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RELATIONSHIP BETWEEN INNOVATION AND PERFORMANCE: IMPACT OF COMPETITIVE INTENSITY AND ORGANIZATIONAL SLACK

Relação entre inovação e desempenho: Impacto da intensidade competitiva e do slack organizacional

Relación entre la innovación y el desempeño: Impacto de la intensidad competitiva y el slack organizacional

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ABSTRACT

Innovation is a key factor in organizational performance. Although there are references from strategic theory to understand the relationships between these two variables, there are still many gaps that need to be filled. Thus, more empirical validation is necessary. This study aimed to verify how the relationship between innovation and performance is affected by the presence of precursor variables such as competitive intensity and organizational slack. This study involved conducting explanatory and cross-sectional investigations by applying structural equation modeling to a sample of small and medium-sized enterprises in Bogotá, Colombia. The results make a relevant contribution to the literature on strategic management by showing that competitive intensity and organizational slack induce innovation and positively impact performance.

KEYWORDS | Innovation, performance, competitive intensity, slack, Cladea 2017.

RESUMO

A inovação é um fator-chave no desempenho organizacional. Embora a teoria estratégica tenha fornecido as referências para entender as relações entre essas duas variáveis, ainda há muitas lacunas a serem preenchidas e falta uma validação mais empírica. O objetivo do presente estudo foi verificar como a relação entre inovação e desempenho é afetada na presença de variáveis precursoras como intensidade competitiva e slack organizacional. O estudo foi realizado através de uma investigação de tipo explicativo e corte transversal, aplicando um modelo de equações estruturais a uma amostra de PMEs bogotanas. Os resultados trazem uma contribuição relevante para a literatura e gestão estratégicas, ao mostrarem que a intensidade competitiva e o slack induzem a inovação, gerando um impacto positivo no desempenho.

PALAVRAS-CHAVE */ Inovação, desempenho, intensidade competitiva, slack organizacional, Cladea 2017.*

RESUMEN

La innovación es un factor clave en el desempeño organizacional. Si bien la teoría estratégica ha proporcionado los referentes para comprender las relaciones entre estas dos variables, aún faltan muchos vacíos por llenar y más validación empírica. El objetivo de este estudio fue verificar cómo se afecta la relación entre la innovación y el desempeño ante la presencia de variables precursoras como la intensidad competitiva y el slack organizacional. El estudio se llevó a cabo mediante una investigación de tipo explicativo y de corte transversal, aplicando un modelo de ecuaciones estructurales a una muestra de pymes bogotanas. Los resultados representan una contribución relevante para la literatura y gestión estratégicas al mostrar que la intensidad competitiva y el slack, inducen la innovación, produciendo un impacto positivo en el desempeño.

PALABRAS CLAVE */ Innovación, desempeño, intensidad competitiva, slack organizacional, Cladea 2017.*

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INTRODUCTION

Innovation has been recognized as a value-generating activity for a company (Marín-Idárraga, Hurtado González, & Cabello Medina, 2016; Rosenbusch, Brinckmann, & Bausch, 2011) and a strategy that is a source of competitive advantage (Keupp, Palmié, & Gassmann, 2012). Although some authors have theoretically pointed out that innovation is a determinant of organizational performance (Damanpour, Walker, & Avellaneda, 2009; Marín-Idárraga & Cuartas-Marín, 2016b; Stock & Zacharias, 2011; Walker, Damanpour, & Devece, 2011), several empirical studies show contradictory results, especially in small and medium-sized enterprises (SMEs) (Rosenbusch et al., 2011). For instance, in such companies, some research studies show a positive and significant relationship between innovation and performance (Alegre & Chiva, 2013; Marín-Idárraga & Cuartas-Marín, 2016a), while others show a negative impact (Freel & Robson, 2004; Heunks, 1998). These results suggest that other variables may be affecting the relationship between innovation and performance. Hence, there is a need to study them from the perspective of SMEs.

In this regard, although several studies have analyzed precursor variables that affect the relationship between innovation and performance (e.g., Alegre & Chiva, 2013; Chang, Hughes, & Hotho, 2011; Vermeulen, De Jong, & O'shaughnessy, 2005), there is still an opportunity to examine the different factors that have possible impacts on this relationship. To do this, this study evaluates whether competitive intensity and organizational slack influence innovation, leading to an improvement in organizational performance. This study is thus based on the following research question: Is the relationship between innovation and performance affected by the precursor variables of competitive intensity and organizational slack?

