Revista de Contabilidade e Organizações
www.rco.usp.br

DOI: http://dx.doi.org/10.11606/issn.1982-6486.rco.2018.142273

Journal of Accounting and Organizations
www.rco.usp.br

Reflexes of local culture on the business incubators' control systems

Reflexos da cultura local nos sistemas de controle de incubadoras de empresas

Iago França Lopes[a]; Ilse Maria Beuren[a]
[a] *Universidade Federal de Santa Catarina*

Keywords
Cultural conditions.
Levers of control.
Business Incubators.

Abstract

This research aims to analyze the reflexes of the local cultural conditions on the usage of the 'levers of control' by business incubators in an environment of technological innovation. The survey sample consists of 75 managers of business incubators. The results of the structural equations modeling show that the higher acceptance of local cultural conditions by business incubators is reflected on the usage of the 'levers of control' adopted by these organizations. Specifically, we observed that whether the incubator is receptive for local cultural conditions from the external context the better is the controls' fit to the context itself. The study provides practical implications for the field of business incubators and alerts managers about the relevance of considering local cultural conditions to adapt and use the 'levers of control'.

Palavras-chave
Condições culturais.
Alavancas de controle.
Incubadoras de empresas.

Resumo

Esta pesquisa tem por objetivo analisar o reflexo das condições culturais locais no uso das 'alavancas de controle' no ambiente de inovação tecnológica das incubadoras de empresas. A amostra da survey compõe-se de 75 gestores de incubadoras de empresas. Os resultados da modelagem de equações estruturais mostram que uma maior incorporação das condições culturais locais nas incubadoras se reflete no uso das alavancas de controle presentes. Especificamente, observou-se que a permeabilidade a estas condições culturais presentes no ambiente externo favorecem a adequação das alavancas ao contexto. O estudo fornece implicações práticas para o campo das incubadoras de empresas, e alerta os gestores sobre a relevância em considerar as condições culturais locais na adaptação e no uso das alavancas de controle.

Article Information
Received: January 10, 2018
Accepted: July 19, 2018
Published: July 24, 2018

Practical implications

This study presents the incorporation of local culture conditions into business incubators. The environment of technological innovation demands control systems in line with typical processes of support to startups, such as interactions maintained with public partners and client entrepreneurs. Business incubators which are more permeable to the external environment can develop more competitive controls.

1 INTRODUCTION

The need to consider cultural aspects in the conception of Management Control Systems is supported by the pieces of research of Henri (2006b), Heinicke, Guenther and Widener (2016), and Curtis and Sweeney (2017). Conceptualizing culture is a challenge in organizational studies, since it has distinct natures. Therefore, to guide this study, 'local cultural conditions' or only 'cultural conditions' are defined as the collection of historical values (coming from factors such as race, religion, ethnicity and population displacement), and interactions of the environment in which the business incubator is located, such as startup companies' preferences, besides its own capability to change values according as several events affect the population involved.

Corresponding Author: Phone: (48) 3721-3891
E-mail: iagofrancalopes@gmail.com (I. F. Lopes); ilse.beuren@gmail.com (I. M. Beuren)
Universidade Federal de Santa Catarina. Campus Reitor João David Ferreira Lima, s/n - Trindade, Florianópolis - SC, 88040-900, Brazil

These elements represent several ways by which cultural conditions affect an organization (Hall, 2004; Badri, Davis & Davis, 2000). The relationship between culture and organization is a simultaneous two-way street (Hall, 2004). At the same time that the organization internally develops its values and practices forming a given culture, the individuals, by interacting with this organization, modify and are modified by their culture. Such individuals carry with them values, beliefs and presuppositions, rites, rituals and ceremonies, stories and myths, taboos, rules and communication processes that have been transmitted to them over time and space (Freitas, 1991). In the case that there is any capillarity between organization and environment, local cultural conditions will be incorporated into the organization and its systems.

The organization is a set of rules and values that condition and appear in individual behaviors (Ribeiro & Scapens, 2006). For the authors, these values tend to prevail in a given social configuration, that is, influenced by and integrated with the environment in which they operate. Understanding interactions with the environment may contribute to the improvement of organizations' strategies and management systems, and refine the alignment of these strategies and systems with the needs of the relationships in this environment (Lowe, 2001; Anzilago, Beuren & Dal Vesco, 2015). Thus, culture is considered a contingency factor that is capable of shaping the Management Control Systems.

Specifically in the case observed, business incubators, by shaping their management systems, could rely on studies that address the influence of local cultural conditions. These organizations act in the development of startups, especially newly created businesses, which, in this early stage of financial and business model consolidation, do not compete with companies consolidated in the market (Leblebici & Shah, 2004).

