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SOURCES OF SUPERIOR PERFORMANCE: MARKET SHARE VERSUS INDUSTRY EFFECTS IN THE U.S. BREWING INDUSTRY*

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Using financial measures of performance we investigate the sources of value creation in the U.S. brewing industry between 1969 and 1979. We find that market share gains in this industry at this time are not correlated with changes in value and that the performance of individual leading firms is highly correlated. Our interpretation is that the success of market share building strategies depends critically on specific industry conditions. Specifically, in the absence of fundamental shifts in the relative resource positions of individual firms, share gains may come at too high a price. In addition, the research shows that intra-industry correlations in returns may result from excessive competition rather than collusion.
(FIRM RESOURCES; PERFORMANCE; MARKET SHARE)

1. Introduction

The folklore of management is replete with anecdotes about specific firms which are considered "winners" and "losers" in their industries. A particularly rich source of such anecdotes has been the U.S. brewing industry in the 1970s. It is repeatedly alleged that during that period Miller Brewing and Anheuser-Busch were industry "winners," that Schlitz Brewing was a "loser," that "winners" won because they gained market share, and that other firms lost because the "winners" won. These views contain judgments about (a) the relative performance of firms in the industry, (b) the association between market share gains and firm performance, and (c) the view that performance within the industry was a zero-sum game.

In this paper we subject these anecdotes to empirical tests. In §2 we briefly review the theoretical arguments. In §3 we describe the study. In §4 we present the results.

2. Theory

a. *Market Share and Performance*

Many believe that there is a causal relationship between market share and performance. The supporting evidence has typically consisted of cross-sectional correlations between market share and accounting measures of return (Buzzell, Gale, and Sultan 1975; Prescott, Kohli, and Venkatraman 1986). However, several authors (Schendel and Patton 1978; Rumelt and Wensley 1981; Spence 1981) have suggested that if market share is an asset, then competition for it should be just fierce enough to reduce the net long-term returns to zero. While this is a compelling argument, it has not been subjected to very convincing empirical tests. In particular, the published results (Rumelt and Wensley 1981; Jacobson 1988) rely on accounting measures of performance. Apart from the usual critique of accounting measures (Benston 1985) in the present context they are especially inappropriate because the net returns from gaining market share may be realized over very long time periods. Capital market measures, which capture the expected net present value of market shares, are clearly superior for this purpose.

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In addition to the above measurement concern, tests of the theory often involve serious sample selection problems. This issue is best understood from the perspective of the resource-based view of the firm (Wernerfelt 1984; Rumelt 1984; Montgomery and Wernerfelt 1988). From a resource perspective, firms earn higher profits, and generally have higher market shares, if they have "better" resources. Better resources in turn are those which convey the firm a competitive advantage and are impossible for competitors to replicate at equal cost. Market equilibria should be understood as contingent on given resource profiles. If relative resources change, equilibrium market shares will typically change also. For example, if a firm gets a patent, is lucky with an advertising theme or otherwise gains fundamental competitive advantage, both its market share and its value should go up. The argument that market share as an asset should be properly priced is contingent on stable underlying resource profiles. Any test which fails to control for shifts in fundamental resource positions will be seriously biased. While there are many ways to separate such spurious effects from causal effects, one possibility is to focus on groups of firms whose relative competitive strengths have remained essentially unchanged. To the extent that one fails to "cleanse" the sample in this way there may be a positive bias in estimates of the relationship between changes in market share and changes in value. (In our view this is a major problem with Sullivan 1977.)

b. *Industry Effects*

Much prevailing thought in strategic management follows the framework for industry analysis introduced by Porter (1980). This framework is in turn heavily influenced by the so-called "classical" school in industrial economics (Bain 1951). According to this view, a major component in firm performance is the ability of industry members to curtail competitive rivalry.

Within economics, the classical school has been under fire from the "revisionists" (Demsetz 1973), who interpret inter-industry differences in profit rates as results of differences in relative firm efficiency, rather than results of differences in competitive restraint. The revisionists operationalized the controversy as a question of whether concentration (collusion) or market share (efficiency differences) correlated most strongly with performance. The initial empirical evidence seemed to favor the revisionists. However, several recent papers (Schmalensee 1985; Wernerfelt and Montgomery 1988) have compared the market share effect with an *industry* (rather than just concentration) effect. In these papers, industry fares much better than market share, explaining 15-20 percent of the variance in returns, versus less than one percent for market share. This result has been interpreted as evidence that some industries enjoy positive collusive benefits, while others are more perfectly competitive. A complementary interpretation, that some industries with high fixed costs get caught in periods of excessive price competition leading to negative effects, has not been put forward. On the other hand, this phenomenon is well known in the theoretical literature (Green and Porter 1984) and, to the extent that it occurs, the evidence on industry effects is much less damaging to the revisionist view.

