

Analysis of Competitiveness in Colombian Family Businesses

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Abstract

Purpose: Building on the Resource-Based View and the Configuration Theory, this study employs a systemic and multidimensional competitiveness index—i.e., that incorporates system constraints among the ten competitive pillars that form the index—to assess the competitiveness level and the connection between competitiveness and economic performance (ROA) in family businesses.

Design/methodology/approach: For the empirical application we use a unique primary dataset drawn from the Global Competitiveness Project (GCP: www.gcp.org) that includes information for 77 Colombian family businesses for 2017. Cluster analysis is used to evaluate the potential relationship between competitiveness, the configuration of competitive pillars and economic performance (ROA).

Findings: The results show that the main competitive strengths are the introduction of product innovations and network (suppliers and customers), while the limited use of technologies and the low online presence are the main competitive weaknesses of the sampled firms. The findings of the cluster analysis reveal that different configurations of competitiveness pillars are associated with different performance levels. Our results contribute to identify how specific strategies aimed at improving different resources or capabilities contribute to enhance business competitiveness and, ultimately, performance.

Originality/value: By using an index number that takes into account the multiple interactions between resources and capabilities, the proposed analysis not only sheds light on the drivers of competitiveness—i.e., resources and capabilities—and its connection to performance, but also contributes to understand the boundaries of the businesses' competitiveness system as well as the strategies that can potentially enhance competitiveness and, subsequently, business performance.

Keywords: Competitiveness, resource-based view, system dynamics, family business

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1. Introduction

The measurement of a country's competitiveness has become a focus of economic research in the last decades (Garelli, 2014; Sala-i-Martin *et al.*, 2014). Existing research has developed a variety of competitiveness indices to rank nations, such as the world competitiveness ranking by the Institute for Management Development (IMD) World competitiveness Centre (Garelli, 2014) and the ranking global competitiveness index by the World Economic Forum (Sala-i-Martin *et al.*, 2014). However, prior studies focus on the measurement of competitiveness at country level, while neglecting firm competitiveness (Cetindamar and Kilitcioglu, 2013).

One of the biggest challenges for researchers is to propose accurate measures of business competitiveness (Ketchen *et al.*, 2007). For example, Ajitabh and Momaya (2004) study competitiveness-related frameworks and models, including the Asset-Processes-Performance (APP) approach. The APP model focuses on firm's internal assets, process and performance, and this approach was found relevant to understand the main drivers of competitiveness in times of economic growth and slowdown. Also, by using Porter's competitiveness diamond (1990) Chikán (2008) develops a general model of competitiveness. This study represents a well-structured model that connects national- and business-level competitiveness.

Over the last two decades researchers have witnessed how the Resource-Based View of the firm (RBV) has become one of the dominant theoretical frameworks used to explain competitive advantage differences among businesses (Ismail *et al.*, 2012). Firms seek to

gain and develop bundles of capabilities which enable them to employ their internal resources more effectively. The primary premise of the RBV is that resource heterogeneity across businesses explains performance differences between them (Wong and Wong, 2011). RBV theorists propose that the associations resulting from connecting resources and capabilities contribute to enhance business competitiveness (Prahalad and Hamel 1990; Wernerfelt 1984). Business competitiveness is an attractive concept characterised by its long-term orientation and dynamism (Barney, 1995; Webb *et al.*, 2010), and is a multidimensional construct that can be analysed from a systemic perspective (Miller, 1996; Cetindamar and Kilitcioglu, 2013).

In most economies, family businesses (FBs) are an important source of economic development and growth among competing firms (Astrachan, and Shanker, 2003). Prior work highlights that FBs are characterised by idiosyncratic firm-level bundle of resources and capabilities, because of the systemic interaction between the family, its members, and the business (Habbershon and Williams, 1999; Habbershon *et al.*, 2003). By examining the outcomes that flow from the creation or development of competencies, the owner or managers of FBs could be in a better position to balance strategic investments with actions that contribute to manage on the organisation's resources and capabilities efficiently, improving competitiveness.

