J Manage Gov (2008) 12:261–285
DOI 10.1007/s10997-008-9060-y

Rivalry and strategic groups: what makes a company a rival?

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Published online: 5 June 2008

Abstract Strategic group literature has generated a significant amount of research over recent decades. However, the rivalry implications of strategic group have remained unclear. This paper analyses rivalry and strategic groups in the house building industry in a small town from a cognitive approach. We consider rivalry as a subjective and directional phenomenon. Estimating rivalry as the direct identification of competitors we try to explain whether similarity affects rivalry and what factors make a company a "rival". Results show that perceived rivalry is strongly related to size, past performance, subjective similarity and strategic group structure.

Keywords Cognitive approach · Rivalry · Strategic groups

1 Introduction

Industry analysis is a necessary activity in the correct formulation of competitive strategies, and a primary objective of this analysis is to understand and predict rivalry between firms in their quest for a competitive position within that particular industry (Porter 1980). Rivalry is the behaviour of an individual firm towards other firms operating in its own market. It is the conscious effort on the part of each individual firm to establish its own supremacy in an industry or specific market (Boari et al. 2003). Rivalry occurs "when one firm orients toward another and considers the actions and characteristics of the other in business decisions, with the goal of achieving a commercial advantage over the other" (Porac et al. 1995,

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p. 204). Firms usually limit their attention to the actions taken by a small number of competitors. In terms of analysing firms competing in an industry, the strategic group approach is by far the most popular and relevant. Although many scholars have employed strategic groups as a tool to understand competition, behaviour, and differences in the performance of firms within an industry (Short et al. 2007; Leask and Parker 2007), there is no consensus in literature on the relationship between rivalry and strategic groups.

There are two main issues in rivalry and strategic group research. One is that strategic group structure would help managers to make sense of their industry, and therefore, identify their main rivals. Although it has been developed theoretically (Fiegenbaum et al. 1996), this topic deserves more attention as there is a lack of empirical papers that examine how the basic group structure and positioning of the firm within that structure are related to the environmental scanning which managers undertake (McNamara et al. 2003). This paper is a first attempt to analyse how the positioning of a firm within the strategic group structure influences its propensity for being considered a rival by other members of the industry. The second issue on rivalry and strategic group research is how similarity affects rivalry, that is, whether rivals will be those firms within the same strategic group or less similar firms located in different strategic groups. There are some authors that suggest that rivalry is stronger among firms within the same strategic group, because companies with similar resources are more capable of competing for the market positions of others (Hatten and Hatten 1987). On the contrary, some researchers argue that similarity enhances cooperation instead of direct competition. Their reasoning is that within a strategic group firms will be better able to recognize their mutual dependence, and cooperate or collude with one another (Caves and Porter 1977; Peteraf 1993). Therefore, there is theoretical controversy on the relationship between similarity and rivalry. Added to this theoretical controversy, empirical studies on the topic are inconclusive (Cool and Dierickx 1993; Smith et al. 1997; Más-Ruiz et al. 2005).

In the present paper we consider rivalry as a subjective and directional phenomenon that occurs when managers compare their organizations with others. This paper analyses rivalry in the house building industry in a small town from a cognitive approach. Measuring rivalry as direct identification of competitors we try to explain whether similarity affects rivalry, and the factors that make a company a "rival".

This paper provides two main contributions to the analysis of rivalry and strategic groups. We will focus on the two main issues regarding rivalry and strategic group research. We will analyse whether strategic group structure is a useful tool that helps managers to make sense of their industry and identify their rivals, and whether similarity accentuates rivalry or not. There is mixed evidence in past studies and we will try to explain this controversy approaching this issue from the managerial and organizational cognition. We will provide a model on the factors that affect rivalry answering the question: what makes a company a rival?

In the following section, we present the theoretical foundations and literature review and we propose several hypotheses to be contrasted. Then, we present our research design. Finally, we expose the results of our empirical analyses and the conclusions that can be obtained.

2 Literature review

2.1 Rivalry

Literature makes a distinction between the concept of "rivalry", which stresses the behaviour of individual companies, and the concept of "competition", which is centred on the properties of the industry or market structure (Chen 1996). Rivalry is driven by two strategic questions (Porter 1980): "who are our rivals?" and "how do we compete?" The "who" question has normally been answered anecdotally by defining rivals as those firms that are "most similar" to each other, with similarity being considered an objective property of interorganizational space. However, it is not similarity per se that structures imperfect markets, but similarity as defined by the market players (Porac et al. 1995). Our statement is that rivalry is a subjective phenomenon. Managers need to identify their competitors and predict how competitors will respond. It requires effective use of information that is overly abundant, complex and of uncertain relevance. As a result, managers need to simplify and limit their attention to the actions taken by a small number of competitors, namely their rivals (Reger and Huff 1993; Porac and Thomas 1994). Following Porac et al. (1995) we believe that rivalry occurs when one firm orients toward another and takes into consideration the characteristics and actions of that firm when making decisions. Managers create mental models of the industry by grouping together organizations that are similar in key characteristics. However, managers also see some organizations as more relevant than others (Porac and Thomas 1990; Reger and Huff 1993).

Traditionally, research on rivalry considers this to be an "objective and observable phenomenon", and therefore, uses quantitative approaches to measure it. Rivalry has been measured in literature estimating conjectural variations (Amit et al. 1988), price/cost ratio (Peteraf 1993), Herfindahl index (Cool and Dierickx 1993) and competitive actions (Smith et al. 1997). Although these studies provide meaningful empirical contributions, most of them measure inter-firm rivalry indirectly. For example, Peteraf (1993) measured rivalry based on average price/cost ratios, assuming that a low ratio implied high rivalry. She used a measure of performance, from which rivalry is inferred. Cool and Dierickx (1993) inferred rivalry from a Herfindahl index calculated for each firm for the market segment the firm participates in, excluding the focal firm's own market share. They assumed that a low Herfindahl index—a measure of structure—was associated with high rivalry. Smith et al. (1997) measure rivalry more closely. Their argument is that rivalry involves actions and reactions of firms to one another; hence rivalry is measured in their paper through competitive responses. A similar approach is used by Más-Ruiz et al. (2005). These studies consider rivalry as an objective and observable phenomenon.

