Commentary

Williamson on Predatory Pricing II

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This commentary addresses issues raised by Professors Areeda and Turner in *Williamson on Predatory Pricing*, which was published in the June 1978 issue of this *Journal*.[1] Areeda and Turner took exception with my earlier treatment of predatory pricing,[2] in which I emphasized its strategic aspects.[3] They defended their previous treatment,[4] in which strategic aspects are ignored or suppressed. Although modeling strategic problems in nonstrategic terms can be illuminating, in that it sometimes helps to place strategic features in perspective, I contend that public policy with respect to strategic behavior ought to be informed by strategic analysis. Areeda and Turner evidently hold otherwise.

Inasmuch as this commentary mainly deals with differences between myself and Areeda and Turner, I should like to emphasize at the outset that we agree on the following: (1) predatory pricing is not an empty concern; (2) a major hazard in allowing private predatory pricing actions to be brought is that they will be used for protectionist purposes; and (3) a principal means of safeguarding against protectionist abuses of the law is to devise predatory pricing rules that have good economic efficiency properties. But although protectionist abuses of predatory pricing actions by new entrants can be serious, strategic abuses by established firms also require attention. Indeed, a complete efficiency analysis is not possible until potential abuses of this latter kind are taken into account.

Section I examines strategic versus nonstrategic approaches to predatory pricing. Section II deals with mistaken welfare arguments on which Areeda and Turner continue to rely. Potentially misleading statements in their comment are considered in section III. Section IV addresses purported operationality problems that they attribute to my output restraining rule and also discusses previously unremarked operationality difficulties endemic

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1. Areeda & Turner, *Williamson on Predatory Pricing*, 87 YALE L.J. 1337 (1978).
2. Williamson, *Predatory Pricing: A Strategic and Welfare Analysis*, 87 YALE L.J. 284 (1977).
3. *Id.* at 286-306.
4. Areeda & Turner, *Predatory Pricing and Related Practices under Section 2 of the Sherman Act*, 88 HARV. L. REV. 697 (1975).

to cost-based rules. Finally, section V contains a discussion of fairness issues, the decision-theoretic character of predatory pricing, and complications that arise when differentiated products are involved.

I. Strategic Behavior

The problems with the Areeda and Turner treatment start, as it were, at the beginning. As Professor Posner observes, Areeda and Turner are curiously silent on possible motivations for predatory pricing: "no theory of why predatory pricing would ever occur is suggested."[5] Areeda and Turner simply omit this crucial step and assert that

> [a] firm which drives out or excludes rivals by selling at unremunerative prices is not competing on the merits, but engaging in behavior that may properly be called predatory. There is, therefore, good reason for including a "predatory pricing" antitrust offense within the proscription of monopolization or attempts to monopolize in section 2 of the Sherman Act.[6]

Bypassing motivational issues in this way would be unobjectionable if it were true that the economic efficiency properties of rules of law for governing predatory pricing could be ascertained without reference to the context. Whether Areeda and Turner believe this to be the case is never expressly discussed. Presumably they do, however, since they continue to appeal to static economic arguments in claiming optimality properties for their marginal cost pricing rules as though static analysis applied without regard for the circumstances.[7]

Not only is this incorrect, but, as Professor Bork has shown,[8] predatory pricing lacks rationality, hence is of doubtful public policy significance, when assessed in static terms. Bork demonstrates this point by considering a firm with an 80 percent market share that "wishes to kill a rival with 20 percent in order to achieve the comforts and prerogatives of monopoly status."[9] He concludes, I think correctly, that "[t]he [static] theoretical argument presented here suggests that predatory price cutting is most unlikely to exist."[10]

Confronted with the inconsistency between their claim that predatory pricing is a relevant antitrust concern and the logic of Bork's analysis, Areeda and Turner have four choices. First, they could show that Bork has erred and that predatory pricing really does pose troublesome antitrust concerns when addressed as a problem in static economic analysis. Second, they could join Bork and reverse their claim that predatory pricing has public policy significance. Third, they could associate themselves with the

5. Posner, *The Chicago School of Antitrust Analysis* (forthcoming 127 U. PA. L. REV. (1979)).
6. Areeda & Turner, *supra* note 4, at 697.
7. Areeda & Turner, *supra* note 1, at 1338-45.
8. R. BORK, THE ANTITRUST PARADOX 149-55 (1978).
9. *Id.* at 149.
10. *Id.* at 155.

emerging view that predatory pricing needs to be examined as an intertemporal issue. Fourth, they could do none of the above and ignore the embarrassing logic to which static analysis leads.

Although Areeda and Turner adopt the last of these,[11] others are apt to regard this as untenable. Those who hold that Bork's analysis is correct, that predatory pricing is a relevant antitrust issue, and that inconsistency is unacceptable are driven to position three. Specifically, I contend that focusing, as Bork does, exclusively on the case in which a dominant firm sets out to *destroy* a rival that has already committed itself by investing in specialized human and physical capital (and therefore needs only to recover its variable costs to remain viable during a predatory siege) fails to disclose the full ramifications of predatory pricing. The necessary distinction is between immediate and eventual effects. Bludgeoning established rivals is relatively unrewarding if there are no subsequent consequences. I submit, however, that the dominant firm that responds contingently to new competition by expanding output disproportionately whenever such rivalry appears will frequently be less concerned with the demise of a specific rival in a particular product market than with signaling its intentions to this and other firms in future periods, in other geographic areas, and, possibly, in related product lines. Successful signaling of a probable punitive response can permit a dominant firm to enjoy greater profits (or an easier life) by reducing the likelihood that its markets will be subject to encroachment.

Most antitrust specialists, Areeda and Turner included, are unwilling to regard predatory pricing as a vacuous issue, presumably because they are aware, at least intuitively, of its strategic features. "Strategic" refers to intertemporal efforts by established firms to take up advance positions and respond contingently to rivalry in ways that either discipline existing rivals, or discourage potential competition, or both. But more than intuitive awareness is required. Static analysis must give way to intertemporal analysis when the strategic nature of predatory pricing is apparent.

