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ADVERTISING PREDATION AND THE  
AREEDA-TURNER AND WILLIAMSON RULES

John C. Hilke<sup>1</sup>

Introduction

Economists' views of predatory behavior have ranged from dismissing it as irrational<sup>2</sup> to accepting it as an important behavior in some markets.<sup>3</sup> The position that predation and predation litigation should be treated as serious phenomena requiring attention has become more widely accepted in recent

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<sup>1</sup> The author would like to thank Phillip Nelson and Robert Stoner for helpful comments on earlier drafts of this paper. Presently the author is a staff economist in the Bureau of Economics, Division of Economic Evidence.

<sup>2</sup> Cassidy, R., Jr., Price Warfare in Business Competition, East Lansing: Michigan State University, 1963; McGee, "Predatory Price Cutting: The Standard Oil (N.J.) Case," Journal of Law and Economics, Vol. 2 (Fall 1958), p. 137; Bork, R., "The Antitrust Paradox," Yale Law Journal, Vol. 154 (1978); and Koller, K., "The Myth of Predatory Pricing: An Empirical Study," Antitrust Law and Economics Review, (Summer 1971), p. 105.

<sup>3</sup> Nicholls, W., Price Policies in the Cigarette Industry, Nashville, Tenn.: Vanderbilt University Press, 1951.

years and this is reflected in the recent growth of economic literature on the subject.<sup>1</sup> Much of the impetus for increased analysis of predatory economic behavior grew out of the

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<sup>1</sup> Posner, R., Antitrust Law: An Economic Perspective, pp. 184-96 (1976); Areeda, P. and D. Turner, "Predatory Pricing and Related Practices Under Section 2 of the Sherman Act," 88 Harv. L. Rev., p. 697 (1975); Scherer, F. M., Industrial Market Structure and Economic Performance, Chicago: Rand McNally & Co., 1971, pp. 228-30; Scherer, F. M., "Predatory Pricing and the Sherman Act: A Comment," Harvard Law Rev., 89 (1976), p. 869; Salop, S. C., "Strategic Entry Deterrence," forthcoming American Economic Review; Spence, M., "Entry, Capacity, Investment and Oligopolistic Pricing," Bell Journal of Economics, vol. 8, no. 2 (Autumn 1977), pp. 534-44; Spence, A.M. "Investment Strategy and Growth in a New Market," Bell Journal of Economics, vol. 10, no. 1 (Spring 1979), pp. 1-19; Dixit, A. "A Model of Duopoly Suggesting a Theory of Entry Barriers," Bell Journal of Economics, vol. 10, no. 1 (Spring 1979), pp. 20-32. Baumol, W. J., "Quasi-Permanence of Price Reductions: A Policy for Prevention of 'Predatory Pricing,'" New York University, 1978, unpublished; Eaton, B. C. and R. G. Lipsey, "The Theory of Spatial Preemption: Location as a Barrier to Entry," Queens University, February 1976; Friedman, J. W., "Limit Price Entry Prevention When Complete Information is Lacking," University of Rochester, 1978, unpublished; Gilbert, R., "A Note on Preemptive Competition," Berkeley, 1978, unpublished; Gilbert, R., and D. Newberry, "Preemptive Innovation," Berkeley, 1978, unpublished; Porter, M. E., "Market Signals," Harvard Business School, 1978, unpublished; Prescott, E. C. and Visscher, M., "Sequential Location Among Firms With Foresight," Bell Journal, 8, Autumn 1977, pp. 378-393; Reynolds, R. J., "Entry Reaction and Preemptive Product Innovation," Department of Justice, 1978, unpublished; Reynolds, R. J. and S. C. Salop, "Credible Limit Pricing and Entry," Department of Justice, 1978, unpublished; Rosenthal, R. W., "Games of Perfect Information Predatory Pricing and The Chain-Store Paradox," Bell Laboratories, 1978, unpublished; Rothschild, M. and Stiglitz, J., "Equilibrium in Competitive Insurance Markets: The Economics of Imperfect Information," Quarterly Journal of Economics, 90, November 1976, pp. 629-649; Salop, S. C., "A Note on Self-Enforcing Threats and Entry Deterrence," University of Pennsylvania, Center for the Study of Organization Innovation, Discussion Paper #14, March 1978; Schmalensee, R., "Entry Deterrence in the Ready-To-Eat Breakfast Cereal Industry," Bell Journal of Economics, Vol. 9, No. 2 (Autumn '78), pp. 305-27; Yamey, B., "Predatory Price Cutting, Notes and Comments," Journal of Law and Economics, No. 1 (April 1972), pp. 129-42.

development of game theory and formal international relations strategy models.<sup>1</sup>

Most of the predation literature to date has concentrated on pricing. However, there are an increasing number of treatments which suggest that predatory behavior and signalling may take other forms than price retaliation.<sup>2</sup>

### The Model

This part of the paper presents a simple model of the demand experienced by a new entrant which shows that advertising can be an effective vehicle for predatory behavior against new entrants<sup>3</sup> when advertising is a prominent feature of the market.

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<sup>1</sup> von Nueman, John and Oskar Morganstern, The Theory of Games and Economic Behavior, N.Y., N.Y.: John Wiley and Sons, Inc. (st. ed. 1944), 1959; Schelling, Thomas, Strategy and Conflict; Jervis, Robert, The Logic of Images in International Relations, Princeton, N.J.; Princeton University Press, 1970.

<sup>2</sup> On capital investment aspects see the previously noted articles by Spence. On locational preemption, see Easton and Lipsey, Hay, and Prescott and Visscher. On brand diversification in particular see Schmalensee's treatment of the RTE cereal industry. On strategic timing of innovation see the articles cited by Gilbert, Gilbert and Newberry, and Reynolds.

<sup>3</sup> For a different but parallel model see Schmalensee, Richard, "A Model of Advertising and Product Quality," Journal of Political Economy, Vol. 86, No. 31, (June 1978), pp. 485-503, especially pp. 486-9. An advertising share effect on sales is also contained in Telser's 1962 article "Advertising and Cigarettes," Journal of Political Economy, (October 1962), pp. 471-499 which derived from the cigarette studies of Nicholls.

