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ORIGINAL ARTICLE

Organizational culture and innovation in small businesses in Paraguay

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Abstract

This paper studies the influence of organizational culture on the implementation of innovations in small businesses. Cameron and Quinn's competing values framework is applied to capture the organizational culture. The empirical analysis is carried out using a sample of 194 small businesses from two regions in Paraguay: the Asunción area and Central Department. Organizational cultures with external orientation (adhocratic and market) are found to have a significant positive impact on innovation. However, the effect of organizational culture on the specific types of innovation (product, process, organizational, and marketing) differs. Hierarchical culture shows a positive influence on process innovation.

KEYWORDS

Innovation, organizational culture, small businesses

JEL CLASSIFICATION

M14; O30; O54

1 | INTRODUCTION

The relationship between organizational culture and innovation has generated growing interest in research applied to various sectors and geographic areas, but especially in developed countries (Büschgens, Bausch, & Balkin, 2013; Hogan & Coote, 2014; Lemon & Sahota, 2004). Nevertheless, in the context of small firms in developing countries, and in particular in Latin America, the specialized literature on this topic remains limited (Gálvez & García, 2011). The dearth of knowledge in the case of developing countries may lead to the erroneous assumption that conclusions for developed countries in this respect are also valid for developing areas. However, innovation presents a very

different nature and characteristics in the different stages of the development process, and hence organizational culture can operate on firms' innovation in different ways in different contexts.

In contrast to those in developed countries, businesses in developing countries have a lower predisposition towards innovation, enjoy less public support, and benefit from a lower level of positive externalities originated in the environment (Du, Liu, Straub, & Knight, 2017). All of these disadvantages lead to the introduction of innovation of a fundamentally incremental nature, which is often not new to the market, but only new to the company, that is, the so-called "new-to-firm innovation" (OECD/EC, 2005). This is usually a type of innovation closely related to the technological absorption capacity, which allows companies to approach the frontier of technical efficiency. However, in more highly developed and innovation-driven economies, innovation of a radical and disruptive nature is often found, and involves innovation in the markets where the company operates and even on a global scale, that is, the so-called "new-to-market" and "worldwide innovations" (OECD/EC, 2005). These variations in the nature of the innovative phenomenon in economies with different levels of development may affect the way in which the organizational culture influences innovation. A specific type of organizational culture may thereby cause results that differ in terms of innovation in countries with different levels of development.

The innovative potential of small firms is largely limited by internal obstacles, such as lack of know-how, employee resistance, and lack of commitment (Strobel & Kratzer, 2017). In this type of business, unlike large corporations, business owners often have limited external contacts, they exercise exaggerated control, and they remain largely unaware of the information available and the changes in the environment (Madrid-Guijarro, Garcia, & Van Auken, 2009). The managerial, financial and booster functions in small firms are integrated into the orientation and leadership of the entrepreneur (Guzmán, 1994), which grants him/her a central role in the culture and operation of the organization (Schein, 1992). Thus, the personal influence of entrepreneurs on their employees together with the organization of small firms enable the behaviour of both the employees and the company to be moulded. These particularities delimit the influence of organizational culture on the processes of innovation in small firms.

This study analyses the influence of organizational culture on innovation from a sample of 194 small firms in Paraguay. It is intended to provide a better understanding of the links between various types of organizational culture and innovation. The literature available on the subject shows partially inconsistent results (Naqshbandi, Kaur, & Ma, 2015; Naranjo-Valencia, Jiménez-Jiménez, & Sanz-Valle, 2012; Ogbonna & Harris, 2000; Zhang, Li, & Wei, 2008). From our point of view, this is due to the use of different methods/typologies to analyse organizational culture, the application of different definitions/types of innovation, as well as inconsistencies in the scope of the studies, since countries with varying levels of development and companies of different sizes and complexity are considered.

This paper uses the "competing values framework" (CVF) methodology, proposed by Cameron and Quinn (1999), since it is the most widely accepted method in organizational culture studies (Deshpandé & Farley, 2004; Lau & Ngo, 2004; Liu, Ke, Wei, Gu, & Chen, 2010; Roldán, Leal-Rodríguez, & Leal, 2012; Shao, 2019; Yarbrough, Morgan, & Vorhies, 2011). As pointed out, this paper is concerned with the particularities of small firms in a developing country, and considers the characteristics of this specific context.

The results of this research show that an adhocratic culture exerts a positive influence on all types of innovation (product, process, marketing, and organizational) in small firms in Paraguay. However, the positive influence of market culture is limited to product innovation. On the other hand, and in contrast with the studies carried out for developed countries, hierarchical culture does not show a negative effect on innovation in small firms in Paraguay, and its impact is even positive in the case of process innovation.

