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A BETTER EXPLANATION FOR WHY
PRICING ABOVE COST SHOULD NOT BE
PREDATORY - AND THE IMPLICATIONS
FOR HOW TO DEFINE COSTS

Einer Elhauge

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Harvard Law School
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By Einer Elhauge*

ABSTRACT

Recently European and U.S. officials have made surprising moves toward banning above-cost predatory pricing, supported by many prominent scholars whose critiques of cost-based tests have never satisfactorily been answered. This article analyzes in depth the four main types of restrictions on above-cost price cuts reflected in antitrust law and scholarship: (1) a price maintenance rule; (2) a short-term profit-maximizing price floor; (3) a pre-entry output ceiling; and (4) a ban on impermanent price cuts. It concludes that none of these rules would likely have desirable post-entry effects because such protecting less efficient entrants is not only harmful in the short run but futile in the long run because they cannot survive once the price restrictions expire by passage of time or loss of incumbent market power. Such rules also give incumbents perverse incentives to raise post-entry prices to speed the day when the restriction expires, and create purely harmful effects when entrants are as efficient as the entrants. Because of their long run futility, these rules would also provide little ex ante encouragement to entry. Further, any entry they did encourage by less efficient firms would likely be undesirable, both because of its direct effects and because it would displace efficient entry and discourage ex ante incentives to invest in making products valuable enough to enjoy monopoly power. These ill effects are likely to be particularly severe in the airline industry that prompted many of the proposals because restricting reactive above-cost price cuts will interfere with normal hub-and-spoke competition. The Article also analyzes more particularized problems with each type of restriction, and shows how the theoretical grounds for rejecting above-cost price restrictions provide guidance for determining what should count as costs under any doctrine that condemns below-cost predatory pricing.

*Professor of Law, Harvard Law School. I am grateful for the support of Harvard Law School and for comments from Bruce Hay, Michael Levine, Mark Ramseyer, Mark Roe, Hal Scott, and Bill Stuntz.

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In 1993, one would have said that predatory pricing claims on both sides of the Atlantic required proof that prices were below cost.² But the last few years have witnessed a surprising movement toward bans on above-cost predatory pricing. The European courts got things rolling with a 1996 decision holding it illegal for monopolists to adopt selective above-cost price cuts that sacrificed revenue in order to eliminate entrants.³ Then in 1998, the U.S. Department of Transportation proposed a regulation banning major incumbent airlines from reacting to entry with above-cost price cuts that resulted in “substantially” lower short-term profits than alternative pricing would have.⁴ In May 1999, the U.S. Department of Justice brought the American Airlines litigation based largely on the same theory.⁵ The Department tried to bring the litigation within existing law by redefining what counted as a “price” and a “cost,” but the end result was the same as condemning above-cost price cuts that did not maximize short run profits.⁶ This government theory was supported by several expert economists, including the Nobel Prizewinning Professor Joseph Stiglitz.⁷ And now an important new article by Professor Aaron Edlin proposes the even broader rule that where an entrant charges at least 20% below the prevailing price, a monopolist cannot respond with any price cut at all for 12-18 months or until it loses its monopoly.⁸ All these positions restrict reactive above-cost price cuts even if they meet (rather than undercut) the entrant’s price, on the notion that buyers would likely stick with the incumbent unless the entrant can offer a lower price.

The basic concept underlying these new legal developments and proposals is hardly new. Some courts and scholars have long thought reactive above-cost price

¹ Professor of Law, Harvard Law School. I am grateful for the support of Harvard Law School and for comments from Bruce Hay, Michael Levine, Mark Ramseyer, Mark Roe, Hal Scott, and Bill Stuntz.

² See *infra* Part I.A.

³ *Id.*

⁴ *Id.*

⁵ *Id.*

⁶ *Id.*

⁷ U.S. v. AMR, 140 F. Supp. 2d 1141, 1180, 1191 (D. Kansas 2001).

⁸ Aaron S. Edlin, *Stopping Above-Cost Predatory Pricing*, 111 Yale L.J. 941, 945-46 (2002).

cuts designed to drive out entrants were predatory, and the idea was a standard staple of Socratic dialogue in antitrust classes.⁹ The Edlin proposal is the same as Professor Williamson's famous 1977 proposal except that it substitutes a ban on incumbents lowering their price for Williamson's ban on incumbents increasing their output for 12-18 months after entry.¹⁰ Edlin's proposal also has much in common, as he acknowledges, with Professor Baumol's ingenious 1978 idea of permitting reactive price-cuts only if they are quasi-permanent.¹¹ These are legendary economists. The approach of the E.U. and U.S. Departments in turn has roots in various cases and scholarship that defined a predatory price as one that would not maximize profits unless it could destroy or discipline competitors.¹² The scholars supporting this approach in writings from 1977-81 included such heavy hitters as Professors Sullivan, Ordover, Willig, Joskow, and Klevorick.¹³

But it did seem as recently as 1993 that this earlier wave of theories had been safely buried, in an apparent triumph for the Areeda-Turner position that predatory pricing must be below cost. Why have they resurfaced in modern legal developments? In my view, the reason is that the prior holdings and scholarly defenses of the cost-based rule never really provided a satisfactory theoretical response to the critics that eliminated the disquietude many felt about industry practices under such a rule. Critics

⁹ See *Transamerica Computer v. IBM*, 698 F.2d 1377, 1386-88 (9th Cir. 1983); *International Air v. American Excelsior*, 517 F.2d 714, 724 (5th Cir. 1975); Scherer, *Predatory Pricing and the Sherman Act: A Comment*, 89 HARV. L. REV. 869 (1976); Williamson, *Predatory Pricing*, 87 YALE L.J. 284, 290-92 (1977) [hereinafter "Williamson, *Predatory Pricing*"]; Baumol, *Quasi-Permanence of Price Reductions*, 89 YALE L.J. 1, 2-3 (1979) [hereinafter Baumol, *Quasi-Permanence*]; see generally III AREEDA & TURNER, ANTITRUST LAW 161-64 (1978) (discussing but rejecting the general theory); III P. AREEDA & H. HOVENKAMP, ANTITRUST LAW 337 (Rev. ed.1996) (specifically considering and rejecting an Edlin-like ban on any price reduction);, ANTITRUST ANALYSIS 178 (2d ed. 1974) (offering typical set of Socratic questions to present this (and other) theories of predatory pricing).

¹⁰ Williamson, *Predatory Pricing*, *supra* note , at 295-96, 333-36. This is, however, a real substantive difference. If demand is constant, the addition of entrant output means the Williamson rule would allow the incumbent to lower its price (to maintain its output), whereas the Edlin rule would require the incumbent to lower its output (to maintain its price). For that very reason, Williamson had in 1977 considered and rejected the alternative of banning incumbents from lowering their prices in response to entry, which apparently originated in the 1976 trial testimony of Professor Oxenfeldt. *Id.* at 296 n.39, 318-20, 328 & nn.109-110, 338 (referring to this 1970s articulation of the Edlin rule as the "price maintenance" or "price umbrella" rule). *Id.* But other than applying his own conclusory labels that a price maintenance rule would be "protectionist" and protect "competitors rather than competition," *id.* at 328, 338, Williamson never really explains why this reduction in post-entry output should be a decisive objection, especially since under his own model the price maintenance rule would also imply higher pre-entry output. Areeda & Turner, *Williamson on Predatory Pricing*, 87 YALE L.J. 1337, 1340-43 (1978). This is the opening Edlin cleverly pursues.

¹¹ Baumol, *Quasi-Permanence*, *supra* note , at 4-6; Edlin, *supra* note, at 978. Again, this does not mean the differences are not substantively significant. See *infra* IV.D. Baumol's rule was actually first proposed by Professors Areeda and Turner but rejected by them. Areeda & Turner, *Predatory Practices under Section 2 of the Sherman Act*, 88 HARV. L. REV. 697, 708-09 (1975).

¹² See *infra* Part I.A.

¹³ *Id.* & note __.

were particularly provoked by a serious problem confronting the airline industry.¹⁴ On many routes there is an incumbent airline that dominates business at that route and sells at a price well above its costs. Periodically, another airline enters the market at a lower price. The incumbent firm then lowers its price to beat (or match) the entrant. The incumbent never prices below its own costs. But because the entrant has higher costs (or lower quality) it cannot compete at the new price, and is driven out of the market. Once the entrant is safely gone, the incumbent re-establishes the old price.

The concern is that such reactive temporary price-cuts not only drive out entrants, but deter similar entry in the future, and allow the more efficient incumbent to perpetuate monopoly pricing well in excess of the price the next most efficient firm would charge. Moreover, although airlines present the concerns in particularly stark form, these concerns can exist in any industry where incumbent firms are more efficient than potential entrants and exploit their market power when entrants are not present to charge prices well above incumbent costs.¹⁵ Indeed, if valid, these concerns would overturn a general current skepticism based on the presumption that predatory pricing is rare because it requires the incumbent to sustain losses on a large number of sales.¹⁶ If harmful predation involves profitable above-cost pricing, it would be far more plausible and prevalent.

These are serious concerns. And so far the responses have not been very reassuring. Some consist of formalistic assertions that such above-cost pricing is “competition on the merits” and not “predatory.”¹⁷ Another response has been that banning above-cost price cuts protects less efficient firms, but this does not really answer the critics’ point that protecting these less efficient firms would lower prices and enhance consumer welfare.¹⁸ The final response concedes that banning above-cost price cuts might have long-term benefits on entry and pricing, but stresses that it would raise prices in the short term after entry and that it would be administratively difficult to sort out when the long run benefits outweighed the short run costs.¹⁹ But this is hardly a satisfying riposte to the claims that the cost-based rule is even more

¹⁴ This was the direct motivation for the Department of Transportation and Department of Justice efforts. *See* 63 Fed. Register at 17920-22; 140 F. Supp. 2d at 1145-69 (recounting similar examples). Airline examples also form the main examples motivating the Edlin analysis. *See* Edlin, *supra* note, at 942-43, 980-87. This concern with above-cost airline predation even goes back to Professor Baumol. *See* Baumol, *Quasi-Permanence*, *supra* note, at 2.

¹⁵ However, the airline industry has some unique features making it particularly susceptible to temporary reactive price cuts, although we shall see these features do not justify a different rule for airlines. *See infra* at ___.

¹⁶ *See, e.g.,* AREEDA & HOVENKAMP, *supra* note, at 224-25 (collecting sources and linking them to argument that rareness of predatory pricing means courts are more likely to erroneously condemn desirable pricing than correctly condemn predatory pricing); *id.* at 226 (assuming predatory must involve the temporary sacrifice of revenue).

¹⁷ *See infra* Part I.B.

¹⁸ *Id.*

¹⁹ *Id.*

difficult to administer and confers no short run benefits because entry will be deterred by the prospect of reactive price cuts by lower-cost incumbents. Unless more seriously addressed, these unanswered concerns about above-cost reactive price cuts will likely continue to influence and expand the development of legal doctrines to deal with those concerns in the U.S. and Europe, both for antitrust law and regulatory agencies, as well as bias conclusions about what counts as a cost wherever a cost-based test is still used.²⁰

It is thus time to take the idea of restricting above-cost reactive price cuts more seriously. But it is not time to adopt that idea. To the contrary, seriously confronting the idea reveals that trying to encourage long-term entry with restrictions on reactive above-cost price cuts is actually futile and affirmatively harmful to consumer welfare both *ex post* (after entry) and *ex ante* (on pre-entry behavior).

I will divide my analysis as follows. Part I will outline the recent legal developments and ambiguities, and explain why the standard arguments employed fail to resolve the debate about above-cost predatory pricing in either direction. Part II then considers what the effect of a restriction on above-cost price cuts is likely to be *ex post*, or after entry occurs. One might think it makes more sense to start with the *ex ante* effects, but we need to analyze the *ex post* effects first because the prospect of them is what determines which *ex ante* effects to predict. And what the *ex post* analysis shows is that restrictions on reactive above-cost price cuts are likely to be wasteful and futile post-entry. The basic reason is that protecting entrants who are less efficient than incumbents is not only harmful in the short run, but ineffectual in the long run because eventually the less efficient firm will be driven out when – by passage of time or loss of monopoly power – any restriction on reactive price cuts by the more efficient incumbent expires. Further, such restrictions can give incumbents perverse incentives to *raise* post-entry prices to speed the day when the restriction expires.

Part III then considers whether restrictions on reactive above-cost price cuts have desirable *ex ante* effects, and concludes they do not. Because any *ex post* protection offered by these restrictions is ineffectual in the long run, they offer little *ex ante* incentive for entry or incumbent limit pricing. Further, even if the restrictions were not futile, their *ex ante* effects are very likely undesirable. To the extent any additional entry by inefficient firms occurs, much of it would actually be harmful. Further, the prospect of such entry would discourage investments both in efficient market entry and in the incumbent's initial creation of products that are desirable enough to give them market power. Indeed, the restrictions would have especially adverse *ex ante* effects on investments in the airline industry that prompted the

²⁰ See *infra* Part I.A.

proposals, in particular deterring optimal investments in efficient hub-and-spoke airline systems. My analysis in fact will suggest contestable market theory and predatory pricing theories cannot really be applied to separate airline routes given the common costs involved in operating a hub-and-spoke system.

These two fundamental problems are common to all the proposals to ban above-cost predatory pricing. Part IV then takes up various problems whose precise nature varies with the particular proposal. The main problems are that the various price or output limits are hard to define, provoke inefficient changes in product quality, and are triggered by a moment of entry or exit that is also hard to define without making the limits ineffectual or problematic. These particularized problems might seem more correctable, but in fact they are an inevitable consequence of trying to substitute a regime of above-cost price regulation for a generally desirable form of market competition. Nor can these be dismissed as mere administrative concerns since their effect is to raise prices, hamper market flexibility, and distort innovation, which are more important than any gain in allocative efficiency the proposals might (erroneously) hope to achieve.

The points raised here are entirely separate from the lively debate about whether even *below-cost* predatory pricing should be banned. Many scholars think not because below-cost pricing inflicts greater losses on the predator than its victims, rarely garners a future recoupment that compensates for losses given time and uncertainty discounts, and can be thwarted by entrant or consumer counter-strategies, all of which make below-cost pricing self-deterring and too irrational to be credible.²¹ Others have reached a different conclusion about these arguments based mainly on arguments about differential access to capital to cover losses, multi-market reputational effects, imperfect information, or efforts to mislead rivals (or their lenders) about predator efficiency or market conditions.²² This Article takes no position on these disputed issues about the desirability of banning below-cost predatory pricing. Rather, I focus on the *separate* theoretical grounds for rejecting any restriction on *above-cost* predatory pricing.

Understanding these grounds provides the necessary theory to determine *which* cost measure to use for any doctrine that condemns below-cost predatory pricing, a question often now resolved by rather atheoretical judgment calls. In particular, the arguments outlined above only work if costs are defined in a way that truly does not

²¹ See Ordoover, *Predatory Pricing* in 3 THE NEW PALGRAVE DICTIONARY OF LAW & ECONOMICS 77, 79 (ed. Newman 1998) (collecting sources); Easterbrook, *Predatory Strategies and Counterstrategies*, 48 U. Chic. L. Rev. 263, 269-304, 333-37 (1981).

²²Ordoover, *supra*, at 79-80; Brodley, Bolton & Riordan, *Predatory Pricing: Strategic Theory and Legal Policy*, 88 GEO. L.J. 2239, 2247-49, 2285-2330 (2000)(synthesizing recent literature).

deter entry by an equally efficient firm. This test has important implications for which cost measure to use. I pursue those implications in Part V to clarify several longstanding problems in defining the relevant costs for predatory pricing. In this way, our inquiry into why above-cost prices are *not* predatory reveals something important about the nature of what *is* predatory.

I. THE CURRENT STATE OF FLUX

I begin in Part A by describing how cost-based tests of predatory pricing have been changed or challenged in recent years and why it makes sense to think that future legal developments on this score will be influenced by the underlying economic theories. I then explain why the easy answers offered by either side fail to resolve the debate, which instead requires the more in depth analysis that follows.

A. *Legal Developments and Ambiguities*

In 1993, the law on predatory pricing appeared relatively settled. The 1991 decision of the European Court of Justice in *AKZO* held that when a firm with dominant market power prices below average variable costs, those prices are presumed abusive, and that when it prices above average variable costs but below average total costs, its prices are abusive if they are intended to eliminate a competitor.²³ This seemed to imply that prices above average total costs could not be abusive even if coupled with such an intent. And in 1993, the U.S. Supreme Court in *Brooke* decided that one necessary element of predatory pricing was proof that the defendant priced below incremental costs.²⁴ *Brooke* did not resolve which measure of costs should be used,²⁵ and the lower U.S. appellate courts were divided between those who required prices below average variable cost (or short run marginal cost) and those who would also entertain claims of prices below average total costs (or long run

²³ See *AKZO Chemie v. Commission*, [1991] European Court Reports I-3359, ¶¶70-73. Just as U.S. Sherman Act §2 makes it illegal to have monopoly power and engage in unilateral exclusionary conduct, E.U. Treaty 86 makes it illegal to have a dominant position and engage in unilateral abusive conduct. *Id.* ¶¶34-75. But U.S. and E.U. law differ in the precise degree of market power necessary to satisfy the first element, and the type of conduct deemed to anticompetitively violate the second element.

²⁴ In addition to requiring prices below incremental costs, *Brooke* required proof of two other elements whose precise definition varied with the antitrust statute in question: (1) sufficient market power to have the requisite anticompetitive effect in the market where the predatory pricing is occurring, and (2) a sufficient likelihood of recouping the investment in below-cost prices after rivals were eliminated or disciplined. *Brooke Group v. Brown & Williamson*, 509 U.S. 209, 222-25 (1993) (adopting somewhat higher standards of market power and recouping likelihood under Sherman Act §2 than under the Robinson-Patman Act).

²⁵*Brooke*, 509 U.S. at 222 n.11.

marginal costs).²⁶ But while there was plenty of disagreement on such issues,²⁷ at least there appeared to be common ground on the proposition that unilaterally set prices had to be below *some* measure of costs to be considered predatory or illegal. But now, the law on above-cost predatory pricing is in a considerable state of flux. In 1996, the European Court of First Instance in *Compagnie Maritime* sustained a European Commission ruling that it constituted an abuse of a dominant position to adopt a “fighting ships” strategy of selective price cuts even though prices were above costs.²⁸ The Commission relied on three factors: (1) the price cuts were reactive and selective, being adopted in response to entry and only for those ships whose sailing dates directly competed with the entrant; (2) the reduced prices met (and once beat) the entrant; and (3) the price cuts reduced defendant profits compared to what they would have been with higher prices.²⁹ The Commission got around *AKZO* by saying that, although this practice was not “predatory” pricing, it was nonetheless abusive.³⁰ The Court of First Instance affirmed, ruling that these three objective criteria meant the reactive above-cost price cuts did not reflect “normal competition” and were thus abusive.³¹ The Court also suggested more broadly that any above-cost price cut (or other conduct) whose “real purpose” was to strengthen a dominant position by eliminating a competitor was illegal, noting internal documents indicating that the defendants purpose was “getting rid” of any independent competitors.³²

The Opinion of the Advocate General recommended affirming the Court of First Instance on these holdings.³³ Rather than getting around *AKZO* by the dubious technique of saying that here the alleged misconduct here was not labeled “predatory pricing,” he simply argued that, while *AKZO* established the circumstances under

²⁶ AREEDA & HOVENKAMP, *supra* note , at 229-230, 242-43, 349 , 368, 395.

²⁷ These disagreements extended beyond the right cost measure. The European Court of First Instance has interpreted E.U. law to reject any requirement to prove a likelihood that the defendant could recoup predatory prices. See *Tetra Pak v Commission*, Case C-333/94 P, [1996] ECR I-5951. E.U. law also rejected the proposition that the dominant position and predatory pricing have to be in the same market, as long as the firm has a dominant position in some market and the leading position in the market where the predatory pricing happened. *Id.* However, the E.U. Advocate General had opined that E.U. law actually should properly be interpreted to require a recoupment test, see *Compagnie Maritime Belge Transports v. Commission*, Opinion of Advocate General, ¶136, C-395/96O & C-396/96P, 1998 ECJ CELEX Lexis 10417, (Oct. 29, 1998), and the European Court of Justice has not yet ruled on the issue.

²⁸ *Compagnie Maritime Belge Transports v. Commission*, Judgment of the Court of First Instance, ¶138-153, 1996 ECJ CELEX LEXIS 8660 (Oct. 8, 1996). This case often goes under the name *Cewal*.

²⁹ *Id.* ¶139-41.

³⁰ *Id.* ¶¶ 129, 139.

³¹ *Id.* ¶144-45, 148, 153.

³² *Id.* ¶146-148.

³³ *Compagnie Maritime Belge Transports v. Commission*, Opinion of Advocate General, ¶¶ 111-139, C-395/96O & C-396/96P, 1998 ECJ CELEX Lexis 10417 (Oct. 29, 1998). The Opinion is worth addressing because it offers much more detail on the possible reasons for affirmance than the ultimate Court of Justice opinion.

which below-cost prices were abusive, it did not affirmatively hold that above-cost prices could never be abusive as well.³⁴ In deciding whether the challenged above-cost price cuts were abusive, the Advocate General relied partly on the defendants’ “avowed purpose” of eliminating its competitor, which he observed was supported by both the subjective evidence and the three objective criteria noted above.³⁵ But he also stated that the selectivity of the price cuts was “important,” noting the case would have been more difficult had the defendants adopted a general price cut, because such a general price cut both (1) would have benefitted all its customers and (2) could not have been subsidized by defendants’ monopoly prices on the other sailings.³⁶ This suggested that a purpose of eliminating rivals might not suffice unless the price cuts were selective. However, then he indicated that proof of “high barriers to market entry” might substitute for selectivity in proving that the reactive price cut was not “competition on the merits.”³⁷ Since high entry barriers are necessary to prove dominant market power, this possibility would effectively eliminate any selectivity limit on this doctrine. Further, he also noted that, in the shipping industry, once a ship was set to sail, the short run marginal cost of taking an additional container is near zero.³⁸ This would seem at most a reason to look to average total cost (or long run marginal cost) rather than short run marginal costs, not a reason to dispense with requiring prices below some cost measure,³⁹ so it is unclear how much weight he intended to put on this factor. Finally, he indicated that it mattered that the defendants “enjoyed not merely a dominant position but, as it says, a *de facto* monopoly,” thus suggesting that this above-cost predation theory might require more than the normal evidence of a dominant position.⁴⁰ The Opinion of the Advocate General thus left rather unclear

³⁴ *Id.* at ¶¶ 123-130. In doing so, he echoed a pre-*Brooke* development in the U.S. Court of Appeals for the Ninth Circuit, which first made a ruling just like *AKZO* about the relevant presumptions depending on whether prices were below average variable costs or between those costs and average total costs, *see* *William Inglis & Sons Baking v. ITT Continental Baking*, 668 F.2d 1014, 1035-36 (9th Cir. 1982), and later held that this earlier holding did not mean that prices above average total costs could not be predatory too, *see* *Transamerica Computer v. IBM*, 698 F.2d 1377, 1386-88 (9th Cir. 1983).

³⁵ *Id.* ¶¶ 119-20, 135.

³⁶ *Id.* ¶¶ 121-22, 135. The United Kingdom Monopolies and Mergers Commission took a similar position. *Id.* n.92 (quoting *Report of the Monopolies and Mergers Commission on the Supply of Concrete and Roofing Tiles* (1981-1982) H.C., ¶10.57).

³⁷ *Id.* ¶122.

³⁸ *Id.* ¶133.

³⁹ *See generally infra* V (analyzing issue of whether and when to examine long run costs instead of short run costs).

⁴⁰ *Id.* ¶135. One might be tempted to add one other possible doctrinal limitation, that *Compagnie Maritime* only applies to cases where the reactive price cuts are adopted by a horizontal combination of firms, since it was a collective conference of shipping lines that adopted this “fighting ships” strategy. But because shipping conferences enjoyed an exemption to engage in horizontal combinations to fix prices, the case was adjudicated under Article 86 on the understanding that “The multilateral character of the price behavior at issue has no bearing on the finding of abuse.”

the precise contours of the doctrine he was advocating.

The European Court of Justice affirmed, unfortunately without making the outside limits of the doctrine much clearer. The Court simply held that it was not necessarily to rule generally on when it was illegal for a dominant firm to make selective reactive above-cost price cuts to meet an entrant, but that such price cuts were illegal when the firm had over 90% market share and had the avowed purpose of eliminating the entrant.⁴¹ Likewise, in *Irish Sugar*, the European Court of First Instance held that it was illegal for a firm with 88% market share to engage in above-cost price cuts that were selectively adopted at the border in order to deter entry from an importer.⁴²

So at a minimum, European law now makes it illegal for a firm with a market share near 90% to respond to entry with above-cost price cuts that are selectively limited to the areas where the entrant competes for the purpose of driving that entrant out. Which other above-cost price cuts illegal might be illegal under European law remains unclear. But the cases suggest the European doctrine might ultimately be interpreted to mean that any above-cost price cut made by a monopolist in reaction to entry is illegal if intended to drive out an entrant, and that such an intent can be established not just by subjective evidence but by objective proof that the resulting price failed to maximize the monopolist's short run profits.

The law regarding above-cost predatory pricing has also been in some flux on this side of the Atlantic. In 1998, the U.S. Department of Transportation proposed a regulation banning major incumbent airlines in their hub markets from responding to entrants by cutting prices (or expanding capacity) to a level that, although above-cost, resulted in "substantially" lower short-term profits than alternative pricing (or capacity) would have.⁴³ The regulation would have defined such pricing as an unfair method of competition under the statute giving the Department of Transportation authority to regulate the airline industry.⁴⁴ The Department of Transportation limited its regulation to "major" carriers in their "hub markets" based on evidence that prices in those hub

Id. ¶ 116. Whether there was a horizontal combination was considered relevant only for purposes of determining whether there was a collective dominant position. *Id.*

⁴¹ *Compagnie Maritime Belge Transports v. Commission*, Judgment of the Court of Justice, ¶¶117-120, 2000 ECJ CELEX LEXIS 4472 (March 16, 2000). The Court noted that it would be different if the selective price cuts were justified by lower costs on those sailings. *Id.* ¶101.

⁴² *Irish Sugar v. Commission*, T-228/97, Judgment of the Court of First Instance, ¶¶ 173-193 (Oct. 7, 1999), *affirmed on other grounds*, C-497/99P, Judgment of the Court of Justice (July 10, 2001). The Court also emphasized that the selectivity of the price cuts was not justified by lower costs in those areas, just by the existence of competition the firm wished to deter. *Id.* ¶173, 188. The Court also suggested that there might be an exception to this doctrine if the entrant priced below cost. *Id.* ¶185.

⁴³ 63 Fed. Register 17919, 17920 (1998).

⁴⁴ 49 U.S.C. §41712.

markets were higher than prices elsewhere.⁴⁵ The Department assumed this effectively established a market power to charge supracompetitive prices in those hub markets,⁴⁶ but did not say it would require a degree of market power sufficient to constitute monopoly power. After receiving comments, the Department of Transportation at the end of the Clinton Administration announced a decision to pursue this strategy by adjudication rather than by regulation.

This regulatory proposal illustrated an important point. Even if barred by antitrust law, theories for banning above-cost predatory pricing can influence the myriad of regulatory agencies that have the power to adopt different rules for a particular industry if they become convinced that would advance consumer welfare. True, the Bush Department of Transportation itself seems unlikely to pursue such an approach since its new head filed comments opposing the proposed regulation before he took office.⁴⁷ But no administration is forever, and there remain plenty of other federal or state regulators who might. Thus, the issue remains important in the U.S. even if federal antitrust law were settled.

But in fact, federal antitrust law is not so settled. Notwithstanding *Brooke*, the U.S. Department of Justice in May 1999 brought the American Airlines litigation based largely on the same theory as the Department of Transportation Regulation.⁴⁸ It claimed antitrust law was violated when a monopolist of an airline route responded to entry by expanding capacity (and lowering prices) in a way that covered costs but “clearly” failed to maximize short run profits.⁴⁹ The notion underlying the approach of both Departments was that choosing a strategy that sacrificed greater short term profits must be predatory since it could only be explained by the long run goal of driving the entrant out of the market.⁵⁰

To stay within *Brooke*, the Department creatively redefined what counted as a “price” and a “cost.” Its main claim was that the incremental revenue from the capacity

⁴⁵ 63 Fed. Reg. at 17920.

⁴⁶ *Id.* It is not at all clear such evidence does actually show market power in individual routes. See *infra* III.C.

⁴⁷ See Comments of Norman Y. Mineta, DOT Docket No. OST 98-3713-814 (July 24, 1999), reprinted at <http://ostpxweb.ost.dot.gov/aviation/domestic-competition/>.

⁴⁸ See <http://www.usdoj.gov/atr/cases/f2400/2438.htm> (May 13, 1999 complaint).

⁴⁹ See *U.S. v. AMR*, 140 F. Supp. 2d 1141, 1179-80, 1200-02 (D. Kansas 2001). The district court correctly held there was no difference between a claimed duty to choose a “more” profitable alternative and a duty to “maximize” profits, but unfairly failed to acknowledge that the claim was only that the defendant refrain from price cuts that “clearly” did not maximize short-term profits. See *id.* at 1180, 1202; Redacted Memorandum In Support of the Response of the United States in Opposition to American’s Motion for Summary Judgment at 31-32 (Feb. 22, 2001), available at <http://www.usdoj.gov/atr/cases/f7600/7665.pdf> [hereinafter “U.S. Summary Judgment Memo”].

⁵⁰ U.S. Summary Judgment Memo, *supra* note , at 15, 17, 19-22; Brief for Appellant United States 29-31 (Jan. 11, 2002), available at <http://www.usdoj.gov/atr/cases/f9800/9814.pdf> [hereinafter “U.S. Appellate Brief”].

increase did not exceed its incremental cost.⁵¹ But the actual measures used to try to make this point either measured incremental revenue by the net effect of the capacity increase on revenue for the route as a whole, or included in incremental costs the opportunity cost of foregone profits.⁵² Either of those amounted to a duty to maximize short-term profits rather than avoid actual losses. Using the incremental revenue on the route as a whole meant the Department was not just considering the prices or revenue earned on the added *marginal* capacity, but also taking into account the fact that adding that marginal capacity lowered prices on the *inframarginal* flights. This amounted to requiring a monopolist to equate marginal revenue and costs, which is precisely the sort of calculation that causes economics texts to predict a monopolist will harm consumer welfare by setting a profit-maximizing monopoly price that is *above* marginal cost.⁵³ Likewise, including in costs the opportunity cost of forgoing the revenue that could have been earned with higher prices (or lower output) implied a duty to maximize short-run profits. The district court rejected these redefinitions, as have other courts in the past.⁵⁴ But, surprisingly, the Bush Administration has appealed,⁵⁵ and in any event this gambit of redefining price and costs remains available to any court persuaded to pursue it.⁵⁶

Even if federal antitrust courts are not willing to go quite so far, theoretical

⁵¹ 140 F. Supp. 2d at 1179-80, 1200-02. The Department also argued that the prices were below fully-allocated costs. *Id.* at 1179, 1203. The district court rejected this for two reasons. First, that was a measure of total rather than incremental costs. *Id.* at 1203. Second, and far worse, it reflected an arbitrary allocation to individual routes of the joint costs incurred by running a hub-and-spoke flight system. *Id.* at 1203-04. Given that the Department defined the market as the individual route, this meant this cost measure included costs incurred in markets other than the one in which the alleged predatory pricing was occurring. *See generally infra* III.C (discussing hub-and-spoke airline economics).

⁵² 140 F. Supp. 2d at 1179-80, 1200-02.

⁵³ CARLTON & PERLOFF, MODERN INDUSTRIAL ORGANIZATION 88-98 (3rd ed. 2000); PINDYCK & RUBINFELD, MICROECONOMICS 334-52 (1989).

⁵⁴ *See* 140 F. Supp. 2d at 1179-80, 1200-02; *Rebel Oil v. ARCO*, 146 F.3d 1088, 1095 (9th Cir. 1998); Baumol, *Predation and the Logic of the Average Variable Cost Test*, 39 J.L. & ECON. 49, 71 n.20 (1996) (collecting cases) [hereinafter Baumol, *Predation*].

⁵⁵ The notice of appeal was on June 25, 2001, see <http://www.usdoj.gov/atr/cases/f8400/8496.htm>, which was after the June 14, 2001, confirmation of Bush nominee Charles James to head the DOJ antitrust division, see <http://www.usdoj.gov/atr/jamesbio.htm> (James confirmation). One might question whether this decision really reflects the views of the Bush Administration since the fact that Mr. James is not listed on the appellate brief indicates he may have had to recuse himself from this decision. *See* U.S. Appellate Brief, *supra* note . This might mean the decision to appeal was made by nonpolitical staff or Clinton holdovers. But after the appointment of the political deputies, the case has been appealed in a way that does not signal any narrowing of the theories pursued at trial. *Id.*

⁵⁶ I will exclude opportunity costs from my cost definition for two reasons. First, it is important to keep predatory theories based on a failure to maximize profits analytically distinct from theories based on pricing below costs. Second, my definition of costs will be the lowest cost measure that prevents a firm pricing at cost from deterring or driving out an equally efficient entrant, *see infra* Part V, and including such opportunity costs would mean that the cost measure would no longer identify prices that threatened equally efficient rivals. *See* Baumol, *Predation*, *supra* note , at 50, 69-71.

concerns about reactive above-cost price cuts continue to influence U.S. courts about which cost measure to use under *Brooke*. At a minimum, these concerns are likely what leads many federal courts to retain some antitrust review for pricing above marginal or average variable costs as long as it is below average total costs.⁵⁷

Nor have U.S. courts been shy about changing antitrust law in more dramatic ways as theories of antitrust economics develop. The list of antitrust cases overruled as a result of new economic theory is long indeed.⁵⁸ Here that possibility is enhanced because many regard *Brooke*'s statement requiring below-cost pricing as dicta.⁵⁹ Thus, the existing *Brooke* rule might well be changed if federal antitrust courts come

⁵⁷ AREEDA & HOVENKAMP, *supra* note , at 229-230, 242-43, 349 , 368, 395 (collecting the surprisingly diverse appellate authorities). There are many other reasons to disagree about which cost measure to use, including which best assures equally efficient firms will not be excluded in particular cases. *See infra* Part V. But courts choosing among the cost measures have also been influenced by the sorts of concerns raised by these proposals about above-cost predatory pricing.

⁵⁸ *See, e.g.*, *State Oil v. Khan*, 522 U.S. 3 (1997) (overruling per se rule against vertical maximum price-fixing announced in prior Supreme Court case); *Continental T.V. v. GTE Sylvania*, 433 U.S. 36 (1977) (overruling per se rule against vertical non-price restraints announced in prior Supreme Court case); *Copperweld v. Independent Tube*, 467 U.S. 752 (1984) (overruling doctrine that a corporation could conspire with a wholly owned subsidiary); *Monsanto v. Spray-Rite*, 465 U.S. 752 (1984) (overruling prior cases that allowed vertical distributional restraints to be based on evidence that a manufacturer demanded it and the distributor acquiesced); *BMI v. CBS*, 441 U.S. 1 (1979) (holding that, although the per se rule against price-fixing excludes justifications, it does not apply to an agreement that literally involves price-fixing but had a procompetitive justification); *Northwest Wholesale Stationers v. Pacific Stationery*, 472 U.S. 284 (1985) (holding that per se rule against boycotts did not apply when the concerted refusal to deal had a procompetitive justification); *United States Steel v. Fortner Enterprises*, 429 U.S. 610 (1977) (holding that per se rule against tying required independent proof of tying market power even though prior cases had not required such proof); *Tampa Electric v. Nashville Coal*, 365 U.S. 320 (1961) (replacing per se rule against exclusive dealing that involved substantial foreclosure with the rule of reason); *Standard Oil v. United States*, 221 U.S. 1 (1911) (adopting the antitrust rule of reason, which had been explicitly rejected in prior cases). Even Justice Scalia has written an opinion for the Court agreeing that, despite his own penchant for textual interpretations and the supposed super-strong presumption against overturning statutory precedent, courts are free to develop and change federal antitrust law in a common law fashion. *See generally* *Business Electronics v. Sharp Electronics*, 485 U.S. 717, 731-33 (1988).

