excluded by a dominant
discounts in a certain market foreclosed 90% of linked sales to 80% of the buyers, then those contracts would achieve 72% marketwide foreclosure in the linked market. This foreclosure would be even more anticompetitive than 100% foreclosure of 70% of linked buyers.

To illustrate the above analysis, suppose the following case. A firm is both a monopolist in product \( A \), for which it charges $1000, and has market power in product \( B \), for which it charges $200 and has a per-unit cost of $100. There are thousands of buyers of \( B \), 80% of which also buy \( A \). Other firms stand poised to enter market \( B \) or expand in it until they achieve economies of scale that would also give them a cost of $100, in which case competition would drive \( B \) prices down to the but-for price of $100. To prevent this competitive result from occurring, the monopolist announces that it will charge unbundled buyers $1010 for product \( A \), but will give buyers a bundled “discount” of $10 on product \( A \) if they commit to buy 90% of their needs of product \( B \) from the monopolist. All the buyers of product \( A \) agree because their individual decision to agree gets them all of the nominal $10 “discount” but externalizes the vast bulk of their marginal contribution to marketwide foreclosure onto the rest of the market. The result is a 72% foreclosure share that prevents rivals in \( B \) from entering or expanding enough to achieve economies of scale, so that product \( B \) continues to get sold at $200, which is double its but-for price. The price for \( A \) with the nominal “discount” would remain at its monopoly price of $1000.\(^{143}\) Thus, here the bundled “discount” would clearly harm consumer welfare and efficiency because product \( B \) would be sold well above cost.

To illustrate the case where the unbundled price for the linking product equals its but-for price, take the hypothetical above, but now instead assume the firm maintains the unbundled price for \( A \) at $1000, giving a $10 discount (to $990) to buyers of \( A \) who commit to buy \( B \) from it. Buyers will benefit from the $10 discount on product \( A \), but

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\(^{143}\) This assumes \( A \) and \( B \) are not used in fixed ratios.
will be harmed by paying $100 more for B than they would have paid without the bundled discount. They can thus still suffer a net loss of consumer welfare, assuming the consumer welfare they lose from paying $100 more for B exceeds the consumer welfare they gain from paying $10 less for A. Allocative efficiency can also decrease, assuming the additional inefficiency in B from paying 100% above but-for levels is smaller than the additional efficiency they get in A from paying 1% below its but-for level.

2. Preserving Linking Market Power. Bundled discounts might also preserve market power in the linking market, again whether or not the unbundled price exceeds the but-for level. The same externality problems noted above give buyers incentives agree to the bundled discount, even though it contributes to a marketwide foreclosure in the linked market that makes the degree of linking market power higher than it otherwise would have been, thus leading to a marketwide price increase that harms all buyers. Each buyer agrees because it gains a nominal individual discount (or avoided penalty) by agreeing, but incurs only a small portion of the harm because the full impact of the harm is shared proportionately by all buyers across the market, and also is (for intermediate buyers) to some extent passed on to buyers further downstream.

To illustrate the case where the unbundled price exceeds the but-for level, take the hypothetical above where the unbundled price for A is set to $1010, but add to it the proposition that, if rivals can enter and achieve economies of scale in B, they are likely to enter market A, and drive prices in that market down to its cost of $500. The bundled discount would in that case cause the additional harm of keeping prices for A at $1000, double its but-for price. This only exacerbates the harm to consumer welfare and efficiency. Likewise, the same harms discussed in Section II.E follow if B is a partial substitute for A or is likely to become a substitute in the future.

The same effects are possible even if the unbundled price on the linking product initially equals but-for levels. Thus, modify the previous hypothetical to make the unbundled price for A $1000. Then the $10 bundled discount would result in a price for A of $990, which is $10 below initial but-for levels, but $490 above the ultimate but-for price that would have resulted if rival entry or expansion into B would have diminished the degree of power in A.

3. Neither Foreclosure Effect Requires Short-Term Profit Sacrifice or Commitment. Even though non-foreclosure effects harmful to consumer welfare are not possible when the unbundled linked price equals its but-for price, such bundled discounts are
still profitable to the bundler without foreclosure. 144 Thus, whether or not unbundled prices exceed but-for levels, bundled discounts need not require any short-term profit sacrifice or commitment by the bundler to achieve foreclosure effects. 145

C. When Bundled Loyalty Discounts Perversely Discourage Discounting

Bundled loyalty discounts can also produce an anticompetitive effect that tying cannot produce – affirmatively discouraging price competition even if rival efficiency is not impaired. This is true whether or not the unbundled price on the linking product exceeds the but-for price. However, the bundled loyalty discount must involve a seller commitment to charge loyal buyers a discount from any future price it charges to disloyal buyers on at least one of the products. 146 If so, loyalty discounts can perversely discourage discounting because the firms using them know that they cannot cut prices to compete for disloyal buyers without also cutting prices for loyalty buyers. 147 As a result, there will be some price that rivals can charge disloyal buyers that is above-cost, but low enough that the firm using loyalty discounts would find the gains from matching it lower than the losses from charging lower prices to loyal buyers.