2 | THEORY AND HYPOTHESES

2.1 | Organizational culture and its role in organizations

Organizational culture has been defined in several ways in the literature. In this paper, it is delineated as a set of beliefs and values shared by members of the same organization that influences firm behaviour (Cameron & Quinn, 1999; O'Reilly,

Chatman, & Caldwell, 1991). Organizational culture is an essential part of the overall functioning of an organization, and its impact depends on the intensity in which it is present in the organization (Martins & Terblanche, 2003).

In the case of small firms, their organizational culture is strongly conditioned by the size of the organization and the leadership of the owners (Melody, Ming-Huei, & Hsiu-Ying, 2014). Entrepreneurs' values and beliefs shape organizational culture by exerting an effective influence on employees' behaviour (Hogan & Coote, 2014; Sánchez-Báez, Fernández-Serrano, & Romero, 2018). When organizational culture is translated into motivation to achieve results, employees show a greater commitment and participation in innovative processes in the organization (Efrat, 2014). By acting on the identity and behaviour of the members of an organization, organizational culture constitutes a major factor in achieving results (Cameron & Quinn, 1999).

The study of organizational culture has generated various tools for its measurement and analysis. Several studies have focused on measuring specific traits or cultural characteristics, while others have aimed at defining culture types. The models/methodologies that have been used most often in research include the model of Schein (1992), the "organizational culture profile (OCP)" model proposed by O'Reilly et al. (1991), and the "competing values framework (CVF)" model developed by Cameron and Quinn (1999).

In the current paper, the CVF methodology is used for the objectives of this research. This model uses a scale widely validated and employed in the literature (Deshpandé & Farley, 2004; Roldán et al., 2012; Büschgens et al., 2013, among others. See also Table 1). Furthermore, the CVF model adopts a typological approach by differentiating between four types of culture in the organizations. The CVF approach is therefore suitable for the description and identification of the dominant organizational culture in each company. This model analyses whether the organization has predominant characteristics according to the values contained in two bipolar dimensions (Figure 1):

1. *Flexibility versus stability*: flexibility refers to dynamism and spontaneity, while stability focuses on control and continuity.
2. *Internal versus external orientation*: the internal approach implies the maintenance of the social and technical system, while the external focus is centred on competence, differentiation, and interaction with the environment of the organization.

The opposite ends of these dimensions form the "competing values" that may predominate in the culture of an organization. As a result, Cameron and Quinn (1999) distinguish the following four types of organizational cultures from a two-dimensional matrix (Figure 1):

1. *Clan*: this culture emphasizes flexibility focused on the internal orientation of the organization. Leaders in this culture tend to be considerate and facilitate participation and teamwork.
2. *Hierarchical*: this culture is internally focused and emphasizes stability through control mechanisms and regulations. Leaders of the organization tend to be conservative and cautious and pay special attention to technical issues.
3. *Adhocratic*: this is oriented towards the external environment with the support of a flexible organizational structure. Leaders in this culture are entrepreneurs and visionaries who are willing to take risks.
4. *Market*: this culture is externally oriented and reinforced by a stable structure focused on productivity and results. Leaders tend to be functional managers who concentrate on productivity enhancement.

2.2 | Innovation in small firms and organizational culture

The Oslo manual (OECD/EC, 2005) defines innovation as the introduction of a new or significantly improved product, a new process, a new marketing method, or a new organizational method in the enterprise practices, in

TABLE 1 Culture types (CVF) and innovative performance

Type of Culture	Scope of research		Country/firm size	Relationship with innovation
	Developed economy	Developing economy		
Clan		Zhang et al. (2008)	Firms in China	Positive
		Yesil and Kaya (2012)	SMEs in Turkey	Positive
		Naqshbandi et al. (2015)	Firms in Malaysia	Positive
	Espín, Jiménez, and Costa (2014)		SMEs in Spain	Positive
	Duréndez, Madrid-Guijarro, and García-Pérez de Lema (2011)		SMEs in Spain	Positive
	Ogbonna and Harris (2000)		UK Companies	Negative
	Deshpandé and Farley (2004)		Firms in 5 countries	Negative
Adhocratic		Tseng (2010)	Firms in China	Positive
		Yesil and Kaya (2012)	SMEs in Turkey	Positive
	Lau and Ngo (2004)		SMEs in Hong Kong	Positive
	Duréndez et al. (2011)		SMEs in Spain	Positive
	Roldán et al. (2012)		Firms in Spain	Positive
	Naranjo-Valencia et al. (2012)		SMEs in Spain	Positive
	Espín et al. (2014)		SMEs in Spain	Positive
	Miron, Erez, and Naveh (2004)		Firms in Israel	Positive
Hierarchical		Naqshbandi et al. (2015)	Firms in Malaysia	Negative
		Yesil and Kaya (2012)	SMEs in Turkey	Negative
		Zhang et al. (2008)	Firms in China	Positive
	Ogbonna and Harris (2000)		Companies in UK	Negative
	Duréndez et al. (2011)		SMEs in Spain	Negative
	Naranjo-Valencia et al. (2012)		SMEs in Spain	Negative
Market		Núñez, Mercado, and Banegas (2015)	SMEs in Mexico	Positive
		Gálvez and García (2011)	SMEs in Colombia	Negative
	Deshpandé and Farley (2004)		Firms in 5 countries	Positive
	O'Cass and Ngo (2007)		Firms in Australia	Positive
	Henri (2006)		Firms in Canada	Positive

