WORKING

PAPERS

ARE JUDGES SMARTER THAN ECONOMISTS?

SUNK COSTS, THE THREAT OF ENTRY

AND THE COMPETITIVE PROCESS

Andrew N. Kleit

and

Malcolm B. Coate

WORKING PAPER NO. 190

June 1991

Fl'C Bureau of Economics working papers are preliminary materials circulated to stimulate discussion and critical comment All data cootained in them are in the pub6c domain. This includes information obtained by the Commi~oo which has become part of pubUc record. The analyses and conclusions set forth are those of the authors and do not nec~ly reflect the views of other members of the Bureau of Economics, other Commission staff, or the Commission itself. Upon request, single copies fi the paper will be provided. References in pubUcatioos to FTC Bureau of Economics working papers by Fl'C economists (other than acknowledgement by a writer that he has access to such unpublished materials) should be cleared with the author to protect the tentative character of these papers.

BUREAU OF ECONOMICS
FEDERAL TRADE COMMISSION

WASHINGTON, DC 20580

Are Judges Smarter Than Economists? Sunk Costs, the Threat of Entry
and the Competitive Process

Andrew N. Kleit and Malcolm B. Coate Federal Trade Commission

June 1991

The views expressed herein are solely those of the authors and not necessarily those
of the FTC, any of its Commissioners, or the Bureau of Economics of the FTC. The authors would

ABSTRACT

Several recent antitrust cases indicate that courts believe the threat of

entry can serve as an effective deterrent to an anticompetitive

I. Introduction
Since 1984 antitrust law has shown a growing respect for the threat of entry as a condition to immunize from legal challenge a merger that otherwise would significantly increase the probability of collusion. Yet the economics literature would appear to indicate that a collusive agreement should not fear entry in the presence of positive sunk costs. This suggests that either the courts have a better grasp of economic realities than economists or that the importance of entry conditions in merger analysis is likely to decline in the future as the courts incorporate the latest economic learning into the case law.
In this paper, we attempt to bring theoretical form to a particular entry argument
that has found favor in the courts. We suggest that sunk costs may not be a major impediment to entry when a group of customers can commit to an entry enhancing strategy. The simplest example involves

II. Entry In Economics - And Antitrust
Baumol, Panzar, and Willig (1982) show how the threat of entry into a perfectly contestable market can be sufficient to deter price from rising above competitive levels, regardless of the level of concentration in the market. As Schmalansee (1987 at 42) observes, however, the contestable market result may describe an "empty box". In practice, the necessary condition for contestability of zero sunk

found against the government in highly concentrated industries with few or no apparent barriers to entry.2 Thus, one could conclude that some

The second quote highlights more tangible affects of entry. By focusing on the
likelihood and magnitude of entry, the Guidelines suggest that it is the magnitude of entry that will occur during a two year period that should be considered. As entry becomes more likely to eliminate an anticompetitive price increase within two years, the 001 becomes less likely to challenge the merger.
The two analyses illustrate different approaches to the entry question. The first approach relies on data that suggest that the threat of entry would deter a price increase, while the second suggests sufficient entry should occur in two years to return the market to competitive equilibrium. The first method is compatible with the classical microeconomic theory of markets in which profits attract entry. In contrast, the second approach appears to consider the idea that sunk costs may prevent entrants from investing in a market in response to supracompetitive prices, because the entry could cause the supranormal returns to disappear.
In a recent merger challenge, the 001 advanced a restrictive reading of this
paragraph, arguing that the only way to defeat a presumption of an anticompetitive effect based on high concentration is "by a clear showing that entry into the market by competitors would be quick and effective." ludge Clarence Thomas, writing for the Court of Appeals for the District of Columbia Circuit, rejected the government's approach, concluding that it is unrealistic to expect such strong proof in the context of a merger case and even if a firm never enters a market, the threat of entry can stimulate competition.3 Thus, although the economic literature appears to support a strong rule for ease of entry as a defense argument,

Our purpose here is to present a model that shows circumstances when the threat of
entry can deter such a price rise in the presence of sunk costs. We note that a model of entry in this context should have several features. First, it should have positive sunk costs. Second, the model must have a competitive equilibrium with more than one firm. Previous models in the literature, such as Gelman and Salop (1983) and Scheffman and Spiller (1987) have assumed an industry with constant cost curves and positive sunk costs. In such an industry, Bertrand competition generates marginal cost pricing and firms are unable to recoup their sunk costs. Thus, the first firm in the market will remain a monopolist or some form of competition will occur until only one firm remains. Either

integration, the ultimate long-term contract) to induce entry.5 What we are presenting here can be thought of as a generalization of Demsetz' original model.
Finally, a model of entry should take account of uncertainty in the market, as has become common in the industrial organization literature over the past decade. The collusive firms are unlikely to know how high they can price without inducing entry. One thing, however, is known for certain: that the potential entrant has not entered. This puts a floor on the costs of entry.

