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Efficiency vs. market power in retailing: Analysis of supermarket chains

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ABSTRACT

The objective of this article is to analyze the relationship between market structure and performance in the Spanish retail sector. As a new contribution, this paper considers a direct measurement of efficiency, which allows us to test different hypotheses explaining profitability in the generic framework of the theories of market power vs. efficiency. The results of the empirical application on a sample of 147 supermarket chains operating in Spain find that the competitive situation that best characterizes this sector is that of the modified efficient structure. Although efficiency does contribute positively to explaining differences in profitability, market share, which would capture the effect of market power, also has a positive effect.

1. Introduction

In the field of industrial organization the analysis of the relationship between market structure and profitability has given rise to abundant literature of both theoretical and empirical natures. Generically, two alternative theories (market power and efficiency) have been put forward to explain the relationship between market structure (market concentration and market share) and performance. On the one hand, the traditional hypothesis of market power (Bain, 1951) posits that market concentration favors collusion. High market concentration and/or market share are/is associated with less favorable prices for consumers, thus generating greater profits for companies. On the other hand, the efficient structure hypothesis (Demsetz, 1973) posits that concentration of the market is the result of the greater efficiency of some firms, which consequently gain in market share and are more profitable.

Traditionally, the most usual way of testing both hypotheses has been to introduce concentration and market share as explanatory variables of profitability, on the assumption that market share will reflect the effect of efficiency. However, market share may also be a manifestation of the residual influence resulting from market power (i.e. market power is not only obtained by collusion as firms may have market power when they enjoy high market shares) or other factors unrelated to efficiency (Maudos, 1998). Thus, the main implication of the analysis of the relationship between market structure and profitability is the need to individually identify each effect (market power and efficiency) through an efficiency control, as otherwise there could be confusion between the respective impacts of market power and efficiency (Akhavein et al., 1997; Timme and Yang, 1991; Berger, 1995; Maudos, 1998).

In this line, the present paper offers new evidences on the hypotheses that explain the relationship between market structure and profitability in the Spanish grocery retail sector. To reach this goal, we develop and test various alternative hypotheses explaining the relationship between market structure and profitability. The main contribution of this paper is the use of a direct measurement of efficiency to analyze this issue in retailing. Thus, we first apply a stochastic frontier production function to estimate efficiency and, secondly, we apply various regression analyses to examine the influence of efficiency and market structure (market share and concentration) on profitability. This analysis will allow us to evaluate the existing competitive situation of the Spanish retail sector. The empirical application is made with data from a sample of 147 supermarket chains operating in Spain in 2004.

To reach the proposed objectives, this study is organized into the following sections. In the second we propose and argue various hypotheses related to the competitive situation of the retail sector in Spain. In the third we present the proposed methodology along with the sample and variables used. The fourth section presents and discusses the results obtained and the final section summarizes the main conclusions of the study.

2. The influence of market share, concentration and efficiency on profitability: hypothesis of efficiency vs. market power

In the field of industrial organization two alternative theories have been put forward to explain the relationship between market structure (market concentration and market share) and performance. On the one hand, the traditional hypothesis of market

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power (Bain, 1951) proposes that high market concentration and/or market share are/is associated with less favorable prices for consumers, which will in turn generate higher profits for producers. Companies operating in concentrated markets can adopt collusive behavior, charging higher prices for their products. In fact, in a concentrated market, firms have incentives to cooperate as opposed to competing because if they are able to coordinate their actions and there are no potential entrants into the market, they can behave monopolistically and maximize the joint profits of the industry.

On the other hand, the efficient structure hypothesis (Demsetz, 1973; Peltzman, 1977) proposes that concentration and/or market share are/is positively correlated with company efficiency, so that the most efficient companies grow more and obtain dominant market shares. Under this hypothesis, high concentration and market share are associated with more favorable prices for consumers if some of the savings made through efficiency are passed on to consumers (possibly as part of the process of reaching dominant market shares), and the greater efficiency of companies in more concentrated markets and with higher market shares would also produce higher profits. In summary, this hypothesis holds that efficiency explains both profitability and concentration and market share, meaning that the positive association between profitability and concentration is due to the greater efficiency of large companies and not to the exercise of monopolistic power in the industry.

