

BUSINESS COMPETITIVENESS IN COSTA RICA: A MULTIDIMENSIONAL APPROACH



COMPETITIVIDAD EMPRESARIAL
EN COSTA RICA: UN ENFOQUE
MULTIDIMENSIONAL

This article evaluates the competitive efficiency of 67 Costa Rican small and medium-sized businesses for 2017. Building on the resource-based view postulates, the proposed competitiveness index is based on the methodology developed by Lafuente, Leiva, Moreno and Szerb (2019b) in which ten interconnected competitive pillars shape business competitiveness. By employing a non-parametric model (Data Envelopment Analysis, DEA) with a single constant input and one output (competitiveness index) the results of the empirical application reveal that, on average, the analyzed Costa Rican SMEs can improve their competitive efficiency by 54.45%. Additionally, the findings indicate that businesses in manufacturing and service sectors present the highest competitive efficiency levels, which is explained by the pillars linked to product innovation and business networks. The proposed competitiveness index is a valuable tool that can support businesses' decision-making processes as well as the design of specific strategies that contribute to improving resource allocation processes and the configuration of competitive pillars at business level.

KEYWORDS: Data envelopment analysis, Competitiveness, Costa Rica, small enterprises, system dynamics

Este artículo evalúa la eficiencia competitiva de sesenta y siete pequeñas y medianas empresas costarricenses para el 2017. A partir de las bases teóricas del Enfoque Basado en Recursos, se aborda metodológicamente la medición de la competitividad empresarial del grupo de empresas en estudio a través de un índice compuesto por diez pilares, según lo propuesto por Lafuente, Leiva, Moreno y Szerb (2019b). Estos pilares se encuentran interconectados y configuran la competitividad empresarial de las pymes. Para estimar su eficiencia, se realiza un modelo de análisis envolvente de datos (DEA por sus siglas en inglés), con especificación de un input y un output. Los resultados de la investigación indican que las empresas agrupadas en los sectores de manufactura y servicios muestran los índices de competitividad y eficiencia mayores, lo que es explicado por los pilares de innovación de productos y redes de negocios; mientras que los pilares menos priorizados son internacionalización, mercado interno y recursos humanos. Se concluye que el índice de competitividad es una herramienta que favorecería la toma de decisiones empresariales, pues contribuiría con en el diseño de estrategias empresariales orientadas hacia una configuración más homogénea en la asignación de recursos y capacidades.

PALABRAS CLAVE: Análisis envolvente de datos, competitividad, Costa Rica, pequeña empresa, sistemas dinámicos.

ABSTRACT

RESUMEN

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INTRODUCTION

The definition of competitiveness has evolved over the decades, mainly as a result of the advancement of different theoretical postulates. Scientific literature currently features abundant discussion of evidence related to its definition and the levels of analysis that can be applied, be this on a national, sectoral, regional or a company level (Bič and Stuchlíková, 2013; Charles and Sei, 2019; Krugman, 1994; Lafuente, Acs, Sanders & Szerb, 2019a; Porter, 1991).

In the initial discussion on the scope of the concept of competitiveness, at least two dominant trends can be identified: the first focuses on the macroeconomic perspective, centering on the topic of national productivity and postulating the need for economic policy mechanisms that create an environment suitable for business performance (Buckley, Will Pass and Prescott, 1988; Delgado, Ketels, Porter and Stern, 2012; Lafuente, Acs, Sanders & Szerb, 2019a); while the second dominant trend takes up a microeconomic perspective, focusing on companies achieving increased efficiency, a greater market share and better rates of return on invested capital through the creation of competitive advantages by means of business strategy (Newbert, 2007; Sirmon, Hitt, Fix & Campbell, 2010).

Within the microeconomic perspective, and as part of the school of thought focusing on strategy, the Resource-Based View emerges (Barney, 2001; Wernerfelt, 1984). This proposes that resources and capabilities can be distributed heterogeneously among competing firms; these differences can be long-lasting and could explain why some firms consistently outperform others (Barney, 2001, p.304).

