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ORIGINAL ARTICLE

Influence of organizational configurations on startup performance

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ABSTRACT

This article aimed to investigate the influence of organizational configurations on startup performance. The gap addressed by the article involved analyzing factors simultaneously, considering the possibility of equifinality with regard to the understanding about startup performance. A survey was conducted of 112 southern Brazilian startups. To compose the configurations, the cluster analysis technique was used. The chi-squared and covariance analysis (ANCOVA) tests were used to identify the effect of organizational configurations on startup performance. The results reinforced the assumptions of the configurational approach, highlighting the relationship of interdependence of imperatives in explaining organizational performance. The main distinctive characteristics of the three startup configurations found were: size; characteristics of the information from the management control system (MCS); entrepreneurial orientation (EO); cost leadership strategy (CLS); acceleration; and entrepreneurial source of investment (ESI). The results showed that differences in the characteristics of the information from the MCS and in the level of EO represent a deviation from the ideal configuration and are related with a drop in performance. The paper extends the knowledge on the imperatives investigated for the context of startups and on how these interact to compose the configurations. The results were shown to be relevant in explaining performance, corroborating the idea of equifinality, in which two distinct configurations presented similar performance. By analyzing the configurations that presented the best performance, managers can evaluate in which configuration they find themselves so as to guide actions to improve the startup success rate.

Keywords: startups, organizational configuration, organizational performance, management accounting.

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1. INTRODUCTION

The startup environment is characterized by a high degree of dynamism, flexibility, and uncertainty and requires innovative and scalable business models that go beyond what is commonly achieved by traditional businesses, governments, communities, and civil society organizations (Bhimani, 2018; Magaldi & Salibi, 2018). Despite many emerging with good ideas and their importance for economic development (Halabí & Lussier, 2014; Paoloni & Dumay, 2015), startups present high mortality rates in their first years of existence (Arruda et al., 2015; Startup Genome, 2011).

Many interconnected elements can explain the difference in performance between startups (Mintzberg et al., 2000), such as aspects of the individuals, the organizations, and the environment that adjust to and reinforce each other, creating optimal sets of characteristics that generate high performance levels (Flaherty et al., 2014). That process of interaction and interdependence between the aspects of an organization characterizes the configurational approach (Miller & Friesen, 1984b; Miller, 1986b, 1987).

The configurational approach promotes a view of organizations as clusters of interconnected structures and practices (Fiss, 2007) in which effectiveness is attributed to the internal consistency among the relevant patterns of context, structure, and strategic factors (Ketchen et al., 1993). The crux of distinctive competency and competitive advantage not only lies in having specific organizational resources or skills, but also in the structuring of integrative mechanisms that ensure complementarity between the various aspects of a company (Miller, 1986b).

Samagaio et al. (2018) and Crespo et al. (2019) used that approach to analyze startup characteristics and their relationship with management control system adoption. In the startup literature, various factors have been used to explain organizational performance (Cacciolatti et al., 2020; Cassar, 2014; Crespo et al., 2019; Davila & Foster, 2005, 2007; Konno, 2015; Lewrick et al., 2011; Miranda et al., 2016; Plummer et al., 2016; Shirokova et al., 2016), but those studies use models that test, in a reductionist way, the association of some variables with performance. One of the main weaknesses of the studies on control systems is their examination of one or two variables in isolation (Flaherty et al., 2014).

In addition to that, the concept of equifinality is an important factor for characterizing the configurational approach (Fiss, 2007). The equifinality assumption is that two or more organizational configurations can be equally effective for achieving different performance levels (Gresov & Drazin, 1994; Miller, 1987).

In light of the above, it is verified that the configurational approach can help to understand, in a holistic way and using various factors at the same time, their impact on performance, even when considering different performance levels. For that reason, it is understood that analyzing factors simultaneously, considering the possibility of equifinality, represents a gap with regard to the understanding about startup performance. Within this context, the aim was investigate the influence of organizational configurations on startup performance.

According to studies that have examined startup performance and small ventures (Crespo et al., 2019; Damke et al., 2018; Davila & Foster, 2005, 2007; Hyytinen et al., 2015; Maciel et al., 2008; Miranda et al., 2016; Wiklund & Shepherd, 2005), the imperatives investigated were: characteristics of the information from the management control system (MCS); differentiation strategy (DS); cost leadership strategy (CLS); entrepreneurial orientation (EO); traditional source of investment (TSI); entrepreneurial source of investment (ESI); acceleration process; age; and size.

The results of the investigation offer three main theoretical contributions. First, this study advances by jointly analyzing elements within the context of startups and the interaction between these to constitute configurations, highlighting the main distinctive characteristics of each configuration. Three configurations were found in which the main distinctive characteristics were size, MCS, EO, CLS, acceleration, and ESI.

Second, the results reinforced the concept of equifinality by highlighting similar levels of performance between two configurations found (Fiss, 2007). It was revealed that differences in the cost leadership strategies and in fundraising, when controlled by the startup life cycle, were not enough to have an impact on performance.

Third, it was shown that differences in the MCS and in the level of EO can be considered a deviation from the ideal configuration and can explain a drop in performance. Managerial information (Crespo et al., 2019; Davila & Foster 2005) and entrepreneurial capacity (Lewrick et al., 2011) are important factors for achieving good performance within the context of startups.

2. THEORETICAL FRAMEWORK

2.1 Configurational Approach and Imperatives

The configurational approach sustains that each variable (imperative) is analyzed in the context of other variables that may be related with it (Fiss, 2007; Harms et al., 2007). The configurational approach suggests a clear break from the predominant (contingent) linear paradigm (Fiss, 2007). The (Cartesian) contingent approach breaks a company's system down into elements that can be examined independently (Fiss, 2007; Gerdin & Greve, 2004).