When the loyalty discount is high enough (considering the foreclosure share) and the firm has just one rival that has achieved economies of scale in the unforeclosed market, both the rival price and the price with the loyalty discount would equal the monopoly price, even though rival efficiency is not impaired. 148 For example, if the foreclosure share were 50%, both firms will sell at monopoly prices if the loyalty discount exceeds the per unit profit at the monopoly price. The higher the foreclosure share, the lower the loyalty discount needs to be to produce monopoly prices for both firms. If the foreclosure share were 80%, then the loyalty discount would have to

144 See Nalebuff, Bundling as a Way to Leverage Monopoly, supra note , at 11.
145 See id. at 11.
146 See Elhauge, How Loyalty Discounts, supra note , at .
147 Id. at .
148 If $d$ is the loyalty discount, $P_m$ is the monopoly price, $C$ is a constant marginal cost, and $\theta$ is the foreclosure share, then with linear demand both prices will be at the monopoly level if $d \geq (P_m - C)\sqrt{(\theta / (1 - \theta))}$. This is true for loyalty discounts with buyer commitments under all conditions, see id. at Lemmas 1a, 1b, 1c, and without buyer commitments if rivals pick prices first, see id. at Lemma 4a.
more than half the per unit monopoly profit. If the foreclosure share were 20%, the loyalty discount would have to be double the per unit monopoly profit.\footnote{149 Because the loyalty discount does not mean a real discount from but-for prices, but just the difference between loyal and disloyal prices, nothing prevents it from exceeding the per unit monopoly profit. Id. at __.}

Even when the loyalty discount is somewhat lower, the rival price and the price with the loyalty discount will still exceed costs and but-for levels. This is true whether or not the loyalty condition requires any buyer commitment or can be abandoned by the buyer at will.\footnote{150 With buyer commitments and constant marginal costs, the rival price and the price with the loyalty discount will be at least $P_m + \theta d - \sqrt{(1 - \theta) \left( (P_m - C)^2 - \theta d^2 \right)}$. Prices can range from that level up to the monopoly price. Id. at Lemmas 1a, 1b, 1c. Without buyer commitments and marginal costs, then the price formulas are somewhat lower, but still all above both cost and but-for levels. See id. at Lemmas 4a, 4b, 4c.} However, buyer commitments produce somewhat higher prices. For example, suppose the foreclosure share is 50%, the monopoly price is $100, the constant marginal cost is $20, and the loyalty discount is $20. Then, a loyalty discount with buyer commitment leads to prices of at least $54.32, whereas without buyer commitment it leads to prices of at least $40.\footnote{151 The solution without buyer commitment assumes the rival picks prices first. See id. at Lemma 4a. If the firm using loyalty discounts picks price first or both pick prices simultaneously, then other formulas apply that also lead to prices that exceed costs and but-for levels. See id. at Lemmas 4b,c.}

On the other hand, without a high foreclosure share, rival prices will be lower than the price with the loyalty discount, which makes buyers unlikely to agree to anticompetitive loyalty commitments.\footnote{152 Id. at __.} Without buyer commitments, buyers are more likely to agree (because there is little downside in doing so), but the loyalty conditions that the buyers accept affect the size of anticompetitive effects. For example, if we lower the foreclosure share in the last hypothetical to 10%, then without buyer commitment the rival price and price with loyalty discounts would instead be $22.47.\footnote{153 This again assumes the rival picks price first. See supra note .} This, coupled with other factors, suggest that this theory should require proof of a substantial foreclosure share.\footnote{154 See Elhauge, How Loyalty Discounts, supra note .}

The analysis above all applies in the case of single-product loyalty discounts, but is
equally true if the loyalty discount on the product at issue was procured using a bundled discount on another product. Indeed, such bundling makes it easier to procure and enforce buyer agreements to loyalty discounts that discourage discounting.\textsuperscript{155}

The above conclusions also still apply if the loyalty discount requires less than 100% loyalty.\textsuperscript{156} Indeed, less than 100% loyalty does not alter the conclusions without buyer commitment at all. With buyer commitments, less than 100% loyalty leads to prices that are less than they would have been with 100% loyalty, but higher than they would be without buyer commitment.

\section*{D. Implications for Possible Legal Tests}

\textit{1. Tests Based on Costs or Exclusion of Equally Efficient Rivals.} Some advocate condemning bundled discounts only if the bundled price is lower than the cost of making both products.\textsuperscript{157} The above analysis indicates this test would be unwise because none of the anticompetitive effects depend on the bundled price being lower than the bundled cost. To the contrary, in all the hypotheticals, non-foreclosure and foreclosure effects harmful to consumer welfare resulted even though the bundled price was well above the bundled cost.