$S_{i,t-1} \cdot Q_{t-1}$ <sup>1</sup> Equation 2 shows  $S_{Li,t}$  in terms of both the firm's previous share and its previous output.

$$(2) \quad S_{Li,t} = \frac{\gamma \cdot S_{i,t-1} \cdot Q_{t-1}}{Q_t} = \frac{\gamma \cdot Q_{i,t-1}}{Q_t}$$

Experimental purchases which make up  $S_{Ei}$  result from new awareness and recall of the trademark(s) of firm i. The probability of recall and experimental purchase, however, is not simply a function of firm i's advertising. Rather the effectiveness of its advertising varies with the level of competing

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<sup>1</sup> The model could be made easily more complex at this point by making  $\gamma$  into a variable which is dependent on absolute or relative advertising activity. The asymmetry conclusions of this model will continue to hold as long as the incumbent firms have some advantage in attracting purchases from consumers who have achieved some experimental information about the incumbent firm's products. Marketing researchers have incorporated this asymmetry in consumer responses using hierarchical models showing that the probability of purchase is positively related to sequential states of familiarity with a product. A firm which already has made sales to an individual is seen as being much closer to making a sales of an additional unit to the consumer because the consumer has already been made aware of the product and at least has knowledge of its characteristics. For discussion of the hierarchy model see Palda, K. S., "The Hypothesis of a Hierarchy of Effects: A Partial Evaluation," Journal of Marketing Research, Vol. 3, No. 1, 1966, pp. 13-24 and Golley, E. H., "Defining Advertising Goals for Measured Advertising Results," Association of National Advertisers of New York, 1961, pp. 49-60.

If the model and the term  $\gamma$  are considered as expressions of expected values, the model can be regarded in stochastic terms with  $\gamma$  being the simple purchase repeat probability. See Bass, F., "The Theory of Stochastic Preference and Brand Switching," Journal of Marketing Research, Vol. XI (Feb. 1974), pp. 1-20 for an example of a stochastic model with a simple repeat purchase constant.

" $\gamma$ " could also be made more complex by assuming that consumer's memories extend beyond one period; such a complex lag formulation would not make any conceptual difference in the model.

messages; the advertising cross elasticity of sales between brands is negative.<sup>1</sup> Advertising by firm A interferes with the advertising of other firms by cluttering communications, thus shifting demand toward firm A. Hence, equation three

$$(3) \quad S_{Ei} = .f (PD_i/PD)$$

where PD is product differentiating advertising expenditures.

One modification of the single period consumer memory built into this model has been suggested that may make the interference effects of normal levels of competing advertising messages less pressing for new firms. Lawrence has suggested that the very novelty of the new firm's presence may make consumers more

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<sup>1</sup> See Clarke, D., "Sales-Advertising Cross-Elasticities and Advertising Competition," Journal of Marketing Research, Vol. X (Aug. '73), pp. 250-61.

The formulation adopted here is that the advertising of one firm alters the effectiveness of other firm's advertising uniformly although a more complex reality in which particular brands are uniquely influential on the success of advertising for some other brands is certainly possible.

Negative advertising cross elasticity of sales between firms has been in other discussions of advertising, notably Comanor and Wilson, Advertising and Market Power, Harvard, 1974, pp. 32-4 and Scherer, F. M., Industrial Market Structure and Economic Performance, Rand McNally & Co., 1971, pp. 336-8; and Teiser, L., "Advertising and Cigarettes," Journal of Political Economy, (October 1962), pp. 471-499.

Advertising cross elasticity of sales is by definition:

$$\frac{\Delta q_x}{q_x} \div \frac{\Delta PD_y}{PD_y}$$

where PD is product differentiating advertising expenditures, X and Y are different firms.

willing to concentrate experimental purchases on the new brand.<sup>1</sup> Older brands may again obtain a relative promotional advantage, however, after the brief introduction of the product and initial experimentation since attitudes<sup>2</sup> and hence awareness and receptivity<sup>3</sup> are positively related to past exposures to a brand. A complex lag function might provide such an advantage for incumbent firms after initial experimentation.

Readers should note that the price dimension is being disregarded in this model for two reasons. First, the possibility of price predation has already been discussed extensively and the purpose here is to show that there is an analogous possibility of advertising predation; therefore we treat advertising separately, holding pricing constant.<sup>4</sup>

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<sup>1</sup> Lawrence, K. J., "How to Test Advertising," Management Today (May 1968), pp. 86-90.

<sup>2</sup> Winter, F. H., "A Laboratory Experiment of Individual Attitude Response to Advertising Exposure," Journal of Marketing Research, Vol. X (May 1973), pp. 130-40.

<sup>3</sup> Watson, D. L., "Advertising and the Buyer-Seller Relationship," Journal of the Market Research Society, Vol. 11, No. 2, 1969, pp. 125-46.

<sup>4</sup> It is possible that the interaction between pricing predation and advertising predation is particularly effective even if the individual tactics taken separately are not. Further research could address the degree of substitutability of pricing and advertising predation. Also it should be interesting to relate differences in the effectiveness of these tactics to the market segmentation models in the work on mobility barriers. See Caves, R. and M. Porter, "From Entry Barriers to Mobility Barriers: Conjectural Decisions and Contrived Deterrence to New Competition," Quarterly Journal of Economics, Vol. 91 (May 1977), pp. 241-61 for a discussion of mobility barriers.

Second, in the initial entry period, demand is primarily a function of making consumers aware of the new product. Demand is generally insensitive to low prices during the initial entry period since consumers will not buy a product, regardless of price, unless they know that it exists. Hence, this model's focus on advertising to the exclusion of price is fairly accurate at least for the immediate entry period.

If for this simple model, we assume that  $n$  is large and that all  $S_i$  are small, we define a monopolistically competitive market in which, despite the  $SE_i$  interaction term, the advertising of one firm is only loosely coupled to the effectiveness of advertising by any other individual firm. Hence advertising is unlikely to be a vehicle for interaction between specific firms, least of all predatory interactions.

Now let us relax the assumption that all  $S_i$  are small. Allow instead for one firm to be large relative to the market. This means, similarly, that one firm's advertising expenditures may be large relative to total advertising expenditures without imposing disproportionate costs on that firm.