In the configurational approach, key organizational attributes tend to group together to form configurations (Ketchen et al., 1993; Maciel et al. 2009). The configuration is formed by the reciprocal and non-linear interaction process of those imperatives that produce interactions between and complement each other (Miller & Friesen, 1984b; Miller, 1986b, 1987; Mintzberg et al., 2000). These configurations describe organizations, revealing their complex, gestaltic, and systemic nature (Miller & Friesen, 1984b).

The alignment of those attributes can help to predict/explain performance. Empirical evidence has reinforced the assumptions of the configurational approach that the interdependence relationships of the variables can operate in a multidimensional way with the potential to generate effects over organizational performance (Bispo et al., 2016; Carraro et al., 2020; Damke et al., 2018; Fiss, 2007; Frare et al., 2021, forthcoming; Maciel et al., 2008; Shirokova et al., 2016; Wiklund & Shepherd, 2005).

Another important point is equifinality. Its premise is that two or more organizational configurations can be equally effective for achieving different performance levels, even if faced with the same contingences (Gresov & Drazin, 1994; Miller, 1987).

Based on organizational theory, Miller (1987) suggests four classic imperatives: environment, structure, leadership, and strategy. However, he states that the configurations proposed and their relationships are illustrative, not final or exhaustive, concluding that the configurational literature lacks a search for the imperatives that form the configurations (Miller, 1986a, 1986b).

The imperatives chosen need to be capable of presenting distinct characteristics between startups to have the potential for differentiation between them and, also, a relationship with performance. If there is a lot of similarity between the variables chosen, it will be hard to distinguish between the groups. Based on previous studies (Bhimani, 2018; Crespo et al., 2019; Frare et al., 2021, forthcoming; Samagaio et al., 2018), this paper identified organizational configurations based on the EO, strategy, MCS, source of investment, acceleration process, age, and size variables.

2.1.1 Entrepreneurial orientation (EO)

EO consists of capturing specific entrepreneurial aspects of decision-making styles, methods, and practices (Lumpkin & Dess, 1996; Wiklund & Shepherd, 2005). Entrepreneurship has been accepted as a company-level phenomenon that warrants academic attention, given the relevance for organizations, independently of size or time in existence (Brown et al., 2001). EO is among the most studied topics in research in the management area (Covin & Wales, 2019; Martens et al., 2016; Wales, 2016; Wales et al., 2011; Wales et al., 2019) and essentially contemplates the elements of innovativeness, proactivity, and risk taking (Brown et al., 2001; Maciel et al., 2008; Wiklund & Shepherd, 2005).

A high EO is considered important for companies, in order to seek new opportunities (Rank & Strenge, 2018; Wales et al., 2013). In a constantly changing business environment, companies tend to be more entrepreneurial and innovative and seek a competitive advantage to differentiate themselves from their rivals and create a sustainable position in the market (Shirokova et al., 2016).

The empirical research indicates that EO has a positive influence on organizational performance (Basco et al., 2020; Galbreath et al., 2020; Shirokova et al., 2016). However, there is a gap in the literature regarding the importance of EO resources in startups (Kee & Rahman, 2018), with evidence that EO can increase the performance of those ventures in certain contexts (Frare et al., 2021, forthcoming; Migliori et al., 2019; Vaznyte & Andries, 2019). The empirical evidence sustains the proposition that the effect of EO on performance varies between different types of external environments (Brush et al., 2001). That is, it is believed that companies that operate in dynamic conditions benefit from a high EO (Gupta & Pandit, 2013; Lumpkin & Dess, 2001).

2.1.2 Strategy

According to Porter (2009), strategy is the mutual compatibility and integration between company activities. The strategic dimension chosen for this study was strategic positioning, which reflects the way the company competes in the market (Porter, 1989). Strategic positioning distinguishes three generic strategies that enable the company to obtain a sustainable competitive advantage (Porter, 1989): cost leadership, differentiation, and focus. Based on the study of Samagaio et al. (2018), in this study we chose the first two.

Cost leadership implies obtaining the lowest cost compared with the competition and the source of competitive advantage can result from factors such as economies of scale and scope, access to favorable raw materials, and superior technology that ensures a low cost (Cinquini & Tenucci, 2010; Langfield-Smith, 2007; Porter, 1989). Differentiation focuses on supplying products with attributes highly valued by their customers, and the source of that competitive advantage can result from factors such as quality, reliability, brand image, product design, after-sales service, installations, and retail (Cinquini & Tenucci, 2010; Langfield-Smith, 2007; Porter, 1989).

2.1.3 Characteristics of the information from the MCS

Bhide (2000) comments that management accounting can hinder the development of innovative businesses. However, studies have pointed in the opposite direction, in which the results have indicated the importance of the MCS for startup growth and value (Carraro et al., 2020; Davila & Foster, 2005, 2007; Davila et al., 2014; Frare et al, 2021, forthcoming; Pavlatos & Kostakis, 2021). In addition, a mutual cooperation relationship occurs between growth and MCS adoption (Davila & Foster, 2005, 2007; Sandino, 2007).

The fact that most startups are small-sized businesses naturally affects the structure/condition of the MCSs and the need for their sophistication. The resources for financial reporting and analysis activities may be very limited, which is typical of small businesses in general. However, this should not be generalized in the case of startups, in which there are also other important factors for the development of the control system, such as the requirements established by venture capitalists and, subsequently, by the stock market (Granlund & Taipaleenmäki, 2005).

Samagaio et al. (2018) used the configurational approach to understand the association of some contingent variables with MCS adoption in Portuguese high-tech startups; the analysis showed four configurations, three with equifinal solutions. Carraro et al. (2020) verified that, to obtain high performance, management control, tools, or practices were needed in the following analysis categories: clients, strategy, information systems, performance, risks, and budgeting.

Frare et al. (2021)(forthcoming) highlighted that cultural and planning controls were the only elements of the MCS included in all the MCS packages of high performance startups. They also discovered that EO has a positive influence on startup performance through the MCS package.

