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## **THE INFLUENCE OF ORGANIZATIONAL COMPETENCES IN THE RELATION BETWEEN CORPORATE CONTEXTS AND STRATEGIC GROUPS**

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### **Abstract**

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## **ABSTRACT**

The literature on strategy has explored the debate between structuralistic approaches and the Resource-Based View in terms of the determining factors for strategic positioning. While the former presents the competitive environment as a determining factor, the latter argues in favor of organizational competences. The purpose of this article was to test the hypothesis that both factors are influential and endogenous. We developed a structural equations model that was applied to the Brazilian pharmaceutical industry and estimated through the Partial Least Squares method. The data were collected through questionnaires forwarded to a population of 193 companies, of which 55 replied. The findings confirmed the influence of organizational competences in strategic groups and show that the influence of the competitive environment is mediated by the position of the companies in organizational competences.

**Keywords:** organizational competences, competitive environment, strategic positioning, strategic groups, structural equations with Partial Least Squares method.

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## **THE INFLUENCE OF ORGANIZATIONAL COMPETENCES IN THE RELATION BETWEEN CORPORATE CONTEXTS AND STRATEGIC GROUPS**

The strategic group concept refers to a set of firms that pursue similar strategies in a single industry. This corresponds to a mid-level analysis, ranking between the individual firm and a consolidated overview of the industry, allowing firms to understand more easily aspects that are important for their competitive positioning, such as identifying their direct competitors and which specific resources underpin a sustainable advantage (Short, Payne, & Ketchen Jr., 2008).

This concept was initially developed on the basis of the structuralistic strategies school, grounded on the structure conduct performance paradigm of the Industrial Organization. Characterized by an ‘outside-in’ view of strategy formation, this approach stresses that strategic actions taken by firms may build up defensive positions against competitive forces, generating comparative advantages (Leask & Parker, 2007; Porter, 1980). Along these lines, it is assumed that strategic choices must be guided by assessments of the competitive environment of the firm.

On the other hand, the Resource-Based View (RBV), which is characterized by an ‘inside-out’ theoretical view of strategy formation, relates the strategic group to the attractiveness of its strategies, considering the individual position of each company in terms of its resources and competences. Through this approach, the comparative advantages would be underpinned by more efficient implementation of a specific strategic option, due to the resources and competences of the firm, which are hard to imitate (Leask & Parnell, 2005).

A third theoretical approach to the strategic positioning of firms argues that strategic groups arise from a social learning process (Narayanan, Zane, & Kemmerer, 2011). In this view, managers working in a single industry would develop common beliefs and perceptions through

their social interactions over time, forming groups with their own specific identities that share a mutual understanding of their competitive environment, as well as its dynamics and the competences required.

When reflecting on the limited consensus found in the literature on the prevailing factors in the formation of corporate strategies, Henderson and Mitchell (1997) suggest that competitive environment and organizational competences are both clearly important and fundamentally endogenous. This paper contributes by conducting an exploratory test of the argument presented by these authors through empirical measurements of the perceptions of managers. The findings show that organizational competences and environment are both influential on strategic groups, and that the influence of the competitive environment context is mediated by corporate positions in competences.

After this introduction, this paper presents the main constructs involved: strategic groups, organizational competences and organizational environments. This is followed by the research methodology, after which the findings are examined and discussed. Finally, the conclusions are presented.

## **POSITIONING AND STRATEGIC GROUPS**

When selecting a competitive strategy, the company deliberately selects a specific set of actions, striving to position itself in a manner that distinguishes it from its competitors, in terms of the forces in the competitive environment, pursuing a singular combination of value for its products or services and thus achieving competitive advantages. Actions taken by companies eager to stand out are reflected in scope-related choices and the application of resources. There

are essentially three types of scope-related choices, related to: the market segment, the mix of products and services, and the geographical area. Firms adopting the same strategic positioning in terms of the competitive environment of an industry, such as distribution and product diversification policies forms strategic groups (Hunt, 1972; Leask & Parker, 2007; Miller & Dess, 1993; Porter, 1980).

Caves and Porter (1977) extend the strategic group concept with that of barriers to mobility. The specific positioning of the firms in a strategically-sized group, such as technological leadership or specialization, for example, raises barriers to mobility that block the entrance of other companies to this group, thus defining its boundaries. Mehra and Floyd (1998) suggest that the formation and stability of strategic groups over time is dependent on the existence of certain heterogeneity of products and / or markets, the existence of resources that are hard to imitate, and barriers to mobility.

For the Resource-Based View (RBV), the comparative advantage of a firm is achieved through more efficient activities underpinned by the ownership of specific resources and development of distinctive organizational competences. Cool and Schendel (1988) and McGee and Thomas (1986), aligned with the RBV strategic choice approach, defined strategic groups as those formed by companies with similar assets, resources and competences. Investments in resources and capabilities, which require time and learning for their development, in parallel to uncertainties over the ability of the firm to successfully imitate its competitors, help raise even higher barriers to mobility, distinguishing groups in a single industry (Leask & Parnell, 2005). Lawless, Bergh and Wilsted (1989) concluded that, in addition to the effect of the competitive environment, corporate competences must be taken into consideration for stepping up the explanatory power of strategic groups.

On the other hand, Cool and Schendel (1988) found empirical evidence that adopting a specific strategic position by companies, forming strategic groups in an industry might not be aligned with their positions in assets and competences. The firm may opt for greater risk exposure or adopt a new strategic positioning in response to a competitive threat or opportunity identified in its competitive environment, even if not endowed with all the capabilities required for the success of this new positioning. Along these lines, McGee, Thomas and Pruett (1995) stress that changes in the surrounding context may alter the industry structure, influencing changes in the strategic positioning of companies. Outstanding among these changes are those of a technological and institutional nature, such as regulatory conditions, which may open up entirely new strategic options for an industry.

There is also a third approach for conceptualizing strategic groups. From this standpoint, managers tend to view their industries on the basis of groups of firms sharing the same cognitive structures, and with the same beliefs on the competitive environment, strategy, business portfolio and corporate governance (Narayanan et al., 2011). These groups develop similar strategies and actions, reifying common cognitive environments (Lant & Phelps, 1999). Authors such as Peteraf and Shanley (1997) and Reger and Huff (1993) argue that cognitive groups emerge as divisions established by managers in their environments in order to lessen uncertainties and deal with limited rationality. The studies conducted by Greve (1998) and Lee (2003) suggest that uncertainty may lead to the formation of strategic groups through the mimetic isomorphism proposed by DiMaggio and Powell (1983). Ocasio (1997) and Spencer, Peyrefitte and Churchman (2003) stressed that, in addition to institutional processes, the intrinsic characteristics of a firm also influence the formation of cognitive structures.