Most empirical work has sought to assess the contribution of different resources and capabilities to performance (Newbert, 2008). On contrary, in this study we propose a multidimensional business competitiveness index that considers the interdependence of a number of resources and capabilities. By accounting for the interactions that exist between resources and capabilities, the proposed competitiveness index connects the Resource-Based View (Wernerfelt, 1984) with the Configuration Theory (Miller, 1996).

We employ the index-building methodology developed by Lafuente *et al.*, (2016) to scrutinise the competitiveness level of Colombian FBs. The analysis of competitiveness is based on an index number that uses a system dynamics model that incorporates systemic constraints between the analysed resources and capabilities. Building on the premises of the RBV, competitiveness is defined as the set of interdependent resources and capabilities that enable the creation or development of valuable competencies (Barney, 2001; Habbershon, and Williams, 1999). The proposed measure of competitiveness consists of 46 variables grouped into ten pillars that represent different resources and capabilities.

Additionally, a second stage of the study involved a cluster analysis in order to gain a more complete picture of the competitiveness of Colombian FBs. This analysis offers the opportunity to assess how different competencies contribute to business competitiveness in contexts where the interactions between resources and capabilities are complex and heterogeneous. The empirical application uses a sample of 77 FBs from different economic sectors located in Colombia in the year 2017.

Our paper makes three contributions to the literature. First, by connecting the RBV with Configuration Theory, we contribute to a better understanding of the factors driving competitive advantage. This way, this study also contributes to the growing stock of empirical literature dealing with the RBV and Configuration Theory in developing settings. Second, existing research focused on competitiveness models at country- and business-level has mainly focused on individual factors or capabilities that increase competitiveness and contribute to success, growth and survival of the firm. In this sense, little attention has been paid to the systemic analysis of competitiveness in family businesses. Our multidimensional competitiveness model employs an index number methodology with systemic constraints that enables multiple interactions between the different pillars that

shape competitiveness. Thus, the results of the proposed analysis help to identify the main determinants of FBs competitiveness and may encourage the development of competitiveness-enhancing support policies. Third, this article contributes to the competitiveness literature by studying FBs in a developing country (Colombia) characterised by continuous changes in economic policy that may affect business performance. In the Colombian context, FBs represent 70% of the total number of firms in the country, contribute more than 50% of the Gross Domestic Product (GDP) and provide 70% of employment (Müller *et al.*, 2018), which further validates the importance of studying business competitiveness in this context.

2. The Resource-Based View of the firm and business competitiveness

The theoretical basis of this study is the RBV of the firm (Wernerfelt, 1984). This theoretical approach emphasises that resources and capabilities are the main source of competitive advantage of businesses (Barney, 2001), and suggests that companies seek to generate a competitive advantage by developing combinations of resources that are valuable, rare and difficult to replace or imitate (Barney, 1991). Habbershon and Williams, (1999) consider that different levels of investment' differentiated investments in the dominant resources of FBs could contribute to competitive advantage by creating idiosyncratic combinations of resources.

The RBV considers the accumulation of resources that are valuable, rare and difficult to replace or imitate as the basis of business competitiveness and profitability (Wernerfelt, 1984; Peteraf, 1993). Newbert (2008) suggests that valuable and rare resources are related to competitive advantage and, subsequently, financial and economic performance. Resource heterogeneity contributes to explain performance differences among businesses, especially

when it comes to creating a sustained resource-based competitive advantage (Wong and Wong, 2011; Ismail *et al.*, 2012). Researchers have theorised that in order to obtain sustainable competitive advantage, firms have to possess valuable resources that are difficult to imitate and must implement new value-creation strategies that competing firms will find hard to replicate (Newbert, 2007)

From the RBV point of view, FBs have the capacity to generate idiosyncratic firm-level bundles of resources and capabilities as a result of the systemic interaction between the family, its members, and the business (Habbershon and Williams, 1999; Nordqvist and Melin, 2010). Chrisman *et al.*, (2003) argued that the contributions of family members to the business may yield to obtain distinctive resources and capabilities, which can serve as a source of competitive advantage for the FBs. Irava and Moores (2010) show that, in the context of FBs, a sustainable competitive advantage emerges from the combination of three main dimensions: human resources, organizational resources, and process resources.