The information characteristics were initially presented by Chenhall and Morris (1986) and refer to four variables: scope, timeliness, aggregation level, and integration level. This research studied scope. Due to the context, size, and structure of these organizations (as previously elucidated), we understood that it was not necessary or viable to investigate the other variables, given the greater complexity of the existence of those aspects and even their relevance in the setting of the companies studied.

Scope has three subdimensions: focus – internal or external events, quantification – information measured in financial or non-financial terms, and time horizon – information related to historical or future events (Bouwens & Abernethy, 2000; Chenhall & Morris, 1986). Based on these three variables, the MCS can be identified as having a limited, average, or wide scope (Bouwens & Abernethy, 2000; Chenhall & Morris, 1986).

2.1.4 Source of investment (type of investor)

Investment is essential to drive startup growth and, therefore, it can be considered a critical factor for the success of that business model (Cacciolatti et al., 2020; Plummer et al., 2016). The search for entrepreneurial strategies, innovation, and high performance entails a major need for financial resources (Wiklund & Shepherd 2005). Similarly, Konno (2015) indicates access to financial capital as a factor that influences startup success, stating that those that manage to raise funds are more likely to survive.

In line with previous studies (Davila & Foster, 2007; Samagaio et al., 2018; Sandino, 2007), sources of investment are divided into traditional (TSI) and entrepreneurial (ESI). TSI are known for being personal investments, or onerous sources of capital (for example, loans from financial institutions) that are characterized

as debt for the company. ESI are mostly characterized as giving control rights over the company invested in (shareholder participation) and are also classified as risk investments (venture capital).

Davila and Foster (2007) indicate that companies supported by venture capital grow faster than companies that are not. That difference may derive from the acquisition of the management experience, network, and financial resources of an investor. Also, in an environment of scarcity of investments, only organizations with greater growth potential manage to obtain third-party investments.

2.1.5 Acceleration process

The acceleration process is presented as an objective measure of the market with regard to startup performance. For the startup to be accelerated or incubated it undergoes a selection process and competes in a public notice process with other startups.

Accelerators have been shown to be fundamental for startup growth. They offer, through a structured and time-limited process, a series of services geared toward startup evolution, such as mentoring, training, physical infrastructure, support services, market access opportunities, as well as financial capital injections, from them or from a network of investors (Cohen, 2013; Pauwels et al., 2015; Radojevich-Kelley & Hoffman, 2012).

Otley (2016) indicates that understanding the context that affects MCS adoption is fundamental. In the context of startups, accelerators, incubators, and technology parks can significantly contribute to understanding MCS adoption (Davila, 2019).

2.1.6 Age and size

Age and size represent measures of development, maturity, and survival of these ventures (Bhimani, 2018; Halabí & Lussier, 2014; Lewrick et al., 2011). The time of the venture and size were measured, respectively, by the year the startup was founded and by the number of employees.

Arruda et al. (2015) show that 50% of startups die within four years or less and the research conducted by Startup Genome (2011), with 3,200 startups, highlights that 92% of those ventures failed. The high mortality rate experienced in the first years of these ventures reinforces the idea that time and size represent measures of development, maturity, and survival of that business model.

2.2 Startup Performance

Performance measurement is the process by which the efficiency of past actions and the success of companies are quantified (Kennerley & Neely, 2002). The measurement can occur in various ways, including financial and non-financial aspects (Miranda et al., 2016). Considering that a startup is a temporary organization (Blank & Dorf, 2014) that operates in an environment of many uncertainties, the main performance indicators should not primarily be financial, but rather concern the achievement of objectives or expectations regarding the product and market (Cassar, 2014; Ries, 2011).

Startup performance can be measured through objective and subjective measures. In this study, both forms were used. First, in accordance with previous studies, perceived performance was evaluated based on the managers' perception regarding the achievement of the objectives (Cassar, 2014; Crespo et al., 2019; Miranda et al., 2016), this being measured in comparison with the competition and in relation to the general performance of the startup itself.

Objective performance was measured according to the context of the startups, using the variables organizational life cycle (OLC) and receipt of certification or awards. Startups are founded with the aim of being scalable businesses, therefore, the OLC can be used to measure performance objectively, as it represents the evolution of these ventures, from the moment the organization is merely testing/validating its idea/hypothesis (ideation) to the moment in which it is already receiving investments and seeking to internationalize its operations (scaleup).

Using the OLC as a measure of performance is intrinsically related to the own characteristics and objectives of startups, which disassociate them from a traditional business model (Blank, 2013; Blank & Dorf, 2014; Ries, 2011). A startup is an organization geared toward rapid growth, that is, scalability (Ries, 2011), which operates through the search for and construction of a business model (Blank & Dorf, 2014). These characteristics associate it with a temporary horizon; once the business model is found, validated, and scaled, the startup becomes a corporation (Blank & Dorf, 2014; Ries, 2011).

The process of startups receiving some award or certification is presented as validation and/or recognition from society or organizations from the startup ecosystem. The award, or certification, represents the external recognition of these ventures and their innovative ideas, informing the market of the most attractive startups.

3. METHODOLOGICAL PROCEDURES

3.1 Research Types, Sample, and Data Collection

To fulfill the objective of the paper, we conducted a cross-sectional quantitative study. The data collection method used was the survey. The research is exploratory, since with the analysis of all the factors simultaneously and possible equifinality expected, no hypotheses were established *a priori*.

The study population was startups from the south of Brazil registered in the database of the Brazilian Startups Association (Abstartups) called Startupbase. Startupbase is the biggest Brazilian database of startups and, in October of 2019, it included a total of 9,850 registered companies (Abstartups, 2019). The limitation to southern Brazilian startups was due to the viability criterion, since all the companies in the population were contacted and invited to participate in the research.