Several surveys were conducted to identify and monitor strategic groups in different industries. In terms of the pharmaceutical industry, Cool and Schendel (1987, 1988) studied strategic groups in the US economy between 1963 and 1982, finding four periods lasting five to seven years with distinct positioning configurations. While differences in performances were noted among the groups in each period, in terms of market share, no differences were noted in terms of profits and risk-adjusted average performance. In order to identify the groups, these authors use interviews with specialized executives and academics to validate the variables established on the basis of a study of this industry conducted by Cool (1985).

Subsequent studies addressing groups in the pharmaceutical industry were based on these variables. Pinho and Silva (2000) and Silva and Dias (2006) studied the strategic groups in Brazil's pharmaceutical industry between 1995 – 1998 and 1999 – 2002 respectively, finding different levels of performance among the groups, with an absence of variation within the groups. Pinho and Silva identified the following factors as defining the strategic positioning of these companies: medications for chronic use, generics, promotion and marketing, corporate scales and focus on the ethical market. Dias and Silva identified two defining factors: generics market share and focus on the ethical market.

## **ORGANIZATIONAL COMPETENCES**

From the Resource-Based View (RBV) standpoint, production factors such as a specialized work force and machines in general – are supplementary assets, also called resources – that the company purchases on the factors market in order to underpin the organizational competences that will be deployed in the course of its activities (Barney, 1986; Penrose, 1959;

Wernefelt, 1984). Idiosyncratic resources – such as specific equipment or the skills and expertise of company employees – are not available on the factors market and are developed and accumulated in-house (Dierickx & Cool, 1989). Thus, resources may be classified as physical (machines, plants, equipment, others), human (individual skills) and organizational (brand, reputation, others) (Barney, 1991).

Corporate competences are deliberate, broad-ranging organizational processes that interlink capabilities and technologies deriving from the composition of organizational resources and routines in order to perform a coordinated set of tasks designed to attain a specific outcome (Dosi, Nelson, & Winter, 2000). The term routine refers to recurring action standards (Becker, 2004). Competences involve the performance and coordination of corporate activities (Dosi & Teece, 1993; Henderson & Cockburn, 1994). For example, competence in manufacturing devices requiring fine mechanics uses in-house routines and resources to perform and coordinate the various production stages.

The market acknowledges organizational competences as sources of distinction in specific competitive dimensions (Mills, Platts, Bourne, & Richard, 2002). The heterogeneity deriving from the individual track records of companies and the immobility of their resources and competences generate and underpin comparative advantage (Froehlich & Bitencourt, 2009). Organizational competences are important when they consist of one or more valuable resources, rare among the competition and that cannot be flawlessly imitated or substituted. This also applies when the composition of resources or their coordination structure adds value and sustainability, regardless of the individual positions of the resources. Along these lines, the manner in which a firm understands its competences leads to a better identification of the sources of its comparative advantages and the opportunities and threats in the external environment.

Prahalad and Hamel (1990) stress that an organization has countless competences and that its managers must be well aware of those that generate competitive advantage.

Outside stimuli deriving from changes in the competitive environment or in-house stimuli – such as managers eager to become more efficient or efficacious – may lead to variations in organizational competences (Bataglia & Meirelles, 2009; Helfat & Peteraf, 2003, 2009; Teece, 2009). Through learning processes, the organization strives to develop its competences and acquire others, focusing on learning by doing (Takahashi & Fischer, 2010) and learning from others (Bataglia, Silva, & Klement, 2011). The generation and selection of alternatives for changes (variations) takes place through organizational decision-taking processes (Bataglia & Yu, 2008; Nelson & Winter, 1982), also influenced by the organizational culture (Fleury, 2009). Successful variations are selected for retention and then disseminated throughout the firm.

Mills et al. (2002) propose that organizational competences may be identified through an assessment of each activity that a company knows how to perform well, considering three core dimensions: support for the competitive advantage, perceived through the effects on corporate costs and sales, and the ability to capitalize on opportunities and offset threats; sustainability, evaluated through the performance of the activity in terms of the competition and ease of acknowledgment, imitation, substitution and depreciation; and versatility, meaning the possibility of transfers to other areas or businesses.

## **ORGANIZATIONAL ENVIRONMENT**

From the 1950s onwards, the organization has been viewed as an open system (Bataglia, Franklin, Caldeira, Silva, 2009; Tosi, 2009), meaning a component in a larger group of organizations, each with its own identity but interdependent. Some theoretical approaches that have arisen since then focus on the objective external environment, formed by the agents with whom the organization interacts, such as customers, suppliers, competitors and regulatory groups. Examples of these approaches are the organizational ecology and contingency theories. Other approaches devote attention to the institutional context, formed by values, rules and laws that influence relationships with outside agents. Institutional theories are examples of these approaches. There are also approaches that focus on the objective environment as well as the institutional context, such as the resource dependence theory.

This paper focuses on the objective external environment. Aldrich (1979, 2006) identified six dimensions for the objective environment: a) environmental capacity, related to the availability of resources in the environment, such as real demand and work force availability; b) homogeneity or heterogeneity, meaning the level of similarity of external elements with which the organization interacts; c) stability or frequency of changes in the environmental agents with which the organizations interact, giving rise to variations in external demands that require organizations to develop the capability to adapt; d) dispersal or level of geographical distribution of the resources required in the external environment; e) agreement or dissent on domain, for public organizations, referring to disputes over the domain or scope of an organization, in terms of other public organizations; and f) turbulence, which is related to the level of uncertainty prompted by susceptibility to specific environmental factors, such as suppliers and the market on which it operates.

Dess and Beard (1984) operationalized five of the environmental dimensions proposed by Aldrich (1979, 2006) for profit-making companies (disregarding agreement/dissent over domain dimension), based on data addressing business industries in the USA, classified by the US Bureau of the Census (1980) under the Standard Industrial Classification (SIC) code. Based on the exploratory factor analysis statistical technique, these authors reduced the organizational environment construct to three dimensions: a) munificence, related to the ability of the environment to provide resources underpinning firm growth and stability; b) dynamism or absence of predictability of the environment; and c) complexity or heterogeneity of the variables to be taken under consideration in the strategic decision-taking processes of companies.