While it is true that the dominant theoretical and methodological approaches have opened up a range

of possibilities on the definition of competitiveness, another element to which attention should be paid is its measurement, given that competitiveness measures proposed by the literature do not capture all the elements of the concept (Buckley et al., 1988). This aspect is of special consideration because competitiveness requires a comprehensive approach and measurement, which is not obtained through the estimation of specific economic factors in the short term, but rather requires an approach taking into account intangible and social resources within a long-term perspective (Lafuente, Leiva, Moreno-Gómez, & Szerb, 2019b).

In this regard, there are calls to measure competitiveness from a complex perspective that takes into account the different assets and processes occurring within companies. On the level of national measurement, authors such as Csath (2007) and Bič and Stuchlíková (2013) can be cited. On a regional level are the works by Lafuente et al. (2019a) and Charles & Sei (2019), while on a business level are investigations by Man, Lau, & Chan (2002), Newbert, 2007, Sirmon et al., (2010) and Lafuente et al. (2019b).

In the business sphere, studies indicate that in addressing the competitiveness construct, strengths and weaknesses count when discussing business efficiency (Lafuente et al., 2019; Sirmon et al., 2010). However, more scientific evidence is needed to understand how and to what extent core resources, capabilities and competencies facilitate the achievement and sustainability of a company's competitive advantage and the impact these have on its performance (Newbert, 2007).

It is important to mention that most of the research reviewed in the field of business competitiveness has focused on studying strengths rather than weaknesses, especially ignoring the fact that weaknesses also form an integral part of each enterprise (Sirmon et al., 2010). This opens up spaces for empirical and methodological research in which deliberate inclusion of this factor is sought, so contributing to the relevance of this research.

Under the above considerations, the objective of the article is to implement the concept of business competitiveness from a multidimensional approach to Costa Rican SMEs during 2017. For its estimation, the

THIS ARTICLE EVALUATES THE COMPETITIVE EFFICIENCY OF 67 COSTA RICAN SMALL AND MEDIUM-SIZED BUSINESSES FOR 2017

definition and methodological approach developed by Lafuente et al. (2019b) is adopted. The contribution of the article is empirical, as it not only provides evidence on how the strengths and weaknesses of firms interact together and affect their competitive efficiency, but it also sheds light on how to promote the strengths of SMEs. It also makes a methodological contribution on the validation of the calculation of a multidimensional index of business competitiveness. Finally, the practical implications focus on showing evidence of how companies organize their resources, calling for a rethinking of said distribution.

In terms of the structure of the article, the second section explains the theoretical reference used, the third section explains the methods applied, while the fourth presents the results obtained according to the index of competitiveness and efficiency. Finally, the fifth section provides conclusions and recommendations.

THEORETICAL FRAMEWORK

This section first provides an explanation of the core elements of the resource-based view, which serves as a basis for explaining the definition of business competitiveness in which the heterogeneity of resources and capabilities plays a key role.

THE THEORY OF THE RESOURCE-BASED VIEW

The resource-based view (RBV) emerged as a branch of the literature on strategic thinking, which seeks to explain the sources of the competitive advantages of companies. It focuses on the link between strategy and the internal resources of a firm, explaining how these resources make firms unique but also condition a stronger or weaker competitive position relative to other enterprises. From this approach, competitive differentiation is based on the interaction between companies' endogenous resources and capabilities—which can be acquired or developed—and on the deliberate selection of the strategy that they implement (Barney, 2001).

The assumptions of the RBV criticize the premises until then prevailing in the discussion on the generation of competitive advantages, which assumed the existence of homogeneity of resources in companies in the same sector

and the free mobility of heterogeneous resources (Porter, 1981; Porter, 1991). In contrast, the RBV is based on two central assumptions: the first proposes that resources and capacities can be distributed heterogeneously among enterprises given their endowments; the second specifies that these differences can be long-lasting due to the persistence of heterogeneity of endowments given their imperfect mobility (Barney, 1991).