Others have concluded that bundled discounts should not be illegal unless attributing all of the bundled discount to the linked product would result in an effective price that is lower than the defendant’s costs of making that product.\textsuperscript{158} Judge Posner and others

\begin{flushright}
\ \textsuperscript{155}Id. at \text\_\_\_.
\textsuperscript{156}Id. at \text\_\_\_.
\textsuperscript{157}See Timothy J. Muris, \textit{Antitrust Law, Economics, and Bundled Discounts}, Submitted on Behalf of the United States Telecom Ass'n to the Antitrust Modernization Commission, at 13-14 (July 15, 2005).
\end{flushright}
more generally advocate condemning vertical agreements (including bundled discounts) only if they would exclude an equally efficient rival.\textsuperscript{159}

But the above analysis shows that bundled discounts can produce anticompetitive foreclosure that impairs rival efficiency even though the effective price for the linked product exceeds the defendant’s costs, and indeed even though the discount amount is small. The rival cannot match that effective price precisely because the bundled discount forecloses enough of the market to prevent it from achieving the same costs as the defendant. Likewise, the equally efficient rival test reaches the wrong result in this case because the anticompetitive effect is precisely preventing the rival from achieving equal efficiency. Nor does a cost-based test even focus on the worst bundled discounts. Instead, a cost-based test would perversely exempt the most worrisome form of bundled discounts: charging penalty prices to get buyers to agree to bundles at prices that are above but-for levels, and thus necessarily above cost.\textsuperscript{160}

Further, even if bundled loyalty discounts do not impair rival efficiency, they can discourage discounting. This produces anticompetitive results harmful to consumer welfare and allocative efficiency even though both the incumbent and rival are charging prices well above cost.\textsuperscript{161} These anticompetitive results exist even if the rival could defeat the loyalty discount with a lower above-cost price, and indeed even if discount levels are quite low. The reason is that such loyalty discounts mean rivals will earn more profit if they do not lower prices than if they do.

Nor is there any good reason to ignore harms to consumer welfare and efficiency that come from exclusionary conditions that foreclose less efficient rivals. Suppose, for example, that the monopoly price for the linked product is $200, and the costs are $100 for the defendant and $150 for the less efficient rival. In that case, using bundled discounts to exclude the less efficient rival will raise prices from $150 to $200, harming both consumer welfare and efficiency. Why should inefficient conduct

\textsuperscript{159}See Posner, supra note \textsuperscript{1}, at 194-196;

\textsuperscript{160}This same logic shows the error in the claim that single product loyalty discounts should be immunized when the price with the loyalty discount exceeds cost. See Hovenkamp, Discounts and Exclusion, supra note \textsuperscript{1}, at 844-849; Lambert, supra note \textsuperscript{1}, at 1712-1714. When a loyalty discount/penalty procures loyalty commitments that raise rivals’ costs and market prices, it would perversely exempt their most anticompetitive type to immunize them when the price with the loyalty condition is above cost. This claim also conflicts with Supreme Court caselaw. See infra at __.

\textsuperscript{161}See Elhauge, How Loyalty Discounts, supra note \textsuperscript{1}, at __.
that harms consumers be tolerated by antitrust law merely because another harmed party was less efficient than the defendant? The equally efficient rival test seems oddly focused on the competitive virtue of the rival, rather than on the effects of the defendant’s conduct on consumer welfare and efficiency.\textsuperscript{162} The focus seems even odder given that, when foreclosure effects are proven, the defendant conduct itself is what tarnishes that virtue by rendering rivals less efficient.

Using the equally efficient rival test to judge bundled discounts also has a profound conceptual problem. If a rival that was equally efficient at making the linked product did enter the linking market, but was less efficient at it than the defendant, it could be excluded because it is less efficient at making the combination of products. If the same rival cannot make the linking product at all, it cannot be excluded because it is equally efficient at the one product it chooses to make. But isn’t the rival less efficient in the latter case than in the first one? Because the equally efficient rival test focuses on the competitive virtue of the rival rather than the effect on consumer welfare or market efficiency, it is not clear why attention should arbitrarily focus on the products a rival attempts to make.

A cost-based test for bundled discounts would also be inconsistent with tying caselaw. This is not only because the cost-based test would allow precisely the anticompetitive effects condemned by tying, but also because Supreme Court cases like \textit{International Salt} and \textit{Northern Pacific} prohibit ties, and deem them foreclosing, even when buyers can escape the tying condition whenever rivals offer a tied product price one penny below what the defendant is willing to charge.\textsuperscript{163} Such a tie could not plausibly survive any cost-based test. The best explanation for this caselaw is that such a tie would eliminate any incentive for rivals to try to undercut the defendant’s price, because the rivals know that no matter what above-cost price they offer, the defendant can always win all sales by matching it. Likewise, bundled discounts have the same effect because rivals in the linked product know that no matter what above-cost price

\textsuperscript{162} In contrast, above-cost pricing should be allowed, not because excluding less efficient rivals cannot be anticompetitive, but because pricing is unavoidable and the systematic effects of barring above-cost price cuts that exclude less efficient rivals would be harmful to consumers and efficiency. See Elhauge, \textit{Why Above-Cost Price Cuts}, supra note __. The same analysis does not extend to exclusionary conditions that lack any redeeming justification and are thus eminently avoidable. \textit{Id.} at 698 n.53.