Countless applications of the organizational environment construct developed by Dess and Beard (1984) have been used to study relationships between organizational variables and external environments (see Boyd & Gove, 2006). This model was tested by Porto, Brito, Silva, Bataglia and Brito (2009) when the US Bureau of the Census adopted the new North American Industry Classification System (NAICS), replacing the Standard Industrial Classification (SIC), obtaining support in the model. These authors also identified the existence of five industry groupings in the US manufacturing segment, characterized by compositions similar to the following environmental factors: munificence, complexity and dynamism. Bataglia, Silva and Porto (2012) found convergent and discriminant validity in the environment construct proposed by Dess and Beard in the Brazilian manufacturing segment, using data on Brazilian business industries classified by the Brazilian Institute for Geography and Statistics (IBGE) under the National Economic Activities Classification (CNAE) code.

Sutcliffe and Huber (1998) proposed a model for measuring the external environments of companies through primary data. These authors maintained the three dimensions found by Dess

and Beard (1984) – munificence, dynamism and complexity – and highlighted aspects related to environmental resource control and management, linked to munificence as specific dimensions, calling them respectively controllability and hostility. The authors tested the convergent validity and reliability of the model. This is appropriate when studying the environment at a lower data aggregation level than business sectors, for example, when a survey conducts an analysis of the environment at the strategic group level (as in this paper), or at different supply chain levels. In these cases, the model proposed by Dess and Beard is not appropriate, as it does not distinguish sub-groupings in these industries.

## **METHOD**

### **Sample and Procedure**

The purpose of this paper was to analyze the influence of the organizational environment and organizational competences on the strategic positioning of firms, meaning in strategic groups. For this purpose, we developed an exploratory multivariate model establishing a relationship among these constructs, which considers the possibility of reciprocal influence between the organizational environment and organizational competences. The structural equation statistical modeling technique was selected in order to measure the relationships addressed in the model.

The competitive environment selected for this survey was the Brazilian pharmaceutical industry, due to its relevance in the Brazilian economy, posting total sales of US\$ 17.18 billion in 2009 (Sindusfarma, 2011). The choice of this industry was also underpinned by its specific

characteristics, with recent changes in the competitive environment that might well trigger variations in the strategic positioning of companies, as well as their assets and competences. Particularly noteworthy are modifications in the regulatory field, such as patent recognition (approval of Brazil's Industrial Property Act in 1997), authorization for the fabrication of generics (Law N° 9,787/1999) and the introduction of a specific industrial policy for this industry from 2002 onwards.

We defined the survey universe as the set of companies in Brazil's pharmaceutical industry, limited to the human health segment, meaning the group of companies whose activities consist of the development and / or production of medications and parenteral solutions for human health. This survey received institutional support from the Brazilian Pharmaceutical Industry Federation (Febrapharma), with the target population defined by its 193 corporate members. All these companies were invited to participate through correspondence and telephone calls. The analysis unit consisted of the CEO and his direct subordinates, in order to avoid distortions in the interpretation of the competitive environment caused by the influence of specific job areas.

## **Measurements**

We operationalized the strategic group construct as set forth in the work of Cool and Schendel (1987). Table 1 presents the indicators used for this construct.

<Insert Table 1 about here>

We operationalized the organizational competences construct based on the comparative advantage, sustainability and versatility dimensions, and their indicators, as proposed by Mills et al. (2002). Table 1 shows the indicators used. In order to ensure comparability for assessing the competences of companies addressed by this survey, we identified a set of twelve specific competences in the literature on the pharmaceutical industry, showed in Table 2, which we presented to the managers so that they could assess the positions of their companies in each of them, based on the indicators set forth in Table 1.

<Insert Table 2 here>

We operationalized the organizational environment construct on the basis of Sutcliffe and Huber (1998), considering the environmental munificence, dynamism, complexity, controllability and hostility dimensions and their indicators as proposed originally by these authors. Table 1 presents the construct, its dimensions and indicators.

We prepared the data collection tool with questions related to the indicators presented in Table 1, resulting in a self-completion questionnaire. In the first section of the questionnaire, the respondents were asked to provide data on the scope of the activities of their companies and the allocation of resources. The second and third sections presented the respondents with statements related respectively to the competences identified in the literature and the organizational environment of the companies. They were asked to express their agreement through a seven-point Likert-type scale, varying from 1 (completely disagree) to 7 (completely agree). This questionnaire was validated by three specialists with at least 25 years experience in this industry:

an executive of a pharmaceutical industry business association and two executives of companies in this industry.

Figure 1 presents the path diagram of the survey, defining the direction of the influence of relationships among the structural-equation model's constructs, connected by arrows, based on the theory (Hair Jr., Anderson, Tatham, & Black, 1998). The first and second order variables were modeled reflectively, accepting that there is correlation among its indicators.

<Insert Figure 1 about here>

An estimate was drawn up through the Partial Least Squares (PLS) method, due to the exploratory characteristics of the study, the large initial number of indicators, the absence of a multivariate normality presupposition and the lighter demands in terms of the size of the sample (recommended at between 30 and 100 cases) (Wetzels, Odekerken-Schroder, & Oppen, 2009). It is worthwhile noting that as PLS ever supposes the existence of correlation between the constructs, arrows with two heads are not used in path diagrams.

## **FINDINGS**

The sample resulting from the contacts consisted of 55 companies, corresponding to 28.5% of the population. The sensitivity analysis conducted through the GPower 3.1 software indicated that this sample can detect medium-sized effects (variances in the constructs greater than 15.66%), with the statistical power remaining at 0.80 (Cohen, 1977). The minimum length and time for the responding managers to have worked in this industry was three years, with 90%

of them with their companies for more than three years. The size of the companies by their headcounts, as noted by the Brazilian Small Business Bureau (Sebrae) indicated that 27% of them are small (20 – 99 employees), 40% are medium (100 – 499 employees) and 33% are larger (more than 500 employees).

With all data collected, it was processed through assessing the findings produced by the Statistical Package for the Social Sciences (SPSS), through descriptive statistical techniques, in order to identify extreme values, and data absent from the replies, in addition to testing the normality of the variable distributions. The extreme value analysis showed only six cases with values slightly higher than the three standard deviations: four related to questions on the organizational environment and two to questions on competences. In view of the initial data volumes in this survey (total of 8,580, with 156 data items for each of the 55 respondents), we decided to keep these cases in the sample. No data were missing. We then evaluated the normality of the indicator distributions, calculating the Kolmogorov-Smirnov and Shapiro-Wilk statistics for each variable. All the variables presented non-normal distribution at a 5% significance level in at least one of the tests. As the exploratory factor analysis and the structural equations modeling using the Partial Least Squares (PLS) method that will be used in this research impose no *a priori* requirements on the normality of the distribution of the variables used, it was possible to continue the survey (Hair Jr. et al., 1998).