Empirically, the most usual way of testing both hypothesis has been to introduce concentration and market share as explanatory variables of profitability, on the assumption that market share will reflect the effect of efficiency. However, Akhavein et al. (1997) indicate that there is a debate over whether market share represents the exercise of market power for differentiated products (e.g. Rhoades, 1985; Shepherd, 1986) or the efficiency of the company, which is not included in the model (e.g. Smirlock et al., 1984; Smirlock, 1985). Recent analyses (Berger, 1995; Berger and Hannan, 1997; Maudos, 1998) attempt to resolve this problem by adding direct measures of efficiency, and find that concentration and market share have a reduced impact on firm performance after controlling for efficiency.

In the case of retailing, Dobson and Waterson (1996) consider that perfect competition is not the norm in most situations and that, conversely, the presence of market power (at least to a limited extent) is more common. In fact, Lamm (1981), Marion et al. (1979), Cotterill (1986, 1999) and Aalto-Setälä (2002) find positive relationships between market structure (concentration) and prices. These findings could support the market power hypothesis, although we have found no studies analyzing the impact of market structure (market concentration and/or market share) on profitability.

In the Spanish case, one of the main characteristics of the grocery retailing sector, as with the rest of Europe, is the presence of a small group of companies with high market shares, along with an atomized market structure with a large number of agents, which creates a situation in between the conditions established in the models of perfect competition and monopoly. Only two papers (Cruz-Roche et al., 2003; Yagüe, 1995) analyze the relationship between market structure and prices in the Spanish market: Cruz-Roche et al. (2003) find a positive relationship between market structure (concentration) and prices, which supports the market power hypothesis; whereas Yagüe (1995) detects a negative relationship between market concentration and prices, which supports the efficient structure hypothesis. Yagüe (1995) considers that the market structure generated by an increase in market concentration can have repercussions to both ends of the distribution channel. These repercussions can be favorable or unfavorable for consumers according to whether or not cost reductions in the production of distribution services are passed on to consumers. In this sense, price increases derived from market power could be offset by potential price reductions coming from efficiency improvements (Dobson and Waterson, 1996).

In an attempt to analyze the competitive structure that best describes the Spanish retail sector (collusion vs. efficient structure) we consider a direct measurement of productive efficiency to analyze the impact that market structure (market concentration and market share) and efficiency exert on profitability. This solution avoids the problem of having to use market share as a proxy variable of efficiency as several authors (Timme and Yang, 1991; Berger, 1995; Maudos, 1998) agree that the main implication is the need to individually identify each effect (market power and efficiency) by controlling for efficiency. Along this line, recent developments (e.g. Maudos, 1998) distinguish between these effects, using the following hypotheses, which have not been tested in grocery retailing.

Firstly, the "pure efficient structure" hypothesis (Demsetz, 1973) assumes that more efficient companies have lower costs and, therefore, make higher profits, thus gaining market share and increasing concentration. Given that efficiency leads to higher market share and concentration, this hypothesis assumes that concentration should not show a significant relationship with company results. Consequently, we propose that:

H_1. The main determinant of the results of a supermarket chain is efficiency.

Note that the efficient structure hypothesis requires, moreover, that efficiency leads to higher market share and concentration. In other words, a necessary additional condition of this hypothesis is that efficiency is an explanatory variable of market share and concentration, and that they are positively correlated.

Secondly, the "modified efficient structure" hypothesis (Shepherd, 1986) assumes that variations in company results are explained, fundamentally, by differences in efficiency and, residually, by market share, a consequence of factors such as differentiation, product quality and market power (larger companies can offer a greater range of products with better quality and at more attractive prices, which leads to higher profits). In this sense, as with the pure efficiency hypothesis, the modified efficient structure hypothesis holds that concentration does not directly affect company results, as concentration is explained by greater efficiency, which in the end leads to larger market share. Put another way, concentration should not affect company results once we have controlled for the direct effect of efficiency and the residual effect of market share. In virtue of the above, we propose that:

H_2. The main determinants of the results of a supermarket chain are market share and efficiency.

Note that this hypothesis also requires that efficiency leads to higher market concentration. This means that a necessary additional condition of this hypothesis is that efficiency is an explanatory variable of market concentration, and that they are positively correlated.

Thirdly, the "pure market power" hypothesis (Bain, 1951) presumes that the main determinant of company results is market concentration, in such a way that higher concentration leads to better company results. Accordingly, we propose that:

H_3. The main determinant of the results of a supermarket chain is market concentration.

The "relative market power" hypothesis (Maudos, 1998) assumes, unlike the pure market power hypothesis, that the