The possibility that the large firm may use advertising expenditures in a predatory fashion becomes clear when we consider that PD in Equation 3 may be substantially determined by the advertising expenditures of the large firm. Advertising is a potential strategic weapon because by changing its own level of advertising, a large and dominant firm can substantially alter



the cost of obtaining sales from the experimental purchases segment of the market for other firms. Figure 1 illustrates the impact of predatory advertising on the cost of reaching the minimum efficient scale of production in sales.

In Figure 1, the level of sales for each level of advertising is shown for two conditions. In both cases price is assumed constant. The solid curve shows the sales response to advertising if the dominant firm maintains its pre-entry level of advertising. The "S" shape of the curve reflects a minimum efficient scale in advertising. Now if instead the dominant firm expands its advertising budget in the face of entry, the effective minimum efficient scale of advertising shifts to the right and the cost for a firm which must reach the MES of production to be viable has been increased accordingly from  $A_1$  to  $A_2$ .

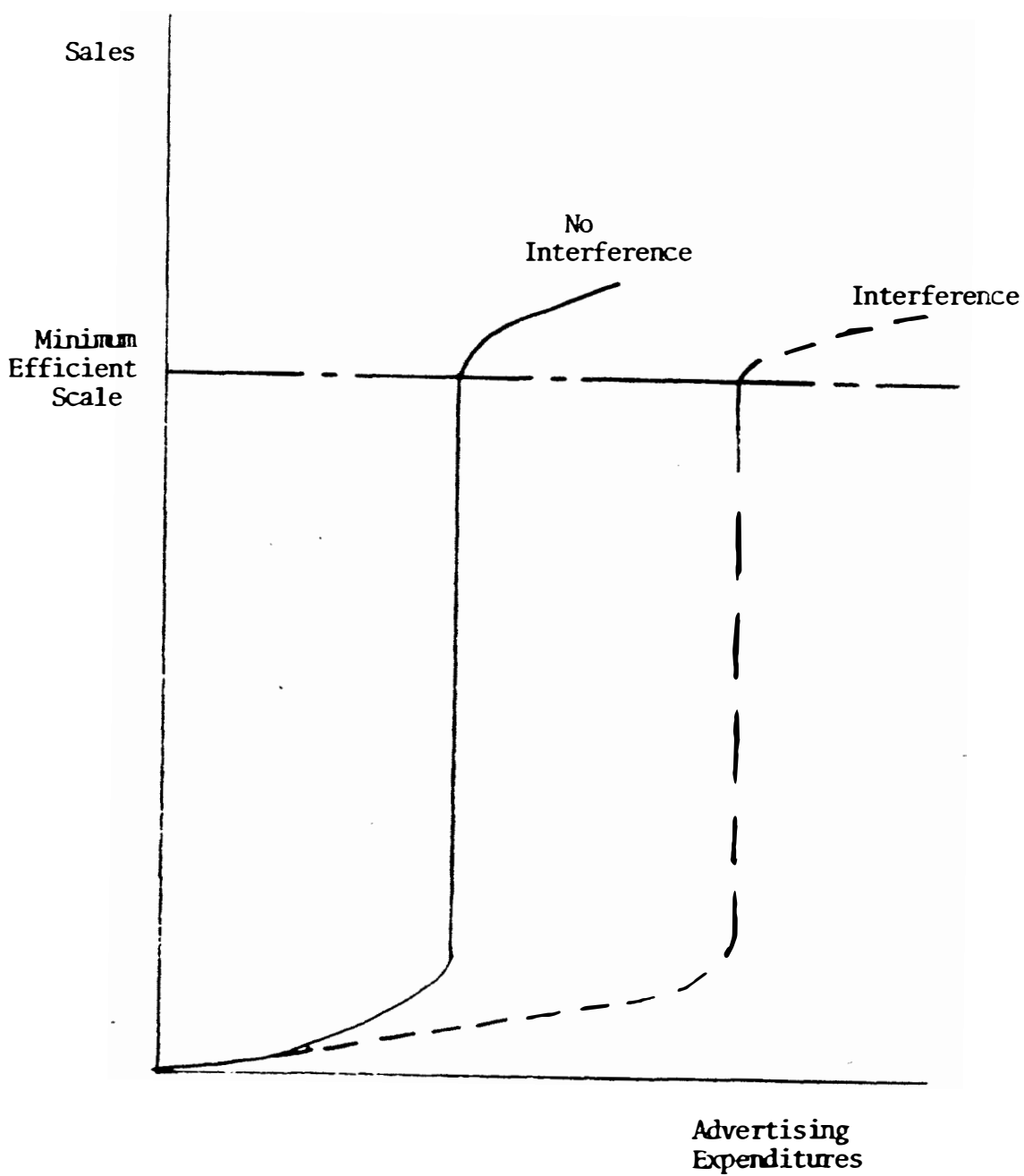
Advertising predation is potentially damaging to any competitor, but it is most effective against entrants because all of their sales must come from the experimental segment of the market as shown below:

$$(4) \quad S_{ie} = f(PD_{ie}/PD)$$

This asymmetric vulnerability of entrants decreases the expected cost of adopting a predatory strategy in two ways. First, assuming diseconomies of scale in advertising, the predatory incumbent firm can impose greater sales costs per unit on the entrant than it will experience itself, thus implying that the predatory firm should be able to remain financially viable at

FIGURE 1

Effect of Advertising Interference on  
Advertising Cost of Reaching the Minimum Efficient  
Scale of Production



the same time that the entrant's financial position becomes untenable. As long as  $\gamma$  is greater than zero, the large firm will have leverage in inflicting higher proportional selling costs on the entrant than on itself. The asymmetry arises from the dominant firm's ability to spread the cost of incremental advertising in the experimental demand segment over invulnerable loyal sales as well. The entrant enjoys no such averaging effect. Second, advertising predation will have an impact on entrants more than on established rivals (old rivals also have loyal sales) so that entrants can be targeted separately from established rivals. If entrants can be targeted in this manner, the likelihood of general escalation of a long-term costly increase in defensive advertising in the industry, subsequent to predation, is reduced. The asymmetry enhances the probability that an advertising response to entry will not be perceived as a general signal of aggressive intent by rivals.