In turn, the approach proposes a triad of basic concepts that become relevant to explaining the decisions of firms. These are: resources, competitive advantage and sustainable competitive advantage. Resources include an extensive list of assets, capabilities, organizational processes, company attributes, information, and knowledge, among other resources controlled by a company, which enable it to design and implement strategies to improve its efficiency and effectiveness (Barney, 1991). As for the definition of competitive advantage, this is obtained when a firm implements a value creation strategy that is not being implemented simultaneously by any current or potential competitor. For its part, the achievement of sustained competitive advantage is not expressed in terms of time, but rather in terms of the ability of a company to sustain its competitive advantage even though others have tried unsuccessfully to replicate its strategy (Barney, 1991; Barney, 2001).

Based on the above assumptions, the creation and sustainability of the competitive advantage of a company is a result that is obtained through efficiency in the use of its endowments of resources and capabilities, which result in obtaining income. In the strategic configurations of firms, all resources make a contribution, both strengths and weaknesses, and it is the interaction of these that allows the achievement of sustained competitive advantages (Sirmon et al., 2010). Thus, the maintenance of these advantages lies not only in understanding the basis of the competitive advantage of firms, but also in understanding and identifying those factors or resources (weak or strong) that can lead to dynamic changes in this base.

Our proposal sees this aspect as central since it justifies the need to consider multiple interactions between pillars or strong and weak resources that shape the competitiveness of companies in the approach to and the measurement of competitiveness. The pillars themselves represent different resources and capabilities

(e.g. human resources, innovation, technology) that shape the competitiveness of companies, and their configuration affects the efficiency of firms (Lafuente et al., 2019b). Thus, business competitiveness must be studied and measured from a holistic perspective, in which the combination of heterogeneous resources and capabilities allows the creation of added value for the company (Lafuente et al., 2019b; Newbert, 2007).

THE HETEROGENEITY OF RESOURCES AND BUSINESS COMPETITIVENESS

From the perspective of the RBV, the link between strategy and the internal resources of companies can be explained by the heterogeneity of resources, with the proposal thus made that a specific resource or capacity is considered valuable, rare, inimitable and non-substitutable (VRIN). This combination of resources “radically defines the types of processes by which companies could exploit resources” (Newbert, 2007, p. 124).

It is important to highlight the previous argument because every resource and capacity makes individual contributions that they bring to the overall performance of the company; nonetheless, these are unproductive individually, as the key to achieving a competitive advantage is not simply the exploitation of a valuable resource or capability, but rather its exploitation made through a combination of resources and capabilities. The more value that can be added by the firm's ability to combine its resources, the greater the competitive advantage it can enjoy as a result of their exploitation (Newbert, 2008). This leads to the concept that competitiveness is a multidimensional concept.

In the combination of resources and capabilities, strengths and weaknesses contribute equally to the competitive performance of companies. Since 1984, Wernerfelt suggested that both strengths and weaknesses shaped firms' capabilities; a couple of decades later, consideration of weaknesses has gained strength in the literature on business strategy (Arend, 2008; Sirmon et al., 2010).

As indicated by Sirmon et al. (2010), just as it is important to identify the most valuable and rare capacities, it is also necessary to work on the least valuable ones, since rarity can exist both in the presence and the lack of a specific resource, and this affects the configuration of a given company's resources. Similar to that which occurs with strengths, there may exist complementary elements among weaknesses that together could produce negative performance results and which should be considered in the configuration of competencies (Sirmon et al., 2010), especially since competitive weakness could manifest itself on a larger scale in small businesses (Lafuente et al., 2019b). Therefore, in the process of generating sustained competitive advantages, strengths and weaknesses have a significant effect on competitive participation in markets and on the overall configuration of strategy.

METHODOLOGICAL APPROACH

The empirical estimate is made for a group of 67 Costa Rican SMEs operating in a variety of industrial sectors (manufacturing, distribution and services). The data of the selected companies were collected between April and June 2017 within the framework of the *Global Competitiveness Project (GCP: www.sme-gcp.org)*¹. The main objective of the GCP is to promote academic debate on business competitiveness by estimating a business competitiveness index in the countries forming part of the initiative. As a result of the efforts and international cooperation of the GCP, it is possible to create the business competitiveness index, which is a valuable tool for both academics and those responsible for designing policies to support SMEs.

