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Corporate entrepreneurship and firm performance relationship under the moderating effect of environmental dynamism: Replication and extension analysis

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Abstract

The purpose of this research is to understand the relationship between corporate entrepreneurship and firm performance of large firms in emerging economies, with consideration of the moderating effect of environmental dynamism. This is a quantitative and cross-sectional study, utilizing a multivariate second-order hierarchical component model. The partial least squares structural equation modeling method was employed for analysis. The findings indicate a highly positive impact of entrepreneurial orientation on profitability, while corporate venturing had a high but negative impact on profitability. Regarding the growth model, it was shown that entrepreneurial orientation had a positive but statistically insignificant impact on firm growth, while corporate venturing had a highly negative but statistically insignificant impact on firm growth. Interestingly, the results indicate that environmental dynamism did not have a moderating effect in this context. This paper has significant implications for senior management decision-making regarding the importance of corporate entrepreneurship in the growth and profitability of companies. It is recommended that large companies invest in entrepreneurial orientation because of its positive influence on profitability. This research fills a gap in the literature on the relationship between corporate entrepreneurship and firm performance in large companies in emerging economies. It highlights the importance of context-specific contingencies to the impact of corporate entrepreneurship on the performance of large companies and cautions against generalizing results across different countries, even those with seemingly similar contexts. The study confirms the positive relationship between entrepreneurial orientation and corporate profitability, particularly for large companies.

Keywords Corporate entrepreneurship · Entrepreneurial orientation · Corporate venturing · Environmental dynamism · Replication · PLS-SEM

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Resumen
El objetivo de esta investigación es comprender la relación entre el espíritu empresarial corporativo y los resultados de las grandes empresas en las economías emergentes, teniendo en cuenta el efecto moderador del dinamismo del entorno. Se trata de un estudio cuantitativo y transversal, que utiliza un modelo multivariante de componentes jerárquicos de segundo orden. Para el análisis se empleó el método de modelización de ecuaciones estructurales por mínimos cuadrados parciales. Los resultados indican un impacto altamente positivo de la orientación empresarial en la rentabilidad, mientras que la iniciativa empresarial tuvo un impacto alto pero negativo en la rentabilidad. En cuanto al modelo de crecimiento, se demostró que la orientación empresarial tenía un impacto positivo pero estadísticamente insignificante en el crecimiento de la empresa, mientras que la iniciativa empresarial tenía un impacto muy negativo pero estadísticamente insignificante en el crecimiento de la empresa. Curiosamente, los resultados indican que el dinamismo ambiental no tuvo un efecto moderador en este contexto. Este trabajo tiene implicaciones significativas para la toma de decisiones de la alta dirección en relación con la importancia del emprendimiento corporativo en el crecimiento y la rentabilidad de las empresas. Se recomienda que las grandes empresas inviertan en orientación empresarial por su influencia positiva en la rentabilidad. Esta investigación llena un vacío en la literatura sobre la relación entre el espíritu emprendedor corporativo y el rendimiento de las grandes empresas en las economías emergentes. Destaca la importancia de las contingencias específicas del contexto para el impacto del espíritu empresarial corporativo en los resultados de las grandes empresas y advierte contra la generalización de los resultados entre distintos países, incluso entre aquellos con contextos aparentemente similares. El estudio confirma la relación positiva entre la orientación empresarial y la rentabilidad de las empresas, sobre todo en el caso de las grandes empresas.

Palabras clave Emprendimiento corporativo · Orientación empresarial · Dinamismo medioambiental · Replica · PLS-SEM

Summary highlights

Contributions: The impact of corporate entrepreneurship on the performance of large companies and business groups is contingent on context-specific factors. Therefore, generalizing findings across countries, even when their contexts appear to be similar, is not advisable. Furthermore, this study confirms the positive relationship between entrepreneurial orientation (EO) and the profitability of large companies and business groups.

Research questions/purpose: This study aims to examine the relationship between CE and firm performance (FP) in large firms operating in emerging economies. Specifically, we investigate whether this relationship is moderated by environmental dynamism (ED). We also explore the relationships between CE's two

dimensions (EO and corporate venturing [CV]) and FP, and whether these relationships are moderated by ED.

Results/findings: The main findings of our research revealed a highly positive impact of the EO [RT, IN, PR] on profitability, as well as a highly negative impact of CV on profitability. With regards to the growth model, a positive but statistically insignificant impact of EO was shown on the firm's growth, and a highly negative but statistically insignificant impact of CV was shown on the firm's growth. Finally, this research revealed that ED did not have a moderating effect on the relationship between EO and firm profitability or on the relationship between CV and firm growth.

Theoretical implications and recommendations: The results are consistent with the resource-based view (RBV) theory (Barney 1991) since they corroborate the positive relationship between EO and FP, where an adequate configuration of resources and capabilities, which depends on the firm's EO (Wales et al. 2021; Wiklund and Shepherd 2003), leads to innovative environments for both new products and new business units. As stated by Anderson and Eshima (2013), EO is related to all the components of the VRIO framework, which is "a valuable, rare, and inimitable organizing gestalt through which firms are able to generate competitive advantage" (p. 417). In addition, the dynamic business environment of subsidiaries of Colombian business groups (SCBG's) leads companies to venture into innovative projects, including portfolio diversification through the development or acquisition of new business units, which implies learning and developing new competitive advantages (Barney 1991).

Practical implications and recommendations: The paper has significant implications for senior management decision-making on the importance of corporate entrepreneurship in the growth and profitability of companies. It is recommended that SCBGs invest in EO to increase their companies' profitability. Considering that the EO construct was complemented with competitive aggressiveness (CA) and autonomy (AU; Lumpkin and Dess 1996), the results suggest that these two additional dimensions are part of the construct, and for the sample of this research each of them behave in the same direction, although according to Lumpkin and Dess (1996), in some contexts they act independently.

Taking into account that CV is relatively new in Latin America (Prats and Siota 2018; Kantis 2018; Kantis and Angelelli 2020), from a practical perspective, this research invites SCBGs to delve deeper into the development of resources and capabilities that allow them to develop more and better corporate entrepreneurship strategies to be more competitive. Some benefits of using better corporate entrepreneurship strategies include new learning beyond firm boundaries (Schildt et al. 2005), which is necessary for CV (Covin et al. 2018; Narayanan et al. 2009). From the firm's RBV theory (Barney 1991), it is possible that SCBGs have more resources and capacities oriented toward production and efficiency for planning companies (Miller 1983) as well as fewer resources and capacities to monitor signals from the environment that are made up of the tastes and needs of customers,

the strategies of competitors, and changes in technologies. Finally, considering the strong relationship between corporate entrepreneurship and international entrepreneurship (IE; Pirhadi and Feyzbakhsh 2021; Etemad 2022), the results of this research can contribute to answer questions about IE, especially in the international context.

Introduction

Corporate entrepreneurship (CE) is essential for fostering innovation, renewal, and firm performance (FP; Zahra 1991; 1996; Bierwerth et al. 2015; Reijonen et al. 2015; Hosseini et al. 2018; Lampe et al. 2020; Urbano et al. 2022). Over the last five decades, CE has garnered attention from academics and entrepreneurs due to its significance in generating economic wealth and ensuring company sustainability (Dess et al. 2003; Glinyanova et al. 2021). Furthermore, there is considerable interest in the relationship between CE and company performance, with a substantial amount of research demonstrating a positive correlation between company growth and CE (Zahra 1991; 1995; Bierwerth et al. 2015; Morris et al. 2011; Wiklund and Shepherd 2003). However, this literature has limitations and areas that require further exploration, such as the antecedents at the environmental level and CE in large firms (Urbano et al. 2022).

Although the literature frequently provides evidence of the positive relationship between CE and FP in small and medium-sized companies in developed countries (Narayanan et al. 2009; Wiklund 1999; Bierwerth et al. 2015; Morris et al. 2011; Wiklund and Shepherd 2003), only a few studies have investigated this relationship in large companies in developing countries under environmental influences (Urbano et al. 2022; De Villiers-Scheepers 2012; Demirkan et al. 2019; Ambad and Abdul Wahab 2017; Zahra et al. 2000). Thus, the aim of this research is to understand the relationship between CE and FP of large firms in Colombia's emerging economy under the moderating effect of environmental dynamism (ED). Therefore, this article aims to answer the following questions: Is there a relationship between entrepreneurial orientation (EO) and FP, and if so, is the relationship moderated by ED? Is there a relationship between corporate venturing (CV) and FP, and if so, is it moderated by ED?

This replication and extension of Ambad and Abdul Wahab's (2017) research revealed a highly positive impact of EO on profitability as well as a highly negative impact of CV on profitability. Regarding the growth model, it was shown that EO had a positive but statistically insignificant impact on firm growth, while CV had a highly negative but statistically insignificant impact on firm growth. Finally, this research revealed that ED did not have a moderating effect on the EO–firm profitability relationship or the CV–firm growth relationship.

The resource-based view (RBV) theory (Barney 1991) can explain the relationship between CE and FP, where innovation serves as the foundation for EO (Schumpeter 1934). The application of partial least squares structural equation modeling (PLS-SEM) represents another contribution, given that there are few

studies on CE that utilize hierarchical linear modeling or similar methodologies, according to Urbano et al. (2022).