These two variables were chosen given their relevance and effects on performance. As far as is known, this matter has not yet been studied, especially in Colombia and for SMEs. Competitive intensity is understood as the environment of rivalry a company faces. It is considered one of the main threats to an organization and an important market factor affecting performance (Jaworski & Kohli, 1993; Kim & Atuahene-Gima, 2010). Organizational slack refers to uncommitted resources that are available for investment. It is a good resource for a company to achieve greater performance (Cyert & March, 1992; Singh, 1986).

The theoretical scheme was verified empirically using a sample of SMEs from the city of Bogotá. This is particularly relevant because, according to generic data from the Colombian Ministry of Industry and Commerce, these companies represent 97% of the enterprises in Colombia. An explanatory research was conducted using a structural equation model (SEM). The results show that, when facing greater competitive intensity, SMEs release their slack to use it for innovative activities, which improves performance.

The importance and contribution of this study lies in the following: i) It is innovative in nature, since it analyzes competitive intensity and slack as precursor variables of innovation leading to improved performance—which has not been studied previously. ii) It is a reference for SMEs on how innovation can lead to improved performance. iii) It is relevant in that confirmation of the hypotheses will advance the knowledge on strategic theory.

The remainder of this paper is divided into seven sections. The first one reviews the literature and proposes the hypotheses. The second section explains the methodology. The third section describes the results. The fourth section presents a discussion. Then, the fifth section presents the conclusions and implications. Finally, the last section explains limitations of the study, and future lines of research.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Companies have to make decisions about organizational design in an increasingly complex and unpredictable environment. They seek to align the organizational culture, organizational structure, and business strategy to face these environmental forces and thus ensure their survival, durability, and greater performance (Ánzola, Marín-Idárraga, & Cuartas, 2017; Burton & Obel, 2004; Marín-Idárraga & Cuartas-Marín, 2013).

In light of this environmental influence, companies must develop endogenous competencies that enable them to better cope with rivalry in the market, where innovation is a key resource to generate competitive advantages (Keupp et al., 2012). Studies recognize innovation as a source of dynamic capabilities that can contribute to greater performance that is sustainable over time (Wang, 2014). Thus, the importance of innovation as a key factor in facing rivalry is emphasized. Accordingly, its management is a determining aspect in organizational growth, especially for SMEs (Lecerf, 2012). An appropriate way to manage innovation is to use slack to try out new operations and to leverage research and development projects (Nohria & Gulati, 1996).

Within this general framework, this section presents the main theoretical references that were reviewed for defining the study's variables and that served to substantiate the research hypotheses.

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Innovation

Innovation is an organizational activity considered the focal point of strategy, a crucial element of durability, and a source of competitive advantage (Damanpour & Gopalakrishnan, 1999). According to Van de Ven (1986), innovation is defined as the development and implementation of new ideas by individuals who, over time, participate in transactions with others within an institutional order. In this regard, different studies agree to recognize innovation as a novel construct, of not only ideas but also behaviors (Damanpour & Wischnevsky, 2006; Gopalakrishnan, Kessler, & Scillitoe, 2010). Therefore, innovation often refers to certain behaviors related to creation and development, driven by various changes that lead to exploring new opportunities or exploiting current strengths (Damanpour, 1996; Drucker, 1985; Wolfe, 1994).

Innovation has been subject to various taxonomies. For example, there are technological and administrative innovations. The first typology corresponds to process or product innovation, while the second involves the organizational structure and management practices. Technological innovation is, to a great extent, associated with the organization's main activity, making it more tangible. Administrative innovation is less observable as it is limited to managerial processes (Damanpour & Gopalakrishnan, 1999).

Organizational Performance

Performance has become one of the most representative variables in research agendas regarding strategic management (Venkatraman & Ramanujam, 1986). Performance can have various semantic connotations. Nevertheless, it is generally defined as the scope of organizational effectiveness, which, in turn, is defined as the concomitance between efficacy and efficiency. Efficacy is the achievement of objectives, and efficiency is the optimal use of resources (Auh & Menguc, 2005; Burton & Obel, 2004; Neely, Gregory, & Platts, 1995).

Measuring organizational performance is still a matter of debate among academics. This is because of its multidimensional condition that makes this variable a complex—and sometimes unobservable—construct (Cameron & Whetten, 1983). From the economic point of view, performance is measured in accounting and financial terms. In organizational theory and strategic management, its measurement has transcended into financial and non-financial areas (Neely et al., 1995; Venkatraman & Ramanujam, 1986). In fact, at present, performance is considered an integral construct in management measurement systems through balance scorecards (Kaplan & Norton, 2005).