the organization of the workplace, or external relations. Although the innovative phenomenon is complex (Martínez-Román & Romero, 2017), this distinction between product, process, marketing, and organizational innovation is the one most used (Madrid-Guijarro et al., 2009).

The relationship between organizational culture and the innovation in SMEs has often been addressed in the previous literature. In this respect, it is well accepted that certain cultural characteristics can help the organization to innovate (Büschgens et al., 2013; Lau & Ngo, 2004; Lemon & Sahota, 2004), while an unfavourable organizational culture can form a barrier to the implementation of innovation (O'Regan, Ghobadian, & Gallear, 2006). Hogan and Coote (2014) emphasize the importance of the indirect role that cultural characteristics play in the performance of SMEs, and show that innovative behaviours can only occur in the presence of favourable organizational routines and norms. These values and norms shape the language of the company and condition the flow of information, the learning

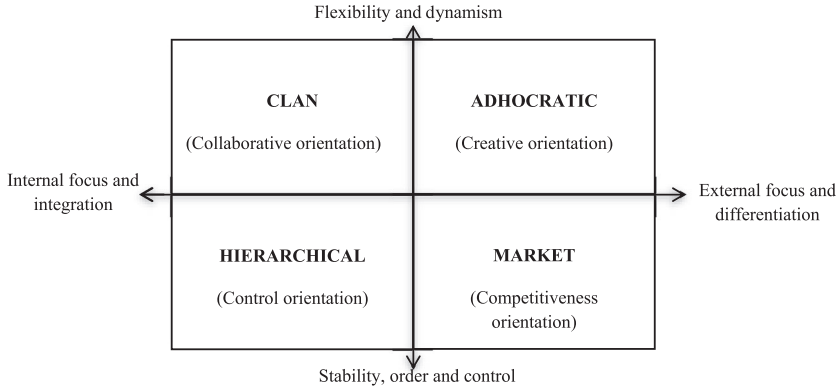

FIGURE 1 Models of values in competing of Cameron and Quinn (1999)

processes, and the access to knowledge, thereby favouring innovation (Du et al., 2017; Machado Engelman, Madalena Fracasso, Schmidt, & Carneiro Zen, 2017). In this respect, Mageswari and Sivasubramanian (2015) find that an organizational culture geared towards knowledge management favours the innovative performance of SMEs. In this type of company, the leadership, commitment and personal values of the entrepreneurs are crucial (Guzmán, 1994; Sánchez-Báez et al., 2018), but participatory management practices can promote the innovation capacity (Laforet and Tann, 2006; Çakar & Ertürk, 2010). This management style encourages the appreciation of innovation by employees, and facilitates the creativity, empowerment and change that are essential to drive innovation (Khazanchi, Lewis, & Boyer, 2007). When entrepreneurs value success and challenging goals and promote professional knowledge and technical skills, thereby encouraging employees to excel, they increase employee motivation and the feeling of self-efficiency to find innovative solutions (Gumusluoglu & Ilsev, 2009; Subramaniam & Youndt, 2005).

Those characteristics can be integrated into broader cultural archetypes, such as those proposed in the typology of Cameron and Quinn (1999). Notwithstanding, the effect of each type of culture on innovation is an open question. The results of previous empirical studies allow us to capture two preliminary considerations:

1. There is no single corporate culture in organizations, but a combination thereof with different degrees of intensity in each (Cameron & Quinn, 1999). Therefore, one culture may dominate over the others, and this would exert an impact on the type and degree of innovation observed in the company.
2. The impact of organizational culture on innovation is conditioned by external factors linked to the socio-institutional environment in which the company operates, such as the national culture, the sector of activity, and the level of development of the territory (Büschgens et al., 2013).