Specifically regarding the method of estimating the competitiveness index, this takes into account the different interactions that occur between resources and capabilities at the enterprise level, based on the combination of 10 pillars (Table 1). The calculation of the competitiveness index (CI) is carried out through a five-step process (see Lafuente et al., 2019b).

¹ The GCP is a scientific research group involving academics from ten universities located in Europe (Spain, France, Hungary, Bosnia, Russia, and the Czech Republic) and Latin America (Costa Rica, Colombia, Mexico, and Brazil).

In the first step, the variables selected to create the competitive pillars ($j=1, \dots, J$ and $J = 46$) are normalized in the range $[0,1]$.

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

Equation (1) $x_{i,j}^*$ contains the normalized value of the variable j obtained for company i , and $x_{i,j}$ is the original value of the respective variable (j). The *benchmark* ($\max(x_j)$) for each variable is (j), the highest value representing an approximation of “best practices” in the sector.

The second step involves the calculation of the ten competitive pillars that make up the $CI(\mathbf{v}=(v_1, \dots, v_{10}) \in R_{+}^{10})$. The values of the pillars are the average of the variables (j) included in each pillar (\mathbf{v}). In addition, the values of the pillars are normalized in the range $[0,1]$ in order to facilitate the interpretation of the results. The normalized values of the competitive pillars are computed according to equations (2a) and (2b):

$$[2a] \quad P_{i,j} = \frac{\sum_{j_v=i}^{J_v} x_{i,j}^*}{J_v}, \quad v = 1, \dots, 10 \text{ and } j_v = 1, \dots, J_v$$

$$[2b] \quad P_{i,j}^* = \frac{P_{i,j}}{\max(P_v)}$$

On this point, it is important to note that the values of the pillars ($P_{i,v}$) are computed at the company level ($i=1, \dots, N$) and that the number of variables used to compute each pillar ($j_v=1, \dots, J_v$) can vary between the different competitive pillars (\mathbf{v}).

The third step equates the marginal effect of improving a given competitive pillar ($P_{i,v}$), and further estimates the direction and magnitude of the adjustment by estimating the following expressions (estimation of the root for δ in the following expression):

$$[3a] \quad y_{i,v} = P_{i,v}^{*\delta}$$

[3b]

$$\sum_{i=1}^N P_{i,v}^{*\delta} - N\bar{y}_v = 0$$

In expressions (3a) and (3b), the term δ represents “the magnitude of adjustment” for pillar v , that is, the moment δ that equals $P_{i,v}$ the average of the respective pillar (\bar{y}_v). Equation (3b) represents a convex and decreasing function, and the solution for δ is obtained by the Newton-Raphson method with initial values of zero. Once the term δ is estimated, the magnitude of the adjustment effect is calculated directly. Thus, from equations (3a) and (3b) we know that:

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

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

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

The fourth step introduces the concept of “penalty for bottleneck” in the competitiveness index with the aim of taking into account the mutual relations that exist between the 10 pillars that make up the competitiveness index. In mathematical terms, this penalty for bottleneck is modeled through a correction to an exponential function ae^{-bx} (Tarabusi & Guarini, 2013). The penalty function takes the following form:

[4]

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

In equation (4), $h_{i,v}$ is the post-penalty value of pillar v and $\min(P_{i,v}^*)$ is the minimum value of the reported pillar for the company i .

Finally, in the fifth step the values obtained for each competitive pillar (Equation (4)) are used to calculate the competitiveness index (CI):

[5]

$$CI_i = \sum_{v=1}^{10} h_{i,v}$$

For the case of the competitiveness index (CI), the description of the 46 variables used within the GCP project is presented in Table 1.