In summary, the entrant's costs of reaching the minimum efficient scale of operations are clearly subject to the large firm's decisions, and predation through the use of advertising is therefore possible. Negative advertising cross elasticities of sales between firms and a minimum efficient scale of production are sufficient to establish the possibility of predatory advertising behavior. As asymmetry in the vulnerability of entrants to advertising cross elasticity effects increases the

probability that advertising predatory strategies will be adopted by decreasing the expected cost of such a strategy for the incumbent dominant firm.

#### Approaches to Predation: Pricing Restraints

In the previous section a simple model of advertising interactions between firms was used to show the logical possibility of advertising predation. The next step is to specify criteria to decide whether or not a large firm's advertising reaction to entry constitutes predatory behavior.

Previous efforts to define predatory behavior have dealt primarily with pricing predation.<sup>1</sup> Three of the general approaches which have been raised are:

- (1) Areeda-Turner - predation occurs if price falls below marginal cost.
- (2) Williamson - predation occurs when dominant firms increase demand adjusted output soon after entry (or where price-cost data must be used, predation occurs when price falls below average cost.
- (3) Baumol - predation occurs when entry related price decreases by dominant firms are only temporary.

Discussion follows.

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<sup>1</sup> Areeda, P. and Turner, D., "Predatory Pricing and Related Practices Under Section 2 of the Sherman Act," Harvard Law Review 88 (1975): 697; Williamson, O., "Predatory Pricing: A Strategic Welfare Analysis," Yale Law Journal 87 (1977): 284; Baumol, W., "Quasi-Permanence of Price Reductions--A Policy for Prevention of "Predatory Pricing," Princeton University and New York University, 1978.

In a recent exchange of articles Professors Areeda and Turner on one part and Professor Williamson on the other have debated the merits and demerits of their respective proposals for determining whether dominant firms have acted in a predatory manner toward a new entrant.<sup>1</sup>

The Areeda-Turner approach labels as predatory any sales at prices below the marginal costs of the dominant firm.<sup>2</sup> Areeda and Turner maintain that, despite the difficulties in adjusting accounting measures of cost to fit economic concepts of cost, their rule is administratable and has the important feature of discouraging entry by firm's which are not as efficient as the dominant firm.

The Williamson approach focuses on the strategic considerations of dominant firms rather than on the static efficiency analysis provided by Areeda and Turner. Williamson, following Modigliani<sup>3</sup>, maintains that "innocent" short run profit maximizing firms will find it to their advantage to make room for new entry by reducing production. Realizing, however, that such withdrawal may encourage other entry, Williamson is willing to

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<sup>1</sup> Areeda-Turner, op. cit., and "Williamson on Predatory Pricing," Yale Law Journal (June 1978), Williamson, op. cit. and "Williamson of Predatory Pricing II," unpublished, Univ. of Pennsylvania, 1978.

<sup>2</sup> For practical application they also rely on average variable cost.

<sup>3</sup> Modigliani, Franco, "New Developments on the Oligopoly Front," Journal of Political Economy, Vol. LXVI, No. 3, (June 1958), pp. 215-31.

allow a business as usual approach; that is essentially ignoring the entry and maintaining constant production. If instead, the dominant firm decides to expand production it can be assumed that it is neither short-term profit maximizing nor carrying on business as usual; rather it is embarking on a predatory campaign against the new entrant. Williamson's rule<sup>1</sup> would, therefore, label as predation any increase in output by the dominant firm during the first year or year and one half of entry. An increase in output would be defined as output beyond the trend adjusted output of the previous period. The output limitation is itself limited to a few months in the belief that entrants can establish themselves in that time and that they should not be sheltered indefinitely.

Where price-cost measures of predation must be used, Williamson argues for an average total cost definition to predation since this is more restrictive than marginal cost and it avoids ex ante incentives to distort the ratios of fixed and variable costs; the latter is discussed below.

Dominant firms will find Williamson's combined average cost and output rules to be more restrictive than Areeda-Turner's as long as the ex ante marginal cost of the firm is less than price. That is, firms pricing above marginal cost will have more downward pricing leeway after entry under Areeda-Turner than under the Williamson's rules.

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<sup>1</sup> Williamson suggests an AVC rule for declining industries.

In addition to restricting the predatory activities of dominant firms, Williamson suggests that his rule provides much more socially favorable ex ante incentives to dominant firms. The ex ante incentive for firms under the Williamson rule is to move toward limit pricing with corresponding welfare gains from lower prices and higher output. The ex ante incentive for major incumbent firms under Areeda-Turner might be to seek a higher capital and lower variable cost input mix that would extend the range of legal predation. The higher the proportion of costs which are fixed the greater will be predatory pricing leeway given the dominant firm under Areeda's and Turner's definition of predation. Excess capacity<sup>1</sup> or input distortions<sup>2</sup> would result, rather than welfare gains, given Areeda-Turner's predation rule.

Areeda and Turner responded to Williamson's proposal and criticisms by reiterating the danger that potential entrants with higher costs might be encouraged to enter under Williamson's rule.<sup>3</sup> They also challenge the ex ante incentive advantages of Williamson's proposal. They propose that there is a dilemma between encouraging ex ante production by the dominant firm and discouraging inefficient entry.

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<sup>1</sup> Spence, A. M., "Entry, Capacity, Investment and Oligopolistic Pricing," Bell Journal of Economics, Vol. 8, No. 2 (Autumn '77), pp. 534-44.

<sup>2</sup> This is Williamson's primary concern.

<sup>3</sup> Areeda, P. and D. Turner, "Williamson on Predatory Pricing," Yale Law Journal, June 1978.

Williamson's rejoinder rejects the notion of a tradeoff between ex ante incentives and inefficient entry by pointing out that even high cost entries increase welfare if they increase net production which the low cost firm refused to provide.<sup>1</sup>

Areeda and Turner also suggest that the very restrictiveness of Williamson's rule which makes entry more likely will force some firms to abandon limit pricing long-term strategies and immediately push the price to the short run profit maximizing level. The net ex ante effect of restricting ex poste behavior would not then, be as unambiguous as Williamson believes.

To summarize at this point, the Williamson output predation rule is superior to the Areeda-Turner price-cost predation rule with respect to both ex ante incentives and to encouraging entry which increases net social welfare.

