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INDUSTRY STRUCTURE, MARKET RIVALRY, AND PUBLIC POLICY*

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I. Introduction

Quantitative work in industrial organization has been directed mainly to the task of searching for monopoly even though a vast number of other interesting topics have been available to the student of economic organization. The motives for this preoccupation with monopoly are numerous, but important among them are the desire to be policy-relevant and the ease with which industrial concentration data can be secured. This paper takes a critical view of contemporary doctrine in this area and presents data which suggest that this doctrine offers a dangerous base upon which to build a public policy toward business.

II. Concentration Through Competition

Under the pressure of competitive rivalry, and in the apparent absence of effective barriers to entry, it would seem that the concentration of an industry's output in a few firms could only derive from their superiority in producing and marketing products or in the superiority of a structure of industry in which there are only a few firms. In a world in which information and resource mobility can be secured only at a cost, an industry will become more concentrated under competitive conditions only if a differential advantage in expanding output develops in some firms. Such expansion will increase the degree of concentration at the same time that it increases the rate of return that these firms earn. The cost advantage that gives rise to increased concentration may be reflected in scale economies or in downward shifts in positively sloped marginal cost curves, or it may be reflected in better products which satisfy demand at a lower cost. New efficiencies can, of course, arise in other ways. Some firms might discover ways of lowering cost that require that firms become smaller, so that spinoffs might be in order.

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In such cases, smaller firms will tend to earn relatively high rates of return. Which type of new efficiency arises most frequently is a question of fact.

Such profits need not be eliminated soon by competition. It may well be that superior competitive performance is unique to the firm, viewed as a team, and unobtainable to others except by purchasing the firm itself. In this case the return to superior performance is in the nature of a gain that is completely captured by the owner of the firm itself, not by its inputs.[1] Here, although the industry structure may change because the superior firm grows, the resulting increase in profit cannot easily serve to guide competitors to similar success. The firm may have established a reputation or goodwill that is difficult to separate from the firm itself and which should be carried at higher value on its books. Or it may be that the members of the employee team derive their higher productivity from the knowledge they possess about each other in the environment of the particular firm in which they work, a source of productivity that may be difficult to transfer piecemeal. It should be remembered that we are discussing complex, large enterprises, many larger (and more productive) than entire nations. One such enterprise happens to "click" for some time while others do not. It may be very difficult for these firms to understand the reasons for this difference in performance or to know to which inputs to attribute the performance of the successful firm. It is not easy to ascertain just why G.M. and I.B.M. perform better than their competitors. The complexity of these organizations defies easy analysis, so that the inputs responsible for success may be undervalued by the market for some time. By the same token, inputs owned by complex, unsuccessful firms may be overvalued for some time. The success of firms will be reflected in higher returns and stock prices, not higher input prices, and lack of success will be recorded in lower returns and stock prices, not lower input prices.

Moreover, inputs are acquired at historic cost, but the use made of these inputs, including the managerial inputs, yields only uncertain outcomes. Because the outcomes of managerial decisions are surrounded by uncertainty and are specific to a particular firm at a particular point in its history, the acquisition cost of inputs may fail to reflect their value to the firm at some subsequent time. By the time their value to the firm is recognized, they are beyond acquisition by other firms at the same historic cost, and, in the interim, shareholders of the successful or lucky firm will have enjoyed higher profit rates. When nature cooperates to make such decisions correct, they can give rise to high accounting returns for several years or to a once and for

[1] A detailed discussion of the implicit notion of team production that underlies these arguments can be found in Armen A. Alchian & Harold Demsetz, Production, Information Costs, and Economic Organization, 62 Amer. Econ. Rev. 777 (1972).

all capital gain if accountants could value *a priori* decisions that turn out to be correct *ex post*. During the period when such decisions determine the course of events, output will tend to be concentrated in those firms fortunate enough to have made the correct decisions.

None of this is necessarily monopolistic (although monopoly may play some role). Profit does not arise because the firm creates "artificial scarcity" through a reduction in its output. Nor does it arise because of collusion. Superior performance can be attributed to the combination of great uncertainty plus luck or atypical insight by the management of a firm. It is not until the experiments are actually tried that we learn which succeed and which fail. By the time the results are in, it is the shareholder that has captured (some of) the value, positive or negative, of past decisions. Even though the profits that arise from a firm's activities may be eroded by competitive imitation, since information is costly to obtain and techniques are difficult to duplicate, the firm may enjoy growth and a superior rate of return for some time.