Recent contributions to the study of predatory pricing not only draw the distinction between static and strategic analysis, but indicate a growing recognition that the critical issues are of the strategic kind. Thus Professor Baumol observes that the static analysis upon which Areeda and Turner rely is "inadequate . . . because it draws our attention from the most pressing issues that are involved."[12] And Baumol also remarks that "Williamson has identified the nub of the problem in his emphasis on the inter-temporal side of the matter."[13] Likewise Posner insists that strategic behavior is cen-

11. Although early in their article Areeda and Turner concede that "predation in any meaningful sense cannot exist unless there is a . . . very substantial prospect that the losses [incurred by the predator] in the predatory campaign will be exceeded by the profits to be earned after his rivals have been destroyed," Areeda & Turner, *supra* note 4, at 698, the lack of correspondence between this statement and their subsequent analysis is striking. Intertemporal considerations effectively vanish. Areeda and Turner rely entirely on static economic theory to conduct their analysis and support efficiency claims on behalf of their proposed rules of law.

12. Baumol, Quasi-Permanence of Price Reductions—A Policy for Prevention of "Predatory Pricing" 2-3 (Apr. 1978) (unpublished manuscript on file with *Yale Law Journal*).

13. *Id.* at 3-4.

tral to an understanding of predatory pricing and notes that Areeda and Turner rely on "pure textbook price theory unadorned by any of the [strategic behavior] concepts of industrial organization."[14] Professor Scherer's original critique of Areeda and Turner also featured strategic objections.[15]

This reorientation of predatory pricing to make express allowance for its strategic features will, I submit, continue. Indeed, there is increasing awareness that the types and extent of strategic behavior, of which predatory pricing is one manifestation, are more widespread than has hitherto been appreciated.[16] Areeda and Turner's use of static rules to deal with an intertemporal problem has resulted in an egregious mismatch. Public policy is well advised both to recognize the contradiction and reject their marginal cost pricing rules as a basis for governing predatory pricing.

II. Mistaken Welfare Arguments by Areeda and Turner

Marginal cost pricing in static, nonstrategic, competitively organized markets is commonly described as "the competitive result" to which "optimal" efficiency properties are ascribed. To the extent, however, that these idealized conditions are not satisfied, the applicability of these same claims is not obvious. If, as I contend, predatory pricing typically arises in circumstances in which intertemporal, strategic, monopolistic attributes are prominent, a striking lack of correspondence exists between the problem under investigation and the textbook assumptions on which short-run marginal cost pricing arguments are based. The principal error of the original Areeda-Turner contribution, which they repeat in their comment, is that they are prepared to invoke the optimality properties of short-run marginal cost pricing without regard to the circumstances.

Rather than acknowledging and attempting to grapple with the fact that, evaluated in standard welfare economics terms, my output restraining rule *dominates their marginal cost pricing rule in both pre-entry and post-entry welfare respects,*[17] Areeda and Turner instead invent a new welfare cal-

14. Posner, *supra* note 5.

15. Scherer, *Predatory Pricing and the Sherman Act: A Comment*, 89 HARV. L. REV. 869 (1976).

16. My confidence here is partly based on the widespread interest in the study of strategic behavior that has been developing. In addition to the sources cited in notes 2, 5, 12 & 15 *supra*, see Salop, *Strategic Entry Deterrence* (forthcoming 69 AM. ECON. REV. (1979)); Schmalensee, *On the Use of Economic Models in Antitrust: The Realemon Case* (forthcoming 127 U. PA. L. REV. (1979)); Spence, *Entry, Capacity, Investment and Oligopolistic Pricing*, 8 BELL J. ECON. 535 (1977); Williamson, *Assessing Vertical Market Restrictions: Antitrust Ramifications of the Transaction Cost Approach* (forthcoming 127 U. PA. L. REV. (1979)).

17. The welfare economics defects of the original Areeda and Turner contribution, which remain uncorrected by their more recent comment, are the following:

1. They confuse the optimality properties associated with marginal cost pricing of a continuing kind with that which is episodic or, even worse, strategic. *See* Williamson, *supra* note 2, at 289-92.

2. Ex ante welfare losses of the following kinds result from relying upon their rules:

(a) holding technology constant, dominant firms will predictably supply less

culus. The relevant tradeoff, as they would have it, is between maximizing pre-entry output and minimizing the incentive for entry on an inefficient scale. Specifically, they claim that choice among predatory pricing rules depends on the pre-entry output decisions of dominant firms on the one hand and "the likelihood of inefficient entry"[18] on the other—where inefficient entry is evidently measured by the extent to which the entrant's costs exceed minimum average cost.

The grounds upon which the relevant tradeoff is expressed in these terms are never disclosed. I submit that the burden of supporting such ad hoc welfare apparatus rests heavily on those who propose it.[19] Absent such a showing, there is little basis for presuming that the issues will be illuminated by reference to nonstandard welfare criteria—and considerable risk that obfuscation will result.[20]

product in the pre-entry period and produce it at higher average cost under their rules than mine;

(b) dominant firm investment incentives are distorted to favor more flexible and more capital intensive plant at great social cost under their rules than mine.

See id. at 307-09, 312-14.

3. Ex post inefficiencies of the following kinds will result from their rules as compared with mine:

(a) the costs of supplying post-entry product will be higher under their rules than mine;

(b) entrants are faced with greater uncertainty under their rules than mine;

(c) prospectively viable entrants are less able to establish their credentials under their rules than mine.

See id. at 309-10, 312, 335-36.