In this paper we will follow a different approach and measure rivalry as direct identification of competitors. Identification of competitors is a task carried out by managers as a preliminary step in the strategy formulation process. We believe that rivalry is a subjective phenomenon, and approaching this issue from the managerial and organizational cognition could help us understand it better.

2.2 Rivalry and strategic groups

Researchers in strategic management have for a long time debated the existence of strategic groups and the importance of studying them. The traditional approach is the selection of archival variables that capture product market and resource commitments, and the application of cluster analysis (e.g. Leask and Parker 2007). Drawing from research in cognitive and social psychology, some researchers propose that managers use grouping templates to simplify their perceptions of the industry landscape, resulting in what are called cognitive strategic groups (e.g. Reger and Huff 1993). Nath and Gruca (1997) found that strategic groups formed by cognitive methods are similar to those formed through the cluster analysis of archival variables.

Although we consider rivalry as a subjective phenomenon, this paper seeks complementary aspects between managerial cognition studies and strategic group theories. Therefore, we will explain the factors that make a company a rival basing our arguments on complementary theories that are based both on strategic group literature and on managerial cognition perspective. Hence, for each of the factors analysed in this paper, we will try to present an argument based on strategic group literature and a complementary argument based on managerial and organizational cognition literature.

Since Hunt (1972) first coined the term strategic group, there has been a wide range of empirical and theoretical studies on the subject. Some of them come from Industrial Economics (Caves and Porter 1977); some present a Strategic Management focus (McGee and Thomas 1986) and some others approach this phenomenon from a cognitive perspective (Reger and Huff 1993). The phenomenon has also been widely studied throughout different industries such as banking (Mehra 1996), airlines (Smith et al. 1997) and the pharmaceutical industry (Cool and Dierickx 1993). It has also been tested in different stages of the industry life cycle (Primeaux 1985).

A main issue with strategic group research is whether rivalry is stronger within the group or with firms from other strategic groups. Strategic groups are based on the concept of mobility barriers (Caves and Porter 1977), which can be expressed in the same way as conventional entry barriers, to an industry (Bain 1956). These barriers are a corollary to the existence of strategic groups and explain why some companies in an industry continuously earn higher profits than others. "A firm within a group makes strategic decisions which cannot readily be imitated by firms outside the group without substantial costs, significant elapsed time, or uncertainty about the outcome of those decisions" (McGee 1985, p. 298). The concept of mobility barriers has the implicit idea that the level of rivalry differs within and between strategic groups. However, there is some theoretical controversy.

Mobility barriers protect current firms from new entrants; therefore there will be some incentives among firms within a group to invest in collective barriers. Firms within strategic groups will collude to competitively isolate themselves from firms outside their group. This collusive action on the part of firms in a strategic group results in the erection of mobility barriers that limit the ability of outside firms to effectively imitate their strategic position. This is what Peteraf (1993) argues when

she states that firms within a group will be better able to recognize their mutual dependence and cooperate and collude. From this perspective, rivalry would be stronger between firms in different strategic groups. Cunningham and Culligan (1988) also argue that strategic groups can be formed by firms that compete like you but not necessarily compete against you, which implies that between-groups rivalry is stronger than intra-group.

On the other hand, Hatten and Hatten (1987) argue that mobility barriers promote within-group rivalry. They affirm that rivalry is stronger among firms within the same strategic group because their similarity makes them more likely to respond to each others behaviour. This argument is based on the contestable markets theory (Baumol 1980). According to this theory, firms that are very similar to each other face high competition and rivalry. On the other hand, firms that identify unique market positions isolate themselves from competition and can build a local monopoly. Fiegenbaum and Thomas (1995) also suggest that firms are likely to focus on their competitive position within their own strategic group and to be more aware of and likely to react to the actions of their own group's members than members of other strategic groups. In the same way, the Resource-Based View of the Firm also states that when resources are homogeneous between firms, rivalry will be more intense (Barney 1991). The argument is that firms within a group have similar resources and capabilities, hence, any competitive movement will be easier for other firms within the group to imitate thereby generating strong rivalry.

As we already mentioned in the previous section, there are two main issues on rivalry and strategic groups that deserve more attention. One is how similarity affects rivalry, and the other is how strategic group structure and firm positioning within that structure influences the identification of a rival. We analyse both topics in the following sections.

2.3 Rivalry and similarity

Literature on strategic groups has expanded on the aspects of rivalry. However, there is no consensus with respect to intra- and between-group rivalry, consequently, the relationship between similarity and rivalry remains unclear. Added to this theoretical controversy, empirical studies on the topic have come up with contradictory results (see Table 1).

Tversky's (1977) Feature-Based Model of Similarity could be given as an explanation of this controversy in literature on rivalry and strategic groups. When a firm/manager analyses his competitors searching for rivals, what he is really doing is a similarity judgement. According to Tversky (1977) when a similarity judgement is formulated in a directional fashion, symmetry does not remain. When a manager scans his environment he compares his company with its competitors. This is a directional similarity judgement. If A is the main competitor of B, it does not necessarily follow that B is the main competitor of A. Hence, this directional aspect of rival identification should be taken into account. It could explain why some studies have found that similarity enhances rivalry while others found that dissimilarity increases rivalry. Recent empirical evidence also demonstrates that rivalry between size-defined strategic groups is asymmetric (Más-Ruiz et al. 2005).

Table 1 Rivalry and similarity

Authors	Industry	Strategic group identification	Rivalry	Findings
Porac and Thomas (1989)	Scottish knitwear manufacturers	Hierarchical categorization	Direct identification of competitors	Within each category, core firms are considered as rivals
Peteraf (1993)	Airlines	Researcher grouping	Price/cost ratio	Rivalry is greater across groups
Cool and Dierickx (1993)	US pharmaceutical industry	Cluster analysis on archival data	A variation of Herfindahl index	There is a shift from intra-group rivalry to between-groups rivalry over time.
Porac et al. (1995)	Scottish knitwear manufacturers	Self-categorization	Direct identification of competitors	Rivalry within each category is different from outside the category
Smith et al. (1997)	US domestic airlines	Cluster analysis on archival data	Competitive actions	Rivalry occurs both within and between groups
Borroi et al. (1998)	Carpi Textile-clothing industry	Self-categorization and cluster analysis on rating values of strategic variables	Direct identification of competitors	Intra group rivalry is greater than cross-group rivalry
Más-Ruiz et al. (2005)	Spanish bank deposit market	Size	Competitive actions	Rivalry is asymmetric

Rivalry is, therefore, a directional similarity judgement that depends on the characteristics of the target firm and, mostly, on whether it is perceived as similar. Rival identification typically defines rivals as those organizations that are "most similar" to each other, with similarity being considered an objective property. Nevertheless, it is not similarity per se that structures imperfect markets, but similarity as defined by the market players: the managers (Porac et al. 1995). Therefore, it is subjective or perceived similarity which drives rivals' identification.