Competitiveness is a multidimensional concept, characterised by its long-term focus, controllability and dynamism. From the perspective of the business, the key for formulating a successful competitive strategy requires the understanding of the relationships between resources and capabilities (Sirmon *et al.*, 2007) as well as of the characteristics of the environmental context in which the firm operates (Chirico and Bau, 2014).

Competitiveness is a complex construct that should be assessed from a holistic approach in order to better understand how organizations 'do business' (Barney, 1995). The core of our analysis is to match resources and capabilities with the creation of value-adding competencies, while acknowledging the multidimensionality of competitiveness, as well as the complementarities that exist between a business' resources and capabilities.

In this study we follow the methodology proposed by Lafuente *et al.*, (2016) to measure competitiveness using a systemic index number. These authors define competitiveness as a *mutually dependent bundle of ten pillars: human capital, product, domestic market, networks, technology, decision making, strategy, marketing, internationalization and online presence, that allow a firm to effectively compete with other firms and serve customers with valued goods/services.*

3. Proposal for assessment of business competitiveness

Organisations have different strengths and weaknesses in terms of resources and capabilities, and it is critical for these to be identified because the key to a business' success and its future development lies in its ability to create or develop valuable competencies (Teece *et al.*, 1997). Competitiveness has been operationalized in several ways. Previous studies have highlighted a number of firm-specific competitive factors; but attempts to measure competitiveness have been based on individual variables or on the estimation of aggregate metrics in which the analysed components contribute individually to competitiveness (Douglas and Ryman, 2003; Fernhaber and Patel, 2012). These measures capture the level of statistical association between the analysed variables. However, studies of competitiveness based on aggregate indicators may not efficiently capture the possible connections between resources and capabilities. Building on Lafuente *et al.*, (2016) and following the theory in section 2, we propose that:

Competitiveness is a mutually dependent bundle of ten pillars: human capital, product, domestic market, networks, technology, decision making, strategy, marketing, internationalization and online presence, that allow a firm to effectively compete with other firms and serve customers with valued goods/services.

The chosen pillars of competitiveness coincide with the postulates of the RBV (Webb *et al.*, 2010; Peteraf, 1993), and their relevance arises from the recognition that there may be multiple interactions within the firm and that the intensity of these relationships affects competitiveness. FBs present significant peculiarities in terms of organisation, resource allocation, management styles and strategic choices (Irava and Moores, 2010). FBs are faced with major resource constraints that increase their vulnerability with respect to environmental changes. SMEs often lack resources that are especially vital for their survival and performance (Newbert, 2007). As a result, networks, external partnerships and efficient channels for disseminating knowledge are critical competencies (Díaz-Chao *et al.*, 2016). Innovation is another variable that is frequently used to explain small firms' differentiating behaviour (Farinha *et al.*, 2018). In addition, the use of ICT-based skills is increasingly considered a central element of SME strategy (Spinelli, 2016). One of the new features of our approach to competitiveness is the inclusion of the firm's online presence and the application of information technologies. There have been several attempts to develop a variety of competitiveness measures, but the multidimensional nature of the relations between the analysed competencies has been largely ignored in the literature. By connecting the RBV with the postulates of Configuration Theory, we propose a five-step procedure to compute business competitiveness.

To estimate the competitiveness index, we first normalise in the [0,1] range all variables included in the analysis ($j = 1, \dots, J$):

$$x_{i,j}^* = \frac{x_{i,j}}{\max(x_j)}, \quad j = 1, \dots, J \text{ and } i = 1, \dots, N \quad (1)$$

In equation (1) $x_{i,j}^*$ is the normalised value for the j th variable obtained for each firm ($i = 1, \dots, N$), and $x_{i,j}$ is the original value of the analysed variable. For each variable (j), the benchmark ($\max(x_j)$) is the highest value as an approximation to the best practice in the sample. We use the distance normalisation approach because, contrary to the min-max technique (mean of zero and variance of one), this approach preserves the observed relative difference among the analysed firms.