18. Areeda & Turner, *supra* note 1, at 1342.

19. Inasmuch as output is not valued for its own sake but only in relation to net welfare gains, the first part of the test is obscure. Also "inefficient entry" is undefined, and Areeda and Turner may be confusing engineering with economic efficiency. The relevant distinction is this: even though an entrant may not be realizing minimum efficient scale (an engineering efficiency concept), remunerative incremental output that is supplied by a (possibly high-cost) entering firm that a low-cost established firm had declined to supply increases allocative efficiency (the economic efficiency criterion).

To be sure, society would have been better off if the incremental output referred to had been supplied by a lower-cost firm. But hypothetical output that could have been, but was not, supplied by a low-cost dominant firm is not output to which welfare benefits can be ascribed.

Moreover, entry by firms of size less than minimum efficient scale may occur under both their cost-based rule and my output restraining rule. Indeed, for the main model that I developed in my original article, the degree to which entering firms fall short of minimum efficient scale is *identical* for each of the predatory pricing rules that I evaluate. *See* Williamson, *supra* note 2, at 297-302. Except as it is more difficult for prospective entrants and/or courts to infer the response curve of dominant firms that are governed by one predatory pricing rule rather than another (*e.g.*, a marginal cost response curve is more difficult to estimate than an output restraint), the *equilibrium probability* of entry is presumably affected little by which predatory pricing rule is in effect. Thus, except transitionally (when one rule or the other is first introduced), the "likelihood of inefficient entry" criterion to which Areeda and Turner appeal is unhelpful for welfare-assessment purposes.

20. Areeda and Turner's introduction of a price-maintenance rule into their rule comparison exercise does not clarify their analysis. They neither endorse such a rule nor display the welfare benefits that would result from it—presumably because the rule is so egregiously inefficient in post-entry respects. Under the rule, established firms would be

III. Conceptual Issues

A. *Misleading Statements and Claims*

The Areeda-Turner comment includes several potentially misleading statements and claims. Among those which I find most troublesome are the following:

1. Areeda and Turner state that *I agree* with their views that "pricing at *SRMC* [short-run marginal cost] is the result in competitive markets, and has the social welfare virtue of avoiding wasteful idling of current productive resources" and that "rules requiring price floors higher than *SRMC* will tend to preserve inefficient rivals or attract inefficient entry."[21] This is a tortured interpretation of my position. I expressly caution against uncritical application of short-run marginal cost propositions to circumstances, of which predatory pricing is one, in which strategic considerations are salient. I demonstrate the inferior welfare properties of this rule as compared with the output restraining rule in the context of predatory pricing. I also reject *SRMC* in favor of average variable and average total cost floors in circumstances in which price-to-cost comparisons are attempted. A discerning reader might detect in a footnote that I find contingent marginal cost pricing objectionable,[22] but my emphatic rejection of the optimality claims which Areeda and Turner advance on behalf of episodic or contingent marginal cost pricing is scarcely evident from their comment.

2. Areeda and Turner argue the optimality properties of their rule in marginal cost terms. However, they effectively abandon marginal cost in favor of an average variable cost "surrogate" when applications are concerned. At times they talk about "*AVC* (or *MC*)" and "*MC* (or *AVC*)"[23] as though these were interchangeable. When theory gives way to practice, a check on whether purported optimality properties carry over is warranted[24]—even in circumstances such as this in which the original theory is incomplete.

3. Areeda and Turner observe that I prefer an average total cost remunerative-pricing test rather than an average variable cost test because a firm "with a less capital intensive technology may have higher variable costs but lower average costs,"[25] in which event the *AVC* test would not correctly discriminate between firms according to efficiency. But they con-

required to idle their capacity since they would have to withdraw product in an amount identical to the output brought onto the market by the entrant in order to keep the price unchanged. *See id.* at 316-18, 328 (demonstration in "generational equipment" example of asset-waste consequences of price-maintenance rule). Moreover, those who take the suggestion of a price-maintenance rule at all seriously must go on to consider the following possibility: why not induce even greater pre-entry output, which is the benefit that Areeda and Turner ascribe to the price-maintenance rule, by requiring dominant firms to *increase* price when confronted by entry? So far as I can determine, the price-maintenance rule is at best an irrelevant alternative.

21. Areeda & Turner, *supra* note 1, at 1339.

22. *Id.* at 1339 n.10.

23. *Id.* at 1350-51.

24. Professor Posner makes a similar observation. *See* Posner, *supra* note 5.

The lack of correspondence between average variable costs and marginal costs is discussed further at p. 1196 *infra.*

25. Areeda & Turner, *supra* note 1, at 1351.

tend that "[t]his possibility cannot carry the weight Williamson puts on it. The instance he cites involves the unusual case of competition among alternative transportation modes, such as railroads and trucks. And he himself observed that 'these problems [the differing technology case] may occur infrequently.' "[26]

The problem with this contention is that although I expressly concede that the technology differences between rail and truck are unusual, Areeda and Turner cite the transportation mode example out of context. Had I thought it necessary to support what seemed to me to be the plausible proposition that capital intensity differences may often complicate problems of inferring efficiency by reference to average variable costs, I would have offered examples of the following kinds: average variable cost differences that are attributable to capital intensity differences between large and small bituminous coal mining companies;[27] or capital intensity differences associated with the use of different fuels in generating electric power.[28]

Another general situation—which may or may not involve capital intensity differences—in which the average variable cost test encounters difficulties occurs when firms differ in degree of vertical integration. Consider two firms, *A* and *B*, that sell a common product at a price of $1.00. Manufacturing is in two stages: the first involves production of the basic material (*M*); this material is then processed to yield the final good (*G*). Firm *A* makes its own *M* at an average total cost of $.60, of which $.40 is a capital charge. Firm *B* buys *M* for $.60 from other suppliers. The costs of processing *M* to produce *G* are $.35 for firm *A* and $.30 for firm *B*, the respective capital charges being $.20 and $.15. The overall costs for *A* and *B*, expressed in average variable and average total cost terms, are:

	AVC	*ATC*
firm *A*	.35	.95
firm *B*	.75	.90

To be sure, this is a hypothetical example. But it both points up the ease with which the differences to which I refer can arise and discloses that strategic incentives for integration may exist if, contrary to Areeda and Turner, prices are not required to cover all costs in the long run.