The subsequent sections of this article have the following structure: literature review, methodology, results, discussion, and conclusion.

Literature review

Resource-based view theory

Barney (1991) proposed the RBV theory, which posits that companies develop competitive advantages by leveraging resources that are valuable, rare, and difficult to imitate in concert with an organizational structure that enables them to fully exploit the potential of these competitive advantages (as captured by the value, rarity, imitability, and organization [VRIO] framework). Additionally, EO is a construct that measures the degree to which a firm is structured to be entrepreneurial (Wales et al. 2021; Wiklund and Shepherd 2003), and CV is related to the creation of new business units inside or outside the organization (Sharma and Chrisman 1999; Kuratko 2017). The latter requires the identification of new and unique forms of recombining resources that lead the company to capture new rents (Barney 1991; Burgelman 1983; Battistini et al. 2013).

Given that CE enables firms to develop and leverage their resources and competitive advantages to explore new opportunities, with these resources being closely related to the firm's EO (Grande et al. 2011), the RBV theory supports the idea that CE should be positively correlated with increased profits and growth for the firm (Narayanan et al. 2009; Urbano et al. 2022).

Corporate entrepreneurship and firm performance

Researchers have made efforts to develop different conceptualizations of and terms for CE, but this has hindered the construction and strengthening of its theory (Lampe et al. 2020; Glinyanova et al. 2021; Ferreira 2010; Hind and Steyn 2015; Sharma and Chrisman 1999). However, Urbano et al. (2022) "consider CE as those initiatives that take place within companies and that aim at creating and adding new business, or at fostering innovation, change and renewal" (p. 5). The domains of CE are EO and CV (Kuratko 2017; Lampe et al. 2020; Wales et al. 2015; Lumpkin and Dess 1996).

According to Wales et al. (2020), EO is a combination of top management style (Nordqvist and Melin 2010), organizational configuration (Lumpkin and Dess 1996), and new entry initiatives (Covin 1991). On the other hand, CV involves adding new businesses to a firm (Urbano et al. 2022; Pirhadi and Feyzbakhsh 2021; Kuratko and Audretsch 2013) to exploit business opportunities and build new capacities (Narayanan et al. 2009).

The literature shows that research regarding the relationship between CE and FP is still in the exploratory stage (Alam et al. 2020). Ambad and Abdul Wahab's

(2017) study was the first to simultaneously test the effects of EO and CV on the FP of a large firm in an emerging economy under the moderation effect of ED. Although the academic community has produced a significant amount of empirical findings regarding the effects of CE on the performance of small and medium-sized enterprises in developed economies, empirical research on large-sized publicly listed companies (PLCs) in emergent economies is scarce (Miller and Le Breton-Miller 2011). Some researchers suggest that large firms, where resources tend to be abundant and employees more risk-averse due to bureaucracy and organizational processes, might be more complex and rigid, which impedes the development of entrepreneurial activities (Plambeck 2011). However, this topic has scarcely been explored in Latin America (Kantis and Angelelli 2020; Prats and Siota 2018), where the contextual conditions are quite different from those of developed countries (Kelley et al. 2016).

The authors of the initial study (Ambad and Abdul Wahab 2017) point out that although CE is a term frequently used to describe behaviors associated with entrepreneurship in large companies, research on the effects of CE on the performance of large companies is surprisingly limited. Most such research has been conducted on small and medium-sized businesses (Miller and Le Breton-Miller 2011), which may have several explanations, such as the natural abundance of small and medium-sized companies in each country, a trend that is much more marked in emerging countries. The above highlights a significant gap in the literature regarding the impact of entrepreneurial activities in large companies, especially considering that the determinants of entrepreneurship (Miller 1983) and the challenges that must be overcome (Beaver 2003) differ based on the size of the company. Additionally, if we consider the differences in the relationship between CE and ED in the three types of companies named by Miller (1983) as simple, planning, and organic firms, it is crucial to carry out more research on the impact of CE on the performance of large companies, which are the organic ones, as stated by the author.

Hypotheses development

Entrepreneurial orientation and firm performance

Considering that EO research shows no signs of slowing down (Covin and Wales 2018), a better understanding of how EO manifests itself is required now more than ever (Wales et al. 2020). EO can be recognized as an attribute of an organization that includes three levels of analysis: entrepreneurial top management style, organizational configuration, and new entry initiatives (Wales et al. 2020). At the first level, EO represents the overarching strategic posture of the company's decision-makers that is reflected in recurring business behaviors (Covin and Wales 2018). At the second level, EO reflects the behaviors associated with the creation of an organizational climate and culture that encourage new processes and routines that are oriented toward entrepreneurship. Finally, at the third level, EO refers to "the attribute of an organization that exists to the degree to which that organization supports and exhibits a sustained pattern of entrepreneurial behavior reflecting incidents of proactive

new entry" (Covin and Wales 2018, p. 5). In conclusion, "entrepreneurial orientation describes how new entry is undertaken" (Lumpkin and Dess 1996, p. 136).

According to Lumpkin and Dess (2001), the dimensions of EO often vary based on organizational conditions and the company's business environment. On the other hand, when studying the EO-performance relationship, it should be kept in mind that the performance construct is multidimensional (Cameron 1978; Chakravarthy 1986). This means that EO processes can have opposite effects on different dimensions of performance. For example, a company that invests heavily in product innovation (PI) has a better chance of entering new markets, which would increase its sales in the long run. However, if such investment in innovation is relatively high, it may decrease the company's profitability in the short term. Soininen et al. (2011) found that EO has a positive relationship with the firm's growth but is not related to the firm's profitability.

Moreover, Rauch et al. (2009) found that several studies reported considerable variation in the magnitude of the relationships between EO and FP. While some studies found that firms perform much better if they adopt robust EO than if they do not (e.g., Covin and Slevin 1991; Ambad and Abdul Wahab 2017; Anderson et al. 2015; Karacaoglu et al. 2012; Kaya 2006; Lee et al. 2019; Mohamad et al. 2011; Wiklund 1999; Hult et al. 2003; Wiklund and Shepherd 2003; Jantunen et al. 2005; Keh et al. 2007; Tajeddini 2010), other studies found lower correlations between EO and performance (e.g., Dimitratos et al. 2004; Lumpkin and Dess 2001; Zahra 1993) or failed to find any significant relationship between EO and FP (Covin et al. 1994; George et al. 2001).

Other researchers such as Anderson and Eshima (2013) believe that EO is related to all components of the VRIO framework, "a valuable, rare, and inimitable organizing gestalt through which firms are able to generate competitive advantage" (p. 417). From the above, it can be inferred that based on the RBV theory (Barney 1991), EO impacts FP because an adequate configuration of both tangible and intangible resources and capabilities such as knowledge and know-how can lead to the generation of innovation (Schumpeter 1934) and new products and business units. In turn, this can become a fabulous source of value for the organization, which is reflected in higher profitability and growth.

Therefore, it can be said that several studies have shown that EO is related to the growth of the firm (Antoncic and Scarlat 2008; Covin et al. 2006; Soininen et al. 2011; Moreno and Casillas 2008; Zhang and Zhang 2012; Antoncic and Hisrich 2001) as well as its profitability (Antoncic 2007; Lumpkin and Dess 2001; Kemelgor 2002; Kreiser et al. 2002; Yoo 2001; Zahra and Garvis 2000). Some studies have found that EO is positively related to both firm growth and profitability (Antoncic and Scarlat 2008; Zahra and Garvis 2000; Hakala 2013; Covin et al. 2006; Ireland et al. 2009; Lumpkin and Dess 1996). These considerations support the formulation of hypothesis H1a: There is a direct positive relationship between EO and the profitability of large firms. This also supports hypothesis H1b: There is a direct positive relationship between EO and the growth of large firms.

Corporate venturing and firm performance

According to Narayanan et al. (2009), "CV is the set of organizational systems, processes and practices that focus on creating businesses in existing or new

fields, markets or industries – using internal and external means" (p. 59). As the earliest domain of CE, CV is related to the creation of new business units inside or outside the organization (Sharma and Chrisman 1999; Kuratko 2017). Measuring the performance of CV projects is relatively difficult due to the potential diversity of objectives, which can sometimes be contradictory. Some of the objectives of CV are to improve financial results, perform technological and market intelligence, access cutting-edge technologies, develop strategic relationships, develop new technologies and products, and enter new markets. The latter requires the identification of new and unique forms of recombining resources that can lead the company to capture new rents (Barney 1991; Burgelman 1983; Battistini et al. 2013). Despite these advantages, venturing in established firms is difficult and has various obstacles. In most cases, CV in established firms presents threats to already established routines and current decision-makers, which can generate political conflicts within the organization in some cases (Gunther et al. 1994).