\textsuperscript{163} See \textit{International Salt v. United States}, 332 U.S. 392, 396–397 (1947); \textit{Northern Pacific Railway v. United States}, 356 U.S. 1, 9, 11-12 (1958);
they might offer on the linked product, the defendant can always win sales because of the bundled pricing. Thus, even if an equally efficient rival could undercut a bundled discount, considering the strategic response of the defendant can eliminate any incentive for the rival to actually do so.164

A cost-based test also seems inconsistent with various other Supreme Court cases. In United Shoe, the Court condemned bundled discounts that (along with other clauses) had the practical effect of a tie without requiring any evidence that they resulted in a bundled or effective price that was below cost.165 In Loew’s, the Court held that an injunction against a firm that engaged in illegal bundling should prohibit bundled discounts that either had the effect of imposing a tying condition or exceeded any efficiency gains created by the bundling, again without requiring any evidence that it resulted in a bundled or effective price that was below cost.166 Although injunctive remedies can extend beyond illegal conduct, presumably the Court designed its remedy to avoid interfering with any bundled discounts it deemed procompetitive. This ruling thus indicates that the Court did not believe that any bundled discounts that left bundled or effective prices above costs would be procompetitive or merit a safe harbor, which conflicts with the logic of the above cost-based tests.

Other Supreme Court decisions have held that single-product loyalty discounts violate antitrust law without any requirement of proving they are below cost, which a fortiori suggests that no cost-based test should apply to bundled loyalty discounts given that they are, if anything, even more anticompetitive than single-product loyalty discounts. In Standard Fashion, the Court held that Clayton Act §3 was violated by exclusive dealing agreements that were procured by loyalty discounts without any evidence that the resulting price was below cost.167 Likewise, in FTC v. Brown Shoe, the Court held that the central policy of both Sherman Act §1 and Clayton Act §3 was violated by single product loyalty discounts, even though they were terminable at will, required only 75% loyalty, and no evidence suggested that they resulted in below cost prices.168

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164 See ElHauge, U.S. Antitrust, supra note, at 412-413; see also Greenlee, et al., supra note, at 1139 (noting that if rivals are equally efficient, a cost-based test assumes disequilibrium behavior).
2. “Only Viable Option” Test. Without determining when bundled discounts are illegal, some courts have held that they should not be treated like ties unless taking the bundle is the “only viable option” for buyers.\(^\text{169}\) Read literally, this would indicate that bundled discounts should not be treated like ties unless the unbundled price for the linking product was set at the choke price and literally prevented any separate sales of the tying product. Although a bundling firm would indeed maximize profits under the above theories by setting the unbundled price to equal the choke price, the above analysis also showed that a firm could achieve similar (though somewhat smaller) non-foreclosure effects with an unbundled price that exceeds the but-for price, even though some buyers would buy the tying product at the unbundled price.

A less extreme version of this approach, used by other courts, would treat a bundled discount like a tie if users of the linked product buy only a low proportion (say 10% or less) of the linking product at the unbundled price.\(^\text{170}\) But this approach would also fail to capture bundled discounts that produced non-foreclosure effects similar to tying. Suppose, for example, that 80% of buyers have the individual demand curve for printers described in Section II.C. The other 20% instead value printers at up to $2000. A bundled discount that chooses an unbundled price of $1000 would squeeze out all consumer surplus from 80% of the buyers, even though the other 20% would buy the printers at the unbundled price.

3. Whether Unbundled Price Exceeds the Pre-Program Price. Some have argued that bundled discounts should be legal if the unbundled price for the linking product is less than or equal to the pre-bundle price.\(^\text{171}\) This test has several problems. First, as shown above, bundled discounts can create harmful foreclosure effects even when the unbundled price for the linking product does not exceed but-for or pre-bundle levels. Even if the unbundled price is below either level, foreclosure can elevate prices for the linked (and ultimately linking) product in a way that harms consumer welfare.

Second, while non-foreclosure effects depend on the unbundled price exceeding the but-for price, the pre-bundle price may well be far higher than the but-for price during the period of bundling. This will be true if costs are declining, which is often the case for industries marked by technological progress. It will also be true if the defendant’s

\(^{169}\) X Areeda, Elhauge & Hovenkamp, Antitrust Law ¶1758b, at 328 (2d ed. 2004) (collecting cases).

\(^{170}\) Id. at 327-328.

\(^{171}\) See Greenlee, et al., supra note , at 1138.
market power is eroding, or would have eroded without the bundling, which is often the case because defendants are most likely to use exclusionary conduct in order to try to maintain (or slow the erosion of) waning market power.\textsuperscript{172}

Finally, a test based on pre-program prices would create an obvious loophole. The defendant could simply raise its pre-program prices to high levels before it institutes bundled discounts.\textsuperscript{173}

4. The Appropriate Test. When the unbundled price for the linking product exceeds the but-for price, bundled discounts have the same non-foreclosure effects as ties and thus should be treated like ties. This means that in such a case liability should turn on market power in the linking product and an absence of offsetting efficiencies, rather than requiring substantial foreclosure in the linked product. The recommended exception to the quasi-per se rule for tying when the products are used in fixed ratios and lack separate utility should also apply to bundled discounts because those market conditions negate non-foreclosure effects.