B. *Other Conceptual Issues*

1. Areeda and Turner appear to take issue with my assumption that dominant firms engage in limit pricing. They observe that "limit pricing would probably make sense only where the dominant firm has a significant and relatively durable cost or product advantage over any potential entrants, or where there are significant economies of scale."[29] But since I

26. *Id.* (quoting Williamson, *supra* note 2, at 289 n.20).

27. *See* Williamson, *Wage Rates as a Barrier to Entry: The Pennington Case in Perspective*, 82 Q.J. ECON. 85 (1968).

28. Griffin, *Long-Run Production Modeling with Pseudo-Data: Electric Power Generation*, 8 BELL. J. ECON. 112, 120-23 (1977).

29. Areeda & Turner, *supra* note 1, at 1343 (footnote omitted).

defined a dominant firm industry as one where entry is not easy, and since significant, though not massive, economies of scale were featured in my model of the dominant firm industry, I am unable to discover what purpose is served by their remarks. I will concede, however, if there was any confusion of the matter, that firms will rarely set price below the short-run profit-maximizing price in circumstances where entry is easy.

Given that I will stipulate that the relevant subset is industries in which entry is difficult, the question is how to interpret dominant firm behavior in these industries. Areeda and Turner's observation that limit pricing involves a tradeoff between current and future profits, where the latter are uncertain and need to be discounted,[30] is correct as far as it goes.[31] But it only scratches the surface.

There are two core issues: First, in what ways, if any, can rules of law be translated into entry barrier effects? Second, if entry can be deterred, what is to be inferred if dominant firms behave in a manner consistent with an entry deterring objective? I demonstrated that, as compared with a rule of law where output is restrained, rules of law that allow dominant firms to expand output in response to entry permit such firms to impede entry more effectively, *ceteris paribus*. Although Areeda and Turner originally disclosed no awareness that ex post responses could affect the ex ante condition of entry, they evidently concede the relation now.

The remaining question is what is to be inferred from dominant firm decisions to increase output disproportionately, as the Areeda-Turner rules permit, when confronted with entry. Although it is possible that dominant firms would increase output in these circumstances without regard to the strategic advantage thereby realized, most antitrust specialists impute rudimentary powers of analysis to dominant firms and would be unwilling to accept mindlessness as an explanation for behavior that systematically serves strategic purposes. Absent a plausible alternative explanation—the burden of which rests on Areeda and Turner who, throughout their extensive commentary on predatory pricing,[32] have nowhere disclosed what it is that motivates dominant firms systematically to increase output when confronted with entry—it seems judicious to infer that behavior that promotes strategic purposes is intended to achieve that very result.

2. Areeda and Turner contend that dominant firms will be confronted with "perverse" output limitations of extended duration if Firm *A* enters a market at one time and Firm *B* enters twelve to eighteen months later, when the restraint on the dominant firm is about to expire.[33] Three points should be recognized, however. First, the dominant firm is restrained only

30. *Id.* at 1343-44.

31. I have addressed the issue of maximizing expected, discounted profits in the context of an entry model previously, *see* Williamson, *Selling Expense as a Barrier to Entry*, 77 Q.J. ECON. 112, 125-26 (1963), and made reference both to that discussion and to the probabilistic nature of the limit pricing tradeoff relation in my original predatory pricing article, *see* Williamson, *supra* note 2, at 294 n.33.

32. 3 P. AREEDA & D. TURNER, ANTITRUST LAW ¶¶ 711-722 (1978); Areeda & Turner, *supra* note 1; Areeda & Turner, *Scherer on Predatory Pricing*, 89 HARV. L. REV. 891 (1976); Areeda & Turner, *supra* note 4.

33. Areeda & Turner, *supra* note 1, at 1349-50.

within markets where there has been entry. Second, even within these, the dominant firm is permitted to expand in a trend-adjusted fashion throughout the entire restraint interval. Finally, successive entry by independent rivals into the same market is rather unlikely if the dominant firm is expanding up to the limit of its trend-adjusted restraint while at the same time the recent entrant is attempting to secure a viable place for itself in the industry. Here as elsewhere, hypotheticals such as this one, which are not operationally interesting, have little significance for the main argument.

3. Areeda and Turner contend that a twelve- to eighteen-month restraint period is of little consequence, since the dominant firm could at the expiration of the period "drive out any new entrant who had come in at an inefficiently small scale, even though the entrant had by then overcome 'learning curve' and other start-up disadvantages."[34] I disagree.

For one thing, the fact that the experienced entrant has overcome start-up disadvantages makes displacement more difficult—a condition that will not be lost in the dominant firm's calculus. But there is more to it than this. Buyers have an interest in maintaining competitive sources of supply—as discussion with any purchasing agent will disclose. Although buyers may be reluctant to engage in contracting with potential entrants,[35] the same does not apply to established entrants that have incurred the fixed costs of entry and also have a demonstrated track record.

It is therefore apparent that the costs of driving out new entrants shift to the disadvantage of the dominant firm by the time the restraint period expires. The negligible consequences to which Areeda and Turner refer do not stand up to scrutiny.

IV. Operationality

Areeda and Turner contend that there are serious operationality problems with the output restraining rule. I submit that these are overstated and that operationality problems with cost-based rules are more severe.