Porter (1979, p. 215) describes how perceived similarity influences rivalry. "Firms within a strategic group resemble one another closely and, therefore, are likely to respond in the same way to disturbances […] and to anticipate each other's reactions quite accurately". A strategic group acts, then, as a reference group. The firms benchmark those firms within the same strategic group. Strategic Reference Point Theory (Fiegenbaum et al. 1996) illustrates the importance of similarity in rival identification. According to this stream of research, because of mobility barriers between strategic groups, the most natural referents are those firms with similar structural variables because they face similar constraints on resources. Therefore, firms will monitor the behaviour of similar referent organizations.

Similarly, organizational identity management theory (Elsbach and Kramer 1996) also argues that interorganizational comparison is more likely with firms that face similar structural constraints because they allow the focal organization to draw favourable comparisons that preserve its image and identity. Firms in the same strategic group make similar assumptions about the future potential of the industry and tend to have similar strategic skills and capabilities. Labianca et al. (2001) analysing emulation in universities, found that universities generally focus their attention on other institutions which are considered to be similar. Therefore, there is a clear relationship between perceived similarity and rival identification. Similarity increases the chances of the firm orientating its actions towards another target firm and considering its characteristics and actions when taking decisions. Inconclusive results in prior empirical studies on rivalry and strategic groups would be due to the fact that similarity is perceived to be the factor which affects rivalry. If we consider rival identification as a directional similarity judgement, we would expect that those firms that are seen as similar will be considered as direct rivals. Formally, we propose:

H_1: The greater the perceived similarity with the target firm, the greater the chances of considering it as a rival.

2.4 Rivalry and strategic group structure

Strategic group research has value if it is able to identify and make sense of the patterns of strategic activities within an industry (Leask and Parker 2007). Strategic groups are important because a manager's cognition is often based upon membership within the context of a strategic group (Reger and Huff 1993). McNamara et al. (2003) studied competitive positioning within and across a strategic group structure and suggested that rivalry is influenced by group structure. They suggested that future research should examine how a strategic group structure is related with the environmental scanning undertaken by managers. In this section,

we will follow that recommendation analysing the relationship between the strategic group structure and the identification of rivals. Although this topic has been developed theoretically (Fiegenbaum et al. 1996), it deserves more attention as there is a lack of empirical papers that examine how the firm positioning within the strategic group structure influences the identification of rival.

Strategic Reference Point Theory (Fiegenbaum et al. 1996) affirms that industry members when formulating their business strategies consider strategic groups as reference points. This implies that managers look at their group members and consider them as points of reference. Managers' understanding of their firms' membership in a strategic group serves as reference points when interpreting and responding to their firm's performance. However, within a strategic group, some firms match a group profile more closely than others and they constitute the "core" of the group (Reger and Huff 1993). Core firms conform closely to the strategic recipe of the group, while "secondary" or "peripherical" firms follow the recipe to a lesser degree. Reger and Huff (1993) suggested that there is a core-and-periphery structure in which some firms are good representatives of a strategic group while others are marginal members. Those firms close to their strategic group's central values should be perceived as core members or representatives of that group. Firms that are distant from the attributes or variable means should be perceived as peripherical and less representative.

Therefore, we can expect that a firm's membership as a core or secondary member of a strategic group will influence how other firms in the industry perceive it. If managers use strategic groups as reference points, and some firms conform more closely than others to the group's characteristics, the core or representative firms will stand a greater chance of being considered as reference points than secondary firms.

From a psychological perspective, the Classification Theory (Rosch 1978) states that in any given mental taxonomy, within a category, there are a few members, called "prototypes", which compile the basic characteristics of the category. A prototype is a subjective representation of the defining attributes of a social category that capture the context-dependent features of group membership. These prototypes are easier to remember for individuals and are usually employed to classify new entities or events in taxonomy. If we consider a cognitive strategic group structure, prototypes will be those firms which are closer, with regard to defining attributes, to the mean values of the category (cognitive strategic group), and they will be used as referents in similarity judgements to clarify ambiguity and define category boundaries (Sammarra and Biggiero 2001). Similarity judgements are influenced by the prominence of the items being compared, so that less prominent members of a set are compared with more prominent members but not vice versa (Tversky 1977). Rosch (1975) suggested that highly representative category members are more salient and prominent that non representative members and thus are used as referents in similarity judgements. Hence, firms that are core to a category or strategic group should be used as referents in the identification of rivals.

Therefore, if rivalry is a subjective similarity judgement phenomenon, firms look at group members to formulate their strategies and there are some firms that "represent" the basic characteristics of the group—prototypes, core or

representative firms[1]—we would expect those firms to be considered as rivals. According to the Classification Theory (Rosch 1978) and the Strategic Reference Point Theory (Fiegenbaum et al. 1996) and considering rivalry as a subjective similarity judgement, firms will look at strategic groups' members to formulate their strategies. They will search especially for prototypes (those firms that represent the basic characteristics of the strategic group). Therefore, we would expect most of the representative firms of the strategic group structure to be considered as rivals. Based on these arguments, we predict that:

H_2: Those firms that represent the strategic group structure of the industry—representative firms or prototypes—have greater chances of being considered rivals by other firms in the industry.