Although this test is conceptually clear, determining the but-for price can be difficult. However, internal documents are often revealing on this issue, showing that the business plan was to raise the unbundled price in order to induce agreement to the bundle. Other times, regression analysis or economic models may yield good results on the but-for price. Or one might rely on a presumption that unbundled prices that exceed the pre-program price exceed the but-for price, rebuttable by some showing that costs have increased over time.

Alternatively, one might rely on a general presumption, rebuttable by the defendant, that the absence of any efficiency justification coupled with market power means the defendant likely set the unbundled price above but-for levels because the analysis above shows that doing so is profit-maximizing. Such a presumption would be consistent with the general economic assumption that firms are rational profit-maximizers. Even in cases where the presumption turned out to be overinclusive, and capture cases where the unbundled price did equal but-for levels, the above shows that a firm has incentives to set bundled discounts to leave consumer welfare unchanged. The lack of any beneficial effect on consumer welfare coupled with an adverse effect

\textsuperscript{172} See Elhauge, \textit{Defining Better}, supra note , at 337-338.

\textsuperscript{173} See Greenlee, et al., \textit{supra} note , at 1138 (acknowledging this problem with their safe harbor test).
on rivals might itself merit antitrust condemnation, especially because in some such
cases the bundle may also cause foreclosure effects that are hard to ascertain. Given
the posited lack of any efficiency justification, there is little reason to tolerate this
under-deterrence.

Where the unbundled price for the linking product does not exceed the but-for price,
then non-foreclosure effects are not possible, so ordinary rule of reason review should
apply. This requires that anticompetitive effects either be directly proven or inferred
from a substantial foreclosure share in the linked market. Because the foreclosure
effects are the same as with exclusive dealing, it makes sense (when effects are not
directly proven) to require the same 20-30% foreclosure share threshold that is,
depending on the authority and on whether the defendant has monopoly power,
required to infer anticompetitive effects from exclusive dealing.\textsuperscript{174} The foreclosure
produced by bundled discounts should be aggregated with any foreclosure produced
by other exclusionary agreements, such as tying, exclusive dealing, or loyalty
discounts, because the effect on rival competitiveness depends on the market
foreclosure share, regardless of the particular means used to achieve it.\textsuperscript{175} The
defendant can then introduce offsetting efficiencies that could not be achieved through
less anticompetitive means.

Measuring a foreclosure share raises the issue of when to deem a bundled discount
foreclosing. When, as typical, the bundled discount is used to induce buyer
commitments to purchase the linked product from the defendant, clearly all purchases
under such commitments should count toward the foreclosure share, for the same
reason that exclusive dealing cases measure foreclosure shares to include all purchases
under exclusive dealing agreements. But when should the foreclosure share include
purchases under a bundled discount that involves no buyer commitment, but just
makes pricing conditional on what the buyer does at each moment?

\textsuperscript{174} See IX AREEDA, ANTITRUST LAW 377, 387-91 (1991) (“foreclosure [should] be presumed
unreasonable when it reaches 20 percent for an individual seller”); Twin City Sportservice, Inc. v.
Charles O. Finley & Co., Inc., 676 F.2d 1291, 1298, 1304 (9th Cir. 1982) (24% suffices for a
monopolization case); Stop & Shop Supermarket Co. v. Blue Cross & Blue Shield of R.I., 373 F.3d
57, 68 (1st Cir. 2004) (generally need at least 30–40% in \$1 case); United States v. Microsoft
Corp., 253 F.3d 34 (D.C. Cir. 2001) (en banc) (need less foreclosure in a monopolization case than
in \$1 case).

\textsuperscript{175} See IX AREEDA, ANTITRUST LAW 94, 104 (1991)
Clearly a cost-based test should not be used to judge when a no-commitment bundled discount is foreclosing, both because a cost-based test correlates poorly to when bundled discounts are anticompetitive and because it conflicts with Supreme Court precedent. Indeed, because *International Salt* and *Northern Pacific* hold that a tie is foreclosing even when the tying condition requires only that the rival price at least one penny below the defendant, they suggest that any bundled discount is legally foreclosing. This makes some sense because, as noted above, even a trivial discount can produce anticompetitive effects given buyer collective action problems. Further, the purpose of measuring the foreclosure share here is simply to determine whether anticompetitive effects are plausible enough to require the defendant to come forth with some procompetitive justification. If a firm charges a higher price to buyers who refuse to comply with its exclusionary condition than to buyers who do, then it does create some clog on competition that seems unjustifiable absent some offsetting efficiency. Because the noncompliant price always exceeds the compliant price for a bundled discount, this approach suggests that the foreclosure share should include all purchases of the linked product that received a bundled discount, even without any buyer commitment.