Considering that CV involves large corporations collaborating with start-ups to enhance innovation (Hill et al. 2009; Sharma and Chrisman 1999), and that CV is a rapidly growing trend worldwide where "annual [corporate venture capital] CVC backed deals jump[ed] 39% while funding soar[ed] 142% [year-over-year] YoY" (CB Insights 2021, p. 21), and "CVC-backed funding to LatAm companies increase[d] more than 6x in 2021" (p. 173), it is very important to understand CV processes and their benefits in these types of collaborations for the structuring and financing of corporate ventures, the development of the innovative ecosystem, and the companies in general (Siota and Prats 2020; Lampe et al. 2020). According to Zahra (1993), ventures and innovation are related to "new business creation, new product innovation, technological entrepreneurship," and "the percent of revenue generated from new business" (p. 338–339).

CV is also associated with the generation of new competitive advantages by leading to the identification of new and better ways to combine the firm's resources (Barney 1991; Peteraf 1993). This is difficult for competitors to understand and replicate in the short term, as it forms the basis of the venturing firm's business model for capturing rents (McGrath et al. 1994). Two theories that support the generation of competitive advantages as a result of CV initiatives are Penrose's (1959), which suggests that the mechanisms used by each firm to combine resources lead to heterogeneity among firms, and Winter and Nelson's (1982), which suggests that each firm's behaviors regarding the combination and use of resources create business routines that are difficult for competitors to identify or replicate. It is precisely these two particularities—the consolidation of firms' routines to combine their resources and competitors' difficulty identifying or replicating these routines—that lead to the generation of competitive advantages (McGrath et al. 1994) that are necessary to take advantage of business opportunities, which can be reflected in the growth and profitability of the company (Narayanan et al. 2009; Ambad and Abdul Wahab 2017; Antoncic and Hisrich 2001; Garud et al. 2002; Zahra 1996).

Additionally, the results of both Antoncic and Hisrich (2001) and Ambad and Abdul Wahab (2017) indicate a positive relationship between CV and the growth and profitability of the company. Based on this, hypothesis H2a can be formulated: There is a direct positive relationship between CV and the profitability of large firms. Hypothesis H2b can also be formulated based on these considerations: there is a direct positive relationship between CV and the growth of large firms.

Environmental dynamism as a moderating variable of the corporate entrepreneurship–firm performance relationship

ED refers to the speed of change and unpredictability of transformations in technologies, customer preferences, product demand, and product features in an industry (Tajeddini and Mueller 2018; Koberg et al. 1996; Martínez-Sánchez et al. 2011; Lumpkin and Dess 2001). According to Lampe et al. (2020), the relationship between entrepreneurial organizations, environmental factors, and FP has received great attention from researchers, as these variables are often used together. Additionally, the literature shows that the relationship between a firm's external environment and CE has been a subject of interest in research (Tajeddini and Mueller 2018; Lampe et al. 2020; Guth and Ginsberg 1990; Zahra 1991, 1993; Zahra and Covin 1995; Covin and Slevin 1989, 1991; Lumpkin and Dess 1996, 2001; Wiklund and Shepherd 2005).

According to some studies, the RBV theory suggests that the effects of a company's resources on its performance and operations depend on the dynamism of the environment (Akgün et al. 2008). Depending on the context, it may be more difficult and challenging for some organizations to (1) assimilate and anticipate environmental conditions (Akgün et al. 2008), (2) identify new technological trends as well as customers' needs and demands, and (3) translate them into specific and appropriate actions. Additionally, Zahra (1993) found that in static and impoverished environments, ED has a negative effect on the interaction of EO and FP. The literature also shows that results of the relationship between CE and FP have been diverse and, in some cases, conflicting. Given the above, Tajeddini and Mueller (2018) highlighted that a potential explanation for this diversity of findings in most of these studies is that the dynamism of the business environment has not been taken into account.

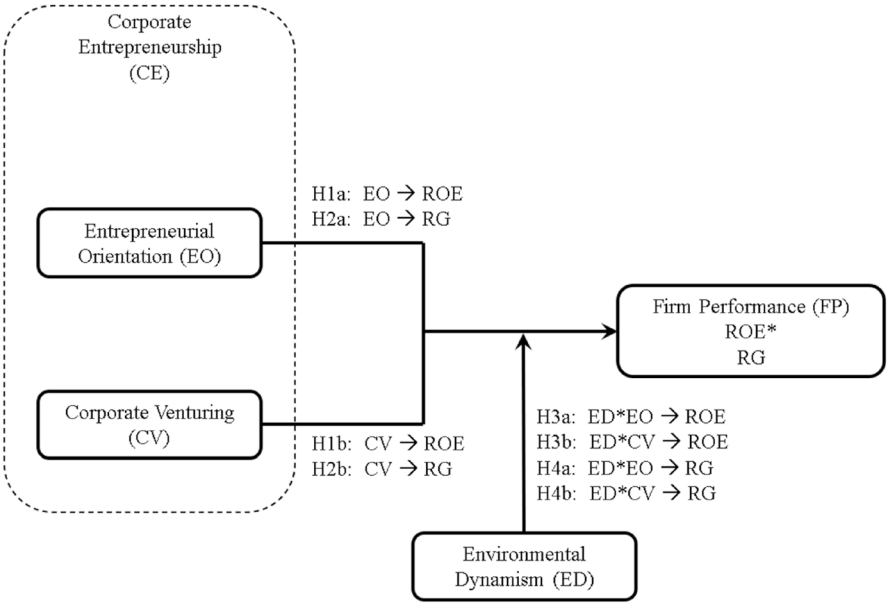
The environment surrounding subsidiaries of Colombian business groups (SCBGs) is quite dynamic since it is influenced by several internal and external factors. Some of these factors are economic conditions, the regulatory environment, technological changes, and competitive pressures. Economic factors include global commodity fluctuations, changes in interest rates, and changes in government policies. On the regulatory side, issues associated with taxes, labor, or the environment are constantly evolving and affecting the costs and profitability of companies. Technological innovations can create new business opportunities, but they can also disrupt traditional business models and force companies to adapt to new ways of doing business. From a competitive standpoint, SCBGs face competition from both domestic and international companies, which can affect their market share, prices,

and profitability. In addition, changes in consumer preferences and behavior can also affect the competitive landscape. This leads companies to venture into innovative projects, including portfolio diversification through the development or acquisition of new business units, which indicates learning and developing new competitive advantages (Barney 1991).

In dynamic environments, according to Lumpkin and Dess (2001), companies have a greater tolerance for error, or the degree to which management commits to large and risky projects, which encourages the organization's creativity when changes are more unpredictable. Additionally, there is evidence proving that companies increase their research and development efforts for new products when the business environment is more dynamic, contrary to the behavior of companies that are in more stable environments (Miller and Friesen 1982; Miller 1988; Zahra 1993). If a company is not attentive to the dynamism of the sector, it runs the risk of losing opportunities to expand its sales and market share (Miller 1988). These considerations support the formulation of hypothesis H3b: ED moderates the relationship between CV and large firm profitability. CV is more positively associated with large firm profitability in dynamic environments. This also led to the formulation of hypothesis H4b: ED moderates the relationship between CV and the growth of large firms. CV is more positively associated with the growth of large firms in dynamic environments.

On the other hand, in contexts where competition and market preferences become less predictable and changes occur at a faster pace, the environment becomes more dynamic (Atuahene-Gima and De Luca 2006). Highly dynamic environments make it more challenging for organizations to adopt older or less innovative technologies, as they must keep up with the changing needs of high-growth industries to remain competitive (Coombs and Bierly 2006). However, the literature presents conflicting results; while some studies have found that ED moderates the relationship between CE and FP (Tajeddini and Mueller 2018; Lumpkin and Dess 2001; Zahra and Covin 1995), others have found no evidence of a moderating effect of ED on the relationship between EO and FP (Wiklund and Shepherd 2005; Zhang 2009; Frank et al. 2010; Kim and Kim 2016).

Further, Zahra (1991) stated that high levels of ED, hostility, and industry heterogeneity intensify entrepreneurship. Additionally, "in an environment of rapid change and shortened product and business model lifecycles, the future profit streams from existing operations are uncertain and businesses need to constantly seek out new opportunities. Therefore, firm[s] may benefit from adopting an EO" (Rauch et al. 2009, p. 764). The preceding considerations support the formulation of hypothesis H3a: ED moderates the relationship between EO and the profitability of large firms. EO is more positively associated with the profitability of large firms in dynamic environments. Additionally, hypothesis H4a proposes that ED moderates the relationship between EO and the growth of large firms. EO is more positively associated with the growth of large firms in dynamic environments. Figure 1 illustrates the theoretical framework, where EO and CV are the independent variables, and FP is the dependent variable (Zahra 1993).



*Return on equity (ROE); revenue growth (RG)

Fig. 1 Theoretical framework, adapted from *The relationship between corporate entrepreneurship and firm performance: evidence from Malaysian large companies*, by Ambad and Abdul Wahab (2017), *International Journal of Business and Society, 17*(2). *Return on equity (ROE); revenue growth (RG)

Methodology

Methodological approach and data analysis

This is a quantitative and cross-sectional study. The selection of this methodology was based on the type and availability of the data required to address the research questions and to be able to test the eight hypotheses proposed in this study (Figueroa 2016). Given that the research design involves a multivariate second-order hierarchical component model and a small sample size, PLS-SEM methodology was used (Hair et al. 2017). PLS-SEM combines factor and regression analyses to examine the relationship between the manifest and latent variables of the measurement model as well as the structural model.