A. *Geographic Markets*

I have argued that the output rule would be especially easy to apply for products that are sold in many geographic markets, since the question of whether output has been increased disproportionately in response to entry will be easier to ascertain if entry occurs in only one or a few such markets. Areeda and Turner claim otherwise, arguing that the complexities of defining geographical markets constitute a formidable bar to such an exercise.[36] I agree that the definition of geographic markets can be difficult, but some of the difficulties to which Areeda and Turner refer may be explained by their unstated but implicit assumption that economically meaningful geographic submarkets need to be carefully defined through-

34. *Id.* at 1345.
35. *See* Williamson, *supra* note 2, at 295 n.37.
36. Areeda & Turner, *supra* note 1, at 1346-47.

out the region where entry occurs. Frequently, however, such detail will not be necessary.

As Professor Schmalensee has argued, it would be a mistake to apply the same market definition standards that characterize enforcement of the merger statutes to predatory pricing litigation.[37] What is needed for the latter is merely to establish that (1) a dominant firm enjoys monopoly power in the general region of which a particular submarket is a part and (2) attempted entry into a submarket is met with a disproportionate output response.

The preoccupation with geographic market definitions to which Areeda and Turner refer is thus supplanted by a study of markets from a marketing point of view. As between similar submarkets served by a dominant firm, some of which have been subject to entry but most of which have not, the critical issue is whether output has been increased disproportionately in the former.[38]

B. *Demand Projections*

Areeda and Turner also contend that demand projections pose formidable problems:

> The period for computing the trended average is unspecified, and the problem has no easy solution. It seems virtually certain that any fixed period, covering the wide variety of product markets, would be wrong most of the time and in some instances would yield wildly implausible results. Yet to leave the appropriate trend-averaging period up to a case-by-case determination would virtually destroy predictability and would encourage litigation.[39]

They are correct that I did not specify the period. Neither did I specify the weights. Rather than resolve this uniformly, in the service of predictability, I suggest that the *data be permitted to speak for themselves.* Thus, for example, sales could be projected on the basis of an exponentially weighted moving average,[40] the weights inferred from all recent data. The

37. *See* Schmalensee, *supra* note 16.

38. Thus, suppose that a dominant firm is selling to 50 cities of 200,000 population or greater and that a new competitor has entered the market in three of these cities. The dominant firm increases output relative to trend by 8-13% in each of the three cities, whereas the maximum output increase relative to trend elsewhere was 4%. I submit that a presumption that the dominant firm is responding selectively and punitively is warranted.

39. Areeda & Turner, *supra* note 1, at 1347.

40. For discussion of a rather primitive kind of sales forecasting, see C. HOLT, F. MODIGLIANI, J. MUTH & H. SIMON, PLANNING PRODUCTION, INVENTORIES, AND WORK FORCE 131-52, 258-71 (1960). For an examination of the statistical properties of exponentially weighted forecasts, see Muth, *Optimal Properties of Exponentially Weighted Forecasts*, 55 J. AM. STATISTICAL A. 299 (1960). For a less technical discussion, see J. ARMSTRONG, LONG-RANGE FORECASTING (1978).

In my original predatory pricing article, I suggested that a 10% allowance over the projection might be warranted in judging whether a dominant firm has responded disproportionately. *See* Williamson, *supra* note 2, at 305-06. This is overly generous if demand projections can be made with confidence. More generally, allowances should vary with the degree of forecast error.

"effective" length of the period thus will vary across products and across markets—with distant observations being assigned negligible weights for some products and markets and greater weights for others, depending on what the data disclose. Areeda and Turner's insistence that such issues be settled in advance is arbitrary and unwarranted; not only is a case-by-case determination appropriate, but such demand projections pose many fewer difficulties than the case-by-case estimation of marginal costs or surrogates thereof upon which the Areeda-Turner tests rely.

Note, moreover, that a secondary output test is sometimes feasible for dominant firms that have defeated an entry attempt by increasing output disproportionately in targeted markets. Is output thereafter cut back to trend-adjusted levels or does it remain in the higher range? Deviations from trend, the origin and termination of which are coterminous with unsuccessful entry efforts, emphatically suggest a pernicious purpose.[41]

C. *Presumptions*

Areeda and Turner contend that my approach to predatory pricing involves "heavy reliance on cost-based rules"[42] and that "most real-world claims of predatory pricing can sensibly be analyzed only by comparing the price to the costs of the alleged predator."[43] I point out in this connection that (1) the distinction between predatory pricing by dominant firms against new entrants and predatory pricing among established firms is basic; (2) dominant firms enjoy the presumption of behaving lawfully if output is not increased disproportionately in response to entry; (3) the qualification that price should exceed average variable cost when trend-adjusted output is held unchanged by a dominant firm allows for remote contingencies and is normally of slight operational importance;[44] (4) the predatory pricing rules that apply to established firms are indeed cost-based and suffer all the disabilities that such tests are subject to, but the cost-based rules that I recommend are never of a marginal cost kind and are identical to Areeda and Turner's only for the declining industry case.

Note in this last connection that Areeda and Turner regard it as a merit of their rules that they "make no distinction between 'intermediate' and 'long' run or between 'normal' demand conditions and those of 'chronic excess supply,' nor between 'early stage growth industries' and others."[45] The source of their pride is not altogether clear. If they are saying the world is not complicated by these factors then I say fine, some of my rules are redundant—in that they apply to circumstances that will never occur. If instead they concede that such complications are real, then the test of

41. As discussed at p. 1185 *supra*, however, it is not necessary that a rival be destroyed in order for the purposes of a contingent output strategy to be realized. The primary test for predatory behavior thus remains the same: is output increased disproportionately when an entrant appears?

42. Areeda & Turner, *supra* note 1, at 1352.

43. *Id.* at 1338.

44. *See* Williamson, *supra* note 2, at 297 n.40, 332-33 & nn.119-20. I have, however, encountered one instance in which the derived demand for a product was almost totally inelastic, so that the evaluation of post-entry behavior turned mainly on an examination of costs.