Table 1 shows the main studies that have investigated the impact of organizational culture on innovation following the CVF methodology according to the level of development of the country under study. In this respect, it is possible to establish certain guidelines that link each type of predominant culture with the innovation implemented in the firms. On the one hand, there seems to be a certain consensus on the positive impact that an adhocratic culture plays in the implementation of innovation, both in developed countries and in developing countries (Tseng, 2010; Yesil & Kaya, 2012). This type of culture is practised in companies that operate in a situation of permanent change and, consequently, there is a commitment to entrepreneurship, creativity, and flexibility (Deshpandé & Farley, 2004; Naranjo-Valencia et al., 2012). The motivation and encouragement that leaders of this type of culture transmit to their employees can facilitate innovation, and external orientation favours access to information through communication with the environment. In this respect, a first hypothesis of this article arises as follows:

H1. *Adhocratic culture in small firms in developing economies has a positive effect on innovation.*

Clan culture, also characterized by its flexibility but with an internal orientation, is more prevalent than adhocratic culture in small organizations (Zammuto & Krakower, 1991). The characteristic flexibility of this organizational culture is compatible with the innovative orientation of the company. The internal approach, however, presents certain disadvantages for innovation compared with the external orientation of adhocratic culture, since it limits the mechanisms to obtaining information from the business environment (Detert, Schroeder, & Mauriel, 2000). In spite of this, several empirical studies have observed a positive relationship between clan culture and innovation in small enterprises in developing countries (Naqshbandi et al., 2015; Zhang et al., 2008), while the evidence is mixed for developed countries (see Table 1). In this regard, the teamwork, collaboration and internal communication of employees seem to be favourable for innovation (Büschgens et al., 2013; Hogan & Coote, 2014). In this respect, the following hypothesis is proposed:

H2. *Clan culture in small firms in developing economies has a positive effect on innovation, but is less intense than that associated with adhocratic culture.*

In turn, hierarchical culture is oriented to the control of processes in order to improve their efficiency. Nevertheless, the excessive internal orientation of this type of culture could lead to a lack of attention to the changing needs of the market, which constitutes a necessary condition in innovation processes (Deshpandé & Farley, 2004). Although, in this culture, stability can satisfy the desire for employee safety, it can be detrimental to innovation by limiting creativity (Büschgens et al., 2013). The empirical results of most of the research analysed show a negative impact of hierarchical culture on innovation, both in developed and developing countries (Naqshbandi et al., 2015; Yesil & Kaya, 2012).

Nonetheless, this type of culture contributes towards maintaining consistent, standardized, and stable processes within the organization and may therefore be appropriate for the promotion of innovative strategies based on imitation and technological absorption, especially in smaller companies and in developing countries (Büschgens et al., 2013; Naranjo-Valencia, Jiménez-Jiménez, & Sanz-Valle, 2011). In this way, Zhang et al. (2008) provide empirical evidence on the positive impact of rigid cultures on innovation in developing countries. In any case, based on the prevailing empirical evidence, the following hypothesis is initially proposed in this paper:

H3. *Hierarchical culture in small firms in developing economies has a negative effect on innovation.*

Finally, in a market culture, it is imperative to govern organization through formal rules and bureaucracy, which reduces experimentation and creativity (Cameron & Quinn, 1999). All the same, external market orientation and the search for efficiency can lead to upgrading process and support innovation (Büschgens et al., 2013). The empirical results for developed countries strongly point to a positive influence of market culture on innovation. However, the evidence for developing countries remains inconclusive. Thus, Gálvez and García (2011) observed that market culture is negatively related to certain predictors of innovation in a study for SMEs in Colombia. Based on the theory and empirical results analysed, the following hypothesis is proposed:

H4. *Market culture in small firms in developing economies has a positive effect on innovation, but is less intense than that associated with adhocratic culture.*

Figure 2 summarizes the conceptual model and the research hypotheses.

3 | DATA AND METHODOLOGY

3.1 | Data collection and sampling

Paraguay is a developing economy characterized by the preponderance of the small-business sector (98% of all companies) and low levels of innovation. According to "The Global Innovation Index 2016" report, Paraguay ranks 98th out of 124 countries in the world in terms of its level of innovation.

