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ECONOMIC RATIONALITY AND THE AREEDA-TURNER RULE

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Abstract The Areeda-Turner rule in U.S. antitrust jurisprudence limits successful predatory pricing cases to circumstances where prices can be shown to have been set below marginal costs. While not cast so, the rule reflects the view that predatory pricing is rarely attempted; and even where attempted is rarely successful; and even where attempted and successful, is difficult to identify. In this paper, we examine the theoretical and empirical foundations of this rule, and conclude that it is time to demote the Areeda-Turner *analysis* from the status of a rule to that of a potentially useful form of inquiry in predatory pricing litigation, but one which is neither necessary nor dispositive.

Keywords Predatory Pricing, Antitrust, Monopolization, Areeda-Turner Rule, Credibility, Subgame Perfection, Rationality, Chain-Store Paradox
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1. Introduction

The Areeda-Turner (1975) (AT) rule in U.S. antitrust jurisprudence limits predatory pricing liability to circumstances where prices are set below marginal costs. While not cast as such, the rule reflects the view that predatory pricing is rarely attempted; and even where attempted is rarely successful; and even where attempted and successful, is difficult to identify.

The AT rule has gained such prominence that it is now embodied in two U.S. Supreme Court decisions. In the first one brought against a group of Japanese television manufacturers and decided in 1986, the Court dismissed a charge that low predatory prices in the U.S. were recouped by high, collusively set prices in Japan.[1] While the decision did not directly address price-cost concerns, it did state that "there is a consensus among commentators that predatory pricing schemes are rarely tried, and even more rarely successful."[2]

Then just seven years later, in 1993, the Supreme Court addressed the price-cost issue directly. The Plaintiff alleged a predatory pricing scheme with which the Jury verdict agreed and assessed damages. However, the trial

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1 *Matsushita Electrical Industrial Co. v. Zenith Radio Corp.,* 475 U.S. 574 (1986).

2 475 U.S. at 594.

judge reversed the verdict as a matter of law. Eventually, the Supreme Court took the case. In its decision, the Court rejected "the notion that above–cost prices that are below general market levels or the cost of a firm's competitors inflict injury to competition cognizable under the antitrust laws," and ruled explicitly that "plaintiff seeking to establish competitive injury resulting from a rival's low prices must prove that the prices complained of are below an appropriate measure of its rival's costs."[3] In effect, the Areeda-Turner rule became law through this decision.

As Herbert Hovenkamp observed, "The effect of Areeda and Turner's predation test has been devastating for predatory pricing plaintiffs" (Hovenkamp 2014, p. 3). Courts are reluctant to take action against purported predators even under highly suggestive circumstances.[4] In this paper, we examine the theoretical and empirical foundations of the rule, and also whether the current judicial antipathy towards predatory pricing actions should be reconsidered.[5]

As a legal matter, the Areeda-Turner rule limits predatory pricing to circumstances where firms set prices

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3 *Brooke Group Ltd. v. Brown and Williamson Tobacco Corp.,* 509, U.S. 209, 210 (1993).

4 Christopher Sagers identified 123 appellate and 191 Federal district court decisions between *Matsushita* (1986) and 2009. None were decided on the merits in favor of plaintiffs (2009 pp. 922, 923).

5 For another review of these issues, although from a different point of view, see Bruce Kobayashi (2010).

below marginal costs.[6] At higher prices, firms receive safe harbor protection which effectively immunizes them from antitrust liability.[7] The rule's premise is that a rational profit-maximizing firm never sets prices below marginal costs in the absence of predatory purposes. For this reason, when such prices are actually observed, there is a strong suggestion of a predatory motive. This premise, of course, is correct only under simple static circumstances.

On the face of it, the Areeda-Turner rule does not imply that prices exceeding marginal costs can never be predatory; but merely that they are ambiguous. From this ambiguity, Areeda and Turner conclude that there should be no liability in such circumstances. This recognition follows because most prices exceed marginal costs and are not predatory. But some prices above marginal costs are predatory, both in effect and intent.[8]

The AT rule rests on a judgment that instances of predatory pricing are so rare that courts should tread lightly in dealing with above-cost pricing allegations. Furthermore, and not obvious on the face of it, applying the

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6 Since marginal costs are difficult to measure, some accounting measure of average variable costs is typically used in practice.