Table 1. Description of variables used to estimate the business competitiveness index

Competitive pillar	Variables included in the pillar
1. Human Capital	<ul style="list-style-type: none"> Number and ratio of employees with higher education Problems with employees Proportion of employees participating in training programs Sophistication of the compensation system The level of "rarity" of human capital in the enterprise
2. Product innovation	<ul style="list-style-type: none"> Product innovation Introduction of new or improved products Ratio of new product sales to total sales Continuous innovation and level of "rarity" of the company's products
3. Domestic market	<ul style="list-style-type: none"> Geographical scope of the company's sales Level of competition in the domestic market Expected market growth over the next five years Competitive intensity of the sector Level of response to customer/consumer demands
4. Business networks	<ul style="list-style-type: none"> Number of cooperation and collaboration agreements Time operating with the network of contacts relative to the age of the business Dependence on external aid for company development Level of specificity (uniqueness) of the contact network
5. Technology	<ul style="list-style-type: none"> Technological level of the company in relation to the local market Technological innovation and age of company technology Environmental investments and quality assurance Level of application of information and communication technology (ICT) Development of technology (licenses, patents, know-how, etc.)
6. Decision-making	<ul style="list-style-type: none"> Use of different sources of information Application of financial analysis in the company Sharing information as a business practice Use of internal and external consultants in decision-making processes Organizational routines related to information management
7. Competitive strategy	<ul style="list-style-type: none"> Direction of business strategy (defensive, proactive) Growth strategy based on the number of company premises Entrepreneurial attributes of the company's founders Level of "rarity" of the company's proactive strategy
8. Marketing	<ul style="list-style-type: none"> Product Pricing strategy for the company's main products Sophistication of the distribution channels used by the company Applied marketing and communication tools Marketing innovation Level of "rarity" of marketing techniques employed by the company

Competitive pillar	Variables included in the pillar
9. Internationalization	Importance of customers abroad Proportion of foreign sales (exports, etc.) Foreign language mastery of company employees Value of business location (in the domestic and foreign market)
10. Online presence	Technical characteristics of the company website Services offered on the company website Contents of the company website Use of online marketing applications

On the other hand, for the estimates of competitive efficiency, the data envelopment analysis (DEA) model is used, which in this study is based on a technology of constant returns of scale that considers that 1 input produces 1 output. This non-parametric technique of data envelopment analysis allows discovery of the competitive efficiency of the Costa Rican companies that participated in the GCP in 2017. To calculate this, use was made of *Efficiency Measurement System*, versión 1.3 (<http://www.holger-scheel.de/ems/>), developed for academic purposes by TU Dortmund University, Germany.

In this way, the competitive efficiency of the analyzed companies is calculated as follows:

[6]

$$\begin{aligned}
 D(1, CI) &= \max \theta_i \\
 \text{subject to: } & \sum_{i=1}^N \lambda_i CI_{i,m} \geq \theta_i CI_{i,m} \quad m=1, \dots, N \\
 & \sum_{i=1}^N \lambda_i x_{i,k} \leq 1 \quad k=1 \nabla i (i = 1, \dots, N) \\
 & \lambda_i > 0
 \end{aligned}$$

When solving the linear program presented in equation (6), the solution for θ is the efficiency estimator calculated for company i . At this point, it should be emphasized that $\theta=1$ for efficient companies, while for inefficient companies $\theta < 1$ and $1 - \theta$ represents the level of inefficiency (possible expansion of the output needed to reach the efficiency frontier). As indicated above, the model presented in equation (6) considers that an output—that is, the competitiveness

index (CI)—is produced and that the single constant input (x) is a vector $i \times 1$ for all enterprises ($k = 1$). The term λ_i is the vector of intensity variables (virtual weights) used to form the linear combinations of the companies analyzed (N), and the restriction $\lambda_i > 0$ determines that the virtual weight for all companies must be positive.

RESULTS OF EMPIRICAL APPLICATION

BUSINESS COMPETITIVENESS IN COSTA RICA

Table 2 presents descriptive data of the companies analyzed according to the estimate of the competitiveness index.

Of the 67 observations, 58.2% come from the service sector, 23.8% from the distribution sector and 17.9% from the manufacturing sector. Out of a maximum score of 10, the overall average Competitiveness Index is 5.21. Table 2 shows that the variables with the greatest weight in determining the competitiveness of this group of companies are business networks, product innovation and marketing. On the other hand, the least prioritized pillars are internationalization, human capital and the domestic market.

