1989

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Custom Citation

Bradburd, Ralph M., and David R. Ross. "Can Small Firms Find and Defend Strategic Niches? A Test of the Porter Hypothesis." *Review of Economics and Statistics* 71 (1989): 258-262, doi: 10.2307/1926971.

CAN SMALL FIRMS FIND AND DEFEND STRATEGIC NICHES? A TEST OF THE PORTER HYPOTHESIS

Ralph M. Bradburd and David R. Ross*

Abstract—A number of studies have found a positive relation between market share and profitability. Michael Porter argues that this need not hold when small firms find strategic niches protected by mobility barriers. This paper examines that hypothesis by comparing the profitability of large and small lines of business when the activities of the two groups (proxied by the allocation of sales across submarkets) differ on average. We find that in heterogeneous product mix industries profits of large LBs are no longer significantly greater than profits of smaller rivals, except that market leaders maintain their advantage regardless of product mix.

I. Introduction

ARE large firms more profitable than small firms? A number of business strategists (e.g., Buzzell et al., 1975) argue that market share is the key to profitability; and a positive relation between market share and profitability has by now been observed in a large number of empirical studies in a variety of settings.[1] However, Michael Porter, in his leading text, *Competitive Strategy* (1980, pp. 145–148), and in earlier work (Porter, 1979; Caves and Porter, 1977), argues that the link is by no means automatic. Where the activities of large and small firms differ within industries, allowing the formation of strategic groups and mobility barriers within industries, smaller firms may be able to find niches from which they can diminish or reverse the profit advantage of large firms.

Received for publication June 17, 1987. Revision accepted for publication July 25, 1988.

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Part of this paper was written while Ross was Visiting Lecturer in Economics at the University of Pennsylvania. We would like to thank William Baumol, Richard Caves, Michael Porter, F. M. Scherer, participants at seminars at Williams College, and two anonymous referees for helpful comments and criticisms. The conclusions presented herein are those of the authors and have not been adopted in whole or in part by the Federal Trade Commission or any entity of the Commission. The Disclosure Avoidance Officer has certified that the data included in this paper do not identify individual company line of business data.

[1] See, for example, Shepherd (1972), Gale (1972), Ravenscraft (1983), and Mueller (1986). Scherer (1980, pp. 283–284) provides references to earlier studies. Recent empirical research using FTC Line of Business data (Schmalensee, 1985; Scott and Pascoe, 1986) suggests that the relation between market share and profitability, though statistically significant, is not of great quantitative importance and explains relatively little of the variance in profitability.

There are many ways in which the activities of large and small firms can differ. In this paper, we consider the effects of only one: the degree to which, within industries, the sales of large lines of business (LBs)[2] are, on average, distributed differently among product-category submarkets than those of smaller firms. In general, our results support Porter's position: large LBs have less of a profit advantage when their product mix differs from that of the average small LB operating within the same industry.

In section II below, we briefly review the leading explanations of the positive relation between market share and profitability as well as leading hypotheses regarding the impact of small firm strategies on that relation. We describe our data in section III. In section IV we propose and describe a measure of product-mix heterogeneity. In section V we describe our statistical test and results. We present our conclusions in section VI.

II. Explaining the Profitability-Market Share Relation

Economists have offered a number of possible explanations for the observed positive relation between market share and profitability. These explanations fall into two broad categories: those that assume that the firms within industries are engaged in a similar set of activities and those that assume that the activities of small firms within industries are in some way different from those of large firms. Within the first category are explanations based on the market power that comes with market share (Shepherd, 1972), explanations based on good fortune and its evolutionary impact (Mancke, 1974; Demsetz, 1973; Clarke and Davies, 1982), and explanations based on cost and/or price advantages of large firms (Gale, 1972; Gale and Branch, 1982). All of these explanations sug-

[2] A line of business represents the operations of a firm within a particular industry. For a small firm, it could cover all of the firm's business; for a large firm, it could represent the operations of one or more subsidiary business units.

gest that the relation between market share and profitability should be positive.

These explanations share a common characteristic: they all assume that the large and small firms being compared are engaged in a similar set of activities.[3] However, the activities of large firms can differ from those of small firms within the same industry.

One way in which they can differ has to do with what has been called "strategic choice." Here one assumes that all the firms in a market produce and sell the same products, but there are systematic differences in the strategies of large and small firms with respect to capital intensity, product promotion, research and development, diversification, etc. The relation of strategic choice to the profitability-market share gradient has been examined by Newman (1978) and Caves and Pugel (1980), among others.