This approach makes sense to the extent that the foreclosure share is being used defensively, in support of an argument that anticompetitive effects are impossible because the foreclosure share is too low. In that case, one should include all purchases under no-commitment bundled discounts in the foreclosure share, because economic theory shows that anticompetitive effects are indeed *possible* with a high foreclosure share despite a small discount. But if the bundled discount is trivial, one might hesitate to use the same foreclosure share offensively, in order to infer that anticompetitive effects are *likely*, because such a trivial bundled discount may have little impact on rival sales. Thus, for a small no-commitment bundled discount, any offensive inference from the foreclosure share should be confirmed by evidence that the bundled discounts actually had an adverse impact on rival competition. Such an adverse impact could, for example, be proven with evidence that buyers receiving bundled discounts bought significantly less from rivals than other buyers or by direct evidence that rival efficiency or competitiveness was impaired. When the size of the bundled discount is significant compared to purchases of the linked product, so that buyers would incur a significant penalty if they were noncompliant, one can infer an adverse effect on rival competition from a substantial foreclosure share without the need for such confirmatory evidence.

In short, the foreclosure share should in all cases be measured to include any
purchases of the linked product that received a bundled discount. For bundled discounts with buyer commitments, a substantial foreclosure share suffices to infer anticompetitive effects. The same holds for bundled discounts without buyer commitments if the size of the discount is significant in relation to purchases of the linked product. For small bundled discounts without buyer commitments, a substantial foreclosure share suffices to show that anticompetitive effects are possible, but should not be used to infer likely anticompetitive effects unless confirmed by evidence of an adverse impact on rival competition.\textsuperscript{176} Whether anticompetitive effects are inferred or directly shown, the bundled discount should remain legal if the defendant can prove they were the least restrictive means of producing offsetting efficiencies.

With the benefit of this analysis, we can take another look at the much (and unfairly) maligned \textit{LePage’s} case.\textsuperscript{177} \textit{LePage’s} involved bundled loyalty discounts on branded Scotch tape sold to retailers who agreed to buy private label tape from the defendant. The bundled discounts were significant in size and sometimes used to procure buyer commitments.\textsuperscript{178} Although the two types of tape were in a common tape market, demand for them differed in a way that made bundled discount analysis appropriate. The court ruled that the bundled discounts could be illegal even if above cost, rejecting a dissent claim that the effective price should have been compared to costs.\textsuperscript{179} The court did not find the bundled discounts quasi-per se illegal based on the defendant’s market power, nor did it reach any conclusion that the unbundled prices exceeded but-for levels in a way that might make tying analysis appropriate. Instead, the court found liability because the bundled discounts lacked any persuasive procompetitive justification and were significant enough to foreclose major outlets and create adverse effects on rival competitiveness, which were directly proven by evidence that the foreclosed rival lost economies of scale.\textsuperscript{180}

Although this case has been much criticized, it reflects a rather straightforward application of garden-variety rule of reason analysis. To be sure, \textit{LePage’s} did not rely on proof of a substantial foreclosure \textit{share}, but foreclosure shares are just a

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\textsuperscript{176} The conclusions of this paragraph also apply to single product loyalty discounts.

\textsuperscript{177} \textit{LePage’s Inc. v. 3M}, 324 F.3d 141 (3d Cir. 2003) (en banc).

\textsuperscript{178} \textit{Id.} at 145, 147, 154, 157-159.

\textsuperscript{179} \textit{Id.} at 147-152.

\textsuperscript{180} \textit{Id.} at 159-164.
\end{flushleft}
possible basis for inferring anticompetitive effects. When direct evidence of anticompetitive effects on rival competitiveness exists, then it obviates the need to prove a market or foreclosure share. Indeed, such direct evidence is far preferable because it directly establishes that the foreclosure share did indeed produce the anticompetitive effect. Given directly proven anticompetitive effects and the absence of any redeeming procompetitive efficiency, rule of reason condemnation was not surprising.

The same rule of reason approach was used in the Third Circuit’s decision in *SmithKline*, which condemned no-commitment bundled discounts on three antibiotics without requiring any evidence that they resulted in an effective price that was below cost. Instead, the court relied on two points. First, the size of the bundled discount was significant in relation to purchases of the linked antibiotic because, although only a 3% discount, the relative amounts of product purchases made the discount equal to 16% of linked product purchases. Second, the court concluded that, although the effective price was above cost, the bundled discount was likely to adversely impact rival competition by making the profits too low to make it worth promoting the rival antibiotic. This case is thus also consistent with my approach.

Professor Hovenkamp acknowledges that above-cost loyalty discounts can create anticompetitive effects, but argues that they should nonetheless be immunized because the above sort of approach would “make impossible information demands” on courts, by requiring courts to determine whether the foreclosure produced anticompetitive

181 FTC v. Indiana Federation of Dentists, 476 U.S. 447, 460-61 (1986) (“Since the purpose of the inquiries into market definition and market power is to determine whether an arrangement has the potential for genuine adverse effects on competition, ‘proof of actual detrimental effects, such as a reduction of output,’ can obviate the need for an inquiry into market power, which is but a ‘surrogate for detrimental effects.’”)