More recently, Baumol<sup>1</sup> has addressed the predation definition question with another proposal. His suggestion is that predation be defined as having occurred if a major firm temporarily decreases price in response to entry. Baumol claims that his rule eliminates any sheltering of entrants and encourages or even ensures meaningful price reductions by major firms when entry occurs.

Baumol's approach is subject to several objections. First, the process of adjusting allowed prices for cost increases could

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<sup>1</sup> Baumol, W., "Quasi-Permanence of Price Reduction: A Policy for Preventing Predatory Pricing," N.Y. University, 1978, unpublished.



be an administrative nightmare. Second, although mandatory continuation of pricing responses to entry decreases the probability that this tactic will be undertaken, it gives such responses vastly increased credibility. Any doubts that the entrant had about the period during which aggressive pricing would last are eliminated.<sup>1</sup> A policy which discourages predation as effectively but does not enhance credibility would be preferable. As a result a smaller price decrease should be sufficient to induce the entrant to give up. Third, the price ceiling imposed on dominant firms may simply provide an incentive to set a predatory price and then reduce the product quality or cease production of the subject item and introduce a substitute. Fourth, ex ante incentives to improve allocative efficiency (lower prices) are missing.

Baumol's approach is enough flawed by its administrative burdens and perverse quality incentives that the Williamson view continues to be the best available approach to pricing predation.

#### Approaches to Predation: Do The Pricing Approaches Also Constrain Advertising?

Areeda-Turner's measure of predation already incorporates advertising costs. If price falls below marginal cost, then the Areeda-Turner rule declares that predation is taking place.

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<sup>1</sup> For a discussion of the importance of credible retaliation see the previous cited articles by Reynolds and Salop and Salop.

The effectiveness of the Areeda-Turner approach in dealing with predatory advertising will depend on how advertising expenditures are treated. Two logical treatments seem possible. The more traditional accounting treatment would be to label all advertising as marginal cost. Hence predatory advertising would increase the marginal cost of the firm and be constrained when such elevated costs consume the dominant firm's profits. The dominant firm might argue, however, that part of advertising, the predatory part, is overhead or fixed since the decision to make that expenditure is unrelated to production levels. Acceptance of this or similar arguments would allow predatory advertising to have more leeway than the traditional accounting method.

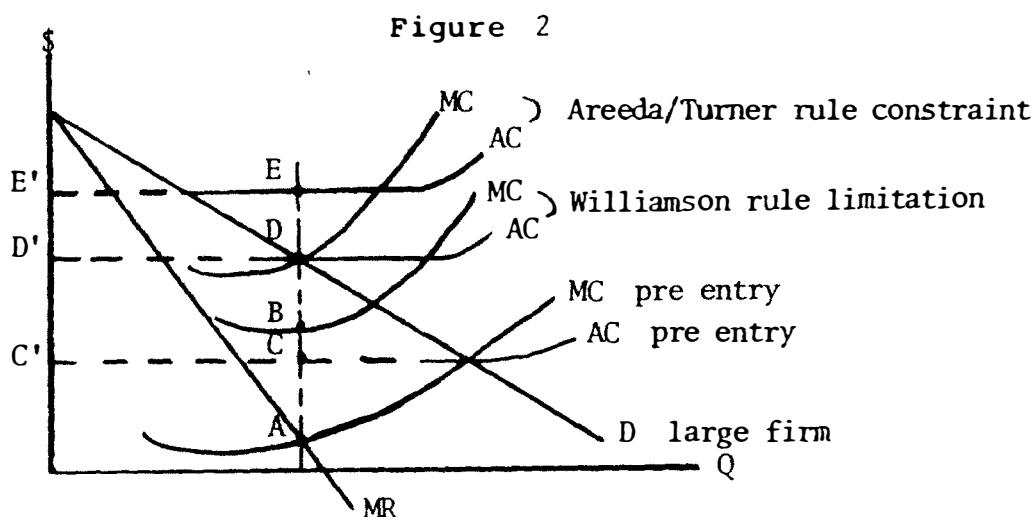
Note that regardless of the treatment of advertising, the Williamson average cost = price fallback rule is still more restrictive than the Areeda-Turner rule. The treatment of advertising as variable or fixed costs only alters the degree of difference.

Turning to Williamson's output rule, if advertising has no marginal effect on the firm's own residual demand (but does reduce the residual demand of the entrant), advertising predation will not be constrained by the Williamson output rule. There is one bit of irony; it may be that the entrant's insistence on defending itself (by advertising) will be the factor that

prevents the dominant firm's demand from increasing enough to cause a violation of the output antipredation rules.<sup>1</sup>

If either the entrant defends itself or the dominant firm's own advertising elasticity of demand is zero, the firm with predatory intent can increase advertising without activating the proposed production conditions of predation and can thereby increase the entrant's costs up to the point at which the dominant firm's cost equals the price. That is Williamson's secondary fallback position.<sup>2</sup>

Figure indicates the difference between the Areeda-Turner and Williamson rules assuming that advertising by the major firm does not shift its demand curve.



<sup>1</sup> This point is also made by Schmalensee's paper "On the Use of Economic Models in Antitrust: The ReaLemon Case," MIT, unpublished, 1978, pp. 36-8.

<sup>2</sup> Using an average total cost rule, advertising predation can be viewed as part of a cost-price squeeze in which predation reduces the entrant's return not by reducing prices but by increasing its marketing costs. This perspective was suggested to the author by H. Michael Mann.

For strategic purposes a large firm subject to conditions in Figure 1 could undertake predatory advertising up to the amount of area  $DD'C'C$  under the Williamson rule (average cost must be equal or less than price). Under the Areeda-Turner rule advertising could rise as high as  $EE'C'C$  which will be larger than  $DD'C'C$  as long as  $MC < AC$ .

The output rule is inoperative here.

If we now relax the assumption that advertising does not alter the demand experienced by the firm, it will be true that as long as demand shift increases the difference between total revenue and production costs, the demand shift will increase permissible advertising predation under either a marginal or average cost regime. To demonstrate this we first indicate the maximum level of advertising expansion beyond the profit maximizing level assuming there is no demand shift. Next we change the assumption and allow demand to shift in response to advertising at the maximum level in the no demand shift scenario. The proof is complete if the maximum allowable level of advertising with the "demand shift" assumption exceeds the maximum advertising level with the "no demand shift" assumption.