Besides the regional delimitation, we also discarded startups that were in the ideation phase, that is, in the initial phase of the life cycle. The ideation phase involves the activities of identifying and validating the opportunities and the business model. Companies in this phase are still searching for a business model and, therefore, it would make no sense to evaluate performance or question them about their business strategies. Thus, the research population is formed of southern Brazilian startups in the operation, traction, and scaleup phases.

Initially, 800 startups in this condition were found in the database. Some inconsistences were observed in the data collection, leading to a reduction in the population. For example, there were registered companies that were not characterized as startups or were deactivated and others with the wrong registration and that were in the ideation phase or did not belong to the South region of Brazil. In the end, a population of 702 startups was reached, 238 being from the state of Paraná, 232 from Santa Catarina, and 232 from Rio Grande do Sul. For the data collection, a structured online questionnaire was used. The research instrument elaborated is composed of 34 questions.

For the data collection, we first searched in Startupbase for information about the startups, such as the institutional website, Facebook page, LinkedIn page, telephone number, email address, and chief executive officer (CEO). Second, we sent a cover letter to the institutional contacts of the startups or the CEOs inviting them to take part in the research. After acceptance, we sent the link to complete the structured questionnaire. The data collection period ran from November of 2019 to January of 2020.

In total, 112 valid answers were obtained, representing a response rate of roughly 16%. We considered as valid the answers received from the owners or employees who held the positions of CEO, manager, or administrator, that is, professionals who had a sufficient role in and/or knowledge of the organization.

3.2 Measurement of the Variables

As discussed, the imperatives analyzed were: MCS, DS, CLS, EO, TSI, ESI, acceleration process, age, and size. MCS, DS, CLS, EO, TSI, and ESI were measured based on seven-point Likert-type scales. MCS refers to the focus (internal and external), to the quantification (financial and non-financial), and to the time horizon (historical and future) of the information (Chenhall & Morris, 1986). To measure it, six items based on Frezatti et al. (2012) were used. CLS and DS were measured based on Crespo et al. (2019) with two and three items, respectively. EO was measured in terms of innovativeness, proactivity, and risk taking with five items based on Covin and Slevin (1989).

With relation to the sources of investments, in line with previous studies (Davila & Foster, 2007; Samagaio et al., 2018; Sandino, 2007), we verified the degree of use of the TSI and ESI types. TSIs were personal reserves of the partners and/or family members, bank loans, and economic subsidies [public investment such as through the Funding Authority for Studies and Projects (Finep)]. ESIs were angel investments, venture capital, accelerators, crowdfunding (collective investment), and seed capital.

The acceleration processes, age, and size were measured objectively and consisted of a dichotomous variable in which the respondent signaled whether the startup had already undergone an acceleration round or not or had been incubated. Time of existence was measured by the year the startup was founded and size by the number of employees (Deutscher et al., 2016; Frank et al., 2010; Maciel et al., 2008; Shirokova et al., 2016; Wiklund & Shepherd, 2005).

Startup performance was measured objectively and subjectively. Considering the context of major uncertainty, high exposure to risks, and high startup mortality rates and that these ventures are founded with the aim of becoming scalable businesses (Arruda et al., 2015; Picken, 2017), we chose to measure performance objectively using the phase of the OLC. The startups were categorized into the following phases: operation (search for clients), traction (growth and fundraising), and scaleup (consolidation of growth) (Abstartups, 2019). We also sought to identify whether the startups had received some type of

certification or external award that validates the perception of performance. This variable is dichotomous (yes = 1, no = 0) and considered the receipt of any type of award or certification.

For subjective performance, the respondents evaluated the startup's performance in relation to the competition based on a seven-point Likert-type scale (1 to 7) taken from Crespo et al. (2019). The perception of performance is relevant in comparison with real performance, as it more strongly directs managerial decisions (Spyropoulou et al., 2018). The correlation test revealed a significant and positive degree of association with the acceleration process (r = 0.27; p < 0.01) and with the scaleup OLC phase (r = 0.23; p < 0.05), supporting the use of these measures to gauge performance (Vij & Bedi, 2016).

3.3 Measurement Properties of the Research Variables

One concern with studies of a cross-sectional nature is the presence of common method bias, a measurement error that can invalidate the conclusions of the study regarding the relationships between the variables (Podsakoff et al., 2012).

To control its effects, some procedures were adopted prior to and after the data collection, as proposed by Podsakoff et al. (2012). First, the questionnaire was subjected to a pre-test, as a way of improving the scales, eliminating ambiguities, and adjusting the content to the sample. Second, despite all the scales being seven-point scales, we altered the way they were anchored. For example, the EO items were anchored in 1 (low intensity) and 7 (high intensity), while the strategy items were anchored in 1 (without effect) and 7 (large effect). Third, the questionnaire was structured with physical and psychological separation between the scales, with each one being presented in a separate section of items and preceded by a sentence or paragraph explaining the nature of the respective construct. Fourth, the scales were subjected to Harman's single factor test, in accordance with previous studies (Demartini & Otley, 2019; Müller-Stewens et al., 2020). The exploratory factor analysis considering a single factor revealed only 32.7% explained variance, enabling us to conclude that a single factor has little power in explaining the data.

To determine the normality of the data, we conducted asymmetry and kurtosis tests. The maximum values found were 1.19 and 2.22, respectively, enabling us to assume data normality (Marôco, 2010). Next, validity and reliability tests were conducted. First, the exploratory factor analysis revealed that all the items presented significant factor loadings in their respective dimensions (λ > 0.50). The Kaiser-Meyer-Olkin (KMO = 0.760) and Bartlett sphericity test ($\chi^2_{Barlett}$ = 606.5, p < 0.001) measures revealed the adequacy of the factor analysis (Fávero & Belfiore, 2017).