2.5 Success and rivalry

Research on managerial cognition shows that some strategic decisions are mimetically adopted by firms in an industry (Greve 1998). According to Institutional Theory (DiMaggio and Powell 1983) there is a tendency to imitate successful behaviours. DiMaggio and Powell (1983) state that firms tend to model themselves upon those organizations in their field that they perceive to be more successful. This is usually a response to environmental uncertainty. Uncertainty often encourages imitation, and firms tend to model themselves on other organizations when the environment is uncertain. The modelled firm serves as a convenient source of practices that the borrowing organization may use. Reliance on established, legitimated procedures usually enhances organizational legitimacy and survival characteristics. According to these arguments, the firms will be orientated towards competitors whose strategies have been proved to be successful in the past. Managers can expand their knowledge and skills on the basis of information conveyed by modelling influences. Proficient models convey effective strategies for managing different situations to observers. As an example, a manager wanting to resolve the uncertainty around the benefits of using a new practice will look for data on the benefits of adopting, such as the performance of prior adopters. Hence, performance is a key factor in the identification of competitors. These arguments suggest that in a given industry, successful firms will be scanned by the rest of their competitors, who will try to imitate their successful strategy. Formally, we predict that:

H_3: The greater the past performance of the firm, the greater the chances of being considered a rival by other firms in the industry.

2.6 Size and rivalry

Size differences are considered a major factor in economic rivalry. Size is usually related to the frequency of market contact with other members of the industry. Large

[1] These three concepts are identical. The term prototype is typically used in cognitive categorization while "core" is usually employed in strategic group literature. We use the term "representative".

firms are more likely to offer many product varieties (Carroll 1985). Small firms tend to be specialists with narrow product ranges (Hambrick et al. 1982). Therefore, large firms should come into market contact with a greater number of other firms than small ones, because they sell a broader range of goods through many different overlapping channels.

Empirical analyses (Chen and Hambrick 1995) indicate that small firms differ from large firms in competitive behaviour, suggesting that there is a relationship between size and rivalry. Similarly, Chen (1996) found that larger companies in the US aeronautic industry consider smaller firms to be insignificant, although the latter considered the former to be their most important competitors. Recently, Más-Ruiz et al. (2005) also found that small firms have a greater degree of response to the competitive actions of large companies than vice versa.

Managers need mental models of the industry to simplify the cognitive task of understanding their strategic situation (Porac and Thomas 1994). One way of simplifying complex organizational fields is to focus on attributes that are particularly informative and predictive of organizational activities (Porac et al. 1995). Size is considered an important structural attribute that constrains a firm's strategic options. The size of a company is an appropriate dimension of scope in industries with a homogeneous product. Havenan (1993) also affirms that managers have "role models" and imitate firms that are large, pinpointing the importance of size. Moreover, empirical studies analysing subjective rivalry (Gripsrud and Gronhaug 1985; Porac et al. 1995) show that there is a strong relationship between size and rivalry. For example Gripsrud and Gronhaug (1985) found that small grocery retailers considered larger firms as rivals as opposed to other retailers located nearby. These findings suggest that there is a relationship between size and rivalry. Formally, we propose the following:

H_4: The larger the firm, the greater the chances of being considered a rival by other firms in the industry.

Now that we have exposed the theoretical foundations and have analysed the factors that can cause a company to be considered a rival by its competitors, in the next section we present the empirical analysis that we have conducted in this paper.

3 Research design: data, variables and method

3.1 Data: the house building industry in a small town

In order to test the propositions argued in the previous sections, we studied the house building industry in a small Spanish town. Following the tradition in managerial cognition studies, we chose a geographically delimited environment,[2]

[2] As an example, De Chernatony et al. (1993) interviewed 24 managers from 5 firms in the North Sea offshore oil industry. Reger and Huff (1993) interviewed 23 managers from 6 bank holding companies headquartered in the Chicago area. Reger and Palmer (1996) interviewed 25 upper echelon executives from 11 firms in the Arizona financial intermediary industry. Borroi et al. (1998) interviewed 62 managers from the Carpi textile-clothing industrial system.

which allowed us better access to the firms and ensured a better mutual knowledge among them. This house building industry is made up mainly by small and medium sized companies owned by a single manager/entrepreneur. The owner is both the manager and entrepreneur and personally takes care of managerial functions in his/her firm. This fact simplifies our research as we can consider entrepreneur and firm as a single entity. We do not need to add top management teams' visions of their competitors as, in this particular context, we could say that there are no top management teams.[3]

The population consisted of 69 firms operating in the marketplace. A sample of 43 companies in the industry, which constituted 63.23% of the population, was studied. CEOs were contacted and interviewed between January and March 2000. This sample has an error of ±9.31%.[4] As this was not a random sample, a test for non-response bias was carried out showing no difference between respondent and non-respondent in two performance variables.[5]

3.2 Dependent variable and method: logistic regression model on rivalry

Given our interest in analysing the factors that make a company a rival, to test the hypothesis proposed in the previous section, we use a logistic regression model where rivalry is our dependent variable. We analyse a model of the factors that can lead a company to be considered as a rival by other members of the industry. We try to explain what can make a company a "point of reference" for its competitors. We measure rivalry as direct identification of competitors. We ask the CEOs to name their rivals and we create a 43 × 43 matrix where rows and columns are the sample firms. In this matrix "row firms" indicate which "column firm" they considered as direct rivals. The cells of this matrix take the value of 1 when row firm (focal) consider column firm (target) as a rival and zero otherwise. This matrix is our dependent variable.

$$\begin{bmatrix} Y_{11} & Y_{12} & \cdots & Y_{1n} \\ Y_{21} & Y_{22} & \cdots & Y_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ \cdots & \cdots & \cdots & \cdots \\ Y_{n1} & Y_{n2} & \cdots & Y_{nn} \end{bmatrix} = f\left(LP_j, S_j, R_j, PS_{ij}\right) \quad (1)$$

It is a non-symmetric matrix, where diagonal elements are zero. To test our hypothesis we analyse the 43 × 43 matrix of pair wise rivalries among firms in our sample—see Eq. 1. Variables included in the model are previous performance, size, representativeness, and perceived similarity with the focal firm. We estimate a binary logistic regression model, which is a form of regression used when the dependent variable is a dichotomy. Through Eq. 2 we estimate the probability of a firm "*i*" identifying another firm "*j*" as a rival.

[3] However, three of the firms in the industry were owned by more than one partner, and a few big companies also operated in this geographical context. In both cases, we considered CEO's statements as if he were the single owner/manager.

[4] 95% confidence; $p = q = 0.5$.

[5] Return on sales and return on equity.

$$P(Y_{ij}) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 LP_j + \beta_2 S_j + \beta_3 R_j + \beta_4 PS_{ij})}} \quad (2)$$

where $P(Y_{ij})$ is the probability that firm "i" identifies firm "j" as a rival. LP_j is the lagged performance of the target firm "j". S_j is the size of the target firm "j", R_j is the representativeness of the target firm "j". Finally, PS_{ij} measures the subjective similarity perceived between firms "i" and "j".