A second way that the activities of large firms can differ from those of small firms within an industry is that the large firms might produce a different mix of products than the small firms. For example, a large firm may offer a product line across all submarkets, while a small firm strives for specialization. Or, a large firm may seek to exploit economies of scale in one or two commodity submarkets, while a small firm concentrates on sectors where customer support is important. Porter (1979) has argued that differences in activity mix may permit smaller firms to find niches in which performance equals or exceeds that of larger firms.[4] Under these circumstances, the positive relation between market share and profitability should be dampened or reversed.

Of course, if large firms can easily imitate the activities of their smaller rivals, smaller firms will not long be left in peace to exploit their niches and the earlier arguments for a positive market share-profitability relation apply. Baumol (1967) goes further, arguing that asymmetrical imitation possibilities will enhance the advantage of large firms when a range of activities are available: "large capital holding firms have the option of competing with smaller enterprises, but the smaller firms cannot always reciprocate" (p. 36).[5] Here, if we were to observe differences in activity mix, it would be because small firms were engaged in relatively unprofitable activities that large firms found uninviting, and the positive market share–profitability gradient would be enhanced.[6] Thus, differences in activity mix should only dampen or reverse the market share–profitability relation in the way that Porter suggests if first mover advantages, trademarks, vertical contractual relationships, etc. cause imitation to be very expensive in time and resources, with the consequent mobility barriers (Caves and Porter, 1977) permitting smaller firms to preserve the advantages of specialization.

In this paper we measure differences in the activity mix of large and small LBs by differences in the groups' patterns of sales among the product categories within industries.[7] We then examine whether these differences dampen the market share–profitability relation.

[3] Even when the models allow the possibility of high market share and profitability being associated with a superior product, a possibility mentioned by both Demsetz and Gale and Branch, the spirit of the models indicates that the large firm's superior product is not viewed as a different product, just a better version of the same product.

[4] There is a temptation to identify firms with a large (industry-defined) market share as large firms, and those with a small market share as small firms. However, large diversified firms can have a modest presence within any given industry, weakening the basis for that identification. Further, if the industry in question is itself modest in size, a large market share does not imply great absolute firm size. The link between the size of a firm and the market share of its LB within any particular industry is therefore weaker than our language suggests it is.

[5] Baumol's argument focuses on the total size of the firm, rather than the scale of business unit operations in an industry. A small subsidiary may be able to imitate rivals' strategic or product mix, if parental resources suffice. Time lags and internal capital budgeting limitations reduce the relevance of this exception. Schmalensee (1985) found firm effects (as opposed to market share and industry effects) to be insignificant in explaining differences in profitability among business units, suggesting that a firm's ability to compete with smaller rivals is more a function of their relative sizes in the markets where they compete. However, Scott and Pascoe (1986), using a different Line of Business sample, did find significant firm effects on profitability. The issue remains unresolved. Since our data are a subset of Schmalensee's, we do not control for firm effects in the results reported below.

[6] Baumol's asymmetric-imitation argument clearly bears some relation to arguments based on economies of scope. Large firms and small firms operating in the same industry might differ systematically in their extra-market activities; if economies of scope are very significant, strategies based on specialization within niches would very likely be unsuccessful. (We are grateful to an anonymous referee to alerting us to this point.) Economies of scope clearly warrant further study. However, given the primary focus of this paper, as well as the profession's current inability to develop satisfactory measures of economies of scope from the available data, we have not attempted to incorporate the role of economies of scope in the empirical research reported in this paper.

[7] The presumption (confirmed by inspection of our data) is that, where sales patterns differ, large LBs have broader product lines and small LBs tend to concentrate their sales in a smaller number of product categories.

III. Data

Our data are based on the Federal Trade Commission's Line of Business survey[8] for the year 1975, which contains 4,198 LB observations. We obtained our sample of 2,078 LB observations by dropping LBs for which no data were reported for 1974 and 1976, dropping LBs from particularly ill-defined industries (e.g., "textiles not elsewhere classified"), dropping LBs where operating losses were so high that the business unit clearly was not operating under equilibrium conditions, and dropping LBs where the linkage to input-output data is particularly tenuous.[9]

Although the reporting firms were required to provide detailed income statement and balance sheet data only at the level of FTC 4-digit industries, the Line of Business Program did request data on the distribution of each LB's sales among the 5-digit product categories subsumed within each 4-digit industry.[10] We used these data to divide industries into two categories, defining a "homogeneous activity-mix industry" to be one in which high and low market share LBs distribute their 4-digit industry sales among the 5-digit product categories in similar proportions, and a "heterogeneous activity-mix industry" to be one in which those proportions are dissimilar.