Second, based on the factor loadings, the average variance extracted (AVE) value was calculated. The values were higher than 0.5, indicating convergent validity of the scales (Fornell & Larcker, 1981). Third, the discriminant validity was tested comparing the square root value of the AVE with the correlation coefficients (Fornell & Larcker, 1981). As expected, no correlation coefficient was higher, indicating the high explanatory power of the items. Fourth, the Cronbach's alpha measures were calculated and all the values were higher than 0.7, enabling us to attest to the reliability of the scales. After verifying the validity and reliability measures, the latent variables were created using the arithmetic mean of the items of each scale (Müller-Stewens et al., 2020). Table 1 presents these descriptive measures as well as the correlation coefficients.

Table 1
Descriptive statistics and correlation coefficients

		1	2	3	4	5	6	7	8	9	10	11	12
1	Time	-											
2	Size	0.10	-										
3	Aceleration[a]	-0.07	-0.09	-									
4	EO	-0.03	0.12	0.13	*0.72*								
5	CLS	-0.02	-0.06	0.04	0.09	*0.87*							
6	DS	0.05	0.02	0.01	0.22*	0.15	*0.81*						
7	MCS	-0.07	0.17	0.02	0.48**	0.04	0.14	*0.72*					
8	TSI	0.06	-0.01	-0.02	0.06	0.00	-0.08	0.11	-				
9	ESI	0.08	0.03	0.36**	0.28**	-0.13	0.00	0.08	-0.20*	-			
10	Performance	0.00	0.18	0.09	0.65**	-0.02	0.17	0.50**	-0.01	0.18	*0.80*		
11	Award[a]	0.21*	0.16	0.27**	0.22*	-0.05	-0.04	0.03	0.09	0.33**	0.17	-	
12	Scaleup[a]	0.06	0.06	0.08	0.11	-0.06	-0.11	0.07	0.01	0.10	0.27**	0.23*	-

Table 1
Cont.

	1	2	3	4	5	6	7	8	9	10	11	12
Mean	3.12	12.60	0.53	5.27	3.92	4.79	5.07	2.70	1.76	5.27	0.50	0.08
Std. deviation	2.13	29.08	0.50	1.19	1.45	1.57	1.16	0.89	1.01	1.14	0.50	0.27
AVE	-	-	-	0.52	0.75	0.66	0.52	-	-	0.63	-	-
Cronbach's alpha	-	-	-	0.75	0.73	0.76	0.84	-	-	0.88	-	-

Note: *Values in bold correspond to the square root of the average variance extracted (AVE).*
CLS = cost leadership strategy; DS = differentiation strategy; EO = entrepreneurial orientation; ESI = entrepreneurial source of investment; MCS = characteristics of the information from the management control system; TSI = traditional source of investment.
a = dichotomous variable (1 = yes; 2 = no).
** = p < 0.05; ** = p < 0.01.*
Source: *Elaborated by the authors.*

3.4 Data Analysis

After evaluating the properties of the research variables, the first step was to build the configurations based on the startup clustering in relation to the imperatives. The aim was to find configurations of startups that were internally homogeneous, but heterogeneous between each other (Distefano, 2012; Lopes & Gosling, 2020).

In accordance with previous papers on the configurational approach (Bispo et al., 2016; Cadez & Guilding, 2012; Feizabadi et al., 2021; Maciel et al., 2008), cluster analysis was adopted. Cluster analysis is an interdependence technique that proposes clustering among observations based on a similarity measure (Hair et al., 2009). The cluster technique employed was the hierarchical one using the complete linkage method, and the distance method used was the Euclidean squared distance (Fávero & Belfiore, 2017).

Before beginning the cluster analysis process, we examined the presence of univariate outliers using the boxplot method, and the scales of the quantitative variables were standardized as suggested by Lopes and Gasling (2020). As the groups are calculated based on measures of distance between the variables, both the presence of extreme values and the differences in the way of measuring the scales can distort the group structure and bias the results. The time and size variables were transformed into natural logarithms to reduce unnecessary variances of the data and achieve a normal distribution (Aitchison & Ho, 1989). The outlier examination indicated distortions especially regarding time of existence. Eight startups had been operating for less than a full year and were excluded from the analysis, since, besides distorting the time variable, it was believed that they had not been operating for long enough to evaluate performance. The variables were standardized with a Z score transformation (Field, 2013). Next, the results analyses are presented.

4. PRESENTATION AND DISCUSSION OF THE RESULTS

4.1 Analysis of the Organizational Configurations

With relation to the characteristics of the 112 startups in the sample, 45 (40.18%) are located in Paraná, 34 (30.36%) in Rio Grande do Sul, and 33 (29.46%) in Santa Catarina. Roughly 86% of the startups were founded five years ago at most, with the average time operating in the market being three years. Most have a small team, with 101 (90.18%) having up to 20 employees. The sectors with the greatest concentration were professional, scientific, or technical services (11%), retail/wholesale (10%), ICT and telecoms (7%), edutech (7%), and aggrotech (6%).

For the cluster analysis, eight startups were excluded as they had been in operation for less than one year. The other 104 startups were grouped into three configurations. The number of configurations was determined according to the distance jumps of the clusters presented in the dendrogram in Figure 1. When there is a considerable distance jump, the number of clusters formed in the clustering stage prior to the jump may be an appropriate indication of heterogeneous groups (Fávero & Belfiore, 2017). The first major distance jump (see dashed ellipse in Figure 1) suggests the division of three clusters (see dashed vertical line). We chose the first major jump, as it offered a simple and parsimonious clustering structure of three homogeneous groups (Hair et al., 2009).