In figures 2A and 2B, we show the average cost constraint with and without a demand shift. In Section 2A, advertising expenditures could be raised by  $ABCD$  without violating the average cost equals price rule. In Section 2B we again show an advertising increase of  $ABCD$ . Demand in this diagram expands from  $D$  to  $D^1$  in response to  $ABCD$  advertising and this

Figure 2A

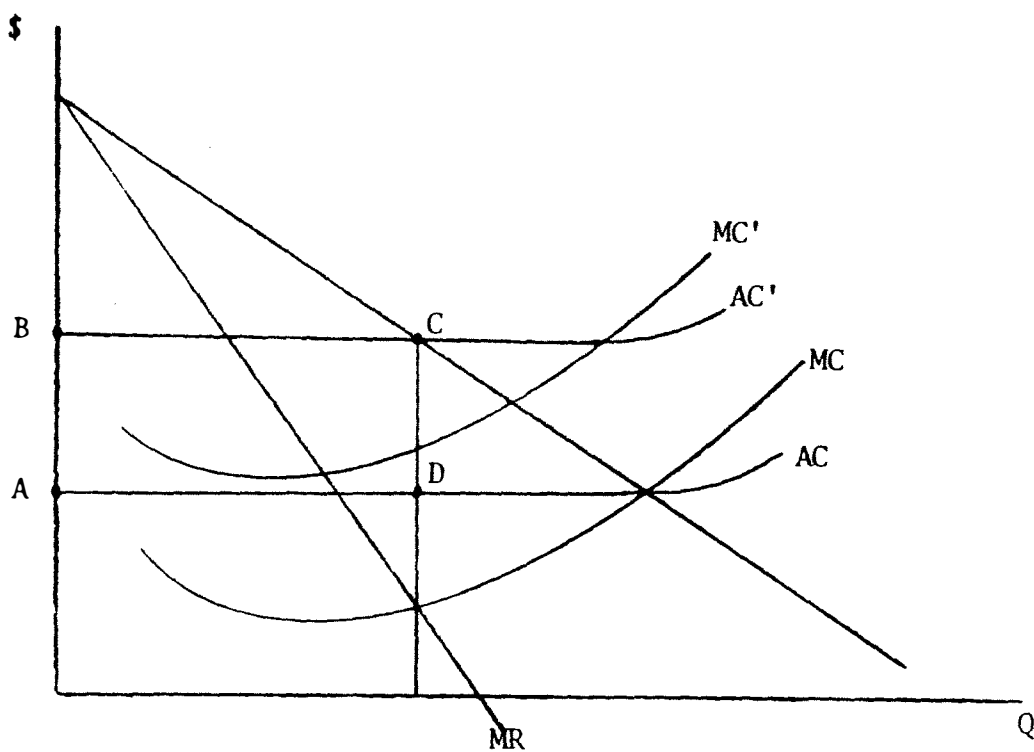
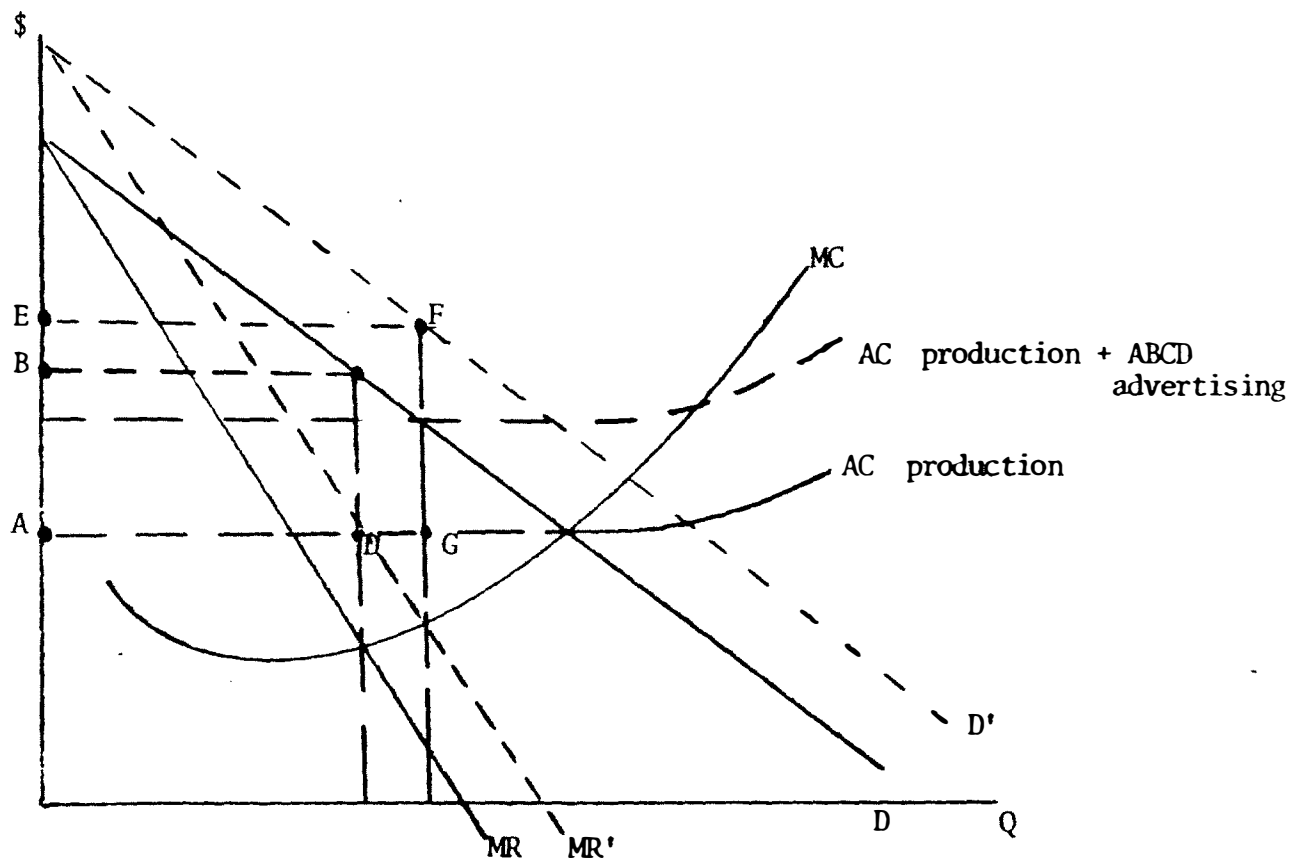
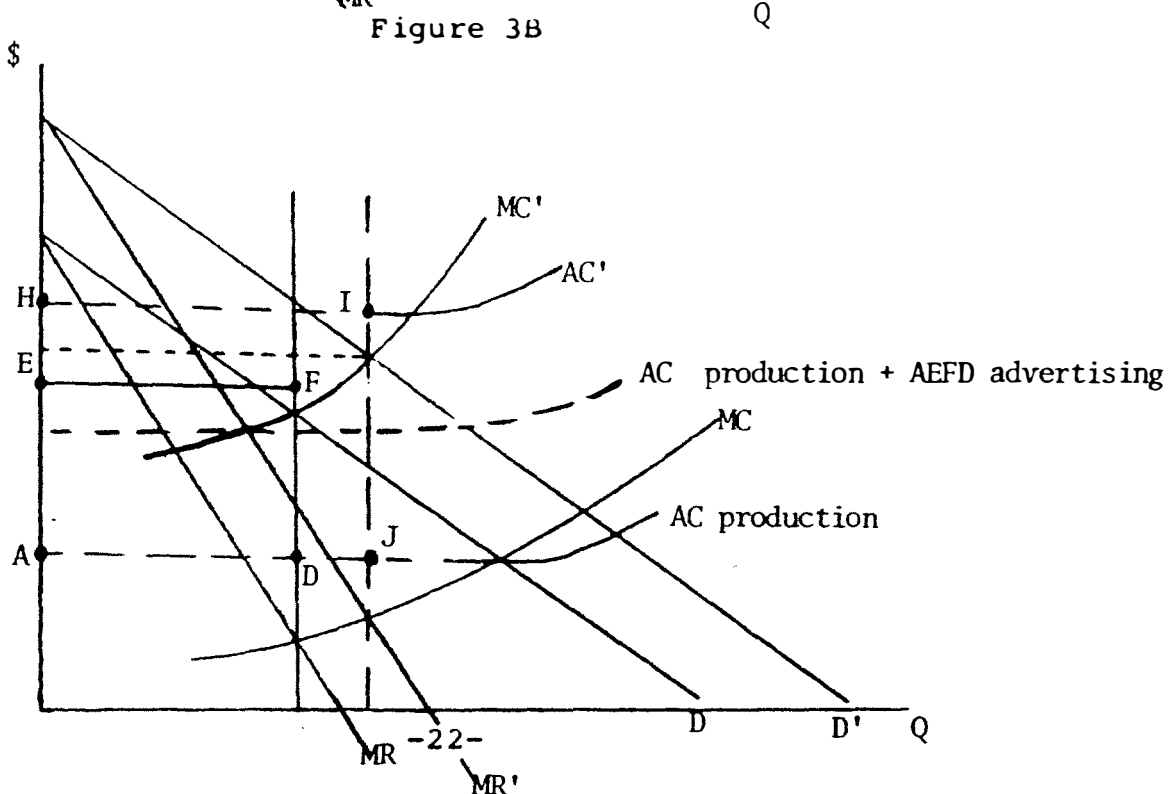
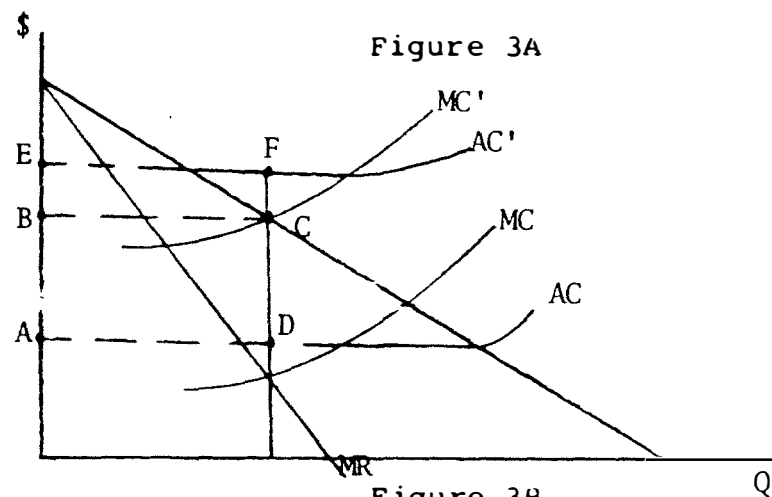