Competitive Intensity

Barnett (1997) defines competitive intensity as the context wherein companies find themselves in zero-sum relations with one another, directly or indirectly, in their dispute over the same group of resources. Thus, when these companies compete in the same niche, competition will be stronger, especially when products and services are homogeneous (Yang & Li, 2011). This can potentially lead to loss of opportunities for the companies' future growth (Auh & Menguc, 2005).

Generally, competitive intensity refers to the degree of competition a company faces in the market where it operates. This means that customers have more alternatives to satisfy their needs (Jaworski & Kohli, 1993). When competition intensifies, companies experience strong pressures toward cost efficiency and price reduction, resulting in narrower profit margins and a more restricted organizational slack (Miller & Friesen, 1983; Zahra, 1996). Under such conditions, incremental innovation, through continuous improvements to products, services, and processes, is required to face competition. However, it is necessary to promote radical innovation as a strategy to develop new sources of competitive advantage (Jansen, Van Den Bosch, & Volberda, 2006; Lavie, Stettner, & Tushman, 2010).

Organizational Slack

Bourgeois (1981) and Nohria and Gulati (1996) argue that organizational slack refers to a company's resources that are in excess of the minimum required for a given level of output. These can be made quickly available to respond to internal and environmental pressures, based on changes in strategy. Studies show that organizations with the capacity to survive and adapt to changes in the environment generate positive effects on organizational slack (Cyert & March, 1992). Therefore, in light of environmental forces affecting organizations, slack can be used to improve organizational performance (Vanacker, Collewaert, & Zahra, 2017).

Previous literature focuses on financial slack and its impact on organizational performance and innovation (Nohria & Gulati, 1996). In addition, it deals with analysis of mainly two types of slack: (i) Unabsorbed or financial slack—measured as the current ratio—corresponds to the availability of current resources to meet

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short-term commitments; and (ii) Absorbed slack—measured as the ratio between operating expenses and sales—corresponds to disbursements for operating activities that are recoverable in the short term due to their income-generating potential (Geiger & Makri, 2006; Lavie et al., 2010). For companies in emerging economies subject to unstable and dynamic environments, unabsorbed slack becomes a fundamental aspect to sustain competitive advantages (Su, Xie, & Li, 2009).

Prior research found that companies with reduced slack do not develop innovations that enable them to endure over time. Companies that maintain excesses over a certain volume of slack are considered inefficient and inert (Mousa & Chowdhury, 2014). Therefore, organizations must monitor their level of slack to promote their best use, for example, through innovative activities that impact performance positively.

Competitive Intensity and Innovation

When companies face a highly competitive environment, the impact of innovation on performance is contradictory to the above. For instance, under strong competition, companies are found trying to leverage current resources to take advantage of the lessons learned and accumulated knowledge. This helps them avoid risk, uncertainty, and the eventuality of additional costs, which involves new searches and developments, a circumstance that affects performance positively (Jansen et al., 2006; Kim & Atuahene-Gima, 2010). In high-competitive-intensity scenarios, companies are also found to resort to innovation to avoid technological obsolescence and proactively anticipate changes in the market. This allows them to enrich current processes and expand their range of products to improve their market position and obtain higher returns on investments (Abebe & Angriawan, 2014; Auh & Menguc, 2005; Chang et al., 2011).

Accordingly, this study presumes that SMEs in Bogotá respond to their competitors' pressures by carrying out innovative activities to achieve a better market position. Thus, the following hypothesis is proposed:

> H1: Competitive intensity has a positive impact on innovation.

Organizational Slack and Innovation

Some scholars have already proven that organizational slack is a good resource for companies as it allows them to achieve greater performance (Cyert & March, 1992; Singh, 1986). In the field of innovation, some studies show that slack leads companies to develop more search and experimentation activities, leading to a greater propensity to innovate and thus enhancing performance (e.g., Katila & Shane, 2005; Lavie et al., 2010; Sidhu, Volberda, & Commandeur, 2004). It has also been demonstrated that planned use of financial resources promotes product innovation and positively impacts performance (Dunk, 2011).

Thus, this study presumes that organizational slack is an explanatory factor of innovation for SMEs in Bogotá. This is because availability of resources makes it easier to promote innovative activities. Therefore, the following hypothesis is set forth:

> H2: Organizational slack has a positive impact on innovation.