On making a sector review, the data indicate that the manufacturing sector has the highest competitive index, followed by the service sector and the distribution sector. In the case of the manufacturing sector, the pillars prioritized in order are: product innovation (0.6512),

business networks (0.5887) and marketing (0.5694), while the weak pillars are domestic market (0.5153), human capital (0.4920) and internationalization (0.4915); these also match the weakest pillars in the competitiveness index in general.

In the case of the service sector, product innovation (0.6189), online presence (0.5896), and business networks (0.5857) are the priority pillars, while the weaker pillars are reflected in the aspects of decision-making (0.5130), marketing (0.5049) and the domestic market (0.5042).

Finally, in the case of SMEs located in the distribution sector, the pillars that are prioritized are marketing (0.5152), product innovation (0.4993) and online presence (0.4892), compared to the weak pillars of technology (0.4288), human capital (0.4208) and the domestic market (0.4092).

COMPETITIVE EFFICIENCY IN COSTA RICA

Having established the estimation of the competitiveness index according to the pillars of higher and lower prioritization, it is possible to go on to find the competitive efficiency of Costa Rican SMEs. For this purpose, DEA analysis is applied, the results of which are summarized in Table 3.

According to the data, the most efficient companies, those of the first quartile, have an average of 5.21. Of this group, the manufacturing sector has the highest competitiveness index, with a score of 5.4619, surpassing the quartile average. This is followed with a slight difference by companies in the service sector with a score of 5.4016, while in third place are the companies from the distribution sector with 4.5865. An interesting fact to note is that the distances between sector 1 and 2 are

Table 2. Business competitiveness in Costa Rica: Descriptive statistics

	Total	Manufacturing	Distribution	Service
Business Competitiveness Index	5,2178	5,4619	4,5865	5,4016
Competitive pillars				
Domestic market	0,4835	0,5153	0,4092	0,5042
Business networks	0,5619	0,5887	0,4840	0,5857
Internationalization	0,4961	0,4915	0,4329	0,5234
Human Capital	0,4939	0,4920	0,4208	0,5244
Product innovation	0,5961	0,6512	0,4993	0,6189
Technology	0,4965	0,5252	0,4288	0,5155
Marketing	0,5189	0,5694	0,5152	0,5049
Online presence	0,5583	0,5486	0,4892	0,5896
Decision-making	0,4997	0,5434	0,4343	0,5130
Strategy	0,5129	0,5366	0,4729	0,5221
Observations	67	12	16	39

Note: The values in bold print indicate the most important pillars (highest values), while the values in italics indicate the weak pillars (lowest values).

Table 3. Competitive efficiency in Costa Rican companies: Results of the DEA model

	Total	Manufacturing	Distribution	Service
Panel A: business competitiveness index				
Average	5,2178	5,4619	4,5865	5,4016
Median (Q2)	4,2180	4,7766	3,4006	4,6457
First quartile (Q1)	5,2178	5,4619	4,5865	5,4016
Third quartile (Q3)	5,2222	5,3007	4,5367	5,4768
Panel B: Competitive efficiency (DEA)				
Average	1,5445	1,4300	1,8825	1,4410
Median (Q2)	1,4100	1,4150	1,6750	1,3500
First quartile (Q1)	1,2400	1,2050	1,3900	1,2400
Third quartile (Q3)	1,7300	1,5700	2,2300	1,6100
Efficient companies	4	1	1	2
Observations	67	12	16	39

significantly small, with the difference being 0.0603. In addition to exceeding the general average, both of these also have fairly homogeneous indices.

In relation to the third quartile, in which 25% of the companies with the lowest competitiveness index are concentrated, the average is 5.22, with this being higher than the general average. In this case, with respect to the other sectors, companies in the service sector have the best index within this group, at 5.4768, followed by the manufacturing sector (5.3007) and the distribution sector (4.5367). The difference between indices is 0.1761. For the interquartile range (Q2), the index is 4.2180, with the manufacturing sector showing the highest competitiveness with a score of 4.7766, followed by services (4.6457) and finally distribution (3.4006).

Nonetheless, considering the results of the competitive efficiency model, it is seen that on average companies can improve their efficiency by 54%. Another finding to highlight is that of the total of the 67 companies, there are 4 efficient benchmark companies to highlight for the groups: 1 for the manufacturing sector, 1 for the service sector and 2 for the distribution sector.