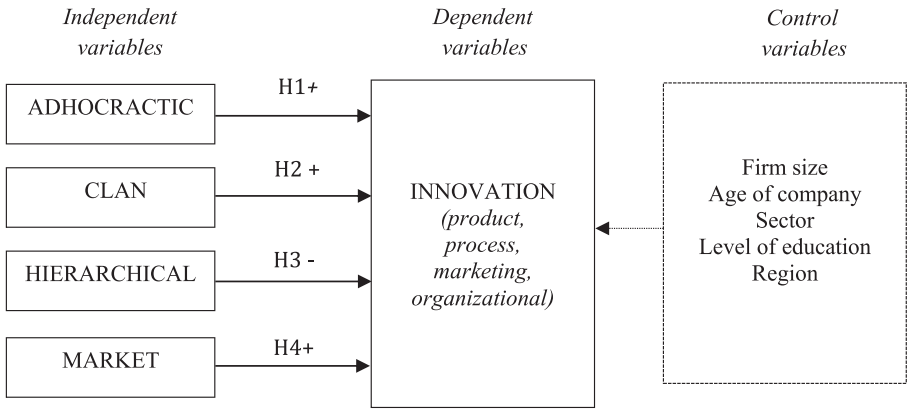

FIGURE 2 Conceptual model

The data for this study was obtained from a survey of small firms in Paraguay, which employ from 11 up to 50 full-time workers. The stratified probabilistic sampling technique was used with quotas for size, sectors and geographical areas. The target population comprises the manufacturing, trade and service sectors, which includes a total of 1,663 companies in the Asunción area (capital) and Central Department (central region of the country). The sample is representative of the selected small-business population, with a sample error of 5% and a 95% confidence level.

The collection of information was carried out through personal interviews of business owners who were also involved in managerial functions. The fieldwork was conducted between September 2015 and January 2016 using a structured questionnaire. As a final result of the process, data on 194 small firms became available. No relevant non-response bias was detected. Table 2 shows several descriptive indicators of the sample.

3.2 | Measures

The variables included in this study can be classified into three groups: innovation scales (dependent variables), organizational culture scales (explanatory variables), and control variables.

3.2.1 | Dependent variables

These represent the types of innovation, as characterized in the Oslo Manual (OECD/EC, 2005), that is, product, process, marketing, and organizational innovation. The respondents were asked whether their companies had introduced any innovation in the last three years in relation to each of the types of innovation identified. The responses were coded as four dichotomous variables. In addition, a general innovation measure was obtained as a dichotomous variable, which takes value 1 if the company introduced any innovation of any type, or 0 if it introduced no innovation whatsoever.

3.2.2 | Explanatory variables

These are the four different types of organizational culture: clan, adhocratic, hierarchical, and market culture. As previously noted, the CVF questionnaire proposed by Cameron and Quinn (1999) was used to capture the various organizational cultures. The six dimensions of the model were measured, including: the dominant characteristics of the organization, organizational leadership, management of employees, organizational glue, strategic emphases, and criteria of success. To capture each of these six cultural dimensions, the model proposes a question with four

TABLE 2 Indicators of the sample

Dummy variables	% Yes	S.D.
Types of innovation		
Product	62.4	0.486
Process	58.2	0.494
Marketing	78.9	0.409
Organizational	71.6	0.452
Innovative companies (with at least one type of innovation)	84.2	0.363
Economic sectors		
Manufacturing	33.5	0.473
Services	43.3	0.496
Trade	23.2	0.423
Level of education of business owners/managers		
Basic education	1.80	0.382
Higher education (higher vocational training and university)	82.0	---
Location		
Capital	55.7	0.498
Central Department	44.3	
Age of the firm		
Young firms (companies less than 10 years old)	24.2	0.429
Mature firms (companies more than 10 years old)	75.8	---
Continuous variables	**Mean**	**S.D.**
Number of employees	23.73	12.31
Organizational culture*		
Clan	29.97	12.86
Adhocratic	16.81	8.35
Hierarchical	28.93	13.95
Market	24.29	9.11

Notes: S.D. = Standard deviation.

*Arithmetic mean of the response options associated with each culture in the 6 dimensions of Cameron and Quinn's (1999) instrument.

response options related respectively to each type of culture (totalling 24 possible responses). The business owners surveyed were required to distribute 100 points among the four response options of each dimension according to the importance that they gave to these dimensions in their companies. Following Quinn and Spreitzer (1991), the 100-point scale was then divided into five equal intervals, thereby transforming it into a 5-item Likert scale. This transformation has been used in a number of studies on organizational culture (see Deshpandé & Farley, 2004; Lau & Ngo, 2004; Naranjo-Valencia et al., 2012).

Most of the previous research using this transformation has reduced the number of dimensions of this instrument (Duréndez et al., 2011; Espín et al., 2014; Gálvez & García, 2011; Lau & Ngo, 2004; Naranjo-Valencia et al., 2012). In this regard, Deshpandé and Farley (2004) defended the use of the whole scale, without this simplification, to better measure the culture of the organization. Following this recommendation, all six dimensions of the instrument are maintained in this paper.