7 There is some disagreement about whether the pricing must be above marginal cost or above average total costs for the firm to enter the safe harbor. In any case, there is a presumption of legality, when prices exceed marginal costs. See Elzinga and Mills (2000-2001, p. 2483). Our analysis does not depend on this distinction.

8 See Aaron Edlin (2001).

marginal cost test in practice is usually quite difficult. Requiring this analysis creates a further barrier to the successful prosecution of cases against predatory pricing, even when the Areeda-Turner criterion for predatory pricing is met.[9]

The Areeda-Turner rule, like most policy rules, rests on the distinction between Type I and Type II errors. By enforcing this rule, the decision-maker seeks to minimize the presence of Type I errors: finding predation when in fact it is not present, a false positive. The rule necessarily permits increased Type II errors: finding no predation when in fact it is present, a false negative. Since both types of error are relevant for antitrust and other policy decisions, enforcing this rule makes sense only if there are few instances of predatory pricing, or alternatively if it is very difficult to determine when they are present, or both. If on the other hand, there are many and varied circumstances where prices are set for predatory purposes, then the premise underlying the rule is questionable, and there may be good reasons to reject or modify it. What then becomes critical is whether predatory

9 See Easterbrook (1981, p. 314) and Hovenkamp (2014, pp. 3, 12-13). Estimating marginal or average variable costs in the common case of multiple products and locations is especially difficult (Wazzan and Frech 2009).

pricing behavior is common and detectable. Shedding light on that question is the purpose of this paper.

2. The Economic Literature

The relevant economic literature points in both directions. First and widely accepted during the antitrust revolution of the 1980s,[10] there is the proposition that rational, profit-maximizing firms do not engage in predatory conduct because it requires the threat of irrational actions at some point in the future; so that firms being threatened will strongly discount the threat as not credible. The critical implication here is that potential predators will not generally make threats which require irrational actions.

An early statement of this argument appeared in John Magee's influential paper on the Standard Oil Trust (1958). He made a clear theoretical argument that predatory pricing was irrational. Furthermore, he contested the then accepted position that Standard Oil had in fact achieved and maintained its market power through predatory means.

The bulk of McGee's paper consists of a detailed interpretation of the available evidence, mostly testimony, from the Standard Oil case. From that review, he concludes

10 See Lott's judgment that "In 1980 the predominant view among economists was that predatory price cutting would rarely if ever be profitable" (1990, p.1).

that “Standard Oil did not use predatory price discrimination to drive out competing refiners, nor did its pricing practices have that effect” (McGee 1958, p. 168). This *empirical* conclusion about Standard Oil’s historical practices has been challenged by later scholarship, based on further review of case materials and other sources (Dalton and Esposito 2007, 2011; Leslie 2012). In modern language, McGee argued that the actual Standard Oil decision was a Type I error, a false positive.

Years later, McGee reaffirmed his conclusion that predatory pricing is rare. Noting that he had proposed a cost-based rule in 1965, predating the Areeda-Turner rule by ten years, McGee gave the rule a qualified endorsement (McGee 1980). There was also an important sympathetic legal decision in this vein by Judge Frank Easterbrook (*A. A. Poultry*, 1989). In large measure, the Areeda-Turner rule resulted from that early consensus.

3.1 The Game Theory Version of the “Predation is not Rational” Argument

A variant of this argument appears in the game theory literature. In that context, it is argued that rational conduct require subgame perfect behavior at all decision

points (any subgame) in any interaction (Selten 1978).[11] This construct offers an alternate means of reaching the same conclusion that because equilibria with successful predation are often not subgame perfect (in finite games), predatory threats are therefore not credible.[12] Carrying out such threats would then not be rational as they would lead to lower profits.