Innovation and Performance

In innovation management, companies make different decisions regarding investment of resources. On one hand, they use a defensive strategy to consolidate their presence in a given market segment. They do this through endogenous actions related to improving organizational routines, leveraging existing capabilities, refining resources, and managing knowledge. This allows them to have adaptive processes through gradual changes. On the other hand, companies develop exploratory strategies to broaden their client base and find new markets. They do this through exogenous actions related to exchange of resources and capabilities, inter-organizational relations, research and development with suppliers and competitors, and technology transfer and adoption. This allows them to have adaptive processes through discontinuous changes (Bierly & Daly, 2007; Zhan & Chen, 2013). These two organizational behaviors provide relevant results in terms of incremental and radical innovations that favorably impact organizational performance (Atuahene-Gima, 2005; Yalcinkaya, Calantone, & Griffith, 2007).

As demonstrated by Chang et al. (2011), the relationship between innovation and performance is affected by different internal and external antecedents. This study presumes that the outcomes of SMEs in Bogotá are influenced, to a large extent, by investment of slack in innovation to face the impact of competition. Consequently, the following hypothesis is proposed:

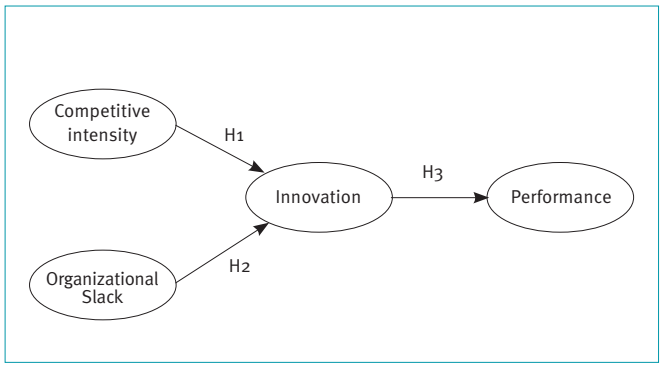
> H3: The relationship between innovation and performance is strengthened by the influences of competitive intensity and organizational slack.

Figure 1 summarizes the referential scheme guiding this study's hypothesis formulation.

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Figure 1. **Conceptual model and study hypothesis**



METHODOLOGY

The methodology applied in this study is described below.

Type of Study, Sampling, and Data

This is an explanatory, cross-sectional study, conducted using an SEM to verify the hypotheses (Bentler & Weeks, 1980). The SEM was selected because it leans towards the analysis of the relationships between several independent variables and one dependent variable that, in turn, becomes independent for another dependent variable (such as the research model presented in Figure 1). To this end, the path analysis technique is used to evaluate the defined or manifest—observable—variables (Hair, Black, Babin, & Anderson, 2009) using the EQS 6.1 software (Bentler, 2006). Thus, a two-phase procedure was conducted. The first phase included the creation of an initial (singular) model that evaluates the relationship between innovation and performance. The second phase involved creating a sequence model whose first path evaluated H1 on the relationship between competitive intensity and innovation. The second path evaluated H2 on the relationship between slack and innovation (first-order model). The third path evaluated H3 on the effect of innovation on performance (second-order model).

This study took the firm as the unit of analysis. Exhibit 1 lists the characteristics of the target population.

Exhibit 1. **Technical data of the study**

Scope:	Bogotá D.C.
Length:	12 months
Elements:	Small and medium-sized enterprises of Bogotá
Sampling units:	CIIU Rev. 3.1 A.C. - 2 digits
Sampling frame:	BPR Benchmark Database™
Respondents:	Strategic-apex executives and middle-line managers

The Benchmark Database was used as the sampling frame. Following Babbie's (2010) and Malhotra's (1999) indications, the companies were selected considering the following criteria: (i) location in Bogotá; (ii) operations within the industrial, trade, or service sectors; (iii) classification within SMEs—in terms of amount of employees; (iv) existence and validity; and (v) availability of contact information and e-mails to send the questionnaire. The result was 157,864 possible units to be evaluated. The probability simple random sampling method was applied to the units using the formula for finite populations, with an estimation error of 4.5%. After the calculations, the sample comprised 579 companies for a confidence level of 97%.