45. Areeda & Turner, *supra* note 1, at 1352.

whether prices are remunerative varies with the circumstances. Since there is no indication that my rules are mistaken in this respect, their objection to matching rules with circumstances apparently reduces to one of administration: a uniform cost standard is all that the courts can handle. I seriously doubt this. If true, however, cost-based rules are even more problematical.[46] Whether predatory pricing among established firms will ultimately have to be ignored for this reason—and attention restricted instead to the dominant firm-new entry case, where the main test is whether output has been expanded disproportionately—is uncertain.

D. *Definitions*

1. *Oligopoly*

As Areeda and Turner observe, my output rule is restricted to dominant firms and collusive oligopolies. They complain, however, that collusive oligopoly is undefined and that the policy is not easily administered in this instance.[47] The latter observation is correct. As for a definition of collusive oligopoly, I observe in my original article that collusive oligopoly is not nearly so widespread a condition as is frequently alleged. It "occurs mainly in mature, highly concentrated industries producing homogeneous products under uniform cost conditions and having significant barriers to entry."[48] I further referred the reader to an elaboration of the argument should he be interested.[49]

Now possibly Areeda and Turner believe that every paper should be self-contained and that, accordingly, I should define "mature," "highly concentrated," "homogeneous," "uniform cost," and "significant barriers." I think this an unreasonable expectation. There is a significant literature that deals with these matters, which most antitrust specialists are familiar with.[50] Lest, however, there be any doubts as to what I consider "highly concentrated," I should make clear that my standard is more severe than what Professor Turner, in collaboration with Professor Carl Kaysen, once described as "tight" oligopoly—namely, a market in which eight or fewer firms supply fifty percent of the market and the largest firm has a twenty percent or higher share.[51] Rather, the Neal Committee Report, which characterized highly concentrated industries as those in which four or fewer firms account for more than seventy percent of the output, seems to me much closer to the mark.[52]

46. Professor Bork's rejection of the Areeda-Turner approach appears to turn partly on the administrative problems that arise in conjunction with their cost-based rules. *See* R. BORK, *supra* note 8, at 154.

47. *See* Areeda & Turner, *supra* note 1, at 1348.

48. Williamson, *supra* note 2, at 293.

49. *Id.* at 293 nn.29 & 30.

50. Professor Scherer's text is highly recommended. *See* F. SCHERER, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE (1970).

51. C. KAYSEN & D. TURNER, ANTITRUST POLICY 72 (1959).

52. White House Task Force Report on Antitrust Policy (1969), *reprinted in* 2 ANTITRUST L. & ECON. REV., Winter 1968-69, at 11.

Also, George Stigler observes that his data show "no relation between profitability and concentration if . . . the share of the four largest firms is less than about 80 percent." G. STIGLER, THE ORGANIZATION OF INDUSTRY 58 (1968).

Areeda and Turner are correct, however, in their contention that, even when four-firm concentration ratios reach seventy percent, problems will arise in administering an output rule against predatory pricing in oligopolies. First, ascertaining whether a local response should be regarded as punitive is more difficult for a collusive oligopoly than in a dominant firm industry—though for "first pass" purposes one could maintain the same standard as for dominant firms and simply look at the aggregate response of the largest firms in markets in which entry has occurred.[53] More serious is the possibility that administering an output restraint during the immediate post-entry period will be difficult and could have the unwanted side effect of reinforcing collusion. I should have acknowledged these difficulties in my original discussion. I am grateful to Areeda and Turner for pointing them out.

2. *Dominant Firms and Entry*

I defined a dominant firm industry as one in which "the largest firm has a market share of at least sixty percent and entry into the market is not easy."[54] Areeda and Turner object that the sixty percent test is much "too inclusive" and claim that my reference to the condition of entry is "hopelessly vague."[55] As to the first, I point out that Kaysen and Turner define a "dominant firm" or "partial monopoly" as "a single large firm supplying sixty percent or more of the market, with no other single seller supplying a significant proportion of demand."[56] But for their reference to other single sellers, which I agree is a useful qualification and am prepared to add, my market share standard is identical to theirs. Others have described dominant firms in similar terms.[57] Should Areeda or Turner, individually or in combination, propose an alternative standard, however, I am confident that it will receive careful consideration.

Defining the condition of entry more completely would entail a major digression, and there exists a substantial consensus within the profession as to what factors contribute to a barrier to entry.[58] The recent Areeda and Turner treatise discusses several of these factors—without, however, quantifying them.[59] Despite this lack of specificity, they conclude their discussion of entry barriers with the observation that, "[t]here are indeed barriers to entry of various sorts that may protect the exercise of market power by

53. There may be special oligopoly cases in which the policing response is assigned to the largest firm. Suppose that the four largest firms occupy 80% of the market and that there are four regional markets within each of which a different member of the four has a 50% market share. A tacit understanding that entry will be resisted in each regional market by the firm which has the largest share in that market might emerge. If this were the case, the "oligopoly problems" referred to in the text would vanish. The operational importance of this hypothetical, however, is limited by its very special nature.

54. Williamson, *supra* note 2, at 292.

55. Areeda & Turner, *supra* note 1, at 1348.

56. C. KAYSEN & D. TURNER, *supra* note 51, at 72.

57. Professor Weiss recently characterized IBM as a "dominant firm" upon reviewing evidence showing that its market share was in the 60% range. Weiss, *The Structure-Conduct-Performance Paradigm and Antitrust* (forthcoming 127 U. PA. L. REV. (1979)).

58. *See* F. SCHERER, *supra* note 50, at 125, 216-34, for a general discussion.

59. 2 P. AREEDA & D. TURNER, *supra* note 32, ¶ 409.

dominant established firms."[60] This is precisely the situation that concerns me.