In relation to the validity and reliability of the instrument, Cronbach's alpha coefficients have been calculated to evaluate the degree of internal consistency for the different response alternatives corresponding to each type of culture (Hair, Anderson, Tatham, & Black, 2005). The values obtained are satisfactory (0.76 for the clan culture, 0.66 for the adhocratic, 0.65 for the market, and 0.78 for the hierarchical culture).

Given the evidence of multicollinearity between cultural types, it was necessary to determine whether the organizational culture measures captured the different dimensions of culture. An exploratory factorial analysis was carried out to provide a parsimonious set of factors. The KMO measure was 0.68 and the Bartlett sphericity test showed a significance level of 0.000, which confirmed that the sample is adequate to carry out the exploratory factor analysis. The main component analysis method (with a *varimax* rotation) was used to extract the factorial solutions, whereby certain coefficients with commonalities lower than 0.5 and factor loadings with absolute values lower than 0.3 were eliminated (Hair et al., 2005). The analysis carried out led to the extraction of four factors with factor loadings and commonalities above 0.5, which cumulatively explain 66.3% of the total variance (see Table 3). The first factor largely captures the hierarchical culture. This first factor loads the items 2_D, 4_D, and 5_D, in accordance with the questionnaire of Cameron and Quinn (1999), and represents 22% of the total variance. The second factor loads three items (3_A, 4_A, and 6_A) and represents almost 37% of the total variance. These three items correspond to the clan culture. The third factorial solution loads items 1_B, 2_B, and 6_B and represents 11% of the total variance. This

TABLE 3 Exploratory factor analysis results

Culture	Hierarchical	Clan	Adhocratic	Market
The management style in the organization is characterized by teamwork, consensus, and participation		**0.798**		
The glue that holds the organization together is loyalty and mutual trust. Commitment to this organization runs high		**0.640**		
The organization defines success on the basis of the development of human resources, teamwork, employee commitment, and concern for people		**0.680**		
The organization is a very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks			**0.702**	
The leadership in the organization is generally considered to exemplify entrepreneurship, innovation, and risk taking			**0.665**	
The organization defines success on the basis of having the most unique or newest products. It is a product leader and innovator			**0.608**	
The organization is very results-oriented. A major concern is with getting the job done. People are very competitive and achievement-oriented			0.356	**0.536**
The organization emphasizes competitive actions and achievement. Hitting stretch targets and winning in the marketplace are dominant				**0.866**
The organization defines success on the basis of winning in the marketplace and outpacing the competition. Competitive market leadership is key		−0.322		**0.556**
The leadership in the organization is generally considered to exemplify coordinating, organizing, or smooth-running efficiency	**0.782**			
The glue that holds the organization together is formal rules and policies. Maintaining a smooth-running organization is important	**0.730**	−0.308		
The organization emphasizes permanence and stability, efficiency, control, and smooth operations are important	**0.843**			
% variance	21.6	15.1	11.1	8.5
% total variance	21.6	36.7	47.8	66.3

Note: Extraction method: principal component analysis. Rotation method: Varimax with Kaiser normalization. Factor loadings higher than 0.500 appear in bold.

factor corresponds to the adhocratic culture, according to Cameron and Quinn (1999). Finally, the last factor corresponds to the items of market culture (1_C, 5_C, and 6_C) and represents 8.5% of the total variance.

A global indicator of the level of presence of each culture in a company is obtained by calculating the arithmetic mean of the response options associated with each culture in the six dimensions. In this regard, it is observed that the cultures with internal orientation (clan and hierarchical) appear to have a greater presence in small Paraguayan firms than do cultures with external orientation (see Table 2).

3.2.3. | Control variables

The firm size, the age of the company, the economic sector and the geographic region where it operates, and the level of studies of the entrepreneurs have all been included as control variables. These variables, which may affect both innovation and organizational culture, have been used in similar studies (Madrid-Guijarro et al., 2009; Romero & Martínez-Román, 2012). Their inclusion in the estimated econometric models allows a more rigorous isolation of the effect of organizational culture on innovation.

In order to compare the hypotheses presented, the logistic regression model was employed using the maximum likelihood method. No multicollinearity problems were observed between the variables, with values of the variance inflation factor below 3 and condition indices below 10.

3.3. | Data analysis and results

Table 4 shows the estimates of the five logistic regressions that examine the effect of different types of culture on innovation, both in a general way and specifically for each type of innovation. First, it is observed that certain control variables are significant predictors in the regressions. The size of the company shows a positive and significant influence on the overall indicator for innovation and on the four types of innovation, respectively. Larger companies are observed to innovate more, whereas smaller firms experience greater difficulty in accessing the resources necessary to innovate (human, financial, and organizational). Likewise, higher levels of education stimulate organizational innovation in a statistically significant way.