For each indicator in the organizational competence construct, it was decided to reduce the twelve competences found in the literature to statistically significant factors. The purpose was to determine the minimum number of factors that would result in the maximum variance in the data for subsequent use of the factor scores in the structural equations modeling, which streamlined the study and preserved the joint positioning view point of companies for the

competences surveyed. Factor-specific solutions were obtained through the SPSS software, based on the key components method, initially without rotating the axes and then with oblique rotation (Direct Oblimin). The examination of the factors was based on the suggestions presented by Kim and Mueller (1978) and Hair Jr. et al. (1998). It was determined that the factor loads of the factor variables must be higher than 0.45 and that their eigenvalues must be equal or greater than one. Variables with commonalities below 0.50 were excluded from the final factor solution. Only three among the twenty factors examined consisted of only two variables. They were retained, as they presented satisfactory internal consistency (Cronbach's Alpha > 0.60) and help explain at least 15% of the total variance of the factor-specific solution found. The Table A1 presented in Appendix A shows the factors identified for each of the indicators of the organizational competence construct. It also presents the outcomes of the KMO and Bartlett tests conducted in order to ascertain the adaptation of the data.

### **Validity of the Constructs**

After identifying factors linked to the organizational competence construct's indicators, we conducted exploratory tests of the reliability and convergent and discriminant validity of the survey model's constructs, using the SmartPLS software. Figure 2 presents the survey measurement model estimated by the Partial Least Squares method, as a graph, after the construct validation stage. Of the 46 original indicators presented in Table 1, fifteen remained.

<Insert Figure 2 about here>

Among the variables proposed by Sutcliffe and Huber (1998) for the organizational environment construct, complexity, hostility and controllability were validated for the Brazilian pharmaceutical industry environment. The instability and munificence variables presented no statistical significance at the 5% level and were removed from the model. These findings seem to reflect the availability of resources in the industry due to government investments linked to industrial policy and regulation by government entities that prevents variations in technology without prior authorization, requiring a slow approval process characterizing the industry as stable. The coefficient's signs indicated that the environment is not complex, although considered as hostile and hard to control by executives. In other words, the companies presented situations that were largely unfavorable (Positive market situation, Favorable opportunities, Gaining situations) and hard to control (Access to critical resources, Market situation control and Manageable situations). The absence of complexity in this industry seems to be related to the limited variety of products manufactured by the companies (Assortment of products) and the skills of their managers to understand the competitive environment (Hardly understand environment). The complex market indicator (Complexity level), interaction with a large number of different organizations (Interaction level) and the influence of other participants in this industry on limitations for solutions (Interorganizational dependence) presented a factor load of less than 0.45 and were eliminated from the model.

With regard to the organizational competences construct, the variable versatility presented no statistical significance at 5% and was removed from the model. The construct proposed by Mills et al. (2002) was validated in terms of the aspect that, in order to generate a competitive advantage, a competence must have effects on costs and sales (Effects on costs and sales), offer the ability to block threats (Ability to block threats) and capitalize on competitive

opportunities (Capitalization of opportunities). The model indicates that the higher the power of the competences in terms of these indicators, the greater the managers's perception about competitive advantages that they generate. In terms of sustainability, among the five original indicators proposed by the authors, only two were confirmed: competence performance level in terms of the competitors (Competence performance level) and time needed for imitation (Imitation time). The indicators for difficulty in acknowledging competences by competitors (Difficulty to acknowledge competences), the level of competence depreciation (Competence depreciation level) and availability of substitutes for competence (Availability of substitutes) presented a factor load of less than 0.45 and also were also removed from the model.

For the strategic group construct, the model demonstrates that there are only two variables that currently represent the main strategic positioning option for this industry in Brazil: investments in R&D (Investments in R&D) and stance with regard to launching new products on the market (New products). The other indicators presented a factor load of less than 0.45 and were eliminated from the model: therapeutic categories (Main therapeutic categories), healthcare services market (Healthcare services market), non-prescription products (OTC market), generics (Generics market), branded medications (Branded market), medications for chronic use (Chronic-use market), exports (Foreign market), patent during the last ten years (Patents in ten years), promotions with physicians (Promotions with physicians), advertising directed to end-consumers (Advertising to end-consumers), direct distribution (Direct distribution) and size by number of employees (Number of employees).

We assessed the reliability of the constructs based on the composite reliability analysis (acceptable values  $> 0.70$ ) and the average variance extracted (AVE) (acceptable values  $> 0.50$ ) (Chin, 1998; Hair Jr. et al., 1998). Table 3 presents the findings.

<Insert Table 3 about here>

The analysis presented in Table 4 corroborates convergent validity for the constructs used in the model, insofar as this indicates higher loads, in absolute values, for indicators in their latent variables, with lower loads for the other variables in the model (Chin, 1998).

<Insert Table 4 about here>

We tested the discriminant validity on the basis of the Fornell and Larcker (1998) criterion. All the constructs used in the model presented discriminant validity, as the square root of the AVE for each latent variable, presented in boldface in the correlation matrix diagonal, is higher than the correlations for the other latent variables, as shown in Tables 5 and 6 respectively, for the first and second degree latent variables.

<Insert Tables 5 and 6 about here>

## **Structural Model**

In terms of the structural model, Figure 2 shows that the relations between organizational competences and strategic groups, and organizational competences and organizational environments are highly significant ( $p < 0.001$ ). However, the relation between organizational environments and strategic groups did not reach statistical significance at the 5% level. This finding confirms that there is a link of influence between the organizational competences of a

firm and its strategic positioning, forming strategic groups in Brazil's pharmaceutical industry in the human health segment. There is also a relation of influence between organizational competences and the perceived characteristics of organizational environments. However, no relation of influence was confirmed between the organizational environments and strategic groups.

However, the relevance of the relation between organizational environments and competences led to an investigation of whether the influence of the environment on the strategic position of companies might be mediated by organizational competences. In order to assess this issue, three other models were estimated. The first addressed the relation between environments and strategic groups; the second focused only on the relation between organizational competences and strategic groups; and the third isolated the relation between organizational competences and environments, always maintaining the same indicators for the first and second order variables. As shown in Table 7, the first model showed that the isolated relation between environments and strategic groups is significant. Models 2 and 3 clearly indicated that the relation between competences and the other two variables retains high significance, even when considered individually. When compared to the original model, in which the relation between organizational environment and strategic group is not significant, these findings show, according to Baron and Kenny (1986), the mediating effect of organizational competences on the relation between the strategic positioning of companies and organizational environments.