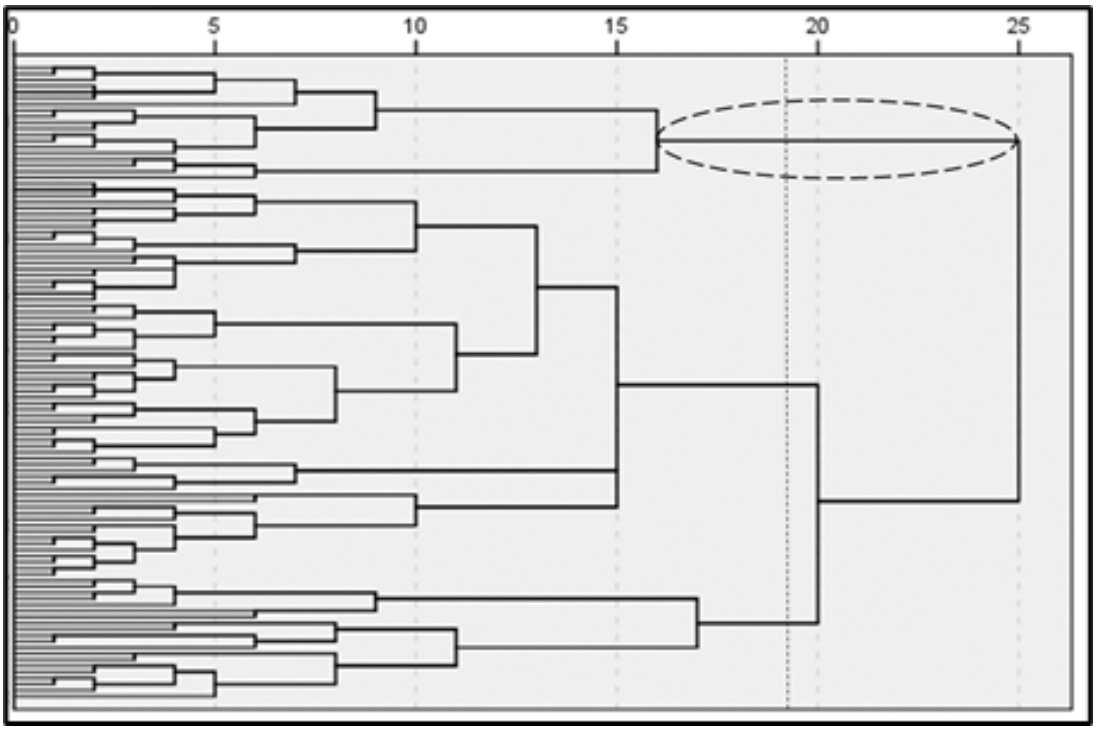

Figure 1 *Configurational clustering*
Source: *Elaborated by the authors.*

Subsequently, we proceeded to interpret the configurations based on the adopted variables. The configurations were subjected to analysis of variance (ANOVA) to identify differences in relation to the average levels of time in operation, size, TSI, ESI, MCS, and EO. To test differences in relation to the acceleration process, we conducted the chi-squared test since a categorical variable was involved (Fávero & Belfiore, 2017; Field, 2013). According to Table 2, there was no significant difference of means between the configurations considering time, TSI, and DS. Thus, each configuration consisted of a different configuration between the size, acceleration, ESI, MCS, CLS, and EO variables.

Table 2
Imperatives of the organizational configurations

	Configuration 1 (C1)	Configuration 2 (C2)	Configuration 3 (C3)	F	χ^2
Time	3.4	3.8	2.7	1.77	
Size	8.5$_{C2.C3}$	36.1$_{C1.C3}$	3.6$_{C1.C2}$	41.91**	
TSI	2.8	2.6	2.6	0.38	
ESI	1.7$_{C2}$	2.7$_{C1.C3}$	1.2$_{C2}$	15.63**	
MCS	5.2$_{C3}$	5.5$_{C3}$	4.1$_{C1.C2}$	9.99**	
CLS	4.1$_{C2}$	2.9$_{C1.C3}$	3.9$_{C2}$	5.93**	
DS	4.9	4.4	4.9	0.79	
EO	5.4$_{C3}$	6.0$_{C3}$	3.7$_{C1.C2}$	32.97**	
Acceleration (yes)	60.0%	55.0%	35.7%		6.74*
n	65	20	19		

Notes: *The variables with an F statistic were subjected to the analysis of variance (ANOVA) comparison of means test. The indications beside the means show the configurations with statistically different means at 95%, according to the Tukey post-hoc test. The acceleration variable was subjected to the chi-squared test for independent samples.*
CLS = cost leadership strategy; DS = differentiation strategy; EO = entrepreneurial orientation; MCS = characteristics of the information from the management control system; ESI = entrepreneurial source of investment; TSI = traditional source of investment.
** = $p < 0.05$; ** = $p < 0.01$.*
Source: *Elaborated by the authors.*

Configuration 1 (C1) covered the greatest number of startups (65) and their main characteristics were the low use of ESI, high level of MCS, high level of CLS, and high degree of EO. Configuration 2 (C2) covered 20 startups and is similar to C1 with regard to the level of MCS and EO, both of which were high. However, the main distinctive characteristics of C2 were size, the greater level of ESI, and low emphasis on CLS. The greatest differences are in configuration 3 (C3), which covered 19 startups. The size of those startups is smaller, as is the degree of EO, the level of MCS, and the use of ESI. C3 has the lowest percentage of companies that have undergone the acceleration or incubation processes.

The configurational results reveal that time and DS were not distinctive characteristics in the sample. The average time varied between 2.7 and 3.8 years and the DS levels ranged from 4.4 to 4.9 (seven-point scale). The short time and high DS level reinforce the notion of startups as temporary and young organizations with a strong tendency to innovate in their business models (Blank & Dorf, 2014; Smith & Smith, 2007; Spender et al., 2017).

Similarly, TSI were also not distinctive characteristics. However, analyzing them in comparison with ESI, it is noted that configurations C1 and C3 used more TSI (e.g. personal reserves) than ESI, which are more compatible with the idea of venture capital and major uncertainty of startups, which may suggest a greater capacity for success (Konno, 2015). These results highlight the predominance of choosing self-financing mechanisms, without the commitment of third-party investors, corroborating the information that the literature links to the context of startups, a scenario which, due to the lack of guarantees (Brown et al., 2012; Hyytinen et al., 2015; Minetti, 2011) and due to investments in innovation often being associated with long and uncertain recovery times (Brown et al., 2012; Minetti, 2011), restricts access to external financing (Berger & Udell, 2006; Hyytinen et al., 2015).