Companies located in the region of the country's capital, Asunción, show higher levels of process innovation. This result suggests the presence of knowledge externalities associated with urbanization. Companies operating in the urban region of Asunción enjoy better access to certain resources, services, and networks for innovation. More opportunities for collaboration with other companies and research and university institutions exist in the capital region. Moreover, companies in the Asunción region tend to be more efficient and open to external influences than those in the Central Department and the rest of the country. These differences lead to regional disparities in terms of innovation activity.

Results of this analysis do not show any significant evidence regarding the existence of different sectoral patterns of innovation when comparing manufacture, services, and trade. This is in line with the findings of Forsman (2011), but contradicts Martínez-Román and Romero (2017), who found greater innovation activity of SMEs in the industrial sector compared to that of services. No statistically significant effect of the age of the companies on innovation is observed, which is in line with the complex effect of age on business innovation, according to the literature (Coad, Segarra, & Teruel, 2016).

Regarding the influence of organizational culture, the results using the general innovation indicator as a dependent variable are presented in model 1. As can be seen in Table 4, there are significant effects of adhocratic culture and, marginally, of market culture on innovation. These results suggest that organizational cultures with an external orientation favour the innovative capacity of small firms. In contrast, organizational cultures with an internal (clan and hierarchical) orientation, which predominate in small Paraguayan firms, appear not to affect their innovation capabilities. Therefore, H1 and H4 are supported by the results obtained, but not H2 and H3.

TABLE 4 Logistic regressions for innovation

	M1		M2		M3		M4		M5	
Variable	Innovation		Product Innovation		Process Innovation		Marketing Innovation		Organizational Innovation	
	B	O.R.	B	O.R.	B	O.R.	B	O.R.	B	O.R.
Adhocratic	0.722** (0.284)	2.058	0.842*** (0.21)	2.32	0.805*** (0.198)	2.237	0.536** (0.232)	1.710	0.385** (0.193)	1.470
Clan	0.094 (0.230)	1.098	0.246 (0.178)	1.278	0.168 (0.167)	1.183	−0.103 (0.189)	0.902	0.31 (0.177)	1.032
Hierarchical	0.066 (0.216)	1.068	0.039 (0.167)	1.040	0.291* (0.172)	1.338	−0.014 (0.191)	0.986	0.150 (0.189)	1.162
Market	0.438* (0.261)	1.619	0.679*** (0.198)	1.972	0.247 (0.174)	1.280	0.147 (0.210)	1.158	−0.2 (0.189)	0.819
Firm size	0.055** (0.025)	1.057	0.041*** (0.016)	1.042	0.047*** (0.015)	1.048	0.039** (0.02)	1.040	0.078*** (0.021)	1.081
Young firms	0.042 (0.464)	1.043	0.41 (0.003)	1.507	0.129 (0.367)	1.137	−0.487 (0.436)	0.615	−0.228 (0.392)	0.796
Manufacturing	−0.6 (0.65)	0.549	−0.36 (0.489)	0.965	−0.559 (0.469)	0.572	−0.362 (0.574)	0.696	−0.658 (0.499)	0.518
Services	−0.014 (0.578)	0.986	0.142 (0.469)	1.153	−0.332 (0.45)	0.718	0.281 (0.518)	1.324	−0.386 (0.465)	0.680
Higher education	0.104 (0.559)	0.901	0.29 (0.468)	0.971	0.352 (0.459)	0.703	0.437 (0.496)	0.646	0.765* (0.466)	0.465
Capital region	0.406 (0.470)	1.501	0.491 (0.491)	1.634	0.795** (0.377)	2.215	0.611 (0.429)	1.843	0.586 (0.397)	1.798
Constant	0.980 (0.972)	2.663	−0.845 (6.985)	0.417	−0.861 (0.782)	0.601	0.405 (0.920)	2.320	−0.741 (0.840)	1.024
Chi-square	7.155		44.742***		39.042***		19.921**		29.826***	
Nagelkerke R Square	0.197		0.281		0.245		0.152		0.205	
% of correct predictions	84.5%		68%		68%		79.4%		72.2%	
Number of cases	194		194		194		194		194	

Notes: Standard error in parentheses. O.R. = odds ratio.

*ρ =0.1; **ρ = 0.05; ***ρ = 0.01.

However, it is interesting to go beyond these general results and observe the possible differential effects on the specific types of innovation. Therefore, in model 2 for product innovation, adhocratic culture and market culture show a positive influence, which is statistically significant.