McGee's early work on predatory pricing can be viewed as anticipating the more formal subgame perfection analyses of Selten. Understandably, a U.S. Supreme Court decision from the 1980s is consistent with this view. Its stated conclusion is that "predatory pricing schemes are rarely tried, and even more rarely successful." (*Matsushita v. Zenith*, 475 US 574, 589-90, 1986). That decision merely repeated the relevant academic literature.

3.2 Theoretical Counterarguments

There are two main threads of counterarguments to the view that predation is irrational, and therefore will not generally be observed because only subgame perfect equilibria represent rational behavior. The two threads

11 This complex form of multi-period rationality is often very demanding and often leads to poorer total outcomes for all players taken together.
12 This specific critique was levied at our earlier work. See Comanor and Frech (1985), comments by Schwartz (1987) and Mathewson and Winter (1987) and our reply (1987).

differ according to the level of information that is presumed.

3.2.1 Perfect Information

Even with perfect information, there are theoretical explanations as to why individuals would not behave in the narrow manner presumed by the requirement of subgame perfect equilibrium. Many of these arguments were developed originally by Selten in the same classic article entitled "The Chain Story *Paradox*," (emphasis added) that provides the analytic foundation of the "predation is irrational" viewpoint. They are thereby worthy of some consideration.

The Selten paper provides a stylized predatory pricing example. Consider a chain retail store operating in twenty local markets, holding some level of market power in each of them. It faces potential sequential entry in each market. In each case, the retail chain can choose between "accommodation" by maximizing profits while accepting the presence of the entrant, or alternatively "resistance" by setting lower prices with the aim of discouraging and perhaps even excluding the entrant. In the short run, "accommodation" is the more profitable strategy for it avoids the immediate cost of predatory actions. However,

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choosing “resistance” may deter entry in later periods which can lead to higher overall profits.

In the game theoretic result for which Selten’s paper is most remembered, he employs the solution concept of backward induction which leads the incumbent firm to accommodate the entrant’s presence at each stage, and therefore in every local market. Under that paradigm, predation is indeed irrational. For Selten, however, this solution concept represents merely one approach to the problem; which he calls the “induction theory.”

What is often ignored is that Selten himself believed that the accommodative outcome frequently conflicts with observed behavior. In Selten’s own words: “there is a disturbing disagreement between plausible game behavior and game theoretical reasoning” (p. 127). For this reason, he advocates using a “limited rationality approach” (p. 127) as an alternative, which he calls the “deterrence theory.”

Under Selten’s deterrence theory, the incumbent pursues an aggressive response to any entrant that appears at the first few decision points. Anticipating this reaction, possible entrants often do not appear. If, however, there are new entrants, the incumbent reacts aggressively and willingly bears the additional costs of doing so. While that conduct may be irrational for the case

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at hand, i.e. the local market, it may still lead to higher profits in the long run, and over all local markets, if potential entrants see the likely consequences of their entry and thereby refrain from entering the local market. The purpose of contesting the entry of any particular firm is the message conveyed to all others about the costs of doing so.

At some point, towards the end of the game, Selten's incumbent recognizes the greater power of the induction approach and switches to a more accommodative strategy. While this theory does not predict when the incumbent switches, Selten suggests "this does not impair the practical applicability of the theory" (Selten 1978, p. 132). He observes that this "not-strictly-rational theory" often leads to higher returns for the incumbent than does fully rational, subgame perfect behavior. Depending on the exact payouts and the length of the game, the gain from not-strictly-rational behavior can indeed be much larger than the profits earned through accommodation.

In Selten's example, and often in the actual economy, the not-strictly-rational approach also leads to higher total payouts for all firms in the industry, including incumbents and entrants. This result occurs because the industry is less competitive without entry, and the producer

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surplus to be divided among sellers is larger as increased monopoly returns are earned in the absence of effective entry.