III. An Entry Game
A. Rules of the Game

We present a simple one period entry game where the threat of entry can deter, at
least under some conditions, any collusive price increase. There are N identicalJy sized producers in this industry, each producing with the same commonly available and known marginal cost structure. Each of the incumbent producers has already paid the sunk costs necessary to enter the industry. To create the required quasi-rents, we assume that the available technology generates for each firm an upward sloping supply curve. This alJows for a competitive equilibrium in the presence of sunk costs, and

distribution of which we will discuss below. Once the entrant has incurred the necessary
sunk costs, it produces with the same marginal cost schedule as incumbents.
In the first stage of this game, producers decide what price they will charge. We
assume that they are able to effectively agree on some price to be charged, absent entry, at
some cost C. We initially assume C=O.
In the second stage buyers have a choice. They can either accept the industry price
or induce entry. Entry is induced by paym10.5 278.05 13 641.p 10.28643 0 0 10.5 5136frome

B. The Base Case Solution

In the model, demand is perfectly inelastic at QY P equals price. Incumbent firms price at marginal cost and have supply curve

(I) QI(p) = (P-A)/B A,B>O.

Let N equal the number of equally-sized minimum efficient scale firms in the industry. (Thus N = I/MES, where MES equals minimum

Assume that the cartel raises price above the competitive level by Pm' It will be
worth an additional PmAQ to the buyer coalition to induce entry. Similar to Crawford and Sobel (1982 at 1440) and McAfee and McMillan (1987 at 109), we assume

cartel will find it ex ante profitable to risk the threat of new entry and will engage in limit pricing.
One issue that often arises in antitrust is whether economies of scale constitute an
entry barrier. (See, for example, Scherer and Ross, 1989, at 424.) In the model here, N
represents the inverse of economies of scale. If economies of scale are a barrier, dRc/dN<O. Differentiating (16) yields

(17) dRc/dN = 2A.j[N+21(N+I)] - 1(2N+I)(I+21)/[N+21(N+I)]2.

A priori, (17) indicates that it is ambiguous whether economies of scale reduce the threat of
entry. Increased economies of scale likely increase the costs of entering because such entry
will have a larger reduce.53 619.45 T=act7294 0 0 12.4 220.21 470.9795.35 476.89educecolk0 10

Again taking derivatives and equating to zero

Rearranging (28) generates a new equation for price

The only difference between (29) and (I3) is the use of the term (I-d) instead of l.
Thus, the remaining analysis is identical except for the additional of (I-d) on the left-hand side of the analysis. This implies that (IS) can be written in the more general form of

(30) R s: [1(2N+I)/[(N+21(N+1)(I-d)].

Integrating both the costs of collusion and the growth model yields

(31) R s: (l+g)2[1(2N+l)/[(N+21(N+1)(I-d)] + (I+g)2 - l.

Retaining the assumptions that N=5, 1 =.2, and defining d=.2 generates a value of R of .372. If growth is considered (i.e. as in equation (31) with a value of .05) the value is .512. This value is 72 percent higher than the initial value for a stagnant market with no costs of collusion.
Even if the threat of entry by itself will not deter a price increase, it is possible that
the optimal price increase will be so small that the cartel is unable to cover the fixed costs

15

of collusion. Thus, collusive activity will not occur, unless the firms can impose a sufficient price increase to cover the fixed costs of cartelization. This implies that the solution to (27) must be positive at the optimal price. Thus, as the fixed costs of collusion increase from zero, small price increases optimal under (28) generate a loss for the cartel, so no price increase will occur.

IV. Large Buyers in Recent Antitrust Cases
Empirical evidence on the threat of buyer-induced entry is inherently difficult to
obtain, because it is the threat of entry, not entry itself, that defeats an anticompetitive price increase. It is possible, however, to gather evidence on the ability of buyer coalitions to induce entry by reviewing litigated cases where actual or potential buyer coalitions played a role. Perhaps the best example of a buyer coalition actually defeating anticompetitive pricing is described in Sewell Plastics Inc. v. Coca Cola Co. 720 F. Supp. 1186 (W.D.N.C. 1988), aff'd. 912 F.2d 463 (1990), cert.

Additional support for the idea of buyer-induced entry can be gleaned from
examining the merger chaIlenges litigated by the government since 1982 (see Table One).20 A review of litigated cases presents examples of when courts believed that the threat of entry was sufficient to maintain competition or when parties induced actual entry to create

competition at verticaIly-related levels of production.21
One of the first observations from reviewing recent merger cases is that it is
relatively rare to have a merger litigated in Federal court involving direct sales to atomistic consumers. Even consumer goods can be sold through retailers that are large enough to create new entry. Other consumer goods are sold through mixed systems with some consumers purchasing directly and others through large buyer groups. The medical industry represents the most obvious example of this type of system. Finally,
when atomistic consumers face monopolistic sellers in retailing, buyer coalition arguments can easily be inverted and applied to input suppliers. Thus, for almost any class of mergers, buyer strategy arguments, or their