This study proposes the discussion about the reflexes of local cultural conditions on the levers of control in business incubators. The effects of culture are expected to impact business incubators in a different way compared with other organizations previously studied. Business incubators operate with innovation and support to the development of business models, gathering less routinized operations, whose influence of the cultural conditions comes from the interactions with a continuous diversity of individuals involved (Hall, 2004).

The contribution offered by this study is the analysis of the levers of the Management Control System from a comprehensive perspective, considering the cultural conditions as a relevant contingency factor (Heinicke, Guenther, & Widener, 2016). Besides, it brings the case of business incubators as a variation of the model of support to the startups under their tutelage. The business incubators' organizational environment would benefit by balancing the need of controlling startup companies' operations, providing a flexible environment for the development of research and technological innovation. Thus, the results of the research can contribute to the moldability demanded by the new business models developed, mainly in the government policies for the improvement of research, development and innovation, as it is the case of the Greater Brazil Plan (Plano Brasil Maior) 2011-2014 (Lopes & Beuren, 2016).

2 DEVELOPMENT OF HYPOTHESES

The Management Control System can be observed in different perspectives. While Anthony (1965) associated key attributes related to the hierarchical level (strategic or organizational, tactical and operational) to the Management Control System, Simons (1995) brings the concept of levers of control. In Simons (1995), the Management Control System should comprise four Levers of Control: Belief Systems; Boundary Systems; Diagnostic Control Systems; and Interactive Control Systems. Other perspectives are presented by Otley (1999), Malmi and Brown (2008), and Ferreira and Otley (2009).

In this study, the option was to analyze the Management Control System from the four levers of Simons' model (1995), due to the empirical contributions that recognize the influence of contingencies on the adequacy and usage of levers of control, such as those of Chenhall (2003), and Heinicke, Guenther and Widener (2016).

For Simons (1995), the Belief System is responsible for communicating corporate culture principles to the company's employees. The Boundary System provides the minimum standards of relationships and task execution, where the basic idea is to define and communicate the desired limits of conduct and organizational behavior. The Diagnostic Control System allows performance monitoring and, in general, is based on quantitative data, statistical analyzes and analyzes of the variance of goals and plans previously established. The Interactive Control System addresses critical aspects in the development of operational activities, and requires face-to-face communication between subordinates and peers (Henri, 2006a).

The 'culture' aspect has become important in the design of the Management Control System, since many companies have developed multinational operations. For Chenhall (2003), culture appears in the contingency-based research as an extension of factors that affect performance. There is a variety of meanings for culture, but Kaplan (1965) affirms that there is consensus among anthropologists about culture being composed of standardized and interrelated traditions, transmitted over time and space by non-biological mechanisms based on linguistic and non-linguistic capabilities developed exclusively by humankind.

The research in question approaches the association of culture as a contingency factor (Chenhall, 2003), affecting the usage of the four levers of Control Systems in business incubators. First, culture is directly associated with the emphasis on belief control (Heinicke, Guenther and Widener, 2016; Abernethy & Lillis, 1995; Bhimani 2003; Henri 2006b). Although belief control is relevant to organizations in general, the flexibility required by the business incubators' innovative environment could affect and be affected by belief control. In this scenario, local cultural conditions tend to receive more attention from managers aiming to encourage innovation in business models by the formal communication of core values.

H_1: The incorporation of local cultural conditions intensifies the belief control in business incubators.

It is assumed that the business incubators' diversity of stakeholders, focused on meeting the demands of research and innovation development, induces managers to act in the belief control, since it is used to inspire and direct the search for new opportunities, indicating the values the organization intends to be adopted, and the direction they should follow (Cruz, Frezatti & Bido, 2015). The incorporation of cultural conditions intensifies the mission statement, the communication of the business incubator's core values, and the workforce's awareness regarding these elements.

The agents involved in the business incubators' environment have different objectives. Investment funds, for instance, apply resources for the development of innovative products and services and, after a certain period, there is divestment; therefore, the focus of these funds is on the sale of their participation in the startup company. In turn, the business incubator, which represents the central nucleus of this relationship in terms of developing the startup company, provides subsidies for it, after some time, to leave the tutelage, developing autonomously. This diversity of objectives can be conducted from the organizational values that are communicated.