According to the results in model 3 for process innovation, adhocratic culture has a positive and significant effect. Similarly, hierarchical culture shows a positive and marginally significant impact for this type of innovation. On the other hand, there is no significant influence of clan and market culture on process innovation.

In the case of marketing and organizational innovations, models 4 and 5, adhocratic culture exerts a positive and significant effect, although it is lower than for innovations in products and processes. However, in these two models, the absence of any significance is observed for the effect of the remaining cultures.

4 | DISCUSSION AND CONCLUSION

Although the results of previous empirical research reveal that organizational culture has a significant influence on business innovation, there is no consensus as to the specific impact of each type of culture, particularly in the case of developing countries. The results presented in this paper confirm adhocratic culture as being the culture that most strongly favours the implementation of innovation, in agreement with previous research results (Duréndez et al., 2011; Lau & Ngo, 2004; Roldán et al., 2012). Firms with a predominance of adhocratic culture adapt more rapidly to changes, are more flexible, and the commitment to experimentation acquired by their employees is higher (Cameron & Quinn, 1999). In addition, this paper reveals that this influence applies transversally to all types of innovation.

Furthermore, the results show that market culture has a positive influence on innovation, which is consistent with previous research (Deshpandé & Farley, 2004; O'Cass & Ngo, 2007). Nevertheless, this influence applies only to product innovation in the analysis carried out in the current paper. Firms dominated by market culture focus on the expansion of commercial goals and consumer loyalty, and seek to exploit different market niches (Cameron & Quinn, 1999), hence innovating in products in these companies is essential for the market share to be maintained.

Notwithstanding, a positive impact of the hierarchical culture can be observed in the particular case of process innovation. This result contrasts with other findings in the literature, which generally show a negative effect of hierarchical culture on innovation in firms (Duréndez et al., 2011; Naranjo-Valencia et al., 2012; Ogbonna & Harris, 2000). The current work indicates that the negative effect of hierarchical culture on innovation would be characteristic of small enterprises in developed countries, while this effect would remain blurred in the case of developing countries. Thus, the hierarchical culture in small companies in developing countries could even favour an improvement of the internal processes, which could prove crucial when developing a strategy of cost reduction in order to increase business performance (Terziovski, 2010). The style of hierarchical leadership and the standardization of processes and products that characterize this organizational culture can stimulate both incremental improvements in processes and the absorption of more advanced technology. Hierarchical culture could stimulate “new-to-firm” innovation and the improvement in a firm's processes by means of imitation (Naranjo-Valencia et al., 2011), which could be a crucial issue for companies in developing countries. In contrast, this type of culture can hamper business innovation in highly developed economies where product innovation benefits from creativity, new ideas and concepts, and from a fast reaction or even anticipation to changes in the market. In this context, the rigidity and the emphasis on internal analysis, which are characteristic of the hierarchical culture, are detrimental to innovation.

In order to encourage its development process, Paraguay needs to increase the productivity of its companies, for which innovation is a key factor. Improvements in terms of productivity and innovation can be favoured by changes in the organizational culture of companies. In this respect, the results of the study also show that the territorial dimension holds significant influence for innovation in Paraguay. In the Asunción capital region, conditions are more favourable for process innovation than in the rest of the country. This suggests the presence of urbanization

economies related to innovation. Linkages with other companies and access to information from universities, research centres, and business support institutions operate as advantages in this respect. The greater availability of human and technological capital in the Asunción region also constitutes a key factor in this regard. Therefore, regional policies should stimulate innovation outside the Asunción area, where companies are less open to external influences. This would require particular efforts to change organizational cultures towards a more external orientation in these areas.

Enterprise policy can also promote innovation in small firms by helping the entrepreneurs to orientate the organizational culture towards the improvement of the innovative capabilities of their companies. In this respect, although the traits associated with adhocratic and market cultures must be strengthened, it should not be forgotten that hierarchical culture can play a positive role in the improvement of the processes in small firms in developing countries. These countries act as factor-driven and efficiency-driven economies, and therefore the competitive capacity of their firms is associated with the low cost of their production factors and the efficiency in their productive processes. In this respect, hierarchical culture could contribute towards a more efficient design of the processes and towards strengthening the mechanisms of technological absorption in small firms.

This study is not without its limitations. First, these results cannot be directly extrapolated to include other countries. Furthermore, it would be interesting to further explore regional differences within Paraguay itself, using larger datasets to estimate separated models for its various regions. In addition, since a cross-sectional sample was used in this study, the analysis could be enriched using longitudinal data. It could also be of interest to use other conceptual/methodological approaches to study the organizational culture in order to attain a broader perspective of the effects on business innovation.

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