<Insert Table 7 about here>

## **DISCUSSION AND CONCLUSIONS**

### **Summary**

The purpose of this survey was to test the hypothesis presented by Henderson and Mitchell (1997) that organizational competences and external environments both influence the strategic positioning of firms, with an endogenous character. Based on structural model applied to the Brazilian pharmaceutical industry, empirical confirmation was obtained of this hypothesis. While the influence of organizational competences on strategic groups was clearly indicated in the model used, the influence of organizational environment on strategic group was mediated by corporate positions in competences.

### **Contributions to Scholarship**

The findings of this study have important implications for theory construction. An analysis of the coefficients expressing the structural model relations (Figure 2) shows that the better a company is positioned for competences that are important for the industry, the more it invest in these competences in its strategic positioning, whereby they generate comparative advantages and are sustainable, stepping up its chances of success. On the other hand, as an outcome of the mediating role played by organizational competences, the perception of the favorability and controllability of the competitive environment increases, in terms of opportunities and expectations of gains, stepping up investments in these competences even more in the strategic positioning. In other words, competences, environment's perception and

strategies interact reciprocally (Figure 3), meaning that discussions are fruitless over which standpoint (structuralistic or RBV) is more valid for explaining the strategic positioning of firms.

<Insert Figure 3 here>

A methodological contribution offered by this paper is the exploratory validation of the procedure for measuring the organizational competences construct proposed theoretically by Mills et al. (2002), expanding the possibilities of research designs on this topic, for the use of multivariate analysis models.

### **Applied Implications**

In addition to academic contributions, this study has important practical implications. Its comparison with earlier studies of the Brazilian pharmaceutical industry discloses evidences that relations among the strategic positioning of companies, the competition environment and organizational competences over time may change the structure of this industry, and must thus be included under the aegis of strategic management.

The introduction of generic medications in this segment in Brazil was ushered in by regulatory alterations during the late 1990s and early 2000s, with the approval of the Industrial Property Act (1997) and the law authorizing the fabrication of generics (1999) followed by the implementation of the industrial policy (2002). This resulted in large numbers of products being launched, focused on the ethical market, as physicians prescribe the active ingredients. The variables differentiating the strategic positioning of companies during this period (Silva & Dias,

2006; Pinho & Silva, 2000) are: product differentiation through promotion and marketing, focus on the ethical market and operating scale.

Companies producing generics maintained their strategic positioning and developed the demanded competences (Figure 3), firming up their position on the market by the end of the decade as major producers, resulting in wider-spread sales for the industry and keener competition (Capanema, 2006; Fardelone & Branchi, 2006). As a result, the competitive alternative became launching innovative products, such as new molecules (the option selected by major corporations in this industry) or new presentations or copies of existing products (alternative selected by medium-sized companies) (Reis, Pieroni, & Souza, 2010). The generic producers seem to be making good use of the resources generated by activities in generics in order to underpin their innovative activities. The amount invested in R&D and the ability to successfully launch new products on the market (Figure 2) are currently the main variables used in the strategic positioning of these companies, as shown in the findings of this survey. Coherently, the competences addressed in the literature that are perceived as more sustainable and relevant for generating comparative advantages for executives in this industry are those related to product innovation and R&D activities (Table A1 in appendix A).

### **Limitations and Future Research Directions**

The first limitation is related to research design. This study is not experimental, as the variables are not subject to control and manipulation. Thus, the relations noted between the constructs must not be understood as causal. There may be other variables intervening in the process that were not taken under consideration.

A second constraint relates to the eminently exploratory nature of the study. Although the sample used 55 cases representing 28.5% of the total population of companies, this allows the measuring model to detect as significant only variances in the constructs ( $R^2$ ) exceeding 15.66%, maintaining the statistical power at 0.80.

It is worthwhile noting that the organizational environment, organizational competence and strategic group constructs validated in this survey must be used with care, as they reflect the current situation of the industry. It is recommended that future works develop confirmatory validations of these constructs, and that they use larger samples, as well as other industries.

It is also stressed that, due to the limited availability of information on companies in Brazil's pharmaceutical industry, which consists mainly of privately held corporations, it was not possible to include variable performance in the model studied. It is recommended that this variable be included in the model for future studies.

Finally, it is worthwhile underscoring the fact that the joint influence of environments and organizational competences explains only 29% of the variance in the strategic group construct. Although relevant, this percentage shows that, in addition to the influences perceived by the resource-based view and structuralistic strategies schools, there are other important influences to be revealed, affecting the strategic positioning of companies. It is suggested that future surveys explore cognitive factors (Narayanan, et al., 2011) as the sources of a supplementary explanation of the effects of competences and environments on strategic groups.

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**APPENDIX A**

**Reducing Competences Found in the Literature to Statistically Significant Factors**

**TABLE A1**

**Organizational Competence Indicators' Factors**

<b>Indicator / KMO &amp; Bartlett Tests</b>	<b>Factor</b>	<b>Competences Composition* (Literature)</b>	<b>Competences Load** (Literature)</b>	<b>Explained Variance (%)</b>	<b>Eigenvalue</b>	<b>Cronbach's Alpha</b>
Effects on Costs and Sales  KMO (.71) Bartlett ( $\chi^2=109.49$ ; df=3; p=.000)	Product Innovation	8	0.95	83.76	2.51	0.90
		7	0.92			
		9	0.87			
Ability to block threats  KMO (.68) Bartlett ( $\chi^2=172.26$ ; df=21; p=.000)	Product Innovation	7	0.95	35.36	2.47	0.87
		8	0.94			
		9	0.79			
	Operations	4	0.77	31.62	2.21	0.70
		11	0.74			
Capitalization of opportunities  KMO (.58) Bartlett ( $\chi^2=169.28$ ; df=21; p=.000)	R&D	7	0.96	34.43	2.41	0.82
		8	0.95			
		12	0.65			
	Production & Direct Distribution	1	0.87	25.36	1.77	0.61
		4	0.82			
	Relationship Physicians	11	0.85	14.76	1.03	0.61
Competence performance level  KMO (.63) Bartlett ( $\chi^2=140.96$ ; df=21; p=.000)	R&D	8	0.93	33.45	2.34	0.84
		7	0.91			
		12	0.77			
	Production & Distribution	2	0.80	31.17	2.18	0.73
		4	0.78			
		5	0.70			
1	0.68					
Difficulty to acknowledge competence  KMO (.70) Bartlett ( $\chi^2=211.32$ ; df=15; p=.000)	Product Innovation with Intellectual Management	7	0.95	42.35	3.39	0.92
		8	0.92			
		9	0.92			
		10	0.78			
	Marketing	5	0.91	30.16	2.41	0.77
		4	0.79			
6	0.73					
3	0.64					