It is also presumed that there is a relationship between cultural conditions and the boundary system. Such a presumption is embodied in the incentive given, according as the importance of formal and rigid policies in the conduction of processes in stable environments is recognized (Heinicke, Guenther & Widener, 2016). Boundary systems can become beneficial allies, since they provide limits to the organizational action (Simons, 1995) in the conduction of the business incubator's relationship with the other agents (Amato Neto, 2007).

The configuration of business incubators demands controls that aim to limit the agents' actions. This role of limiting and determining the actions desired by the organization is exercised by the boundary system (Henri, 2006a). The incorporation of cultural conditions, coming from the business incubator environment, has the characteristics of intensifying the boundary system, since the granted freedom is restricted to pre-established limits (Heinicke, Guenther & Widener, 2016).

On the other hand, a code of conduct, which conditions the agents' behavior, is influenced by cultural conditions of the environment, aspect usually neglected by the literature on Management Control Systems. It is presumed that the boundary system, characterized by the contribution to mitigating organizational risks (Simons, 1995), is intensified in the business incubator environment according as cultural conditions are incorporated.

H_2: The incorporation of local cultural conditions intensifies the boundary system in business incubators.

In Simons' levers of control (1995), the usage of diagnostic control is monitoring, defined as a feedback system of cybernetic logic. In this system, objectives are defined in advance, production is measured, objectives and output are compared, feedback is provided, and corrections are made. Business incubators are dependent on external resources, coming mainly from government policies. Thus, a diagnosis is necessary to comply with such policies and ensure the effectiveness of the process as a whole, that is, generate new businesses and innovations (Barros, Claro & Chaddad, 2009). Although there is flexibility in the business incubators, the diagnostic control system contributes to the congruence of objectives and interests of employees and business incubator (Heinicke, Guenther, & Widener, 2016).

H_3: The incorporation of local cultural conditions intensifies the usage of diagnostic control of the Management Control System in business incubators.

Finally, the interactive control system is a formal system used by a company's top management to engage regularly and personally in the decision-making process at all company's operational levels (Simons, 2000). Although the decisions are centralized, the management of the tasks is performed via meetings between leaders of several sectors, demanding integration between teams and their managers (Jordão & Souza, 2012).

Similar studies have been conducted in innovative environments (Davila & Foster, 2005; Davila, Foster, & Jia, 2015). The interactive use of the Management Control System would provide the business incubator with the necessary flexibility for the development of technological innovation, desirable in this organizational environment. Openness to the incorporation of local cultural conditions would intensify and be intensified by the need for flexibility and adequacy to the interactions of new enterprises. In little routinized environments, there is probability of cultural elements to influence organizational scope (Hall, 2004) as, for instance, in the business incubators' necessarily flexible environments.

H_4: The incorporation of local cultural conditions intensifies the interactive use of the Management Control System in business incubators.

In general, the expected influence of local cultural conditions as conditioning factors of the interactive use of the Management Control System repositions the system as a receiver of changes in the external environment. Therefore, recognizing the influence that cultural conditions exert on the levers of control proposed by Simons (1995) offers contributions to the promotion of change and continuity in the business incubator environment.

3 METHODOLOGY

This research applied a questionnaire to managers of 227 business incubators in the Midwest, Southeast and South regions of Brazil, which are members of the National Association of Entities Promoting Innovative Enterprises (Anprotec, 2016). The non-probabilistic sample by accessibility was formed by 75 valid answers out of the 88 answers received between November 2016 and January 2017. The manager of each business incubator was identified by telephone contact, when e-mail addresses of their managers, coordinators and executive directors were requested

The survey instrument (presented in the complementary material) is composed of three blocks. The first block encompasses the Belief System and the Boundary System, with questions based on the study by Widener (2007). The respondents were asked to indicate on a Likert scale (1 = totally disagree to 7 = totally agree) the degree of agreement in relation to how much each assertion effectively contributed to the business incubator's internal and external organizational development. The second block encompasses the Diagnostic Control System and the Interactive Control System, with questions based on the study by Henri (2006a). Respondents indicated the intensity of use of such instruments in the business incubator (1 = It does not exist in the business incubator to 7 = widely used in general).

The third block addresses the Cultural Conditions that surround the business incubator. In Hall (2004), the environment in which the organization is inserted is captured by characteristics such as historical aspects of race, religion, ethnicity and population displacement, which would affect the construction of the corporate identity.

Target audience preferences may also influence the innovations advocated by the organizations (Badri, Davis & Davis, 2000); therefore, in this block, the preference variations of business incubators' client entrepreneurs are considered. The organization capability to change cultural values, and how values and rules change according as events affect the stakeholders involved were also included. For this block, it was requested that the respondents indicated how much each local cultural condition is incorporated and present internally in the business incubator in which they operate (1 = little present and 7 = very present).