3.3 Independent variables

3.3.1 Lagged performance

Lagged performance of each firm participating in the study is measured using its previous year return on equity—ROE. We expect a positive relationship between lagged performance and the dependent variable.

3.3.2 Size

Size of the firm is operationalized using the total number of houses and flats built in the current year. According to our hypothesis, we expect that the probabilities of being considered a rival increases with the size of the firm.

3.3.3 Strategic group structure: representativeness

We wanted to know the degree in which any given firm "represents" the strategic group structure of the industry, and how that degree influences the chances of being considered a rival by other firms in the industry. In doing so we had to previously identify the strategic groups in the house building industry. We identified the strategic groups that integrated that industry following the Strategic Management literature. To categorize the strategic groups, eleven variables reflecting scope and resource commitment decisions were analysed[6] (see Table 2). A two-step cluster analysis (Punj and Stewart 1983) was carried out. Ward's hierarchical algorithm was used to obtain the number and centroids of the groups. And secondly, with that information, a k-means cluster analysis was employed. A five-cluster solution was obtained. Our research followed recent advice on improving the use of cluster analysis on strategic group research (Ketchen and Shook 1995; Leask and Parker 2007) and all variables were transformed to a common scale via z-scores. The clustering solution was confirmed by significant ANOVAs and by a subsample analysis of 32 randomly chosen firms. Results of these analyses can be seen in Table 2 in the next section.

Finally, in order to measure the degree of representativeness of each firm, we calculated the distance of each firm from its strategic group centroid. The centroid of a strategic group is the mean vector of the strategy variables used to characterize

[6] Choice of variables is critical to strategic group analysis. Variable selection was made after several interviews with three industry experts (two managers and an estate agent) about the factors that could generate and maintain a competitive advantage in the industry.

Table 2 Strategic groups in the house building industry

Variable	Variable definition	Builders	Small firms	Leaders	Conservatives	Vanguards	*F*	Scheffé test
Non-public	Percentage of non public houses	0.75	0.98	1	0.63	1	5.21**	4 < 2,3,5**
Non-promoted	Number of buildings not-promoted by the company	3.5	0.15	0	0.2	0	27.74**	1 > 2,3,4,5**
s-family	Percentage of single-family homes	0	0	0	0.2	30	77.87**	5 > 1,2,3,4**
Town	Percentage of houses in the town	0.75	0.96	0.87	0.95	0.96	2.61*	1,3 > 2,4,5**
Zone	Percentage of houses in a particular area of the town	0.33	0.8	0.25	0.8	0.5	5.20**	2,4 > 5** > 1,3**
e-agents	Percentage of sales through estate agents	0	22	12.5	11.46	5	0.86	
Price	Price of m^2	1,600	1,450	1,400	1,380	1,400	0.91	
Advertising	Amount of advertising expenses per building	2,000	300	6,000	1,000	6,000	3.30**	3,5 > 1,4** > 2**
Prev-sales	Number of houses sold before starting to build	0.66	0.2	0.63	0.7	0.35	11.27**	4 > 2,5**
n-houses	Number of houses per building	23.75	17.45	37.5	24.85	29	2.41*	3 > 2**
n-promotions	Number of promotions	5.75	1.65	8	2.53	3.5	42.20**	3 > 5** > 4,2**
N		4	20	2	15	2		
%		9.30	46.51	4.65	34.88	4.65		

** $p < 0.05$; * $p < 0.1$

the competitive strategy of the firms. The centroid represents the core characteristics of the group. Core or representative firms would be those closer to the centroid, whereas peripherical or secondary firms would be those further from the centroid. Therefore, we measured "representativeness" in a negative way and we expect, according to our second hypothesis, a negative relationship between this variable and the dependent variable.

3.3.4 Perceived similarity: cognitive strategic groups

In order to test our first hypothesis, the relationship between the perceived similarity with the target firm and the probabilities of considering it as a rival, we had to identify the cognitive strategic groups in the house building industry and analyse managerial perceptions of similarity among the firms in this industry. Managers represent knowledge about their environment in the form of mental or cognitive models[7] (Porac and Thomas 1990). Cognitive mapping techniques are methods used to assess the structure and content of mental models showing how an individual integrates information about his environment graphically (Fiol and Huff 1992). It is also argued that managers in different organizations within an industry may share a common set of assumptions called "industry recipes" (Spender 1989),[8] "macrocultures" (Abrahamson and Fombrun 1994) or industry-specific frames of reference (Calori et al. 1992).[9] Competitors in the same industry are confronted by similar economic and technical problems which have a finite number of solutions. Firms usually exchange information regarding their commercial activities. Industry associations and trade magazines act as communication channels between firms. Ideas are diffused by these and other channels between the managers in an industry, which results in common beliefs. A collective cognitive map can be formed more easily within a population of firms in the same industry, which also belong to the same limited geographic area (Borroi et al. 1998). In a geographically delimited environment, close social relationships between people with managerial functions are established. Personal links, often long-standing, promote the development of a common language regarding technical issues and contractual rules. All these factors help the construction of a set of shared assumptions and a collective vision of the industry.

There is a variety of cognitive mapping techniques, although only a few have been applied to assessing individual manager's mental models of competition. Three main techniques have been applied: hierarchical sorting methods (e.g., Porac and Thomas 1989; Borroi et al. 1998), repertory grid technique (e.g., Reger and Huff 1993; Reger and Palmer 1996) and visual card sort mapping (e.g. Daniels et al. 1995).

We use a variety of repertory grid called full context form (Fransella and Bannister 1977), similar to visual card sort mapping, combined with multidimensional scaling. The method requires the respondent to name all those companies that he/she can think of that compete with his/her own company. The names of the

[7] Walsh (1995) provides an overview of the managerial cognition literature.

[8] An industry recipe is a set of beliefs and assumptions common to most managers.