⁵⁹ Because the actual ground for decision in *Brooke* was that plaintiff failed to establish the element of likely recoupment, prominent scholars have characterized its statement requiring below-cost pricing as dicta. AREEDA & HOVENKAMP, *supra* note , at 230-32, 235, 240-41, 318, 347, 359-60. But any holding requiring recoupment by implication requires pricing that incurs some sort of losses, otherwise there is nothing to recoup, as Edlin acknowledges. *See* Edlin, *supra* note , at 942 n.4. Although this forecloses Edlin's own approach, requiring a likelihood of recoupment does not (as Edlin supposes, *id.*) necessarily foreclose all bans on above-cost predatory pricing. In particular, it would not necessarily foreclose the Department of Justice position banning only reactive above-cost price cuts that sacrifice short term profits, a "loss" which could be said to be "recouped" after the entrant exits. *See* AREEDA & HOVENKAMP, *supra*, at 256-57 (recoupment can be of foregone profits). This position might find obstacles in Court language requiring a likelihood of the defendant "recouping its investment in below-cost prices," and interpreting its past cases to hold that lowering prices to an above-cost level cannot inflict antitrust injury. 509 U.S. at 224. Nonetheless, one could imagine the argument that, strictly speaking, this phrasing and interpretation was also dicta, and that the narrow holding was to require only proof of some recoupment. My point is not to resolve that issue here, however, but only to observe that these arguments about *Brooke*'s requirement of below-cost pricing possibly being dicta marginally increase the likelihood of a change in law (or could serve for the pretext for one) if such a change were deemed desirable as a matter of antitrust policy.

to accept the economic critique. State antitrust courts are also not bound by *Brooke* and thus free to adopt different interpretations of state antitrust law. And statutory amendment is always possible if Congress or state legislatures become convinced of the merits of proposals to ban above-cost predatory pricing.

In any event, we have long since passed the time when only U.S. law matters in antitrust. With the unification of Europe, its markets are often as important as U.S. markets. Further, markets are increasingly globalizing and the U.S. and E.U. effectively have dual antitrust jurisdiction over global markets. Not only is the E.U. position on antitrust issues thus relevant, it generally matters more because, as the more aggressive antitrust enforcement agency, the E.U. effectively defines the line between legality and illegality in global markets. If U.S. antitrust officials think a given practice violates antitrust, the more aggressive European officials probably do so as well. If the U.S. antitrust officials do not think a given practice violates antitrust, whether that practice is illegal in global markets will depend on whether the more aggressive European officials agree or do not. The line between legality and illegality on global markets thus comes to be drawn by the more aggressive regulators, who today are the European officials. Accordingly, if U.S. antitrust law does not prohibit above-cost predatory pricing and E.U. law does, then on global markets it is the European doctrine that trumps, banning above-cost predatory pricing and defining the line between it and procompetitive pricing. There is thus considerable practical import both in the U.S. and E.U. in dispelling transatlantic economic theories about above-cost predatory pricing that might influence the development of legal doctrine by the more aggressive courts or regulators of either place.

However, some recent cases suggest the importance of emphasizing that the issue whether and when a straight price that is above cost should be illegal must be distinguished from the situation when a seller *conditions* an above-cost discount on the buyer taking all or a high percentage of its purchases from the seller. Two recent decisions applying *Brooke* to the latter contain language indicating they may have mistakenly confused the issues.⁶⁰ But in fact the condition means that the latter, while not constituting predatory pricing, can amount to *de facto* exclusive dealing under both U.S. and European law.⁶¹ The key reason for the difference is that, by foreclosing the

⁶⁰ See *LePage's Inc. v. EM*, 277 F.3d 365, 2002 WL 46961, at *9-11 (3rd Cir. 2002), *vacated for rehearing on en banc*; *Concord Boat v. Brunswick Corp.*, 207 F.3d 1039, 1061-62 (9th Cir. 2000).

⁶¹ See IIIA AREEDA & HOVENKAMP, ANTITRUST LAW ¶768B3, AT 151 (1996); XI HOVENKAMP, ANTITRUST LAW ¶1807, at 115-18 (1998); *Virgin/British Airways*, European Commission Decision, IV/D/2/34.780, ¶¶97-107 (July 14, 1999); *Michelin*, Case 322/81, ECR 3461 (1983); *Hoffman-La Roche*, Case 85/76, ECR 541 (1979). Other language in *LePage's* and *Concord Boat* indicate that the courts recognized this doctrine, but mistakenly seemed to assume a discount was not conditioned when a higher discount *amount* depended on the buyer buying a high percentage from the defendant

market share rivals need to reach the minimum efficient scale, such loyalty rebates can raise rivals' costs or exclude it from the market altogether.⁶² When they do so, they exclude rivals not by virtues of advantages they earned by improving their own efficiency, but by worsening the rivals' efficiency. Rewarding the former is socially desirable. Rewarding the latter is not.

B. The Inadequacy of Traditional Responses in Either Direction

Why has the 1993 caselaw that seemingly established the cost-based rule proven so vulnerable? Probably because the underlying concerns about above-cost predatory pricing have never been satisfactorily addressed. One unfortunate tendency has to declare victory by definition, by asserting a "predatory" price is below cost or that low above-cost prices involve "competition on the merits."⁶³ But these are mere formalistic labels which do not answer the substantive question concerning what the law should define as "predatory" pricing or "competition on the merits." Indeed, the European Commission had a very similar test, whether reactive above-cost price cuts that intended to eliminate rivals involved "normal competition" and simply drew the opposite formalistic conclusion that they do not.⁶⁴ Assertions about such formalistic labels in either direction do not really aid the inquiry.

Another unfortunate tendency has been to dismiss bans on above-cost predatory pricing with the observation that they protect only "higher cost" or "less efficient" firms.⁶⁵ This observation is important, but does not by itself dictate any conclusion about the desirability of keeping less efficient firms in the market in order to restrain monopoly prices. If proponents are right that restricting reactive above-cost prices cuts would increase entry, lower incumbent prices, and enhance consumer welfare,⁶⁶ then keeping less efficient firms in the market is desirable, and courts could

or when the buyer voluntarily agreed to accept the discount. 2002 WL 46961, at *12; 207 F.3d at 1044-45, 1059-60, 1063-64. Still there is also other language indicating that the actual holdings of the cases can be limited to the proposition that the claims of *de facto* exclusive dealing were not supported by sufficient proof that the discounts produced substantial market share foreclosure. 2002 WL 46961, at *12-13; 207 F.3d at 1059-60..

⁶² See generally Thomas G. Krattenmaker & Stephen C. Salop, Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power Over Price, 96 YALE L.J. 209, 214 (1986).

⁶³ See, e.g., *Brooke*, 509 U.S. at 223; AREEDA & HOVENKAMP, *supra* note , at 223; AREEDA & TURNER, *supra* note , at 150-51, 161; Areeda & Turner, *supra* note , 88 HARV. L. REV. at 706-07, 711.

⁶⁴ *Compagnie Maritime Belge Transports v. Commission*, Judgment of the Court of First Instance, ¶130, 1996 ECJ CELEX LEXIS 8660 (Oct. 8, 1996).

⁶⁵ See, e.g., *Brooke*, 509 U.S. at 223; AREEDA & HOVENKAMP, *supra* note , at 330-331, 338; AREEDA & TURNER, *supra* note , at 161, 163; RICHARD POSNER, ANTITRUST LAW 188, 193 (1976); Areeda & Turner, *supra* note , 88 HARV. L. REV. at 711; Areeda & Turner, *supra* note , 87 YALE L.J. at 1339, 1342.

⁶⁶ See Edlin, *supra* note , at __ 945-49.

re-define “predatory pricing” to cover (and “competition on the merits” to exclude) any undesirable reactive above-cost price cuts.⁶⁷

The more substantive response has traditionally been to concede that low above-cost prices often do have long-term undesirable consequences on entry and prices, but to observe that they lower short-term prices (and increase output) following entry, and that it is administratively difficult to try to distinguish low above-cost prices that are desirable from those with net undesirable effects.⁶⁸ But the first point is not really responsive to the claim that the posited adverse short run effect never materializes, or is outweighed by long run benefits, because the restriction on reactive above-cost price cuts would encourage entry or lower everyday incumbent prices that otherwise never would have occurred.⁶⁹ And the second lends itself to the critique that price-cost comparisons are themselves difficult to administer, and to efforts to make the restrictions more administrable by banning all reactive price cuts or output expansions (like Edlin or Williamson) or at least those that clearly or substantially sacrifice short term profits (like the Departments).

For example, the leading antitrust treatise notes no particular administrability problem with an Edlin-like ban on any price reduction, but dismisses it with the simple observation that it would lower the incumbent’s post-entry output.⁷⁰ Why this objection should be a showstopper is never explained, which seems odd since one of the authors had previously observed that such a price maintenance rule increased pre-entry output.⁷¹ This treatise also considers a price floor at the short-term profit-maximizing level (like the one developing in the E.U. and proposed by the U.S. Departments), but dismisses it purely on grounds it is inadministrable.⁷² Moreover, one of the offered inadministrability arguments -- that the incumbent might be sacrificing short term profits to avoid government regulation or develop the market, – seems a relatively implausible explanation for timing price cuts to respond to entry. In fact, both price maintenance and price floor rules create reduced post-entry output and administrability problems, and both those problems are only part of a larger and more

⁶⁷ Even if prices were lowered, there is the additional question whether this benefit to consumer welfare offsets the loss of productive efficiency that results from transferring market share to a less efficient producer. *See infra* Part II.

⁶⁸ *Brooke*, 509 U.S. at 223-24; *Barry Wright Corp. v. ITT Grinnell Corp.*, 724 F.2d 227, 231-35 (1st Cir. 1984) (opinion of then-judge Breyer); AREEDA & HOVENKAMP, *supra* note , at 228, 318, 327-28, 332-46; AREEDA & TURNER, *supra* note , at 161-64, 166-68; Areeda & Turner, *supra* note , 88 HARV. L. REV. at 708-09; Areeda & Turner, *supra* note , 87 YALE L.J. at 1339; AREEDA, ANTITRUST ANALYSIS 196-97 (3rd ed. 1981).

⁶⁹ Edlin, *supra* note , at ___ 945, 956, 977.

⁷⁰ AREEDA & HOVENKAMP, *supra* note , at 332, 337.

⁷¹ *See supra* note ___.

⁷² *Id.* at 335-336.

fundamental set of problems, as this Article will explain.

By the same token, the debate is also not resolved in the other direction by asserting that reactive above-cost price cuts must be illegal because they fit the test of being designed to maintain monopoly power by excluding rivals. As we saw, some language in the European caselaw seems to embrace this argument.⁷³ Likewise, in the U.S., proponents have argued that reactive above-cost pricing must be illegal because it fits the basic *Grinnell* test of being designed to exclude rivals and maintain monopoly power.⁷⁴ *Grinnell* stated:

"The offense of monopoly under § 2 of the Sherman Act has two elements: (1) the possession of monopoly power in the relevant market and (2) the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident."⁷⁵

The second element is often rephrased as requiring "exclusionary conduct," which is conduct that tends to exclude rivals other than "competition on the merits."⁷⁶

But, as antitrust scholars have long understood, the problem with the *Grinnell* test is that it is either wrong or conclusory. Often a firm deliberately tries to exclude rivals and acquire or maintain monopoly power with superior products, business acumen, or other conduct that could be considered competition on the merits. The two are not mutually exclusive concepts, as *Grinnell's* "as distinguished from" language wrongly suggests. In practice, this tension is resolved by court decisions labeling particular conduct that excludes rivals and enhances monopoly power as being either "predatory" and "anticompetitive" on the one hand, or "business acumen" and "competition on the merits" on the other. But without some underlying normative theory to explain when to apply which label, such caselaw would merely be conclusory. The question in the end must always be whether particular challenged conduct drives rivals out of the market in an improper manner, and that requires a normative inquiry into whether the methods used are socially undesirable and, if so, whether those undesirable methods can be selectively discouraged without unduly discouraging desirable behavior.

Nor is the matter settled, as the European Commission and U.S. Departments apparently thought, by evidence that the defendant has sacrificed short run profits and is thus engaging in behavior that could only be profitable if it had the long term aim of

⁷³ See *supra* I.A.

⁷⁴ See U.S. Summary Judgment Memo, *supra* note , at 14-15; Edlin, *supra* note , at 965.

⁷⁵ *United States v. Grinnell Corp.*, 384 U.S. 563, 570-571(1966).

⁷⁶ *Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*, 472 U.S. 585, 605 n.32 (1985)

acquiring monopoly power and earning monopoly returns.⁷⁷ True, such a definition of “predation” has long been advanced by many courts and a long line of distinguished antitrust scholars.⁷⁸ But the problem is that this definition would apply equally to all sorts of desirable conduct. It would apply to any monopolist that does not fully exploit its monopoly power, because a failure to charge the full profit-maximizing monopoly price could only be explained by a desire to discourage further entrants.⁷⁹ This would amount to a legal duty to engage in monopoly pricing. Worse, this definition would apply to any firm that invests research and development funds to invent a new innovative product that will allow it to drive out rivals and earn monopoly rents.⁸⁰ It would also apply to any firm that sacrifices short term profits by investing in building new facilities, training personnel, or making organizational or distributional changes in order to improve costs or quality and drive out rivals.⁸¹ Sacrificing short-term profits to build a better or cheaper mousetrap or organization is socially desirable

⁷⁷ See *supra* Part I.A.

⁷⁸ *Transamerica*, 698 F.2d at 1386-88 (prices above average total costs can be predatory if “the anticipated benefits of defendant’s price depended on its tendency to discipline or eliminate competition and thereby enhance the firm’s long-term ability to reap the benefits of monopoly power”); *International Air*, 517 F.2d at 724 (pricing above average variable cost can be predatory if “the competitor is charging a price below its short-run, profit-maximizing price and barriers to entry are great enough to enable the [defendant] to reap the benefits of predation before new entry is possible”); *Janich Bros. v. American Distilling*, 570 F.2d 848, 856 (9th Cir. 1977) (“Pricing is predatory only where the firm foregoes short-term profits in order to develop a market position such that the firm can later raise prices and recoup lost profits”); *Neumann v. Reinforced Earth*, 786 F.2d 424, 427 (D.C. Cir. 1986) (Bork, J.); AREEDA & HOVENKAMP, *supra* note , at 350 n.12 (collecting other cases quoting similar tests); SULLIVAN, HANDBOOK OF THE LAW OF ANTITRUST 113 (1977) (characteristic feature of predation is a “price substantially below the profit maximizing ... price” which thus “makes sense if, but only if, it is seen as a means of driving out or controlling competitors.”); Ordovery & Willig, *An Economic Definition of Predation*, 91 YALE L.J. 8, 9-10, 15-16 (1981) (same); Joskow & Klevorick, *A Framework for Analyzing Predatory Pricing Policy*, 89 YALE L.J. 213, 219-20 (1979) (same); Brodley, Bolton & Riordan, *supra* note , at 2242-43 (adopting same definition and collecting other sources).

⁷⁹ See *infra* III.B.2 (discussing why limit pricing would violate this proposed test).

⁸⁰ Indeed, anticipating this implication, Professors Ordovery and Willig would actually extend their prohibition to condemn as “predatory” any product innovations whose profitability depends on their ability to drive rivals out of the market. See Ordovery & Willig, *supra* note , at 22-30. But this ignores the fact that innovations create long-term positive externalities for society (by lowering cost curves or increasing product value) that matter much more than any short-term loss of allocative efficiency, and spurs a dynamic response of innovation by other firms and entrants that can trump the first innovation. See *supra* I.D ; *infra* II.B.3. Our intellectual property laws thus correctly adopt the different premise that it is socially desirable to reward innovations with a right to exclude rivals from its fruits. Further, their test would sometimes prohibit innovation because it sacrificed profits earned on the innovator’s older products even if those profits were supracompetitive. See Ordovery & Willig, *supra* note , at 25-26. But such a sacrifice of supracompetitive profits is desirable because it brings the quality-adjusted price of market products closer to their cost. Ordovery and Willig wrongly think that such a profit sacrifice can only have an anticompetitive objective, *id.* at 26 n.49, but this ignores the possibility that incumbents fear rival competition in innovation over time, which would naturally tend to squeeze out the supracompetitive profits on the preexisting good unless the Ordovery-Willig test were adopted.

⁸¹ Indeed, Schumpeter would say that all innovative investments require such a sacrifice of short term profits to reap monopoly gains, and thus necessarily require the possession or prospect of some degree of market power. See generally *infra* note ___.

even though it produces long term monopoly profits. Indeed, the prospect of those long term monopoly profits are desirable precisely because they encourage such efforts.

The proper question thus cannot be whether the defendant sacrificed short-run profits or intended to gain a monopoly. It is whether the *means* it chose to do so are undesirable in a way antitrust law can regulate without having unduly negative effects on other desirable conduct. And that requires an assessment of the desirability of the consequences of adopting any restriction on reactive above-cost price cuts. It is to that task that I turn next.

II. POST-ENTRY EFFECTS

The effects one predicts from a restriction on above-cost price cuts obviously depend on what counts as a cost. Let us here define “costs” so that an incumbent pricing at cost cannot deter or drive out an equally efficient entrant. I will have some concrete conclusions about what those costs are.⁸² But for purposes of establishing my general thesis, one can substitute for the word “costs” whichever measure of costs the reader believes suffices to prevent an incumbent pricing at cost from deterring or driving out equally efficient entrants. While the lowest possible cost measure that satisfies this test may be controversial, there is consensus in the literature that a price at or above long run incremental cost cannot drive out an equally efficient rival.⁸³ Since the restrictions under consideration would all ban some prices above long run incremental costs, they can be described as banning above-cost predatory pricing no matter which cost measure one uses.

Given this cost definition, any entrant that is just as or more efficient as the incumbent could profitably respond by matching or beating any above-cost price cut the incumbent makes. Rather, the only entrants who would be protected by a ban on above-cost predatory pricing would be entrants who are less efficient, either because

⁸² See *infra* Part V.

⁸³ See *id.* The European Advocate General expressly agreed with the general standard that predatory pricing law should favor “more efficient firms” and protect only firms that were “equally or more efficient” than the dominant firm. *Compagnie Maritime Belge Transports v. Commission*, Opinion of Advocate General, ¶¶ 117, 132, C-395/96O & C-396/96P, 1998 ECJ CELEX Lexis 10417 (Oct. 29, 1998). But he was of the mistaken view that selective above-cost price cuts could somehow drive out an equally efficient firm because of “its lesser financial capacity.” *Id.* ¶¶ 122, 132, 138. In fact, this is impossible if one defines costs correctly and certainly if one defines them to include all long run marginal costs. See *infra* Part V. Perhaps the Advocate General had in mind the intuition, shared by many theories, that a firm might be equally efficient in the long run, but not in the short run, and thus need financing to overcome its initial inefficiency. I address that possibility below. See *infra* II.C, III.A.2.

their costs are higher than the incumbents', or because their quality is lower at the same cost. Since the latter amounts to saying the entrant has higher costs of delivering the same level of quality (that is, higher quality-adjusted costs), one can call either a case of a higher-cost entrant. The incumbent firm with a cost advantage can drive such entrants out of the market by cutting its prices to a level above the incumbent's costs but below the entrant's costs, which the entrant cannot profitably match. Likewise, an incumbent with a quality advantage can drive the entrant out of the market by matching the entrant's price, which effectively means a lower quality-adjusted price.

This conclusion that a ban on above-cost predatory pricing can only protect less efficient entrants should not be permitted to end the analysis by epithet.⁸⁴ Even less efficient firms play a useful role in constraining the prices that more efficient firms can charge.⁸⁵ Nonetheless, it is vital to keep this fact in mind when trying to analyze the likely consequences of a ban on above-cost predatory pricing. The fundamental problem is that in the long run it is futile – and in the short run harmful -- to try to keep a less efficient firm in the market through an above-cost incumbent price floor. Further, where the entrant is *not* less efficient, the only effect a restriction on reactive price cuts can have is the adverse one of raising market prices and lowering output.

Section A begins by considering the various restrictions on reactive above-cost price cuts under the assumption that the incumbent maintains its efficiency advantage after entry. Section B addresses the case when entrants are not initially less efficient. Section C analyzes the possibility that an initial efficiency disadvantage might narrow after entry.

A. Constant Incumbent Efficiency Advantage

I consider first the Edlin proposal to prohibit any incumbent price cut in response to entry since its rule and effects are somewhat simpler, and thus allow focus on certain core issues applicable to all such restrictions on reactive above-cost price cuts. I then address the additional wrinkles raised by the European doctrine in *Compagnie Maritime* and the proposals of the U.S. Departments and Williamson, which effectively impose lower and more flexible price floors. Finally, I explain why the root problem that renders all these restrictions futile in the long run will persist no matter how one modifies them.

⁸⁴ See *supra* Part I.B.

⁸⁵ In fact, in every market there is some firm that is more efficient than the others. Workable competition is still valuable on such markets. Indeed, even when one firm is so much more efficient that it can be said to be dominant, the existence of the less-efficient firms constrains the pricing of the most efficient firm. See, e.g., VISCUSI, VERNON & HARRINGTON, *ECONOMICS OF REGULATION AND ANTITRUST* 164-66 (1998); CARLTON & PERLOFF, *supra* note , at 107-118.

1. Post-Entry Effects of Edlin's Price Maintenance Rule. (i) *Long Term Futility.* – By hypothesis under Edlin's rule the entrant is offering a price 20% below the incumbent's price. Because of the ban, the incumbent cannot respond by lowering its price. Buyers will thus switch as rapidly as possible to the entrant that enjoys a protected 20% price advantage. The incumbent's market share will accordingly plummet quickly below whatever market share is necessary to establish monopoly power in that market.

In markets where there are few physical limitations on entrant expansion, the effect may be nearly instantaneous. In particular, in the airline industry that was the genesis of these proposals, airplanes are relatively easy to move when demand increases on some routes, and relatively to lease if total demand for the airline rises. There thus may be no effective barrier to an entrant expanding to take all the consumer demand that might respond to its lower prices. In many technology or intangible markets, there may likewise be few physical limitations to expanding entrant market share: for example, when output expansion requires merely more downloads of software.

But even if the entrant must ramp up its capacity over time, an entrant with a 20% price advantage will sooner or later take enough market share to deprive the incumbent of its monopoly share. It seems likely to be sooner rather than later when one considers four additional points. First, monopolists rarely have 100% market share, but rather normally begin the post-entry period with a market share only somewhat above whatever threshold defines monopoly power. They thus need not lose much market share to lose their monopoly power. Second, because the Edlin rule at the outside affords 12-18 months of protection, it is especially unlikely to encourage less efficient firms to enter when that requires large capital investments that cannot be recouped in that short a period. Yet such large capital investments are the major reason why entrants might need time to ramp up capacity. Entrants who do not need such large capital investments are more likely to fall within the first category of easily expandable entrants. Third, while efficient firms are limited in number, the world of *less* efficient firms is hardly scarce, so that if the Edlin price umbrella encourages entry by any of them, it is likely to encourage entry by lots of them, all of which can ramp up capacity simultaneously.

Fourth, incumbents will adjust their strategy in response to the new rule. Since they cannot drive the entrant out as long as the restriction is in place, they have perverse incentives to *lose* market share as rapidly as possible to bring closer the day when the restriction expires and they can drive the entrant out and restore monopoly pricing. This incentive will be heightened because one natural way to lose market share will be to increase prices to a level that is even more profitable on any sales that

incumbent does make. The incumbent will even have incentives to raise prices *above* its short-term profit-maximizing level because that speeds the return of long run monopoly profits.⁸⁶ Sometimes this will even cause the incumbent to increase prices above its pre-entry level.⁸⁷ Such an increase above pre-entry prices will be especially likely when the pre-entry price was a attempted limit price (that the incumbent mistakenly set a bit too low to deter entry) and thus below the short-term profit-maximizing level from the start.

It thus seems likely that, if the Edlin rule is adopted, incumbents will generally lose their monopoly market share in far less than the 12-18 month period that Edlin sets as the outside limit for his ban on reactive price cuts. And once the incumbent's market share has plummeted in this fashion, the restriction on its pricing behavior will expire. This is explicit under Edlin's rule, which applies only "until the entrant's share grows enough so that the monopoly loses its dominance."⁸⁸ Thus, after it inevitably loses its monopoly market share, the incumbent becomes free to lower its price to any level it wanted. Since the incumbent's costs remain lower than the entrant's, the incumbent could easily set a profitable price that drove the entrant from the market after the restriction expires.

In sum, the ban on reactive above-cost price cuts will allow the entrant to take enough market share to eliminate the incumbent's market power, which will then free the incumbent to engage in reactive price cuts that make the whole experience futile. This may happen almost immediately in some markets and fairly quickly in most markets, in part because the incumbent has incentives to make it quick. Even when the erosion of monopoly market share is slow, the 12-18 month cutoff under the Edlin proposal means that the incumbent can cut prices and drive out the less efficient no latter than 12-18 months after entry. Indeed, if it took the passage of time to make the Edlin price restriction expire, the incumbent by definition remains a monopolist at expiration, and thus will probably be better placed to drive out the less efficient entrant quickly. In any case, the entrant will not have any long term impact on the market.

(ii) Short Term Post-Entry Effects – What are the post-entry effects of Edlin's

⁸⁶ Note the irony. The concern about predatory pricing is that the incumbent might lower prices to reap long term profits, but the restriction can cause the incumbent to instead *raise* prices to reap long term profits.

⁸⁷ It will not always do so because the addition of entrant output will itself lower the short-term profit-maximizing price of the incumbent by leaving less residual demand for the incumbent (absent an offsetting increase in total market demand). Thus, if the pre-entry price was at the short-term profit-maximizing level, then an inability to cut prices because of the Edlin rule already puts the incumbent above the likely short-term profit-maximizing level. Whether going even further above the profit-maximizing level will be a cost-effective way to speed the expiration of the restriction will depend on the particular facts.

⁸⁸ Edlin, *supra* note , at 945. See also Edlin, *supra* note , at 968-69.

price maintenance rule in the short run before the less efficient entrant is eliminated? To be concrete, let's suppose that in the particular industry the incumbent has 100% market share and the minimal market share at which a firm will be said to have monopoly power is 70%. (The nature of the analysis that follows holds no matter what that percentage is, and whether or not it varies from industry to industry). In the short run before the incumbent drops below its monopoly share, the ban will allow the entrant to ramp up from 0% to 30% market share, and cause the incumbent to ramp down from 100% to 70%.

What are the post-entry effects on consumers during this short run period? During the ramp up period, 70-100% of consumers will be stuck buying from the incumbent at a price that at least equals the monopoly price that prevailed before entry, and might well exceed that price given incumbent incentives to speed the expiration of the price floor. Most consumers will thus necessarily be paying a higher price than if the incumbent had been permitted to lower prices to match or beat the entrant, and often even a higher price than they paid before entry.⁸⁹ The other 0-30% will be buying from the entrant at a lower price than those buying from the incumbent. But again, by definition, they will be paying a higher price than they would have paid if the monopolist had been permitted to undercut the entrant's price.⁹⁰ Indeed, the restriction is also likely to have adverse effects on the entrant's initial price by giving it strong incentives not to offer any price below a 20% discount from pre-entry prices since the entrant knows the incumbent cannot cut prices. In any event, consumers who buy from the entrant in the short run will pay higher post-entry prices than they would have paid without the restriction, when competition with the incumbent would have instead driven prices down to or below the entrant's costs. The ban accordingly increases the post-entry prices charged to consumers in the short run before the entrant is eliminated. This harms consumer welfare. Because the higher prices are above cost, it also harms allocative efficiency.

What are the short run effects on producers? During this period, 0-30% of the market would be shifted to a less efficient producer. This necessarily lowers productive efficiency.⁹¹ Further, unless market demand has sharply increased, the

⁸⁹ It will always be most consumers because no court considers a firm with less than 50% market share a monopolist.

⁹⁰ If the monopolist could have driven the entrant out by matching its price, the monopolist must have a quality advantage, and thus consumers would be deprived of an opportunity to get a better product at a lower price, which is another way of saying consumers would end up paying a higher quality-adjusted price to the entrant with the ban than they would have paid to the incumbent without the ban.

⁹¹ The effects are even worse if, as Section II.C indicates is likely, the incumbent's drop in output also causes the incumbent to suffer a decline in productive efficiency. That would mean that the *entire* market will be shifted to less

incumbent will have to lower output significantly since the entrant is taking a large share of market output and the incumbent has to maintain its old price level. This will subject the incumbent to a wasteful process of contracting production during the restriction period, that it then has to turn around and expand after the restriction expires. That may entail costly and disruptive layoffs, contractual breaches or changes, idling and maintaining capacity, building renovations and the like. Such contractions and closings are a necessary cost of competitive markets, where they have the virtue of signaling when resources should switch from one firm or industry to another. But they constitute sheer waste when a more efficient firm is being forced by regulation to mothball capacity that ultimately will return to the market.⁹²

(iii) A Longer Short Term? One offsetting benefit of Edlin's price maintenance rule might be that it would lengthen the short run period before the less efficient entrant is eliminated. After all, however long it takes to drive out the entrant, the commencement of that period will be delayed until the Edlin rule expires, and the entrant will have a larger market share when the effort to drive it out starts. Whether extending the short run is a benefit or not depends partly on whether the incumbent raises pre-entry prices to speed expiration of the price floor. If the incumbent does so, then most customers (and probably the lion's share given most definitions of monopoly share thresholds⁹³) will be buying at a higher price with the entrant in the market than without. This can easily offset the benefit to the minority of customers who are paying the entrant a price lower than the pre-entry price.⁹⁴ If the incumbent does not raise pre-entry prices, then extending the length of the short term will enhance consumer welfare and allocative efficiency because the minority that buys from the entrant will enjoy lower prices during the existence of the entrant than without it.⁹⁵

efficient production. It would also mean the incumbent is even more likely to raise prices above pre-entry levels since its costs have increased. But for now I abstract from that to consider only the case of a constant incumbent efficiency advantage.

⁹² Since I am here assuming a constant efficiency advantage, these costs will not affect operating costs but rather will be visited on owners, workers, and others who contract with the incumbent. Section II.C adds the point that these costs may also harm operating efficiency.

⁹³ Moreover, if the rate at which the incumbent loses market share is constant, the average percentage of customers who are burdened with this effect will be halfway between the minimum monopoly share threshold and the actual share at which the incumbent started. For example, if the incumbent started at 100% share and the threshold is 70%, then during this period an average of 85% of customers will be paying a higher price than before entry.

⁹⁴ Given the assumptions of the last footnote, on average 15% of customers would enjoy this benefit during the extension of the short run. If the pre-entry price were \$100, and the entrant priced at \$80 given the Edlin 20% discount rule, there will be a net harm to consumer welfare if the desire to speed the demise of the entrant causes the incumbent to raise prices to any level above \$103.53.

⁹⁵ This possible post-entry benefit from restricting above-cost reactive price cuts has generally been ignored by traditional analyses, which instead assume that such restrictions exchange certain short-term post-entry costs for

Where extending the length of the short run does benefit consumer welfare, the magnitude of that benefit turns on how long the extension will be. But it seems unlikely the Edlin rule would extend the period of post-entry competition significantly. First, as noted above, the protection of the Edlin rule lasts at most 12-18 months, and generally far less. This is not likely to increase significantly the short run period because, even without any protection against reactive above-cost price cuts, few if any entrants are likely to enter without the staying power to last such a short period. Indeed, less efficient entrants will rarely be induced to enter no matter what the rule because they are not viable in the long run,⁹⁶ which means all these post-entry effects will rarely be observed.

Second, the short run is generally not so short without the Edlin rule. This can be obscured if one has the airline industry mainly in mind, but the airline industry has a combination of features that many other markets do not share. In the airline industry, incumbent capacity is easy to expand, and consumers cannot realistically engage in significant long-term contracting and or storage. In markets lacking this combination of features, a reactive price cut designed to drive out entrants cannot be nearly so temporary, for the following reasons.

If capacity cannot easily be expanded, then it may take the incumbent a significant period to expand output enough to drive out a less efficient entrant. True, for physical products made in plants, the incumbent may maintain some excess capacity for just this purpose. But the costs of doing so may not be worth bearing.⁹⁷ Moreover, even in such a plant, expanding capacity may not be as easy as turning on a switch. Extra personnel have to be added or trained, or if the incumbent has also kept excess workers idle, their skills will be rusty. These problems are likely to be even greater in service industries. The airline industry seems exceptional in this regard because the relevant capital goods and personnel are so easy to move to a targeted

an uncertain long-term gain. See, e.g., *Barry Wright Corp. v. ITT Grinnell Corp.*, 724 F.2d 227, 234 (1st Cir. 1984) (opinion of then-judge Breyer) (analogizing it to sacrificing bird in the hand for two in the bush); Demsetz, *Barriers to Entry*, 72 AMER. ECON. REV. 47, 56 (1982) (same); sources cited *supra* note ___. More surprisingly, this effect has largely also been ignored by advocates, who instead mainly focus not on short-term post-entry effects but on the argument that the advocated restrictions have *ex ante* effects on the likelihood of entry and/or incumbent pricing. See *infra* Part III

⁹⁶ See *infra* III.A.1.

⁹⁷ Williamson simply assumes that under any rule the incumbent will invest to maintain enough excess capacity to be able to reduce entrant profits to zero. See Williamson, *Predatory Pricing*, *supra* note ___, at 294, 297-98, 310 n.66, 314. But in many markets, this may be too costly to be profitable at all, and in all markets it involves a tradeoff between pre-entry profits and post-entry hazards that may not be worth making. Williamson's contrary conclusion is based on what he admits is the "arbitrary assumption" that incumbents strictly prefer avoiding post-entry hazards to earning pre-entry profits. *Id.* at 314. There is no reason to think this assumption is accurate, and thus incumbents often will not have sufficient excess capacity on hand.

market.

Even if the incumbent can rapidly expand output, consumers will have incentives to respond to any price cut they anticipate is temporary by stockpiling as much as possible of the good. This effectively makes any temporary price cut more permanent. This is not a feasible consumer reaction in the airline industry because future travel needs are sufficiently uncertain that it is hard to stockpile too many tickets. But it seems far more likely to be a feasible reaction in markets where the incumbent is just turning on plant capacity to make a physical good, which was the one case where incumbent output expansion seemed likely to be faster than entrant output expansion. Finally, in any market where buyers engage in long-term contracting, an entrant facing the prospect of a reactive price cut can try to contract with enough buyers to assure its survival for a substantial period such as 12-18 months. This is not so feasible in the airline industry where most purchasing is done on an effective spot market for each trip.⁹⁸ But it is feasible in many markets.

These differences do not necessarily make it impossible to impose temporary price cuts to drive out entrants. Stockpiling can be impossible or costly if storage expenses are high, goods are perishable, or future needs are difficult to estimate. Stockpiling will also be limited if consumers mistakenly expect the price cut to be permanent. The more difficult or costly storage is, and the more mistaken consumer expectations are, the more any market resembles that of an effectively non-storable good like airline flights.

Long-term entrant contracting will also be limited to the extent it has inefficiencies⁹⁹ or buyers face collective action problems. Markets with one buyer face no collective action problem because that single buyer can itself determine whether the entrant stays in the market. Thus, a single buyer would compare the entrant's long term contract price to the expected incumbent price stream, which features a temporary cut and then monopoly prices. But markets with many buyers face a collective action problem because each individual buyer will correctly figure that its

⁹⁸ Even in the airline industry, though, corporations can and do negotiate for long-term discounts from regular prices. The main problem there has been that the incumbent airlines are the ones with those contracts, thus making it harder for entrants to break in. *See* 140 F. Supp. 2d at ___.