Size, acceleration, ESI, MCS, CLS, and EO were imperative for the configurations found, as they presented statistical significance for the difference of means, and the differences between the configurations may be possible explanations for the differences in performance (Maciel et al., 2008). Despite DS being a predominant strategy among the startups, which requires innovation, the creation of opportunities, and risk taking, the configurations presented different intensities of EO and ESI (Maciel et al., 2009).

Regarding size, it is noted that the biggest startups present a wider scope of MCS and higher percentages of companies that have undergone an acceleration or incubation process, that is, a quicker process of growth and acquisition of managerial skills (Davila & Foster, 2005, 2007; Sandino, 2007). Concerning CLS, this was notably greater in C1, which covers the greatest number of startups. However, in that configuration, there are high levels of DS and CLS, which can be characterized as ambidextrous companies (Gibson & Birkinshaw, 2004).

To test the association between the configurations and performance, we initially evaluated the association between the three configurations and the receipt or not of some certification/award. As they are categorical variables, they were subjected to the chi-squared test for independent samples (Fávero & Belfiore, 2017). The results are in Table 3.

Table 3
Association between the organizational configurations and awards

	Award (n)			Award (%)			χ^2
	No	Yes	Total	No	Yes	Total	
Configuration 1 (C1)	31	34	65	48	52	100	7.57*
Configuration 2 (C2)	6	14	20	30	70	100	
Configuration 3 (C3)	14	5	19	74	26	100	
Total	51	53	104	49	51	100	

* = $p < 0.05$.
Source: *Elaborated by the authors.*

Roughly 51% of the sample had received some type of award or external certification. That proportion takes different values between the different configurations. While in the startups in C2 the proportion of companies awarded is 70%, in C1 and C3 it is 52% and 26%, respectively. Considering the probability associated with the statistic $\chi^2 = 7.57$ ($p < 0.05$), it can be concluded that there is an association between the configurations and receiving an award. Therefore, bigger startups, with a high level of EO, wide scope of MCS, funded by venture capital, and mostly accelerated (C2), presented a greater proportion of certified or awarded companies. Conversely, the smallest startups, with a low degree of EO, limited scope of MCS, focused simultaneously on CLS and DS,

and with greater TSI (C3), presented a lower proportion of awarded companies.

Besides awards, the OLC was adopted to measure objective performance. Given that startups are companies subjected to much experimentation, excessive risks, and scarce sources of investments, it is common for them to have a high mortality rate or unsatisfactory results (Arruda, et al., 2015; Picken, 2017). Therefore, the evolution from the initial phases of the OLC to the scaleup phase is a measure of performance. The sample contains companies in the operation (searching for clients), traction (growth and fundraising), and scaleup (consolidation of growth) phases. The scaleup phase represents the highest performance level and contains startups that have already sufficiently matured their business model and present high growth rates (Abstartups, 2017). The chi-squared test was used to evaluate the association between the configurations and the OLC. The results are in Table 4.

Table 4
Association between the organizational configurations and the life cycle

	Life cycle (n)				Life cycle (%)				χ^2
	Operation	Traction	Scaleup	Total	Operation	Traction	Scaleup	Total	
Configuration 1 (C1)	28	31	6	65	43	48	9	100	23.64*
Configuration 2 (C2)	4	13	3	20	20	65	15	100	
Configuration 3 (C3)	18	1	0	19	95	5	0	100	
Total	50	45	9	104	48	43	9	100	

** = $p < 0.05$.*
Source: *Elaborated by the authors.*

The probability associated with the statistic $\chi^2 = 23.64$ ($p < 0.01$) reveals the significant association between the configurations and the stages of the OLC. There is a predominance of startups in the operation (48%) and traction (43%) phases, while only 9% are in the scaleup phase. However, when analyzed individually, 15% of the startups in C1 are in the scaleup phase, the most advanced stage of the OLC. That percentage is 9% for C2 and 0% for C3. Conversely, the percentage of companies that are in the operation phase, the earliest stage in this study, is highest among the companies of C3 (95%) and lowest in those of C2 (20%).

These results highlight that, although the time of existence among the configurations is similar, there are differences between the configurations regarding the proportions of companies in each stage of the OLC, which can be explained based on the imperatives. Again, C2 presented the best performance, followed by C1. Configurations C2 and C1 only differ in size and access to ESI. C3 presented the worst performance.

Organizational performance was also measured subjectively. Subjective measures are important, as they are based on what is most important to the respondents and, consequently, they are more likely to influence management decisions and behaviors (Van der Stede et al., 2006). To test the effect of the configurations over performance, ANCOVA was used, which enabled us to test the differences of means of performance between the startups, inserting covariables (Hair et al., 2009). Considering that the configurations were significantly associated with the stages of the OLC and with receiving awards, we tested the difference between the means of the perception of performance of the three configurations adjusted by those two variables. It was thus possible to evaluate the effect of the configurations on performance controlled by the OLC and by awards. The idea was to eliminate any difference in performance that is linked to those covariables and not to the configurations (Hair et al., 2009). In addition, size and time were included in the model as control variables. The results are in Table 5.

Table 5
Analysis of covariance between the configurations and perceived performance

	Sum of the squares of type III	DF	Mean squared	F	Sig.
Corrected model	42.59	5	8.52	8.72	0.00
Intercept	1,345.15	1	1,345.15	1,377.73	0.00
Configurations	15.19	2	7.59	7.78**	0.00
Award	0.11	1	0.11	0.11	0.74
OLC	9.09	2	4.54	4.65**	0.01
Error	95.68	98	0.98	0.00	0.00

Table 5
Cont.