Superior ability also may be interpreted as a competitive basis for acquiring a measure of monopoly power. In a world in which information is costly and the future is uncertain, a firm that seizes an opportunity to better serve customers does so because it expects to enjoy some protection from rivals because of their ignorance of this opportunity or because of their inability to imitate quickly. One possible source of some monopoly power is superior entrepreneurship. Our patent, copyright, and trademark laws explicitly provide as a reward for uncovering new methods (and for revealing these methods), legal protection against free imitation, and it may be true in some cases that an astute rival acquires the exclusive rights to some resource that *later* becomes valuable. There is no reason to suppose that competitive behavior never yields monopoly power, although in many cases such power may be exercised not by creating entry barriers, but through the natural frictions and ignorance that characterize any real economy. If rivals seek better ways to satisfy buyers or to produce a product, and if one or a few succeed in such endeavors, then the reward for their entrepreneurial efforts is likely to be some (short term) monopoly power and this may be associated with increased industrial concentration. To destroy such power when it arises may very well remove the incentive for progress. This is to be contrasted with a situation in which a high rate of return is obtained through a successful *collusion* to restrict output; here there is less danger to progress if the collusive agreement is penalized. Evidence presented below suggests that there are definite dangers of decreasing efficiency through the use of deconcentration or antimerger policies.

III. Inefficiency Through Anti-concentration Public Policy

The discussion in part II noted that concentration may be brought about because a workable system of incentives implies that firms which better serve buyers will tend to grow relative to other firms. One way in which a firm could better serve buyers is by seizing opportunities to exploit scale economies, although if scale economies are the main cause of concentration, it is difficult to understand why there is no significant trend toward one-firm industries; the lack of such a trend seems to suggest that superiority results in lower but *positively* sloped cost curves in the relevant range of large firm operations. This would set limits to the size of even the successful firms. Successful firms thus would seem to be more closely related to the "superior land" of classical economic rent analysis than to the single firm of natural monopoly theory. Whether or not superiority is reflected in scale economies, deconcentration may have the total effect of promoting inefficiency even though it also may reduce some monopoly-caused inefficiencies.[2]

The classic portrayal of the inefficiency produced by concentration through the exercise of monopoly power is that of a group of firms cooperating somehow to restrict entry and prevent rivalrous price behavior. Successfully pursued, this policy results in a product price and rate of return in excess of that which would have prevailed in the absence of collusion. However, if all firms are able to produce at the same cost, then the rate of return to successfully colluding firms should be independent of the particular sizes adopted by these firms to achieve low cost production. One firm may require a small scale, and hence have a smaller investment, while another may require a large scale, and corresponding large investment. At any given collusive price, the absolute amounts of monopoly profits will be proportional to output, but capital investment also will be proportionate to output, so we can expect the rate of return to be invariant with respect to size of firm.

If one size of firm earns a higher rate of return than another size, given any collusive price, then there must exist differences in the cost of production which favor the firm that earns the higher rate of return. Alternatively, if there is no single price upon which the industry agrees, but, rather a range of prices, then one firm can earn a higher rate of return if it produces a superior product and sells it at a higher price without thereby incurring proportionately higher costs; here, also, the firm that earns the higher rate of return can be judged to be more efficient because it delivers more value per dollar of cost incurred.

[2] For a discussion of the social costs that might be incurred by deconcentration, especially in the context of scale economies, see John S. McGee, In Defense of Industrial Concentration 159 (1971).

A deconcentration or antimerger policy is more likely to have benign results if small firms in concentrated industries earn the same or higher rates of return than large firms, for, then, deconcentration may reduce collusion,[3] if it is present, while simultaneously allocating larger shares of industry output to smaller firms which are no less efficient than larger firms. But if increased concentration has come about because of the superior efficiency of those firms that have become large, then a deconcentration policy, while it may reduce the ease of colluding, courts the danger of reducing efficiency either by the penalties that it places on innovative success or by the shift in output to smaller, higher cost firms that it brings about. This would seem to be a distinct possibility if large firms in concentrated industries earn higher rates of return than small firms.

The problem posed is how to organize data to shed light on the probability that deconcentration will promote inefficiency. Correlating industry rate of return with concentration will not be enlightening for this problem, for even if concentrated industries exhibit higher rates of return, it is difficult to determine whether it is efficiency or monopoly power that is at work. Similarly, large firms would tend to earn high profit rates in concentrated industries either because they are efficient or because they are colluding. However, partitioning industry data by size of firm does suggest that there exists a real danger from a deconcentration or anti-merger public policy, for the rates of return earned by small firms give no support to the doctrine relating collusion to concentration. A successful collusion is very likely to benefit the smaller firms, and this suggests that there should be a positive correlation between the rate of return earned by small firms and the degree to which the industry is concentrated. By the same token, if efficiency is associated with concentration, there should be a positive correlation between concentration and the difference between the rate of return earned by large firms and that earned by small firms; that is, large firms have become large because they are more efficient than other firms and are able to earn a higher rate of return than other firms.