The second step consists of separating the vector of normalised variables (J) to create the 10 vectors (\mathbf{v}) that correspond to the analysed competitiveness pillars ($\mathbf{v} = (v_1, \dots, v_J) \in R_+^J$). The comparative scores for each pillar are the average value of the variables included in each pillar (\mathbf{v}). Additionally, the values of the pillar scores are normalised in the [0,1] range to make the results easier to interpret. To compute the normalised competitiveness pillar scores, one must solve:

$$p_{i,v} = \frac{\sum_{k=1}^K x_{i,v}^*}{K}, \quad v = 1, \dots, 10 \text{ and } k = 1, \dots, K \quad (2a)$$

$$p_{i,v}^* = \frac{p_{i,v}}{\max(p_v)}, \quad (2b)$$

Note that the pillar scores ($p_{i,v}$) are computed for each firm ($i=1, \dots, N$) and that the number of variables used to estimate each pillar ($k=1, \dots, K$) might vary.

In addition, the pillar values (equation (2b)) vary considerably, which can cloud the interpretation of the results. Firms do not use productive resources with the same intensity and the required efforts to improve competitiveness can be significantly different between firms and between pillars, regardless of whether these efforts improve the pillars with higher or lower values. Given the management approach of this study, the additional

resources required to achieve the same marginal improvement in the average pillar scores should be the same.

So, and to ensure a robust estimation, in the third step the marginal effect of the competitive pillars is equalled ($p_{i,v}$), and the strength and direction of the adjustment of each pillar is estimated by solving the following expression for δ :

$$y_{i,v} = p_{i,v}^{*\delta}$$

(3a)

$$\sum_{i=1}^N p_{i,v}^{*\delta} - N\bar{y}_v = 0 \quad (3b)$$

In equations (3a) and (3b) δ represents the ‘adjustment strength’ for the v th pillar, i.e. moment δ -th of variable $p_{i,v}^*$ corresponds to the average value of the corresponding pillar (\bar{y}_v). Equation (3b) delineates a decreasing, convex function, and the solution for δ is obtained by using the Newton-Raphson method with initial values of zero (Atkinson, 2008). From the analysis of equations 3(a) and 3(b) it follows that:

$$\bar{p}_v^* < \bar{y}_v \quad \delta < 1$$

$$\bar{p}_v^* = \bar{y}_v \quad \delta = 1$$

$$\bar{p}_v^* > \bar{y}_v \quad \delta > 1$$

So, using the procedure presented in equations (3a) and (3b) we can obtain the strength (and direction) of adjustment (δ) in the analysed pillars.

The fourth step considers the mutual dependence of the 10 competitiveness pillars by introducing a penalty for bottleneck to the estimation of the competitiveness index.

Following Configuration Theory (Miller, 1996), improvements can be only achieved by strengthening the weakest link, the bottleneck, that constrains the performance of the whole system. Good performing pillars can only partially and not fully compensate for poorly performing pillars. This imbalance reduces the firm's competitive performance. Mathematically, the bottleneck is modelled by means of a correction in the form of an exponential function ae^{-bx} (Tarabusi and Guarini, 2013). In this study, the penalty function is defined as:

$$h_{i,v} = \min(p_{i,v}^*) + (1 - e^{-(p_{i,v}^* - \min(p_{i,v}^*))}) \quad (4)$$

where $h_{i,v}$ is the post-penalty value for the v th pillar and $\min(p_{i,v}^*)$ is the pillar with the lowest reported value for the analysed firm (i).