IV. A Measure of Activity-Mix Heterogeneity

We propose the following measure of heterogeneity (as measured by sales in that industry alone): Divide a 4-digit industry into large and small LBs and into J 5-digit product categories. Let $m_{L\cdot}$ be the proportion of 4-digit sales made by large LBs; $m_{S\cdot}$ be the proportion made by small LBs; $m_{\cdot j}$ be the proportion of 4-digit shipments made in product category J; and let m_{Lj}, m_{Sj} be the proportion of all 4-digit shipments made by large and small LBs, respectively, in product category j. If the distribution of sales is homogeneous across large and small LBs (i.e., the average large LB has the same proportion of its shipments in each product category as the average small LB), then $m_{Lj} = m_{L\cdot} \cdot m_{\cdot j}$ and $m_{Sj} = m_{S\cdot} \cdot m_{\cdot j}$. An industry is heterogeneous to the extent that these equalities fail to hold. In earlier work (Ross and Bradburd, 1987), we have proposed a measure of category heterogeneity (HET)[11] normalized to lie between 0 and 1—a value near 0 indicating extreme homogeneity, a value near 1 indicating extreme heterogeneity.[12]

V. Testing the Activity-Mix Hypothesis

We wish to test the hypothesis that the profit differential between LBs with large and those with small market shares shrinks as their activities within an industry become more dissimilar. In order to do so, we require a measure of profitability at the LB level, and for this we employ the ratio of operating income (sales minus traceable and nontraceable operating and nonoperating costs) to sales.[13] We call our profit measure *OIS*.

[8] See Benston (1985) and Ravenscraft (1983) for discussions of the methodology behind the survey.

[9] See Ross and Bradburd (1987) for a fuller description of the dataset, which was created as part of a wider research program. While the linkage of FTC data with input-output data was not needed for the analyses reported here, there is no reason to believe that the few observations dropped to make this linkage possible would have any systematic effects on the results reported below.

[10] FTC industries correspond imperfectly to economically meaningful markets (Ross and Bradburd, 1987). In collecting data, no effort is made to account for transportation barriers and products are linked based on somewhat arbitrary judgments of supply substitutability rather than cross elasticity of demand. In most cases, true markets probably correspond to a lower level of aggregation than FTC 4-digit industries.

[11] Our quadratic measure,

$$S = \sum_{j=1}^{J} J \cdot (m_{Lj} - m_{L\cdot} m_{\cdot j})^2 / m_{L\cdot} m_{\cdot j} + \sum_{j=1}^{J} J \cdot (m_{Sj} - m_{S\cdot} m_{\cdot j})^2 / m_{S\cdot} m_{\cdot j},$$

ranges from 0 to ∞. To obtain an index between 0 and 1, we draw on the analogy between S and the χ^2-statistic for a contingency table to define

$$HET = \int_0^S \chi^2_{2(J-1)}\, d\chi^2.$$

[12] There are several aspects of the Line of Business data which might bias our measure toward the appearance of heterogeneity. An LB may use output in one 5-digit category as an input in another. To the extent that firms report such transfers, we sought to adjust for them. Also many firms reported modest levels of shipments of wholly unrelated products within the 4-digit level. To deal with the resulting explosion of product categories, we removed all 5-digit product codes which accounted for less than $20/J$ percent of 4-digit shipments. For example, if an industry started with 10 product codes, we deleted product codes accounting for less than 2% of industry shipments. Thus, as a result of the original double counting problem and our adjustments, $\Sigma_J m_{Lj} + \Sigma_J m_{Sj} \neq 1$. However, our earlier work (Ross and Bradburd, 1987) suggests that the resulting discrepancy has a minor effect on HET.

[13] This is the profitability measure employed in Ravenscraft (1983) and most other line of business studies.

TABLE 1.—AVERAGE OPERATING INCOME TO SALES RATIOS BY SALES HETEROGENEITY AND LB RANK
LARGE = TOP 4 LBS

HET	LB Rank: Large	LB Rank: Small	All LBs	Difference *t*-statistic
< 0.10	0.09045	0.07566	0.08080	2.27
> 0.10	0.06649	0.05592	0.05984	1.54
> 0.60	0.07342	0.07097	0.07177	0.17
All Indus.	0.07974	0.06735	0.07178	2.35

[a] Corresponding tables giving the number of firms and OLS variance are available from the authors upon request.