[9] The industry-specific frame of reference is the "combination of perceptions shared by the top managers in a given industry on the structure and/or dynamics of that industry" (Calori et al. 1992, p. 63).

elicited companies are written on cards. Then, the CEO is asked to directly form groups by sorting the cards into subsets (if any), so that those companies the respondent perceives to be more similar to each other are placed most closely together. That information is then arranged into a grid. The grid shows which firms are similar and which are not according to the interviewees' perceptions.[10] The 43 individual's groupings of similarity were used as an input in the multidimensional scaling.[11] We used multidimensional scaling to determine the cognitive groups of firms and the resulting competitive position of each house building company according to the perceptions of the managers. We use SPSS PROXCAL algorithm to obtain the map and the distances between the firms according to managers' perceptions of their industry. We have measured perceived similarity using the distances between every pair of firms in the study.

4 Results

4.1 Preliminary results

Operationalization of two of our independent variables (representativeness and perceived similarity) required two preliminary empirical analyses. In order to measure the degree in which every firm represented the strategic groups' structure of the industry we had to previously identify strategic groups in this sector. Moreover, in order to measure the perceived similarity between every pair of firms in this industry we had to carry out a cognitive strategic groups' analysis.

4.1.1 Strategic group analysis and representativeness

The strategic group analysis carried out yielded a five-cluster solution. Table 2 shows the mean value of strategy variables in each group.[12] The main characteristics of every strategic group—SG—are the following:

(i) *SG1*. We call this group "Builders" and it is 9.3% of the sample. The basic features of these firms are that they do not promote the constructions and that they carry out some other building activities apart from houses. These companies have a wider geographic scope of activities. They have the lowest value in the variable that indicates the percentage of their activities carried out in this town (*town* = .75). Another characteristic of these firms is that they do not rely on estate agents to sell their houses, as can be seen in the variable that measures the percentage of their sales that come from this distribution channel (*e-agents* = .00).

[10] This technique requires the respondent to state how the firms are similar/dissimilar. For the purpose of this paper we were only interested in identifying the cognitive groups, not in the underlying dimensions. Therefore, we will just show the cognitive map without any information on the dimensions.

[11] Pegels and Sekar (1989) used multidimensional scaling as a tool to determine strategic groups and similarity profiles of hospitals in Western New York.

[12] Cluster analysis was carried out with standardized variables. However, to facilitate interpretation of groups, Table 2 shows the original variables.

(ii) *SG2*. Although this industry is basically made up of small and medium sized firms, this group, which represents 46.5% of the sample is made up of very small firms. We call this group "Small Firms". These are small companies where the manager focuses on production activities. Contrary to the previous group, these firms have to rely on estate agents (*e-agents* = 22.00) to sell around 20% of their houses. Furthermore, this group spends the least money on advertising (*advertising* = 300).

(iii) *SG3*. The third group is called "Leaders" as it is formed by 4.6% of the sample. The larger firms in volume make up this group as can be seen by analysing the variables: number of houses built and the number of simultaneous promotions carried out in a year (*n-housing* = 37.50 and *n-promotions* = 8.00). Their competitive advantage relies on their economies of scale in the acquisition of materials. They have more bargaining power against suppliers.

(iv) *SG4*. This group called "Conservatives" is made up of 34.8% of the sample. These are risk averse companies that build subsidized houses (*non-public* = .63) that use their clients to finance their buildings. As can be seen in Table 2 these firms wait until they have sold around 70% of their houses before they start to build them (*prev-sales* = .70). In common with SG2, these firms usually build and promote in a certain geographic area within the town, as can be seen by the score of the variable that measures the percentage of houses built in a certain area of the town (*zone* = .80).

(v) *SG5*. Finally, our cluster analysis identifies a group of 4.6% of the sample. We call this group "Vanguards". The basic characteristic of the firms in this group is their proactive behaviour. Their innovative behaviour and marketing orientation clearly define these firms. They have realized the demand for single-family housing and have taken advantage of this opportunity (*s-family* = 30.00).

It is not the scope of this paper to give a deep explanation of the industry structure. We just want to look at the strategic groups of this sector. The names of the groups try to capture the basic characteristics and behaviour of the firms within them. In order to improve cluster analysis, ANOVA and Scheffé tests of differences in means were made. Results are also presented in Table 2, showing significant differences among groups.

Once we had classified every firm in a particular strategic group, in order to measure the degree of representativeness of each firm, we calculated the distance of each firm from its strategic group centroid. That information is used as an independent variable in our logistic regression model.

4.1.2 Cognitive strategic groups and perceived similarity

We asked the managers to compare the firms they had previously identified as direct rivals. They had to decide which firms were similar to each other, and which dissimilar. They were asked to use any criteria they felt important to them. These comparisons were used in a multidimensional scaling program (SPSS PROXCAL) that produced a two-dimensional plot. This plot can be seen in Fig. 1. Table 3 shows the stress and fit measures.

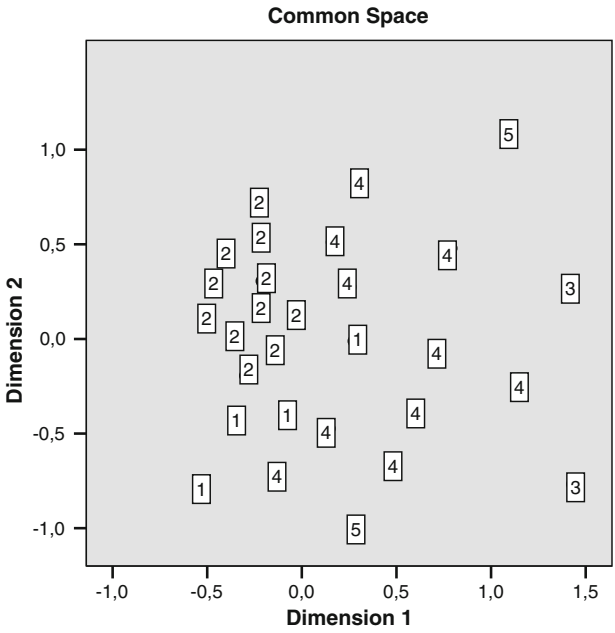

Fig. 1 Strategic groups in cognitive strategic groups space

Table 3 Stress and fit measures

Normalized raw stress	0.05574
S-stress	0.12285
Dispersion accounted for (D.A.F.)	0.94426
Tucker's coefficient of congruente	0.97173

With the information provided in the plot, analysts usually use their knowledge of the industry and data collected from other sources to identify and name the dimensions the managers considered relevant and to form the cognitive strategic groups. This procedure involves some subjective interpretation on the part of the researchers.