Finally, the fifth step uses the results obtained from equation (4) to estimate the competitiveness index (CI) for each firm as the sum of the ten competitiveness pillars:

$$CI_i = \sum_{v=1}^{10} h_{i,v} \quad (5)$$

It is important to note that in our approach to competitiveness, 1) competencies subject to bottleneck penalties dilute the contribution of other valuable competencies, 2) improvements in bottleneck competencies are a costly investment, 3) the harmonisation of competencies is a source of competitive advantage linked to the exploitation of resources and capabilities, and 4) the development of competitive strengths leads to superior performance. The proposed systemic approach to the measurement of competitiveness is a valuable managerial tool that not only reveals a firm's weaknesses and their effect on

competitiveness, but also captures the multiple relationships that exist among the analysed competitiveness pillars.

4. Empirical application: Data and variables used to build the competitiveness index and method

4.1 Data

For the empirical application we use a primary dataset drawn from the *Global Competitiveness Project* (GCP: www.gcp.org), an international research programme developed by the University of Pécs (Hungary) and the Polytechnic University of Catalonia (UPC Barcelona Tech, Spain) to identify the potential competitiveness of firms. In Colombia, the Universidad de la Costa (Barranquilla) is leading the GCP.

The data was collected specifically for this study and the procedure was fully supervised by the project team. The procedure for selecting the surveyed FBs was carried out in two phases. First, we identified a group of firms that operate in different industrial sectors and have a relationship with the University. At this stage of the study, senior executives are a relevant group of respondents. So, after an initial phone call to gain their approval, the second step involved a face-to-face interview with one of the owners (only if he or she is a member of the senior executive) in the case of companies with less than 20 employees, while for companies with more than 20 employees, a senior executive was interviewed, regardless of whether or not he or she is a shareholder in the company. The data collection procedure involved self-administered structured interviews in which managers were asked to answer mainly closed questions. The questionnaire was subjected to a preliminary test to correct potentially confusing or confusing questions.

A total of 107 surveys were obtained. However, in order to ensure a rigorous methodology, we only included observations for which a complete dataset could be constructed for the analysed variables. We therefore excluded 30 companies due to incomplete data. This yielded a final sample of 77 FBs. The companies have an average of 87 employees, with 16 years of experience in the market. An analysis of the industrial makeup of the final sample reveals that 46.15% of the companies provide knowledge-intensive business services, 18.27% are in the construction sector, 15.38% are in the manufacturing sector, and the proportions of professional services companies and retail firms are 17.31% and 7.69%, respectively. We tested the non-response bias for initial and late respondents in terms of business size (employees), business age and return on assets (ROA) in the analysed industrial sectors and no significant differences were detected (*t*-test).

4.2 Variables used to estimate the competitiveness pillars

To compute the competitiveness index, we employed a set of variables dealing with different resources and capabilities. Respondents were asked to score the individual importance of a series of resources and capabilities on a five-point scale. These resources and capabilities are only valuable if the respondents deem them to be so (Priem and Butler, 2001). On the proposed Likert-type scale a value of 4 designates a highly relevant variable, while a value of 1 represents a variable of very little relevance. A 0 value indicates that the focal resource or capability has no strategic value whatsoever (Douglas and Ryman, 2003), and the remaining points on the scale ensure the uniform evaluation and quantification of the variables' importance. Also, the division of the positive scale values (from 1 to 4)

allows a sufficient degree of differentiation in the valuation of the analysed variables (Lederer *et al.*, 2013).

It is important to note that, in order to make the survey easier for respondents to read, the coding of some variables was modified. In the case of the human capital pillar, numerical values were used to codify employees' educational achievements (number and share of employees with a higher education degree) and the proportion of employees actively participating in training programmes. Similarly, the weight of new products in the firms' sales is introduced to the product pillar, while the strategic pillar includes the number of economic activities (NACE codes) as a proxy variable for the firm's diversification strategy. The networks pillar considers the number of cooperation and innovation agreements. Finally, the proportion of sales in foreign markets was included in the internationalisation pillar. Therefore, from our questionnaire it is possible to obtain information for 46 variables related to the ten competitiveness pillars (competencies) analysed in this study. The description of the variables used to build the competitiveness pillars is presented in the Appendix (Table A1).