⁹⁹ Williamson sees the possibility of long-term entrant contracting, but assumes it will be rare for three reasons. *See* Williamson, *Predatory Pricing*, *supra* note , at 295 n.37. First, he assumes it is generally inefficient. But on many markets it is used, suggesting it is efficient in those markets. Second, he assumes customers won't want to commit themselves unless the entrant has committed itself by incurring fixed costs. But any long-term contract can be made contingent on the entrant incurring those costs or initiating actual entry. Third, he assumes the dominant firm will contest these pre-entry sales. True, but if so then the "temporary" price cut will be even less temporary, extending to pre-entry periods and beyond if the incumbent itself offers long-term contracts to compete. At the extreme, the dominant firm will have to keep offering competitive prices all the time to fend off entrants.

single long-term contract will not significantly affect the odds that entry will occur or be successful. Judge Easterbrook concludes any collective action problem can be avoided by having each buyer enter a long-term contract with the entrant at a price below pre-entry prices and contingent on the entrant getting enough commitments to be successful.¹⁰⁰ Alas, his reasoning is flawed. Such a single contract cannot make the buyer better off unless it meaningfully changes the odds of successful entry, and this is true no matter what the individual buyer hypothesizes the end result will be. If the entrant ultimately will not enter, such a contract gains the buyer nothing. If the entrant will enter but be driven out, then the entrant will not supply the product in the long run, and in the short run the buyer will be better off accepting the incumbent's temporary price cut to a level below the entrant price. If the entrant will enter and succeed, the buyer need not enter into the long term contract to get the benefit of entrant prices in the long run, and in the short run will still be better off accepting the incumbent's temporary price cut. Thus, although buyers collectively have an incentive to enter long-term contracts with entrants to encourage their entry, individually buyers do not in markets with many buyers.¹⁰¹ The greater buyers' collective action problems and the shorter the term of an efficient contract in their market, the more other markets will resemble markets with little long-term contracting like the airline industry.

But to the extent markets differ from the airline industry in these respects, the longer any incumbent price cut would have to be to drive out an entrant in a world without any price restrictions. And if the price cut would have to last longer than 12-18 months without any price restriction, the Edlin rule cannot lengthen the short term. One thus cannot overgeneralize from the example of the airline industry. Moreover, at least one feature of the airline industry cuts both ways. In particular, the fact that airline capacity on a single route can be expanded so readily also means that the period of protection under the Edlin rule is unlikely to last as long as 12-18 months. And if it cannot last that long, it is unlikely to lengthen the short term significantly. (There are also other features of the airline industry that raise questions about whether price cuts on individual routes can properly be considered predatory pricing, but I defer those issues until to Section III.C.)

In short, although the Edlin price maintenance rule may extend the length of the

¹⁰⁰ See Easterbrook, *supra* note , at 270-71.

¹⁰¹ Even if there are a multitude of consumers, there may be sufficiently few buyers up the distribution chain – like retailers or wholesalers – to enable them to enter into long term contracts with entrants. *Id.* at 271. On the other hand, retailer or wholesalers also have incentives to enter into Coasean bargains with the monopolist to split the supracompetitive surplus rather than eliminate it, because increased costs can be passed on to consumers in higher prices, and the resulting decreased volume can be made up for by getting a share of the monopoly profits. See IV AREEDA, HOVENKAMP, & SOLOW, ANTITRUST LAW at 204-06 & n.4 (rev. ed. 1998).

short run period of post-entry competition somewhat, that extension is not likely to be significant. Nor is it clear such an extension will benefit consumers since the rule may induce incumbents to raise short term prices above pre-entry levels. Even if the extension does result in some consumer benefit, there is no reason to think its significance would outweigh the consumer welfare loss resulting from the fact that rule increases prices during the unextended short run that corresponded to whatever period the entrant would remain in the market even without the protection of the rule. There is even less reason to think any consumer benefit would outweigh the fact that the rule worsens productive efficiency, a loss that is only exacerbated if the rule also extends the length of the short run during which production will be shifted to the less efficient entrant.

(iv) *Summary and Net Post-Entry Effects.* Edlin focuses his piece on the supposed virtues of protecting less efficient entrants with a rule against reactive price cuts.¹⁰² Indeed, that is the only sort of entrant he explicitly models.¹⁰³ But the Edlin price maintenance rule cannot protect any less efficient entrant from being driven from the market, and thus will be futile in the long run. The short run effects on consumer welfare and allocative efficiency are mixed but probably on balance negative. The Edlin rule will raise prices in the short run period before the entrant is driven out, which harms consumer welfare and allocative efficiency. The Edlin rule may make the short run period of competition between an incumbent and a less efficient entrant somewhat longer, but that will not always be beneficial and, even when it is, the benefit will likely not be that significant. The short run effects on productive efficiency are clearly negative. Market output would be shifted to a less efficient producer, and the industry would be forced to go through wasteful contraction and expansion with no long term purpose.

If one instead concluded that the increased length of the short term probably meant a net positive effect on short-term consumer welfare and allocative efficiency, we then would have to face up to a tradeoff between that (ambiguous) net benefit and the clear negative effect on productive efficiency. There is little reason to think this tradeoff would be desirable. Productive efficiency generally matters much more than allocative efficiency. Even in static models, the efficiency gains from a small cost reduction usually offset the efficiency loss from a large price increase.¹⁰⁴ The basic

¹⁰² See Edlin, *supra* note , at 944, 956, 962-63, 965.

¹⁰³ See *id.* at 955-60, 973-78.

¹⁰⁴ Professor Williamson has shown that even at a very high demand elasticity of 2, a cost decrease of .25% offsets a price increase of 5%, and a cost decrease of 9% offsets a price increase of 30%. See Williamson, *Economies as an Antitrust Defense: The Welfare Tradeoffs*, 58 AMER. ECON. REV. 18, 22-23 (1968). A more normal demand elasticity of 1, it takes half the cost decrease to offset the same price increases: a .12% cost decrease offsets a 5% price increase

reason is that the cost reduction creates efficiency gains for all output, whereas the price increase produces an efficiency loss only for the marginal output reduction. The net tradeoff is even more likely to favor productive efficiency where (as here) the price increase is ambiguous and the productivity decrease is not.

Indeed, Richard Schmalensee showed some time ago that “privately profitable entry may not be socially desirable if the entrant's costs exceed those of existing firms” because it can worsen productive efficiency more than it improves consumer surplus.¹⁰⁵ And this was under the assumption that such entry was permanent and that free post-entry price competition was allowed. Where instead the entry is induced by a temporary price umbrella that worsens short term price effects and makes long term benefits futile, there is even more reason for skepticism. But even under his more generous assumptions about entry, Schmalensee concluded that it could well be that: “Society as a whole would be better off if existing firms would be allowed to bribe potential [higher-cost] entrants not to enter, or if entry was restricted by government regulation of some sort.”¹⁰⁶ *A fortiori*, the less beneficial sort of short-term entry being considered here cannot justify barring those existing firms from engaging in price competition.

True, it is a disputed issue whether antitrust law does (or should) protect just consumer surplus or total efficiency (measured by the sum of consumer and producer surplus).¹⁰⁷ Judge Bork’s argument for the latter was roundly critiqued as based on the premise that monopolists are owned by shareholders who are consumers too.¹⁰⁸ But Bork’s proposition seems more distributionally attractive now that most workers are invested in stocks through their pension plans. More persuasively, one might add that the per capita income of any nation must in the end rest on its productivity. More productive efficiency thus generally means higher wages for workers. Accordingly, increases in productive efficiency benefit consumers both as employees and investors, making it more likely that consumers will be better off when the productive efficiency gain outweighs the loss in consumer surplus. The odds increase even further when one takes into account that any increased productive efficiency will also increase tax receipts that benefit the general citizenry. Indeed, some argue that taxes can generally achieve any redistributive aim better than substantive law, and that therefore

and a .5% cost decrease offsets a 30% price increase. *Id.* At a lower demand elasticity of .5, a .06% cost decrease offsets a 5% price increase, and a 2.25% cost decrease offsets a 30% price increase. *Id.*

¹⁰⁵ See Richard Schmalensee, *Is More Competition Necessarily Good?*, 4 *Indus. Org. Rev.* 120, 120 (1976).

¹⁰⁶ *Id.*

¹⁰⁷ Compare Lande, *Wealth Transfers as the Original and Primary Concern of Antitrust*, 34 *HASTINGS L.J.* 65, 68; with BORK, *THE ANTITRUST PARADOX* 107-115 (1978).

¹⁰⁸ BORK, *supra* note , at 110.

substantive law should focus solely on wealth-maximizing efficiency and leave the redistribution to taxation.¹⁰⁹

2. Post-Entry Effects of Profit-Maximizing Price Floors. In contrast to Edlin, the European doctrine in *Compagnie Maritime* and the proposals of the U.S. Departments of Transportation and Justice would not ban all reactive price cuts. They would ban reactive price cuts (or their mirror capacity expansions) only when they are “clearly” or “substantially” (and in the E.U. doctrine maybe “selectively”) below the price that would maximize short term profits. Professors Ordover and Willig and others had earlier proposed a test just these without the “clearly” or “substantially” or “selectively” qualifier.¹¹⁰ All these variations share the common feature that, rather than freeze prices at pre-entry levels, they set a lower price floor below which reactive price cuts cannot go.¹¹¹ The floor is flexible in the sense that it varies with market conditions, but fixed in the sense that for any given set of market conditions, each proposal sets a fixed above-cost price floor.

These variations thus require us to consider the different possible effects on entrants of a reactive price cut that stays above these price floors. There are two possibilities. One possibility is that a conforming price cut nonetheless suffices to drive the entrant out. Indeed, Edlin rejects this approach precisely because a short-term profit-maximizing price can sometimes drive out entrants.¹¹² In that case, the restriction on sharper price cuts has no long term effect because the entrant will be driven out with or without the restriction. In the short run, the restriction can only be harmful: preventing the incumbent from cutting prices even further (that is, below the price floor), which would have benefitted consumers and increased allocative efficiency.

The other possibility is that the conforming price cut does *not* suffice to drive

¹⁰⁹ See Kaplow & Shavell, *Why the Legal System Is Less Efficient Than the Income Tax in Redistributing Income*, 23 J. LEGAL STUD. 667(1994).

¹¹⁰ See Ordover & Willig, *supra* note , at 9-10, 15-16. See also *supra* note ___ (collecting other prior authorities proposing similar test even when prices are above cost).

¹¹¹ Which Department’s proposal sets the higher price floor may depend on circumstances. For example, if it were 100% certain that the incumbent could make a 1% higher profit with a higher price, then the Department of Justice position would require at least that price (since it would “clearly” increase profits) but the Department of Transportation position would not (since it would not increase profits “substantially”). Alternatively, if it were 51% certain that an incumbent could make a 50% higher profit with a higher price, then the Department of Transportation position would require at least that price but the Department of Justice position would not. But in general, one would expect the proposals to largely track each other since the more substantial the expected profit-difference the more likely it is to be clear some profit is being sacrificed.

¹¹² See Edlin, *supra* note , at 957-59, 977-78, 981-82.

the entrant out of the market.¹¹³ In this case, the effect of the proposed price floor is much the same as the effect of Edlin's higher price floor. The entrant will be able to enter the market at a price that is below the lowest price the incumbent can legally charge. In the long run, which may be quite quick in many markets, this price disadvantage will cause the incumbent to lose their monopoly or market power. They will then be free to cut prices to a level that drives out the entrant, making the restrictions ineffective in achieving any long run objective.

In the short run, the incumbent monopolist will be at a price higher than it otherwise would have charged. Indeed, to bring closer the day when they can drive out the entrant, the incumbent will have incentives to price substantially *above* the short-term profit-maximizing level set as floor.¹¹⁴ The buyers stuck with the incumbent in the short run would thus pay higher prices than they would have paid without the regulation, and perhaps even more than they paid pre-entry. Those who buy from the entrant in the short run would pay a lower price than those stuck with the incumbent, but it would still be a higher price than they would have paid if the incumbent had been able to undercut the entrant. The restriction would also give entrants perverse incentives to make their initial prices higher. Even if the entrant is not initially sure just where the incumbent's price floor will be, the entrant can reveal that floor by setting its opening price high, and then very slightly undercutting each incumbent price cut until it arrives at a price just below the lowest price the incumbent is able (or willing) to charge. The result is that the entrant will not only set initial prices very high, but at the end of this process will set prices no lower than a price just below the incumbent's

¹¹³ Professors Ordover and Willig assumed their test could *never* protect a less efficient entrant. See Ordover & Willig, *supra* note, at 18-19. Their reasoning was that if the incumbent priced above entrant costs, it would lose all production to the entrant, thus pricing slightly below a less efficient entrant's costs would always be more profitable alternative. *Id.* But if the entrant is capacity constrained over the short run, then the entrant will not be able to take all market output. Instead the incumbent will be left with a residual demand curve determined by subtracting entrant output from the total market demand curve, and pricing above cost will likely maximize the incumbent's short run profits. Further, Professors Ordover and Willig would apply their test to condemn an above-cost price cut in one product if it diverted sufficient profits from another substitute product made by the incumbent. *Id.* at 20-21. But if the substitute product enjoys any supracompetitive profit margin, this test would prevent what is effectively an efficient price cut that brings the price on the combination of products closer to their cost, and would protect a less efficient entrant in one product to preserve the incumbent's supracompetitive profits in the other product. Still, if the entrant is not capacity constrained and such substitution effects are irrelevant, Ordover and Willig appear to be correct that their price floor cannot protect less efficient entrants absent erroneous application. Further, even if an entrant begins with a capacity constraint, eventually its output will rise sufficiently to raise this problem absent substitution effects. This confirms the point above that the short-term profit maximization test cannot offer any long term protection to a less efficient entrant. If the goal is to deny protection to less efficient entrants, a price-cost comparison test will be better because it denies protection to less efficient entrants when capacity-constraints or substitution effects matter, and is generally easier to apply accurately. See *infra* Part IV.

¹¹⁴ See *supra* II.A.1.

price floor, perhaps even higher if the incumbent instead adopts a strategy of keeping prices above profit-maximizing levels to speed the end of the restriction. This harms consumers because, without the protection of this price floor, competition with the incumbent would have driven entrant prices down to (or below) entrant costs.

Again, an offsetting benefit might come if the restriction increases the length of the short run period before the less efficient entrant is driven out. But the net effect is even more likely to be negative than under the Edlin rule since these price floor restrictions also have undesirable effects on short-term prices in cases where the restriction does not protect the entrant from being driven out at all.

Further, the regulation would in the short run cause unambiguous productive inefficiency by shifting production to a less efficient firm. Absent increased demand, it would also cause likely wasteful contraction and expansion. This follows even if we assume that, both before and after entry, the incumbent monopolist sets a short-term profit-maximizing price that implies subcompetitive output levels. The reason is that whatever output the entrant takes away amounts to a leftward shift in the incumbent's residual demand and thus (absent an offsetting increase in total market demand) implies a lower incumbent output will maximize its short-run profits. An even more dramatic reduction in output will result if we take into account two additional factors. First, sometimes the pre-entry price will be an (unsuccessful) limit price rather than a profit-maximizing price, and thus may affirmatively have to be *raised* to comply with the post-entry price floor. Second, the incumbent has incentives to charge a post-entry price *above* the profit-maximizing level to speed the end of the restriction.

The short run effects of a profit-maximizing price floor are probably not quite as bad as under Edlin's price maintenance rule, since the incumbent is able to lower prices somewhat.¹¹⁵ But the short run effects on productive efficiency remain clearly negative under either proposal, the short run effects on consumer welfare and allocative efficiency are likely negative too, and neither has any long term effect since the less efficient entrant will inevitably be driven out of the market.

3. *Post-Entry Effects of Williamson's Output Ceiling Rule.* Professor Williamson would ban an incumbent with dominant market power from expanding

¹¹⁵ The difference in effects on entrant prices is less clear. Under Edlin's proposal, entrants would charge no less than 20% below the pre-entry incumbent price. Under the U.S. Departments' proposals, entrants would charge no less than a price clearly or substantially below the incumbent's post-entry short-term profit-maximizing price. In different industries, one or the other of these prices may be higher. But under either proposal, the restriction gives the entrant incentives not to offer prices any lower than that level even though competition would have otherwise driven them to price as low as their own costs.

output for 12-18 months after entry.¹¹⁶ Although this does not directly regulate prices, it does set an effective price floor. The incumbent would be able to cut prices, but only to the extent necessary to maintain output after the entrant has added its own output to the market. Williamson would thus allow prices lower than the Edlin approach. Williamson's effective price floor is generally also lower than a price floor set at the level that maximizes short-term profits. The normal short-term profit-maximizing response to entry would be constricting output since the entrant is adding output to the market. The Williamson rule would allow the incumbent to instead maintain output, and the higher output implies a lower market clearing price.¹¹⁷

As with the profit-maximizing price floor approach, we can divide analysis of the Williamson rule into its two possible outcomes. One possibility is the effective Williamson price floor does not suffice to prevent a monopolist from driving the entrant out of the market. This can happen if, for example, maintaining incumbent output does not leave enough market output left for the entrant to operate at a large enough scale to profit at a lower price.¹¹⁸ In such a case, the post-entry effects are similar to the parallel case under the profit-maximizing price floor approach. The Williamson rule's price floor will be ineffectual in protecting entrants, and can only have the harmful effect of preventing an even bigger incumbent price cut that would have also driven out the entrant but would have benefitted consumers (and allocative efficiency) more in the meantime.

The second possibility is that the effective Williamson price floor does suffice to prevent the incumbent from driving the entrant out of the market during the 12-18 month period of the restriction. Williamson's model seems to exclude this possibility by assuming that the incumbent always has the knowledge and desire to set pre-entry output sufficiently high that maintaining that output after entry will make entry

¹¹⁶ See Williamson, *Predatory Pricing*, *supra* note , at 295-96, 333-36. Williamson justifies this rule with a brilliant model that is, unfortunately, limited to cases where the entrant has the same (declining) cost curve as the incumbent. *Id.* at 295, 297-98, 313. He thus does not directly consider the case discussed here where the entrant is less efficient at every output level, though as we shall see his analysis seems to have certain implications for them.

¹¹⁷ If demand increased sufficiently, the profit-maximizing response could be increasing output, which might suggest the Williamson rule would require a higher price floor to prevent pre-entry incumbent output from rising. But to avoid this result Williamson ultimately makes his test one of "demand-adjusted" output. See *infra* Part IV (discussing other complications this raises). In theory, the U.S. Departments' approach might impose a lower price floor because they only ban prices that are "clearly" or "substantially" below the profit-maximizing level. But maintaining output in the face of an entrant's addition to market output will normally more than satisfy this test. Moreover, Williamson also includes his own version of a clearly-or-substantially qualifier by allowing a 10% increase in output over the demand-adjusted prediction in the hopes that this will circumvent problems with ascertaining demand-adjusted output. *Id.*

¹¹⁸ See Williamson, *Predatory Pricing*, *supra* note , at 297-98; AREEDA & HOVENKAMP, *supra* note , at 332-333; Scherer, *supra* note , at ___.

unprofitable.¹¹⁹ But these assumptions about incumbent knowledge and desire are both false. Williamson himself recognizes that in fact no incumbent is that omniscient. Instead, there are a range of probabilities, so that the incumbent will have to set pre-entry output at an average which will sometimes make entry unprofitable but sometimes will not.¹²⁰ Second, his premise that the incumbent will always want to set pre-entry output high enough to make entry unprofitable rests on what Williamson acknowledges is the “arbitrary assumption” that incumbents strictly prefer avoiding post-entry hazards to earning pre-entry profits.¹²¹ If we instead adopt the more rational assumption that the incumbent attaches some positive value to pre-entry profits, they will make tradeoffs that lower pre-entry output somewhat, and will thus sometimes be unable to drive out a less efficient entrant under a rule that prohibits output expansions. Indeed, incumbents would have strong incentives to do so since any increased pre-entry profits will not have the time and uncertainty discount applied to fears of a decline in post-entry profits.¹²²

Thus the Williamson output ceiling will sometimes prevent the incumbent from being able to drive out a less efficient entrant. Here again, the effects are similar to the parallel case under the profit-maximizing price floor approach. In such cases, the Williamson rule will be ineffectual in increasing long-term market competition because the 12-18 month period will expire and even before then the dominant market power necessary to justify any price/output restriction will likely have eroded.¹²³ In the short run, the Williamson rule will produce higher post-entry prices because the price floor prevents the monopolist from cutting prices further, gives the monopolist incentives to price above the price floor (and even above the short-term profit-maximizing level) to hasten the expiration of the restriction, and encourages the entrant to charge no lower than a price just below the incumbent price floor. This lowers consumer welfare during any short run period, with possible but unlikely offsetting benefits if the short run lasts longer. The Williamson rule will in the short run also shift some output to a

¹¹⁹ See Williamson, *Predatory Pricing*, *supra* note , at 294, 297-98, 310 n.66. Williamson assumes an entrant having the same cost curve as the incumbent will be left at zero profits, which means a less efficient entrant with a higher cost curve would suffer an actual loss.

¹²⁰ *Id.* at 294 n.33

¹²¹ *Id.* at 314.

¹²² See also *infra* Part III.B.1 (noting other reasons why the incumbent may not keep pre-entry output so high).

¹²³ Williamson applies his rule only to dominant firms, which he defines as having a market share of at least 60% and enjoying significant entry barriers. See Williamson, *Predatory Pricing*, *supra* note , at 292-93. Although Williamson’s initial statement of his rule also applied to collusive oligopolies, *id.*, he later recognized that applying his rule to such cases would have the undesirable effect of aiding oligopolistic coordination and thus seems to abandon that extension. See Williamson, *Williamson on Predatory Pricing II*, 88 YALE L.J. 1183, 1195 (1979) [hereinafter “Williamson, *Predatory Pricing II*”].

less efficient producer than would have provided it post-entry without any price/output restriction. This lowers productive efficiency.

The short run adverse effects of the Williamson rule are less adverse than the other proposals because it does not require the incumbent to reduce its output. If the incumbent maintains its output, none of that pre-entry output will shift to a less efficient producer, though the rule would still switch all the post-entry increase in output to a less efficient producer. Maintaining output would also mean the Williamson rule would not cause any wasteful mothballing and re-opening (or destruction and re-creation) of incumbent capacity. These advantages are only relative to the other approaches. For any less efficient entry that has occurred, the post-entry effects of the Williamson rule remain negative compared to a rule that does not restrict above-cost prices. Still, if (and it is a big if) the Williamson rule encourages entry that otherwise would never have occurred,¹²⁴ it does not (unlike the other restrictions) *require* a tradeoff between allocative and productive efficiency.

But there is far less to this relative advantage than meets the eye. Although the Williamson rule does not require a post-entry output reduction, it will often induce one. After all, it sets a ceiling on output, so output can only stay the same or go down. On average, then, incumbent output has to decline somewhat. More important, the incumbent has affirmative incentives to reduce output in *any* case where the output ceiling actually protects an entrant from being driven out of the market in the short run.¹²⁵ There are three reasons for this. First, reducing output will likely increase the incumbent's short-term profits given that the entrant is now taking up some market output. Second, maintaining output (by hypothesis in the second possibility) cannot drive out this entrant and restore monopoly profits, and thus the incumbent has no reason to sacrifice short term profits by maintaining output. Third, to the contrary, it is *reducing* output that will bring closer the day when the incumbent's market share erodes sufficiently to lift the restriction and allow the incumbent to drive out the entrant. This means that under the Williamson rule, the incumbent who is prevented by the output ceiling from driving out an entrant actually has incentives to speed the day when the rule expires by pricing *above* the short-term maximizing price, which means setting output below that level. (The result is that, in any case where they actually have bite – that is, actually protect the entrant from above-cost pricing – the

¹²⁴ In fact, none of the restrictions on reactive above-cost price cuts are likely to encourage any less efficient entry, especially when incumbent output does not go down. See *infra* III.A.1.

¹²⁵ Where the output ceiling does not suffice to protect entrants, it has no beneficial post-entry effects, and it is hard to see why it would offer any encouragement to entry. Any benefits would instead have to be based the claim that it encourages a pre-entry output expansion that amounts to a form of limit pricing. See *infra* III.B.

incumbent will set the same short term price under the Williamson output ceiling as under a profit-maximizing price floor.) Williamson sees the first factor but apparently not the other two, and in any event effectively excludes all of them from his model by simply assuming that in response to entry the incumbent will always set the maximum output allowed by the legal rule.¹²⁶ But we must assume incumbents will be dynamic not just in their responses to entry but also in their responses to legal rules that frustrate efforts to make entry unprofitable. Thus the Williamson rule will on average produce a reduction in post-entry output, and will in fact do so in every case where the rule prevents the incumbent from driving out the entrant.

4. Possible Modifications Cannot Eliminate the Root Problem. The root problem is that, because monopoly or market power is required before any firm's prices can be regulated under any antitrust or competition law, any restriction on above-cost predatory pricing that hopes to protect less efficient entrants must be futile in the long run. One might thus be tempted to dispense with the monopoly or market power requirement. But this would require a statutory or treaty amendment. Further, as we shall see, this requirement is not merely an artifact of the particular proposals made. It is rather a necessary feature of any doctrine of predatory pricing. Nor would any such modification alter the adverse short term effects of any restriction on above-cost incumbent pricing.

To begin with, monopoly or market power is required by existing competition law, which does not restrict even below-cost predatory pricing unless the actor has monopoly or market power. To be sure, we could change that law. But we could not do so through case law. It would require a statutory amendment in the U.S. or a treaty amendment in Europe. Under U.S. law, a claim that unilateral pricing decisions constitute monopolization (or attempted monopolization) under Sherman Act §2 requires proof not just of predatory pricing but monopoly power (or enough market power to create a dangerous probability of acquiring monopoly power).¹²⁷ Likewise, European law requires proof of a dominant position to make predatory pricing actionable under Article 86.¹²⁸ Monopoly power is not necessary under the U.S.

¹²⁶ See Williamson, *Predatory Pricing*, *supra* note , at 294 & 295 n.35, 297-98, 310 n.66.

¹²⁷ *Brooke Group v. Brown & Williamson*, 509 U.S. 209, 222 (1993); *United States v. Grinnell Corp.*, 384 U.S. 563, 570-571(1966) (defining monopolization); *Spectrum Sports v. McQuillan*, 506 U.S. 447, 455-56 (1993) (defining attempted monopolization). Some have argued that the recoupment requirement itself seems to impose a higher market power requirement, and may thus eliminate or constrict any claim of attempted monopolization through predatory pricing. *AREEDA & HOVENKAMP*, *supra* note , at 235-36, 292-93.

¹²⁸ *AKZO Chemie v. Commission*, [1991] European Court Reports I-3359, ¶¶35-73. That decision said that a market share over 50% would suffice. *Id.* at ¶60. Market shares below 50% might also constitute a dominant position depending on other structural factors that affect the degree to which market shares imply market power. See *French Republic v. Commission*, 1998 ECJ CELEX LEXIS 1433, ¶¶111, 242-48 (E.C.J. 1998); *Gencor v. Commission*, 1999 ECJ CELEX LEXIS

Robinson-Patman Act, but even it requires some level of market power.¹²⁹ Moreover, the Robinson-Patman Act has various statutory limitations that make it a poor vehicle for generally policing predatory pricing. In particular, the Robinson Patman Act is limited to price-discrimination (and thus does not cover a uniformly predatory price) and commodities (and thus would not cover airline transportation or other services).¹³⁰ Further amendments would be necessary to restrict above-cost predatory pricing. In particular, the Robinson-Patman Act specifically allows price cuts to match competition in good faith,¹³¹ which directly contradicts the core of these proposals to restrict reactive above-cost pricing.

More important, any amendment eliminating the market power requirement would be unwise. Without such a requirement, a doctrine of predatory pricing would effectively aim to regulate all reactive pricing on competitive markets. Such competitive pricing is precisely what the antitrust laws seek to foster on the grounds that competitive markets can best set prices. Competitive firms are supposed to compete by each trying to match and then beat the price and quality of their rivals. To interfere with this is to interfere with the “central nervous system of the economy,”¹³² and “set sail on a sea of doubt” by requiring courts to determine what reasonable prices are on competitive markets.¹³³ Moreover, once one dispenses with the market power requirement, it is not clear which firm in any given market would be subject to the restriction on reactive above-cost predatory pricing since all the firms in the competitive market are reacting to each other. One could try to ban *all* firms from reacting to new entrants, but then one faces the question why the law should so favor entrants (which would seem to lead to inefficient overinvestment in entry into competitive markets) and whether any new entrant would not then immediately become an incumbent forbidden from engaging in reactive price cuts. The result would be to ossify and distort pricing on competitive markets.

Another possible modification would concede that any price restriction must expire when the monopoly power erodes, and thus the incumbent would be free to

281, ¶¶ 202, 239-63, Case T-102/96 (C.F.I. March 25, 1999); Alcatel/AEG Kabel, M165, ¶23 (1991) (market performance); Ninth Report on Competition Policy, point 22; VAN BAELE, COMPETITION LAW OF THE EUROPEAN COMMUNITY ¶248-52, at 82-87 (1994).

¹²⁹ *Brooke*, 509 U.S. at 222 (defendant must have enough market power that its predatory pricing creates at least “a reasonable possibility” of substantial injury to competition). The recoupment requirement may elevate the market power requirement even further. *See supra* note __

¹³⁰ 15 U.S.C. §13(a).

¹³¹ 15 U.S.C. §13(b). The Act also allows different prices based on varying costs or market conditions. *Id.* §13(a).

¹³² *United States v. Socony-Vacuum Oil*, 310 U.S. 150, __ n.59 (1940).

¹³³ *United States v. Addyston Pipe*, 85 F.271, __ (6th Cir. 1898), *aff'd*, 175 U.S. 211 (1899).

offer a post-expiration above-cost price cut that undercuts the entrant. But this modification would argue that, when this price cut causes the incumbent market share to grow back over the monopoly threshold, the incumbent's low above-cost price would amount to attempted monopolization. Through this sort of regulation one might hope to keep the incumbent perpetually shy of a monopoly share. But this modified approach would raise new problems because the illegal pricing decision would be neither (1) a price cut nor (2) reactive to entry. Since the incumbent price cut would be itself legal, what the law would have to make illegal is the incumbent's failure to impose a price *increase* (or output decrease) once the incumbent got back to a market share close to monopoly power. This hardly seems likely to promote consumer welfare. Other problems would result because the rule would no longer be triggered by a reaction to entry. The moment when the period of price regulation begins would become obscure, with the modified rule putting the incumbent at great peril for not guessing accurately when a court will deem it on the verge of passing the line to monopoly power again. Nor would the right baseline for a legal price or output be clear since it would no longer be the price or output that just preceded the moment of illegality.

One might be tempted to respond to this problem with an amendment providing that, while the bans on above-cost predatory pricing apply only to incumbents who *begin* with monopoly or market power, those bans continue to restrict those incumbents even after they lose their monopoly or market power. However, the effects of such a modified proposal would be even worse. The short run effects would be the same as the existing proposals. But the long run effects would differ. If unable to ever cut prices to match or beat the entrant, the incumbents would necessarily be driven from the market in a way that will not permit reentry. The market will thus be left to the new entrant who is, by hypothesis, less efficient. That new entrant will have incentives to raise prices to its own monopoly level, which will be higher than pre-entry incumbent prices because its marginal costs are higher. Thus, in the long run, rather than just being futile like the existing proposals, the modified proposal would affirmatively harm productive efficiency and consumer welfare.

In the longer run under this modified proposal, perhaps other less efficient entrants might enter, and produce a competitive market full of less efficient firms. In effect, a low cost monopoly would be replaced by a high cost unconcentrated market. Such a replacement is unlikely to be desirable. In part this is because, for reasons noted above, increased productive efficiency generally offsets reduced consumer

welfare in the short run.¹³⁴ Moreover, whereas earlier I assumed a net harm to consumer welfare in the static model, that is not so clear here. Lower costs tend to offset any tendency of monopolies to increase prices.¹³⁵ Indeed, the evidence turns out to be quite disputed about the degree to which high concentration figures even produce higher prices.¹³⁶ Some conclude that the degree to which market shares fluctuate influences market performance far more than the size of market shares.¹³⁷ Professor Schmalensee's review of the literature concludes that while the "relation, if any, between seller concentration and profitability is weak statistically" in studies comparing the concentrations in different industries, "[i]n cross-section comparisons involving markets in the same industry, seller concentration is positively related to the level of price."¹³⁸ Since efficiencies are more likely to differ between industries than within the same industry for a firm operating in different geographic markets, this observation is consistent with the conclusion that concentration earned by greater efficiency does not increase prices, but concentration produced by other (nonmerit) factors does. Since here the initial incumbent is (by hypothesis) more efficient, there is little reason to think its replacement with less efficient competitors would benefit consumers with lower prices even in the short run.

More important, if one moves away from static models to dynamic ones, it is clear that in the long run the pace of innovation advances consumer welfare far more than maintaining allocative efficiency.¹³⁹ Schumpeter goes even further to argue that

¹³⁴ See *supra* II.A.1(iv).

¹³⁵ The monopolist price will reflect a markup over cost that depends on demand elasticity. See, e.g., PINDYCK & RUBINFELD, MICROECONOMICS 339 (1989). Thus, any reduction in cost reduces the difference between the monopoly and competitive price. If the monopoly has sufficiently lower costs, the monopoly price will be less than the competitive price. See, e.g., 1992 Horizontal Merger Guidelines, 57 Fed. Reg. 41552, §4 (merger that creates market power has defense if it creates increased efficiencies that fully offset the tendency of the market power to increase prices).

¹³⁶ See CARLTON & PERLOFF, *supra* note , at 257-59; Demsetz, *Industry Structure, Market Rivalry, and Public Policy*, 16 J.L. & ECON. 1 (1973); Peltzman, *The Gains and Losses from Industrial Concentration*, 20 J.L. & ECON 229 (1977); Demsetz, *Two Systems of Belief About Monopoly*, in INDUSTRIAL CONCENTRATION: THE NEW LEARNING (ed. Goldschmid, Mann, and Weston 1974); K. Ewing, *The Soft Underbelly of Antitrust*, ANTITRUST REPORT 2 (Sept. 1999); B. Harris and D. Smith, *The Merger Guidelines v. Economics: A Survey of Economic Studies*, ANTITRUST REPORT 23 (Sept. 1999).

¹³⁷ R. Caves and M. Porter, *Market Structure, Oligopoly, and Stability of Market Shares*, J. INTL. ECONOMICS 289 (1978); M. Sakakibara and M.E. Porter, *Competing at Home to Win Abroad: Evidence from Japanese Industry*, REVIEW OF ECONOMICS AND STATISTICS (2001).

¹³⁸ Schmalensee, *Inter-Industry Studies of Structure and Performance*, in 2 HANDBOOK OF INDUSTRIAL ORGANIZATION 976, 988 (eds. Schmalensee & Willig).

¹³⁹ AREEDA & HOVENKAMP, *supra* note , at 206 & n.3 (collecting sources); AREEDA & KAPLOW, ANTITRUST ANALYSIS 31 (5th ed. 1997); JOSEPH A. SCHUMPETER, CAPITALISM, SOCIALISM AND DEMOCRACY 84-92, 99-106 (3rd ed. 1950); R. Solow, *Technical Change and the Aggregate Production Function*, 39 REVIEW OF ECONOMICS AND STATISTICS 312 (1957); R. Solow, *A Contribution to the Theory of Economic Growth*, 70 QUARTERLY JOURNAL OF ECONOMICS 65 (1956); M. Abramowitz, *Resource and Output Trends in the United States since 1870*, 46 AMERICAN ECONOMIC REVIEW 5 (1956).

firms with higher market power are more likely to innovate because they can reap a larger share of the benefits of their innovation, whereas if there were perfect competition no one would have the incentives to invest in product improvements.¹⁴⁰ But we need not rely here on any controversial proposition that monopolists are generally more innovative more than competitive markets. It is enough to point out that where, as with the current posited tradeoff, the monopolist is by definition more efficient, it will likely be more innovative than other firms that have failed to figure out how to be equally efficient. This follows as long as the past history of firms correlates at least somewhat with their future. If so, then we can assume firms that were sufficiently innovative in the past to figure out how to make a superior product or to make it more cheaply are somewhat more likely to be innovative in the future than other firms that not only failed to demonstrate the same past innovative skills but cannot even imitate that past innovation sufficiently to achieve the same efficiencies.