Sample selection and inclusion criteria

To select the sample, 857 of the largest SCBGs were considered. Data collection utlized a mail survey, which was sent to master's degree students and graduates of two private universities in Bogota who met the condition of being employed by the companies in the sample (Studies 1 and 2). This study employed data from 202

Table 1 Respondent features

Respondent profile	Studies 1 and 2		Ambad and Abdul Wahab (2017)	
	Number	Percentage	Number	Percentage
Gender				
Female	8	4%	47	36,2%
Male	194	96%	83	63,8%
	202	100%	130	
Ages				
Less than 25	13	6%		
Between 25 and 30	62	31%	8	6,1%
Between 31 and 35	40	20%	122 > 30	93,9%
Between 36 and 40	37	18%		
Between 41 and 45	27	13%		
Between 46 and 50	12	6%		
Between 51 and 55	6	3%		
Between 56 and 60	3	1%		
More than 60	2	1%		
Study level				
Bachelor's degree	202	100%	74	56,9%
Specialization	100	50%		
Professional	56	28%		
Master's degree	40	20%		
PhD candidate	2	1%		
Doctor	2	1%		
Other	2	1%		
Job title				
Professional analyst	79	39%		
Director / coordinator / area manager	55	27%		
Project manager	22	11%		
Department manager	9	4%		
Vice-president VP/ TMT*	3	1%	130	100%
Other	34	17%		

* TMT: Top management team

employees selected through homogeneous convenience sampling of 700 survey responses (Jager et al. 2017). Table 1 presents the characteristics of the respondents.

Sample size

According to Fig. 2, to ensure a statistical power of 80% and a coefficient of determination (R^2) of 0.2 in a PLS-SEM analysis of a model with a complexity level of three and a significance level of 5%, a minimum sample of 75 was required (Cohen

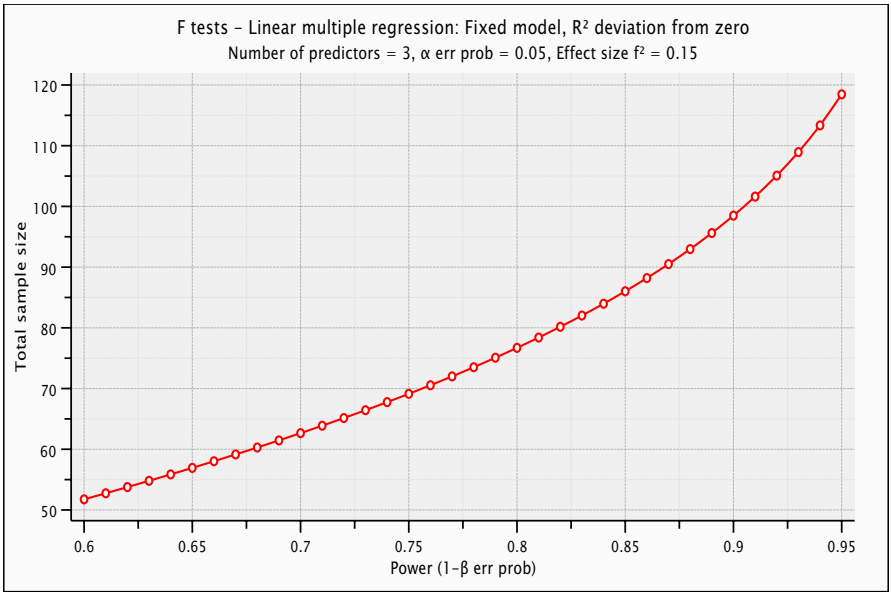


Fig. 2 Sample size for survey - power - G*Power - http://www.gpower.hhu.de/

1992; Hair et al. 2019; Marcoulides and Saunders 2006). This study exceeds the minimum recommended sample size with data from 87 SCBGs. PLS-SEM has advantages when the sample size is small and the model has many indicators and relationships, as is the case in this study (Hair et al. 2017, 2018).

Data collection instruments

To measure the exogenous latent variables (EO, CV, and ED), Likert-type semantic differential scales from 1 to 7 were adapted. In the case of EO, the scales proposed by Miller (1983) and Covin and Slevin (1989) were considered, including three covarying dimensions: innovativeness (IN), risk taking (RT), and proactiveness (PR). Additionally, the scale made by Lumpkin and Dess (1996), which included two additional dimensions (competitive agressiveness [CA] and autonomy [AU]), was also considered. For CV, the scale proposed by Zahra (1993) was considered, which includes four dimensions: business creation (BC), technological entrepreneurship (TE), expansion and growth (EG), and PI. The scale designed by Miller and Friesen (1982) and originally proposed by Khandwalla (1977) was used to measure ED. This tool measures a company's production processes, including how quickly marketing practices change, how fast its products become obsolete, and the predictability of competitors' actions and changes in customer preferences and tastes (Tajeddini and Mueller 2018).

In addition, to measure FP, we used return on equity (ROE) and revenue growth (RG).

ROE = net income/total equity
RG = (current year′s revenue − previous year′s revenue)/(previous year′s revenue)

Following Zahra's (1993) procedure for normalizing inter-industry variations, the mean industry score was subtracted from company performance, and the result was divided by the mean industry score. Then, the product was multiplied by 100. These results showed how much better (or worse) a company performed in contrast to its average industry competitor (Zahra and Covin 1995).

$$\mathrm{ROENi}^{1} = (\mathrm{ROE\_Ci}^{2} - \mathrm{AROE\_s}^{3})/(\sigma^{4}(\mathrm{ROE\_s}^{5}))$$
$$\mathrm{RGNi}^{6} = (\mathrm{RG\_Ci}^{7} - \mathrm{ARG\_s}^{8}/(\sigma(\mathrm{RG\_s}^{9}))$$

[1] ROEN*i*: Normalized ROE of the company i. [2] ROE_Ci: ROE of the company i. [3] AROE_s: Average ROE of the sector. [4] σ: Standard deviation. [5] ROE_s: ROE of the sector. [6] RGNi: Normalized RG of the company i. [7] RG_Ci: Net RG of the company i. [8] ARG_s: Average RG of the sector. [9] RG_s: Net RG of the sector.

Validity and reliability of the measurement and structural model

The methods used to analyze the validity and reliability of the models are detailed in Table 2.

Table 2 Measurement and structural model validation

Model validity and reliability		Heuristics/techniques	
1	Content validity	• Literature review • Judges	
2	Face validity	• Pilot test • Judges	
Measurement model valuation			
1	Convergent validity	• Composite reliability • Average variance extracted (AVE) • Cronbach's alpha	
2	Internal consistency	• Indicator reliability	
3	Discriminant validity	• Cross loads • Fornell and Larcker (1981) • Heterotrait-monotrait (HTMT)	
Structural model valuation			
1	Collinearity analysis		
2	Size and significance of path coefficients		
3	Coefficients of determination		R^2
4	Effect sizes		f^2

Replication and extension analysis

Several prominent academics, such as Nobel Prize winner Daniel Kahneman, have urged us to reflect on the need for and importance of replicating studies. This allows us to validate the quality of the original research and to strengthen the empirical evidence needed to evaluate whether the initial results can be generalized or extended to other contexts (Witteloostuijn et al. 2021; Bettis et al. 2016; Durand et al. 2017). Some even argue that we are falling behind in replicating research in the specific field of entrepreneurship (Block and Kuckertz 2018).

Following the replication literature (Tsang and Kwan 1999; Walker et al. 2019), we conducted two studies. The first study is an empirical replication of Ambad and Abdul Wahab's (2017) research in a different population, and the second study is a generalization and extension of Ambad and Abdul Wahab's (2017) research in "a different population while seeking to extend the original findings by adopting additional measurements and analyses" (Walker et al. 2019, p. 7). These studies aimed to test the impact of EO and CV on FP under the moderating effect of ED, conducted on SCBGs. To assess EO for the first study, we used the scale proposed by Miller (1983) and Covin and Slevin (1989). For the second study, we included the CA and AU dimensions proposed by Lumpkin and Dess (1996) to assess EO. These studies not only increased the empirical evidence for this field of research but also have the potential to broaden its theoretical scope (Block and Kuckertz 2018). As a result, we strengthen the confirmatory power of EO to FP and CV to FP by implementing different types of replications (Schmidt 2009). Table 3 summarizes the research methods.

Results

The purpose of this paper is to elucidate the relationship between CE and FP in large firms in Colombia, which has an emerging economy, under the moderating effect of ED. The main findings of this research revealed a highly positive impact of EO on profitability as well as a highly negative impact of CV on profitability. Regarding the growth model, it was shown that there was a positive but statistically insignificant impact of EO on the firm's growth as well as a highly negative but statistically insignificant impact of CV on the firm's growth. Finally, this research revealed that ED did not have a moderating effect on the EO–firm profitability relationship or the CV–firm growth relationship.