We wanted to show the collective cognitive map of the managers of the house building industry without adding any interpretation on the part of the researcher. That is why we have left the results "raw" and have not named the dimensions or tried to group the firms. We will use the results of this analysis to measure the perceived distance between firms, that is, their similarity, without making any consideration on the factors that make firms similar or dissimilar.

Several firms are considered identical, as no subjective distance has been found between them. This is the reason why the number of points shown in the chart is lower than the number of firms participating in the study.

In order to compare the results of the strategic group analysis with manager's cognitive strategic groups, we have plotted the 5 cluster solution obtained in the

previous section in the collective cognitive map of the industry. Firms in the cognitive map are identified by the number of the strategic group in which they were classified in the previous section. As can be seen in Fig. 1, there is a relationship between archival strategic groups and cognitive strategic groups in this industry. This result is reliable with previous studies comparing archival and cognitive strategic groups (Nath and Gruca 1997).

Figure 1 shows that, although related, strategic group structure does not fully reflect that of managerial cognitive strategic groups. It can also be said that cognitive strategic groups do not fully reflect strategic group structure in this industry. This is consistent with previous literature. Borroi et al. (1998) showed that the cognitive model used by the owners to perceive the structure of their business environment does not appear to discern all the categories of firms that emerge when a cluster analysis algorithm is applied to structural and strategic characteristics of the firms. Our results show that managers in the house building industry perceive a cohesive group of firms that correspond with SG2—*Small firms*. These firms have negative values in dimension 1 and positive values (between 0 and 0.5 mostly) in dimension 2. Managers also perceive that SG3—*Leaders*—are far from the rest of industry members in terms of dimension 1, with values close to 1.5. However, SG4—*Conservatives*—is not seen as a very cohesive group by managers in this industry. Something similar happens with SG1—*Builders*. Finally, it is interesting to note that firms in SG5—*vanguards*—are perceived as two completely independent firms. Both firms are seen at both extremes of dimension 2.

The SPSS PROXCAL algorithm allows us to obtain the map and the distances between the firms according to managers' perceptions of their industry. We have measured perceived similarity using the distances between every pair of firms in the study. That information is used as an independent variable in the subsequent analysis.

4.2 Results of logistic regression analysis

We start from a 43 × 43 matrix as a dependent variable. These 1,849 observations (43 × 43) take the value of 1 when row firm considers column firm as a rival and zero otherwise. This matrix is a non symmetric one. This is consistent with recent research on strategic groups and rivalry (Más-Ruiz et al. 2005) that shows that rivalry is an asymmetrical phenomenon.

Table 4 shows the descriptive statistics of the variables included in the model, and Table 5 shows the results of the logistic regression on the factors that make a company a rival. It shows the values of the coefficients, their levels of significance, the value of the χ^2 statistic, Nagelkerke R^2, Hosmer and Lemeshow goodness of fit test, and the percentage of cases correctly forecasted. *Z*-scored variables where used.

According to Table 5, we can corroborate our hypotheses, that is, firms identify as rivals those other companies that are considered similar. Managers use strategic groups as a frame of reference for rival identification, and those firms closer to the core characteristics of each strategic group have greater chances of being considered

Table 4 Descriptive statistics and Pearson correlation matrix

	Mean	SD	1	2	3	4	5
Subjective rivalry	0.137	0.344	1				
Lagged performance	3.046	0.963	.12	1			
Size	105.825	150.255	.38	.19	1		
Representativeness	41.437	15.762	.08	.08	.43	1	
Subjective distance	0.824	0.387	−.19	−.05	−.06	−.03	1

Table 5 Results of the logistic regression on subjective rivalry

	β
Lagged performance	0.678*
Size	0.873*
Representativeness	−0.406*
Subjective distance	−0.678*
Constant	−2.408*
χ^2 model	360.224*
Nagelkerke R^2	0.321
Hosmer and Lemeshow[a]	8.939 ($p = 0.348$)
−2 Log likelihood	1,119,580
% correctly predicted	87.6

[a] The Hosmer and Lemeshow Goodness-of-Fit Test divides subjects into deciles based on predicted probabilities, and then computes a chi-square from observed and expected frequencies. The *p*-value = 0.348 here is computed from the chi-square distribution with 8 degrees of freedom and indicates that the logistic model is a *good* fit. That is, if the Hosmer and Lemeshow Goodness-of-Fit test statistic is .05 or less, we reject the null hypothesis that there is no difference between the observed and predicted values of the dependent; if it is greater, as it is in our model, we fail to reject the null hypothesis that there is no difference, implying that the model's estimates fit the data at an acceptable level

Z-scored variables were used. * $p < 0.001$

a rival. Moreover, best performers and larger firms increase their propensity of being identified as a rival by other firms in the industry.

Our first hypothesis stated that managers would identify as rivals those firms considered similar. We measured similarity in a negative way. In our model we calculated the perceived distance from every pair of firms according to the collective cognitive strategic groups map. We expected a negative relation between rivalry and subjective distance. Table 5 shows that there is a negative and significant relationship between subjective distance and rivalry ($\beta = -0.678$; $p < 0.001$). Those firms that are seen to be closer have greater chances of being considered as rivals. Hence, we can corroborate our first hypothesis. Therefore, according to our empirical findings, we can affirm that *the greater the perceived similarity with the target firm, the greater the chances of considering it as a rival*.

Following Strategic Reference Point Theory (Fiegenbaum et al. 1996) and Classification Theory (Rosch 1978) we expected those firms representing the core characteristics of each strategic group—prototypes or core firms—to be considered as rivals by a greater number of competitors than the rest of the firms. We thought that "representativeness" was correlated with subjective rivalry. We measured representativeness as the distance from its strategic group centroid, hence expecting a negative relation with rivalry. The results of our empirical analysis ($\beta = -0.406$; $p < 0.001$) corroborate our second hypothesis. Therefore, according to our empirical findings, we can state that *those firms that represent the strategic groups' structure of the industry—representative firms or prototypes—have greater chances of being considered a rival by other firms in the industry*.

We can also corroborate our third hypothesis. According to the results of our empirical analysis, best performers are seen as rivals by the rest of the members of the industry. There is a positive relation between *lagged performance* and *rivalry* ($\beta = 0.678$; $p < 0.001$). This is consistent with Institutional Theory (DiMaggio and Powell 1983) which states that there is a tendency to imitate successful behaviour. When managers of the house building industry analyse their competitors they consider those that have performed well in the past. Therefore, we can affirm that *the greater the past performance of the firm, the greater the chances of being considered a rival by other firms in the industry*.