**TABLE A1**

**Organizational Competence Indicators' Factors (Continuation)**

Indicator / KMO & Bartlett Tests	Factor	Competences Composition* (Literature)	Competences Load** (Literature)	Explained Variance (%)	Eigenvalue	Cronbach's Alpha
Imitation time  KMO (.65) Bartlett ( $\chi^2=180.01$ ; df=21; p=.000)	Production & Distribution	4	0.88	42.78	2.99	0.82
		1	0.80			
	Product Innovation	2	0.79	28.02	1.96	0.84
		5	0.76			
		8	0.94			
Availability of substitutes  KMO (.70) Bartlett ( $\chi^2=169.72$ ; df=28; p=.000)	Product Innovation with Intellectual Management	7	0.86	37.56	3.00	0.84
		10	0.81			
		9	0.74			
		8	0.87			
	Promotion & Distribution	5	0.82	27.02	2.16	0.75
		2	0.76			
		4	0.73			
Competence transfer to other areas  KMO (.72) Bartlett ( $\chi^2=394.93$ ; df=15; p=.000)	Product Innovation with Property Management	8	0.97	64.02	3.84	0.95
		7	0.97			
		9	0.95			
		10	0.85			
	Production and promotion – OTC medications	2	0.87	20.39	1.22	0.70
		1	0.85			
		8	0.97			
Competence transfer to other businesses  KMO (.79) Bartlett ( $\chi^2=331.65$ ; df=21; p=.000)	Product Innovation with Intellectual Management	7	0.96	59.60	4.17	0.95
		9	0.93			
		10	0.89			
		8	0.97			
	Production and Promotion	2	0.85	20.20	1.41	0.76
		3	0.84			
		1	0.76			

\* Identification of competences: (1) Production at competitive scale; (2) Production and promotion of over-the-counter (OTC) medications; (3) Production and promotion of prescription medications; (4) Direct distribution of medications; (5) Management of distributor partnerships; (6) Brand management; (7) Management of R&D investments program; (8) Development of R&D partnerships; (9) Introduction of innovative products; (10) Intellectual property management; (11) Pharmacovigilance; (12) Uptake of funding for investments. For a detailed description of these competences see Table 2.

\*\* p < .001.

**TABLE 1**  
**Research Model's Construct Indicators**

Constructs	Indicators
<b>Strategic Group Construct</b>	
1 Percentage in total sales of three main treatment categories produced by the company	Main therapeutic categories
2 Percentage of sales to healthcare service units	Healthcare service market
3 Percentage in total sales of OTC medications	OTC market
4 Percentage in total sales of generic medications	Generics market
5 Percentage in total sales of branded or benchmark medications	Branded market
6 Percentage in total sales of medications for ongoing use	Chronic-use market
7 Share of exports in total sales	Foreign market
8 Proportion of outlays on R&D x total sales by the firm	Investments in R&D
9 Number of patents filed during the past ten years	Patents in ten years
10 Proportion of sales represented by products launched during the past two years	New products
11 Proportion of outlays x total sales for promotion to healthcare practitioners	Promotion with physicians
12 Proportion of outlays x total sales for advertising to end consumers	Advertising to end-consumer
13 Proportion of outlays x total sales for direct distribution of medications	Direct distribution
14 Headcount	Number of employees
<b>Organizational Competence Construct</b>	
<b>Tier 1 Variable - Competitive Advantage</b>	
1 Effect of competence on costs and sales	Effects on costs and sales
2 Effect of competence on ability of firm to rebut competitive threats	Ability to block threats
3 Effect of competence on ability of firm to capitalize on competitive opportunities	Capitalization of opportunities
<b>Tier 1 Variable - Sustainability</b>	
4 Competence performance level in the organization compared to competitors	Competence performance level
5 Level of difficulty for competitors to acknowledge competence	Difficulty to acknowledge competence
6 Time needed for competitor to mimic competence	Imitation time
7 Level of depreciation of competence with no investments in maintaining it	Competence depreciation level
8 Availability of substitutes for competence	Availability of substitutes
<b>Tier 1 Variable - Versatility</b>	
9 Possibility of competence being applied or transferred to another area or product of the firm	Competence transfer to other areas
10 Possibility of competence being applied or transferred to another type of business	Competence transfer to other businesses
<b>Organizational Environment Construct</b>	
<b>Tier 1 Variable - Instability</b>	
1 Customer demand is relatively stable in my industry	Stability of customer demand
2 My company must change its production processes frequently in order to be competitive	Changes in production processes
3 The behavior of my suppliers (including materials, equipment and work force) does not change much from year to year	Changes in supplier's behavior
4 The sales volumes in the industry vary very little from year to year	Sale instability
5 My company changes its technology frequently in order to stay competitive	Technological instability
<b>Tier 1 Variable - Munificence</b>	
6 Demand for products and / or services were rising in 2008 in my industry	Rising of demand
7 In 2008, good investment opportunities were opening up in my industry	Investment opportunities
8 Opportunities for expansion open to the set of products and / or services offered by my company were extremely limited in 2008	Opportunities for scope expansion
9 The total value of corporate assets in my industry dropped during 2008 and should continue to decline during the next few years	Value of corporate assets
10 Sales were on the rise in my industry in 2008	Sale rising
11 Investments in new plant and machinery were rising in 2008	Investment in new plants and machinery
<b>Tier 1 Variable - Complexity</b>	
12 My company is facing a complex market environment	Complexity level
13 The competitive environment of my company is hard to understand	Hardly understandable environment
14 My company interacts with many different organizations for production and product	Interaction level
15 My company produces a wide assortment of products	Assortment of products
<b>Tier 1 Variable - Hostility</b>	
16 Most market situations are positive for my company	Positive market situation
17 The market situations faced by the firm constitute good opportunities	Favorable opportunities
18 It is expected that market conditions will offer gains for the company	Gaining situations
<b>Tier 1 Variable - Controllability</b>	
19 The company has access to resources for resolving most situations (threats or opportunities) imposed on it by the market	Access to critical resources
20 Most market situations can be controlled by the company	Market situation control
21 The company manages most situations instead of being managed by them	Manageable situations
22 The solutions open to the company are limited by other players on the market (suppliers, customers, competitors)	Interorganizational dependence