An alternative to Selten's "deterrence theory" is that offered by Roy Radner. His approach is useful for explicitly describing the likely gains from conduct that is not strictly rational. This involves Radner's concept of "epsilon equilibrium." He presents a rigorous way of weakening the strict rationality requirement present in a Cournot-Nash equilibrium. Radnor's epsilon equilibria rest on adopting a combination of strategies so that each player lies within epsilon (in terms of profit) of his best possible response in the action at hand. To be more explicit, in long finite games, the loss in playing in a predatory manner, as opposed to Nash best-response play, is small, relative to the gain from predation. Much like Selten's deterrence theory, the predatory approach disappears towards the end of the game. However, even with a small error in calculation, a slight bias towards predation can lead to large gains. Thus, Selten and Radner both describe circumstances where predation is a likely outcome even in finite, full-information games.[13]

13 There is a literature on the evolutionary advantages of both a tendency to both dominant and cooperative behavior in both humans and other animals (Hirshleifer 1977; Sachs, Mueller, Wilcox and Bull (2004); Van Doorn, Hengeveld and Weissing (2003). This analysis makes the

3.2.2 The Presence of Multiple Equilibria

A common feature of modern game theory is the presence of multiple equilibria.[14] Merely specifying the characteristics of each player, along with underlying market conditions, is often not sufficient to permit one to determine a game's final outcome. A recent paper provides a formal connection between predatory pricing and the presence of multiple equilibria, where each equilibrium point rests fundamentally on different expectations.

In the authors' model

> multiple equilibria arise … [when] there is more than one set of firms' expectations regarding the value of continued play that is consistent with rational expectations about equilibrium behavior and industry dynamics. Which of these is realized depends on firms' expectations. Loosely speaking, if firms anticipate that predatory pricing may work, they have an incentive to choose the extremely aggressive prices that, in turn, ensure that predatory pricing does work. (Besanko et al., 2014, p. 871)

What that study emphasizes is that rationality in the presence of multiple equilibria is an elusive concept. Identifying rationality with one particular equilibrium concept can be highly misleading particularly in the

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adherence to the strong concept of rationality in perfect equilibria less attractive and supports the view of Selten and Radner.

14 For a classic discussion of the question of multiple equilibria, although from different perspectives, see Franklin Fisher (1989) and Carl Shapiro (1989).

presence of alternative sets of expectations leading to widely different equilibria.

3.2.3 Imperfect information

Game theoretic arguments supporting the presence of predatory pricing are better known in an imperfect information setting. Consider a game (or an industry) where potential entrants never observe an incumbent's costs or technology. In that case, they never actually know if their rival's actions are profitable or not. In such circumstances, it may be rational for an incumbent to threaten and sometimes carry out predatory pricing schemes. Some of the classic papers in this tradition are Krebs and Wilson (1982); Milgrom and Roberts (1982) and Fudenberg and Tirole (1986).

Consider the "signal-jamming" model of Drew Fudenberg and Jean Tirole (1986). In their model, a potential predator wants both to induce efficient entrants to exit as well as to deter future entry. It recognizes that these goals can be achieved only if it can mimic what a superior competitor with lower marginal costs would do in the same circumstances. The potential predator does this by setting a price below the short-run profit maximizing prices. While that strategy would not work if all costs were transparent,

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it can be successful when actual or potential rivals are deceived. Note that in this model and related reputational models, predation is not connected to the incumbent pricing below his (or the entrant's) marginal costs. In this context, the Areeda-Turner rule does not lead to valid conclusions.

A similar result obtains in the economics of auctions. Predation is often an equilibrium strategy when information is incomplete. In certain types of auctions, such as ascending price auctions, aggressive early bidding may discourage the entry of other bidders (Klemperer 2002). Even if no other bidders are kept out, early aggressive bidding may lead to higher prices and lower purchase prices later. Following Sushil Bikhchandani (1988, p. 99), consider a second-price auction[15] with two bidders where one of them has some probability of having a higher valuation of the good (bidder 2). If so, bidder 1, (the possibly the weaker one), has an incentive to bid lower and is therefore less likely to win. Knowing this, bidder 2 sets a higher bid. If the bidder 2 then wins, which is likely, he pays less precisely because he pays the amount bid by bidder 1. In a multi-period auction, it pays bidder 2 to bid

15 In a second-price auction, the wining bidder pays the price from the second-highest bidder and not his own bid.

aggressively in early rounds to establish a reputation, even if he does not really value the good more highly.[16]

Auctions on the buying side are studied more often by economists than those on the selling side. But, the economics are symmetric. Auctions involving bidders trying to sell goods are typically less formal and are common in the private sector (e.g. the competition to supply avionics to aircraft builders). Aggressive early bidding represents low early bids, resulting in a reputation that leads to high later sales prices.