According to the data, companies in the manufacturing sector could optimize their production by 43%; that is, they could reduce the inefficiency gap by this percentage. For its part, the service sector could improve by 44.10%, while those in the distribution sector could optimize the allocation of resources by more than double, 88%, as compared to the total number of enterprises. Considering the first quartile, which corresponds to 25% of the most efficient companies, the manufacturing sector could optimize its efficiency by 20%, while the service sector could do so by 24% and the distribution sector by 39%.

Regarding the third quartile, representing those with the least competitive efficiency, their optimization average is 73%. In this case, manufacturing companies in this quartile could optimize by 57%, while those in the service sector could do so by 61%, and those in the distribution sector by 123%.

For Q2, in which the median range of all companies is reflected, the percentage of optimization is 41%. The lowest optimization in the allocation of resources is performed by companies in the service sector with 35%, followed by manufacturing with 41.5% and distribution with 67.5%.

In Tables 2 and 3, the companies grouped in the manufacturing and service sectors are those with the highest competitiveness and efficiency indices, which is due to the product innovation and business network pillars. The distribution sector, comprising 24% of the companies consulted, has the lowest competitiveness index as well as the lowest values of competitive efficiency. These companies, unlike other sectors, prioritize marketing over innovation, followed by online presence.

DISCUSSION AND CONCLUSIONS

DISCUSSION

According to the above results, efficiency is linked to product innovation but also to business networks and marketing activities (Tables 2 and 3). For their part, the processes of internationalization, human resources and internal markets were identified as the weakest or least prioritized pillars with regards to the competitiveness and efficiency of the SMEs studied. These resources and the interaction between them influence both the level of business competitiveness and the competitive efficiency of the companies analyzed.

In terms of innovation, in the commercial scenario of recent decades SMEs have had to adopt highly innovative business strategies in order to adapt to more effective but above all more flexible forms of organization. Moreover, they continue to be companies participating with limited resources and sometimes with domestic conditions that determine their performance; for these companies, innovation and learning are considered central mechanisms to maintaining their competitiveness (Theodoulides, 2006). From this perspective, the role of innovation is key and small companies have been playing an important role as technological promoters of innovative product and process development; therefore it is no coincidence that in the bid towards innovative practices, product innovation is one of strongest pillars contributing to competitiveness and efficiency for our group of companies.

Despite their relevance, innovation and learning do not occur in isolation and require SMEs to participate in various types of networks involving different actors,

such as large companies, knowledge providers, transfer agencies and other support institutions, in which different types of knowledge are exchanged and exploited (Cooke, 2007). Hence company participation in networks is vital, as is evidenced in this being the second strongest pillar.

International empirical evidence explains how linking companies through business networks is associated with improvements in their performance and accelerates business development abroad (Tag, 2011). This has been associated with factors such as the acquisition of new market knowledge, organizational learning and opportunities to improve their positioning in the sector (Chaminade and Vang, 2008; Tag, 2011). However, the authors argue that the different forms of networking vary between industries, so special consideration of the particularities of the sector is required for the acquisition of new skills and resources, or recombinations of these.

Networks are also a factor contributing to the development of specific marketing activities for small businesses (O'Donnell, 2011; O'Donnell, 2014), however for this to happen, the skills of SME managers to naturally promote networking interactions is a crucial point. On these lines, the development of effective dynamic managerial capacities could be a valuable and inimitable resource that Costa Rican SMEs should consider in order to sustain their competitiveness.

With respect to the less prioritized pillars, internationalization, the domestic market and human capital are of equal consideration to those given greater prioritization, since each of the resources individually make their contribution to the competitiveness of firms due to the mutual dependency between the resources and capabilities of each SME.