**TABLE 2**  
**Organizational Competences in Brazil's Pharmaceutical Industry**  
**Found in the Literature**

Competences		Description
1	Production at competitive scale	Processing volumes at scale allowing competitive production costs.
2	Production and promotion of over-the-counter (OTC) medications	Publicizing products to end consumers through de publicity / advertising programs targeting this public on television, in magazines, sponsoring events or celebrities.
3	Production and promotion of prescription medications	Publicizing products to healthcare practitioners, setting up a team of sales representatives and engaging in sponsorship activities targeting this public.
4	Direct distribution of medications	Setting up teams to handle the marketing and logistics of direct sales of medications without going through wholesale distributors.
5	Management of distributor partnerships	Setting up partnerships with wholesale distributors in order to attain competitive scales for sales, distribution logistics and joint product promotion activities.
6	Brand management	Integration of product development and marketing processes, focused on establishing brand identities for company products among retail customers.
7	Management of R&D investments program	Maintain an R&D department with its own qualified staff, setting new product development goals.
8	Development of R&D partnerships	Finding partners to cooperate in technological development with institutions that are external technology sources.
9	Introduction of innovative products	Conducting clinical trials and preparing up the regulatory technical documentation required to place new medications on the market.
10	Intellectual property management	Assessment and implementation of intellectual property protection mechanisms for innovative goods / products developed or under development by the company, including specialized staff.
11	Pharmacovigilance	Identification and assessment of the side effects of the mends launched by the company, noted after its introduction on the market.
12	Uptake of funding for investments	Relationship with development and financing entities underpinning the feasibility of accessing the funding needed to underwrite its investments in expansion and innovation, under compatible repayment conditions.

**TABLE 3**  
**Construct Reliability**

VARIABLES	INDICATORS	FACTOR LOADS*	AVE	COMPOSITE RELIABILITY
Organizational Environment	Complexity	-0.75	0.68	0.86
	Hostility	0.89		
	Controlability	0.83		
Complexity	Hardly understandable environment	-0.58	0.57	0.72
	Assortment of products	-0.90		
Hostility	Positive market situation	-0.71	0.74	0.89
	Favorable opportunities	-0.95		
	Ganing situations	-0.90		
Controlability	Access to critical resources	-0.74	0.66	0.85
	Market situation control	-0.87		
	Manageable situations	-0.82		
Organizational Competences	Competitive Advantage	0.97	0.86	0.90
	Sustainability	0.88		
Competitive Advantage	Effects on costs and sales	0.92	0.86	0.95
	Ability to block threats	0.96		
	Capitalization of opportunities	0.90		
Sustainability	Competence performance level	0.85	0.73	0.84
	Imitation time	0.86		
Strategic Groups	Investments in R&D	0.88	0.67	0.80
	New products	0.77		

\* All factor loads are significant at  $p < .001$  but for the indicator **Hardly understandable environment** with  $p < .01$ .

**TABLE 4**  
**Cross Loads for Convergent Validity Assessment\***

	Complexity	Controlability	Hostility	Competitive Advantage	Sustainability	Strategic Groups
Hardly understandable environment	<b>-0.58</b>	0.23	0.28	-0.04	-0.06	0.10
Assortment of products	<b>-0.90</b>	0.45	0.56	-0.28	-0.29	-0.21
Access to critical resources	0.46	<b>-0.74</b>	-0.44	0.27	0.29	0.39
Market situation control	0.36	<b>-0.87</b>	-0.48	0.21	0.25	0.35
Manageable situations	0.33	<b>-0.82</b>	-0.36	0.29	0.18	0.33
Positive market situation	0.37	-0.34	<b>-0.71</b>	0.08	0.23	0.09
Favorable opportunities	0.56	-0.51	<b>-0.95</b>	0.28	0.37	0.18
Gaining situations	0.57	-0.50	<b>-0.90</b>	0.33	0.38	0.22
Effects on costs and sales	0.27	-0.39	-0.28	<b>0.92</b>	0.68	0.55
Ability to block threats	0.27	-0.31	-0.33	<b>0.96</b>	0.67	0.50
Capitalization of opportunities	0.16	-0.16	-0.17	<b>0.90</b>	0.70	0.43
Competence performance level	0.16	-0.31	-0.40	0.60	<b>0.85</b>	0.31
Imitation time	0.29	-0.19	-0.25	0.65	<b>0.86</b>	0.38
Investments in R&D	-0.05	-0.27	-0.05	0.58	0.46	<b>0.88</b>
New products	0.30	-0.47	-0.30	0.26	0.17	<b>0.77</b>

\* All factor loads are significant at  $p < .001$  but for the indicator **Hardly understandable environment** with  $p < .01$ .

**TABLE 5**  
**Pearson Correlation among Tier 1 Latent Variables\***

	Complexity	Controlability	Strategic Groups	Hostility	Sustainability	Competitive Advantage
Complexity	<b>0.75</b>					
Controlability	-0.47	<b>0.81</b>				
Strategic Groups	0.13	-0.44	<b>0.82</b>			
Hostility	-0.59	0.53	-0.20	<b>0.86</b>		
Sustainability	0.27	-0.29	0.41	-0.38	<b>0.85</b>	
Competitive Advantage	0.25	-0.31	0.53	-0.28	0.73	<b>0.93</b>

\* The square root of the AVE for each latent variable is presented in the correlation matrix diagonal.

All correlations with absolute values greater than 0.13 are significant at  $p < .001$ .

**TABLE 6**

**Pearson Correlation between Tier 2 Latent Variables\***

	Organizational Environment	Organizational Competences
Organizational Environment	<b>0.82</b>	
Organizational Competences	-0.39**	<b>0.93</b>

\* The square root of the AVE for each latent variable is presented in the correlation matrix diagonal.

\*\* p < .001.