	Sum of the squares of type III	DF	Mean squared	F	Sig.
Total	3,015.28	104	0.00	0.00	0.00
Corrected total	138.27	103	0.00	0.00	0.00

Notes: *$R^2 = 0.308$; adjusted $R^2 = 0.273$.*
DF = degrees of freedom; OLC = organizational life cycle.
*** = $p < 0.01$.*
Source: *Elaborated by the authors.*

Among the covariables added to the model, the OLC was significantly related to the perception of performance ($F_{2.98} = 4.65$; $p < 0.01$). Even when controlled for the effect of the OLC, the configurations were also significantly related to performance ($F_{2.98} = 7.78$; $p < 0.01$), indicating that there are differences in the means of performance perception between the startups from the three configurations. C1, C2, and C3 presented a corrected mean performance of 5.57, 6.07, and 4.66, respectively. The post-hoc comparison of means test adjusted by Bonferroni corrected values (Field, 2013) revealed that the difference between C1 and C2 was not significant at the 95% confidence level. However, the differences between C3 and the rest were significant.

Thus, when the perception of performance was adjusted by the expectations of the startups in each stage of the OLC, C1 and C2 did not present significant differences, reinforcing the concept of equifinality. The main differences between these two configurations are size, ESI, and CLS. Size and fundraising are variables associated with the different stages of the OLC. In each stage, startups will present distinct expectations. For example, in C1 there is a predominance of startups in the operation and traction stages, which are still concerned about growing their client base and the operation. In C2, the percentage of companies in the operation phase is smaller and there is a significant portion in the scaleup phase that has already undergone significant growth in recent years and rounds of investments. Therefore, when adjusted for the OLC, the main difference between the startups in C1 and C2 lies in the CLS, reinforcing the idea that different configurations can be equally effective and that satisfaction with performance can be achieved via different paths (Harms et al., 2007).

With relation to C3, even when controlled for the OLC, the performance perception level was lower in relation to C1 and C2. The main distinction of the startups in C3 is the lower levels of MCS scope and EO. EO is fundamental for companies that operate in environments with major changes and depend on innovation and exploration of opportunities to obtain satisfactory performance, such as startups (Rank & Strenge, 2018; Shirokova et al., 2016). Studies highlight that in hostile environments EO is an important driver of company performance (Covin & Slevin, 1989; Martins & Rialp, 2013).

Similarly, management information is important for environments of major change and innovation because it helps in the coordination of routines and use of resources, it directs individuals toward the measures that are critical for success, and it detects and informs changes (Müller-Stewens et al., 2020). The result of this research, which found a high level of MCS scope in configurations C1 and C2, would go against Bhide's (2000) belief that management accounting would impede the development of innovative businesses. Some studies sustain the affirmation that there is an association between startup growth and MCS use (Davila & Foster, 2005, 2007; Sandino, 2007). One explanation for that finding could be a non-rigid management control system (loose coupling) that enables control and innovation at the same time, along the lines of ambidexterity.

In summary, it was observed that C2 presented greater maturity in relation to the others in terms of company size, greater use of ESI (which leads to greater risk), and more companies in the scaleup phase. The different configurations presented perceived performance consistent with objective performance and with the distinctive characteristics of each one. They also reinforced the equifinality proposition, highlighting that different configurations can result in similar performance. That is, it reinforces the notion that different characteristics or choices can be equally valid or equally effective (Cadez & Guilding, 2012; Samagaio et al., 2018).

5. CONCLUSIONS AND RECOMMENDATIONS

Based on the configurational approach, the study analyzed the influence of organizational configurations on startup performance. The results reinforced the assumption of the configurational approach: a relationship

of interdependence of imperatives in the holistic explanation of organizational performance. The results indicate that, unlike some studies that have sought to explain startup performance using one-directional or two-dimensional relationships, a set of dimensions based on MCS, DS, CLS, EO, TSI, ESI, acceleration process, age, and size was relevant and dissociable in explaining startup performance.

The contributions derived from this research are: the search for fuller explanations about how these ventures work and the contexts in which they are most effective; the analysis of the organizational configurations that presented the best performance, in order to improve the knowledge on startups, helping to understand the entrepreneurial process and guide public policies to improve the startup success rate. Fried and Tauer (2015) found that identifying current and future successful ventures helps to promote the understanding of the entrepreneurial process and to guide public policies to improve the startup success rate.

The research also contributes by reinforcing the idea of equifinality, which proposes that there is more than one path (configuration) for achieving a good result (Harms et al., 2007). The results highlighted similar performance levels between two configurations found (C1 and C2).

As the study proposed to form configurations elaborated based on the relationship of organizational imperatives that have the capacity to influence performance, by analyzing the configurations that presented the best performance, managers can evaluate in which configuration they find themselves in order to guide actions to improve the startup success rate. Identifying the configurations can serve as a parameter for startups themselves to assess their composition, and that self-analysis would basically involve an attempt to fit among the configurations (Bispo et al., 2016).

The results of this study showed that differences in the characteristics of the information from the MCS and in the level of EO can be considered a deviation from the ideal configuration and can explain a drop in performance. The result of that effort to fit can guide the actions of startups, whether to maintain or reinforce their characteristics, or to enact important alterations to go on to benefit from an alignment between the elements presented (Bispo et al., 2016).

For future research, we suggest using other organizational imperatives in an attempt to generate new configurations. We also suggest conducting longitudinal studies, which would enable an observation of how configurational arrangements occur over time, since, as those configurations mature, they can change that arrangement. Finally, in the literature on the configurational approach, we can perceive the adoption of other multivariate techniques for clustering the observations that are more robust than the cluster analysis adopted in this study, such as fuzzy-set qualitative comparative analysis (Fs/QCA) (Cepiku et al., 2021) or latent class analysis (LCA) (Lepori, 2021). The adoption of those techniques could provide new clusters based on probabilistic measures, and such techniques could be adopted in new studies for comparing the results.

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