Another approach would involve the predator signaling that its primary decision-maker is not strictly rational. As reflected in Radner's model, a predator's deviation from strict rationality can be small and still gain its desired result. A critical feature in all these models is that relationships among rivals are inherently asymmetrical.

The potential predator's signals must be understood by current and possible rivals so they must be observable (Comanor and Frech 1993). For this reason, an inquiry into a predator's intent can be both easier and more productive than is widely believed.[17] For a predator to succeed, it

16 See Paul Klemperer (2002) for examples of predatory behavior in recent large-scale auctions.

17 For an especially clear argument which is contrary to our view on the usefulness of intent, see Judge Easterbrook's opinion in *A.A. Poultry* (1989). By and large, Easterbrook's view predominates in U.S. predatory pricing law. The law in Europe has taken a different tack

must communicate its commitment to its likely prey. As a result, the situation again is inherently asymmetrical. We believe therefore that evidence of intent to communicate a predatory commitment should be given substantial weight. While hostile statements including bragging or misplaced analogies to war and sports may not be relevant, specific attempts to communicate commitments are relevant.

As an example, consider the following statements by Intel Executive Vice President, Paul Otellini, as reported in the press. In January 1999, Mr. Otellini emphasized that his company was "deadly serious" about maintaining market shares at or above 80 percent. He emphasized that "we intend to stay at that level or move upward;" and to do so will continue the company's "aggressive" pricing policy.[18] This is a clear statement of a commitment. Sometimes, interpretation of a firm's commitment will require knowledge of context, perhaps gleaned from document discovery or testimony, for interpretation. But, we believe that this not beyond the competence of the courts.

3.2.4 The Role of Costs

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than in the U.S. In European law, evidence on intent is used to help distinguish predation (generally included in the term "abuse of dominance") from mere aggressive competition. See Stephen Martin (2014, pp. 22-26).

18 Business Week, July 12, 1999; The Register, June 20, 2001.

A striking feature of the theoretical economics literature on predatory conduct is the minimal role played by costs. They are not the pivotal factor emphasized in the Areeda-Turner approach. What instead are important are the expectations that firms have of each other. Depending on these expectations, rivals may or may not engage in predatory actions. That is the essential message we draw from this brief review of the economic literature.

While many factors can drive expectations, a critical one is the perception of a rival's costs. However, what is relevant here are not actual costs but rather the firm's judgment of the rival's costs. When a firm believes his rival's costs are lower than his own, he likely believes that a rival's price cuts can be maintained longer than his can; and he will respond accordingly. On the other hand, if he judges his rival's costs are higher, then he recognizes his own advantage and can sometimes gain from employing predatory tactics. In this context, costs by themselves, are unimportant except through their influencing firms' expectations.

That conclusion applies to the question of whether a rival's newly set prices are above or below its own marginal costs. What is relevant for predation is the ability and

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willingness of a predator to earn lesser profits in the short run in exchange for longer run gains; and this calculus is present when all prices are set above marginal costs just as they are when a new set of prices lies below marginal costs. On a theoretical basis, it is the willingness to sacrifice current profits for exclusionary purposes that marks the presence of predatory pricing, and not whether its prices fall above or below some pre-specified measure of costs.[19]

As noted above, although the AT rule is framed in terms of marginal cost, that concept is commonly translated for measurement purposes into average variable cost (AVC). As a result, firms can set prices which contribute little or nothing to fixed costs but still retain their "safe harbor" status from antitrust liability. So long as short run profitability is maintained, so is their antitrust immunity.