182 See SmithKline Corp. v. Eli Lilly & Co., 575 F.2d 1056 (3d Cir. 1978). Some argue that the district court in *SmithKline* required evidence that the effective price was below cost. See Bush DOJ Unilateral Conduct Report, supra note, at 92. However, the appellate court affirmed liability without ever comparing effective prices to cost, and thus held it was unnecessary. Moreover, the district court actually found that the effective price would have left an equally efficient rival with a 4% return on sales, thus clearly indicating that the effective price was above incremental cost. 427 F. Supp. 1089, 1122-23 (E.D. Pa. 1976). The district court instead relied on an expert claim that, with such a low but positive profit margin, the rival would not want to retain salespersons to promote its rival antibiotic. *Id.*
effects and whether those effects were offset by redeeming efficiencies. This is an exceedingly odd argument, because the above approach not only reflects the sort of rule of reason analysis that courts apply all the time, but also mirrors the same inquiry that Professor Hovenkamp advocates for tying and exclusive dealing. It is hard to see how the recommended inquiry there could suddenly become inadministrable here.

Professor Hovenkamp and others further argue that the above sort of approach is misguided because rival competitiveness might also be harmed by above-cost price-cutting. But above-cost price-cutting is different because it benefits consumer welfare and harms rivals only if the monopolist has increased its own efficiency. As the above shows, that is decidedly not true for bundled discounts. Moreover, for bundled or loyalty discounts, what requires justification are the exclusionary conditions, not the pricing. The above approach imposes no limit at all on firms lowering prices to above-cost levels without attaching exclusionary conditions to them. Nor can one just assume that bundled discounts lower prices. That commits the intellectual error of allowing oneself to get so beguiled by the rhetoric of “discounts” that one pre-judges the issues of (1) whether the price difference really reflected an unbundled penalty rather than a true discount from but-for levels, and (2) whether the foreclosure increased market price baselines.

A case where the bundled discount was equated with tying was Advance Business Systems. In that case, the defendant offered its copier separately for $4250 and in a bundle with other supplies and service for 3.5 cents a copy. The court held that such a bundled discount constituted a tie unless “the components are separately available to the customer on a basis as favorable as the tie-in arrangement.” As stated, this test goes too far because any bundled discount, by definition, offers the bundle on a basis more favorable than separate sale. Literally read, this test would mean that all bundled discounts constitute a tie. However, the facts of the case suggest that the court was concerned that the separate price was set far above the but-for price, so far

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183 Hovenkamp, Discounts and Exclusion, supra note __, at 843-844, 847.
185 See Hovenkamp, Discounts and Exclusion, supra note __, at 847-848; AMC Report, supra note , at 97 (collecting sources).
186 See Elhauge, Defining Better, supra note , at 315-324.
188 See id. at 62.
above it that no buyer ever wanted to buy it separately.\footnote{Id.}

Finally, consider again the holding in \textit{Loew’s} that an injunctive remedy for bundling should ban bundled discounts that either have the effect of imposing a tying condition or exceed any efficiency gains.\footnote{United States v. Loew's Inc., 371 U.S. 38, 54-55 (1962).} That holding is consistent with my suggested approach because an unbundled price that exceeds the but-for price and lacks offsetting efficiencies has the same effects as a tying condition and causes a differential that exceeds any efficiency gains.

\textbf{5. Multiple Bundlers and Cumulative Foreclosure.} Cases when multiple firms engage in bundling create their own issues. Some have argued that if at least one significant rival could offer the same bundle, then the appropriate test is to compare the bundled price to the cost of making the bundle.\footnote{See Hovenkamp, \textit{Discounts and Exclusion}, supra note \_, at 844-845, 848-849; Bush DOJ Single Firm Conduct Report, supra note \_, at 101.} However, unless the rival eliminates the market power of the defendant in the tying product, all the same non-foreclosure effects remain possible despite prices well above costs. The existence of the rival may go to the degree of market power, but does not disprove non-foreclosure effects. Moreover, in a differentiated linking market, it is entirely possible that the two firms might have linking power over different sets of buyers, enable both of them to inflict non-foreclosure effects.

As for foreclosure effects, if two significant firms are engaged in bundling, then their cumulative foreclosure of the linked market is even greater, producing an even greater foreclosure effect on other rivals.\footnote{See IX Areeda, \textit{Antitrust Law} 94, 103-04 (1991) (where a defendant and up to four rivals engage in tying, “the relevant foreclosure aggregates those of the defendant and of his rivals.”); Elhaug, \textit{U.S. Antitrust}, supra note \_, at 335-337 (explaining economics of cumulative foreclosure); Aaron Edlin & Daniel Rubinfeld, \textit{Exclusion or Efficient Pricing?}, 72 \textit{Antitrust L.J.} 119, 121, 152, 156 (2004) (concluding that cumulative foreclosure could be appropriate to judge the foreclosing effect of bundled discounts that multiple publishers offer to libraries); Joseph Lin, \textit{The Dampening-of-Competition Effect of Exclusive Dealing}, 39 \textit{J. Indus. Econ.} 209, 209-210, 217 (1990) (cumulative foreclosure economically justified when multiple sellers engage in exclusive dealing in a concentrated, differentiated market).} If those other rivals are driven from the market, bundling could create or preserve a duopoly where otherwise a competitive market could have existed. Having two firms use bundled loyalty discounts also only
Finally, if the two markets are differentiated, then having multiple firms offer bundled discounts decreases social and consumer welfare by producing an inefficient product mix and excessive bundling, even though it also lowers both firms’ profits. This effect on firm profits makes it even worse policy to adopt the rule, suggested by some, that above-cost bundled discounts should be allowed if other firms could form a joint venture to offer the same bundle, because the first bundled discount would generally make forming such a joint venture unprofitable and thus deter its formation.