The constructs were treated in a unidimensional way, with internal consistency validated by confirmatory factorial analysis. To test the hypotheses, the Structural Equation Modeling technique was applied, which is proper to understand complex relationships (Hair Jr., Hult, Ringle & Sarstedt, 2014). Structural models emphasize latent constructs, and the nature and magnitude of relationships between constructs (Hair Jr., Black, Babin, Anderson & Tatham, 2009). The parameters of these relationships indicate the effect of the independent variables on the dependent variables (Marôco, 2010).

The application of Structural Equation Modeling requires a model of measurement and evaluation of the structural model (Ringle, Silva & Bido, 2014). Thus, after confirming the measures of the measurement model as adequate, the general adjustment indicator of the model should be evaluated, namely: (i) Pearson Coefficient of Determination (R^2); (ii) Stone-Geisser test for Predictive Relevance; and (iii) Goodness of Fit Index (GoF).

The study sample was estimated using G*Power 3.1.9 software (Faul, Erdfelder, Buchner, & Lang, 2009). Considering the construct that receives the largest number of relationships (arrows), which in this situation is 1, with $\alpha = 0.05$ significance, explanatory power of 0.80, and median $f^2 = 0.15$, the sample meets the minimum number of 55 respondents, allowing Partial Least Squares analysis via bootstrapping.

In the modeling, it is not assumed that data are normally distributed. Thus, the bootstrapping process, or resampling, is randomly designed (with replacement) of the original data set (Hair Jr. et al., 2014). Each sequence is used to estimate the path coefficients for the direct and indirect relationships, besides providing greater reliability to the results. This process is repeated until the creation of a number of subsamples; in this case, it was repeated 500 times, with replacement. As parameters to explain the test, Cohen (1988) mentions that, in Social Science research, 2% R^2 represents a weak effect, 13% R^2 represents an average effect, and 26% R^2 represents a strong effect.

3.1 Sample description

Table 1 presents the profile of the questionnaire respondents. The sample consists of 75 managers from 75 mostly small-sized business incubators.

Table 1. Profile of respondents and business incubators studied

Gender	Quant.	%	Age	Quant.	%
Female	36	48,.0	Up to 31 years of age	18	24.00
Male	39	52.00	32 to 38 years of age	20	26.67
Qualification	**Quant.**	**%**	39 to 47 years of age	16	21.33
Undergraduate degree	29	38.67	48 to 68 years of age	18	24.00
MBA/Specialization	5	6.67	No response	03	4.00
Master's Degree	6	8.00	**Function**	**Quant.**	**%**
Doctorate Degree	3	4.00	Assistant	15	20.00
Postdoctoral researcher	1	1.33	Analyst	8	10.67
No response	31	41.33	Manager	23	30.67
Years in the Function	**Quant.**	**%**	Coordinator	21	28.00
			Executive Officer	8	10.67
Up to 11 months	8	10.67	**Business incubator size**	**Quant.**	**%**
1 year to 5 years	46	61.33	1 to 5 employees	52	69.33
6 to 10 years	12	16.00	6 to 10 employees	17	22.67
11 to 15 years	6	8.00	6 to 15 employees	3	4.00
16 to 20 years	2	2.67	16 + employees	3	4.00

Source: Prepared by the authors.

Respondents participating in the research are in the age group of 31 to 68 years, and in genders. However, a concentration regarding qualification and years in the function can be noticed. About 41% respondents have not completed the academic training, and 38.67% have not continued studies beyond undergraduate degree. Moreover, 70% of them are not in the function for more than 5 years. In addition, almost 70% business incubators are small-sized, with up to 5 employees.

Table 2 below presents the means obtained in each question, and their descriptive statistics.