**TABLE 7**

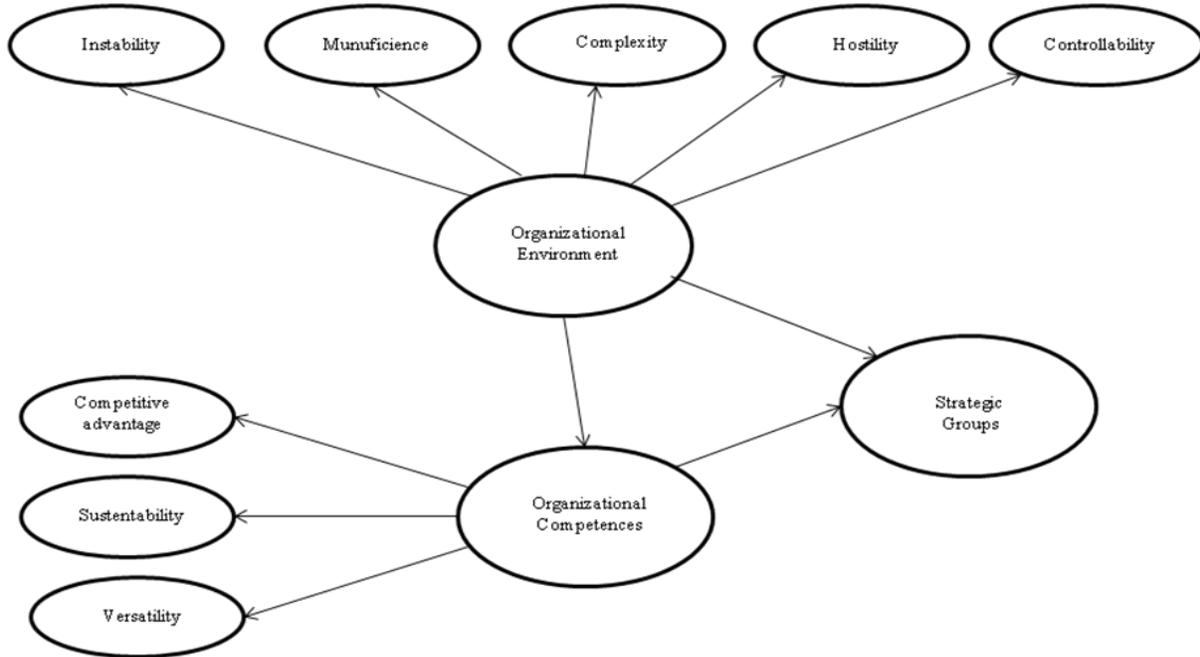
**Standardized Regression Coefficients**

	Environment → Strategic Groups	Competences → Strategic Groups	Competences → Environment
Model 1	-0.42*	-	-
Model 2	-	0.56*	-
Model 3	-	-	-0.38*

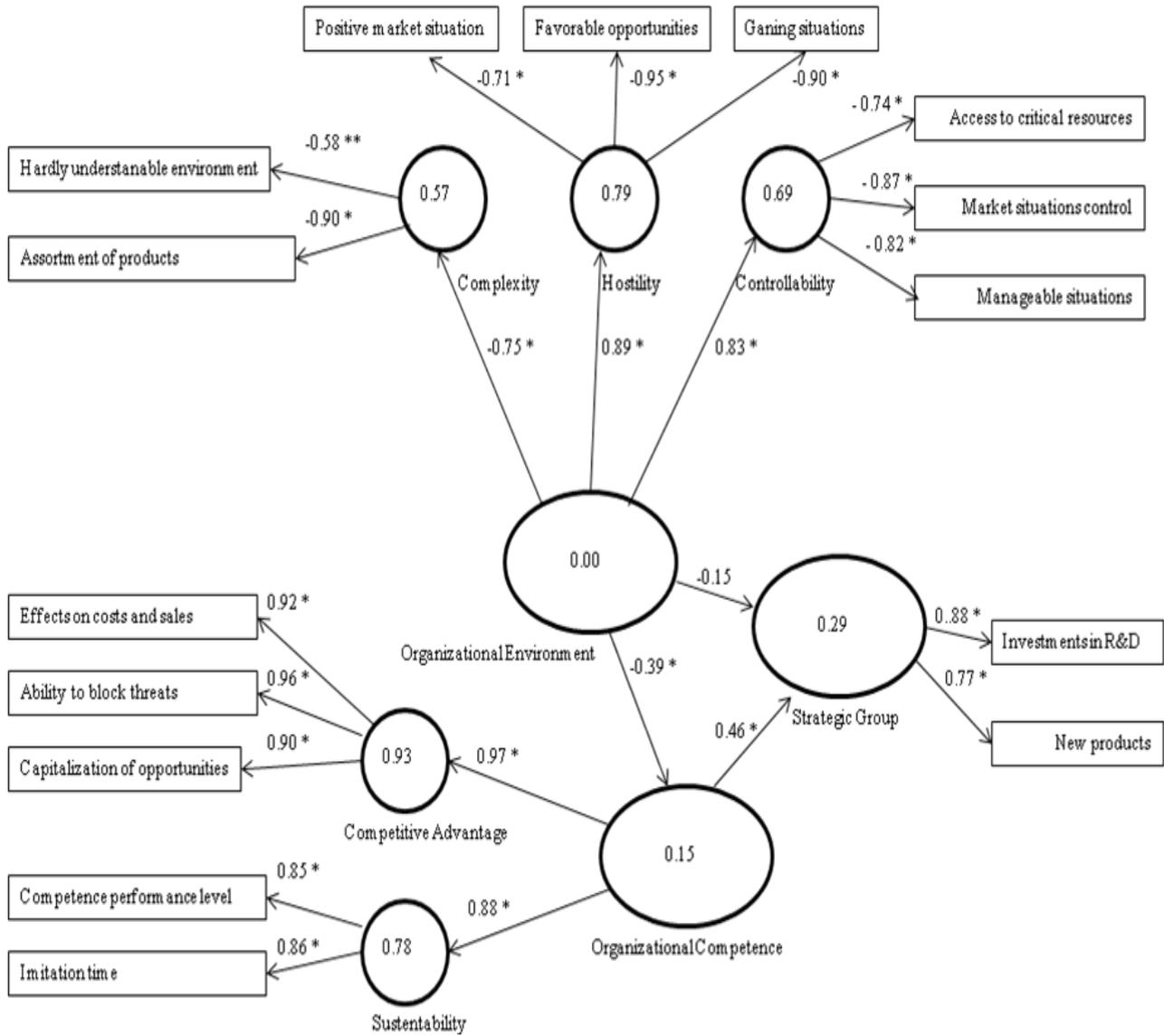
\* p < .001

**FIGURE 1**

**Path Diagram of the Research’s Structural-Equation Model**



**FIGURE 2**  
**Measurement Model**



Note: Findings presented by the SmartPLS software for the data analysis conducted by the authors. The significance of the coefficients was estimated through a bootstrap technique with N = 55 and 1,000 repetitions.

\* p < .001

\*\* p < .01

**FIGURE 3**

**Relations among Competences, Competitive Environment and Strategic Positioning**