Alternatively, one might try an amendment providing that, although the restriction on above-cost predatory pricing applies irrespective of whether the incumbent maintains monopoly or market power, the restriction does not last forever but only for some specific period of time, like the 12-18 months suggested by Edlin. But again the short run post-entry effects would be the same as the actual proposals: higher prices to consumers, lower productive efficiency, and wasteful contraction of production that will just have to be re-expanded. Likewise, the long run effects on entrants would again be nil. Because (by assumption) the incumbent's cost and quality advantage has not been reduced by having to mothball capacity, then the regulation would again be futile because at the expiration of 12-18 months (or whatever period is specified) the incumbent would again lower prices and drive out the entrant. In fact, of course, one might expect that a long period of mothballing would erode some of the incumbent's advantages, meaning that its costs after the period expired would be higher than its costs before the entry. But, as we shall see below, the effects will be even worse when the incumbent's efficiency advantage deteriorates in this manner.¹⁴¹

¹⁴⁰ SCHUMPETER, *supra* note , at 87-92, 99-106. Professors Areeda and Kaplow have disputed this hypothesis with evidence that firms with market power do not obtain more patents or spend more on research and development. AREEDA & KAPLOW, *supra*, at 31-33. But this misapprehends Schumpeter's point, which was that innovation includes not just technological progress but changes in organization, distribution, or scale that are *not* protected by patents and would thus go unrewarded without some degree of market power. SCHUMPETER, *supra*, at 84-85, 88-89. The huge investments necessary to create hub-and-spoke airline systems would be just such an example. *See infra* III.C. Indeed, properly understood, Schumpeter's theory would predict firms that lack market power would have greater incentives to shift their innovation investments toward research and development designed to obtain patents because that is the only form of innovation for which they can exclude competition and obtain rewards.

¹⁴¹ *See infra* Section II.C.

B. Entrants That Are Not Less Efficient

1. The Adverse Post-Entry Effects. Now consider a case ignored by proponents of bans on reactive above-cost price cuts: the case of the entrant that from the moment of entry is just as or more efficient as the incumbent. For these entrants, the effects of a restriction on reactive above-cost price cuts is even more negative. Such restrictions cannot protect (or induce) these entrants since an incumbent who prices at or above cost cannot drive them out. But such restrictions can induce these entrants to charge higher prices (than they otherwise would have charged) to take advantage of the price umbrella afforded by the proposals.

Under the Edlin rule, the entrant will charge a price no lower than 20% below the incumbent price, even though without any rule its greater efficiencies would have led it to price lower in competition with the incumbent. Under the Williamson and profit-maximizing price floors, every entrant has an incentive to set initial prices very high, and to follow the incumbent down until it reaches a price just below the restriction's floor on incumbent pricing. Moreover, entrants have incentives to maintain prices at that level until the restriction expires due to passage of time or erosion of the incumbent's market share.

This effect on entrant pricing is similar to that for less efficient entrants but is even more likely to be harmful. First, because more efficient entrants have lower costs, it is more likely they would have otherwise set a price below this price umbrella. Second, their lower costs mean the prices they otherwise would have set would have been lower.

Moreover, this post-entry adverse effect on entrants who are *not* less efficient than incumbents is unambiguously harmful. This is because even proponents of a restriction on reactive above-cost price cuts acknowledge that such a restriction cannot encourage entry by these entrants. Thus, the long run effect with or without the restriction is the same: free competition between the entrant and incumbent. But in the short run before the restriction expires, it would encourage these entrants to enter the market at a higher price, and to keep that price there for as long as they enjoy the protection of the price umbrella. Without the restriction, short run competition between the entrant and the incumbent could instead be expected to have driven entrant prices down. Because this adverse short run effect is not even arguably offset by any beneficial *ex ante* effect, it is unambiguously harmful to consumer welfare, and also to efficiency, since output will be inefficiently low at these higher prices.

One might think Edlin avoided this problem by providing that his ban only applies in cases where the "incumbent monopoly enjoys significant advantages over

potential entrants.”¹⁴² This sounds like it excludes any protection for more efficient entrants, and perhaps even for entrants whose efficiency disadvantage is small enough to make it plausible they will overcome it. But Edlin latter disavows any such limitation, arguing for a ban on reactive price-cuts that applies to any incumbent monopoly.¹⁴³

Still, one might be tempted to modify any of the restrictions on reactive above-cost price cuts by defining them to exclude cases where entrants are not initially less efficient. The problem is that neither regulators nor antitrust litigation seem likely to accurately gauge when an entrant is less efficient than an incumbent. To the extent regulators or litigation errs, or incumbents predict they will err, the effects on post-entry pricing behavior by more efficient entrants will be unambiguously adverse. Moreover, any such limit could not exclude the case of the entrant who is initially less efficient but becomes more efficient over time. Indeed, such entrants are the best hope of such a restriction.¹⁴⁴ For such entrants, the effects of the restriction on their pricing behavior will be unambiguously adverse once they become at least as efficient as the incumbent. And it will be especially difficult to distinguish them from entrants who are more efficient from the get-go.

2. *Entrants That Share the Incumbent’s Declining Cost Curve.* One important classification issue is how to treat entrants that have the same cost curve as the incumbent, but the curve is a declining one so that costs are higher at low firm outputs than at high firm outputs. Not only is the case a recurring one, but it forms the centerpiece of Williamson’s famous model purporting to prove that a rule prohibiting output expansions in reaction to entry will always have favorable welfare effects.

The short answer is that the classification depends on whether the entire cost-output curve is immediately available to the entrant, or is only available after the passage of time. Williamson’s own model assumes the former, and concludes that the incumbent will nonetheless (under any rule) be able to set an output that leaves the entrant at the high cost portion of the curve.¹⁴⁵ This seems to make this the case of a less efficient entrant. But Williamson’s conclusion depends heavily on his dubious assumption that, if the entrant and incumbent have identical prices, the incumbent will be able to sell all its output first, leaving the entrant with only the residual demand.¹⁴⁶

¹⁴² Edlin, *supra* note , at 945.

¹⁴³ *Id.* at 967-68.

¹⁴⁴ *See infra* Section II.C.

¹⁴⁵ Williamson, *Predatory Pricing*, *supra* note , at 295, 297-98, 313.

¹⁴⁶ *Id.* at 294 & 295 n.35, 297-98, 310 n.66. To put it technically, he assumes that under his rule the incumbent will choose a price P_T at which the incumbent will sell all its initial output, Q_0 , leaving the entrant with only the residual market output Q_T . *Id.* at 297, 310 n.66.

Williamson could have equally adopted the opposite assumption that the entrant sells all the output it can at an equal price, leaving the incumbent with the residual demand and thus at the low-output, high-cost portion of the curve.¹⁴⁷ After all, dominant firm models typically make such an assumption when they assume the dominant firm faces a residual demand curve determined by subtracting the output of the fringe firms at any given price.¹⁴⁸ Indeed, in this context, there are good reasons to make such an assumption because buyers would all have an affirmative interest in making sure the entrant stays in the market, and at an equal price buyers would suffer no individual detriment from dealing with the entrant that might create collective action problems for them.¹⁴⁹ One would thus think buyers would have a general preference for the entrant at any equal price, at least until the entrant becomes established enough to feel like another incumbent. If so, the entrant would also reach the low cost portion of its cost curve and would instead fit the profile of an equally efficient entrant.

Perhaps implicitly Williamson is assuming that the incumbent has a brand name advantage or familiarity that will lead consumers to choose it at the same price. But if that is the case, it means that, according to the consumers' revealed preferences, the incumbent good is actually more valuable than the entrant's.¹⁵⁰ Thus, the two firms either have different demand curves or one must adjust their cost curves to take into account the fact that the cost of producing an equally valued product is higher for the entrant. Either way, Williamson's model would no longer hold. Instead, what we would have is the case of an entrant who is less efficient at every output level.¹⁵¹

Perhaps more plausible than either extreme assumption, one could assume consumers have no categorical preference for either the incumbent or entrant, but would buy from them equally if the price were equal. If that were the case, the entrant could respond to any above-cost incumbent price with a lower entrant price, expanding total market output until half of it put the entrant on the flat portion of the cost curve.¹⁵² In a sense, this is a product of how Williamson drew his demand and

¹⁴⁷That is, Williamson provides no reason to think that at equal price P_T the entrant would not instead produce output Q_O and leave the incumbent at Q_T .

¹⁴⁸ See CARLTON & PERLOFF, *supra* note , at 113-114.

¹⁴⁹ Compare *supra* II.A.1. If long-term contracting is possible, the entrant with the same cost curve should indeed be able to lock up a sufficient share of the market to put it at least at the minimum efficient scale. *Id.* But even if long-term contracting is not possible, each buyer on the spot market has an incentive to deal with the entrant at the same price to keep the competition going.

¹⁵⁰ See *infra* Section III.B.3 (explaining why brand name advantages reflect buyer valuation).

¹⁵¹ See *supra* Section II.A.

¹⁵² Referring to his model, if the incumbent tried to drive out the entrant by selling at P_T as Williamson posits, the entrant would at the same price be able to sell half of total market output, or around Q_* , which given Williamson's particular drawing would put the entrant beyond its minimum efficient scale and make entrant sales profitable. See

cost curves, because in his drawing a price equal to the minimum long run cost produces a total market output that is more than double the minimum efficient scale where an individual firm can enjoy that cost minimum.¹⁵³ But if his curves were *not* drawn that way, then the market would be a natural monopoly because only one firm could stay in the market at the minimum efficient scale. And if the market is a natural monopoly, there can be no successful competition between the entrant and incumbent in the long run. Instead, the situation would be that described below of an initially less efficient entrant that can never become as efficient as the incumbent even though its entry degrades incumbent efficiency and raises entrant efficiency.¹⁵⁴ For any market that *does* have the sort of demand and cost curves that Williamson posits, an entrant with the same declining cost curve as the incumbent is not really an initially less efficient firm but rather a firm that is equally efficient from the beginning, and thus could not be deterred by any incumbent price at or above cost.

Finally, even if one thought customers did have a generic preference for incumbents at the same price, an entrant with the same cost curve as the incumbent could overcome that because, unlike the incumbent, the entrant can offer a promotional below-cost price.¹⁵⁵ The entrant need only make the small additional investment of offering a promotional price slightly below cost, which the incumbent could not match since it is constrained to price at cost. The small price advantage will bring enough sales to the entrant to bring its production to the minimum efficient scale.¹⁵⁶ This is a powerful justification for allowing entrants to offer promotional prices, but provides no justification for condemning above-cost incumbent prices. Indeed, it confirms the conclusion reached above that cases fitting the Williamson

Williamson, *Predatory Pricing*, *supra* note , at 297. If the incumbent tried to respond by undercutting that price, the entrant could keep matching or undercutting the incumbent price all the way down to P_C , below which the incumbent could not go without pricing below cost. At that price, the entrant would capture an output of $\frac{1}{2}Q_C$, which by definition will be on the low flat portion of the cost curve for any drawing that describes a market where the minimum efficient scale is below half of total market output at that price.

¹⁵³ *Id.* (drawing a declining long run cost curve that gets flat at a firm output about 1/3 the total market output at that price).

¹⁵⁴ *See infra* II.C.1.

¹⁵⁵ AREEDA & HOVENKAMP, *supra* note , at 447-50.

¹⁵⁶ Using Williamson's model, the entrant would offer a price of $P_C - \epsilon$, where ϵ is whatever small discount is necessary to overcome consumer inertia to choose an entrant product over an equally valuable incumbent product. Williamson, *Predatory Pricing*, *supra* note , at 297. Given how Williamson draws his model, a one penny discount would suffice. At a promotional price, the entrant could sell all the output it wanted. But presumably the entrant would stop once it got to an output above the minimum efficient scale since it loses some (albeit small) amount on any sales past that point, and would no longer be able to offer a promotional price if its output got so large that it would be deemed to have enough market power to make the ban on below-cost predatory pricing apply to it. AREEDA & HOVENKAMP, *supra* note , at 449-50. Thus, once the promotional price has brought the entrant to the minimum efficient scale, the entrant will raise prices to cost and both it and the incumbent will be competing with the same costs in the same market.

model are (even with his assumption of a categorical consumer preference for incumbent output at the same price) effectively the same as the case of an equally efficient entrant described above.

In short, if economies of scale and scope are equally available to both entrant and incumbent from the moment of entry, so that they both have the same declining cost curve, there are two possibilities. If the minimum efficient scale is below half the maximum market output, the case is actually one where the incumbent and entrant are equally efficient from the beginning. If the minimum efficient scale is higher than half the maximum market output, we have a natural monopoly, with no possibility of long term competition. The entrant efficiency will increase with its increasing output, but never to the level of the incumbent. The case will thus have all the adverse effects described for a less efficient entrant, with the additional ones that flow from the deteriorating incumbent efficiency.¹⁵⁷

Alternatively, one might assume that the entrant can only access the low cost portion of his cost curve over time, perhaps because the entrant needs time to ramp up his capacity or engage in learning by doing. Although they do not actually model that case, Williamson and Edlin express such a view.¹⁵⁸ If so, then we do not have the case of an entrant who is initially just as efficient as the incumbent. Rather, the transfer of output to the entrant will be inefficient in the short run, and the case is actually one where entrant efficiency improves with time (rather than just output) and thus fits the profile I analyze next.

C. Incumbent Efficiency Advantage That Narrows With Time

In the prior sections, I have assumed that the incumbent and entrant efficiencies remained constant. This may well be an accurate assumption in many markets, especially when the period of losing and regaining a monopoly share is likely to be

¹⁵⁷ See *infra* II.C. 1. A similar analysis applies if both the entrant and incumbent have economies of scale available from the moment of entry, but their cost curves differ so that at high output one has lower costs than the other. If it is the entrant that has lower costs at high output, it has no need of protection from a ban on above-cost predatory pricing. Without any such ban, the entrant could have entered at a price below the lowest cost of the incumbent, and taken over all market output. All the ban can do is raise incumbent prices in the meantime, and perhaps entrant prices too. The long run effect will be the unchanged -- an entrant monopoly -- because this is the case of a more efficient entrant. If it is the incumbent that has lower costs at high output, protecting the entrant cannot help in the long run. Even though the entrant's efficiency increases with its growing output, it will not increase to a level that matches incumbent efficiency. Whenever the restriction expires, the incumbent will just lower its price to match its lower cost at high output, drive out the less efficient entrant and take over the market. In the short run, there will be all the adverse effects described below for cases where the combination of increased entrant efficiency and decreased incumbent efficiency does not suffice to overcome the incumbent's initial efficiency advantage.

¹⁵⁸ Williamson, *Predatory Pricing*, *supra* note , at 296, 298 n.43, 303-04, 313; Edlin, *supra* note , at 975 & n.95, 977.

very short. The predictions in Section A also hold if the incumbent begins with an efficiency advantage that actually increases post-entry. This might happen if the incumbent, unable to spend funds on expanding capacity, instead spent its funds on research and innovation to lower its costs (which it could implement immediately) or improve its products (which under the Edlin proposal they could implement after they lost monopoly power or after 12-18 months, whichever comes first).

But the proposals to restrict above-cost price cuts have partly been based on the hope that, after entry, the efficiency advantage of the incumbent will be narrowed and perhaps eliminated.¹⁵⁹ There are two reasons this might happen: the efficiency of the entrant might increase, or the efficiency of the incumbent might deteriorate. Those advocating the restrictions have emphasized the former. And it has some basis. There might be economies of scale or scope at low output that are only available over time as production is ramped up. Or experience in the industry might lower costs or improve quality. But there are also various reasons the efficiency of an incumbent might deteriorate after entry. First, to the extent the incumbent's efficiency advantage results because of economies of scale or scope that still apply at large outputs, a reduction in its scale or scope will make it less efficient.¹⁶⁰ Second, the incumbent has presumably selected a plant size that minimizes the short-run costs of producing its pre-entry output: thus any decline in output increases its short-run costs.¹⁶¹ Third, because the restriction on reactive price cuts may require the incumbent to mothball capacity and layoff workers in the short run, it may disrupt an efficient operation. Machines that were well-oiled may become rusted, or new workers may need to be hired and re-trained. When full production starts up again, the costs may thus be higher, or the quality lower.

We can divide our analysis of the effects of such shifts in entrant and incumbent efficiency into three cases. Advocates of restrictions on reactive above-cost price cuts normally ignore the first two.

1. When Efficiency Advantage Is Narrowed But Not Overcome. One possibility is that the combination of a deterioration in incumbent efficiency and an increase in entrant efficiency will *not* suffice to fully offset the incumbent's initial

¹⁵⁹ See Williamson, *Predatory Pricing*, *supra* note , at 296, 298 n.43, 303-04, 313; Edlin, *supra* note , at 975 & n.95, 977.

¹⁶⁰ An economy of scale results when average costs for a product fall as firm output increases, whereas an economy of scope results when two products can be produced more efficiently together than separately. See CARLTON & PERLOFF, *supra* note , at 35-40, 44-47.

¹⁶¹ Cf. Williamson, *Predatory Pricing*, *supra* note , at 297, 300-02, 309-10 (assuming incumbent plant size minimizes the short run costs of making the pre-entry output, so that any decrease or increase in incumbent output necessarily reduces its efficiency and raises its costs).

efficiency advantage before the restriction expires due to passage of time or erosion of incumbent market power. Then the incumbent would still retain some efficiency advantage when freed from the restriction on reactive price cuts, and would thus be able to cut prices to an above-cost level that would drive out the still less-efficient entrant.

The effects would be similar in kind to that with a constant efficiency advantage but even more adverse. As before, the restriction would offer no long term protection to the entrant. In the short run, consumers will pay higher post-entry prices, and production would be shifted to a less efficient producer. But productive efficiency would suffer even more because the restriction will have increased incumbent costs. Consumer prices can also only be worsened because increased costs increase the incumbent's profit-maximizing price. The profit-maximizing price floors will further exacerbate this increase in consumer prices by requiring the incumbent to price at something close to the short-term profit-maximizing price. Under the other restrictions, the incumbent also has incentives to increase consumer prices with increased costs because maximizing short run profits brings gains without any cost to long term profits since it cannot drive the entrant out in the short run anyway. To the contrary, maximizing short-run profits just reduces incumbent output in a way that brings closer the day when the restriction expires and the incumbent can drive the entrant out. The restrictions rules might even motivate the incumbent to price *above* the short-term profit-maximizing price to speed up the day when its output falls to the level where the restriction will be lifted and the incumbent can drive out the entrant and earn long-term monopoly profits. This effect can drive short term incumbent prices above even their pre-entry level. The effects are even worse if the decline in incumbent efficiency persists past the time when the entrant is driven out of the market. For now the incumbent will have higher long run costs, meaning not only worsened long run productive efficiency, but a long run monopoly price that is higher than it was before entry.

All this means that the effects predicted in Section II.A are probably too generous to the restrictions on post-entry price cuts because I there adopted the simplifying assumption that the incumbent's efficiency advantage was static. It is more realistic to assume incumbent efficiency will normally decline at least somewhat if incumbent output is reduced because a legal rule effectively transfers some of its output to a less efficient entrant. This means that, in any case where the entrant is unlikely to overcome an initial efficiency disadvantage, both the long and short term result would be less productive efficiency and higher prices more adverse to consumer welfare than predicted above.

2. When Overcoming Incumbent Efficiency Advantage Requires

Deteriorating Incumbent Efficiency. Another possibility is that, although increased entrant efficiency alone does not suffice to overcome the initial efficiency disadvantage, the combination of any increased entrant efficiency with a deterioration in incumbent efficiency *does* suffice. Because the degradation of incumbent efficiency was necessary to overcome the initial efficiency advantage, the final efficiency of the entrant (and incumbent) must be less than the initial efficiency of the incumbent.¹⁶²

The final result would thus be the same as predicted for the permanent restriction on reactive above-cost price cuts discussed above.¹⁶³ The now less efficient incumbent would effectively be eliminated from the market. To be sure, if the deterioration in efficiency left the incumbent roughly equivalent to the entrant, a firm with the same *name* as the incumbent would remain in the market. But *functionally* the more efficient version of the incumbent would be eliminated. What would remain would be a less efficient version functionally indistinguishable from the other less efficient entrants. As with a permanent ban, it is highly unlikely that a market full of less efficient firms would be as societally desirable as a market with an efficient monopolist.

Note that without a restriction on above-cost price cuts, the incumbent in such a case would have lowered prices to an above-cost level that allowed it maintain its output and avoid suffering any loss of efficiency. Moreover the incumbent would be able to do so indefinitely since (by hypothesis) the entrant cannot overcome its efficiency disadvantage unless incumbent efficiency deteriorates. It is only the presence of some effective above-cost price floor that can allow such an entrant to stay in the market and persevere.

3. When Increased Entrant Efficiency Suffices to Overcome Incumbent Efficiency Advantage. A final possibility is that entrant efficiencies alone will increase sufficiently with time to overcome its initial efficiency disadvantage before the restriction on reactive price cuts expires. This can include cases where the incumbent efficiency declines, as long as the final efficiency of the entrant exceeds or equals the initial efficiency of the incumbent. This might be true when there are economies of scale the entrant can only access over time, and the minimum efficient scale is less than half the potential market output. It might also happen when the increased entrant efficiencies come from experience and learning by doing, which need not come at the expense of incumbent efficiency.

It will not be possible for an incumbent to drive out such an entrant with any

¹⁶² In the extreme, some of these cases will be ones where the entrant experienced no efficiency improvement but was able to overcome its initial efficiency disadvantage solely because of deteriorating incumbent efficiency.

¹⁶³ See *supra* Section II.A.4.

above-cost price. True, such an entrant will suffer initial losses if the incumbent's above-cost price is below the entrant's initial costs. The entrants will initially have to charge a below-cost price to remain in the market, which is one more reason to allow entrants to charge promotional prices.¹⁶⁴ But this initial need for a promotional price fund will simply be one of the many capital costs of entry that any firm that actually enters would anticipate.¹⁶⁵ The entrant will thus have raised enough money from the capital markets to cover its initial inefficiency losses, just like it will have raised enough to cover other capitalized entry costs. The entrant will do so whenever it can earn a sufficient return from the fact that in the long run it will be just as efficient as the incumbent or more. Such a return should be easy to justify since such an entrant will at worst remain in the market and more likely will enjoy supracompetitive profits from either its own monopoly (if it ends up having an efficiency advantage that allows it to drive out the incumbent) or oligopolistic coordination with the incumbent (if neither has the efficiency advantage or sufficient incentive to drive out the other).¹⁶⁶ When the initial inefficiency results from inexperience, the investment will be in human capital rather than physical capital, but that makes no difference.

What then are the post-entry effects of a above-cost price restriction on such entrants? During whatever initial period the entrant remains less efficient than the incumbent, the short term effects are much as described above for less efficient entrants. Prices will be higher, indeed the incumbent will use the short-term profit-maximizing price if that is above the price floor since the entrant cannot be driven out of the market in the long run given its eventual efficiency.¹⁶⁷ Production will be shifted to a less efficient producer. Thus, both consumer welfare and efficiency will suffer.

During the middle period, when the restriction on the incumbent remains in effect but the entrant has become just as (or more) efficient as the incumbent, the effects are also unambiguously adverse. Without the restriction, competition between the incumbent and entrant could have driven prices below the price floor applicable during this middle period. But as long as the restriction on above-cost predatory pricing has bite, the incumbent cannot go below that price floor, and the entrant who has become more efficient has incentives to offer a price slightly below that price floor and above the incumbent's costs, secure in the knowledge that the incumbent cannot cut prices to match it. The entrant will charge no less than 20% below the

¹⁶⁴ See *supra* II.B.2.

¹⁶⁵ I defer to Section III.A.2 the question whether the proposed restrictions would have a positive *ex ante* effect on the likelihood of such entry.

¹⁶⁶ *Id.*

¹⁶⁷ The incumbent will not, however, set a price higher than the short-term profit-maximizing level in order to hasten the end of the restriction because such an entrant has long term viability without any restriction.

incumbent's pre-entry price under the Edlin rule, or just below the effective incumbent price floor set by the other restrictions. To the extent the restriction on above-cost predatory pricing has any post-entry effect at all in the medium term, then, it will be to keep prices higher than they otherwise would have been. This will harm consumer welfare and produce a lower output harmful to market efficiency.

In the long run after the restriction expires (due to time or loss of incumbent market power), there will be competition between this entrant and the incumbent. But this desirable post-entry effect would have been the same without the restriction,¹⁶⁸ and thus (if the rule has not decreased incumbent efficiency) the rule will have no net positive or negative long run post-entry effect. Worse, in the cases where the restriction reduces incumbent efficiency, it will have adverse long run effects, on top of (even worse) bad effects in the short and middle run.

Williamson reaches the strikingly different conclusion that his output limitation rule has no effect on post-entry price or output when the entrant's efficiency would (with increased output) increase to match the incumbent's.¹⁶⁹ The only effect he predicts is that his rule will lower post-entry incumbent costs because his output ceiling bars the incumbent from reacting to entry by exceeding its optimal plant output.¹⁷⁰ But these predictions are once again artifacts of his assumptions. He assumes prices and outputs are unchanged because he assumes that (no matter what the rule) the incumbent will do the same thing post-entry: produce the level of output that, given an assumed categorical consumer preference for the incumbent, leaves an entrant selling at the same price with a low residual output where it has high costs and cannot earn profits.¹⁷¹ But this assumption depends heavily on his premises that incumbents have perfect knowledge about the cost curves of potential entrants, that all entrants have identical cost curves, and that the incumbent does not care about pre-entry profits at all and thus picks whatever pre-entry output level minimizes post-entry hazards.¹⁷² Since those assumptions in fact are not true, the incumbent's actual pre-

¹⁶⁸ Recall again that throughout Part II we are analyzing only the effect of the restrictions once any entry has occurred, and are deferring until Part III the claim that the restrictions increase the likelihood of entry.

¹⁶⁹ See Williamson, *Predatory Pricing*, *supra* note , at 309-10.

¹⁷⁰ Any increase or decrease in incumbent output necessarily increases short run incumbent costs on Williamson's reasonable assumption that incumbent plant size was set to minimize the short run costs of making the pre-entry output. See *supra* at _____. Thus, if current law allows an incumbent to increase short run output in response to entry, it necessarily increases incumbent short run costs compared to the pre-entry period. But current law only increases firm costs compared to the Williamson rule on his further assumptions that incumbent output will be unchanged under his rule, and that entrant output is the same under any rule. Those assumptions are dubious for reasons noted in text.

¹⁷¹ See Williamson, *Predatory Pricing*, *supra* note , at 294 & 295 n.35, 297-98, 310 n.66, 314.

¹⁷² See *supra* II.A.3.

entry output will reflect average expectations and profit tradeoffs, and thus an output limitation rule will sometimes set an effective price floor that makes it impossible for the incumbent to make the initial entry unprofitable. Moreover, the more reasonable assumption that incumbents will enjoy no categorical consumer preference at the same price (or that any preference can be overcome with promotional pricing) means that the growth of an initially less efficient entrant that will ultimately share the same declining long run cost curve cannot be contained by just lowering incumbent prices to a level that leaves the incumbent above-cost and the entrant on the high-cost part of the curve.¹⁷³ And if incumbents cannot set a price that either drives out the entrant or contains its growth, then the incumbent's incentives will lead it to instead raise post-entry prices in order to maximize short-term profits. Thus, the Williamson rule will produce an average decline in post-entry output, with corresponding ill-effects that include a likely increase in incumbent costs.

D. Conclusion Regarding Ex Post Effects

The post-entry effects of a restriction on reactive above-cost price cuts (or output changes) are strikingly negative. It cannot in the long run keep any less efficient firm in the market, but in the short run increases prices, shifts production to less efficient producers, and causes wasteful contraction of production that will have to be re-expanded. It might also decrease the efficiency of incumbents, and causes adverse effects when entrants are (or will become) as efficient as the incumbent began or more.

III. EX ANTE EFFECTS ON ENTRANTS AND INCUMBENTS

The case for restricting reactive above-cost price cuts does not rest solely or even mainly on its post-entry effects. Instead, advocates argue that such restrictions have desirable effects *ex ante* on the likelihood of entry and the incumbent's pre-entry pricing (or output) behavior.¹⁷⁴ If the incumbent keeps initial prices high (or output low), the argument is that the restriction on lowering price (or raising output) will encourage more entry. If so, while any post-entry effects may be less desirable with the restriction, the restriction makes it more likely we will have post-entry effects at all. At the extreme, the claim is that the effect is purely positive because without the restriction we would get no entry by firms that are initially or permanently less efficient,

¹⁷³ See *supra* II.B.2.

¹⁷⁴ Edlin, *supra* note , at 945-47, 973-78; Williamson, *Predatory Pricing*, *supra* note , at 308.

and thus we would not have gotten any good post-entry effects on output and prices without the restriction. If the incumbent responds to this greater likelihood of entry by reducing initial prices to a “limit price” (or increasing pre-entry output) in order to keep out the less efficient entrants who would be encouraged by the restriction, proponents argue that this too is a desirable *ex ante* consequence. In short, proponents argue that we will have either (1) more entry and a greater likelihood of lower post-entry prices or (2) lower pre-entry limit pricing and higher pre-entry output. Moreover, sometimes the incumbent will try to set a limit price but get it wrong by setting too high a price, in which case we will get both more entry and lower pre-entry prices.

At least that is the argument. But alas it is an argument based on a partial and flawed assessment of the *ex ante* consequences. Instead, as Section A demonstrates, the restrictions are not likely to significantly increase entry by less efficient firms and may even mildly decrease entry by more efficient firms. Further, much of the entry encouraged will be undesirable under the restrictions. Likewise, Section B shows that incumbent firms are unlikely to lower their prices to keep out less efficient entrants, and if they do so that would itself have bad *ex ante* incentives on the willingness of firms to make the investments necessary to create products so valuable that they confer monopoly profits. Finally, Section C points out that the intuition to the contrary in airline studies is partly based on a misguided application of contestable market theory to individual airline routes. One implication of that point will turn out to be that, even if restrictions on above-cost predatory pricing did decrease prices along a particular route, it would likely decrease output along an entire hub-and-spoke system and harm aggregate consumer welfare.

A. Ex Ante Effects on Likelihood of Entry

Arguments for restricting reactive above-cost price cuts sometimes give the impression that there is only one type of entrant and their entry can only be encouraged. But in fact entrants are a differentiated group, and their entry can be both encouraged and discouraged by such restrictions. I will thus separately address three different classes of entrants whose *ex ante* incentives might be affected: (1) entrants who are and will remain less efficient than the incumbent, (2) entrants who are initially less efficient but become more efficient before the restriction on reactive price cuts expires; and (3) entrants who are as or more efficient than incumbents from the moment of entry.

1. Ex Ante Effects on Entry by Less Efficient Firms. Let’s begin with entrants who are less efficient than the incumbent, and will remain so during the period

of any restriction on reactive price cuts.¹⁷⁵ These are the sorts of entrants Edlin focused on in claiming desirable *ex ante* effects from a price-maintenance rule.¹⁷⁶ But as described above, a restriction on reactive price cuts cannot protect such entrants in the long run. Eventually the restriction will expire because the incumbent's market power has dissipated or any outside time limit has lapsed. The incumbent will then lower prices and drive the entrant out. Given that entrants will be unable to persist in the market, it is unlikely that they will have any significantly increased incentive to enter. The restriction cannot alter the fact that they cannot reap any long term profits from entry.

True, a restriction on reactive price cuts does mean that less efficient firms will enjoy some price protection and higher profits in the period before the restriction inevitably expires. But it will be the rare case where those short term profits suffice to induce the entrant to incur the ordinary capital costs of entry. Such entry costs ordinarily require recoupment over a longer period of time. Moreover the short run may be very short indeed where expansion and contraction are relatively quick, especially since the incumbent has incentives to make it quick so that the price restriction will expire. Entry will thus be encouraged only when it requires very little capital investment. But in industries that require little capital investment, the incumbents are unlikely to have any market advantage that makes them permanently more efficient.

Further, the lack of encouragement to entry by less efficient firms will be even greater if the restriction is rendered ineffective (as discussed below) either by buffer zones established to escape the difficulty of adjusting for demand or cost shifts, or by a failure to regulate non-price reactions.¹⁷⁷ It will also be even more ineffective if the restriction is defined to begin at a moment of entry that is not sufficiently early (and longlasting) to effectively restrain reactive price cuts that anticipate entry.¹⁷⁸ Nor can these likely sources of regulatory ineffectiveness be easily avoided since doing so requires incurring the serious adverse effects of mistaken adjustments in price controls, freezing innovation, or a lengthier distortion of prices and innovation.¹⁷⁹

In the rare case where the restrictions offer less efficient entrants the prospect of enough short term profits to induce entry that otherwise would not have occurred,

¹⁷⁵ I here include both entrants that have a constant efficiency disadvantage and those who have an efficiency disadvantage that narrows but does not disappear. The entrants considered here thus correspond to the classes of entrants whose post-entry effects were previously considered in Parts I.A and I.C.1.

¹⁷⁶ See Edlin, *supra* note , at 944, 956, 962-63, 965, 955-60, 973-78.

¹⁷⁷ See *infra* IVA-B.

¹⁷⁸ See *infra* IV.C.

¹⁷⁹ See *infra* IV.

it is not at all clear that the net effects will be desirable. Note that we are now talking about the net effects of the entry under the restriction, and are thus comparing pre-entry conditions to post-entry conditions under the restriction. In Part I, in contrast, the entry was assumed, and the comparison was between post-entry conditions with the restriction and post-entry conditions without the restriction.

Some effects of such less efficient entry are clearly desirable. The consumers who buy from the entrant will enjoy lower prices than they would have paid without any entry at all. But they will only be a small subset of consumers because if they were larger they would deprive the incumbent of the monopoly share necessary to restrict its prices. And they will only enjoy this benefit over the short run. The effects may not be so desirable for consumers who still buy from the incumbent. They cannot pay any less than before entry under the Edlin rule, but might actually pay more under any of the restrictions. First, such a restriction on reactive price cuts will normally produce a decline in incumbent output that lowers incumbent efficiency.¹⁸⁰ Higher incumbent costs will raise the short-term profit-maximizing price of the incumbent. Second, an incumbent that cannot drive out the entrant has incentives to raise post-entry prices even above the short-term profit-maximizing level to speed the day when its market share declines enough to free it to drive out the entrant and restore long-run monopoly profits.¹⁸¹ Either effect, but especially the two in combination, may mean that the majority of consumers stuck with the incumbent pay higher prices post-entry than pre-entry even if we assume the incumbent was charging a short-term profit-maximizing price before entry.¹⁸² If we instead assume the incumbent was not maximizing short-term profits before entry but was rather charging an (unsuccessful) limit price, then the restrictions will almost surely cause an incumbent price increase. This is because the restriction (in any case where it encouraged entry) will make it impossible to drive out the entrant, and thus the incumbent will have no reason not to raise prices to at least the short-term profit-maximizing level until the restriction expires.

It is thus not at all clear any additional entry by less efficient entrants encouraged by a restriction on above-cost price cuts would confer a net benefit to consumer welfare. Further, additional entry by less efficient firms would impose a clear loss of productive efficiency. Not only will it often reduce incumbent efficiency, it will always shift production to a higher cost producer. In addition, the mothballing of incumbent

¹⁸⁰ See *supra* II.A & II.C.

¹⁸¹ See *supra* II.A.

¹⁸² That will not always be the case because the addition of entrant output will (absent increased demand) tend to reduce the short-term profit-maximizing price of the incumbent. Thus, if the incumbent was charging a short-term profit-maximizing price before entry, the net effect of these conflicting influences may raise or lower its price from pre-entry levels.

capacity during the period of restriction will (even if it does not make the incumbent less efficient) involve unrecoverable costs of contracting capacity that will just have to be re-created.¹⁸³ The prospect of incurring those unrecoverable costs repeatedly to keep out less efficient entrants will raise incumbent costs and thus prices.