The information was collected using a self-administered and structured questionnaire addressed to the companies' strategic apex executives and middle-line managers. They were selected because, according to Mintzberg (1979), they are in charge of the organizational strategic direction and implementation and take part in the decision-making processes. The questionnaires were sent via e-mail. Then, to follow up, participants were contacted via telephone to ensure the highest number of responses possible. This was based on the mixed and tailored-design method suggested by Dillman, Smyth, and Melani (2011).

Upon finishing field work, 419 completed questionnaires were collected. Of these, 18 were discarded because they had too many missing values according to the recommendations of the literature (Malhotra, 1999). The final sample was 401 valid cases representing a response rate of 69% (401/579). This rate is acceptable for such type of studies (Baruch, 1999) and is much higher than that in previous studies with similar methodology (e.g., Lee & Yang, 2011). Of the respondents, 53% (213) were strategic apex executives and 47% (188) were middle-line managers.

To ensure there were no differences among the answers obtained in the three sectors evaluated, the Kruskal–Wallis test was implemented. For all cases, $p > 0.05$, which meant there were no differences among the answers provided by executives in the industrial, trade, and service sectors. Similarly, to verify there were no differences among the answers obtained from the two organizational levels, the Mann–Whitney U test was used. Again, for all cases, $p > 0.05$, which meant there were no differences among the answers provided by the strategic apex executives and middle-line managers. Since part of the initial sample (78 of 579 companies) did not respond to the questionnaire, the non-response bias was verified based on data known to the whole population, such as the size and amount of annual sales (Armstrong & Overton, 1977). The Student's t-test analyses show no significant differences among the respondents and non-respondents ($p > 0.05$).

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Measurement

A structured questionnaire was designed based on a review of the literature. All items were measured on a seven-point Likert-type scale, wherein 1 indicates low and 7 indicates high levels of the item in the company.

Considering the above, for competitive intensity and organizational slack, four items were included in each variable, taken and adapted from Jaworski and Kohli (1993) and Atuahene-Gima (2005), respectively.

Although innovation has different taxonomies, this study focuses on technological innovation and measures improvements and new developments in processes and products. From this, four items were included following the conceptual descriptions by Damanpour (1987) and Dewar and Dutton (1986).

Performance was measured using (financial and operational) objective scales and (self-perception) subjective scales (Venkatraman & Ramanujam, 1986). Some authors show the benefit of subjective measurement of performance (Atuahene-Gima, 2005; Zhang, Linderman, & Schroeder, 2012). Therefore, this last measurement was implemented with five items adapted from Lee and Yang (2011).

Scales and their Validity

Of the total questions to be answered by the sample (401*17=6,817), only few ones were not answered (27 items). Therefore, to ensure completeness of data, the missing values were substituted following the imputation method for the mean of the values completed (Hair et al., 2009).

Since the scales used were adaptations of previous studies, the methodological literature recommends executing the corresponding validity tests (Babbie, 2010; Malhotra, 1999).

Content Validity

This refers to the degree to which responses to the questionnaire are representative of the behaviors, attitudes, knowledge, and emotions observed in the field in which inferences are made. Using a pretest, four expert judges assessed the questionnaire and expressed their opinions. Content validity rates higher than 0.7 were obtained for all questions. It was thus concluded that the scales' content was valid and no modification was necessary. Similarly, a pilot test was applied to five companies selected from the sample, and no critical problems were detected in its completion.

Refinement Analysis

This analysis involves verifying whether all items are relevant to form the additive scale (Hair et al., 2009). It was conducted based on an exploratory factor analysis using principal components. According to the result obtained and for scale refinement, three items were eliminated (one each from the competitive intensity variable, slack, and performance). This is because they presented communalities lower than 0.6 according to Hair et al. (2009). The Kaiser-Meyer-Olkin (KMO) test result was close to 1 and the Bartlett's test of sphericity was significant ($p < 0.05$), which indicated the feasibility of the factor analysis.

Unidimensionality Contrast

This involves determining whether the items are strongly associated with each other for only one concept (Hair et al., 2009). For this purpose, a factor analysis with VARIMAX rotation, using the criterion of eigenvalues greater than 1, was employed. The KMO test result was close to 1, the Bartlett's test of sphericity was significant ($p < 0.05$), and all scales presented factor loadings higher than 0.6. This proved its statistical significance, and the unidimensionality was verified. In addition, this analysis suggested the creation of a reflective scale, which was used in the descriptive analyses and to conduct the Kruskall–Wallis and Mann–Whitney U tests (described above).