3. The Study

We first present a very direct test of the hypothesis that gains in market share which are not prompted by shifts in fundamental resource positions result in no value creation. Specifically, we consider the six major players in the U.S. brewing industry between 1969 and 1979. This sample was chosen for several reasons. First, it consists mostly of publicly traded single business firms. Changes in value therefore can be measured and related to changes in shares of the beer market. Second, the industry was quite unstable during the period in question, such that changes in market share and value are nontrivial. Third, the industry has been the subject of several studies (Schendel and Patton 1978; Lynk 1984), to which we can relate our findings.

When evaluating market share changes in the brewing industry the key question is whether or not the gains are the result of fundamental shifts in relative resource positions. In particular, one must consider if the gains resulted from new resources being differentially available to firms (e.g., if one firm patented a new product or process, or secured a position in product or geographic space which could not be duplicated).

These conditions do not appear to hold among brewing industry leaders during this period (1969–1979). Although technology in the industry changed substantially during this time and placed small brewers at a critical disadvantage, the advancements were well known and available to all major firms. Other changes during this period, e.g., the shift to aggressive advertising and product differentiation, were readily imitable among industry majors. Not surprisingly, Lynk (1984, p. 53) described the situation as one where competitive rivalry, on balance, worked to the advantage of the consumers.

The above factors suggest that industry leaders in this setting should not be able to earn excess rents by "buying" market share. At a minimum one would expect that share would be priced fairly as argued by Rumelt and Wensley (1981) and Posner (1975).

To measure changes in firm value, we use as a benchmark the capital asset pricing model (CAPM). Following CAPM, the equilibrium market returns for a given firm can be found as

$$R_{jt} - R_{ft} = \beta_j(R_{mt} - R_{ft}) + e_{jt} \tag{1}$$

where R_{jt} is the return on the stock of firm j in period t, R_{ft} is the return on risk free assets (i.e., T-bills) in period t, R_{mt} is the return on the market portfolio in period t, β_j is the "systematic" (nondiversifiable) risk for firm j, and $e_{jt} \sim N(0, \sigma_j)$.

The idea is now to estimate

$$R_{jt} - R_{ft} = \hat{\alpha}_{jT} + \hat{\beta}_j(R_{mt} - R_{ft}) + \hat{e}_{jt}, \qquad t \in T, \tag{2}$$

over a study period T. Since CAPM assigns $\hat{\alpha}_{jT}$ an expected value of zero, the estimated intercept in some sense reflects the average extent to which the firm has created or destroyed value.

This method, originally due to Jensen (1969), has been the subject of both theoretical and empirical criticism. On the theoretical side, Roll (1978), Admati and Ross (1985), and Connor and Korajczyk (1986) have pointed to conceptual problems underlying CAPM. Empirically, problems may relate to two issues. First, certain measurement problems may produce an upward bias in returns for less frequently traded firms (Blume and Stambaugh 1983; Scholes and Williams 1977). Second, one has to worry about various misspecifications of CAPM, including the small firm effect (Banz 1981) and various forms of parameter nonstationarity (Kon and Lau 1979). Nevertheless, perhaps for want of alternatives, the method is still widely used in finance to evaluate the performance of portfolios (Kon 1983).

In our first test daily stock returns are used to estimate $\hat{\alpha}_{jT}$ for each year and each firm. These measures of value creation are then correlated with contemporaneous market share changes. Since the theory attributes both value creation and market share changes to shocks in underlying resources, the assumption about timing is that it takes the stock market roughly the same amount of time (within a year) to recognize the changed resources as it takes the firm to translate them into market share gains. An additional assumption is that expectations over market share dynamics follow a random walk. While this is the conventional and natural model of expectations, we do not know if the results would hold in the face of more complicated models of expectations formation.

Market share data were obtained from Keithahn (1978), and stock price data from the CRSP tapes (Anheuser-Busch, Philip Morris-Miller, Schlitz) or from OTC hardcopy (Pabst, Coors—from 1976, Heileman—from 1974). Except for Philip Morris, these

were all essentially single business firms and in 1979 their combined market share exceeded 80%.

4. Results

The correlation between yearly changes in market share and yearly value creation is −0.4906, significant beyond the 1% level with 47 degrees of freedom. (This result does not change materially if Philip Morris, a diversified firm, is removed from the sample.) This finding suggests that these industry leaders, on the average, competed too fiercely for market share during the study period. As further evidence, Table 1 lists the estimated super normal returns of the six firms. On the average, firm value was destroyed during this period although market share gains were substantial.