Moreover, the capital costs of entry will be wasted because the less efficient entrant will eventually be driven from the market. The entrant will still enter in the odd case where its short term profits exceed these capital costs, but such cases effectively involve a form of wasteful rent-seeking. The entrant will be shifting producer surplus from the incumbent to itself. Because some, and at the extreme all, of this surplus will be dissipated by the expenditure of entry costs that otherwise would have been avoided, the result is an efficiency loss.¹⁸⁴ Further, the entrant will be depriving the incumbent of producer surplus that the incumbent earned with investments or innovation that gave it a better or more efficient product. This shift of producer surplus from the incumbent to the less efficient firm will thus, as discussed below in Section III.B.3, lower the incumbent's own *ex ante* incentives to invest and innovate in ways that create better products or more efficient methods of production.

Finally, where less efficient entry is induced, it will sometimes be affirmatively harmful because of the inevitable imprecision of the restrictions on price cuts. In particular, the rules will discourage incumbent innovation. The Williamson rule does so by capping output based on past demand trends.¹⁸⁵ The Edlin rule is even more direct: explicitly prohibiting incumbents from making significant product enhancements.¹⁸⁶ Indeed, under the Edlin approach, a less efficient firm that realizes a wave of innovation is forthcoming has incentives to enter in order to trigger the prohibition on incumbent product enhancements. This not only has undesirable effects on incumbent innovation, it encourages costly and inefficient entry by a firm that would not enter but for the ability to freeze the innovation of others. This is undesirable enough when the innovation affects only one market. But because innovation in one market often ends up having applications to other markets, and sometimes even redefines the markets, it raises the even graver concern that a firm in

¹⁸³ If under the Williamson rule the incumbent responds to entry by maintaining pre-entry output levels, then it will not cause mothballing costs, nor any loss of productive efficiency for entry that would not have occurred without the rule. See Part I.A.3. But even then it will reduce productive efficiency for any entry that would have occurred anyway. *Id.* Further, on average the Williamson rule will produce an output reduction, especially in cases where the entrant cannot be driven out, and thus will produce a mothballing and productive efficiency loss. *Id.*

¹⁸⁴ See Posner, *The Social Costs of Monopoly and Regulation*, in TOWARD A THEORY OF THE RENT-SEEKING SOCIETY 71-80 (eds. Buchanan, Tollison & Tullock) (producer's monopoly rents will tend to be dissipated by costly competition over which producer gets those rents unless that competition has socially valuable byproducts).

¹⁸⁵ See *infra* IV.A-B.

¹⁸⁶ See *infra* IV.B.

a related market might enter the incumbent's market to freeze innovation that might pose a competitive threat in that related market.

2. *Ex Ante Effects on Entry by Firms That Will Become More Efficient With Time.* Other entrants are initially less efficient, but during the period of restriction will with time become as or more efficient than the incumbent. We can divide these entrants into two sorts.

First, for some of these entrants, overcoming their initial efficiency disadvantage necessitated some deterioration in incumbent efficiency.¹⁸⁷ These entrants in the end are less efficient than the incumbent was before entry. Such entry will indeed be encouraged by the restriction, for without the restriction the entrants never would have been able to compete effectively with the incumbents. The incumbent would just have lowered its post-entry price to an above-cost level that enabled it to maintain output and fend off any efficiency degradation, while still undercutting the entrant and driving it out of the market.

But encouraging such entry is undesirable. It changes an efficient monopoly market into an inefficient market with one or more firms. For reasons noted above, this is generally likely to be undesirable, so encouraging the sort of entry that (coupled with the efficiency-reducing effects of the restriction) creates this result is likely to be affirmatively harmful.¹⁸⁸ Under the Edlin proposal, entry that freezes the ability of the incumbent to improve its product could be regarded as a special case of entry that reduces the efficiency of the incumbent.¹⁸⁹

Second, for other entrants, their own post-entry increase in efficiency sufficed to overcome their initial efficiency disadvantage.¹⁹⁰ After such firms enter the market, the post-entry effects of the restriction are likely to be undesirable: raising prices throughout the period of restriction, probably reducing incumbent efficiency, and shifting production to less efficient firms during the period before the firm becomes more efficient.¹⁹¹ But one might well hope that the restrictions will encourage the entry of such firms. The short run effect of encouraging initially inefficient entry under a restriction would be mixed for reasons similar to those described above for entry by less efficient entrants. But it would have a long term positive effect since such firms would not be driven from the market after the restriction expires. Free competition between equally efficient firms would then replace the prior monopoly. Indeed, at

¹⁸⁷ See *supra* II.C.2.

¹⁸⁸ See *supra* II.A.4, II.C.2.

¹⁸⁹ See *infra* IV.B.

¹⁹⁰ See *supra* II.C.3.

¹⁹¹ See *id.*

times the proposed restrictions on reactive price cuts seem premised on the notion that these are the sort of entrants they had in mind. But although encouraging such entrants is desirable and far from futile, this premise is problematic in various respects.

To begin with, this analysis would suggest that any restriction on reactive above-cost price cuts should be limited to cases where the courts know the entrant will enjoy a sufficient increase in efficiency to overcome the incumbent's efficiency advantage. In fact, the proposals are not so limited, and thus would cover (and have adverse effects on the entry of) all the other sorts of entrants.

One could try to respond to this problem by modifying these proposals to apply only after entry by a firm that is likely to increase its efficiency enough to overcome the incumbent's initial advantage. But that modification would itself raise serious problems. It will not suffice to observe that the entrant's efficiency is likely to improve post-entry, for many entrants are likely to experience such improvements but be unable to overcome their initial efficiency disadvantage or be able to do so only if incumbent efficiency deteriorates. Instead, one must accurately gauge which entrants will experience an increase in efficiency that alone suffices to overcome the incumbent's initial efficiency advantage. Even the best market analyst may be uncertain about when this will be true, especially since the incumbent will not be standing still but will be trying to improve its own efficiencies. It is even less likely litigation will be very good at making this prediction. Because litigation will reach many erroneous conclusions, it is likely to mistakenly apply the restriction in many cases where its effects are clearly harmful. Indeed, since what matters is what firms predict the outcome of such litigation will be (which will surely be resolved long after any 12-18 month period is over), this harmful uncertainty effect will be multiplied.

More fundamentally, even if one *could* accurately predict which entrants will enjoy increasing efficiencies that allow them to overcome the incumbent's efficiency advantage, a restriction on reactive price cuts is unlikely to increase their ex ante incentive to enter in any significant or desirable way.

The main reason is that, if such accurate predictions are possible, such an entrant could (without the protection of any restriction) persuade capital markets to lend it enough money to get established. The initially less efficient entrant will suffer start-up losses, but those losses are like any capital cost of entry that must be considered. There is no reason to treat the necessary investment in human capital (to overcome inexperience) any different from investments in physical capital necessary for entry. Nor is this entry cost an artificial one since it reflects a real societal loss of efficiency from shifting production in initial stages to a less efficient firm. If the entrant cannot earn a sufficient return to cover this entry cost, there is no more reason to think its entry desirable than it would be for an entrant that cannot cover the capital cost of

building a plant. Thus, if entry by an initially less efficient firm is itself efficient and desirable, the capital markets should be willing to provide the necessary start-up capital.¹⁹² One might think they would not because the long term result will be competition between the equally efficient entrant and incumbent with both pricing at long run costs. But here cost has the economic definition that includes a normal rate of return on capital investment, and if entry is efficient, that normal rate of return should suffice to recoup this and other entry costs.

Another concern might be the general concern about *any* sunk entry cost – that the threat of the incumbent pricing at its variable costs will suffice to deter entry by an equally efficient entrant. But since this is a general problem with any sunk entry costs, there is no reason to adopt a special doctrine to deal with sunk entry costs that happen to take the form of initial inefficiency losses due to inexperience. Instead, a more general doctrine must be developed to deal with this issue. For reasons analyzed below, it turns out that an incumbent threat to price at whatever costs are variable to it during any pricing period will *not* suffice to deter an equally efficient entrant because once the entry occurs such pricing cannot drive out the entrant and would thus be utterly irrational.¹⁹³

Furthermore, in fact the addition of the entrant will convert a monopoly to a duopoly, which (once it is clear the incumbent cannot drive out the entrant) is likely to evidence at least some degree of long-term oligopolistic coordination and supracompetitive pricing that will suffice to cover the capital investment of bearing the initial inefficiency loss. Because that will be the long term result, it would be even more irrational for the incumbent monopolist not to accommodate entry by pricing at oligopoly levels immediately rather than dropping prices to less profitable levels in a fruitless attempt to drive out entry. In this respect, incumbents themselves have incentives to sort out the efficient entrants from the inefficient ones, and only attempt to drive out the latter with price cuts. Thus, once the initially less efficient entrant raises the initial capital to cover initial inefficiency losses, that itself should assure the incumbent's initial reactive pricing will be high enough that those initial losses will never actually be incurred.¹⁹⁴

¹⁹² Below-cost incumbent pricing is a different story because it might mislead prospective entrants or capital markets into thinking incumbent efficiencies are greater (or market conditions are worse) than they actually are. *See* Brodley, Bolton & Riordan, *supra* note , at 2247-49, 2285-2330 (synthesizing recent literature).

¹⁹³ *See infra* Part V.

¹⁹⁴ The claim that oligopoly pricing will result immediately assumes the incumbent shares the belief of the capital markets that the entrant will eventually be as efficient. But even if only the capital markets have this belief, the other point holds that the long run result will be oligopoly pricing that should suffice to induce capital funding to cover the initial inefficiency loss. The points in text hold when the incumbent is a monopolist in only one market. If the incumbent

Even if one did not accept the last two points for any reason, the solution would be to simply define one's cost measure to include the amortized cost of the sorts of sunk entry costs that are variable to the entrant when it decides whether to enter.¹⁹⁵ That measure would then include any start up sunk costs in human or physical capital necessary to achieve equal efficiency with the incumbent.

Thus, while entrants who in the long run will be just as efficient as the incumbent can be sustained under a rule that restricts reactive above-cost price cuts, the problem is that such entrants would also enter and stay on the market without any such restriction. The only reason to expect any difference would be if courts are somehow *better* than firms and capital markets at identifying entrants who have this characteristic, which is surely implausible. Not only do capital markets have far more expertise on this matter, they have a lot more incentive to make correct decisions. Indeed, whether or not they on average are better at identifying good entrants, the market will drive firms who prove to be bad at making this identification out of the market, leaving only the firms who do better.

Williamson is apparently of the view that the capital markets might wrongly fail to provide funds because it is too costly for entrants to disclose their actual state of competitiveness persuasively to potential investors.¹⁹⁶ But that information cost is a real societal cost of entry, and absent more precise information the capital markets should rely on the average competitiveness of such an entrant, which there is no reason to think they cannot gauge as accurately as the courts. His rule (and the other restrictions) would effectively protect *all* entrants without incurring the cost of becoming any more informed. This will induce the entry of some firms that prove to be competitive, but will also induce the entry of many firms that are not, and on average will induce more of the latter entry than the former in any case where capital markets were not willing to make the investment given the average competitiveness of the class of entrants.

is a monopolist in multiple markets, it could conceivably be rational for it to respond to entry in the first market by permanently offering a price that does not allow the entrant to cover the entry costs of initial inefficiency losses, in order to deter future entry in the other markets. But this raises a disputed issue about whether cost measures should cover entry costs to prevent the deterrence of equally efficient entrants in such multi-market situations, a general issue applicable to all entry costs and not limited to entry costs that take the form of these initial inefficiency losses. *See infra* Part V (analyzing the issue). If this issue were resolved in favor of fears of deterrence, one could use a measure of long run incremental costs that included (as one of the recoupable entry costs) the startup losses from initial inefficiencies that are equally applicable to all firms (including the incumbent). Condemning as predatory only prices below such costs would prevent deterrence of these initially inefficient entrants without imposing a price umbrella that has all the other ill-effects for these and other entrants.

¹⁹⁵ *See infra* Part V.

¹⁹⁶ Williamson, *Predatory Pricing*, *supra* note , at 304 n.58.

To put it another way, one could accurately characterize the various restrictions on reactive above-cost price cuts as mandatory consumer financing of the new entrant. Instead of having the financing provided by capital markets, the financing is provided by consumers in the form of higher post-entry prices. And instead of having the financing decision made voluntarily by experts on capital markets, it would be made involuntarily based on a regulatory or litigation assessment of the particular entrant, or a mistaken blanket rule that includes all entrants. Indeed, the Edlin and Williamson proposals include a 12-18 month limit only as a rule specification of the more general standard that the period of price restriction should last long enough to allow the entrant enough “sufficient time to recover its entry costs and become viable.”¹⁹⁷ But the persons from whom the entrant is “recovering” its entry costs will be the consumers who are paying higher post-entry prices than they otherwise would have. And unless there is a (mistaken) global judgment that all entrants can do so, the person making the judgment whether the entrant will become viable (i.e., efficient in the long run) will be the regulator or antitrust judge or jury. There is no reason to think it desirable to have such government-ordered consumer financing of entrants that cannot get financing on capital markets.

And if there were good reasons to think capital markets were so imperfect that mandatory consumer financing were desirable, there would be no reason to limit that proposition to the particular set of cases where entrants face incumbents with market power who are likely to drive them out with reactive above-cost price cuts. The proposition would justify protecting all entrants with government subsidization, tariffs, or post-entry price floors and output ceilings. If such infant industry arguments are not persuasive generally, there is no greater reason to find them persuasive here.

In short, any entrant who is likely to experience a sufficient efficiency improvement to overcome an initial efficiency disadvantage will likely get the financing to enter without any restriction and thus cannot have its entry encouraged by the restriction. The restriction is likely to encourage entry only in cases where the government and capital markets diverge in their prediction of whether a entrant’s efficiency will rise enough to overcome its initial inefficiency. And the most likely reason for such divergence is that the government has erroneously overestimated the ability of the particular entrant’s efficiency to rise or erroneously overincluded all entrants. Thus the restriction is more likely to encourage entry by firms that in fact will never overcome the efficiency disadvantage (which is undesirable) than to encourage entry by firms who will.

The restrictions are likely to be particularly ineffective at encouraging such entry

¹⁹⁷ Edlin, *supra* note , at 969; Williamson, *Predatory Pricing*, *supra* note , at 296.

if they fail to regulate non-price competition, or define a period of price restriction that is too short or starts too late, so that the incumbent can cut prices before or after the period begins.¹⁹⁸ And, as we'll see below, any restriction on post-entry prices or output that does not create those problems will create even worse ones.¹⁹⁹ Further, for any such firms who would enter with or without the restriction (the bulk of firms if capital markets are reasonably efficient), the post-entry effects will be worse with the restriction than without it. And those post-entry effects are even worse if incumbency efficiency is lowered, or if (to try to remedy the above problems) innovation is frozen to stop non-price competition, or a longer period of restriction is defined to stop reactive above-cost price cuts before or after that period.²⁰⁰

3. *Ex Ante Effects on Entry by Firms That Are Not Less Efficient.* It is an interesting characteristic of the above-cost predatory pricing models that none of them considers the case of the more efficient entrant. They tend to instead assume entrants either have an inherent inefficiency disadvantage, or one that just depends on where their output is located on a cost curve equally available to entrant and incumbent. The effect of this is to assume away competition in making the sorts of innovations and investments that can lower cost curves and raise demand curves. Thus, though these models pride themselves on taking dynamic account of strategic intertemporal considerations,²⁰¹ and do improve on prior static models in that regard, they end up being very static in their assumptions about where the cost and demand curves lie, and to ignore the dynamic possibility those curves might be changed by innovation or investment.

Firms that are more efficient than the incumbent cannot have their entry encouraged by a restriction on reactive above-cost price cuts. With or without such a restriction, such firms would enter the market. That alone is important because, to the extent these restrictions cover such entrants, they will result in harmful post-entry effects that are not at all compensated by any positive ex ante effects on the likelihood of entry. Thus any application of the restrictions to entry by more efficient firms is unambiguously negative.²⁰² The same goes for entrants that are equally efficient as the incumbent, a case that we saw above includes entrants that share immediate access to the same long run cost curve as the incumbent.²⁰³

But that does not end the ex ante analysis. Rather, we need to take it one further

¹⁹⁸ See *infra* IV.B-C (describing the unavoidable problems those issues raise).

¹⁹⁹ *Id.*

²⁰⁰ *Id.*

²⁰¹ See, e.g., Williamson, *Predatory Pricing*, *supra* note , at 284.

²⁰² See *supra* Section II.B.1.

²⁰³ See *supra* Section II.B.2.

step ex ante, to consider what effects such restrictions have on ex ante incentives to create a more efficient entrant. Entrants who are more efficient than incumbents are not magically generated. They require creative effort and capital investments. Both are scarce. We thus need to inquire into the likely effect the proposed restrictions would have on whether this scarce effort and capital will be allocated to these or other forms of entrants.

The analysis above suggests that the restrictions are not likely to encourage much entry at all. But to the extent they do encourage entry, it is entry by firms that are and will remain less efficient, or whose ability to overcome their initial efficiency disadvantage is (probably mistakenly) judged more favorably by courts than by capital markets. Since effort and capital is scarce, this suggests that to the extent these restrictions encourage entry by these less efficient entrants, they must divert effort or capital that otherwise would have otherwise gone to the more efficient entrant. Of course if one knew one entrant was less efficient and the other was more efficient, investors would all choose the latter. But in fact there will often be a probabilistic judgment, where a new firm has, say, 50% odds of being more efficient and 50% odds of not being more efficient. The proposed restrictions effectively reduce the difference in returns between less efficient and more efficient entrants, and thus at the margins induce more investment in less efficient entrants as compared to others that might be more efficient. The effect will be to decrease the creation of more efficient entrants.

Note that this effect is not produced from the (possibly mistaken) application of the restrictions to more efficient entrants. It is instead produced by the application of the restrictions to the less efficient entrants, which at the margin causes some substitution effect. Indeed, any modification to limit the restrictions to cases involving less efficient entrants exacerbates the problems because it would mean that less efficient entrants enjoy an extra return from a short term price umbrella that is unavailable to more efficient entrants.

In short, there are two possibilities. One is that the restrictions on reactive above-cost price cuts have no meaningful ex ante effect on entry, in which case they cannot be desirable since they have plainly adverse post-entry effects. The other is that the restrictions do encourage entry by less efficient firms, in which case they have a corresponding negative effect on entry by more efficient firms. Any decline in entry by more efficient firms will probably not be as large since, if the returns to entry are increased, increased effort and capital should flow to entrants from other areas of the economy. But whatever negative effects the restrictions do have on entry by more efficient entrants are likely to be far more important than any positive effects on entry by less efficient entrants. This is because more efficient entrants have prospects of

long term profitability that makes them more likely to enter and have permanent desirable market effects, compared to less efficient entrants that cannot be protected in the long run by a restriction on reactive price cuts. Further, more efficient entrants can actually lower costs or improve product quality, either of which is ultimately far more socially important. The adverse effect on the behavior of more efficient entrants is thus likely to be more important to market efficiency.

Ex ante incentives for more efficient entry will be diminished even more strongly if, as proponents argue, their restrictions will lead to limit pricing, for such limit pricing reduces the rewards from improving market efficiency. But before addressing that issue, we first need to address the general issue about link between the proposed restrictions and a regime of enforced limit pricing.

B. Ex Ante Effects on Incumbent Incentives

Proponents of restrictions on reactive price-cuts also argue that they are desirable because their protection of entry by less efficient firms will force incumbent monopolists to lower everyday prices from a monopoly price to a limit price that is just low enough to keep out less efficient entrants.²⁰⁴ But it is doubtful that: (1) this supposed ex ante effect on incumbent pricing will occur, (2) such a regime of enforced limit pricing is legally consistent with the argument for banning reactive above-cost price cuts, and (3) such enforced limit pricing would be desirable, especially when one considers the ex ante effects on the incentives of firms to create products that are so socially valuable that they earn monopoly power.

1. Will Limit Pricing Result? The conclusion that a restriction on reactive price cuts will lead to limit pricing (or a parallel increase in pre-entry output) depends on the premise that incumbents will want to limit price in order to bar entry by less efficient firms. But in fact, the restrictions are unlikely to induce much limit pricing for several reasons.

First, not all prospective entrants will be less efficient. To the extent incumbents anticipate that some new entrants will be *as* efficient as the incumbent (or more), those entrants are likely to enter no matter what price or output the incumbent sets. To try to set a limit price or output for them would effectively mean pricing down to costs (or below). It would make no sense to sacrifice *all* current monopoly profits to reduce the risk that such entrants *might* deprive them of monopoly profits in the future.

Second, even if we restrict our attention to less efficient entrants, the restrictions are unlikely to increase the likelihood that incumbents would adopt limit pricing.

²⁰⁴ Edlin, *supra* note , at 946-47, 973-78; Williamson, *Predatory Pricing*, *supra* note , at 308.

Incumbents contemplating limit pricing must calculate a tradeoff between lowering their pre-entry profits and decreasing the risk that entry will lower their post-entry profits. Williamson assumed the latter would always govern but admitted that was based on an “arbitrary assumption” that incumbents strictly prefer avoiding post-entry hazards to earning pre-entry profits.²⁰⁵ In fact, the preference is likely to run strongly in the other direction.

In part this is because the pre-entry profits are earned in the present with certainty, and thus should not have the time and uncertainty discounts a firm would rationally apply to any risk of a decline in post-entry profits.²⁰⁶ Present value calculations can make the discounted value of any future loss of income from entry relatively small. Further, in a dynamic model incumbents would not assume that today’s cost and demand curves and entrant characteristics will prevail tomorrow. The market may be entirely changed by Schumpeterian competition, increases in entrant efficiency, decreases in barriers to entry, changes in consumer preferences, or sudden cost shifts. This uncertainty makes it rational to further discount any future profits that might be gained by deterring entry.

More important, though, is the low degree and magnitude of the *additional* risk of entry created by the restrictions on above-cost price cuts.²⁰⁷ Incumbents will come to realize that less efficient entrants will be rare because their entry is futile in the long run. Further, incumbents will realize that if less efficient firms do enter, the incumbent can (even with the restriction) drive them out with some relatively minor time delay. It is highly unlikely it would be rational for the incumbent to sacrifice everyday high pre-entry profits to avoid this low additional risk of a brief interruption in those profits. That would require the incumbent to permanently forego present certain monopoly profits on all its sales in order to produce a small reduction in the uncertain risk that future entry will make the incumbent temporarily forego a fraction of its sales. It would almost surely be more rational for the incumbent to fatten up on pre-entry monopoly profits, which not only maximizes its expected wealth but also assures itself enough reserves to deal with the wasteful losses from mothballing capacity that will occur when less-efficient entry happens.

Pre-entry limit pricing would be even less attractive when the rational response to entry under a restriction will be not to try to compete with the less efficient entrant but rather to *raise* incumbent prices to hasten the time when prices can be reduced to

²⁰⁵ Williamson, *Predatory Pricing*, *supra* note , at 314.

²⁰⁶ See Areeda & Turner, *supra* note , 87 YALE L.J. at 1343-44.

²⁰⁷ To the extent firms would engage in limit pricing with or without such a restriction, their limiting pricing can hardly be claimed as a benefit of the restriction. It is only any *increased* likelihood of limiting pricing that matters.

drive out the entrant.²⁰⁸ In those cases, entry will not pose a risk of even temporary lowered prices, though it will pose a risk of a temporary output decrease.

2. Is Enforcing Limit Pricing Legally Consistent? There is a legal oddity of the Edlin and Department of Justice position. As noted above, they argue that reactive above-cost pricing is predatory because it fits the *Grinnell* test of being designed to exclude rivals and maintain monopoly power.²⁰⁹ But that characterization would be equally true of the limit pricing they seek to induce incumbents to make. Setting a limit price has precisely the same effect on entrants and purpose of maintaining monopoly power as a reactive price cut to the same price level.

Indeed, this led earlier courts who were attracted to the proposition that reactive above-cost price cuts could be predatory to the conclusion that limit pricing could also be predatory.²¹⁰ This conclusion is surely misguided. We do not want antitrust courts in the business of forcing monopolists to raise their prices. That would amount to a scheme of enforced monopoly pricing. But it does confirm that one cannot properly deduce whether pricing is predatory by simply determining whether it tends to keep rivals out of the market and maintain monopoly power.

The *Grinnell* test thus cannot itself support restricting reactive above-cost price cuts in order to enforce a regime of limit pricing. By the same token, the fact that current law permits limit pricing does not mean that limit pricing is affirmatively desirable or that we would want to force firms to adopt it. The lack of a legal ban merely means that trying to prohibit limit pricing would have undesirable consequences. As discussed next, trying to affirmatively require limit pricing would in fact likely be undesirable.

3. Is Enforced Limit Pricing Desirable? Suppose the proponents were correct that their restrictions on reactive above-cost price cuts would lead incumbents to adopt limit pricing. If firms were exclusively motivated to exclude less efficient entrants, the Edlin price maintenance rule would result in a lower pre-entry price (and higher pre-entry output) than the other rules, which set an effectively lower post-entry price floor and thus allow a greater cut from the pre-entry price.²¹¹ This would have the desirable effect of lowering everyday prices by incumbent monopolies, which increases consumer welfare and allocative efficiency. So far, so good. But that is not the only effect such limit pricing would have. It would also discourage entry and the investments necessary to create an incumbent monopoly.

²⁰⁸ See *supra* Part II.

²⁰⁹ See *supra* Section I.B..

²¹⁰ See, e.g., *Transamerica Computer v. IBM*, 698 F.2d 1377, 1387 (9th Cir. 1983).

²¹¹ *Accord Areeda & Turner*, *supra* note , 87 YALE L.J. at 1340-43.

Consider first the effect on entry. A limit price will discourage entry by firms that (permanently or temporarily) are less efficient than the incumbent. This effect will necessarily be small because few permanently less efficient firms would enter anyway, and most temporarily less efficient firms would enter regardless of the limit price. But it is noteworthy because deterring this entry eliminates the only claimed positive effect on entry of the restrictions. In particular, it would eliminate the hope that the restriction would convert monopolies to competitive markets by increasing entry by many firms that are less efficient in the short run but just as or more efficient in the long run.²¹² Instead, the claimed positive virtue would have to rest solely on the claim that limit pricing is itself on balance desirable. That claim is disputed below, but even if limit pricing were by itself desirable, the problem would remain that the restriction would purchase this benefit at the cost of harmful post-entry effects for every class of entrant, including entrants who are more efficient or who although initially less efficient were likely enough to become more efficient that they would get capital funding. The supposed desirability of limit pricing thus has to be large indeed to overcome these negative effects.

But the problem is deeper because, even if we exclude any effect on entry, a change from monopoly to limit pricing does not necessarily enhance consumer welfare and efficiency. To see why, we need to take one more *ex ante* step backward in time. We have to ask about the link between the price a monopolist can charge and the incentives that gives firms to invest or innovate to create something so valuable that it enjoys monopoly power.

We must remember that monopoly power is not itself undesirable. Market power simply means that the firm holding that power has a product so much more desirable or cheaper to provide than rival options, that those other options do not constrain the firm to price the product at cost.²¹³ And monopoly power just means a “substantial” or “significant” degree of market power,²¹⁴ which merely means the firm has a product that is substantially more desirable or cheaper to provide than rival options. Creating a product that is substantially better or cheaper than rival options is highly desirable since it leaves society far better off than it would have been had the

²¹² The limit pricing caused by a restriction might even *reduce* entry by firms that are initially but not ultimately less efficient. This is because it would eliminate their ability to profitably make sales in the interlude (without a price restriction) between entry and incumbent price reaction. But this negative effect is likely to be small since generally not much time is required for an incumbent price reaction.

²¹³ See AREEDA & KAPLOW, *ANTITRUST ANALYSIS* 556 (5th ed. 1997); 1992 Horizontal Merger Guidelines, 57 Fed. Reg. 41552, §§1.0-1.22.

²¹⁴ See AREEDA & KAPLOW, *supra* note , at 448; *Reazin v. Blue Cross & Blue Shield of Kansas*, 899 F.2d 951, 967 (10th Cir. 1990).

product not been created.

Such monopoly power does not arise out of thin air. Someone had to invest or innovate under conditions of uncertainty to create a substantially better or cheaper product. And their incentives to take risks, invest, and innovate will be greater the larger their profits when they are successful. The ordinary rewards for doing so are the prospect of monopoly profits. We thus must be careful not to act as if the purpose of antitrust laws was to eliminate monopoly profits themselves. Such profits are an extremely valuable inducement to the creation of better or cheaper products. If firms are instead restricted to lower limit prices, they will necessarily undertake less investment and innovation to try to become the next monopolist.

These problems are particularly acute in the high technology markets, where such investments and innovation have the promise of not only creating something so valuable that it confers market power over pre-existing rival options, but may even generate a new market by creating a product much more desirable than pre-existing market options. But the adverse effect on ex ante incentives is not limited to high technology markets. It also exists whenever a firm has to decide whether to make investments in some old technology that will create a new facility that consumers will consider irreplaceable because of standard stuff like transportation costs, or that will create market power because it satisfies a market niche that was previously unrecognized. Investments in changes in distributional methods or organizational form, personnel training, or the sheer creation of large scale production methods can also lower costs or improve product quality in ways otherwise unattainable.²¹⁵ In short, monopoly power can be desirably created in many low-tech and high-tech ways, and both of them will be discouraged if the ability to reap monopoly profits when successful is curtailed.²¹⁶ This is true whether the innovation is patented or not, for the various restrictions on reactive price cuts would reduce monopoly profits on innovations whether or not they are manifested in patents.

True, society would be even better off if it could have the more desirable or cheaper product and have it produced at cost. But that is a false choice. Unless given a high rate of return, firms will not invest to create the substantially more desirable or cheaper product. The monopoly power we are tempted to restrain will then never be created, but society will be worse off since it will be relegated to substantially worse or more costly market options.

²¹⁵ See *supra* at ___.

²¹⁶ Monopoly power can of course also be created in various anticompetitive ways, but if the antitrust laws are operating properly the incumbent monopolies should have achieved their monopolies through desirable means. And if they are not operating properly, then that is what needs to be fixed.

This problem with restrictions on reactive above-cost price cuts is really just a special case of the more general point that regulation (inside and outside antitrust) cannot just take into account the ex post effects that regulation has once a market and market power already exists. Regulation must also take into account any negative effect regulation has on ex ante incentives to invest and innovate to create something so valuable that it confers market power (over pre-existing rival options) and may even generate a new market (by creating a product much more desirable than pre-existing market options). Limit pricing might seem desirable in a static model that focuses only on allocative efficiency. But in a dynamic model, such limit pricing will reduce productive efficiency, innovation and investment, and Schumpeterian competition to acquire temporary monopolies and the associated monopoly profits.²¹⁷ Indeed, it has generally been shown that nations with better market performance generally compete by innovation and differentiation rather than by price and imitation.²¹⁸

To use the concrete illustration most important for predatory pricing purposes, consider the various market advantages that Edlin and the Departments describe incumbents as having in the airline industry: frequent daily flights, available connecting flights, economies of scale and scope, and brandname advantages.²¹⁹ These are certainly advantages, but it is not as if they are undesirable or unearned. They rather reflect the desirable consequence of the incumbent making the necessary investments to produce a more valuable (or cheaper) product than its rivals.²²⁰ This is clearly true of developing a big enough network of flights to offer frequent and connecting flights and take advantage of economies of scale and scope. It is even true for the market advantage that attends having a more recognizable brand name. Because this advantage does not necessarily have any concrete manifestation in product quality, it is sometimes dismissed as insubstantial. But if people are willing to pay more for certain brand names, that means they value the greater predictability and peace of mind

²¹⁷ See generally SCHUMPETER, *supra* note , at 84-92, 99-106.

²¹⁸ M.E. Porter, *The Current Competitiveness Index: Measuring the Microeconomic Foundations of Prosperity*, in THE GLOBAL COMPETITIVENESS REPORT 2000.

²¹⁹ See U.S. v. AMR, 140 F. Supp. 2d 1141, 1149 (D. Kansas 2001); Memorandum of the United States, U.S. v. AMR, No. 99-1180-JTM, *available at* <http://www.usdoj.gov/atr/cases/f4800/4859.htm> (May 4, 2000); Edlin, *supra* note , at 943 n.12, 959.

²²⁰ Other advantages are more suspect: frequent flier programs and overrides paid to travel agents. 140 F. Supp. 2d at 1149. Both of these can be characterized as kickbacks that take advantage of agency problems to induce passengers to take less efficient flights. The frequent flier programs arguably induce individuals to spend more on business travel (the cost of which is billed to someone else or is shared with the government through tax deductions) in return for free personal travel. The travel overrides arguably reward travel agents with larger commissions for advising their clients to take more costly flights. But if either of those characterizations is true, then the proper remedy is not to ban above-cost price cuts but to ban the frequent flier programs and travel agent overrides that put passengers on higher priced flights.

that comes with that choice. That's one reason they prefer to buy at McDonald's rather than the unknown hamburger joint. We have no warrant for second-guessing what consumers choose to value, and thus no more reason to question their preference for brand names than to question their preference for vanilla ice cream over pistachio. The revealed preferences of buyers shows that brand name goods are of higher quality in the only sense that is meaningful on a market: consumers are willing to pay more for it.

Finally, limit pricing would also have negative effects on ex ante incentives for more efficient entry. This is not because incumbent limit pricing can keep more efficient entrants out of the market. It is rather because without the restriction (and effectively required limit pricing) the more efficient entrant can hope not only to enter but to drive the incumbent out of the market, and then charge its own monopoly price. With the restriction, the successful more efficient entrant will be restricted to a limit price. True, this does not matter if the entrant *knows* it will be more efficient. It would either way make the necessary investment. But it will often be the case that at the time of investment there is considerable uncertainty whether the proposed new entrant will be more or less efficient. Consider the inventor who is deciding whether to devote her time to research that has a 50% chance of resulting in a more desirable or efficient product, and a 50% chance of coming up empty. Or consider the venture capitalist who is deciding whether to make an investment in a new technology that has a 50% chance of being preferred by consumers to the incumbent product, but a 50% chance of flopping. In either case, whether the inventor or venture capitalist makes the necessary investment of time and money will depend on how great the returns are if the product does turn out to be better or cheaper. If the returns of a successful product are higher, they are more likely to make investments that lead to more efficient entrants. If the returns are lower, they are less likely.

This above concerns have tended to be missed by those advocating bans on above-cost predatory pricing because they adopt static assumptions about demand and cost curves and often seem to implicitly assume the current incumbent is merely the undeserving beneficiary of those static market conditions. Indeed, as Baumol pointed out, limit pricing is generally only possible if an incumbent is a natural monopolist.²²¹ But if a firm is truly a natural monopoly, antitrust law has little to contribute because it is impossible to create competition in such a market. Antitrust law can generally only contribute by protecting or restoring competition in markets that can support multiple firms, or in keeping free the even more important competition to create new product advantages that confer temporary monopoly power. Natural

²²¹ Baumol, *Quasi-Permanence*, *supra* note , at 11.

monopolies are by definition more durable. For them, the only real role of antitrust is to protect competition to become the natural monopolist. Such competition provides a market test that the monopoly really is natural, and that it remains so since today's natural monopoly can become tomorrow's temporary one if technology, costs or demand change sufficiently. Such competition also assures that the most efficient firm becomes the monopolist. But the hypothesis in these proposals is that the incumbent is as or more efficient than the entrant (or else the entrant would hardly need protection), so such concerns are not at issue.

Instead, in natural monopolies inhabited by the most efficient firm, the grounds for regulating price are really no different than the traditional grounds for utility rate regulation. People who are otherwise attracted to such rate regulation might thus, where for whatever reason the government has failed to institute such rate regulation not surprisingly, favor employing predatory pricing theory to try to fill in gaps in natural monopoly markets. But the most likely reason that rate regulation does not exist for any particular is that the government was not persuaded by the arguments for it. And if one thought such natural monopoly rate regulation was warranted, there would be no reason to limit it to cases in that industry where some claim of reactive price cuts provides the pretext. Moreover, triggering price regulation for all reactive price cuts risks applying it in cases that do not truly involve natural monopolies. It also means conducting such regulation through adversarial litigation and antitrust tribunals that lack the ongoing involvement or expertise of utility regulators, or through other regulators who have not yet persuaded the legislature to give them the authority to engage in such general rate regulation.