Internal Consistency

This establishes reliability of a scale controlling the errors caused by questionnaire respondents. It verifies that the scales measure the same construct. It was obtained through the Cronbach's alpha (α) in the exploratory factor analysis, as well as through the scale composite reliability (SCR) indicator (Bagozzi & Yi, 1988) and average variance extracted (AVE) (Fornell & Larcker, 1981) in the confirmatory factor analysis. According to Hair et al. (2009), the general agreement on the lower limit for the Cronbach's alpha and SCR is 0.70, although it may reduce to 0.60 in exploratory research; for the AVE, it is 0.5.

Table 1 shows the results, where performance has $\alpha = 0.83$, SCR = 0.83, and AVE = 0.55; innovation has $\alpha = 0.86$, SCR = 0.86, and AVE = 0.60; slack has $\alpha = 0.83$, SCR = 0.83, and AVE = 0.63; and competitive intensity has $\alpha = 0.74$, SCR = 0.74, and AVE = 0.49. According to these results, all dimensions had α and SCR values above 0.7 and AVE values higher than 0.5. The closest value to the lower limit was competitive intensity. However, this did not affect the results, especially when considering the appreciation of

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Chin (1998), who states that the SEMs' rules should not be so inflexible when there are no significant deviations. Therefore, internal consistency of the scales was confirmed.

Table 1. **Evaluation of the measurement model**

	Standardized loading	t-value	Reliability
Performance			*a* = 0.83 *SCR* = 0.83 *AVE* = 0.55
How was the overall profitability of the company?	0.77	-[a]	
How were the results of the company in relation to its closest competition?	0.73	13.71*	
How was the scope of the sales goals?	0.76	14.25*	
How was the operating profit (earnings before interest and taxes [EBIT])?	0.71	13.33*	
Innovation			*a* = 0.86 *SCR* = 0.86 *AVE* = 0.60
To what extent does the company implement improvements to existing products?	0.72	-[a]	
To what extent does the company implement improvements to existing production processes?	0.75	13.81*	
To what extent does the company develop new products?	0.83	15.03*	
To what extent does the company develop new processes?	0.80	14.62*	
Slack			*a* = 0.83 *SCR* = 0.83 *AVE* = 0.63
To what extent does the company commit resources that can be used quickly to finance strategic initiatives?	0.82	-[a]	
To what extent is the company able to obtain resources in the short run without affecting long-term initiative financing?	0.79	15.59*	
How is the degree of resources at the discretion of the administration to finance new strategic initiatives?	0.76	15.15*	
Competitive intensity			*a* = 0.74 *SCR* = 0.74 *AVE* = 0.49
To what extent is price competition a hallmark of the company's market?	0.64	-[a]	
How is the impact of competition in the sector in which the company operates?	0.72	9.84*	
To what extent do people talk about a new competitive movement almost every day?	0.73	9.85*	

-[a] Fixed parameters

* $p < .05$

$X^2_{(71)} = 197.21$, $p < .05$; CFI = 0.95; IFI = 0.95; NNFI = 0.93; RMSEA = 0.07 [0.06–0.08].

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Convergent Validity

It estimates the level at which attempts to measure the same concept are consistent among each other (Hair et al., 2009). A confirmatory factor analysis was conducted applying the maximum likelihood estimation based on the covariance matrix. The convergent condition in unidimensional factors is achieved when scores are elevated, with acceptable values higher than 0.5 (Anderson & Gerbing, 1988; Fornell & Larcker, 1981).

Different indicators suggested by the literature were used to establish goodness of fit of the measurement model (Byrne, 2006; Hair et al., 2009). The results in Table 1 show that the chi-square test ($X^2_{(71)} = 197.21$, $p < .05$) did not produce a significant result. This is common when samples with more than 200 cases are processed (Martínez-López, Gázquez-Abad, & Sousa, 2013). Nevertheless, indicators for the maximum likelihood method—comparative fit index (CFI) = 0.95, incremental fit index (IFI) = 0.95, non-normed fit index (NNFI) = 0.93, and root mean square error of approximation (RMSEA) = 0.07 [0.06–0.08]—show that the model has acceptable fit (Hooper, Coughlan, & Mullen, 2008). The standardized solution produced scores higher than 0.5 in all dimensions along with significant maximum likelihood *t* values ($p < .05$). This confirmed the convergent validity.

Discriminant Validity

This represents the degree to which theoretically similar concepts differ from each other (Hair et al., 2009). It was measured considering that the AVE is higher than the square correlation among the constructs (Anderson & Gerbing, 1988). Table 2 introduces the intercorrelations and square root of AVE in the main diagonal, confirming it is higher in all cases. This proved the discriminant validity.