Figure 2B



increases revenue net of production costs (AC production) by E, F, G, and H. But unlike A, the revenue net of production is not equal to ABCD and the difference between the two is the additional leeway for advertising predation created by the demand shift. Of course, additional advertising above ABCD up to AEFG might well shift demand still further and an iterative process could ensure.

Figure 3 illustrates the situation for the marginal cost-price constraint.



In figure 3A the MC = Price rule proposed by Areeda-Turner permits advertising predation as great as AEFD. In figure B we again show advertising of AEFD but we also allow AEFD worth of advertising to shift demand from D to D'.

This demand shift moves the MC=MR level of production and the price. The important observation is that maximum advertising predation is now AJIH which is larger than AEFD indicating that the demand shift response to AEFD increases potential advertising predation. Further demand shifts in response to advertising of AJIH would increase potential advertising predation even further. This holds, as mentioned previously, as long as total revenue minus production costs increases as a result of the demand shift.

While it is true that a demand shift response to advertising aggravates the permissible level of advertising predation under either an average or a marginal cost based rule, any disproportionate advertising response of the firm's own demand schedule as opposed to the general industry demand schedule would violate the Williamson output rule. The disproportionate demand shift precipitated by advertising would compel an increase in production in excess of the industry trend adjustment provided in Williamson's output rule. If  $\Delta D$  for the firm is greater than

D

$\Delta D$  for the industry, the Williamson output rule would restrict

D

predation at a lower level than the average or marginal cost rules. But as mentioned before, if the entrant is advertising to

defend its sales this will reduce the effectiveness of the Williamson output rule in constraining advertising predation.<sup>1</sup>

The Baumol proposal which requires that pricing responses to entry be quasi-permanent, puts no apparent constraint on advertising at all. Baumol acknowledges that, in fact, his proposal does not fully prevent any activity so he expresses willingness to include an average cost rule paralleling Williamson's rule. As a result the advertising predation restraint imposed by Baumol's proposal is identical to Williamson's except there is, of course, no output constraint.