4.3 Method

This study employs cluster analysis to scrutinise how business specific factors contribute to explain performance differences among the sampled Colombian FBs. Additionally, we present a complementary descriptive analysis including the competitive pillars in order to further explore how competitive drivers relate to performance. Table 1 presents the descriptive statistics for the variables used to cluster Colombian FBs: size measured by the number of employees, age of the company expressed in years, and return

on assets (ROA). This study proposes a non-hierarchical cluster analysis (K-means) using the variables in Table 1 as inputs.

The cluster analysis is especially suitable for the study of the connection between relevant business characteristics (i.e., firm size and firm age) and performance (ROA). This technique highlights the variety of competitive structures across the analysed Colombian FBs, that is, this procedure makes it possible to classify the units of analysis (FBs) based on their similarities in resources and capabilities and offers a picture of the relationship between the different configurations of competitive pillars and performance (ROA).

--- Insert Table 1 about here ---

The non-hierarchical cluster analysis requires the establishment of a fixed number of groups (clusters), which presents a challenge in many fields of social science research where this type of analysis is usually more of an exploratory nature. In order to corroborate the number of clusters and the validity of the analysis, we adopted two approaches. First, the Calinski and Harabasz (1974) statistic is used to determine the optimal number of groups for the analysis: the result indicates that the cluster number that maximizes the Calinski and Harabasz index is 4 (pseudo-F value: 67.63). Therefore, the final non-hierarchical cluster analysis requires a division into four groups.

Second, a discriminant analysis was performed to validate the results of the cluster analysis. The results of the discriminant analysis in Table 2 reveal a high convergence between the groups resulting from the cluster analysis and the groups generated by the discriminant analysis. Therefore, this suggests that the approach proposed for the examination of the competitiveness levels of Colombian FBs is appropriate.

--- Insert Table 2 about here ---

Finally, by presenting a supplementary analysis that includes the competitiveness pillars, we seek to further explore how the configuration of competitive pillars relates to economic performance (ROA) among the sampled businesses.

5. Results

Before analysing the results of the cluster model, we first present a descriptive analysis of the results of the competitiveness index for the surveyed Colombian FBs.

These findings (equation (5)) are shown in Table 3, and indicate that the analysed FBs have an average competitiveness level of 5.347 (on base 10), and that business competitiveness ranges between 1.979 and 8.448.

The results also show how the main competitive strengths of the analysed firms are related to the introduction of product innovations (0.549) and the development of a solid network of contacts with suppliers and customers (0.545). This result is in line with Singh and Kota (2017) and Farihna *et al.*, (2018), who remark that innovation is a crucial factor for the competitiveness of FBs. Also, these results are similar to those reported by Monroy *et al.*, (2015) who show that the quality of the social ties with employees, allies and family members is a relevant determinant to competitiveness. On the other hand, it is observed that the main competitive weaknesses of these companies are the limited use of technologies in their operating processes (0.519) and their limited online presence (0.528). This result is in sharp contrast to Lundvall and Nielsen, (2007), and suggests that the adoption of

technologies and online presence are not critical competitiveness factor among the sampled businesses.

--- Insert Table 3 about here ---

Table 4 presents the four different groups of firms resulting from the cluster analysis: small young companies (not very old) (Group 1), medium-sized companies (Group 2), small consolidated companies (very old) (Group 3) and large companies (Group 4).

--- Insert Table 4 about here ---

Group 1 includes 12 firms (13% of firms) that present a low level of competitiveness (average= 5.33) and the lowest profitability out of the groups extracted from the cluster analysis (average= 4.33%). A more detailed analysis of the competitive pillars reveals that human capital is the main competitive strength in this group (average= 0.6063). This group also stands out for more intense development of competitive strategies (average= 0.5934) and for the quality of the products they offer (average= 0.5845). In FBs it is common that the firm's founder works to fulfil the agreements made with suppliers and clients, offering quality products and services (Müller *et al.*, 2018). The main competitive weaknesses of these companies lie in their poor decision-making processes, given how weak their management systems and corporate governance structures are (average= 0.4515), and their limited focus on exports (average= 0.4640). In fact, many FBs lack comprehensive information on markets and strategic planning, and rely on centralised decision-making processes implemented by the founder/entrepreneur (Nordqvist, and Merlin, 2010).