Table 2. **Mean, standard deviation (SD), and correlation**

	Mean	SD	1	2	3	4
Performance	4.95	0.93	*0.74*			
Innovation	4.71	1.26	0.36**	*0.77*		
Slack	4.23	1.28	0.48**	0.44**	*0.79*	
Competitive intensity	4.16	1.36	0.11*	0.32**	0.25**	*0.70*

N = 401

* $p < .05$

** $p < .01$. Values of the main diagonal (in italics) correspond to the square root of the average variance extracted.

RESULTS

Both descriptive and explanatory results obtained in this study are presented below (hypotheses testing).

Descriptive Results

Table 2 presents some descriptive statistical data. When observing values of the mean, it is noted that they are closer to the upper range, according to the applied questionnaire (values higher than 4.0). Therefore, it can be concluded that SMEs in Bogotá carry out innovation activities, achieving good performance results. In addition, these innovative actions are positively correlated with the slack and competitive intensity.

The study's effective sample comprised 401 SMEs belonging to the industrial (163), trade (86), and service (152) sectors of the city of Bogotá. Most of these companies have up to 50 employees (62.8%) and up to 10 years of existence (45.1%); see Table 3.

Table 3. **Sector, size, and age of the sample**

Concept	%
Sector	
Industrial (163)	41
Trade (86)	21
Services (152)	38
Size (Number of employees)	
From 11 to 50	66.6
From 51 to 100	15.7
From 101 to 150	7.5
From 151 to 200	10.2
Existence (Years of operation)	
Between 1 and 10	44.4
Between 11 and 20	26.2
Between 21 and 30	16.7
More than 31	12.7

Structural Model and Hypothesis Testing

Table 4 presents the findings. Based on SEM techniques, the singular model to assess the relationship between innovation and

performance variables was obtained. First, there was a positive and significant incidence (0.42; $t = 6.86$, $p < 0.05$). Then, the first- and second-order joint structural models were obtained to evaluate the hypotheses on the influences of competitive intensity and slack on innovation, and of their influence on organizational performance. In this model, the result was $X^2_{(74)} = 278.08$ ($p < 0.05$) with normed chi-square (X^2/gl) of 3.8. Although this value is higher than the maximum recommended of 2 and the X^2 is not significant, authors such as Martínez- López et al. (2013) and Hair et al. (2009) explain that this is because of samples larger than 200 cases. This implies the absence of multivariate normality that tends to inflate the chi-square statistic. Thus, they recommend using other indicators of goodness. Therefore, CFI = 0.91, IFI = 0.91, NNFI = 0.89, and RMSEA = 0.08 [0.07–0.09] were obtained, and their results indicate acceptable fit. Second, regarding the first-order model, there is a positive and significant incidence between competitive intensity and innovation (0.28; $t = 4.58$, $p < 0.05$), supporting hypothesis 1. Third, there is a positive and significant incidence between organizational slack and innovation (0.50; $t = 8.16$, $p < .05$), supporting hypothesis 2. Fourth, regarding the second-order model, there is a positive and significant incidence between innovation and organizational performance (0.44; $t = 7.15$, $p < 0.05$). In addition, there was a significant increase in the influence of innovation on performance between the singular and second-order models (from 0.42 to 0.44). Therefore, this supports hypothesis 3.

Table 4. **Path analysis**

Path		Direct effect	*t* value	Hypoth.	Supported
Singular model a Innovation → Performance		0.42	6.86*		
First-order model					
B	Competitive intensity → Innovation	0.28	4.58*	H1	Yes
C	Slack → Innovation	0.50	8.16*	H2	Yes
Second-order model					
D	Innovation → Performance	0.44	7.15*	H3	Yes

* $p < .05$

$X^2_{(74)} = 278.08$, $p < .05$; CFI = 0.91; IFI = 0.91; NNFI = 0.89; RMSEA = 0.08 [0.07–0.09].

DISCUSSION

In the case of SMEs in Bogotá, this study found that greater competitive intensity has a positive impact on innovation (H1). This indicates that, when these units face greater competition, they feel pressured to optimize costs and reduce prices. This affects profit margins and available slack positively (Miller & Friesen, 1983; Zahra, 1996). This confirms that SMEs use innovation—represented as improvement in and development of products/services and processes—to face competition, which means designing a strategy to be more competitive. This is in line with ideas of different authors in that, to avoid technological obsolescence and anticipate changes, companies use innovation to optimize current processes and improve existing products or develop new ones. They thus seek better positioning in the market that allows them to enhance performance (Abebe & Angriawan, 2014; Auh & Menguc, 2005; Chang et al., 2011).