While this approach might be understood where fixed costs are moderate or of limited duration, it is particularly troublesome where there are high fixed costs which last for lengthy periods of time. In that case,

19 Van Damme and colleagues express this distinction in a slightly different manner: predatory prices are those which are "profitable only because of induced changes in the behavior of competitors or of the market structure;" as contrasted from those that "normally competitive." (2006, p. 11)

strict enforcement of the AT rule immunizes conduct which might otherwise raise competitive issues. Hovenkamp observes on this matter that “Areeda and Turner (1975) did not develop this problem at any length in their original article … [but] did suggest that an overly strict definition of variable costs (or short run marginal costs) would give defendants too much leeway, particularly if fixed costs were substantial.” (2014, p. 5)

In the European context, the AT rule immunity is somewhat attenuated. Van Damme and colleagues (2006) observe that “according to [European] case law, a price is predatory if it is below marginal cost (AVC), or if it is below average cost (ATC) and is part of an explicit plan to eliminate a competitor.” (p. 10) This latter requirement opens to door to considering non-cost factors in evaluating predation issues.

Einer Elhauge offers an interesting perspective on this issue, but one which suffers from its highly specialized, assumption-specific framework (2003). In the presence of substantial common fixed costs across different markets, and facing different classes of consumers with different price elasticities, sellers with market power may need to practice extensive price discrimination merely to cover their common

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costs. In that case, entrants who attract customers limited to particular market segments can represent business-threatening events if the incumbent cannot then cover its fixed common costs. In such circumstances, so Elhauge's paper suggests, cutting prices in response to an entrant's much lower prices in some market segment can be pro-competitive since it keeps the multi-product incumbent firm in business and thereby increases consumer welfare.

Elhauge's analysis has interesting paradoxical implications. The incumbent's low prices are designed to and have the effect of driving entrants from the market. However, under his assumed conditions, they are also welfare improving. For this reason, he does not label them as predatory. Alternatively, one could reasonably conclude that although predatory in both purpose and effect, the incumbent's price cuts are also welfare-enhancing as needed to keep a multi-product monopolist in business. We do not question Elhauge's conclusion that there can be possibly be conditions where predatory price cuts are efficiency-enhancing. His analysis is actually a particular version of the natural monopoly theory where any entry is inefficient and should be prevented.

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Strikingly, Elhauge's conclusions apply to price cuts both above and below marginal costs. For this reason, they have little bearing on the current debate over the Areeda-Turner rule.

3.3 Experimental Evidence

In an oft-cited early laboratory experiment involving a single market, Mark Isaac and Vernon Smith attempted but failed to induce predatory pricing behavior (1985). They interpreted that result as supporting Selten's subgame perfect game theoretic equilibrium (Isaac and Smith 1985, p. 342). As noted above, however, that result does not rest on the behavior that Selten actually expects to occur.

Furthermore, subsequent experiments involving multiple markets have reported different results, where predatory pricing actions are more commonly found. Yun Joo Jung, John Kagel and Dan Levin (1994) examined a structure similar to Selten's chain store example, except that it was a game of incomplete information. In that sense, it was related to Milgrom and Roberts (1982). With experienced players, they find predatory behavior (keeping entrants out until near the end of the game) for two different versions of the game (1994, p. 73). In one form of the game, there are low-cost and high-cost incumbents. Potential entrants do not know

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the incumbent's costs. In these circumstances, predation takes the form of high-cost incumbents contesting entry, thereby sending the false signal that they are a low-cost incumbents. When the experimenter created both high-cost and low-cost incumbents, predation occurred in every instance early in the game. Interestingly, even when there were no low-cost incumbents by design, in 85 percent of the games, there was still predation.

In a similar, but smaller-scale experiment, Monica Capra, Jakob Goeree, Rosaio Gomez and Charles Holt (2000) also frequently find predation early in the game although not at the end. These results and those of Jung, Kagel and Levin (1994) are very similar to what Selten predicted and quite different from Isaac and Smith. Similar experiments performed later also find predation (Gomez, Goeree and Holt 2008). In related work, Jeroen Hinloopen, Wieland Mueller and Hans-Theo Normann show predatory-type behavior. They finds that bundling products across markets can function as a commitment device, leading to higher profits for a seller who is a monopolist in one market but a duopolist in another (2014).[20]

20 For a review of European (abuse of dominance) and American (predation) antitrust law and related experiments, see van Damme, Larouche and Muller (2006).