Regarding the internationalization pillar, Ghosh, Mehta and Avittathur (2019) explain how for a group of Indian companies engaged in high-tech manufacturing, the decision to seek foreign markets was affected by the issue of networking and contact management, but even more so by the quality of the inputs required and of the intermediate suppliers on which they depended. This fact not only influences the search for new markets, but also attention to the domestic market. For the case of our group of companies, this evidence should draw attention to rethinking current and future strategies focusing on current and potential markets—which may well be in

THE FINDINGS INDICATE THAT BUSINESSES IN MANUFACTURING AND SERVICE SECTORS PRESENT THE HIGHEST COMPETITIVE EFFICIENCY LEVELS, WHICH IS EXPLAINED BY THE PILLARS LINKED TO PRODUCT INNOVATION AND BUSINESS NETWORKS, WHILE THE LEAST PRIORITIZED PILLARS ARE INTERNATIONALIZATION, INTERNAL MARKET AND HUMAN RESOURCES

another geographic region of the country or abroad—but above all, on how to optimize this weakness in order to contribute to the generation of added value.

Finally, and linked to the theme of markets, the quality of the human resources available to SMEs influences both their internationalization (Onkelinx, Manolova and Edelman, 2016) and their performance (Sheehan, 2014). Research such as that of Collins and Smith (2006) and Huselid, Jackson and Schuler (1997) have already provided overall evidence on the positive relationship between human resources and performance for companies, however, in the cases of SMEs, the acquisition of human resources is different from that of the other companies, being defined by their constitution (Richbell, Szerb, and Vitai, 2010). In the aforementioned study on SMEs in Hungary, the authors showed that the human resources of this group of companies was defined by their own constitution via the formative background of owners, and that this was also reflected in a lack of formalized organizational structures such as having business plans or a written commercial strategies. Taking this into account, SME owners could think of actions to train and enhance this resource with a view to improving this weakness and thus contributing to the configuration of business competitiveness created through complementary elements between resources and capabilities.

CONCLUSIONS AND IMPLICATIONS

The application of the competitiveness index from a multidimensional approach to Costa Rican SMEs reveals the importance of detecting both the factors that drive competitiveness and those that weaken it. In this sense, it is vital to study competitiveness from a systemic perspective as this allows the generation of measures to counter the potential negative effect that competitive weaknesses have on the overall competitiveness of SMEs.

In turn, the estimation of the competitiveness index as well as of the competitive efficiency of the group of companies identifies the elements that could enhance the strengths of SMEs and thus calls for reflection on new configurations and actions to improve weaknesses. It invites a rethinking of the organization of the current resources and capacities of SMEs with a view to improving their distribution and contribution to the generation of resource-based competitive advantages.

It is concluded that competitiveness is a multidimensional construct and the GCP project offers a tool that allows the establishment of competitiveness at the company level, as well as the configuration of the pillars that make up the competitiveness index. This should be taken into account for the objective of generating policies to support SMEs that have an effective impact on business competitiveness.

In practical terms, if we start from the fact that the heterogeneity of resources and capacities makes the difference in the generation of sustained competitive advantages for firms, the above results have implications for productive policy makers and SME owners/managers. With regard to policy makers, the results indicate the existence of the differentiation and prioritization of the pillars by sector, therefore these guidelines should be differentiated so that they meet the objective behind their formulation. In this way, the promotion of support initiatives and training to promote and develop certain skills and resources require adaptation to the sectors and the needs of companies.

In terms of recommendations for SME owners, the individual outcomes of the index can give a clear indication of how the distribution of resources is being carried out with a view to achieving a more homogeneous distribution between the pillars. It also shows how weaknesses interact

with strengths, which ultimately affects the generation of competitive advantages. SME owners could plan operational and economic mechanisms, actions and strategies to gradually overcome these weaknesses. The management of networking with other SMEs in the sector and partnerships between public and private institutions are means that should be exploited in order to alleviate or optimize the weaknesses identified.

In future research it would be interesting to monitor the changes over time of the current group of companies analyzed, which could give evidence of the contribution that the instruments used make in measuring competitiveness from a comprehensive approach. Finally, it would also be valuable to compare the results obtained through the competitiveness index to a larger sample of Costa Rican SMEs, in which companies from all over the country are included in the estimate.

As proposed by Newbert (2007), it is considered necessary to continue to generate scientific evidence to understand how and to what extent resources, capabilities and core competencies facilitate the achievement and sustainability of a company's competitive advantage and their impact on its performance.

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