In other cases, permitting bundling because a rival could offer the same bundle will force other rivals who wish to remain in the market to engage in similar bundling. If the bundling lacks any efficiency justification, then forcing other rivals to do the same forces them into less efficient arrangements, thus undermining market efficiency. Even if one thought that bundle-to-bundle competition between two firms that offer both products were procompetitive, there is a less restrictive alternative. The firms could offer ties or bundled discounts with carveouts for purchases from rivals who do not offer both products. Bundles with such carveouts could achieve any purported procompetitive benefits of bundle-to-bundle competition without foreclosing firms that do not make all the products in the bundle.

Finally, a test that immunized above-cost foreclosing bundles when another significant firm also uses a foreclosing bundle would be inconsistent with Supreme Court precedent, which cumulates the foreclosure shares created by above-cost foreclosing agreements when they are used by a few large firms. In all these cases, the Court

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196 Nalebuff, *Competing Against Bundles*, supra note , at 325, 331.

197 Standard Oil & Standard Stations v. United States, 337 U.S. 293, 295, 309, 314 (1949) (assessing foreclosure by aggregating defendant's exclusive contracts with those of the seven leading oil producers to produce an aggregate foreclosure of 65%); FTC v. Motion Picture Advertising Service, 344 U.S. 392, 395 (1953) (concluding that, under the Sherman Act and FTC Act, the relevant foreclosure was the aggregate 75% produced by adding the exclusive dealing arrangements
reached that conclusion without any finding or evidence of a conspiracy between the firms whose foreclosure shares were aggregated. Indeed, in one case, the dissenting argument that such a horizontal conspiracy was required was explicitly rejected under the Sherman Act.198

Although cumulative foreclosure is appropriate when exclusionary agreements (such as bundled discounts) are used by a few large firms, it obviously would be inappropriate if 100 small firms all engaged in the same exclusionary agreements because in the latter cases the agreements would not produce any anticompetitive effect. Where is the dividing line? I would define the “few” and “large” conditions functionally, based on the relevant anticompetitive effect. “Few” should generally mean less than the number of firms deemed necessary to secure competition under the merger guidelines, because driving the market below that number is usually necessary to cause the claimed anticompetitive effect.199 “Large” should generally mean above minimum efficient scale. Cumulative foreclosure should generally not include exclusionary agreements used by firms below their minimum efficient scale because such agreements could not contribute to the usual claimed anticompetitive effect, which is preventing a greater number of firms from operating at the minimum efficient size. Indeed, agreements by such small firms are likely to procompetitively help them achieve their own economies of size.

VIII. CONCLUSION

Stylized assumptions can produce the conclusion, contrary to intuition and precedent, that tying and bundled discounts cannot create additional monopoly profits and thus

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198 Motion Picture, 344 U.S. at 393-95; id. at 399-400 (dissent). The contrary decision in Paddock Publ’ns v. Chicago Tribune, 103 F.3d 42 (7th Cir. 1996), was thus mistaken.

199 See ELHAUGE ELHAUGE, U.S. ANTITRUST, supra note , at 336-37. This is consistent with Professor Areeda’s conclusion that “foreclosure [should be presumed unreasonable when it reaches ... a total of 50 percent for five or fewer sellers.” IX AREEDA, ANTITRUST LAW 377, 387-91 (1991). However, he did not offer criteria for determining how large a firm has to be to included in the five.
must be explicable by efficiencies. But under more realistic assumptions, economics shows that the opposite is true. Where a substantial share of the tied market is foreclosed, tying can increase market power, prices, and profits in both the tied and tying markets. Even without foreclosure, tying that lacks an efficiency justification by a firm with market power generally harms consumer welfare, and probably also harms total welfare in typical tying cases. Tying doctrine thus correctly condemns tying based on tying market power and a lack offsetting efficiencies, even without substantial tied foreclosure. However, this so-called quasi-per se rule should not apply when the products are used in fixed ratios and lack separate utility because under those conditions anticompetitive effects are not possible without substantial tied foreclosure.

When the unbundled price for the linking product exceeds its but-for price, bundled discounts can produce the same harmful non-foreclosure effects as tying, and thus should be condemned based on linking power when offsetting efficiencies are absent. Otherwise, bundled discounts should be judged under ordinary rule of reason analysis that requires proof of substantial foreclosure or direct proof of anticompetitive effects.