E. *Cost-based Rules*

Virtually everyone who has commented on cost-based rules acknowledges that cost estimation poses very serious difficulties.[61] Disputes over which definition of costs is correct—including the appropriate time horizon, the proper method of prorating common costs, and the rate at which fixed costs become variable—predictably arise and occasion protracted litigation in close cases. Realizing that average variable cost is a poor surrogate for marginal cost at outputs that exceed capacity, Areeda and Turner now argue that "a defendant monopolist be allowed to rely on *AVC* only when he offers some evidence indicating that *AVC* is not significantly below *SRMC*."[62] What qualifies as "some" is surely a matter of great dispute. Since they also argue that "*SRMC* rises steeply as output nears that at which short-run *AC* is minimized,"[63] so that SRMC and AVC diverge sharply thereafter, it must be concluded, on their assumptions, that AVC only rarely serves as a useful surrogate for SRMC.

My cost-based tests are not subject to this SRMC-AVC schizophrenia and accordingly are more straightforward. Bork nevertheless contends that "true average variable costs cannot be reconstructed adequately from business records in a firm of any complexity."[64] Except in close cases, in which the standards of adequacy are more severe, I am more sanguine than this. At the same time, I agree that the administration problems of cost-based tests are formidable. Accordingly, even if the Areeda-Turner approach to predatory pricing were free of the analytical defects that beset it, the rules of law which they propose might be rejected because of administrative difficulties.

The problems, moreover, do not stop with defining costs. Cost-based tests involve a comparison of *price* in relation to *cost*. Areeda and Turner address none of the problems associated with determining price, possibly because they regard it as a scalar which can be determined by simple inspection of invoices, when it is in fact a vector. If other terms of exchange are changing, pecuniary price may be an imperfect measure of *effective price*. Thus, if quality, service, credit, delivery, or allowances are changing, the relevant price[65] for judging predatory pricing ought to reflect these conditions.[66]

60. *Id.* ¶ 409g.

61. *See* R. BORK, *supra* note 8, at 154; Williamson, *supra* note 2, at 312 nn.70-72.

62. Areeda & Turner, *supra* note 1, at 1338.

63. *Id.* at 1345.

64. R. BORK, *supra* note 8, at 154.

65. Professor Posner makes a similar observation about the multidimensionality of supply. *See* R. POSNER, ANTITRUST LAW 60 (1976). Conceivably Areeda and Turner intend that price adjustments of these kinds will be captured instead by their measure of average variable cost. If so, the need to make cost adjustments with respect to these dimensions ought to be expressly acknowledged.

66. To be sure, the definition of quantity is also clouded if quality is changing. But quantity measures do not necessarily need to be corrected for changing service, credit, delivery, allowances, and other terms of supply, whereas effective price needs to be corrected for each.

There may be additional problems in defining price. Suppose that the dominant firm is selling frozen pies and frozen cakes, that an entrant appears offering frozen pies, and that the dominant firm responds by cutting prices locally on both pies and cakes with the understanding that buyers will purchase both in the accustomed ratio. The effective price cut in these circumstances presumably ought to be concentrated entirely on the product where the new competition has appeared.

Opportunities to resort to such tactics may not arise frequently and, when they do, tied sales, or similar constraints, may be too transparent a dodge to worry about. When, however, *constrained* multiproduct sales responses are observed to occur in reaction to single product entry, problems of ascertaining whether the relevant price has been reduced below cost or whether output has been increased disproportionately are both complicated.

V. Additional Considerations

A. *Fairness*

As I noted in my preliminary response to Areeda and Turner,[67] nowhere in their comment—or for that matter in their original article—do they examine predatory pricing rules from the standpoint of fairness. For those who, like myself, believe that fairness is among the values that antitrust law is designed to foster, explicit consideration of this issue is warranted.

Cost-based rules expressly allow dominant firms to supply output on a contingent basis that is specifically targeted at localities where entry has appeared. As I have argued previously,[68] such contingent supply—"now it's there, now it isn't, depending on whether an entrant has appeared or perished—has the earmarks of a punitive purpose."[69]

By contrast, my output rule draws the line between permissible and impermissible behavior on terms that appeal to a sense of fairness. Consider the following three questions, which exhaust the range of output responses: Is it fair to require the dominant firm to make room for a new entrant by withdrawing product when the entrant appears? Is it fair to subject the new entrant to disproportionate output increases in target localities when entry occurs? Is it fair that the dominant firm should be permitted to continue business as usual when entry occurs, in which event the new entrant must expect to make a place for itself?

My answer to the first is that such a requirement would be protectionist. Absent special justification, such a rule unfairly penalizes established firms. The contingent supply of additional product in reaction to entry is the punitive purpose to which I referred above. This puts entrants to an unfair disadvantage. The dividing line between these protectionist and punitive purposes is uniquely satisfied by a *business as usual* rule that permits established firms to continue to produce and sell at their accustomed level of activity.

67. Williamson, *A Preliminary Response*, 87 YALE L.J. 1353 (1978).
68. *See* Williamson, *supra* note 2, at 338-39.
69. *Id.* at 339.

B. *Product Differentiation*

Predatory pricing issues are complicated when product differentiation is introduced. For one thing, it may be useful and even necessary to distinguish between main markets and fringe markets—by fringe markets I mean those that are remote from the main market either geographically or in product characteristics—in assessing dominance. Conventional market share measures may either understate or overstate the effective main market position of the dominant firm under these circumstances, depending on the distribution of its participation in main market and fringe market activities. Also, rivalry is multidimensional and may be relatively undisciplined in differentiated product industries. To the degree that nominal dominance does not for this reason carry the same leadership or disciplinary potential, the strategic incentives to police markets are attenuated and the hazards of predation are correspondingly reduced.

In any event, the key question remains whether the dominant firm responds contingently by increasing output disproportionately when entry occurs. Responses that involve offering a new variant rather than increasing the sales of the existing product would, of course, need to be "weighted" appropriately. Except, however, in close cases, the choice of weights may not be critical.