Results of study 1: empirical generalization

Table 4 presents the results of the empirical generalization analysis in comparison to Ambad and Abdul Wahab's results (2017). In addition to those of Ambad and Abdul Wahab (2017), two additional criteria were included: effect size (f^2) and confidence interval. Regarding the profitability model, the results support hypothesis H1a, similar to Ambad and Abdul Wahab (2017), as EO is positively related

Table 3 Research methods

	Studies 1 and 2	Ambad and Abdul Wahab (2017)
Country	Colombia - developing country	Malaysia - developing country
Business size	Large companies	Large companies
Firm type	PLCs - SCBGs	PLCs
Design	Cross-sectional	Cross-sectional
Techniques	PLS-SEM, SPSS	PLS-SEM, SPSS
Data gathering	Survey, secondary sources	Survey, secondary sources
Response rate	28,8%	19,6%
Number of cases	87 samples	130 samples
Bootstrap samples	5000	1000
Scales	All responses were measured by using seven-point Likert scale semantic differential items	All responses were measured by using seven-point Likert scale semantic differential items
Financial data source	Return on equity (ROE) and revenue growth (RG) from the Emerging Markets Information Service (EMIS).	Return on assets (ROA) and return on sales (ROS) from the company's annual reports
Survey respondents	Middle level executives (MLE): professional analyst, director/ coordinator/ project/ department manager and VP	Top management team (TMT): executive director, senior manager, chief executive officer (CEO), vice-president (VP) or president

PLC: Public-listed companies; SCBG: subsidiaries of Colombian business groups; PLS-SEM: Partial Least Squares-Structural Equation Modeling; SPSS: Statistical Package for the Social Sciences

Table 4 Study 1: hypothesis testing - replication: empirical generalization

		Replication - EO [RT, IN, PR]							Ambad and Abdul Wahab (2017)					
Hypothesis	Relationship	Path coefficient	t-value	R^2	f^2	95% confidence intervals	VIF	Supported	Path coefficient	t-value	R^2	f^2	95% confidence intervals	Supported
H1a	EO --> ROEN	0,3519	2,257**	0,091	0,0423	[0,0348, 0,6360]	3,22	Yes	0,279	3,065***	0,08	--	--	Yes
H1b	CV --> ROEN	-0,3870	2,462**	0,091	0,0506	[-0,6823, -0,0763]	3,25	No	0,010	0,124	0,08	--	--	No
H2a	EO --> RGN	0,227	1,180	0,078	0,0174	[-0,1435, 0,6105]	3,20	No	0,002	0,038	0,06	--	--	No
H2b	CV --> RGN	-0,261	1,458	0,078	0,0227	[-0,6356, 0,0740]	3,26	No	0,204	2,069***	0,06	--	--	Yes
H3a	ED*EO --> ROEN	-0,079	0,780	0,091	0,0080	[-0,2734, 0,1203]	1,04	No	0,158	1,896**	0,140	--	--	Yes
H3b	ED*CV --> ROEN	0,005	0,046	0,084	0,0000	[-0,1943, 0,2061]	1,04	No	-0,122	1,515	0,140	--	--	No
H4a	ED*EO --> RGN	0,031	0,255	0,078	0,0012	[-0,1838, 0,2894]	1,04	No	0,032	0,649	0,192	--	--	No
H4b	ED*CV --> RGN	0,052	0,470	0,080	0,0035	[-0,1562, 0,2843]	1,04	No	0,322	2,242***	0,192	--	--	Yes

Two-tailed test t-value = 1,96. f^2 range values: ,02 small, ,15 medium, ,35 large. Note: * $p < ,10$; ** $p < ,05$; *** $p < ,01$.

Entrepreneurial orientation (EO); risk-taking (RT); innovativeness (IN); proactiveness (PR); corporate venturing (CV); environmental dynamism (ED); variance inflation factor (VIF); return on equity normalized (ROEN); revenue growth normalized (RGN).

to ROEN (ß = 0.352, t-value = 2.257**) and the confidence interval did not contain zero [0.0348, 0.6360]. This model explains 9.1% of the variance in firm profitability. In contrast to hypothesis H1b, CV is negatively related to ROEN (ß = -0.387, t-value = 2.462**). However, hypothesis H3a did not receive support, contrary to Ambad and Abdul Wahab's findings (2017), as the moderating effect of ED on the relationship between EO and firm profitability did not have a significant effect (ß = -0.079, t-value = 0.780), and the effect size was marginal ($f^2 = 0.008$; Cohen 1988). Likewise, hypothesis H3b did not receive support, as the moderating effect of ED on the relationship between CV and firm profitability had no significant effect (ß = 0.005, t-value = 0.046), which is in line with Ambad and Abdul Wahab's (2017) results. Moreover, the effect size (f^2) was zero (Cohen 1988).

Regarding the growth model, in accordance with Ambad and Abdul Wahab (2017), hypothesis H2a was not supported because the EO effect on RGN was not significant (ß = 0.227, t-value = 1.180), and the confidence interval contained zero [-0.1435, 0.6105]. On the other hand, contrary to Ambad and Abdul Wahab's (2017) findings, hypothesis H2b did not find support because CV and RGN had a negative causal relation (ß = -0.261, t-value = 1.458), so it was also not significant; and the confidence interval contained zero [-0.6356, 0.0740]. Moreover, like Ambad and Abdul Wahab's (2017) results, hypothesis H4a did not find support because the moderation effects of ED on the relationship between EO and firm growth had no significant effect (ß = 0.031, t-value = 0.255), and the effect size was marginal ($f^2 = 0.0012$; Cohen 1988), and the confidence interval contained zero [-0.1838, 0.2894]. Contrary to Ambad and Abdul Wahab's (2017) findings, hypothesis H4b was not supported because the moderation effects of ED on the relationship between CV and firm growth had no significant effect (ß = 0.052, t-value = 0.470), the effect size was marginal ($f^2 = 0.0035$; Cohen 1988), and the confidence intervals contained zero [-0.1562, 0.2843].

Results of study 2: generalization and extension

Table 5 presents the generalization and extension results compared to those of Ambad and Abdul Wahab (2017). Given the significance of organizational configuration, which encompasses organizational culture and processes, we included CA and AU as additional dimensions for EO, as proposed by Lumpkin and Dess (1996). With regard to the profitability model, the findings partially support hypothesis H1a. Similar to Ambad and Abdul Wahab's (2017) findings, EO was positively correlated with ROEN (ß = 0.327, t-value = 2.061**). However, the confidence interval included zero, indicating a possible range of effect sizes [-0.0015, 0.6335].

This model accounts for 8.3% of the variance in firm profitability. Contrary to hypothesis H1b, CV was negatively associated with ROEN (ß = -0.3762, t-value = 2.328**). However, hypothesis H3a did not receive support because, in contrast to Ambad and Abdul Wahab's (2017) findings, the moderation effects of ED on the relationship between EO and firm profitability were not significant (ß = -0.081, t-value = 0.803), and the effect size was marginal ($f^2 = 0.083$; Cohen 1988). Finally, hypothesis H3b did not receive support because the moderation effects of

Table 5 Study 2: hypothesis testing - replication: generalization and extension analysis

		Replication - EO [RT, IN, PR, CA, AU]							Ambad and Abdul Wahab (2017)					
Hypothesis	Relationship	Path coefficient	t-value	R^2	f^2	95% confidence intervals	VIF	Supported	Path coefficient	t-value	R^2	f^2	95% confidence intervals	Supported
H1a	EO --> ROEN	0,327	2,061**	0,083	0,0377	[-0,0015, 0,6335]	3,10	Partially	0,279	3,065***	0,08	--	--	Yes
H1b	CV --> ROEN	-0,3762	2,328**	0,083	0,0486	[-0,6882, -0,0482]	3,17	No	0,010	0,124	0,08	--	--	No
H2a	EO --> RGN	0,2331	1,215	0,082	0,0190	[-0,1154, 0,6364]	3,10	No	0,002	0,038	0,06	--	--	No
H2b	CV --> RGN	-0,2665	1,468	0,082	0,0243	[-0,6583, 0,0612]	3,18	No	0,204	2,069***	0,06	--	--	Yes
H3a	EO*ED --> ROEN	-0,081	0,803	0,091	0,0830	[-0,2809, 0,1093]	1,04	No	0,158	1,896**	0,140	--	--	Yes
H3b	CV*ED --> ROEN	0,006	0,054	0,083	0,0000	[-0,1924, 0,2218]	1,04	No	-0,122	1,515	0,140	--	--	No
H4a	EO*ED --> RGN	0,026	0,218	0,079	0,0008	[-0,1933, 0,2674]	1,04	No	0,032	0,649	0,192	--	--	No
H4b	CV*ED --> RGN	0,052	0,472	0,082	0,0036	[-0,1501, 0,2904]	1,04	No	0,322	2,242***	0,192	--	--	Yes

Two-tailed test t-value = 1,96. f^2 range values: ,02 small, ,15 medium, ,35 large. Note: * $p < ,10$; ** $p < ,05$; *** $p < ,01$.

Entrepreneurial orientation (EO); risk-taking (RT); innovativeness (IN); proactiveness (PR); competitive aggressiveness (CA); autonomy (AU); corporate venturing (CV); environmental dynamism (ED); variance inflation factor (VIF); return on equity normalized (ROEN); revenue growth normalized (RGN).