The description of extensions of the Areeda-Turner, Williamson, and Baumol approaches to cover predation in advertising indicates that none of these rules restricts advertising predation until the level of advertising costs consumes all of the predator's profits and the Areeda-Turner rule allows advertising to go high enough to require cross subsidization. The only exception would occur if the large firm's advertising efforts shifted its demand disproportionately to the shifts of the industry demand curve. Note that a disproportionate shift will be curtailed by any efforts of the entrant or incumbent rivals to defend their positions. If despite the defenses of

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<sup>1</sup> If the dominant firm increased advertising without meeting demand increases, this would either raise prices which would improve the entrant's sales or cause shortages which would also improve the entrant's position.



other firms, demand shifts disproportionately to the predatory firm, the Williamson output rule would curtail advertising predation more effectively than cost rules. The Williamson rule for output is not systematic since it only applies when the entrant and rivals do not defend themselves or when advertising has no positive effect on demand.

There is a strong social welfare justification for preventing advertising predation policies from increasing costs in this manner. The cost rules are established on the assumption that production efficiency is already maximized, that is resources consumed in production are producing the maximum output. However, if increased advertising by the dominant firm provides no "benefit" except interfering in the transfer of information from the entrant to consumers, the increase in costs is no longer based on efficient production. Rather the increased cost is pure social waste in the sense that resources are consumed with no resulting increase in social welfare. Hence, although an average cost rule or variable cost rule will put a cap on the level of predatory advertising, this cap will exceed the socially appropriate cap on advertising.

#### Converting Pricing Predation Rules to Advertising Predation Rules

None of the pricing predation rules effectively constrains advertising predation in a consistent manner. Therefore, it is inappropriate to rely on current formulations of the pricing predation rules to constrain advertising predation.

The most direct way to reformulate the pricing predation rules to constrain advertising predation is to apply the same conceptual schemes into an advertising framework.

With the Areeda-Turner proposal a reformulation is unnecessary because the original wording already incorporates advertising costs in the requirement that marginal cost equal price. The same is true for the average cost portion of the Williamson and Baumol proposals. But none of these constrain advertising predation effectively.

Therefore, our attention centers on reformulating Williamson's output constraint and Baumol's quasi-permanence constraint.

Williamson's output constraint can be reformulated by broadening it to a general "business as usual" requirement. A business as usual approach requires that the firm's ex post behavior be related to its ex ante behavior on all dimensions until the entrant has a chance to become established; it requires that the firm disregard (temporarily) its strategic capabilities and act toward the entrant in the same manner it has acted toward established firms.

Hence, a firm's advertising practice would be defined as predacious if advertising increased beyond the inflation adjusted pattern of previous years.

The ex post welfare advantage of the "business as usual" rule stems from the increased production and lower prices that entry should bring about. The ex ante incentives of the output and advertising constraints are parallel. The restriction of

post entry attacks on entrants will encourage firms with substantial market power to defend their position with more conventional barriers to entry strategies and limit pricing or limit advertising.

Unfortunately the welfare benefits of an ex ante incentive to increase production are not necessarily parallel to those of ex ante advertising incentives. Increased production rectifies resource misallocation but advertising increases may not provide any similar welfare benefits. The nature of the welfare effects of increased advertising depend on assumptions about the content of the advertising and its effect on consumer tastes and rival advertising effectiveness.

This ex ante incentive is regrettable but it is not fatal to the credibility of the business as usual approach. If heavy ex ante advertising is successful in preserving a dominant firm's share and profitability, the industry's status may be addressed using conventional barriers to entry analysis and monopolization procedures. The ex ante incentive to over or 'limit advertise' is more serious when, like limit pricing, it reduces the firm's profitability enough to bring returns close to the normal rate of return. At that point, the antitrust agencies might view the firm as being competitive even though its prices approach the monopoly level.

Baumol's quasi-permanent price rule can also be reformulated as a parallel quasi-permanent advertising rule. Advertising would be defined as predatory if it increases after entry and then returns to pre-entry levels.

There are no ex ante incentives built into the Baumol proposal but three troubling factors continue to be present. First, any advertising retaliation which does take place is given full credibility by the entrant. Whereas entrants may have discounted advertising predation as temporary under current rules, with the Baumol approach they would be forced to accept any such actions as permanent and this should decrease the probability that the entrant will continue in the market. Second, in the event entry occurs and the entrant fails (for reasons related or unrelated to predation) society is stuck with a fully wasteful expenditure for a long period which otherwise would not have been made. This expenditure may also discourage subsequent entry efforts. Third, an extensive government monitoring period is involved which could generate high administrative costs.

Given the problems with the reformulation of Baumol's proposal, the "business as usual" approach recommended by Williamson for pricing and extended here to advertising is the preferable definition.

Using the business as usual approach, the definition of advertising predation is then

- (a) A substantial increase in advertising beyond the inflation adjusted level of some base period (several years)
- (b) Undertaken by a firm with substantial potential interest in strategies designed to preserve market position (measured in terms of market share and market power)
- (c) Which occurs in close proximity to entry.

### Summary and Comment

Discussion of predatory behavior in the economic literature has increased in the last few years in response to both litigation of predatory cases and extensions of the purview of predatory behavior beyond pricing. The most extensive debate has centered around providing a per se definition of pricing predation.

This paper's intent has been, first, to raise the possibility that advertising may be used in a predatory manner against entrants, second, to show that pricing rules for predation do not systematically constrain advertising predation, and third, to propose that an extension of Williamson's "business as usual" rules be applied to define advertising predation.

While the intent here has been to address advertising predation in particular, the motivation for such a treatment comes from the general conviction that tighter and more certain constraints on pricing predation will tend to deflect corporate strategies towards other means of achieving the same ends. A major task in the next few years for the antitrust literature will be to discover, define, and analyze the implications of these alternative means of perpetuating market dominance. This look at advertising predation is part of the task.