C. Reconsidering Contestable Market Theory in the Airline Industry

The recent interest in restricting reactive above-cost price cuts, particularly in the airline industry, has not been driven by practical concerns alone. Rather, the source of the intuition that such restrictions would have desirable *ex ante* effects has in part been intellectual, having roots in frustrations about the failure to realize the predictions of contestable market theory in the airline industry. It will thus help to directly address that theory in order to put to rest theories about banning above-cost predatory pricing.

Contestable market theory held that in markets where entry was very easy, it would not matter whether an incumbent firm had 100% market share. The threat of entry would make the incumbent lower prices to competitive levels. Individual airline routes were considered the classic example of a contestable market because it was so easy to move or lease planes to enter a route if an incumbent monopolist charged prices that were too high. Thus, the expected result of airline deregulation was that

each route would be priced at competitive rates (no higher than the cost of the most efficient potential entrant) no matter how much any individual carrier dominated sales on that route.²²²

Alas, the predictions of contestable market theory never came true for airlines. Airline deregulation was generally a success. But after deregulation, prices turned out to be significantly higher on routes that connect spokes to concentrated hubs than they are on other similar routes.²²³ This led many to the conclusion that if contestable market theory was not working, it must be because the airlines were engaged in some anticompetitive conduct to exclude entrants. Reactive price-cuts seemed one promising target. Restricting them, and encouraging inefficient entry, had the hope of forcing airlines to at least engage in a type of limit pricing that amounted to restoring the market to a contestable state. Edlin's piece is clearly in this spirit.²²⁴

However, the more likely reason contestable market theory failed was that its application to individual airline routes was always misguided. The premise that airline markets were properly defined by a route between City A and City B failed to recognize that the advent of hub and spoke systems of airline travel meant that routes could no longer be separated from a general network of airline routes. With a hub-and-spoke system, airlines can satisfy customers who desire travel between a multitude of city-pairs with dramatically fewer flights and less cost by having one "hub" city with flights to each of the other "spoke" cities.²²⁵ Moreover, the flights will be fuller (and thus cheaper per passenger) in the hub and spoke system, and more likely to sustain a reasonable schedule of travel on the larger jet planes that passengers prefer because of their more comfortable ride.²²⁶ Indeed, it is clear that without hub-and-spoke systems it would not be possible to sustain a reasonable schedule of air travel to small cities that may have hundreds of people traveling *somewhere* each day (who could thus fill a flight to a hub) but only a handful of people traveling to any single city (who could thus not cover the cost of a schedule of nonstop flights from their small city to all their separate destinations).²²⁷

The efficiencies driving this hub-and-spoke system are thus overwhelming. But these efficiencies mean one cannot simply assume routes between different cities are separate markets. Passengers with different itineraries are being combined on the same

²²² See generally Levine, *Airline Competition in Deregulated Markets*, 4 YALE J. REG. 393, 395, 400-01, 403-05 (1987).

²²³ 63 Fed. Reg. at 17920; 140 F. Supp. at 1147, 1150.

²²⁴ See Eldin, *supra* note, at 990.

²²⁵ See Levine, *Airline Competition*, *supra* note, at 441-46.

²²⁶ *Id.* at 441-42.

²²⁷ *Id.* at 442-43.

flights. The market prices for seats on a flight from hub city A to spoke city B thus turn not just on the demand for travel between those cities, but also on the demand for travel between B and cities C-Z. And travel between city B and cities C-Z might be serviced by rivals not only through the same hub, but with nonstop flights or through other hub cities. Some passengers might be interested only in nonstop flights between a hub and spoke city, but in a sense they are side-beneficiaries of a system driven mainly by the need to provide hub-and-spoke coverage. Indeed, the hub-and-spoke system makes possible nonstop service between cities that otherwise would not be possible.²²⁸ With the routes intermingled in this way, it may thus make much more sense to think about the entire hub-and-spoke network as the relevant product an airline provides.²²⁹

If the hub-and-spoke network itself is the relevant product, then the relevant price and cost would clearly be those earned and expended across the hub-and-spoke network, not on individual routes. Indeed, even if individual routes are separate products for some purposes, their integration into a hub-and-spoke system requires incurring large common costs, whose allocation across the constituent routes is largely arbitrary.²³⁰ Developing such a hub and spoke system requires large investments. The airline cannot just have flights between the most attractive city-pairs to reap the advantages of hub and spoke travel but must rather have a full network of flights. It must have sufficient gate slots and ticketing offices, a fleet of planes and equivalent maintenance facilities, baggage transfer operations, a large team of trained personnel, and a complex system for marketing, planning, scheduling, reserving, dispatching, and pricing across the entire hub-and-spoke network. Perhaps more important, it must incur the costs of maintaining flights that impact revenue on connecting flights, and incurring increased ground time for planes in order to provide connections, which also

²²⁸ *Id.* at 443.

²²⁹ See generally 1992 Horizontal Merger Guidelines, 57 Fed. Reg. 41552, §§1.0-1.22 (examining buyer and supplier substitution to define antitrust markets).

²³⁰ See Baumol, *Predation*, *supra* note , at 59 (any allocation of common costs is arbitrary). Airlines sometimes allocate these common costs by simply dividing the total hub-and-spoke costs by number of flights or flight hours. 140 F. Supp. at 1175-77. But while this may make sense for accounting or business purposes, it is clear that as an economic matter any allocation of joint production costs is inherently arbitrary. For example, over 50% of passengers in major hubs are “connecting passengers” (they are flying through the hub between two spokes), see Edlin, *supra* note , at 944 n.12, which leaves something less than 50% as “hub passengers” (the hub is one-end point of their travel). Thus one could take the view that because the connecting passengers would support the relevant flight, the incremental cost of flying the hub passengers is extremely low. See *id.* Alternatively, one could take the view that because the hub passengers would support the flight, the incremental cost of flying the connecting passengers is extremely low. The problem is that could be true, making any allocation of joint costs to the individual flights arbitrary.

generally entails using more gates.²³¹ As Professor Levine put it, “for a network airline, the cost of providing each passenger with a trip is shared with passengers with different itineraries. Airline networks combine passengers originating at and/or destined for multiple cities on the same flight in order to share the indivisible burdens of providing desirably frequent service in markets which don’t attract enough passengers to support nonstop service at competitive costs.”²³² Moreover, in order to maintain the reliability of its hub-and-spoke system over time, the airline probably has to commit to covering certain routes even though they become unprofitable over the short run.

It turns out to be efficient to recoup the common costs of a hub-and-spoke system not with uniform prices, but with a complex regime of prices that vary sharply not just from route to route, but from customer to customer and day to day. Since passengers flying nonstop between a hub and spoke city get a more valuable slice of the hub-and-spoke system (quicker, more convenient travel), they are charged more per mile.²³³ The basic concept is not much different than the movie theater that (without any market power) covers the common costs of exhibiting movies by price discriminating between adults, seniors and children, or the slaughter house that (without any market power) covers the common costs of each cow by charging different per pound prices for different cuts of beef. Price discrimination among jointly produced products is thus common even on highly competitive markets.²³⁴

The prices for such jointly produced products may thus vary greatly, but in a competitive market the total price for the combination of products will equal their common costs. If rivals lower prices to the set of customers who were previously being charged higher prices for one of the joint products (adult moviegoers, filet mignon eaters, or hub customers), a firm will naturally respond by lowering its prices

²³¹ An airline that does not offer connecting flights like Southwest Airlines has very little turn around time because it just needs enough to unload one set of passengers and load the next. It need not keep the plane waiting for connecting customers. This shorter ground time also means it can run more flights per gate. This reduces the capital costs of planes and gates.

²³² See Levine, *Price Discrimination Without Market Power*, YALE JOURNAL ON REGULATION (forthcoming Winter 2002).

²³³ This is true even though the very feature that makes their air travel more valuable also might make it seem that their travel is less costly: they take a more efficient route, require fewer takeoffs and landings, need no arrangements to make sure connections are made, and do not require multiple sets of baggage handling. But which passengers enjoy these advantages of directness is itself a product of how the hub-and-spoke system is structured. Moreover, as noted above, the allocation of joint costs is inherently arbitrary.

²³⁴ See Levine, *Price Discrimination*, *supra* note ; see also Baumol, *Predation*, *supra* note , at 65-67 (pointing out that differential pricing will generally be desirable in markets where multiple firms are efficient but prices that equal the marginal costs of serving the marginal set of customers do not suffice to support the firm most efficient at serving those customers).

for that product, as long as the resulting price remains above its incremental cost of production, which is to say any cost of producing that product beyond the common costs incurred to produce both joint products. But because this lower price now covers a smaller share of the common costs, the firm will have to raise prices to customers of the other jointly produced product to continue to cover all common costs.²³⁵ In particular, the operator of a hub-and-spoke system has to combine the revenue produced by both hub and spoke passengers in order to cover the common costs of running a full system of frequent and connecting flights. The operator cannot afford to fly with half the passengers any more than the theater can afford to stop selling to adults or the slaughter house can afford to let certain cuts of meat rot. Nor can the operator ordinarily afford to drop flights between the hub and spoke A if the price on that route drops since that would eliminate not just transportation between those cities but also transportation between all the other spokes and spoke A. But the operator also cannot afford to exhibit movies, slaughter cows or maintain a hub-and-spoke system without covering the requisite common costs. So a price decline for one customer segment will result in a price increase to other customers. The effect will be a transfer payment between two sets of customers, with output changing to the extent the new schedule of price discrimination fails to maximize industry output of movie exhibitions, slaughtered cows, or hub-and-spoke systems. A complex equilibrium will result, as competing firms search for the schedule of price discrimination that, given differing demand for the joint products, best maximizes overall output.

Nonetheless, two features make operating hub-and-spoke flight systems different from, and more complex than, exhibiting movies or slaughtering cows. First, depending on the particular demand and supply conditions, it may often be the case that to maintain a hub-and-spoke system an airline will need a *disproportionate* share of the sales to hub customers because their system focuses around a particular hub that rivals do not share. In contrast, the theater or slaughter house need only maintain a proportionate share of sales to adults or of fine cuts of meat. Second, airline systems of price discrimination are vulnerable to being undercut by rivals who provide only the high value slice of the system, because an entrant can provide flights on a single route without incurring the cost of servicing the rest of the hub-and-spoke system. A theater or slaughterhouse does not face the same problem because any rival who charges less to adults or for filet mignon will still have to cover the common costs of exhibiting movies or slaughtering whole cows, and will thus have to raise prices to

²³⁵ If the rivals also serve the other market segment, they too will have to raise prices to it in order to cover costs unless the rivals are more efficient.

nonadults or for other cuts of meat. Rival competition among theaters or slaughterhouses may thus experiment with different price schedules, but can be expected to converge on the price schedule that maximizes overall output.

In contrast, in a competitive market for hub-and-spoke systems, each hub-and-spoke airline will offer the price discrimination schedule that maximizes the output of the entire hub-and-spoke system when they can, but will have to deviate from that schedule by sharply reducing prices on nonstop flights to or from their hubs when entrants try to take just that slice of the market.²³⁶ They will lower price to any level that still exceeds the incremental costs of those flights, but this price reduction means these nonstop flights will cover a smaller share of the common costs of the system. When that is the case, entry that reduces prices for nonstop flights may not be desirable because (1) the price reduction just results in a transfer payment from nonstop customers on that route to connecting customers and to nonstop customers on other routes who benefit from the flights partly supported by demand from those connecting customers, and (2) the deviation from the optimal price schedule lowers total flight output across the hub-and-spoke system. Firms in a fully competitive hub-and-spoke market would thus naturally respond to single route entrants by lowering prices to any level above that route's incremental costs (even though the new price covers a smaller share of common costs than before), which will then drive such entrants out and allow the firms to raise prices on that route back to the price that matches the output-maximizing price schedule for the hub-and-spoke system.

In short, the observed pattern of single route entry, reactive above-cost price cuts by hub incumbents, exit by the single route entrant, and restoration of higher prices thus can be explained by fully competitive behavior. One need not assume that the incumbent airline must have monopoly power that it is trying to protect it through strategic pricing. Indeed, the non-monopoly explanation is more consistent with the empirical evidence that the airline industry has not only failed to enjoy monopoly profits, but has been unable to sustain even a competitive rate of return for any five year period since deregulation.²³⁷

A concrete example might help. Suppose the cost of making either product A or B separately is \$60. The cost of making them jointly in a process that produces one of A for every one of B is \$100, which includes common costs of \$40 incremental

²³⁶ If an incumbent airline faces a more efficient entrant, it will not be able to lower prices enough to maintain a significant volume of hub passengers, and will thus have to rely mainly on connecting passengers. This is how American airlines dealt with the lower cost competition provided by Southwest Airlines. 140 F. Supp. at 1181-82. Such a great reliance on connecting passengers may well lower the efficiency of the hub-and-spoke system as a whole, but does shift hub passengers to a clearly more efficient provider.

²³⁷ See Dorman & Baumol, *On Cures That Bring Their Own Diseases*, draft available from author, at 4.

costs of \$30 for either one. The markets for A and B are competitive, and no producer has market power. It is cheaper to make A and B together than separately, so a separate producer cannot ultimately survive in the market. But suppose that (when no separate producers are present) competitive joint producers find that the price schedule that maximizes total output is to charge \$65 for A and \$35 for B. This might be the case if, given differing demand for A and B, this price schedule would produce an equal number of customers for A or B. A joint producing firm might be tempted to lower the A price below \$65 to sell more A, but to cover common costs it would then have to raise the price for B to over \$35. This would reduce B sales, and thus total market output would decline since A and B are produced in a one-to-one ratio. This would produce unmet demand for A at the lower price that some producer is likely to respond to by raising prices back to \$65 for A, and selling B and \$35 to B customers that were priced out of the market. In this way, competition would restore the output-maximizing price schedule that should reflect the competitive equilibrium among joint producers.

Now suppose a separate firm enters the market producing only A and charging \$60 for it. The competitive joint producers will then respond to this separate entry by lowering the price for A to \$59.99 to retain their sales. But they have to cover their common costs, and cannot charge less for A and B combined than \$100 since that is the cost of making them. So they will raise the price for B to \$40.01. This price increase will not be constrained by competition in B because separate provision of B costs \$60. But the joint producers also cannot charge more than \$100 for A and B combined because they are in a competitive market that will drive the combined price down to joint costs. While the separate entrant remains in the market, overall output will be reduced because, since 65-35 was the price ratio that maximized output, 60-40 must necessarily result in lower output. Thus, although the entry reduces the price for A, it basically just causes a transfer payment from A to B and decreases total output of A and B combined. Once the entrant is driven out of the market by the joint producers price reduction in A, they will raise prices for A again, thus restoring the output maximizing price schedule.

This analysis has several implications. To begin with, it undermines an important premise underlying the Departments' proposals to restrict above-cost reactive price cuts by airlines. That premise was that hub airlines must be exploiting market power if they charge higher prices in routes that connect spokes to concentrated hubs than they do on other routes with similar distance and destiny.²³⁸ Instead, it may not make sense to conclude an airline has market power unless it

²³⁸ 63 Fed. Reg. at 17920.

dominates (and earns monopoly profits on) the whole set of cities connected by a hub-and-spoke system. This analysis also undermines the intuition that something nefarious is going on when an incumbent airline lowers nonstop prices in response to single route entry, and then raises them again after entry. Both price changes can be explained by the simple reality that the fact of entry (at a particular price) has changed the market price on the nonstop route and thus requires a readjustment of the price discrimination schedule, and the fact of exit makes the old price discrimination schedule optimal again.²³⁹

Perhaps a more profound implication is that it means that – even if proponents were entirely correct about the predicted effects of a restriction on reactive price cuts on individual airline routes – those predicted effects would likely be undesirable. If proponents are correct, their restrictions will lead to lower everyday prices on nonstop flights from concentrated hubs. But obtaining these benefits means deviating from the price discrimination schedule that maximizes the overall output of the hub-and-spoke system. There is no particular reason to think that overall result would be desirable. It would be similar to legislating lower prices for adult movie tickets or filet mignon than the unregulated market would produce. Adult moviegoers and filet mignon eaters will be better off, but prices would have to rise for nonadults and eaters of less cuts of meat, and the overall output of movie exhibitions and meat would go down since the new price schedule would no longer be the one that optimizes output. Likewise, even if the restrictions lowered prices for nonstop hub flights, that would make nonstop fliers from hubs to spokes better off, but raise prices on the rest of the hub-and-spoke system. The overall output of flights between cities connected by hub-and-spoke systems would decline, which would likely lower total social efficiency and consumer welfare.

An analogy might be drawn to the price discrimination schedules that are used to recoup the joint costs of flying a plane. As everyone who travels knows, some seats are sold for much more than others on the same flight. This may sometimes mean that the price on the lowest discount seats is less than the average cost per seat. But given the dominance of joint costs, this should not make the price on those seats predatory. Instead, the incremental revenue for the flight must be compared to its incremental cost of making that flight.²⁴⁰ What hub-and-spoke analysis suggests is that

²³⁹ See Levine, *Price Discrimination*, *supra* note .

²⁴⁰ See *International Travel Arrangers v. Northwest Airlines*, 991 F.2d 1389, 1396 (9th Cir. 1993). Alternatively, one might reason that if one were really to consider pricing on a seat level, the proper cost to consider would be the incremental cost of serving the additional passenger. See AREEDA & HOVENKAMP, *supra* note , at 382. But that incremental cost is near zero since costs are almost the same whether the seat is empty or full, which makes the alternative practically meaningless. Thus, the dominance of common costs (which makes incremental costs practically

the common costs are actually so much broader, and the market definitions so intertwined, that the prices a hub-and-spoke airline charges should probably not be considered predatory unless the overall revenue on a hub-and-spoke system falls below the cost of providing the entire hub-and-spoke system.²⁴¹

Consideration of hub-and-spoke effects thus sharply undercuts the intuition that reactive above-cost price cuts that drive out entrants on particular airline routes should be deemed predatory. The routes may not represent separate markets and, even if they do, have many common costs in a hub-and-spoke system that makes separate price-cost comparisons meaningless. Nor can any hoped-for procompetitive effect from reducing prices on one route be disentangled from the anticompetitive effects that would create on other routes or the hub-and-spoke system as a whole.

IV. MORE PARTICULARIZED OBJECTIONS

Parts II and III detailed the fundamental problems posed by any restriction on reactive above-cost prices. In addition, there are a host of other objections whose precise nature varies with the specific restriction. But this is not because the restrictions are poorly formulated. It is because they make different choices about how to deal with specific problems that will bedevil any effort to regulate above-cost predatory pricing. No matter what system is adopted, it would have to somehow define a price floor (or output ceiling) in the face of changing market conditions, deal with quality changes designed to evade any price floor (or output ceiling), and ascertain the moment of entry that triggers the price floor (or output ceiling). In doing so, there are no perfect choices. Any choice will have some significant distorting

meaningless) drives one to compare the flight revenue to flight cost.

²⁴¹ Professor Baumol, for example, concludes products with common costs should be considered below-cost if the price for any one product is lower than its separate cost (which is unlikely since those costs should exclude common costs) *or* if the prices for the combination of products falls below their combined cost (which includes common costs). *See* Baumol, *Predation*, *supra* note , at 59-61. Likewise, if one product with common costs is sold at different prices to different sets of customers, the prices are predatory if the price to any one set of customers is below the separate cost of producing that quantity *or* if the prices recovered from the combination of customers is lower than the combined costs of producing the aggregate quantity. *Id.* at 63-65. *Cf.* AREEDA & HOVENKAMP, *supra* note , at 244, 414-15, 418-22 (reaching similar conclusions though sometimes for unclear reasons requiring proof of both rather than either). One additional argument for such a conclusion is that, if a multi-product firm cuts prices on one product (or to one set of customers), but its prices for the combination of products (or customers) still covers all costs (including common costs), the initial prices for the combination of products (or customers) must have exceeded their combined cost and been supracompetitive. Thus, the price cut on one product (or to one set of customers) amounts to a discount from oligopoly or monopoly prices. *Cf.* X AREEDA, ELHAUGE & HOVENKAMP, ANTITRUST LAW ¶1758f (1996) (establishing similar proposition for package discounts offered in tying cases).

effect on efficient pricing, innovation, and entry.

A. Difficulties in Defining the Incumbent Price Floor or Output Ceiling

The approaches that set the incumbent's post-entry price floor in relation to the price that would maximize short-term profits raise plain administrability problems. Determining what price maximizes profits is highly uncertain and variable over time. True, critics of cost-based test are correct that judging incremental costs is also administratively difficult. But determining the profit-maximizing price requires determining not just the costs that were incurred at the marginal output level, but the costs all along the supply curve at every possible output level. Thus such profit-maximizing price floors multiply all the complex problems about projecting costs, distinguishing between fixed and incremental costs, allocating common costs, and valuating capital costs and risk. Worse, determining the profit-maximizing price also requires ascertaining the incumbent's demand curve at each price and output point, as well as the extent of incumbent market power, to determine just what price equilibrates marginal revenue and cost. And determining the incumbent's demand curve necessitates knowledge not just of total buyer demand at each price (which will turn not only on their inherent preferences but willingness to switch to substitute products or markets) but what outputs and prices rivals would offer at each incumbent price. Further, each of those curves, and thus the profit-maximizing price, will change from day to day as market conditions or technologies change.

There is thus probably no practical way to determine any difference between an above-cost price and the short-term profit-maximizing price.²⁴² Firms have trouble enough in making such judgments, but are in the business of doing so and in the end are policed by markets which weed out the firms that tend to guess wrong. Regulators are not. Worse, if made an antitrust claim, the issue will be left to antitrust courts that will have even greater difficulty since they are not (like a regulator might be) a single entity with the expertise and power to continuously monitor and prospectively approve price levels. Instead, antitrust courts will in effect be regulating prices through the clumsy vehicle of adversarial lawsuits that involve varying judges and juries asked to retroactively assess claims that a particular set of prices was too low. Such a cumbersome litigation process would be highly burdensome on courts and impose direct costs that firms would pass on to customers. It would also cause uncertainty that, to avoid the risk of treble damages, will incline incumbents to charge higher prices

²⁴² See Joskow & Klevorick, *supra* note , at 255; Barry Wright Corp. v. ITT Grinnell Corp., 724 F.2d 227, 234-35 (1st Cir. 1984) (opinion of then-judge Breyer); AREEDA & HOVENKAMP, *supra* note , at 335-36.

than they otherwise would have, thus harming consumer welfare.²⁴³

The U.S. Departments tried to avoid these problems by banning price cuts only if they are “clearly or “substantially” lower than the short-term profit-maximizing price.²⁴⁴ This should make incumbents less risk averse about pricing down to their short-term profit-maximizing level. But around any price floor there will be an inevitable zone of uncertainty. And here the zone is great because it depends not only on just what adjudication might conclude about the short-term profit-maximizing level, but also on the vague terms “clearly” or “substantially,” which will likely mean something different to every adjudicator who applies it. This approach does not eliminate the ambiguity, it just moves the ambiguity to a different price point, and worsens the degree of ambiguity to boot.

The U.S. Department of Justice also emphasized that American Airlines was foregoing an option it had itself decided was more profitable in the short run.²⁴⁵ But to the extent the rule hinges on the availability of such internal documents, all it will do is drive profit calculations underground, thus leaving the rule ineffectual. If it does not hinge on the existence of internal documents, then the rule will remain inadministrable and uncertain, deterring incumbents from desirable price cuts. These effects will be particularly undesirable in the cases of entry that really matter for the long run: when the entrant is (or soon will be) just as efficient as the incumbent.

The European cases may likewise be trying to escape these problems with their emphasis on the selectivity of the price cuts.²⁴⁶ But the rationale for this possible limitation is unclear. If a selective price cut really does not alter prices elsewhere, it must be because the selected area is its own market. The price cut then is simply occurring in the market where entry occurred, which is not much of a limitation. Perhaps the European authorities have in mind that the selectivity of the price cut means that the uncut prices in other areas provide an objective benchmark as to what price level does maximize short run profits. But while this (as those authorities at points suggested) helps dismiss the possibility that the price cut was prompted by some cost reduction rather than by entry, the fact is that the short term profit-maximizing price in a market with an entrant will differ from that price in other areas where there is no competitor.²⁴⁷ So the selectivity of price cuts cannot avoid the

²⁴³ Antitrust courts have consistently rejected any legal theory that requires them to monitor the day-to-day reasonableness of prices under changing market conditions as inadministrable for courts, burdensome on litigation, and too uncertain for business planning. *See, e.g.,* *United States v. Trenton Potteries*, 273 U.S. 392, 397-98 (1927).

²⁴⁴ *See supra* I.B.

²⁴⁵ 140 F. Supp. 2d at 1152-53, 1155, 1181.

²⁴⁶ *See supra* I.A.

²⁴⁷ *See supra* II.

administrability problem of determining what the short term profit-maximizing level is. And it adds the inadministrability problem of determining just when pricing is sufficiently “selective” to invoke the rule.

Edlin tries to get around these well-known problems with a flat rule. The incumbent cannot charge any price lower than its pre-entry price if the entrant has offered a 20% discount. But this also has serious problems. Even if the nominal price is clear, the effective price will vary with differences in service, credit, or delivery associated with the product. There will also be ambiguities about the nominal price whenever the incumbent varies prices or sells a variegated product. For example, in the airline industry that provoked these proposals, a seat on a plane is sold at widely disparate rates depending on purchaser identity, advance purchase, Saturday stayovers, restrictions on changes, and the competing demand from customers in all the other cities that fly through that route. The last factor means the price for a seat from Hub City to Spoke City A turns not just on demand for travel between Hub and Spoke A, but also on demand for travel between Spoke Cities B-Z and Spoke City A.²⁴⁸ There is no one single price to pick. If courts tried to pick an average price, they raise prices for the whole array (roughly half) of customers who otherwise would have paid a lower price. Similar problems apply if the incumbent varied financing or credit terms for different buyers.

These problems are multiplied by the need to compare the pre-entry incumbent schedule of prices to entrant prices to determine whether the entrant prices are 20% lower. Indeed, the need for that comparison introduces a new problem: the entrant product might be of lower quality. Edlin recognizes that this will require a quality-adjustment to determine whether the entrant has offered a “20% quality-adjusted discount.”²⁴⁹ These quality-adjustments are significant enough that a 25-40% price difference only “probably” qualifies as a 20% discount.²⁵⁰ But once one introduces this vague assessment of quality-adjustments, any supposed administrative simplicity vanishes. The problem is even worse if one resorts to Edlin’s alternative standard that the entry has offered a “substantial” discount,²⁵¹ a vague placeholder whose definition can vary widely from tribunal to tribunal.

More important, to the extent the pre-entry price and 20% discount trigger can be established, setting a price floor for the incumbent (and price ceiling for the entrant) has obvious inefficiencies. Prices in all markets vary with rapidly changing costs,

²⁴⁸ See *supra* III.C.

²⁴⁹ See Edlin, *supra* note , at 982.

²⁵⁰ *Id.*

²⁵¹ *Id.* at 945, 967.

technologies, and demand. Requiring firms to stick to price floors and ceilings thus rapidly produces inefficiency. For example, if demand or costs go up sharply, it might be efficient for the entrant to raise its prices. But it may not do so because going above a price 20% below the pre-entry incumbent price will free the incumbent from its own price floor. The entrant will thus bear some inefficiency in its pricing to get the benefits of imposing an inefficient price on the incumbent. From the incumbent's perspective, the existence of the entrant is only one factor that might influence its pricing. To set a price floor at pre-entry levels ignores all the other reasons for lowering prices, like technological changes or drops in demand or costs. This will invariably produce inefficiency. One need only recall all the distortions under Nixon's wage and price controls, which caused inefficiencies that took the rest of the decade to sort out. Or consider specifically the airline industry that provoked these proposals. There costs routinely change sharply with shifts in fuel or labor costs, and demand not only varies with economic cycles but predictably varies seasonally. Sometimes the shifts are even sharper: imagine how disastrous it would have been to freeze airline prices at the level they were at right before the September 11, 2001 attack dramatically reduced demand for airline flights. Further, freezing into place inefficient prices on a route between Hub City and Spoke City A not only causes inefficiency in that market, but spreads inefficiency on all the connecting flights from Spokes B-Z to the Hub that in part transport customers who travel on to Spoke A.

Edlin attempts to address the problem of changing market conditions in two ways. First, he allows for an exception when after-entry costs fall "dramatically," which he defines as by at least 20%.²⁵² But this does not alter the inefficiency of the price floor for any cost reduction below 20%, nor the inefficiency of the effective price ceiling on the entrant if costs increase. Nor does it alter the inefficiency of the price floor (and ceiling) if there have been changes in demand rather than cost. And it renders the Edlin restriction ineffectual whenever costs do go down by 20% or more.

Second, Edlin sets a 12-18 month outside limit on his ban on reactive price cuts.²⁵³ But this does not eliminate the problem during that 12-18 month period. Any changes in market conditions that do occur will make the short term pricing freeze inefficient. Nixon's wage and price freeze, after all, only lasted three months.²⁵⁴ Moreover, setting the 12-18 month outside limit only reinforces the futility of the ban

²⁵² Edlin, *supra* note , at 969-970.

²⁵³ *Id.* at 945-46, 969..

²⁵⁴ See JACK. E. MEYER, WAGE-PRICE STANDARDS AND ECONOMIC POLICY 67 (1982). The additional problems created by the more flexible wage and price controls applied in the months after the freeze was lifted give testament to the difficulty of making price adjustments based on changing economic conditions. *Id.* at 67-69.

on reactive price cuts. It means that even if entrant expansion takes longer than that to erode the incumbent's monopoly power, the incumbent will (unless it has lost its efficiency advantage) be able to cut prices to a level that will drive the entrant out.

The Williamson rule might seem a flat rule like the Edlin rule, only substituting pre-entry output for pre-entry price. But, seeing one of the problems of changing market conditions, Williamson recognizes that such a flat rule would be a disaster if demand increased. So in the end, he proposes that the output ceiling be "demand adjusted."²⁵⁵ But this creates all sorts of new problems. Just how is one supposed to know how much of an adjustment in output to make when demand has increased? Williamson tries to get around this problem in various ways.²⁵⁶

First, Williamson suggests projecting future demand from past trends. But there is no reason to think this chartist approach works any better for projecting demand than for predicting future stock prices. Demand goes up and down depending on changes in consumer income, preferences, innovation, prices, and quality, as well the availability, price, and quality of substitutes. Courts cannot accurately project future demand from a past trend. Nor will that inquiry give an unambiguous answer since every trend will depend on the dates one picks and adjustments one makes. Williamson suggests relying on internal incumbent records. But since incumbents do not have a crystal ball either, they will often err in their projections. This is not so costly when firms can adjust to future realities, but if firms are bound by projections even when erroneous, the costs are much higher. It is not clear why we want to visit such high antitrust penalties on those projections that do not pan out. Further, any rule based on incumbent documents simply invites the strategic drafting of documents in response to the rule. Although Williamson assumes firms will set actual output and prices in response to legal rules, he is oddly dismissive of the notion they will take the less costly tack of changing the wording of their documents in response to legal rules.

Further, the extent to which increased demand will justify increased output depends on the intersection of that new demand with the incumbent's cost curve. Thus, adjusting for demand cannot avoid the problems of inquiry into costs, but multiplies them by requiring inquiry up and down the cost-output curve. Perhaps most worrisome, limiting future output based on past demand trends discourages incumbents from making investments in innovation and product improvements designed to accelerate any trend of increased demand.

Second, given inaccuracies in trend projection, Williamson changes his test to allow an output increase up to 10% above the projected demand. But this 10% buffer

²⁵⁵ See Williamson, *Predatory Pricing*, *supra* note , at 305-06, 333-34.

²⁵⁶ *Id.* at 305-06.

makes his restriction ineffective at protecting entrants (and thus unambiguously harmful²⁵⁷) when demand has not increased by that amount. Further, it has the same flaw as the U.S. Departments' approach: it does not eliminate the ambiguity, it just moves it to a new point. Now the ambiguity will be about whether or not the incumbent is at a point 10% above an ambiguous demand-adjusted output. These ambiguities are worsened if, as Williamson did in response to criticism, the percentage buffer is varied from case to case based on the estimated degree of projection error.²⁵⁸

Third, Williamson says that when predatory pricing is alleged in one of many multiple geographic markets, then a simple comparison will tell us whether output in one of those markets has increased "disproportionately." Obviously, that only applies when the incumbent is in multiple geographic markets and has monopoly power only in some. And even when it does apply, the ambiguities remain great. It will generally be unclear whether one can properly analogize between demand in different geographic markets. They have different consumers with different consumer preferences and income. Quality might differ. The markets might have different input costs, or different degrees of market power, both of which influence prices and thus affect realized demand for the good. Likewise substitutes might differ in price and quality, and often their availability will differ because some geographic markets are further from substitutes than others. There is thus no general reason to think demand will rise by the same amount in different geographic markets, or to think courts can accurately quantify the differences. And all these ambiguities are exacerbated if the court is asked whether the difference is "disproportionate," which will mean varying things to varying tribunals.

True, these problems are somewhat reduced because, like Edlin, Williamson sets a 12-18 month limit on his rule. But this does not eliminate the problem during that period and reinforces the long term futility of the restriction. Further there are other problems. Although Williamson adjusts for an increase in demand, he makes no adjustment for a decrease in costs, even though that too would indicate the efficiency of an expansion in output. Further, where a product is variegated or changing, it may be difficult to determine what even the baseline pre-entry "output" was. The Williamson rule raises particularly difficult problems when a firm responds to an output ceiling by introducing a "new" product that is similar to the old product but varies it somewhat.

Many of these administrative problems are well-known, and commonly cited as a reason to reject these proposals. But three general points about them are

²⁵⁷ See *supra* Section II.A.3.

²⁵⁸ Williamson, *Predatory Pricing II*, *supra* note , at 1192 n.40.

underappreciated and bear emphasis. First, it is not merely a matter of judgment whether the administrative problems with any flexible price floor outweigh the (considerable) administrative problems with a cost-based rule. Any flexible floor must take into account changing market conditions and consider price-output possibilities up and down the changing demand and cost curves. A cost-based rule need only compare, at one actual output point, the incumbent's price to its actual costs.

Second, these administrative problems cannot be avoided by tweaking the proposals. They are rather an inherent consequence of trying to regulate incumbent pricing or output. There are two basic methods of implementing such regulation.²⁵⁹ One can like Edlin use a bright-line rule that, as stated, is over- and underinclusive and thus sacrifices facial correlation to social desirability. Or one can like the European doctrine, the U.S. Departments and Williamson use a standard that correlates better to social desirability but cannot be applied as precisely, and thus will in actual application also be over- and underinclusive. Whichever method one chooses, the regulated price will often be incorrect and produce inefficiencies. Those inefficiencies are a large cost of the restrictions on above-cost predatory pricing that would offset any gains from such restrictions even if, contrary to the above analysis, such gains existed.

Third, the commonly discussed administrative problems with setting price floors and output ceilings only scratch the surface of the problems. Even bigger problems result from possible quality distortions and difficulties in defining the moment of entry, as the next sections discuss.

B. Post-Entry Quality Changes

Whenever prices are regulated, firms predictably shift to non-price competition. For example, back when airline prices were thoroughly regulated, airlines competed with fancy meals and more frequent, less crowded, flights. More generally, one can expect firms whose prices are regulated at above-cost levels to compete by improving the quality of their product. This complies with the restrictions on price cuts but effectively lowers the quality-adjusted price in a way that allows the incumbent to still drive out the less efficient entrant. But because the restriction prevents price cuts that otherwise would occur, it inevitably induces the creation of products that make a different quality-price tradeoff than buyers would prefer on a free market, and these quality improvements are thus inefficient.

The U.S. Departments' proposals were partially responsive to this problem, regulating not just prices but airline capacity. Airlines would thus not be able to

²⁵⁹ See generally Bundy & Elhauge, *Knowledge About Legal Sanctions*, 92 MICH. L. REV. 201, 267-79 (1993).

respond to an entrant by just adding planes to provide a more convenient schedule, which is one way of improving quality. But airlines could still have evaded this restriction by offering more frequent flights on smaller planes, which would be inefficient but still offer fliers more flexibility while complying with the capacity limit. Or airlines could inefficiently improve quality in other ways, with fancier meals or service. All these quality improvements would be inefficient because (to the extent the restriction on price cuts has bite) they would be replacing a price cut that consumers would prefer to the quality enhancement.