ED on the relationship between CV and firm profitability were not significant (ß = 0.006, t-value = 0.054), similar to Ambad and Abdul Wahab's (2017) results. Additionally, the effect size (f^2) was zero (Cohen 1988).

Regarding the growth model, hypothesis H2a did not receive support, similar to Ambad and Abdul Wahab's (2017) findings, as EO's effect on RGN was not significant (ß = 0.2331, t-value = 1.215), and the confidence interval included zero [-0.1154, 0.6364]. On the other hand, in contrast to Ambad and Abdul Wahab's (2017) results, hypothesis H2b was also not supported, as there was no significant relationship between CV and RGN (ß = -0.2265, t-value = 1.468), and the confidence interval also included zero [-0.6583, 0.0612]. Additionally, hypothesis H4a did not receive support, like Ambad and Abdul Wahab's (2017) findings, as the moderation effects of ED on the relationship between EO and firm growth were not significant (ß = 0.026, t-value = 0.218), the effect size was marginal ($f^2 = 0.0008$; Cohen 1988), and the confidence interval included zero [-0.1933, 0.2674].

Contrary to Ambad and Abdul Wahab's (2017) results, hypothesis H4b did not receive support, as the moderation effects of ED on the relationship between CV and firm growth were not significant (ß = 0.052, t-value = 0.472), and the effect size was marginal ($f^2 = 0.0036$; Cohen 1988). Additionally, analyzing the moderation effects of ED on the relationship between CV and firm growth did not result in significant effects, unlike the findings of Ambad and Abdul Wahab (2017; ß = 0.052, t-value = 0.472), and had a marginal effect size ($f^2 = 0.0036$; Cohen 1988). Therefore, it can be concluded that hypothesis H4b did not receive support.

Assessing reflective measurement model

The reflective measurement model exhibits acceptable item reliability, internal consistency, and convergent and discriminant validity. Moreover, the structural model does not present collinearity issues. Table 6 displays the measurement model assessment for the profitability model. Loadings higher than 0.708 indicate acceptable item reliability. In addition, composite reliability between 0.80 and 0.90 ensures the internal consistency of the model as well as satisfactory to good reliability. An average variance extracted (AVE) score above 0.5 indicates that the reflective constructs have convergent validity (Hair et al. 2018). The measurement model assessment of the growth model is similar. According to Fornell and Larcker's (1981) criterion, Tables 7 and 8 demonstrate that the model exhibits discriminant validity, indicating that the constructs are valid measures of unique concepts. Finally, it is worth noting that based on Henseler et al.'s (2015) recommendation, the maximum threshold for HTMT is 0.85, and the model therefore exhibits discriminant validity (Table 9).

Assessing structural model

Tables 4 and 5 show that the values of the variance inflation factor (VIF) are below five, indicating that the model has no collinearity issues (Hair et al. 2017). In replication studies, such as that of Ambad and Abdul Wahab (2017), the R^2 values for the

Table 6 Study 1: measurement model valuation - profitability model - empirical generalization - replication of Ambad and Abdul Wahab (2017)

		Replication - empirical generalization						Original results of Ambad and Abdul Wahab (2017)					
			Convergent validity		Internal consistency reliability		Discriminant validity		Convergent validity		Internal consistency reliability		Discriminant validity
		Loadings	Indicator reliability	AVE [c]	Composite reliability	Cronbach´s alpha		Loadings	Indicator reliability	AVE [c]	Composite reliability	Cronbach´s alpha	
Latent variable	Indicators	> 0,70	> 0,50	> 0,50	0,60 – 0,90	0,60 – 0,90	HTMT [d] confidence interval does not include 1	> 0,70	> 0,50	> 0,50	0,60 – 0,90	0,60 – 0,90	HTMT [d] confidence interval does not include 1
RT [a]	RT1 [b]	0,900	0,810	0,8112	0,9280	0,8836	Yes	0,533	0,284	1,000	1,000	1,000	--
	RT2	0,913	0,834					0,793	0,629				
	RT3	0,887	0,790					0,796	0,633				
	--	--	--					0,852	0,726				
	--	--	--					0,838	0,702				
IN	IN1a	0,855	0,734	0,7055	0,9052	0,8595	Yes	0,732	0,536				
	IN1b	0,875	0,769					0,524	0,274				
	IN2a	0,871	0,759					0,810	0,656				
	IN2b	0,751	0,561					0,864	0,746				
	--	--	--					0,768	0,590				
PR	PR1a	0,890	0,792	0,7894	0,9374	0,9107	Yes	0,866	0,750				
	PR1b	0,923	0,852					0,852	0,726				
	PR1c	0,847	0,717					0,883	0,779				
	PR2a	0,890	0,794					0,826	0,682				

Table 6 (continued)

		Replication - empirical generalization						Original results of Ambad and Abdul Wahab (2017)					
			Convergent validity		Internal consistency reliability		Discriminant validity		Convergent validity		Internal consistency reliability		Discriminant validity
		Loadings	Indicator reliability	AVE [c]	Composite reliability	Cronbach´s alpha		Loadings	Indicator reliability	AVE [c]	Composite reliability	Cronbach´s alpha	
Latent variable	Indicators	> 0,70	> 0,50	> 0,50	0,60 – 0,90	0,60 – 0,90	HTMT [d] confidence interval does not include 1	> 0,70	> 0,50	> 0,50	0,60 – 0,90	0,60 – 0,90	HTMT [d] confidence interval does not include 1
BC	BC2	0,811	0,658	0,6335	0,8960	0,8543	Yes			0,648	0,916	--	--
	BC3	0,819	0,669					0,804	0,646				
	BC4	0,702	0,493										
	BC5	0,829	0,687					0,867	0,751				
	BC6	0,812	0,659										
TE	TE3	0,771	0,598	0,7021	0,8241	0,5875	Yes	0,823	0,677				
	TE5	0,900	0,806										
EG	EG1	0,853	0,728	0,6806	0,8949	0,8434	Yes						
	EG2	0,830	0,689										
	EG3	0,830	0,689					0,836	0,699				
	EG5	0,785	0,616										
PI	PI1	0,722	0,521	0,6845	0,8962	0,8442	Yes	0,808	0,653				
	PI2	0,850	0,723										
	PI3	0,879	0,773					0,651	0,424				
	PI5	0,849	0,721										

Table 6 (continued)

		Replication - empirical generalization						Original results of Ambad and Abdul Wahab (2017)					
			Convergent validity		Internal consistency reliability		Discriminant validity		Convergent validity		Internal consistency reliability		Discriminant validity
		Loadings	Indicator reliability	AVE [c]	Composite reliability	Cronbach´s alpha		Loadings	Indicator reliability	AVE [c]	Composite reliability	Cronbach´s alpha	
Latent variable	Indicators	> 0,70	> 0,50	> 0,50	0,60 – 0,90	0,60 – 0,90	HTMT [d] confidence interval does not include 1	> 0,70	> 0,50	> 0,50	0,60 – 0,90	0,60 – 0,90	HTMT [d] confidence interval does not include 1
ED	ED1	Dropped	--	0,6216	0,8310	0,6971	Yes	0,664	0,441	0,537	0,832	--	--
	ED2	0,735	0,541					0,841	0,707				
	ED3	0,818	0,669					0,640	0,409				
	ED4	0,809	0,654					0,819	0,671				
	ED5	Dropped	--					Dropped	--				
FP	ROEN	1,000	1,000	1,000	1,000	1,000	Yes	1,000	1,000	1,000	1,000	1,000	--

[a] Risk-taking (RT); innovativeness (IN); proactiveness (PR); business creation (BC); technological entrepreneurship (TE); expansion and growth (EG); product innovation (PI); environmental dynamism (ED); firm performance (FP); return on equity normalized (ROEN)

[b] The names of the items correspond to the way they are labeled on their measurement scales

[c] AVE: average variance extracted

[d] HTMT: heterotrait-monotrait

Table 7 Study 1: discriminant validity profitability model - empirical generalization - Fornell and Larcker (1981)

	BC	ED	EG	IN	PR	PI	RT	TE
BC [a]	**0,7959** [b]							
ED	0,0526	**0,7884**						
EG	0,4379	0,3170	**0,8250**					
IN	0,6334	0,2059	0,6237	**0,8399**				
PR	0,5774	0,1090	0,5207	0,6072	**0,8885**			
PI	0,7383	0,1662	0,5930	0,6597	0,5557	**0,8273**		
RT	0,5730	0,1857	0,5652	0,5606	0,6053	0,5885	**0,9007**	
TE	0,3416	0,2569	0,6208	0,5390	0,5734	0,5438	0,5872	**0,8379**

[a] Business creation (BC); environmental dynamism (ED); expansion and growth (EG); innovativeness (IN); proactiveness (PR); product innovation (PI); risk-taking (RT); technological entrepreneurship (TE).

[b] Diagonals (bold) represent the square root of the average variance extracted (AVE), while other entries represent the correlations.