Finally, results also show that *size* has a positive and significant effect on the dependent variable ($\beta = 0.873$; $p < 0.01$). *The larger the firm, the greater its propensity of being considered a rival by other firms in the industry*. Moreover, this factor has a higher impact on the dependent variable. This result corroborates our fourth hypothesis.

5 Discussion

In this paper we have studied the two main issues in rivalry and strategic group research. We have analysed how strategic group structure helps managers to make sense of their industry, and therefore, identify their main rivals. And secondly, we have analysed how similarity affects rivalry. Mixed evidence in past studies and theoretical controversy motivated this research.

Starting from a definition of rivalry as a subjective and directional identification of competitors, we tested a model on the factors that can make a company a rival. This paper is a first attempt to analyse how the position of a firm within the strategic group structure influences its propensity of being considered a rival by other members of the industry. It also contributes to the literature empirically testing the relationship between perceived similarity and subjective rivalry. The usual caveats about limited generalizability of results due to small sample size and use of a single industry apply to our research.

Our results show that best performers and larger firms have greater chances of being identified as rivals by other firms in the industry. Firms also identify as rivals those other companies that are considered similar Moreover, we have demonstrated that managers use strategic groups as a frame of reference for rival identification,

and those firms closer to the core characteristic of each strategic group have a higher propensity of being considered a rival.

According to our findings, size is the factor with the highest impact on the dependent variable in our model. This result is consistent with our hypotheses and with previous research (Gripsrud and Gronhaug 1985; Chen 1996). However, due to the special characteristics of this industry, size means measuring something more than dimension. House building companies compete for resources, scarce resources such as land. Their competition is mostly based on the acquisition of land. One of the most important competitive factors in this industry is then location. Firms that locate their constructions near each other are competing for the same clients, and therefore, will consider each other as direct competitors. One of the missing variables in our model that could explain rivalry is, then, location. However, in this particular industry, "size" includes "location". Size increases the frequency of market contact with other members of the industry. The larger the company, the greater the chances of directly competing with other firms that locate their constructions nearby. Hence, it is comprehensible why larger firms are considered as rivals, because their size increases the possibilities of direct confrontation. The probability of competing for a given piece of land with a large firm is much higher than with a small company.

Results of our empirical analyses show that strategic groups represent a range of viable strategic positions firms may stake out and use as reference points. Firms focus upon the behaviour of similar firms, and the positions in competitive space occupied by other strategic groups when making competitive strategy decisions. Our findings show that those firms perceived as similar are identified as rivals. Moreover, those firms representing the core positions of other strategic groups are also considered as rivals, providing support for Strategic Reference Point Theory (Fiegenbaum et al. 1996).

Strategic group structure has an impact on a manger's perceptions of their industry. Although the cognitive model used by managers to perceive the structure of the house building industry does not appear to discern all the categories of firms that emerge when a cluster analysis algorithm is applied to structural and strategic characteristics of the firms, cognitive strategic groups and strategic groups are related. Some cognitive strategic groups have a clear image of the strategic groups obtained using archival data. Moreover, strategic group structure is a useful tool that helps managers to make sense of their industry. Strategic groups serve as reference points for managers in this industry and those firms that represent the basic characteristics of each strategic group are identified as rivals. Strategic group structure is related with the environmental scanning which managers undertake. Managers look for core firms or prototypes, as they "represent" the pool of viable strategies that are being carried out in their industry. Managers limit their attention to the actions taken by a few competitors. In this process, peripherical or secondary firms are avoided, and firms tend to focus on core firms—representative or prototypes.

Although some research has questioned the value of the traditional view of strategic groups as being a primary determinant of firm performance (Tang and

Thomas 1992), we see some value in studying strategic groups. The strategic group construct helps managers and researchers to understand the relative positioning of firms to the prototypical strategies developed in the industry. Strategic groups serve as reference points for managers, guiding the sort of behaviours that are being carried out within an industry.

The paper has some implications for managers. According to our findings, similar firms will be identified as rivals. Managers should be aware of those firms considered similar because there is a great chance that they will be monitoring their strategy and competitive moves. Moreover, the larger and more successful the firm, the greater the chances of it being considered a rival by its competitors. Attention is given to high performers, larger companies and representative firms—prototypes—even if they are not perceived as following similar strategies. Best performers show how successful strategies can be implemented and representative firms give us an idea of the current strategies developed in the industry. Strategic choices taken by larger, better performers, representative firms, and those firms perceived as similar stand a greater chance of being mimetically adopted by other firms in the industry.

In this paper we have analysed how strategic group structure is perceived by managers and how managers use strategic groups and core firms as reference points. An interesting future line of research could be to analyse whether the firm's own positioning within the strategic group structure influences its environmental scanning procedure. We have shown that the closer the firm to the core characteristics of its strategic group, the greater the chances of it being considered a rival by other members in the industry. Recent research (McNamara et al. 2003) has also studied the performance benefits from the legitimacy of being a member of a group, that is, core and secondary firms perform differently. However, a remaining question is whether core and secondary firms behave alike in terms of rival identification. Do secondary or peripherical firms tend to look for firms with more "aggressive", "new" or "outlier-kind" strategies? We believe that future research could study the relationship between strategic group identity—own positioning within the strategic group structure—and scanning behaviour.

Strategic group research is a valuable tool to identify and make sense of the patterns of strategic activities that occur within an industry. However, the lack of consensus in the literature with respect to intra- and between-groups rivalry could be due to the fact that rivalry is a subjective, directional and asymmetrical phenomenon as we have considered in this paper. Further research should introduce some other factors that could explain subjective rivalry as well as search for indirect and moderating effects, as we believe it is a promising stream of research. In this line, it would be useful to carry out longitudinal studies of firm's behaviour to develop a deeper understanding of perceived rivalry over time.

Acknowledgements We would like to thank three anonymous reviewers and the editor for their helpful and constructive comments on previous versions of this paper. All remaining errors are ours. Financial support from Junta de Comunidades de Castilla-La Mancha, Consejería de Educación y Ciencia, España, PAI07-0099-3219, is gratefully acknowledged.

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