TABLE 2.—AVERAGE OPERATING INCOME TO SALES RATIOS BY SALES HETEROGENEITY AND LB RANK
LARGE = TOP 8 LBS

HET	LB Rank: Large	LB Rank: Small	All LBs	Difference *t*-statistic
< 0.10	0.07370	0.06260	0.06960	2.04
> 0.10	0.07941	0.07476	0.07722	0.51
> 0.60	0.06192	0.07806	0.06752	−0.49
All Indus.	0.07514	0.06670	0.07178	1.81

TABLE 3.—AVERAGE OPERATING INCOME TO SALES RATIOS BY SALES HETEROGENEITY AND LB RANK
LARGE = LEADING LB

HET	LB Rank: Large	LB Rank: Small	All LBs	Difference *t*-statistic
< 0.10	0.10414	0.07062	0.07347	2.75
> 0.10	0.09500	0.06714	0.06999	2.84
> 0.60	0.11753	0.05553	0.06435	3.00
All Indus.	0.09929	0.06895	0.07178	3.89

Tables 1–3 present average *OIS* ratios by industry sales heterogeneity and LB rank. The tables represent three different definitions of large LBs: the largest four LBs, the largest eight, and the leading LB, reflecting common categorizations in the industrial organization literature (Scherer, 1980). We define an industry to be homogeneous if HET < 0.10 and use two alternative definitions of heterogeneity: HET > 0.10 and HET > 0.60[14]

Define δ to be the difference in the *OIS* ratios between large and small LBs. The last column presents the *t*-statistic[15] for the null hypothesis $\delta = 0$ in each row, assuming OIS_L and OIS_S are drawn from identical normal distributions[16] (Kmenta, 1986, p. 145).

The tables confirm the standard result: On average, large LBs are more profitable than small ones. However, categorizing industries by activity mix allows us to say a bit more. Leading LBs are always more profitable (table 3), but leading *groups* of LBs lose their edge when small LBs have a different product mix.[17] Thus, our results support Porter's position, as well as indicating the value of market dominance.

There are at least two alternative explanations for the results reported above, and these must be addressed before we can proceed to any conclusions. One possible explanation of our results is this: Suppose that the differences in the market shares of large and small LBs are much larger in those industries that we have defined as homogeneous than in those industries we have defined as heterogeneous, or that there are no significant differences in the market shares of large and small LBs in very heterogeneous industries. Under these circumstances, our results would reflect a spurious correlation between our measure of heterogeneity and the extent of differences in the market shares of large and small LBs within industries. We are able to rule out this case by observing that whether one compares the largest LB within an industry to all others, the largest four to all others, or the largest eight to all others, there are statistically significant differences (0.005 level or better) in the market share of the average large and small LB within industries for the homogeneous category and for both heterogeneous categories. We did find that the differences in market share are smaller in the heterogeneous groupings than in the homogeneous grouping; however, the differences in the differences are so small that, given the very modest market share effects that have been found in previous research (Schmalensee, 1985; Scott and

[14] Because our measure compares the sales distribution of the *average* large and small LB, there are very few examples of extreme heterogeneity (values of HET > 0.90). We use the 0.60 cutoff to ensure confidentiality of LB data. Raising the cutoff strengthens the results of tables 1 and 2 and has no effect on the results of table 3.

[15] $$t = \delta \Big/ \left(\frac{1}{N_L} + \frac{1}{N_S}\right)^{1/2} \left(\frac{N_L s_L^2 + N_S s_S^2}{N_L + N_S}\right)^{1/2}$$

[16] Because of the large number of observations, relaxing the assumptions of equal variance for the processes generating OIS_L and OIS_S does not alter the basic results. One would appeal to the central limit theorem and the statistic derived from δ would have a standard normal distribution.

[17] The special status held by leading firms is consistent with results reported in Kwoka and Ravenscraft (1986).

Pascoe, 1986), it is unreasonable to attribute to them the results reported in tables 1–3.

The second alternative explanation for our results is that heterogeneity may be acting as a proxy for variables not captured by our analysis. A plausible candidate is capital intensity,[18] which is systematically related to the ratio of operating income to sales. We found no statistically significant differences in the capital intensity of large and small LBs within the industry group that we define as homogeneous nor within either of the industry groups that we define as heterogeneous.[19]

To examine the robustness of our results relative to less plausible factors, we estimated the relationship represented by tables 1–3 controlling for industry effects, i.e., including dummy variables for each industry. The results remain qualitatively unchanged.

VI. Conclusions

A number of writers have argued that greater market share should be associated with higher profitability. Our study joins a long list of articles in confirming that large business units are more profitable on average than smaller operations.

However, Porter (1979, 1980) has argued that mobility barriers may allow smaller firms to find and defend strategic niches. Using an approach that allows us to examine the Porter hypothesis with a minimum of structural assumptions and without resort to a subjective definition of heterogeneity, we examined the influence of activity mix, the degree to which LBs operate within different submarkets, on the market share–profitability relation. We found support for Porter's argument. For industries with a heterogeneous activity mix, small business units are able to reduce or reverse the profit advantage of larger rivals. An exception is the observation that market leaders maintain their edge regardless of activity mix.

[18] We measured capital intensity by the ratio of gross book value of assets to sales.

[19] These results are surprising, as one might expect the larger firms to show evidence of greater capital intensity; they merit further analysis.

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