Group 2 includes 23 mostly medium-sized firms (average size= 67.91 employees). Compared to businesses in Group 1, this group is, on average, more competitive (5.8468), has more developed decision-making processes (0.6173), and is more focused on the domestic market (0.6112) by leveraging its contact networks (0.6076). These companies mainly focus on competing in a specific market as well as increasing their market share to achieve sustainable growth and performance (Cetindamar and Kilitcioglu, 2013).

The small consolidated companies in the market, which make up Cluster 3, have an average of 12 workers and 15 years of operation. The firms in this cluster present higher returns on assets (average= 19.26%) than those observed in the other clusters. However, this group of companies has the lowest level of competitiveness (4.8339). They have a consolidated product on the market (0.5272) and a strong relationship with their customers and suppliers (networks= 0.5083), but their main weaknesses are their online presence strategies (0.4281) and their poor use of new technologies in their production processes (0.4528).

Group 4 comprises large and experienced firms (average size= 467 employees; average market experience= 43 years). This Group has 10 companies that present the best competitiveness results (5.86). Their main strengths are: focus on international markets (0.6325) through the export of their products, high online presence (0.6785), and a consolidated corporate governance structure that allows them to make more accurate decisions (0.6390). Singh and Kota (2017) highlight that strategic planning and decision-making is a critical factor for firms offering their services and products to international markets. Zahra (2005) shows that FBs have relatively high levels of internationalisation; however, in Group 4 the result for the human capital pillar (0.5387) and the quality of their competitive strategies (0.4954) are below the level reported by firms in Group 1.

Overall, our empirical analysis of competitiveness in FBs shows that the role of competitive pillars on performance is heterogeneous across the analysed FBs. We find that discrepancies in FBs' resources and capabilities result in different competitive positions (advantages and disadvantages) with respect to the pillars driving competitiveness. Also, from the results of the cluster analysis we observe that the evolution on FBs' competitiveness does not follow a homogeneous pattern. The findings suggest that the determinants of FBs competitiveness may be different in young vis.-à-vis. more consolidated family businesses (Hoy & Sharma 2010).

Furthermore, the results show how the proposed analysis of competitive pillars contributes not only to clarify how competitiveness impacts performance but also to improve our capacity to operationalise relevant competencies with performance consequences.

6. Conclusions and implications of the study

The purpose of this paper has been to evaluate business competitiveness from a systemic perspective by taking into account the interrelationships between the resources and capabilities available to the analysed Colombian FBs. Building on the RBV and Configuration Theory, competitiveness was contextualised as a multidimensional construct that considers the interdependence of resources and capabilities (Barney, 2001; Prahalad and Hamel, 1990). More specifically, our comprehensive competitiveness measure employs an index number methodology that takes into account both the multiple interactions between different competencies, and the potentially restraining effect of weak (bottleneck) competencies on overall business competitiveness.

The results reveal the explanatory power and benefits of the proposed managerial tool by showing how the adoption of strategies aimed at improving different resources or capabilities contributes to the enhancement of business competitiveness. Our analysis therefore shows how FBs can optimise the allocation of additional resources in the hope of becoming more competitive. In general, we find that the configuration of a firm's competitive system (in terms of resources and capabilities) conditions the success of the strategy that has been implemented, and how these strategies (associated to the acquisition or development of resources and capabilities) can have a (generally) heterogeneous and positive effect on competitiveness.

These findings have important implications for academics and practitioners. First, the proposed competitiveness index coincides with the postulates of the RBV, which emphasises the complexity of the associations between resources and capabilities with the need to accurately measure competitiveness from a holistic perspective. Our proposal adopts a system dynamics approach that takes into account the interactions between resources and capabilities in order to explain the boundaries of businesses' competitiveness system. In this sense, this study contributes to the literature dealing with the determinants of competitiveness (Newbert, 2008). Also, this study contributes to expand the research work associated with the competitiveness of FBs as well as the competitiveness level of organisations operating in developing economies (Tálas. and Rózsa, 2015), and provides valuable information to policy makers and practitioners on the subject matter.