C. *Decision-Theoretic Issues*

My approach to predatory pricing emphasizes the strategic aspects and assesses the properties of alternative rules in ex ante and ex post welfare respects. Although I address some of the enforcement issues, I do not examine the probabilities that mistaken judgments will be made or the costs associated with such errors. A more comprehensive treatment would take these features into account. I understand that work of this kind is in progress.[70]

Conceivably, rules will need to be matched with market characteristics in a more discriminating way than I have attempted. I would be surprised, however, if such an approach disclosed that a marginal cost pricing rule has optimal properties in any market situation in which predatory pricing poses interesting public policy issues. I would also be surprised if, once allowance is made for the strategic uses to which predatory pricing may be put, Professor Bork's conclusion on the irrelevance of predatory price cutting stands up.[71]

Among the issues that require attention are the difficulties already discussed[72] concerning policy toward predatory pricing in the setting of oligopoly. If efforts to curtail predatory price cutting in oligopolistic circumstances serve to promote greater interdependence or if some rules are

70. I have benefited from discussions with Paul Joskow and Alvin Klevorick on decision-theoretic aspects of predatory pricing. They advise me that they have a paper in progress in which these matters are developed.

71. Professor Bork reached this conclusion on the basis of a nonstrategic analysis of the issues. R. BORK, *supra* note 8, at 155.

72. *See* pp. 1194-95 *supra*.

more apt to promote interdependence than others, such effects ought to be taken into account.

Moreover, there are interaction effects between the law governing predatory pricing and the relative frequency of particular types of punitive behavior. Thus to show, as Koller does, that predatory price cutting convictions are uncommon[73] says little about the incidence of, or proclivity to engage in, predatory pricing. Because Koller's sample was restricted to cases that were brought to court, there is an understatement bias from the outset. In addition, that predatory price cutting is uncommon when it is unlawful does not establish that it will be equally uncommon if it is made lawful. Finally, unless predatory pricing is addressed in strategic terms, the standards for judging predatory behavior may be too permissive, as the analysis of the Areeda-Turner rules demonstrates.

Conclusion

The original Areeda-Turner article performed two distinct services. First, it flagged in a more prominent way than had been done previously the potential for abuse that predatory pricing cases—especially private predatory pricing actions—posed. Lacking standards, the risk that protectionist predatory pricing claims will succeed under an unstructured "all factors" analysis is great. Second, Areeda and Turner demonstrated that the issues could be systematically addressed using the tools of conventional economic analysis.

These are important contributions. That their proposed rules of law have defective economic properties and pose administrative problems does not detract from this. As with many important contributions that serve to open up an area for renewed scrutiny, subsequent refinements are often possible and sometimes needed. Areeda and Turner's preoccupation with protectionist abuses of predatory pricing amounts to overkill: while devising rules which assuredly stamp such abuses out, the strategic incentives that their cost-based rules introduce are ignored.

Scherer was quick to recognize this and identified a number of deficiencies in the Areeda-Turner analysis.[74] He developed his argument in somewhat nonstandard terms, however, which may have limited its impact. The main force of his argument, in which intertemporal efficiency and strategic considerations are prominent, was further obscured by his suggestion that a complex judicial inquiry be used in place of Areeda and Turner's cost-based tests. As a consequence, Bork dismissed Scherer's "theoretical points . . . because they lead him to an unworkable proposal."[75] Areeda and Turner score heavily in their reply to Scherer by emphasizing the unworkable aspects of his proposal.[76] My analysis is more standard and

73. Koller, *The Myth of Predatory Pricing: An Empirical Study*, 4 ANTITRUST L. & ECON. REV., Summer 1971, at 105.

74. *See* Scherer, *supra* note 15.

75. R. BORK, *supra* note 8, at 155.

76. For Scherer's views on the all factors approach, see Scherer, *supra* note 15, at 890. For the Areeda-Turner rebuttal, see Areeda & Turner, *supra* note 32, at 897. My views are expressed in Williamson, *supra* note 2, at 288 n.16.

my proposal is much more workable. The spirit of Scherer's approach and that of mine, however, are very similar.[77]

Evidently Areeda and Turner remain unpersuaded that strategic abuses of predatory pricing rules pose a public policy problem. Having dealt with one side of the issue, they insist that other aspects be ignored. By contrast, I contend that *two-sided issues require two-sided analysis.* The output rule that I propose expressly makes allowance for strategic aspects and has efficiency properties that are superior to their rule.[78] Since it is also superior in fairness respects and is easier to administer, I repeat my suggestion that my rule be used instead. I do not, however, regard my work as the last word in this area and anticipate that special cases may require additional attention. Refinements that sharpen the applicability of the "business as usual" rule may well result. Some qualifications may also be necessary. But I predict with confidence that the strategic aspects that Areeda and Turner suppress will continue to be prominently featured in subsequent studies.[79]

77. Scherer summarizes the objectives of predatory pricing law as follows:

> The most workable competition in a [dominant firm industry] occurs when the dominant firm fears that it cannot deter entry from a high-price posture and is therefore led toward a continuing low-price, high-output strategy, recognizing *inter alia* that no rules will force it to make room if entry does occur.

Scherer, *Some Last Words on Predatory Pricing*, 89 HARV. L. REV. 901, 902 (1976). I submit that these objectives are precisely those that are realized under the output restraining rule that I propose.

78. I should acknowledge that since Areeda and Turner's rules have not yet been fully adopted by the courts, strategic prepositioning with the full set of adverse efficiency consequences that I associate with it will not presently materialize. This, however, is a transitory feature; should their rules gain judicial legitimacy, prepositioning responses will predictably appear. It would only be a matter of time until the inefficiency consequences of their rules fully set in. In the meantime, moreover, legitimate plaintiffs would frequently be unable to secure relief because of the onerous burden of having to show that price (correctly defined) was reduced below marginal cost (correctly defined). Even in the short run, therefore, the Areeda-Turner rules have little to recommend them—*a fortiori* over time.

79. *See* note 16 *supra* (collecting authorities).

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