3.4 Empirical Evidence

Like their theoretical counterparts, empirical studies of the presence of predatory pricing are mixed. On the one hand, for example, is the study of Kenneth Elzinga and David Mills, covering the beer industry and an ex post analysis of key antitrust cases. They conclude that the courts' skepticism of predatory claims is warranted. Similarly, a more recent survey by Joshua Wright and Judd Stone concludes that "price predation … remains as elusive as ever in the wild" (2011-2012, p. 882). And a major text observes that "given all the theoretical difficulties with successful predatory pricing, it is no surprising that economists and lawyers have found few instances of successful price predation" (Carlton and Perloff 2005, pp. 359-360).

In contrast, however, is a review of the relevant economic literature by Zerbe and Mumford (1996) which finds that instances of predation are neither "rare nor unsuccessful" (p. 957). In one example, they review the data and find "about 46% (of the cases) involved predation." (p. 961). Of course, much depends on how predation is defined, and different authors use different constructs. Stephen Martin reviews a different source of evidence, the business history literature. He finds many accounts of predation (Martin 2014, pp. 19-21).

Consider the issue of mergers and acquisitions, which is sometimes considered a reason why predatory pricing should be rare. The idea is that mergers eliminate rivals at a lower cost than direct predatory actions. Indeed, McGee's original paper on the Standard Oil Trust (1958) is often cited for that conclusion. While McGee demonstrates that Standard Oil used mergers to gain its monopoly position, Zerbe and Mumford respond that Standard used actual and threatened predatory pricing to obtain favorable railroad rebates, which then allowed it to pay less to acquire its rivals (p. 957).

That conclusion also applies to acquisitions made by the American Tobacco Trust in achieving its monopoly position. Using a data set comprised of all acquisitions made between 1891 and 1906, Burns (1980) reports that the "alleged predation reduced the acquisition costs of American Tobacco both by lowering the amounts paid for asserted victims and by creating a reputation for misconduct that lessened expenditures for competitors acquired peacefully thereafter" (1986, p. 269). What Burns' study suggests is that predatory actions and the acquisition of rivals are complementary rather than alternative strategies. From his study, he suggests that "below-cost pricing [may actually be] a systemic business practice." (pp. 268-269).

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3.5 Airline Predation

There are various reported instances of predation in which leading airlines have responded to the entry of smaller rivals by charging much lower prices in relevant city-pair markets, and then raising prices to pre-existing levels after the new entrants have left the market. Two instances include Northwest Airlines' response to the entry of Sprint Airlines in the early 1990s and the campaign of American Airlines against low cost airlines on routes originating at its Dallas-Fort Worth hub. Both involve actions taken against smaller rivals designed allegedly to force them either to set higher prices or exit the market (Sagers, 2009, pp. 953-954).

In the case of Northwest/Sprint, two city-pair markets were at issue: Detroit-Philadelphia and Detroit-Boston. In 1995, prior to Sprint's entry, Northwest's shares were 69% and 90% respectively (Elzinga & Mills, 2014, pp. 320-321). At that time, its average one-way fares were about $200 for Detroit-Philadelphia and about $250 for Detroit-Boston. But once Sprint entered the market at the end of 1996, Northwest cut fares precipitously to under $100 in each case; and it increased the number of flights in both markets as well. Although its fares remained slightly lower than the new

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lower prices set by Northwest, Sprint's load factors declined sharply; and finally canceled all flights in both markets just nine months after it had entered. Immediately thereafter, Northwest raised prices to nearly its previous levels (pp. 313-316). Sprint brought suit, and the issue before the Court was whether Northwest's actions represented predatory actions or were merely normal pricing practices under the competitive need to meet competition.

Sprint must have believed that Northwest's implicit threat to maintain for the foreseeable future the low prices set during the first half of 1996 was credible. Otherwise, it would have remained in the market until Northwest raised its fares towards its earlier levels. Even at the new lower fares set by Northwest, Sprint apparently believed they could be maintained indefinitely, or at least long enough so that its own continued presence in these markets would be a losing proposition. While Northwest's actions may not have been subgame optimal at each decision point, they were profitable in the end.