Second, prior research on the RBV has addressed the individual contribution of relevant variables of different resources and capacities to competitiveness (Douglas and Ryman, 2003; Fernhaber and Patel, 2012). Our results reveal that, when business competitiveness is comprehensively evaluated, it is possible to identify the resources and

capabilities that to a greater or lesser extent contribute to a firm's competitiveness (strengths and weaknesses). Also, the findings provide important information to managers of family firms that can be used in decision-making processes linked to investments in specific resources that may contribute to create or develop a competitive advantage by creating idiosyncratic combinations of resources. Furthermore, these specific investments are potentially conducive to higher survival rates and superior performance among FBs.

There are several limitations to this study that should be addressed in future research. First, the data does not permit direct analysis of the effect of improvements in resources and capabilities on competitiveness. Interpretations of how actions to improve resources and capabilities impact competitiveness are presented, but we do not evaluate how firms implement such actions, nor how firms internalise these investments and how they affect their competitiveness. Second, future research should corroborate the robustness of the proposed competitiveness index in other types of firms that are exposed to external market pressures and whose managers tend to prioritise short-term profits over long-term strategic targets (Cetindamar and Kilitcioglu, 2013).

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List of Tables

Table 1. Cluster analysis: Descriptive statistics for the selected variables

	Average	Std. Dev.	Minimum	Maximum
ROA	0.110	0.259	-0.0985	2.073
Firm size (employees)	87.67	220.87	3	1300
Firm age (years)	16.67	16.07	1	81

Table 2. Results: Discriminant analysis

Cluster Analysis (groups)	Classification generated by the discriminant analysis				N
	Group 1	Group 2	Group 3	Group 4	
Group 1	12 (100%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	12
Group 2	0 (0.00%)	23 (100%)	0 (0.00%)	0 (0.00%)	23
Group 3	1 (3.13%)	0 (0.00%)	32 (100%)	0 (0.00%)	32
Group 4	0 (0.00%)	0 (0.00%)	0 (0.00%)	10 (100%)	10

Table 3. Business competitiveness: Descriptive statistics

	Average	Std. Dev.	Minimum	Maximum
Competitiveness Index (<i>CI</i>)	5.347	1.353	1.979	8.448
Human capital	0.535	0.165	0.124	0.886
Product	0.549	0.195	0.147	0.960
Domestic market	0.538	0.122	0.275	0.846
Networks	0.545	0.173	0.186	0.883
Technology	0.519	0.178	0.117	0.925
Decision making	0.539	0.223	0.094	0.960
Competitive strategy	0.537	0.154	0.213	0.837
Marketing	0.532	0.176	0.062	0.912
Internationalization	0.525	0.180	0.015	0.936
Online presence	0.528	0.232	0.081	0.964

Table 4. Results: Cluster analysis

	Group 1	Group 2	Group 3	Group 4	Total
Variables included in the cluster analysis					
ROA	0.0433	0.0562	0.1926	0.0630	0.1118
Firm size (employees)	10.75	67.91	12.09	467.30	87.68
Firm age (years)	2.75	14.83	15	43	16.68
Competitiveness (not included in the cluster analysis)					
Competitiveness Index (<i>CI</i>)	5.332	5.847	4.834	5.859	5.347
Human capital	0.606	0.557	0.490	0.539	0.535
Product	0.585	0.547	0.527	0.584	0.549
Domestic market	0.518	0.611	0.490	0.549	0.538
Networks	0.481	0.608	0.508	0.593	0.545
Technology	0.511	0.577	0.453	0.607	0.519
Decision making	0.452	0.617	0.485	0.639	0.539
Competitive strategy	0.593	0.584	0.495	0.495	0.537
Marketing	0.570	0.581	0.481	0.542	0.532
Internationalization	0.464	0.578	0.477	0.633	0.525
Online presence	0.552	0.589	0.428	0.679	0.528
N	12	23	32	10	77

Number of observations: 77 firms.