Thus, the U.S. Departments' approach has the problem that generally bedevils efforts to restrict non-price competition. Whenever one tries to clamp down on one form of non-price competition, the underlying incentives drive firms to whatever forms remain unregulated. For example, back airline regulators tried to make their price regulations meaningful by clamping down on nonprice discrimination, they specified that airlines could only offer "sandwiches" on international economy flights. Airlines responded by such tactics as putting duck a l'orange on one slice of bread for an open-faced "sandwich."

A firm might even have incentives to change its product so much that it can argue it has a new product that is not subject to the price restriction. This can create incentives to inefficiently improve or even worsen the product to make it sufficiently different that the price restriction can effectively be evaded.

The Williamson rule faces similar problems. Firms will have incentives to evade the output ceiling (and the effective price floor that implies) by increasing quality. Likewise, firms will have incentives to inefficiently improve or worsen its product because if the change renders the product sufficiently different, then it might not count as part of the same output. If courts respond by subjecting new products to the output ceilings imposed on old related ones, then the rule will deter genuine innovation.

Edlin once again takes a more absolutist approach to deal with the problem. He would ban incumbents not only from cutting prices but also from making any "significant product enhancements."²⁶⁰ Once again, this creates severe administrability problems. Just how is the antitrust court or jury supposed to decide which product enhancements are "significant," or more to the point, how is the incumbent supposed to be able to predict what a future unknown judge or jury will later decide was "significant"? Further, what is a court supposed to do if the incumbent says it is not enhancing the old product but introducing a new one?

Moreover, to the extent this restriction on product enhancements is administrable, it is undesirable. It achieves the aim of lessening non-price competition

²⁶⁰ Edlin, *supra* note , at ___.

that might undermine a price floor at the cost of lessening all product innovation. Even if the price floor did seem well designed to achieve allocative efficiency by restraining monopoly pricing, that rarely is as important as the efficiency benefits of product innovation.²⁶¹ But where as here the price floor's contribution to allocative efficiency is probably harmful (or at least questionable), there is no sensible reason to sacrifice the productivity gains of innovation in order to maintain the price floor.

Again, the problem is an unavoidable one. One can leave quality competition largely unconstrained, which makes the price or output regulation ineffective at achieving its goal of protecting entrants but harms customers by depriving them of the lower price-quality tradeoffs they prefer. Or one can really clamp down on quality competition, which makes the regulation effective but at the excessive cost of eliminating product innovation.

C. When Is the Moment of Entry?

Under all the approaches for restricting reactive above-cost price cuts (or output increases), the restrictions are triggered by entry. But the moment of entry is not so easy to define. Is it when the entrant first announces its entry? When it first applies for a permit or license? When it begins construction on a new plant? When it begins its marketing campaign? When it sells its first test product? Or when it first attempts a substantial quantity of sales? Edlin takes varying positions on this. In analyzing one case, he states that the attempt to enter did not qualify because the entrant never got to the point where it actually produced the product.²⁶² In another case, he concludes that beginning construction suffices to trigger the ban even though the entrant had never yet sold the product.²⁶³ But either position raises problems, which are only exacerbated by ad hoc shifts from one position to the other.

Suppose one picks one of the later moments as the true moment of entry. Then the problem is that at one of the earlier moments the incumbent will know entry is forthcoming and thus can lower prices (or expand output) in anticipation. The restriction on reactive price cuts will be toothless because the incumbent can react before the defined moment triggers the restriction. For example, if the entry is defined by actual production, then the incumbent can just wait until construction is almost completed and cut prices before the entrant ever sells anything. Here, Edlin effectively creates an ad hoc rule. In one case, cutting prices before the entrant makes any sales

²⁶¹ See *supra* at ____.

²⁶² Edlin, *supra* note , at 987-88.

²⁶³ *Id.* at 988.

is inappropriate because the entrant's construction plans made it "substantial."²⁶⁴ In another case, cutting prices before the entrant makes any sales is acceptable because one can infer the entrant was not "insubstantial" from the fact that a buyer with 50% market share accepted a 5-10% price cut from the incumbent.²⁶⁵ Edlin bases the latter conclusion on the assumption that such a big buyer's incentives are largely aligned with consumer welfare.²⁶⁶ But this inference of efficiency is probably untrue because powerful buyers often have incentives to cut deals that benefit themselves even though they create seller market power.²⁶⁷ In any event, this approach introduces additional sources of great uncertainty: just which buyers are large enough that their acceptance of a reactive price-cut justifies deeming entrants "insubstantial," and what are the other situations where an inference of efficiency will justify suspending the ban on reactive price cuts?

Suppose one instead picks one of the earlier moments of entry, such as announcing entry or applying for a permit or license. Then the problem is that the regulation lends itself to all sorts of strategic problems. By merely announcing entry or making an application, any firm can restrict the prices (and under the Edlin proposal freeze prices and quality) of another firm. If one tries to avoid this by restricting the moment of entry to credible announcements or committed applications, then one has the ambiguity of just which announcements or applications are credible or committed enough to trigger the restriction, and just how incumbent firms are supposed to predict what antitrust litigation will in the future conclude on that topic. Picking some middle moment like actual construction of a new facility might work for some markets, but even when it does, it lends itself to reactive price cuts after the announcement or application but right before construction begins. And just when construction begins might itself be ambiguous.

Moreover, even if the prospect of future entry has been made certain by the announcement or application, how can an incumbent know whether the coming entrant will actually offer the 20% discount necessary to trigger the Edlin rule? This seems especially uncertain since, under Edlin's own analysis, differences in quality might make a nominal 20% price difference insufficient.²⁶⁸ Even if the entrant says it will

²⁶⁴ *Id.*

²⁶⁵ *Id.* at 987-88.

²⁶⁶ *Id.* at 987-88.

²⁶⁷ See, e.g., Hovenkamp, *Mergers & Buyers*, 77 VA. L. REV. 1369 (1991); IV AREEDA, HOVENKAMP, & SOLOW, ANTITRUST LAW at 204-06 & n.4 (rev. ed. 1998). This is just an application of the Coase Theorem: a powerful buyer and seller will have incentives to make an agreement that preserves supracompetitive pricing and divides the profits among them.

²⁶⁸ See *supra* Part I.D.2.

offer a 20% price discount and the same quality, such announcements are unreliable, nonbinding and may be made purely strategically to freeze their rivals. Here Edlin creates another ad hoc exception. Although no 20% price discount has been offered, the “substantial” entry requirement should be deemed satisfied if the entrant has construction plans to serve most of the market, with the price freeze lifted if the entrant turns out not to actually sell at a 20% discount.²⁶⁹ This allows entrants to freeze rival prices by mere construction even though they have not undercut incumbent prices at all, and the creation of another ad hoc exception again undermines any certainty the rule might have had.

Even if announcements, applications, or construction were never strategic or ambiguous, a long delay between them and actual entry creates anomalies. For example, the Edlin ban on reactive price cuts only lasts for 12-18 months. But if the announcement, application, or construction occurs (as it often does) more than 18 months before the entrant actually seriously sells its product, then the incumbent will be free to lower prices and drive the entrant out when the actual sales start. The profit-maximizing price floors do not raise this problem since they set no expiration time. But they produce a different anomaly. The incumbents’ prices would have to be monitored for a long period of time before actual entrant sales commence to make sure the incumbent came sufficiently close to maximizing short-term profits. Such monitoring is costly. Moreover, since the entrant would not yet be making sales, the price that maximizes short-term profits would be the monopoly price. Thus, such a restriction would mean that for a substantial period the government would be mandating monopoly pricing. Even if we want to encourage entry, it is hard to believe we want to do so by giving potential entrants an entitlement to require incumbents to charge monopoly prices before the entrant makes any sales.

All these problems are multiplied if one not only triggers the restrictions in cases of actual entry, but as Williamson would, in cases where a “fringe firm” makes a “new investment” significant enough to be considered tantamount to entry.²⁷⁰ The impulse is understandable because the economic effects of such investments and entry may be the same. But it exacerbates uncertainty when incumbents cannot be sure which rival investments will be considered significant enough to trigger above-cost restrictions, and it widens opportunities for strategic gaming when announcing any new investment might freeze the output of a dominant firm.

Again, the problem is not an avoidable one. To make them plausible, all the proposals have to start with some moment of entry to trigger the restriction on reactive

²⁶⁹ Edlin, *supra* note , at 988.

²⁷⁰ Williamson, *Predatory Pricing*, *supra* note , at 292 n.26.

price cuts. Otherwise, they would amount to a general regulation of pricing that is entirely inconsistent with a market approach. But no matter which moment one picks, the restriction either becomes toothless or produces strategic behavior and anomalous results.

D. The Baumol Ban on Impermanent Reactive Price Cuts

Professor Baumol has offered an interesting variant on the above restrictions. He would allow an incumbent monopolist to make reactive price cuts, but forbid those reduced prices from being raised after the entrant leaves the market unless costs or demand have changed.²⁷¹ He would apply this price-ceiling for a quasi-permanent period, and suggests five years as a possible choice.²⁷² Since this would not make any reactive above-cost price cuts themselves illegal, the Baumol rule might seem somewhat outside the scope of the present inquiry. But his rule would mean that making a reactive above-cost price cut subjects incumbents to a regime of price regulation that itself imposes costs on them. In particular, it forces incumbents to keep in place a price that might become less profitable if antitrust courts do not correctly adjust for changes in market conditions. Baumol's rule thus amounts to a restriction on reactive above-cost price cuts with a unique penalty. The penalty would not be standard antitrust damages. The penalty is instead whatever costs are associated with triggering the equivalent of quasi-permanent monopoly rate regulation.

Edlin argues that the Baumol rule should be rejected because it does not fit the standard *Grinnell* definition of prohibiting conduct that tends to create or maintain monopoly power by excluding rivals.²⁷³ Instead, Edlin argues, the Baumol rule prohibits a price increase that would, if anything, encourage entry that might end the monopoly power. But the Baumol rule does not really prohibit price increases simpliciter. It prohibits impermanent reactive price cuts. Thus, if its effects were desirable, one could easily square the Baumol rule with the standard legal definition. One need only say that impermanent reactive price cuts are *not* deemed "competition on the merits," but rather are deemed strategic anticompetitive pricing to exclude rivals, whereas quasi-permanent reactive price cuts *are* deemed "competition on the merits" since they only drive out entrants through means that confer enduring benefits on consumers. As usual, whether or not we treat the conduct in question (an impermanent reactive above-cost price cut) as "competition on the merits" must turn not on conclusory legal labels but on a close analysis of whether banning that conduct

²⁷¹ Baumol, *Quasi-Permanence*, *supra* note , at 4-6.

²⁷² *Id.* at 8.

²⁷³ Edlin, *supra* note , at 978.

on balance has desirable consequences.²⁷⁴ Once that analysis is completed, the legal label should follow.

1. Post-Entry Effects. Post-entry, the Baumol rule will have some ill-effects. We can divide the cases into three possible scenarios. One possibility is that the costs of triggering quasi-permanent rate regulation will be so high that the monopolist will be deterred from making any price cut in response to entry at all. The monopolist will instead maintain pre-entry prices in order to maintain its price freedom. Worse, as noted above, it may even raise prices in order to speed the day when its market share erodes to the point that it can cut prices in an unrestricted way that allows it to drive out the entrant and re-establish monopoly prices.²⁷⁵ In this case, the post-entry effects of the Baumol rule will be the same as the Edlin rule. The short-term post-entry effect will be increased post-entry prices, lower consumer welfare, and increased productive inefficiency. But in the long run the rule will expire because the monopoly power has eroded or the period of quasi-permanence has passed. Thus, the rule cannot effectively protect less efficient entrants in the long run. Since it was also never necessary to protect more efficient entrants, it will be ineffectual in the long run.

A second possibility is that the incumbent will be willing to cut prices somewhat, but the fact that the resulting price must be maintained (and will form the baseline for future rate regulation) will deter them from cutting prices to a level low enough to drive out the entrant. In this case, the Baumol rule effectively sets an incumbent price floor, and thus its short-term post-entry effects will be similar in nature to that created by the different price floors set by the Williamson, the European doctrine, or the U.S. Departments' proposals. Higher post-entry prices, lower efficiency and consumer welfare, but in the end no ability to keep any less efficient entrant in the market.

The third possibility is that the cost of triggering rate regulation will not deter the monopolist from cutting prices to a level low enough drive out the entrant.²⁷⁶ In this case, the short-term post-entry effects will, if any, be adverse. Prices will go down, and the entrant will exit. But because any price-cut is quasi-permanent, the incumbent may be reluctant to cut prices quite as aggressively as it would have if prices were unrestricted. If so, prices will be higher and consumer welfare worse off in the short run. However, the long-term post-entry effects might be better in this third scenario

²⁷⁴ See *supra* I.B.

²⁷⁵ Like the other proposals, the Baumol rule only applies to firm that have market power. Baumol, *Quasi-Permanence*, *supra* note , at 5 n.15. See generally *supra* I.A.4 (explaining why this limitation is unavoidable). Thus once an incumbent loses that market power, it will be free to impose an impermanent price cut to drive out any less efficient entrant and raise prices after the entrant exits.

²⁷⁶ See Edlin, *supra* note , at 978-79.

because, after the entrant has exited, the monopolist will have to keep prices at that lower level for some quasi-permanent period. Thus one cannot say of the Baumol proposal, as one can of the others, that it is necessarily futile in the long run. This apparent advantage in the third case is, however, more than compensated by the fact that such a long-term price ceiling creates even worse administrative problems and incentive effects.

2. Administrative and Incentive Problems. To avoid problems in defining entrants, Baumol ultimately triggers his rule by exit rather than entry. His price ceiling applies “to any firm whose low prices are *suspected* of having driven its competitor from the field, whether or not that competitor was a recent entrant.”²⁷⁷ But this exit test raises many new problems. First, the fact of exit can be unclear or invite strategic manipulation. What happens if a price cut does not drive a rival out of the market but reduces it to a crippled fringe size? If that does not count as an exit because the firm is still “in the field,” then an incumbent will have incentives to inefficiently decline to service some set of customers in order to leave entrants in business.²⁷⁸ And if small entrants do not count, courts have to define just what the size threshold is.

Second, the cause of exit will often be unclear and so plausibly connected to rival price as to make the Baumol rule ubiquitous. Firms exit markets all the time. Their exits have multiple causes that are difficult to sort out, an uncertainty only worsened by a test based on whether a causal link to the price cut is “suspected.” Indeed, failed firms could always plausibly connect their exit to their rival’s prices. After all, presumably at some price they would have stayed in the market. Do we really want every firm exit to trigger rate regulation of any remaining firms in that market that have market power?²⁷⁹ That undermines normal market competition since in most cases firms have market power precisely because they are more efficient and thus able to charge lower prices than their rivals.

Third, even if we know we have a qualifying exit, we must define the precise moment of exit that determines when, and at what price, the cap is triggered. What happens if the incumbent increases prices just before the entrant exits? Baumol allows the incumbent to rescind a price cut if the entrant is still “alive and well” but that raises difficult questions about just how well the entrant has to be.²⁸⁰ In practice, there will be varying prices during any period of incumbent-entrant competition. It will be

²⁷⁷ Baumol, *Quasi-Permanence*, *supra* note , at 6 n.17 (emphasis added).

²⁷⁸ Or after exit it might do the same to induce a compliant new entrant that will stay small but can serve as an excuse for lifting the price ceiling.

²⁷⁹ Baumol does not limit his proposal to monopoly cases but includes any oligopoly market in which firms have market power. *Id.* at 5 n.15.

²⁸⁰ *Id.* at 4 n.12.

unclear what time to use as the baseline, and choosing any particular time invites strategic manipulation.

Even if exit issues are resolved, defining the price and product on the exit date can be hard when both are variegated, and when associated terms influence the effective price. The incumbent also has incentives to introduce a related “new” product to evade the ceiling,²⁸¹ requiring an unwelcome choice between allowing evasion and clamping down on new innovations. Further, after that date, demand shifts will require changing the price ceiling with all the problems described above for the Williamson approach. Likewise, cost shifts will require changes with all the problems of rate regulation noted for the profit-maximizing price floors.²⁸² But the problems are even worse. If the price ceiling is mistakenly set too low, it can make the incumbent lose money and even drive it out of business entirely. Further, if a mistakenly set price ceiling reduces incumbent output, there will by hypothesis be no entrant to take up the slack in output.

Finally, trying to maintain the price regulation for a quasi-permanent period of five years exacerbates the problems of changing market conditions raised by an 12-18 month period. True, one could try (and Baumol is open to) other specifications of the period of price restraint.²⁸³ Professors Joskow and Klevorck, for example, basically adopt the Baumol rule but change the period of quasi-permanence to two years.²⁸⁴ But the quicker the price ceiling expires, the more ineffectual the rule. Thus, the underlying problem remains that, no matter what specification one makes, one faces the problem of greater inefficiencies the longer the period is and greater ineffectualness the shorter the period is.

To try to get around these linedrawing problems, Baumol allows price increases as long as they are within “an order of magnitude” of the claimed increase in demand or costs.²⁸⁵ By now this gambit should be familiar, and it has the same problem as the efforts to avoid linedrawing by saying a price or output has to “clearly,” “substantially,” or “disproportionately” exceed some benchmark.²⁸⁶ All these rules move the ambiguity to a new point but cannot eliminate it. And they do so at the cost

²⁸¹ Baumol would prohibit withdrawal of the old product, *id.* at 9 n.24, but that raises difficult enforcement problems. How are courts to decide how many sales of the old product must be made, whether sales and advertising have become insufficiently enthusiastic, or whether service and deliver has become too surly?

²⁸² The Baumol rule does not set a ceiling at the profit-maximizing level but raises similar problems because it effectively sets a ceiling at whatever price level creates the same profitability as the reactive price cut.

²⁸³ Leaving the period defined as “quasi-permanent” would be utterly vague and worsens uncertainty problems.

²⁸⁴ Joskow & Klevorick, *supra* note , at 255 (applying it to reactive price cuts above average total cost).

²⁸⁵ Baumol, *Quasi-Permanence*, *supra* note , at 7.

²⁸⁶ *See supra* IV.A.

of making the posited rule ineffectual. Presumably Baumol does not mean the mathematical definition of an order of magnitude since that would allow any price increase as long as it was within a multiple of ten of the posited increase in demand or costs, and really make the rule ineffectual. But whatever meaning is given to the term, some tradeoff of harmful effects remains.

Where the Baumol price ceiling most worsens the types of concerns considered above is in its adverse effects on innovation. Like the price floors, a price ceiling will induce quality changes to evade the price restriction that are inefficient and would not otherwise have been tried. But now the incumbent can be expected to try to evade the price ceiling by making its product *worse* through cheaper production, so that it can still earn a monopoly profit, which not only creates an inefficient price-quality but degrades product quality. Even more problematic is the case where the price ceiling cannot effectively be evaded. Then, any investment in innovations to improve the product in a way to make it more valuable to consumers will be discouraged because the incumbent will not be able to raise prices to reflect that extra value and recoup the cost of that investment. Such a lowering of productive innovation is likely to be far more detrimental than any gain in allocative efficiency.²⁸⁷

3. *Ex Ante Effects.* The Baumol ban on impermanent reactive above-cost price cuts will, if anything, offer even less encouragement to entry than the various restrictions on reactive above-cost price cuts. If entrants foresee that the rule will not prevent incumbents from cutting prices to a level that will drive them out, the rule cannot encourage entry at all. If entrants instead foresee that the rule will effectively impose a price floor on the incumbent, then it will have the same effect of the Edlin, Williamson or Departments's proposals. The long term futility of protecting less efficient firms means that their entry will hardly be encouraged, and the rule provides no encouragement (and possibly some discouragement) to the more efficient firms that would otherwise enter.

The Baumol rule is even less likely to create incentives for *ex ante* limit pricing than the other rules because it offers less encouragement to entry. Indeed, since the incumbent retains the option of driving out the entrant with a reactive price cut that amounts to an *ex post* limit price, it is hard to see why the incumbent would ever adopt that limit price *ex ante*.²⁸⁸ They would be better off charging a monopoly price, and imposing a limit price only for a quasi-permanent period after entry, than charging a limit price every day. Not only would the reactive strategy mean that incumbents

²⁸⁷ See *supra* at ____.

²⁸⁸ Edlin reaches the same conclusion that the Baumol rule will never induce *ex ante* limit pricing, but does so based on different reasoning. Edlin, *supra* note , at 979.

would get to charge a monopoly price rather than a limit price on more days, it also means that incumbents are less likely to impose a limit price that is unnecessarily low because incumbents imagine entrants might be more efficient than they turn out to be. Instead incumbents can impose just the right post-entry limit price to drive out the entrant.

Finally, when entry occurs, and incumbents respond with price cuts that trigger a long-term price ceiling, the Baumol rule discourages innovation and investments by the incumbent in product improvement or, even worse, encourages product degradation. The problem is not just that this will occur post entry, but that the prospect of such an *ex post* restriction on incumbent prices will reduce each firm's *ex ante* incentives to make the investments of time and money that created something so valuable it enjoyed monopoly power.²⁸⁹

E. Conclusion on Particularized Objections

The fundamental problems posed by restrictions on above-cost pricing are exacerbated by other problems whose precise nature varies with the specific restriction but that cannot be avoided in one form or the other. The price floor will either be uncertain, driving prices up because of risk aversion, or fixed, freezing prices at levels that become inefficient as market conditions change. Quality changes will either be left unregulated, which makes the price restriction even more ineffectual and encourages inefficiently high levels of quality, or will also be restrained, which freezes desirable innovation. The moment of entry that begins the period of restriction will either be defined in a way that makes the price restriction ineffectual, or in a way that makes the period of price restriction long, exacerbating its tendency to distort pricing and innovation.

Although not technically a ban on any reactive above-cost price cuts, the Baumol rule requiring that any price cut be quasi-permanent has similarly adverse post-entry effects. The big difference is that its imposition of a price ceiling may sometimes buy increased long-term post-entry allocative efficiency. But it does so at a cost of greater administrative problems and a baleful effect on innovation that likely outweighs any benefit. Moreover, the Baumol rule is even less likely than the other proposals to have any beneficial *ex ante* effect on entry.

V. IMPLICATIONS FOR THE RIGHT COST MEASURE

²⁸⁹ See *supra* III.B.3.

The analysis of what predatory pricing is *not* has important implications for what the right measure of costs should be in a regime that condemns below-cost predatory pricing. In particular, it indicates pricing should be considered above-cost (and immune from any claim of predation) if it cannot deter or drive out equally efficient entrants. This helps to frame the question of what precise measure of costs should be used to determine when predatory pricing is below cost. It should be whatever measure of costs would prevent an incumbent pricing at cost from inflicting losses on an equally efficient entrant that might deter its entry or cause its exit.²⁹⁰ Judge Posner and Professor Baumol have previously proposed a similar benchmark, but did not justify it with a theory explaining why that benchmark would advance social welfare.²⁹¹ The analysis here provides that underlying theory. This is the correct benchmark because otherwise the social welfare grounds detailed above for rejecting restrictions on “above-cost” pricing would not apply.

Although this analysis thus provides a better justification for using the equally-efficient-entrant standard for judging cost measures, there remains an unresolved debate about just what cost measure satisfies that standard. Before venturing into that question, I emphasize that the conclusions of this paper hold regardless of what the correct cost measure turns out to be. Even if readers disagree with my analysis below about what measure of costs satisfies this standard, the analysis above still would support rejecting a restriction on any price that is not below whatever cost measure the reader believes does satisfy this standard. However, the literature on this issue has evidenced much confusion that it will be helpful to address, not only for its own sake, but because it addresses a mistaken premise in models used by Edlin, Williamson, and others: that any cost-based test would necessarily deter entry by barring an entrant from recovering sunken entry costs.²⁹²

Scholars have taken a variety of positions about the proper cost measure.

²⁹⁰ I use the word “might” in text because of the divided literature on whether the infliction of losses on an entrant will in fact deter or drive it out, or whether instead the entrant will conclude any predatory pricing strategy is too irrational to persist. See *supra* Introduction. But it is plain that any ban on *below*-cost pricing must proceed on the premise that inflicting losses on an entrant *can* deter or drive out entrants, otherwise the doctrine is not only unnecessary but harmful. It is further clear that – no matter what theory one holds – pricing that does *not* inflict losses on entrants cannot deter or drive them out of markets.

²⁹¹ Posner advocates such a benchmark, but does not justify it. See POSNER, *supra* note , at 188. Baumol analyzes a similar benchmark (although limited to pricing that might drive out rivals as opposed to deterring their entry) as a “legitimate borderline” but acknowledges his own work indicated such a benchmark might reduce social welfare by allowing firms to drive out marginally less efficient firms. See Baumol, *Predation*, *supra* note , at 50, 55-57 & n.12.

²⁹² See Edlin, *supra* note , at 955-60, 973-78; Williamson, *supra* note , at . Although Edlin does not extend this model to equally efficient entrants, others have done so with a similar assumption about entry costs, and thus concluded that (at least when the incumbent is a monopolist in multiple markets) pricing above variable costs can deter equally efficient entrants. See Easley, Masson & Reynolds, *Preying for Time*, 33 J. INDUS. ECON. 445, 447-54, 457 (1985).

Professors Areeda, Hovenkamp and Turner argue that short run marginal cost is the correct measure but recommend using average variable cost as an imperfect but more measurable surrogate.²⁹³ Both measures exclude fixed or sunk costs that do not vary with short run changes in predator output.²⁹⁴ But Areeda and Turner acknowledge their test might allow pricing below average total costs that destroys or deters an equally efficient entrant.²⁹⁵ Further, Areeda, Turner, and Hovenkamp would switch to average total costs if they are exceeded by the predator's marginal costs in part because prices above average total costs could not drive out equally efficient rivals.²⁹⁶ Professor Baumol has argued that the right measure of costs to prevent predation that could drive out an equally efficient rival must be whatever sorts of costs the rival could avoid by exiting the market.²⁹⁷ He calls these "average avoidable costs," and notes they exclude inescapable sunk costs but include any unincurred fixed costs that would have to be incurred to continue production.²⁹⁸ Other prominent scholars worry that

²⁹³ See AREEDA & HOVENKAMP, *supra* note , at 238-40; AREEDA, ANTITRUST ANALYSIS 194-95 (3rd ed. 1981); AREEDA & TURNER, *supra* note , at 153-54. They justify their marginal cost measure as what normal firms look at when pricing in the short run and what determines prices on perfectly competitive markets, so that a price cut that remains above marginal cost produces an efficient allocation of resources in the short run. See AREEDA & HOVENKAMP, *supra*, at 325-26, 367; AREEDA & TURNER, *supra*, at 156-57; AREEDA, *supra*, at 194-95. Thus, their implicit benchmark appears to define costs so that prices set at cost could not exclude equally efficient short run production of the marginal output. This might sometimes deviate from the question whether the pricing could exclude the entire output of an equally efficient entrant in the short or long run.

²⁹⁴ AREEDA & HOVENKAMP, *supra* note , at 320-321.

²⁹⁵ See Areeda & Turner, *supra* note , 88 HARV. L. REV. at 711-12; AREEDA & TURNER, *supra* note , at 164-68 & n.7. They justify this result on the grounds that the alternative is (1) protecting some less efficient entry and (2) incurring short run (and perhaps long run) market inefficiency since there must be excess capacity for marginal cost to be below average cost. Edlin and Williamson have properly criticized them for failing to connect the goals of short run efficiency and minimizing inefficient entry with any larger social welfare calculus, especially since Areeda and Turner concede alternative tests would have the long term effect of increasing pre-entry output. See Edlin, *supra* note , at ___; Williamson, *Predatory Pricing II*, at 1183, 1186-87; Areeda & Turner, *supra* note , 87 YALE L.J. at 1339, 1342. Further, the Areeda-Turner test, as stated, encourages the inefficient pre-entry creation of excess capacity that justifies the short run price below average cost. See *supra* at ___.

²⁹⁶ See AREEDA & HOVENKAMP, *supra* note , at 367, 373; AREEDA & TURNER, *supra* note , at 153, 160-61, 170. They also take the position that when marginal cost falls below average variable costs, one should go by average variable costs not just as a surrogate but on the merits because if prices are below average variable costs it would be more efficient for the firm to close operations. *Id.* at 175; AREEDA & HOVENKAMP, *supra*, at 381; AREEDA, *supra* note , at 195. Further, to deal with the problem that average variable cost can be below marginal cost, they would require a defendant to show that marginal costs were not "substantially" or "significantly" above average variable costs. *Id.*; AREEDA & TURNER, *supra*, at 176; AREEDA & HOVENKAMP, *supra*, at 386. Thus, in the end they really have a three-stage test: (1) when below the output that minimizes average variable costs, use those average variable costs; (2) when between the outputs that minimize average variable and total costs, use average variable costs unless marginal costs are significantly higher; and (3) when above the output that minimizes average total costs, use average total costs.

²⁹⁷ See Baumol, *Predation*, *supra* note , at 57-59.

²⁹⁸ *Id.* at 58-59. Baumol defines fixed costs differently than Areeda, Turner, and Hovenkamp. To Baumol, "fixed costs" are costs that must be incurred in a lump in order for any output at all to be provided," whereas a "sunk cost . . . is a cost that cannot be avoided for some limited period of time." *Id.* at 57 n.13. To Areeda, Turner, and Hovenkamp,

a predator's price could be above short run marginal, variable or avoidable costs, yet well below an equally efficient firm's long term cost of staying in business. They thus advocate use of a cost measure that includes fixed and sunk capital costs (called variously "long run marginal costs," "long run incremental costs," or "average total costs"), condemning prices below that cost measure presumptively or when coupled with an intent to exclude rivals.²⁹⁹ The cases have responded to this disagreement mainly by holding that prices between average variable and total costs might be illegal, but differ on whom to allocate the presumption against, and on the grounds for rebuttal.³⁰⁰ The result is that if you are a monopolist or victim and prices are in between these cost measures, you do not really know where you stand.

In short, the debate is something of a mess. But we can add some clarity. Much of the problem is there is little discussion about the actual source of disagreement. The current debate is framed as being about *which costs* to include, when in fact the real debate is about what *time period*, *output*, and *firm* to consider in deciding how to categorize a cost. All costs are variable or avoidable in the sufficiently long run.³⁰¹ The fixed costs (like overhead) necessary to make any output this year need not be incurred next year. Generally even sunk costs are inescapable only for a time: the big expensive plant will eventually wear out and thus require a decision about whether or not to incur the cost of its replacement.³⁰² Even land costs are not inescapable in the long run: although the land does not wear out, the plant on it does, so that continuing to use the land for present purposes incurs the opportunity

"fixed costs are costs that would continue even if the firm produced no output at all." AREEDA & TURNER, *supra* note , at 154; AREEDA & HOVENKAMP, *supra* note , at 320. Areeda and Turner's notion of "fixed costs" thus seems to correspond to Baumol's notion of "sunk costs." And Baumol's notion of fixed costs seems to correspond to what Areeda and Turner might call the marginal or variable cost of producing the first unit of output. I will adopt Baumol's terminology since it helpfully distinguished between two different sorts of lump sum costs: those that can be avoided by ceasing operations and those that cannot.

²⁹⁹ POSNER, *supra* note , at 189, 191-93 (price between short-run and long-run marginal cost predatory if coupled with intent to exclude rival); Posner, *The Chicago School of Antitrust Analysis*, 127 U. PA. L. REV. 925, 942-44 (1979). (same for price between average variable and total costs); Joskow & Klevorick, *A Framework for Analyzing Predatory Pricing Policy*, 89 YALE L.J. 213, 252-54 (1979) (price between average variable and total cost presumed predatory unless predator shows it maximizes short-run profits, which is likely only when industry has excess capacity); Brodley, Bolton & Riordan, *Predatory Pricing: Strategic Theory and Legal Policy*, 88 GEO. L.J. 2239, 2271-82 (2000) (price above average avoidable cost but below long run incremental cost gives the defendant a burden of production (but not persuasion) on whether the pricing maximized short-run profits or had market-expanding efficiencies).

³⁰⁰ See AREEDA & HOVENKAMP, *supra* note , at AREEDA & HOVENKAMP, *supra* note , at 229-230, 242-43, 349, 368, 375, 395 (collecting U.S. cases); AKZO Chemie v. Commission, [1991] European Court Reports I-3359, ¶70-73 (European law). Some state laws only use average total costs. See, e.g., *William Inglis & Sons Baking v. ITT Continental Baking*, 668 F.2d 1014, 1340 n.17 (9th Cir. 1982) (describing California law).

³⁰¹ See AREEDA & HOVENKAMP, *supra* note , at 321, 386-87; AREEDA & TURNER, *supra* note , at 155-56; AREEDA, *supra* note , at 199.

³⁰² See Baumol, *Predation*, *supra* note , at 57 n.13.

cost of not selling the land for its market value. There is thus no cost that is inherently variable, avoidable, fixed, or sunk. It all depends on which time period one uses, whether that period looks backwards or forwards, and whose output and ability to vary or avoid costs during that period matters. But there has not been much explicit debate about these points.

A. Look to Costs Variable During the Period of Predatory Pricing

Professors Areeda, Hovenkamp, and Baumol all state that the correct time period for judging whether costs are variable or avoidable is the time period of the alleged predatory pricing.³⁰³ But Areeda and Hovenkamp provide no justification for this standard, which they in fact abandon in favor of a blanket assumption of “middle-run” variability,³⁰⁴ and the choice requires much more justification and elaboration than Baumol gives. The basic logic is simple enough. Until the alleged predatory price lasts long enough to be exceeded by those costs that were variable or avoidable for that period, an equally efficient entrant cannot have suffered any loss it could have avoided by exit, and thus cannot have had any incentive to exit. Alleged predatory prices that only last one month cannot cause an equally efficient rival to lose any money by not exiting unless those prices are lower than the very short run costs the firms incurred by operating that month. In contrast, pricing that lasts for ten years will cause an equally efficient rival to lose money (relative to exit) if the price does not suffice to cover the fixed costs of producing anything next year (like overhead) or the future capital costs of rebuilding facilities that seemed like sunken costs in the short run but are variable over a time horizon of ten years. Thus, we need not pick one time period or cost measure in the abstract; the choice is dictated by the time period of the alleged predation.

What then is the concern of those who favor using long term costs even when the predatory pricing period is short? One theory is that predatory pricing at the “*rival’s variable costs*” can induce their exit because “[t]he rival, who also incurs

³⁰³ See Baumol, *Predation*, *supra* note , at 61-62; AREEDA, *supra* note , at 199-200; AREEDA & HOVENKAMP, *supra* note , at 387.

³⁰⁴ Although acknowledging the period of predation is the correct time period “theoretically,” Areeda and Hovenkamp recommend adopting a “relatively arbitrary definition of middle-run variability” based on administrative concerns and a crude overall judgment that it is “reasonable” to deem “most costs” variable. AREEDA & HOVENKAMP, *supra*, at 377, 387, 389; AREEDA & TURNER, *supra* note , at 173-74. But it is not clear why the administrative concerns should be so great given that the time period of alleged predatory prices is presumably known, nor why it should be reasonable to make an allocation that is clearly wrong for many time periods or firms. Further, any seeming administrative advantage from a using a categorical definition seems eliminated by their willingness to abandon average variable costs, or narrow or broaden their definition, when the categorical rule seems to lead to bad results. AREEDA & HOVENKAMP, *supra*, at 384-85, 391-93, 403-09.

fixed costs, exhausts its financial resources and leaves the market.”³⁰⁵ But this is wrong. As long as the price exceeds the rival’s variable or avoidable costs, the rival would lose money from leaving the market. True, it might have to renegotiate loans or go into bankruptcy because it becomes unable to meet any loans that it incurred on the assumption it could cover its sunk or fixed costs. But since the rival is worth more as a going concern (which follows from the assumption that prices exceed its variable costs), even then the business will be maintained in bankruptcy and the firm will stay in the market. This point is sometimes lost because of the popular image that firms somehow “vanish” in bankruptcy, but in fact bankruptcy reorganizations just change the owners of the business from shareholders to creditors, and the bankruptcy trustee as fiduciary for the new owners has the obligation to continue operating the firm if that creates profits for the new owners. (Note the question would be different if below-cost pricing were inflicting actual losses, for then the firm would have to convince creditors to provide additional funding to keep the firm afloat.) Thus, predatory pricing at the rivals’ variable costs may injure the rival’s shareholders or lenders, but cannot drive out an equally efficient rival. Accordingly no rational predator would do it, especially since the predator would be inflicting the same injury on its own shareholders or lenders. There is also the question why the predator would have any better access to capital markets than the rival, but that is a general question for below-cost predatory pricing.³⁰⁶ Here, the problem is that pricing above the rivals’ variable costs cannot inflict any loss that drives out the rival at all even if the predator *does* have better access to capital markets.