Table 8 Study 1: discriminant validity growth model - empirical generalization - Fornell and Larcker (1981)

	BC	ED	EG	IN	PR	PI	RT	TE
BC [a]	**0,7959** [b]							
ED	0,0588	**0,7701**						
EG	0,4379	0,2302	**0,8250**					
IN	0,6334	0,1729	0,6237	**0,8399**				
PR	0,5774	0,0816	0,5207	0,6072	**0,8885**			
PI	0,7384	0,1693	0,5929	0,6597	0,5556	**0,8273**		
RT	0,5730	0,1490	0,5653	0,5606	0,6053	0,5885	**0,9007**	
TE	0,3416	0,2466	0,6208	0,5390	0,5734	0,5437	0,5872	**0,8379**

[a] Business creation (BC); environmental dynamism (ED); expansion and growth (EG); innovativeness (IN); proactiveness (PR); product innovation (PI); risk-taking (RT); technological entrepreneurship (TE).

[b] Diagonals (bold) represent the square root of the average variance extracted (AVE), while other entries represent the correlations.

endogenous variable are typically weak. Figures 3 and 4 depict the structural equation models (SEMs) for the profitability and growth models, respectively.

Discussion

The original article by Ambad and Abdul Wahab (2017) reported a positive and significant relationship between EO [RT, IN, PR] and firm profitability but not with firm growth. Further, they found a positive and significant relationship between CV

Table 9 Study 2: discriminant validity - HTMT ratio - generalization and extension analysis

	AU	AG	BC	ED	EG	FP	IN	PR	PI	RT	TE
AU [a]											
CA	0,4952										
BC	0,5550	0,7567									
ED	0,1605	0,1234	0,1451								
EG	0,4768	0,3565	0,5064	0,3929							
FP	0,3690	0,2962	0,2515	0,5717	0,2482						
IN	0,5023	0,4824	0,7369	0,2671	0,7252	0,2622					
PR	0,6346	0,5081	0,6498	0,1687	0,5925	0,1886	0,6864				
PI	0,4834	0,5079	**0,8675**	0,2594	0,6933	0,5255	0,7780	0,6315			
RT	0,7329	0,5712	0,6587	0,2323	0,6461	0,1923	0,6437	0,6715	0,6758		
TE	0,6733	0,3922	0,4394	0,3876	**0,8683**	0,3140	0,7370	0,7445	0,7448	0,7971	

[a] Autonomy (AU); competitive aggressiveness (CA); business creation (BC); environmental dynamism (ED); expansion and growth (EG); firm performance (FP); innovativeness (IN); proactiveness (PR); product innovation (PI); risk-taking (RT); technological entrepreneurship (TE).

HTMT values > 0,85 are in boldface.

and firm growth but not with profitability. They also found that ED moderates the relationship between EO and profitability as well as between CV and firm growth.

One of the most significant strengths of Ambad and Abdul Wahab's (2017) study is that it was one of the first to investigate the impact of EO and CV on the performance of large firms in emerging economies simultaneously. However, a weakness of their study is that they did not report confidence intervals, which provide additional information about the stability of a coefficient estimate (Hair et al. 2017). Confidence intervals are generated using bootstrap methods (Henseler et al. 2009) and represent a range in which the true population parameter will lie, assuming a certain confidence level (e.g., 95%). If the confidence interval for an estimated coefficient does not include zero, it can be assumed that a significant effect exists (Hair et al. 2017). "Reporting of the bootstrapping confidence interval is less common despite their value-added but is likely to increase in the future" (Hair et al. 2017, p. 197).

The main findings of our research revealed a highly positive impact of EO [RT, IN, PR] on profitability as well as a highly negative impact of CV on profitability. Regarding the growth model, the study shows a positive but statistically insignificant impact of EO on the firm's growth as well as a negative but statistically insignificant impact of CV on the firm's growth. Finally, this research revealed that ED did not have a moderating effect on the EO–firm profitability relationship or on the CV–firm growth. The result of the relationship between EO [RT, IN, PR] and firm profitability is consistent with the research of Ambad and Abdul Wahab (2017) and other studies that corroborate a positive relationship between those variables (e.g., Hakala 2013; Kemelgor 2002; Moreno and Casillas 2008; Miller and Friesen 1983; Miller et al. 1988; Zahra 1993; Antoncic 2007; Lumpkin and Dess 2001). Furthermore, consistent with the findings of Ambad and Abdul Wahab (2017) and other

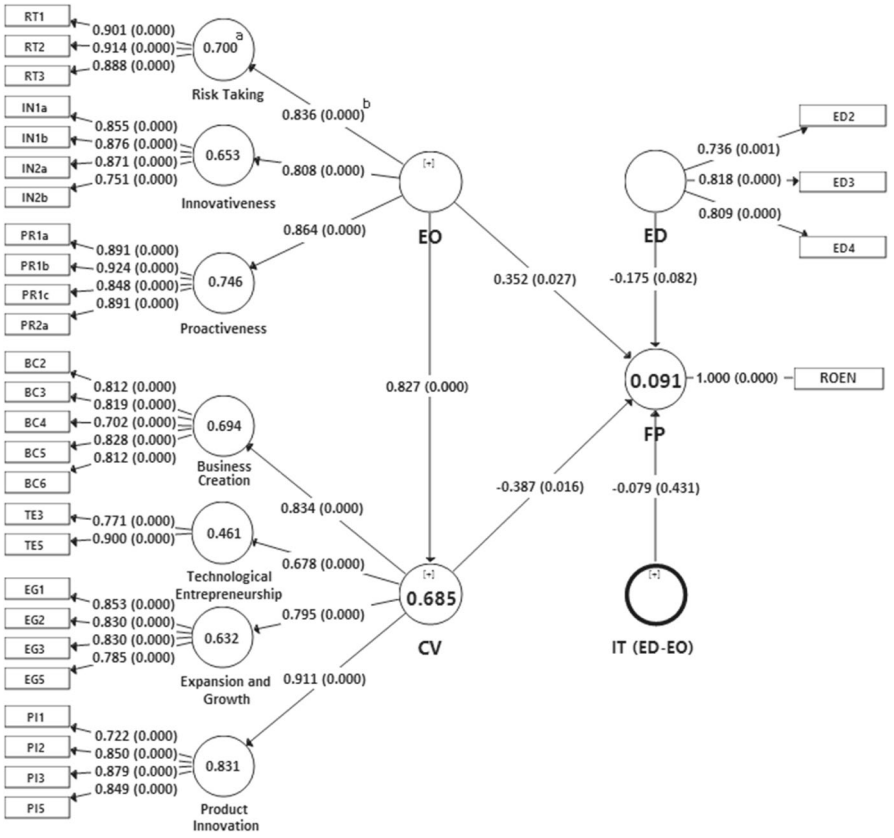


Fig. 3 SEM moderating effect of ED on EO and ROEN. a: coefficient of determination (R^2); b: loadings (p-value); RT: risk taking; IN: innovativeness; PR: proactiveness; BC: business creation; TE: technological entrepreneurship; EG: expansion and growth; PI: product innovation; EO: entrepreneurial orientation; CV: corporate venturing; ED: environmental dynamism; FP: firm performance; IT: interaction term; ROEN: return on equity normalized

previous research (Karacaoglu et al. 2012; Zahra and Garvis 2000), this study also reveals that CE in large firms has significant effects on firm profitability.

It is noteworthy that our replication results indicated a negative and significant relationship between CV and profitability, which contradicts the results of Ambad and Abdul Wahab (2017). A possible explanation for this result, as well as the discrepancy with the original study, is that if a company has a relatively high investment in CV, it may cause a decrease in short-term profitability. This is due to the costs of acquiring new companies, mergers, and alliances as well as financing new companies (Zahra and Garvis 2000).

On the other hand, our research results regarding the moderating effect of ED on the relationship between CE and FP present discrepancies with the results of the original study by Ambad and Abdul Wahab (2017). While the original study found that ED exerts a positive moderating effect between EO and profitability as well as CV and firm growth, our study cannot statistically corroborate those