Similar circumstances arose in American Airline's (AA) response to the entry of various low-cost carriers into their Dallas-Fort Worth (DFW) hub in the mid-1990s. Prior to this entry, AA enjoyed relatively high margins at their DFW hub. While their flights to and from that hub

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represented only between 40 and 58 percent of AA's domestic capacity, they accounted for between 60 and 86 percent of the airline's domestic earnings (US v. AMR Corp., 2001, p. 1150). It thus had a strong incentive to defend its most profitable territory, and it did just that when new rivals appeared. AA cut prices and increased available flights in order specifically "to get them out."[21] This is precisely the behavior that Selten calls "resistance to entry."

American Airline officials acknowledged that this "strategy would be very expensive in terms of AA's short-term profitability" (p. 1152). What occurred, as the judge in the lawsuit observed, was that the airline "weighed the cost of short-term profit loss against its 'benefits' that include both the reduction of competition from current competitors and discouragement of future entrants" (p. 1155). In effect, the costs borne by AA in the form of lower profits represented an investment in future profitability. This behavior cannot be described as subgame perfect optimal conduct even though it may have led to greater AA profits in the long run.

A relevant finding from the lawsuit was that AA's cost per available seat mile was 8.54 cents while a rival's comparable cost was only 4.32 cents (p. 1151). This

21 Statement by AA's CEO Robert Crandall as quoted in US v. AMR Cor., 2001, p. 1154.

observation raises the question of why the entrant could not compete with the established incumbent and was forced to leave the market. One answer is that the incumbent had better access to financial resources (the long purse). In any case, larger established firms seem able to withstand low predatory prices despite having higher reported costs.

This issue is relevant because the Court ruled that AA did not price below "an appropriate measure of cost" nor did it price below its rivals' fares (p. 1218, 9). Despite that finding, AA's lower fares along with its major capacity increase on the relevant routs were apparently sufficient to lead the new rivals to exit.

In both instances, the established airlines raised its fares to prior levels after the rival had left the market. The courts were asked to decide whether the lower interim prices should be described as merely meeting competition or as exclusionary conduct. Under the first explanation, the presumption is that market conditions had changed so it was to be expected that the incumbent's prices would change as well. On the other hand, the second explanation specifically presumes that the incumbent's purpose is to discipline or exclude its rival in order to permit it to resume the profitable pricing practices that had existed prior to the rival's entry. In this regard, the firm's purpose and

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intent play important roles in helping the courts make this distinction.

4 Conclusions

There are both theoretical and empirical reasons for believing that predatory pricing is more common than acknowledged in recent court decisions. As Aaron Edlin concludes in his review of current economic studies of this issue: if “business folk think so,” it is so (Edlin, 2012, p. 147). A similar point is made in Besanko et al (2014) where the authors argue that some of their multiple equilibria are “predation-like” and supported by differing expectations (2014, p. 871). This is also consistent with Selten’s deterrence model.

We agree that analyzing predatory pricing is highly dependent on the perceptions and expectations of market participants. Our view therefore contrasts with the sweeping generalizations regarding predatory pricing which appeared after McGee’s 1958 paper and which underlie judicial acceptance of the Areeda-Turner rule. The proposition that predatory pricing rarely occurs is not supported either by economic theory or empirical evidence.

As to the specific issue of the usefulness of price-cost tests, we observe that whether prices are above or

below marginal costs plays little role in any of the theoretical or empirical discussions of predatory pricing. We therefore believe that using the Areeda-Turner cost test as a filter or hurdle for litigation, and granting safe harbor status to all price cuts above marginal cost, represents misplaced concreteness. To be sure, analyzing available cost and price data, particularly during alleged predatory episodes, may provide useful information; but it is merely one source of information among others. It is therefore time to demote the Areeda-Turner approach from the status of a rule to that of a potentially useful form of inquiry in predatory pricing litigation, but one which is neither necessary nor dispositive.

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