Tables 1 and 2 show 1963 rates of return based on internal revenue data partitioned by size of firm and industry concentration for 95 three digit industries. In these tables, C_{63} designates the four firm concentration ratio measured on industry sales; R_1, R_2, R_3, and R_4, respectively, measure accounting rates of return (profit plus interest)/total assets, for firms with asset value less than \$500,000, \$500,000 to \$5,000,000, \$5,000,000 to \$50,000,000 and over \$50,000,000. Table 1 is calculated by assigning equal weight to all in-

[3] This statement is incorrect if a deconcentration or anti-merger policy causes firms to adopt socially less efficient methods of colluding than would be adopted in the absence of such a policy.

TABLE 1
RATES OF RETURN BY SIZE AND CONCENTRATION (UNWEIGHTED)

C_{63}	Number of Industries	R_1	R_2	R_3	R_4	$\overline{R}$
10-20%	14	6.7%	9.0%	10.8%	10.3%	9.2%
20-30	22	4.5	9.1	9.7	10.4	8.4
30-40	24	5.2	8.7	9.9	11.0	8.7
40-50	21	5.8	9.0	9.5	9.0	8.3
50-60	11	6.7	9.8	10.5	13.4	10.1
over 60	3	5.3	10.1	11.5	23.1	12.5

TABLE 2
RATES OF RETURN BY SIZE AND CONCENTRATION (WEIGHTED BY ASSETS)

C_{63}	Number of Industries	R_1	R_2	R_3	R_4	$\overline{R}$
10-20%	14	7.3%	9.5%	10.6%	8.0%	8.8%
20-30	22	4.4	8.6	9.9	10.6	8.4
30-40	24	5.1	9.0	9.4	11.7	8.8
40-50	21	4.8	9.5	11.2	9.4	8.7
50-60	11	0.9	9.6	10.8	12.2	8.4
over 60	3	5.0	8.6	10.3	21.6	11.3

dustries. It is based, therefore, on the assumption that each industry, regardless of size, offers an equally good observational unit for comparing the efficiency and monopolistic aspects of industry structure. Table 2 presents the same basic data with accounting rates of return weighted by asset value. Hence, an industry with many assets owned by small firms receives a larger weight in calculating the small firm rate of return for a given interval of concentration ratios.

Both tables fail to reveal the beneficial effects to small firms that we would expect from an association of collusion and industry concentration. The rate of return earned by firms in the smallest asset size does not increase with concentration. This seems to be true for the next two larger asset size classifications also, although in Table 1 the 11.5 per cent earned by R_3 firms in industries with concentration ratios higher than 60 per cent offers some indication of a larger rate of return than in less concentrated industries.[4] The data do not seem to support the notion that concentration and collusion are closely related, and, therefore, it is difficult to remain optimistic about the beneficial efficiency effects of a deconcentration or anti-merger public policy.

[4] Since firms are segregated by absolute size, for some industries the R_3 firms will be relatively large. A better test could be secured by contrasting the rates of return for the 1—% largest and 10% smallest firms in each industry. But the data do not allow such a comparison. However, see footnote 6 for the result of a similar type of adjustment.

On the contrary, the data suggest that such policies will reduce efficiency by impairing the survival of large firms in concentrated industries, for these firms do seem better able to produce at lower cost than their competitors.[5] Both tables indicate that R_4 size firms in industries with concentration ratios greater than 50 per cent produce at lower average cost.

Since a larger fraction of industry output is produced by larger firms in the more concentrated industries, these industries may exhibit higher rates of return than other industries. That this is so can be seen from the unweighted row averages given by column $\bar{R}$. Industries with $C_{63} > 50$ per cent seem to have earned higher rates of return than less concentrated industries. But this result, which is consistent with some earlier studies, may be attributed to the superior performance of the larger firms and not to collusive practices. Table 2 reveals this pattern even more clearly. Because the rates of return of smaller firms receive a larger weight (by total assets) in Table 2, industry rates of return are reduced even for concentrated industries in which large firms continue to perform well.

The general pattern of these data can be seen in Table 3. The results of regressing differences in profit rates on concentration ratios are shown in this table.