military purposes). Although the potential for buyer-induced entry in these examples appears clear, the relevant decisions imply that a buyer coalition would have had difficulty inducing entry, because entry was technically a long and difficult process. In other cases, entry appeared to be much easier. For example, in U.S. v. County Lake et al. (1990 at II) District Court Judge Renner found that the large milk distributors, who controlled over 90 percent of the market, could and would seek suppliers outside the local area or vertically integrate in response to anticompetitive pricing by local milk processors. This was considered sufficient to maintain competition. Similarly, in U.S. v. Calmar (1985 at 1304), District Court Judge Debevoise found that buyers of pump dispensers and sprayers would react to an anticompetitive price increases by either vertically integrating or entering into a joint venture with another firm to make such products.
Another example of the potential for buyer strategies can be found in the recent
Baker Hughes decision.22 District Court Judge Gesell noted the major customers for hardrock hydraulic mining equipment would insist on receiving competitive bids and were
likely to have contacts with mining equipment manufacturers in Canada (see Baker Hughes
731 F. Supp. at 10-11). Thus, Judge Gesell felt that buyer strategies would facilitate
successful entry into the U.S. market were the merger to induce collusion. A key point in
the decision appears to be the sophistication of buyers rather than their absolute size. Thus,
even when the buyers do not have large market shares, it has been concluded that they may

be able to contribute to maintaining competition. Similarly in Echl_1 1 Tf4034.6 393.2 258.96 T3 35 10.6 25Simj 1110.9237 0.6 72386 22.96 T3 35 3 31611_1 1 25Simj 11som 11.5294 0 0 10.6 67T1_1 1 Tf 0.89Tm (t 25Simj 11powe.)Tj 6 0 0 10.6 300.61 306.4922360.62

do it themselves (Echlin at 467). Thus, buyers were considered potential entrants whose existence was believed to keep the market competitive.
While buyer-induced entry has had significant success as a defense tactic in merger litigations, it by no means represents a panacea for defendants. For instance, buyer strategy arguments have been given little weight in hospital merger decisions where third party payers (Blue Cross and the government) appear to be very large buyers.23 In Hospital Corp. of Am. v. F.T.C., 106 F.T.C 361,509 (1985), 807 F.2d 1381 (7th Cir. 1986), cert. denied 107
S.Ct. 1975 (1987), the Commission rejected the buyer stra tegy argument, observing Blue
Cross could not switch its business to hospitals outside the geographic market. In reviewing
the case, Judge Posner developed this idea further by noting third party payers are not
completely analogous to large buyers (Hospital Corp. of Am. 807 F 2d at 1391). Insurance
companies are obligated to pay the contracted portion of the medical charges for their
customers as opposed to large buyers that could strategically reduce purchases of product. pu110.36 .97

increased concentration level. Although the concept of buyer induced-entry was not explicitly mentioned in this decision, it could have easily been integrated into the analysis. Overall, buyer strategy arguments may be applied to hospital mergers, but only in limited fact situations.
Finally, the idea of buyer-induced entry can easily be inverted into supplier strategy arguments. If a retailer attempts to monopolize a geographic area, both suppliers and

themselves sitting ducks for leaner, hungrier competitors. Or, as Syufy saw,
the tactic may boomerang, causing big trouble with suppliers.24

V. Conclusion
This paper attempts to bridge the gap between judicial decisions and economic
theory relating to entry. Our model shows how buyer strategies can be used, at least in some circumstances, to overcome the presence of sunk costs such that the threat of entry is able to deter

U.S. Department of Justice, "Merger Guidelines," Antitrust and Trade Regulation Report, No. 1169, Special Supplement (June 14, 1984).

Uri, Noel and Coate, Malcolm B., "The Department of Justice Merger Guidelines: The Search for Empirical Support: International Review of Law and Economics, 7 (June 1987) 113-120.

Yu, Ben T., "Potential Competition and Contracting For Innovation," Journal of Law and Economics 24 (1981) 215-238.

23

Table One
Products in Merger Challenges Government Cases in Federal Court, 1982-1990 (Number of Cases in Parentheses)

Banking Services (2)
Carbon Black for Tires
Pre-recorded Music
Commercial Trash Collection
Carburetor Kits
Corrugating Medium
Sprayers and Dispensers
Milling of Paddy Rice
Plastic Fuel Stocks (2)
Carbonated Soft Drinks
Aircraft Transparencies
Hospital Services (3)

Gasoline Distribution
Rigid Wall Containers
Industrial Dry Corn
Automatic Railroad Tampers
Supermarkets
Night Vision Tubes
First Run Movie Releases
Fluid Milk
Hardrock Hydraulic Mining Equipment Printing Services
Schmidt-Cassegrain Telescopes
Movie Laboratory Service Agreements

Source: Various Federal Court Merger Decisions