If in fact these firms engaged in occasional price and advertising wars during the study period, there should be a strong positive correlation between firm and industry returns. To evaluate the effect of unexpected industry developments (e.g. price wars) on a firm's stock price, one can relate the firm's returns, after controlling for systematic risk, to those of a portfolio of industry stocks.

Because such disaggregation does not alter the total amount of value created but only decomposes it into specific sources, it has been pursued less intensely in the field of finance. Nevertheless, quite a substantial literature on so-called industry-betas has developed over the years (King 1966; Cohen and Pogue 1967; Elton and Gruber 1973; Myers 1973; Livingston 1977; Brown and Weinstein 1985). Unfortunately, no general agreement exists on how to measure the industry effect. Some studies are sequential in nature and look at value from the CAPM residuals, while others decompose the raw returns. Furthermore, both regression and factor analysis methods are used.

In the present study, we are in the fortunate position of having a portfolio of industry stocks. Therefore, we do not need to create and interpret factors. To estimate the industry component of value creation, we take the daily residuals a_{jt} from CAPM and estimate:

$$a_{jt} = \alpha^*_{jT} + \gamma^*_j (R_{it} - R_{ft}) + e^*_{jt}, \qquad t \in T, \tag{3}$$

where R_{it} is the return on a value weighted portfolio of industry stocks in period t and γ^*_j estimates the fraction of industry returns that translate into excess returns for firm j. These estimates are given in Table 2.

To arrive at a minimalistic interpretation of these results, recall that a positive bias was created by including R_{jt} in the calculation of R_{it}. Even in the absence of an industry effect, the average γ should be equal to $\frac{1}{6}$. In fact, the average γ is 0.341, exceeding $\frac{1}{6}$ by

TABLE 1

Market Share Changes and Average Yearly Alpha

Firm	Change in Market Share[1]	Average Yearly Alpha† Entire Period	Average Yearly Alpha† 1976–1979
Anheuser-Busch	10.8	−0.005* (1969–79)	−0.004*
Miller	16.3	−0.010 (1969–79)	−0.006*
Schlitz	−2.1	0.003* (1969–79)	0.005
Pabst	0	−0.007* (1969–79)	−0.001
Coors	2.2	0.001 (1976–79)	−0.001
Heileman	3.6[2]	−0.007 (1974–79)	−0.004

[1] In percentage of total barrelage sold in U.S. (Keithahn 1978).

[2] 1974–79.

* Significantly different from zero at the 0.05 level.

† 0.01 implies 1% "extra" return to stockholders per year.

TABLE 2
Estimated Values of Gamma

Firm	Gamma	*t*-statistic	Sample Period
Anheuser-Busch	0.280	19.2	(1969–79)
Miller	0.076	5.8	(1969–79)
Schlitz	0.416	20.9	(1969–79)
Pabst	0.400	20.2	(1969–79)
Coors	0.157	6.0	(1976–79)
Heileman	0.718	7.1	(1974–79)

0.174, which is significantly different from zero beyond the 1 percent level. Thus we estimate that industry effects account for 15 to 20 percent of the variance in returns—a result very consistent with the cross-sectional literature (Schmalensee 1985; Wernerfelt and Montgomery 1988).

Given that we found excessive market share competition *it is logical to attribute part of the industry effect to mutual value destruction in price and advertising wars*, rather than to collusion.

5. Discussion

We have performed a partial decomposition of the sources of value creation in the U.S. brewing industry between 1969 and 1979. The analysis suggests that (a) on the average, gains in market share were associated with the destruction, rather than the creation, of firm value, and (b) a portion of the industry component of returns came from excessive competition, rather than collusion.

This picture of the industry is quite consistent with that painted by earlier work and answers questions posed by it. Schendel and Patton (1978) argued that the majors engaged in advertising wars to gain market share with presumed later benefits. Since they used yearly accounting returns, they were not able to pursue the topic in further depth. Similarly, Lynk (1984) argues that competition, rather than collusion, characterized the industry. His data did not allow him to evaluate whether the competition was "excessive," only that it dominated collusion.

A final clarification: it is not our view that competition for market share should be avoided. It is only overzealous attempts to gain share that are problem. Neither is it our view that all, or even most, industry effects result from excessive competition. We merely claim that it is unlikely that collusion tells the whole story.[1]

[1] We are grateful for comments by participants at various seminars, Robert Keeley, the Associate Editor, and an anonymous referee. The usual disclaimer applies.

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