This study shows that organizational slack has a positive and significant effect on innovation (H2), which is consistent with some authors' propositions (Chen & Huang, 2009; Nohria & Gulati, 1996). In the presence of slack, SMEs invest surplus resources in short- and long-term innovation programs, which leads to better results thanks to the acquisition, adaptation, and improvement of processes and products. This study also suggests that innovation activities of SMEs in Bogotá are motivated by internal decisions on investment of marginal resources (Marín-Idárraga & Cuartas-Marín, 2016a). This is in line with some studies that show how firms develop exploitative innovations due to the use and refinement of internal resources (Andriopoulos & Lewis, 2009; Greve, 2007; Zhou & Wu, 2010).

Finally, the case of SMEs in Bogotá proves that slack and competitive intensity are a relevant strategy to boost innovation and, consequently, positively influence organizational

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performance (H3). This ratifies the propositions of different authors (Jansen et al., 2006; Kim & Atuahene-Gima, 2010; Mousa & Chowdhury, 2014; Nohria & Gulati, 1996).

In summary, the main finding of the study is that the relationship between innovation and performance is affected by other precursor variables. For SMEs in Bogotá, this study shows that, when they perceive a competitive environment, they make use of their slack—understood as available surplus resources—to invest in innovative activities that lead to novelty states, in either processes or products, that result in a significant improvement in their performance.

CONCLUSIONS AND IMPLICATIONS

Although there is a wide body of research on the relationship between innovation and performance, the results obtained show contradictory conclusions, especially for SMEs (Rosenbusch, Brinckmann, & Bausch, 2011). This study assessed precursor variables that affect said relationship and concluded that competitive intensity and organizational slack positively influence innovation, leading to an improvement in performance.

Although executives understand the importance of innovation to improve performance, they give little importance to the implications for the rest of their organizations (Alegre & Chiva, 2013). Moreover, a large percentage of small entrepreneurs believe that product innovation is something that simply "happens" (Vermeulen et al., 2005). However, this study confirms that, for companies in emerging economies, which are subjected to unstable and dynamic environments, slack becomes a fundamental element for maintaining competitive advantages (Su et al., 2009). This is because it is used to boost innovation as a response to competitive pressures.

This study offers two important contributions. First, it proposes a strategic theory with empirical evidence confirming that competitive intensity and slack foster innovation. This, in turn, positively impacts performance. Second, it provides criteria for strategic management to understand companies' operations. This suggests that, under strong competition, investment of surplus resources (i.e., slack) in innovation represents an important source to boost performance.

Particularly for executives of SMEs in Bogotá (which was the site of this research), this study suggests that uncommitted current resources, which are usually represented in available cash, can be used to promote innovation as an alternative to creating competitive advantages, when competition intensifies. The findings prove that this action has a positive impact on organizational performance.

This result presents new empirical evidence in the SME literature. This helps better understand the relationship between innovation and performance, showing that it is affected by the incidence of different precursor variables.

LIMITATIONS AND FUTURE LINES OF RESEARCH

This research had some noteworthy limitations. First, the study included a path analysis of the influence of competitive intensity and slack on innovation and of innovation on performance. However, it has been proven that there are other precursor, moderator, and mediator variables—such as those used in the work of Alegre & Chiva (2013)—that could be included in a structural model in future research.

Second, this study measured financial slack. Thus, results could vary in the presence of other types of slack, such as those related to innovation (Mousa & Chowdhury, 2014) and human resources (Stan, Peng, & Bruton, 2014). Moreover, it measured only technological innovation in the improvement of products and processes. Subsequent studies could test the hypothesis of influence, including different types of slack and innovation not covered in this work.

Third, the study demonstrated that competitive intensity impacts innovation and performance. However, other exogenous aspects that may affect the results were not considered. This could be validated in the future with studies that consider other environmental variables impacting competitive intensity, such as technology and economic conditions, among others.

Finally, the results obtained come from a cross-sectional study applied to a sample of SMEs in the city of Bogotá. Although this sample segmentation may contribute to a particular characterization of the population, it may not provide generalizable results for all SMEs. Future research could conduct longitudinal studies in other regions to establish comparative parameters and reach broader and more accurate conclusions.

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