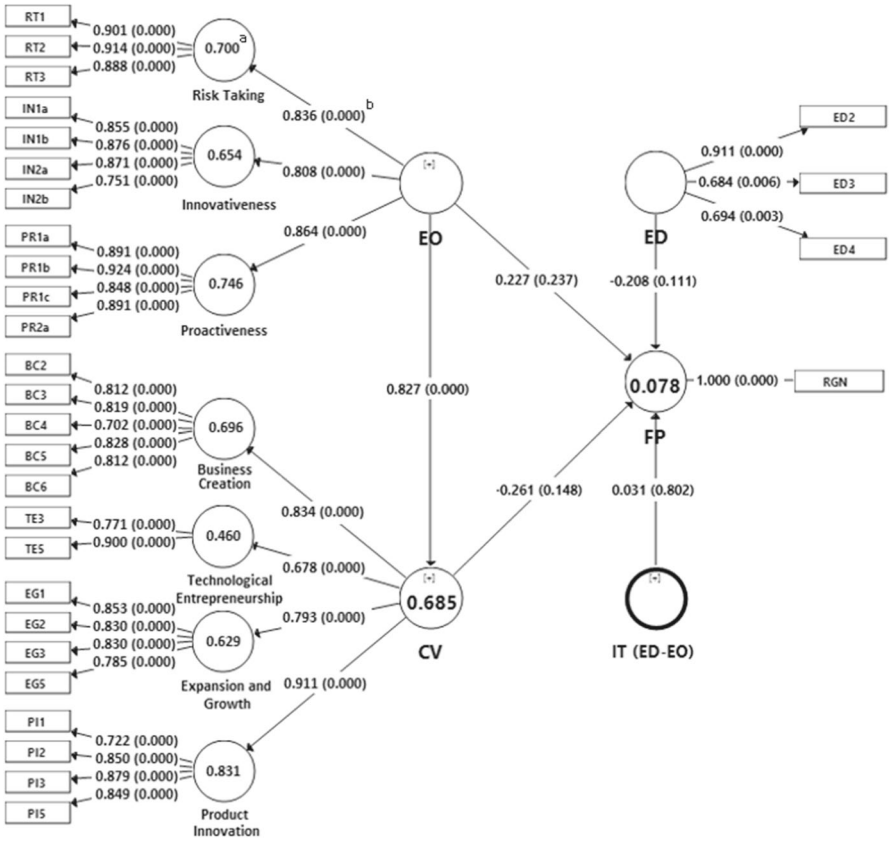


Fig. 4 SEM moderating effect of ED on EO and RGN. a: coefficient of determination (R^2); b: loadings (p-value); RT: risk taking; IN: innovativeness; PR: proactiveness; BC: business creation; TE: technological entrepreneurship; EG: expansion and growth; PI: product innovation; EO: entrepreneurial orientation; CV: corporate venturing; ED: environmental dynamism; FP: firm performance; IT: interaction term; RGN: revenue growth normalized

results. While the results of Ambad and Abdul Wahab (2017) are consistent with the studies of Zahra and Covin (1995) and Narayanan et al. (2009), which corroborated the moderating effect of ED on the relationship between CV and FP, our results are consistent with Kim and Kim's (2016) study, which found that "[…] ED had no significant effect on the EO-FP relationship (ß = 0.206, n.s.)" (p. 7). It is also consistent with Zhang's (2009) study, which found that ED did not have a moderating effect on the relationship between the EO of 143 subsidiaries of multinationals in China and their FP. On the other hand, the results of our study reaffirmed those of Frank et al. (2010) and Wiklund and Shepherd (2005), who stated that the moderating effect of ED on the relationship of EO–FP was not significant.

When companies find themselves in a highly uncertain and unpredictable environment, they must have a greater orientation toward entrepreneurship to increase

their profitability (e.g., Hakala 2013; Kemelgor 2002; Moreno and Casillas 2008; Miller and Friesen 1983; Miller et al. 1988; Zahra 1993). However, according to Miller (1983), large companies that tend to operate in heterogeneous and dynamic environments where customer preferences, technologies, and competitor strategies change unpredictably, like the SCBG's, are organic firms. Organic firms adapt their levels of entrepreneurial activity to the demands of the business environment, take advantage of the experience of their managers in heterogeneous environments to identify new business opportunities, and respond deliberately to the challenges of the business environment using their organizational structure, which is crucial (Miller 1983). Given the above, it is surprising that we were not able to confirm the moderating effect of ED on the relationship between CE and FP.

Taking into account the results obtained, it is not possible to extrapolate the findings to different countries, even if their contexts appear to be similar (Wales et al. 2021; Covin and Slevin 1989).

Conclusion

Main results

The purpose of this paper is to understand the relationship between CE and FP of large firms in Colombia, an emerging economy, under the moderating effect of ED. Therefore, this article aims to answer the following questions: Is there a relationship between EO and FP, and if so, is this relationship moderated by ED? Is there a relationship between CV and FP, and if so, is this relationship moderated by ED? The results are somewhat different from those of Ambad and Abdul Wahab (2017), but an agreement was found in five of the eight outcomes. The main findings of this research revealed a highly positive and statistically significant impact of EO on profitability, as well as a highly negative and statistically significant impact of CV on profitability. Regarding the growth model, a positive but statistically insignificant impact of EO was shown on the firm's growth, and a highly negative but statistically insignificant impact of CV was shown on the firm's growth. Finally, this research revealed that ED did not have a moderating effect on the relationship between EO and firm profitability or on the relationship between CV and firm growth. From this study, we can learn that the impact of CE on the performance of large companies or business groups depends on the contingencies associated with each context. Therefore, the results cannot be extrapolated between different countries, even if their contexts seem to be similar (Wales et al. 2021; Covin and Slevin 1989). In addition, this study confirms the positive relationship between EO and corporate profitability, particularly for large companies and business groups.

Theoretical implications

The results are consistent with the RBV theory (Barney 1991), as they support the positive relationship between EO and FP. An adequate configuration of resources

and capabilities, which depends on the firm's EO (Wales et al. 2021; Wiklund and Shepherd 2003), leads to innovative environments for both new products and new business units. As Anderson and Eshima (2013) stated, EO is related to all the components of the VRIO framework, which is "a valuable, rare, and inimitable organizing gestalt through which firms are able to generate competitive advantage" (p. 417). Additionally, the dynamic business environment of SCBGs leads companies to embark on innovative projects such as portfolio diversification through the development or acquisition of new business units. This process involves learning and developing new competitive advantages (Barney 1991), which are necessary for CE as it is a predictor of FP (Rauch et al. 2009).

Practical implications

The paper has significant implications for senior management decision-making regarding the importance of CE in the growth and profitability of companies. The results are supported by a meta-analysis, which suggests that EO is a significant predictor of FP (Rauch et al. 2009). Therefore, it is recommended that SCBGs invest in EO to increase their company's profitability. This study used Lumpkin and Dess's (1996) EO construct, which includes two additional dimensions (CA and AU) with the five independent dimensions. The results suggest that these two dimensions are part of the construct and behave in the same direction in the sample studied. This finding did not significantly affect the load balance of the model or the R^2 of the dependent variable (see Tables 4 and 5).

Considering that CE is relatively new in Latin America (Prats and Siota 2018; Kantis 2018; Kantis and Angelelli 2020), this research encourages SCBGs to focus on developing resources and capabilities that enable them to formulate better CE strategies and become more competitive. Improved CE strategies can provide benefits such as new knowledge beyond firm boundaries (Schildt et al. 2005), which is necessary for continuous innovation and value creation (Covin et al. 2018; Narayanan et al. 2009). From the perspective of the RBV theory (Barney 1991), it is possible that SCBGs may have more resources and capacities oriented toward production and efficiency for planning companies (Miller 1983) but fewer resources and capacities to monitor signals from the environment such as customer tastes and needs, competitor strategies, and technological changes. Moreover, this research's results can contribute to answering questions about international entrepreneurship given the strong relationship between CE and IE (Pirhadi and Feyzbakhsh 2021; Etemad 2022). This study confirms Wales et al.'s (2021) and Covin and Slevin's (1989) arguments that the impact of EO on FP depends on the contingencies associated with each context and cannot be linearly extrapolated between countries, even if their contexts are similar.

Originality of the study

Although this study is a replication and extension of Ambad and Abdul Wahab's (2017) research, it is important to highlight this study's novelty in that it contributes to filling the gap in the literature on the relationship between CE and FP in large companies in

emerging countries, such as Colombia, where this topic has scarcely been explored (Kantis and Angelelli 2020; Prats and Siota 2018). The contextual conditions are quite different from those of developed countries (Kelley et al. 2016), and large companies face different challenges than small companies due to their different organizational designs and management styles; this is respectively described as simple, planning, and organic firms (Miller 1983). On the other hand, considering that according to Urbano et al. (2022) there are few studies on CE that use hierarchical linear modeling or similar methodologies, another contribution of this study is the application of PLS-SEM. Regarding the validity and reliability of the measurement and structural model, this study used the confidence interval criterion, which was not used in the original research. "Reporting of the bootstrapping confidence interval is less common despite their value-added but is likely to increase in the future" (Hair et al. 2017, p. 197).

Limitations and future lines of investigation

The primary challenge of this study was consolidating valid survey data due to the specificity of the target population, which consists of the largest business groups in Colombia. Out of the 700 responses received, only 202 strictly met the inclusion criteria. Additionally, while the financial data of the business groups were obtained from the Emerging Markets Information Service database, it was challenging to triangulate the data at the business group level to ensure its accuracy.

This study has identified new research avenues associated with EO and CV and changing environmental conditions such as new and disruptive technologies, the internationalization of firms, and knowledge as a basis for new business development. The disruption of business environments due to technological changes presents a significant challenge for established companies, making it crucial for scholars and practitioners to understand how these changes can be navigated through business behaviors and CE. Since large companies and business groups require considerable efforts for their internationalization, future research could explore how to increase the positive impacts of EO to create or identify internationalization opportunities (Etemad 2022). Furthermore, due to the threats posed by traditional competencies that force companies to continuously learn about new technologies, processes, and market opportunities, future research could integrate disruptive ideas from the literature associated with CV (e.g., Covin et al. 2018) and knowledge-based theories (e.g., Carayannis and Campbell 2012) that enable organizations to cope with dynamic global environments.

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Data availability The data that support the findings of this study are available from the corresponding author upon request.

Declarations

Competing interests The authors have no relevant financial or non-financial interests to disclose.

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