TABLE 3

$R_4 - R_1 = -1.4 + .21^{*}C_{63}$ (.07)	$r^2 = .09$
$R_4 - R_2 = -2.6 + .12^{**}C_{63}$ (.06)	$r^2 = .04$
$R_4 - R_3 = -3.1 + .10^{**}C_{63}$ (.05)	$r^2 = .04$

*, **, significant at the 1% and 5% levels respectively.
Standard errors are shown in parenthesis.

These regressions reveal a significant positive relationship between concentration and differences in rates of return, especially when comparing the largest and smallest firms in an industry.[6] The three regressions taken to-

[5] On the margin of output, however, these large firms need not have an advantage over small firms, just as fertile land has no advantage over poor land for producing marginal units. The failure of the large firms to become more dominant in these industries suggests the absence of such advantage.

[6] Three adjustments in procedure and in variables were undertaken to analyze certain problems in the data and the theory.

(1) It is believed by some that the profits of firms, and especially of small firms, are hidden in administrative wages. To check on the possibility that this phenomenon might have accounted for the data relationships shown above, the data were recalculated after adding back to profits all administrative salaries of firms in the R_1 asset size class. Although this

gether indicate a nonlinear, decreasing impact of concentration on relative rates of return as the size of the smaller firms is increased from R_1 to R_3.

The competitive view of industry structure suggests that rapid changes in concentration are brought about by changed cost conditions and not by alterations in the height of entry barriers. Industries experiencing rapid increases in concentration should exhibit greater disparities between large and small rates of return because of the more significant cost differences which are the root cause of rapid alternations in industry structure. The monopoly view of concentration does not imply such a relationship, for if an industry is rapidly achieving workable collusive practices there is no reason to suppose that the difference between large and small firm profit rates should increase. At the time of writing, matching data on concentration were available for both 1963 and 1967. This time span is too short to reveal much variation in concentration ratios, and so we cannot be very confident about evidence gained by regressing differences in profit rates on changes in concentration ratios. However, the persistently positive coefficient of the variable C_{67}–C_{63}

increased very slightly the rates of return for this asset size class, as, of course, must be the case, no correlation between concentration and rate of return was produced. In fact, rates of return so calculated were virtually perfectly correlated with the rates of return shown above for this asset size.

(2) The asset size categories used to calculate the above data are uniform over all industries. Some industries, however, had no firms in the largest asset size category, and these were dropped from the sample. An alternative method was used to check on the impact of this procedure. For each industry, the largest asset size class was redefined so as to include some firms in every industry. The mechanics of the procedure was to categorize asset sizes more finely and choose the largest three size categories containing some observations for each industry. These were then counted as the larger firms in each industry, and the rate of return for these firms was then compared to those firms contained in the three smaller asset size categories containing some observations. The unweighted average difference between large firm rate of return, R_L, and small firm rate of return, R_S, compared with industry concentration is shown below. This table is consistent with the text tables.

C_{63}	$R_L - R_S$
0 — 20%	6.4%
20 — 30	9.4
30 — 40	7.0
40 — 50	7.0
50 — 60	12.8
over 60	14.0

(3) The efficiency argument suggests that for a given degree of industry concentration, measured by the four firm concentration ratio, the greater the difference between the sizes of the largest firms and the sizes of the smallest firms, the larger will be the disparity between R_4 and R_1. A linear regression of $R_4 - R_1$ on C_{63} and the average size of firms in the R_4 class yields a positive but not highly significant coefficient for the variable "average asset size of firms in the R_4 class." Also, there was a small reduction in the significance of the coefficient of C_{63}.

TABLE 4

$R_4 - R_1 =$	$1.5 + .21^{*}C_{63} + .21(C_{67} - C_{63})$		$r^2 = .09$
	(.07)	(.42)	
$R_4 - R_2 =$	$-2.9 + .12^{**}C_{63} + .37(C_{67} - C_{63})$		$r^2 = .06$
	(.06)	(.28)	
$R_4 - R_3 =$	$-3.4 + .10^{**}C_{63} + .29(C_{67} - C_{63})$		$r^2 = .05$
	(.05)	(.24)	

*, **, respectively, 1% and 5% confidence levels.

in Table 4 is consistent with the competitive viewpoint, and must increase our doubts, however slightly, about the beneficial effects of an active deconcentration or anti-merger policy.

I have presented an explanation of industry structure and profitability based on competitive superiority. The problem faced by a deconcentration or anti-merger policy was posed on the basis of this explanation. Is there a danger that such a policy will produce more inefficiency than it eliminates? The date presented suggest that this danger should be taken seriously.