A related theory appears to be that an equally efficient rival would exit the market after even a short period of prices below long run costs because the rival sees before it a future where prices will not allow it to stay in business. Thus, some think that when the predator prices at the rival’s variable costs, “a rational rival should leave at the first indication that the incumbent is even contemplating a predatory campaign, there being no point in sticking it out and squandering resources when exit is inevitable.”³⁰⁷ But this too is wrong. Even if the rival were convinced the predator’s pricing will be permanent,³⁰⁸ it would have no incentive to exit prematurely. Until the

³⁰⁵ Ordoover, *supra* note , at 79-80 (emphasis in original; summarizing literature); *see also* Williamson, *Predatory Pricing*, *supra* note , at 322 (accepting deep pockets theory).

³⁰⁶ *Id.* at 80.

³⁰⁷ *Id.* at 79. (Check Telser and Benoit papers supposedly making this point)

³⁰⁸ There are reasons to doubt the predator’s ability to credibly commit to continue a scheme of pricing that imposes long term losses on itself or even forgoes short-term profits, but those reasons are equally applicable to below-cost pricing. *Id.* (describing objections that below cost-pricing is irrational because the predator cannot recoup the losses).

rival begins to have to make decisions on whether to keep incurring fixed or capital costs, those will not be variable, and the rival will stay in the market because it is making a profit at the alleged predatory price relative to its short run variable or avoidable costs.

Thus, one need not worry about the effect of a disjunction between price and long run costs on an existing rival because that rival will not exit the market as long as the price allows it to cover the costs that are actually variable or avoidable during the period of alleged predation. To test the proposition, let's directly confront the example that has most bedeviled modern antitrust scholars: what do we do with software whose marginal or variable cost of production is near zero? The usual answer is that the "new economy" has to be treated differently because marginal or variable costs are so low.³⁰⁹ But this is hardly satisfactory. In the old economy, marginal or variable costs are also often below average or long term costs. Indeed, the distinction between these cost measures only matters because sometimes they diverge. If this divergence presents a big problem when it is large, it must present at least a small problem when the divergence is small. Our theory for how to deal with that divergence should be able to address the full range of possible magnitudes rather than having ad hoc exceptions, especially since those exceptions create ambiguity about just what the vague dividing line might be. The better answer is instead that it all depends on how long the pricing lasts. If pricing at a near zero price occurs for a short time, it cannot persuade any equally efficient software rivals to exit since they will also have near zero marginal costs and thus retain a profit from operating during that period. If instead such pricing lasts for years, then it could be predatory because it would not allow an equally efficient software rival to recoup the software development costs of updating that software to stay in the market. The latter costs become variable or avoidable if the predatory pricing is lengthy but not if it is brief. Paradox solved.

B. Look to Variable Costs of Replacing the Victim's Output

³⁰⁹ See, e.g., Brodley, Bolton & Riordan, *supra* note , at 2272-73. They base this on the assumption that "the short-run incremental cost of a program downloaded from the Internet is nil," *id.* at 2272, but this is probably overstated since advertising and market effort affects the level of sales through downloads, and additional downloads require more billing effort and technical support. But in any event the incremental costs seem very low relative to the fixed or sunk costs of making the software, and this is the basis for their conclusion. Likewise, Areeda and Hovenkamp are sympathetic to cases that make an exception to average variable cost rules in regulated or high technology markets with (a) "an unusually high ratio of fixed to variable costs" and (b) where the industry is "expanding." AREEDA & HOVENKAMP, *supra* note , at 406-09 & n.44 (agreeing long run incremental costs is there relevant but then deciding test could not be implemented). Factor (a) is irrelevant for reasons noted in text. Factor (b) is relevant to the extent it means the relevant capital costs are in fact variable during the period of the alleged predatory pricing. Compare *infra* at ___ (noting that when an industry is contracting, capital costs may not recur). Thus rather than creating a special exception, it is more straightforward to see this as one application of the general principle.

A different concern is that equally efficient firms might have varying ratios of fixed and variable costs. For example, Williamson observes that more capital intensive firms can have lower marginal or average variable costs even when they are less efficient than more labor intensive firms.³¹⁰ He thus advocates instead using average total costs as a better means of sorting out the efficiencies of firms. But there are two possibilities. One possibility is that the capital intensive firm's marginal cost is below its average total cost. This means expanding output would lower its average cost, and that the firm must be below its optimal capacity. The capital intensive firm thus should expand output. At optimal capacity, its marginal cost will equal its short run average cost and long run average cost, so we would have no disjunction. And if the labor-intensive firm cannot compete at a price that equals the capital-intensive firm's costs at optimal capacity, then the labor intensive firm is *not* in fact more efficient. The other possibility is that marginal cost exceeds average total cost because the firm is above its optimal capacity. If so, then the capital intensive firm will be above its minimum average total cost, and thus if it prices above that cost cannot exclude any equally efficient rival, which can offer a lower price by keeping its output at the level that minimizes average total costs.³¹¹

Pricing at or above average total costs thus should be a conclusive defense since it cannot drive out an equally efficient firm.³¹² But that does not imply any price below average total costs could exclude an equally efficient rival when a firm is exceeding its optimal capacity. True, average variable cost, which is by definition lower than average total cost, might well offer inadequate protection to an equally efficient rival if based on an average of the costs that are variable for the predator's entire output.³¹³ However, that just means we have to be more precise in defining the relevant output whose costs can be varied. For purposes of determining what cost measure prevents a firm from driving out an equally efficient rival, the relevant costs that are variable or avoidable are *not* the costs of producing the predator's entire

³¹⁰ See Williamson, *Predatory Pricing*, *supra* note , at 321-22. A capital-intensive firm may not always have lower average variable costs: it depends in part on how much its capital assets depreciate with increased use. AREEDA & HOVENKAMP, *supra* note , at 323-25. But the problem can arise sometimes.

³¹¹ AREEDA & TURNER, *supra* note , at 164; AREEDA & HOVENKAMP, *supra* note , at 373. Professor Scherer assumes otherwise on the premise that the rival will be left with only the residual demand left over after the predator sells its output. See Scherer, *supra* note , at __. But this seems incorrect. If the predator is above its minimum average total cost, and must keep prices at that level, an equally efficient rival can undercut that price by selling at its minimum average total costs, and sell all the output it can produce at that optimal scale.

³¹² AREEDA & TURNER, *supra* note , at 153, 159-64, 170; AREEDA & HOVENKAMP, *supra* note , at 367, 373.

³¹³ Average total cost always exceeds average variable cost by definition since it is the sum of average fixed and variable costs. AREEDA & TURNER, *supra* note , at 155; AREEDA & HOVENKAMP, *supra* note , at 320-21.

output but the costs of the predator replacing the *rival's* output.³¹⁴ This is because the concern is rival exit and thus the question is which firm is more efficient at producing the rival's output. Accordingly, if the capital-intensive firm had to go above its optimal capacity to replace its rival output, we should look only to the higher variable costs when it does so, not to the lower variable costs it incurred in getting to optimal capacity.³¹⁵ If, even above optimal capacity, the capital-intensive firm's variable costs of producing its rival's output are lower than the rival's own variable costs of producing that output, then the rival is in fact not equally efficient at making its output.

C. Look to Magnitude of Predator Costs for the Sorts of Costs Variable to the Victim If Short Term Pricing Can Deter Long Term Investments

Another concern, so far neglected in the literature, is that the predator might time its alleged predatory pricing to begin after the predator has incurred a sunk cost but right before its rival has to decide whether to do the same. Suppose, for example, the predator has just renewed a ten year lease on its factory but knows that its equally efficient rival has an upcoming decision about whether to renew its own factory lease. The predator then cuts prices to a level that do not suffice to cover the sum of operating and lease costs. The price exceeds the predator's variable costs since its lease costs are sunk.³¹⁶ But the price would not exceed an equally efficient rival's variable or avoidable costs because, since the rival can avoid committing to the lease, the lease payments are variable or avoidable to it. If that market price persists, the rival

³¹⁴ See Baumol, *Predation*, *supra* note , at 64-65. This approach also addresses a conundrum otherwise created by the approach of Areeda, Turner, and Hovenkamp. Although their cost measure means a predator should shut down when its price is lower than its average variable cost, *see supra* note , they recognize that this creates an anomaly when there is so much excess capacity that this legal rule would require every firm in an industry to shut down and thus create an exception to their own rule, *see AREEDA & HOVENKAMP, supra* note , at 384-85. But under the equally efficient entrant benchmark, the question is not whether the predator is profiting by producing its output, it is whether it could profitably replace the *rival's* output. A firm pricing at marginal costs that are below its average variable costs necessarily lowers its average variable costs by expanding output. Thus, it may well be that its prices are below its current average variable costs but would *not* be below the average variable cost it would incur by adding output equal to what the rival used to produce. In such a case, the declining demand that created the excess capacity simply means that the minimum efficient scale can sustain fewer firms than before.

³¹⁵ This approaches using a marginal cost measure for prices between average variable and total costs, but instead of using the marginal cost of producing the last item, relies on the incremental cost of all the units of predator output necessary to replace the rival's output.

³¹⁶ The lease cost is sunk for that ten year period even though the rents will be paid in the future because the obligation to pay them will exist whether the firm stays in production or not. I here simplify since probably there is some possibility of a sublease, just as there is some alternative use for just about any sunken investment. If so, the actual sunk cost is the difference between what they paid and what they might get with a lower valued sublease or substitute use.

will lose money by renewing the lease and thus has incentives to exit the market rather than renew. The same holds if a firm lowers software prices to near-zero after it has come out with the latest software update but before its rival has invested in the software development to follow suit.

Now there are good reasons not to treat this problem as serious because short term pricing may not be able to deter a long term investment. But since those reasons also apply to the next concern, let me defer them for a moment. The point for now is that, even if this concern is serious, it does not justify a general rule employing long term costs, which would be overinclusive. Rather, the solution is to be careful in defining just which variable or avoidable costs one examines. Because we want to make sure our cost measure is not protecting less efficient firms, we generally say the examination is into the *predator's* variable or avoidable costs. But it would be more precise to say that our benchmark only requires that *the magnitude* of any variable or avoidable costs must come from the predator's cost data. Which *sorts* of costs we deem variable or avoidable would, if this concern is serious, instead turn on whether those sorts of costs were variable or avoidable *to the rival* during the period of alleged predation. The reason is that the purpose of our test is not to determine whether the price is profitable in the short run to the alleged predator, but rather to determine whether it could drive out an equally efficient rival.

The following illustrates the proper approach if this concern is serious. Suppose that each of two firms has one plant that costs \$10,000 a year to lease and makes 1000 gizmos annually. Take two factual scenarios. (1) Each firm also has operating costs of \$10 per gizmo and is thus equally efficient. The alleged predator then leases two plants and begins charging \$15 a gizmo. If the rival has already rented its plant too, the costs of leasing a plant are not variable or avoidable to the rival. The correct measure of variable or avoidable costs is thus \$10/unit and the price is not predatory because it cannot cause the rival to exit. If the rival has not rented its plant yet, its variable or avoidable costs include not just its operating cost but the cost of leasing a plant. The correct measure of variable or avoidable cost is thus no lower than \$20/unit, and the same \$15 price is predatory because it inflicts a loss on this rival that might cause it to exit. This difference in results is not anomalous because the \$15 price can drive out the rival that has not incurred a lease obligation but cannot drive out the one who has because, although equally efficient, each rival will compare the \$15 price to the differing costs that it can vary or avoid. (2) The rival has operating costs of \$15 per gizmo and is thus less efficient. If the rival has not rented a plant, we should look to both lease and operating costs because they are the *sorts* of costs that are variable or avoidable to the rival. However, \$25 is not the right measure of those costs because the *magnitude* of those sorts of costs are determined by looking at the

predator. Even though any price below \$25 could inflict losses that might drive out this rival, that is only because it is less efficient. The right cost measure is \$20/gizmo, reflecting the magnitude of the alleged predator's costs for the sorts of costs that are variable to the rival.

The final concern is that, even if the above measures of variable or avoidable costs can prevent an incumbent from *driving out* an equally efficient rival, they may not prevent an incumbent from *detering* entry by equally efficient firms. An entrant, this concern stresses, will not enter unless they expect prices to cover their sunk costs of entry. Thus if an equally efficient entrant anticipates incumbent price levels that cover variable or avoidable costs but do *not* cover sunken entry costs, they will not enter.³¹⁷ But if this concern is a serious one, a question I will take later, it really is no different than the last case. Detering entry is just a special case of deterring sunken investments. The correct time period in this case starts before entry because that is the rival decision being influenced. The sorts of costs that are variable or avoidable during this period to the potential entrant include the (not yet sunk) capital costs of creating new facilities. Thus, the correct cost measure should include the incumbent's long term capital costs of replacing its facilities with new ones. If the incumbent's future costs of plant replacement are lower than the entrant's cost of building its plant, then the incumbent should be able to manifest that greater efficiency in lower long term pricing even though it excludes less efficient entrants.

D. Look to the Future to Measure Cost Magnitude

Even when the rivals' cost variability during the relevant period indicate including the above sorts of capital costs but measuring them by their magnitude to the incumbent, this does not mean we should look to the incumbent's average total costs. The problem with most measures of average total costs is that they look *backwards* at the sum of variable and fixed costs the firm has already incurred. But what matters (if this concern is serious) is the magnitude of the *future* costs the incumbent will incur if its alleged predatory pricing persists. If the market is in a steady state, then basing average total costs on past data is a good proxy for future long run costs. But the proxy might be poor if the market is changing. For example, if the industry is declining, then such measures of average total costs are a poor proxy because firms should be contracting or exiting, and thus their past sunk or fixed capital costs will not recur. Combining this future orientation with the other analysis above helps address a nagging debate when the alleged predator's marginal costs are lower than average

³¹⁷ See Easley, Masson & Reynolds, *supra* note , 33 J. INDUS. ECON. at 447-54, 457 (offering model under which an incumbent could deter entry with prices above average variable costs).

total costs.

Defenders have tended to stress that if short run marginal costs are below average total costs then by definition expanding output should lower average cost, which must mean the alleged predator is below its optimal (least average cost) output and has excess capacity.³¹⁸ They thus conclude it will be cheaper to use that excess capacity than to build new more expensive capacity. Objectors have tended to stress that marginal or variable cost measures of predatory pricing give monopolist's inefficient incentives to build the excess capacity that is necessary to justify future pricing below average total costs that makes entry unprofitable.³¹⁹ Applying the approach outlined above can provide a more systematic resolution to the problems raised by the four possible sources of excess capacity.

(1) We might have a declining industry. Here we would not want to require prices that cover capital costs because that would encourage investment and entry at a time when market economics dictates exit. Advocates of total cost measures have tended to respond by creating a declining industry exception to their favored cost measure.³²⁰ But a more satisfactory answer is again to be more precise about when and what we costs are measuring, rather than to use overinclusive cost measures or make equally overinclusive exceptions. To the extent plant replacement costs will *not* recur in the future because firms are contracting or exiting, then the *magnitude* of

³¹⁸ See AREEDA & TURNER, *supra* note , at 164-168 & n.7; AREEDA & HOVENKAMP, *supra* note , at 238-39, 369, 400-01; AREEDA, *supra* note , at 195-96. Actually there is technically one exception: it might be the case that the marginal cost of the final item produced is below average total cost but that the cost of adding one more unit of output would exceed average total cost. For example, in the lease hypotheticals noted above, the strict plant output limit of 1000 meant that going from 2000 to 2001 units has a marginal cost of \$1010. Thus the \$10 marginal or variable cost of making 2000 units is below the average total cost of \$20 even though the predator is not below optimal plant size and does not have excess capacity. But if output limits are less strict, marginal costs will rise less sharply and this exception will not arise.

³¹⁹ See Spence, *Entry, Capacity and Oligopolistic Pricing*, 8 BELL. J. ECON. 534 (1977); Posner, *supra* note , 127 U. PA. L. REV. at 942; Scherer, *supra* note , at 171 n.12.

³²⁰ See POSNER, *supra* note , at 189-90; Williamson, *Predatory Pricing*, *supra* note , at 322-23. They are not the only ones who create an ad hoc exception in this circumstance. Areeda and Hovenkamp also create an exception to their rule banning prices below average variable costs when this results from industry-wide excess capacity. See *supra* note __ (explaining how that issue can instead be addressed by defining the output whose costs are in question). They also create a similar exception when a defendant builds a plant that turns out to be so costly compared to demand that prices do not cover a standard measure of average variable costs that includes use depreciation. AREEDA & HOVENKAMP, *supra* note , at 391-93. But rather than creating a special exception for this case, it is clearer to see it as just one result of the general rule that, when the sunk costs of building the plant will not be incurred again, the magnitude of any such costs (whether manifested in use depreciation or otherwise) is zero. They create an exception in the other direction when prices exceed average variable costs but the industry is growing and fixed costs greatly exceed variable costs. See *supra* note __ (explaining how that issue can instead be resolved by assessing whether the costs are variable during the time period of the alleged predation). They also create an exception when prices exceed average variable costs but fixed costs were incurred just to drive out the rival. *Id.* at 403-04. Again, it is clearer to instead see this as just one application of the general rule that the relevant variable or avoidable costs are those that the firm can vary during the period of predatory pricing in order to create the additional output that replaces rival output.

those predator costs will be zero.³²¹ The incumbent's future capital costs will thus be far below the past capital costs reflected in backward-looking measures of average total costs.³²² Instead, combining the magnitude of future predator costs with the sorts of costs that are variable or avoidable for the potential entrant during the period of predatory pricing will produce the right result without having to patch up a hole in the cost measure theory with an ad hoc exception.³²³

(2) We might have a temporary cyclical decline in demand that creates temporary excess capacity. But since one cannot know whether the decline is temporary until it ends, during the duration of any demand dip the magnitude of the alleged predator's plant replacement costs should be zero as above. Pricing at that level will defer entry, which is the right result since during that time the entrant will be less efficient than a firm that need not incur capital costs. But entry will not permanently be deterred if the decline is indeed temporary.³²⁴ Nor will the predator be able to drive out any equally efficient existing firm that also has excess capacity with any price that exceeds their (equal) variable or avoidable costs during that temporary period.³²⁵

(3) We might have economies of scale that make it cheaper for the largest firm to provide additional output. But once again we do not have to create an ad hoc exception. Even if plant replacement costs are the sorts of costs that should be considered variable or avoidable, their magnitude is determined by the incumbent's costs. Given economies of scale, the incumbent monopolist would incur smaller such costs in future production of the output the entrant proposes to add than the entrant would. Pricing at those future incumbent costs will deter entry but the entrant is not

³²¹ One might think they can never be zero because the predator will have to replace its plant at some point to stay in the market. But there are two possibilities. (1) The predator has multiple plants. Then, what matters is the long run cost of operating the marginal (least efficient) plant. In the face of declining market demand that produces prices that do not suffice to cover the capital costs of plant building, the predator will close this marginal plant rather than rebuild it. (2) The predator might have only one plant. Here if demand has declined to the extent that the predator can efficiently supply the entire market with this one plant, then the decline has made the predator into a natural monopoly and the analysis that follows in text for natural monopolies would apply.

³²² It is surprising Posner did not see this point since he himself pointed out the past-future divergence between average total costs and future marginal costs. *See* POSNER, *supra* note , at 190.

³²³ Alternatively one could say that what matters is "anticipated" average total costs, and that neither they nor "long run marginal costs" nor "long run incremental costs" should include capital costs that will not recur.

³²⁴ Suppose we instead assume that it is crystal clear the demand decline is temporary but that entry cannot be deferred. That is unlikely but if so any entrant would know to discount the temporary decline in demand and enter now, recovering entry costs when demand returns if entry is efficient.

³²⁵ Areeda and Turner suppose that it might, but do so based on the argument about exhausting rival financial resources that was rebutted above. *Compare supra* at __, *with* AREEDA & TURNER, *supra* note , at 165-66.

equally efficient given the relevant economies of scale.³²⁶

(4) The incumbent monopolist might be retaining inefficient excess capacity on hand in order to be able to respond to entry. Defenders of cost-based approaches acknowledge the difficulty, and either advocate an exception or reject one as inadministrable and accept this as a downside of their rule.³²⁷ But a more satisfactory approach would recognize that in such a case the magnitude of future incumbent capital costs will include the replacement costs of maintaining that inefficient excess capacity even if the market is in steady state. And that sort of cost must be included because that is the sort of cost that is variable or avoidable to the entrant. A monopolist required to price at the requisite cost level thus will not be able to keep out an equally efficient entrant even if the entrant believes the pricing will persist indefinitely, and will thus have no incentive to create excess capacity to make such an attempt.

***E. Look to Sorts of Costs Variable to Predator During the Period of Pricing
If Short Term Pricing Cannot Deter Long Term Investments***

The foregoing analysis assumed the concern that short-term predatory pricing might deter a long-term investment was serious, a proposition that is doubtful for reasons I have till now deferred. The main problem is the following. The claim that pricing (or threats to price) above the alleged predator's variable or avoidable costs might deter investment or entry by equally efficient firms depends on a crucial supposition. That supposition is that, in making its long-term investment or entry decision, the rival will believe that such pricing will *persist* in the long run, or that any threat to impose such pricing after entry will *both be carried out and persist* in the long run. This supposition is what allows an alleged predator with a *short* term pricing strategy (or mere threat to begin such pricing) to influence rival investment or entry decisions that are made based on *long* term expectations. But any rival will realize that, *if* it incurs the sunk cost in question, it will no longer be rational for the alleged predator to persist in pricing that covers variable or avoidable costs but not sunken capital costs, let alone to carry out a threat to begin such pricing. The reason is that, once the sunk cost is incurred, such pricing cannot give the equally efficient rival any incentive to leave the market. Since the alleged predator could make more money with pricing that covers these long run costs, and cannot drive out the rival with lower

³²⁶ For more extensive analysis on when the entrant will be equally efficient giving declining costs see *supra* Section II.B.2.

³²⁷ AREEDA, *supra* note , at 198-99 (rejecting exception); Joskow & Klevorick, *supra* note , at 253-54 (recognizing one); AREEDA & HOVENKAMP, *supra* note , at 402-03 (suggesting both).

pricing, it would be irrational for the predator to persist in such low pricing. The prospect of such irrational pricing thus would not induce exit by the equally efficient rival, which will instead assume the unremunerative pricing will not continue.

This might seem indistinguishable from the claim that an equally efficient rival cannot be deterred or driven out by pricing *below* the predator's variable or avoidable costs because it would be irrational for the predator to persist in it.³²⁸ But actually the issue here is different. There, the pricing below variable or avoidable costs inflicts actual losses on the rival that at least *might* induce it to exit and thus make it rational for the predator to persist. Here, once the sunk cost is incurred, pricing above variable or avoidable costs cannot inflict *any* future loss on the rival and thus cannot give it any incentive to leave the market. A single-market monopolist will thus literally have no reason to persist in such a pricing strategy.³²⁹ It will instead raise prices to at least cover long run costs, and probably higher to some oligopoly level.

Still, some of the counter-theories used to justify bans on *below*-cost predatory pricing could be extended to this case where predator prices do not cover its long term costs. One theory is that the predator's bluff to persist in such pricing may never be called because the short-term predatory pricing deters investment or entry by misleading the rival (or its bankers) into thinking the predator's efficiency is greater (or market demand lower) than it actually is.³³⁰ But this would not apply to a mere threat to lower prices in response to investment or entry: actual lower prices would be necessary to create the misleading impression. This theory thus has little application to the topic of reactive price-cuts to new entry.³³¹ Further, the assumption that other firms and capital markets can be fooled in the long run seems dubious. Such pricing creates a market opportunity for any capital investors savvy enough to realize when current prices are an unreliable indication of future prices, especially since the actual future prospects are for oligopoly prices and a share of supracompetitive profits.³³²

³²⁸ See *supra* Introduction.

³²⁹ The perhaps counterintuitive implication is that, where incumbent and entrant are equally efficient, pricing just barely above variable or avoidable costs but below long run costs is actually a *less* rational incumbent strategy that pricing *below* variable or avoidable costs. Compare Edlin, *supra* note , at 961-63 (assuming that above-cost predatory pricing must be more rational than below cost pricing).

³³⁰ Ordovery, *supra* note , at 80-81 (synthesizing recent literature); Brodley, Bolton & Riordan, *supra* note , at 2247-49, 2285-2330 (same at greater depth).

³³¹ Having incurred the sunk costs of entry, an entrant cannot be driven out by a reactive price cut to variable cost levels. On the other hand, if the entry is announced but not yet completed because some important capital investment remains to be made, see *supra* IV.C (on difficulties of defining moment of entry), then price cutting at that stage might deter the investment necessary to complete entry if it misleads the entrant. But it is hard to believe entrants will be that misled by pricing that is plainly reactive to their entry plans.

³³² See *supra* III.A.2. Any assumption about uncertainty must also be applied evenhandedly. The predator will also be uncertain about entrant efficiency and future consumer demand. If the rival is less efficient, pricing below total

More important, even if actual short-term pricing that did not cover long term costs does fool rivals (and their bankers), their investment or entry will only be deferred. To continue deterring it, the predator will have to maintain such pricing for the long term. If it does so, then such pricing below long term total costs will become predatory because the relevant capital costs will have become variable or avoidable for the predator too during the long period of alleged predatory pricing.

Alternatively, one might conclude it is rational for the predator to persist in pricing that does not cover long term costs if it is a monopolist in *many* markets and wants to signal firms in other markets that they will lose money if they enter (or incur the periodic sunk costs necessary to stay in) those other markets.³³³ For example, suppose that after an equally efficient firm enters one market, the incumbent responds with a price that allows the entrant to recover the costs that are now variable or avoidable to it, but that does not allow recoupment of its sunk costs of entry. Such a price cannot drive out the entrant for reasons described above and would thus be irrational if only the first market were considered. But suppose the incumbent does not set its price to drive out the first entrant: instead it sets that price to deter other equally efficient firms -- who have *not* yet incurred entry costs -- from entering the other markets. If the other potential entrants believe the incumbent will respond with the same pricing in those other markets, they will (even though equally efficient) be deterred from entering because they cannot recoup their entry costs. A similar strategy might be employed to deter the sunken investments necessary for existing rivals to stay in multiple markets.

But there are manifold problems with this multi-market theory of predation through costs above variable or avoidable costs. The first is obvious: often the alleged predator is not a monopolist in multiple markets, making this theory utterly inapplicable. Second, it will rarely be the case that in *all* the predator's markets, the predator has made sunk investments that rivals or potential entrants are just about to

costs would sacrifice profits for no good reason since total cost pricing would deter investment or entry anyway. If the rival is more efficient, then pricing at incumbent variable costs may not deter investment or entry even if the entrant mistakes that price for an indication of the incumbent's total costs. If the rival is equally efficient, the predator will still be uncertain whether the rival (and its lenders) will interpret its pricing as indicating total rather than variable costs. Uncertainty about what sort of rival or potential rival it faces, and how any price signal will be interpreted, thus seem sufficient to deter the predator from pricing at levels that sacrifice profits in all cases in order to send a signal to a mere subset of rivals, especially since that level of pricing cannot in fact inflict post-investment or post-entry losses on equally efficient rival.

³³³ See Ordoover, *supra* note __, at 80 (reviewing literature); Easley, Masson & Reynolds, *supra* note , 33 J. INDUS. ECON. at 447-54, 457 (offering multi-market model under which an incumbent could deter entry of equally efficient entrants in subsequent markets with prices above average variable costs in the first market).

decide on. Such a strategy thus cannot help induce exit or deter entry in any markets where the rivals have already incurred the relevant sunk cost. Third, this pricing strategy cannot deter investment or entry by any rival that simply invests or enters in all the remaining markets simultaneously, since then the pricing cannot send a signal to any remaining market.³³⁴ Capital markets should be willing to provide the financing to increase the scale of entry since getting (or retaining) a slice of supracompetitive profits in these markets will be highly profitable. And if no single rival can invest or enter in all markets, they can always organize a group of firms to make simultaneous investments or entry.³³⁵

Fourth, even if rivals cannot act in multiple markets, such a pricing strategy cannot deter investment or entry by a rival in the *last* of the markets where rivals have not yet incurred the relevant sunk costs. The reason is that carrying out and persisting in such pricing will be irrational since it can neither drive out the last entrant nor send a signal to any further market. Since the threat is not credible, investment and entry by that last rival will not be deterred. Further, the rival in the next to last market would likewise not be deterred because the rival would realize such predator pricing would be irrational since it could not deter investment or entry in the only remaining market. And so on, until by backward induction one reaches the conclusion that the threat of initiating or continuing such pricing could not deter investment or entry in any of the prior markets.³³⁶

Others have argued backward induction fails because rival information is imperfect about whether incumbents can profit from below-cost predation against an equally efficient entrant.³³⁷ But here that uncertainty is inapplicable since pricing above variable or avoidable costs can never profitably drive out an equally efficient entrant. Others argue there is no clear end point at which a rival will know it is in the last market.³³⁸ But applying this assumption evenhandedly implies equal ambiguity about who is in the *first* market that begins this supposed signal-sending game. If a predator

³³⁴ Easterbrook, *supra* note , at 286-87.

³³⁵ *Id.* at 288. Since the firms would by definition be in the separate markets and unable to enter them all, they would not be horizontal competitors subjecting their agreement to judicial hostility. In any event, since an agreement to make simultaneous investments or entry need not involve any agreement or price or agreement not to also make investments or entry in each other's territories, it does not seem to involve any per se violation. And under the rule of reason an agreement to add output without more would be procompetitive.

³³⁶ Selten reaches the same conclusion for a threat of unprofitable below-cost predatory pricing. Selten, *The Chain Store Paradox*, 9 THEORY & DECISION 127 (1978). If that conclusion holds there, *a fortiori* it will be true when variable cost pricing in the last market cannot inflict any loss that will induce the rival in the last market to exit after it incurs the sunk costs of investment or entry.

³³⁷ See Ordovery, *supra* note __, at 80 (reviewing literature). Even in these models, there will be an equilibrium where a below-cost pricing strategy is only sometimes credible enough to deter investment or entry.

³³⁸ See *id.* (reviewing literature).

is in 10 ongoing markets, and deprives a rival in one market of the ability to recoup total costs, rivals in other markets seem more likely to draw inferences from the nine markets than the one outlier. The predator may thus need to carry out such a scheme in most markets to send a message to those that remain, which makes the scheme less rational (since profits will be sacrificed in a majority of markets where driving out the equally efficient rivals is impossible) and makes it clear to the remaining rivals that they are the last ones (which strengthens backwards-induction problems).

More important, for the signal sent from any single market to be convincing, the predator will have to persist in the low price long enough to actually deprive its rival of a profitable long term return on its investment or entry. If the predator just offers a price at variable or avoidable costs for a short time, then it will not send the signal that the predator is willing to persist in pricing below its total costs long enough to deprive an equally efficient rival of any ability to recoup sunk costs even when the rival cannot be driven out of the market. But the need to persist in such a scheme over the long haul to create an object lesson for other markets creates two serious problems. The first is that, by the time they have persisted long enough to create the signal in the first market, rivals will have made sunken capital investments in the other markets (which presumably share the same rate of capital replacement). Second, the predator's *own* capital costs will become variable or avoidable during such a lengthy period of the predatory pricing. And even under the most restrictive definition, pricing below the predator's own variable or avoidable costs will be predatory. Thus, any multi-market plan must begin with conduct that would be an antitrust violation under variable or avoidable cost measures in the first market, and probably in most markets to send a clear enough signal. The imposition of treble damages in those markets should suffice to deter such a scheme.

F. Conclusion on Proper Cost Measure

In short, it seems implausible that a predator could deter long term investments or entry by any equally efficient firm with short-term threats or pricing strategies that exceed short term costs. And when the predator pursues a long term pricing strategy, the difference between variable and total costs disappears because all costs are variable over the long term. My own conclusion is thus that allowing alleged predators to price at their own variable or avoidable costs will *not* deter or drive out equally efficient entrants as long as we are careful to consider *all* costs of replacing the *rival's* output that are variable or avoidable *to the predator* during the period of alleged predation. Accordingly, prices above this price level should not be deemed predatory.

If the logic behind that conclusion were rejected, it would still clearly be the case that a predator could not deter or drive out an equally efficient rival if its prices

covered a cost measure reflecting the *magnitude* of predator costs for the *sorts* of costs in replacing the rival's output that are variable *to the rival* during the period of entry or investment decisions influenced by the short term existence or threat of such pricing. Thus, even on this somewhat less sanguine view, prices above this somewhat higher cost level should never be deemed predatory even if below long run total costs. *A fortiori*, prices above long run total costs should not be predatory on any view, since everyone acknowledges they cannot exclude equally efficient entrants.

CONCLUSION

Both recent and longstanding analysis supporting a ban on above-cost predatory pricing requires a better response than current scholarship has so far given for why predatory pricing should be restricted to below-cost prices. This Article endeavors to provide that better response by showing why efforts to restrict above-cost reactive price cuts are likely to be futile and harmful. This is true both when one focuses on the *ex post* effects after entry, and when one examines the *ex ante* effects on the likelihood of entry and incumbent creation.

Ex post, such restrictions are likely to be futile in achieving their main objective of protecting entrants because less efficient entrants cannot be protected in the long run, and entrants who are (or will predictably become) more efficient need no protection. But the restrictions will have harmful effects by raising prices and lowering productive efficiency during any period of price restriction, as well as distorting innovation and price flexibility in response to changing market conditions.

Ex ante, the futility of protecting less efficient entrants means their entry is unlikely to be encouraged by the restrictions, and to the extent they are encouraged it will sometimes be undesirable and may even result in a marginal decrease in entry by more efficient entrants who are ultimately far more important. Because of this, incumbent monopolists are unlikely to lower prices *ex ante*, and even if they did that would have the bad consequence of decreasing their incentives to make the investments necessary to create products so valuable that they confer monopoly profits. Further, in the airline industry that provoked the recent proposals to restrict reactive above-cost price cuts, inducing incumbent airlines to lower everyday prices on routes from hubs would likely have the adverse consequence of increasing prices along the rest of the hub-and-spoke system, and thus producing a new schedule of prices that reduces the total output of the hub-and-spoke system and aggregate consumer welfare.

The dynamic intertemporal models of above-cost predatory pricing offered by

several leading economists, including not just Edlin but legends like Williamson, Baumol and Stiglitz, have made important advances over the traditional static model that has dominated since first put forth by Professors Areeda and Turner. It is vital to consider not just short term and long term effects, but *ex ante* effects too. But while the intertemporal models have been usefully dynamic in considering incumbent strategies, they have been surprisingly static in their assumptions about market demand, costs, and technological changes that affect both. They have failed to consider that competition between incumbents and entrants is generally competition about which can become more efficient in ways that change demand and cost curves. And they have failed to properly appreciate the ways in which changes in demand and costs and technology can undermine their regulations of price, and how reductions in productive efficiency can offset the posited gains to allocative efficiency. They have also failed to take sufficient account of the dynamic responses of not just incumbents and entrants, but also customers and capital investors, to variations in legal rules trying to protect entrants from reactive price cuts.

Taking these factors into account in a fuller dynamic analysis reaffirms the wisdom of the position that antitrust law should not recognize any claim of above-cost predatory pricing. It also helps specify just what should count as costs.