Table 2. Descriptive statistics of the questions

Questions	Minimum	Maximum	Mean	S. deviation	S. deviation/mean
Belief System					
Clarity in communicating organization's mission	1	7	5.49	1.37	0.25
Clarity in communicating organization's values by the managers	1	7	5.55	1.33	0.24
Employees aware of organization's values	2	7	5.74	1.23	0.21
Organization's mission statement inspires the workforce	1	7	5.47	1.44	0.26
Boundary Systems					
The organization uses codes of conduct	1	7	5.23	1.57	0.30
The code of conduct informs undesirable behaviors	1	7	5.26	1.51	0.29
Risks to be avoided are informed	1	7	4.92	1.59	0.32
Employees are aware of the code of conduct	1	7	5.06	1.61	0.32
Diagnostic Control System (intensity of usage for)					
Monitoring progress of activities towards goals	1	7	5.30	1.62	0.31
Monitoring results	1	7	5.51	1.35	0.25
Comparing outcomes with expectations	1	7	5.09	1.54	0.30
Reviewing key performance measures	1	7	5.13	1.53	0.30
Interactive Control System (intensity of usage for)					
Promoting discussion between superiors, subordinates and peers	1	7	5.40	1.29	0.24
Discussing underlying data, assumptions, and action plans	1	7	5.12	1.40	0.27
Providing a common view of the organization	2	7	5.55	1.27	0.23
Enabling the organization to focus on common issues	1	7	5.42	1.24	0.23
Enabling the organization to focus on critical success factors	1	7	5.32	1.41	0.27
Developing a common vocabulary within the organization	1	7	5.45	1.33	0.24
Incorporation of Local Cultural Conditions					
Historical values (race, religion, ethnicity and population displacement)	1	7	3.82	1.78	0.47
Environment in which the organization is located	2	7	5.81	1.15	0.20
Variation of taste and preferences of the clients	1	7	4.88	1.38	0.28
Organizations with capability to change cultural values	1	7	4.74	1.53	0.32
Values and rules that change with external facts and events	1	7	4.74	1.50	0.32

Source: Prepared by the authors.

4 ANALYSIS AND DISCUSSION OF RESULTS

4.1 Initial analyzes

Table 3 shows how the constructs behave in intervals. The first interval brings the lowest score assigned to each of the four levers of control of the MCS, and the last interval shows the highest score assigned by the respondents. Segregation was performed by adding scores within each construct of the Management Control System and incorporating local cultural conditions. If the Belief System construct has four assertions (on a 1-7 scale), for instance, the sum of a respondent ranges from 4 to 28. In this case, the intervals of 4-10; 10-16; 16-22 and 22-28 are set.

Table 3. Descriptive statistics of constructs segregated into intervals

Constructs	First and last intervals of the sum of the items	Amount of business incubators in the interval	Minimum Sum	Maximum Sum	Construct Mean	Standard
Belief System	1st Interval 4-10	1	1	4	2.80	2.68
	4th Interval 22-28	47	4	7	6.34	0.71
Boundary System	1st Interval 4-10	5	1	6	2.05	1.15
	4th Interval 22-28	35	4	7	6.39	0.65
Diagnostic Control System	1st Interval 4-10	4	1	7	2.38	1.93
	4th Interval 22-28	40	4	7	6.31	0.70
Interactive Control System	1st Interval 6-15	1	1	7	3.43	4.39
	4th Interval 34-42	31	3	7	6.40	0.68
Incorporation of Cultural Conditions	1st Interval 5-12	1	1	4	2.00	1.22
	4th Interval 27-35	25	2	7	6.03	1.00

Source: Prepared by the authors.

In interval segregation, the largest group of business incubators is in the fourth interval (22 to 28). The Belief System is relevant and has a strong agreement in relation to such relevance among respondents (Mean = 6.34; Standard Deviation = 0.71), particularly in relation to the business incubator's mission statement of clearly communicating its core values. It suggests an action by the managers to communicate the business incubator's core values, and their knowledge by the workforce. Moreover, there is agreement with regard to the business incubator workforce being inspired by its mission.

In the Boundary System construct (mean = 6.39 Standard Deviation = 0.65), there is strong agreement on whether the business incubator is based on a code of conduct to define the appropriate behavior of its workforce, also informing the behaviors that are off-limits proclaimed by the business incubator. There is also agreement in relation to the presence of a system that communicates to the workforce the risks that should be avoided. Finally, there is agreement regarding the workforce's awareness of the existence of a code of conduct in the business incubator.

The Diagnostic Control System presents high usage in business incubator internal and external scopes (Mean = 6.31; Standard Deviation = 0.70). Monitoring progress of activities towards goals, monitoring results, comparing outcomes with expectations, and reviewing key performance measures are activities relevant to the business incubators' support. As business incubators are dependent on external resources for their operation, mainly from public sources, such as the Financier of Studies and Projects (FINEP), there is a need for controls to enable their operations (Jordão & Souza, 2012). In this way, more rigid controls, such as those of the Diagnostic Control System, are indicated for this purpose.

The Interactive Control System is also highly used by business incubators' managers (Mean = 6.60; Standard Deviation = 0.68). Promoting discussion at meetings with superiors, subordinates and peers; providing the continuous challenge and discussing action plans; providing a common view of the organization; enabling the organization to focus on common issues; enabling the organization to focus on critical success, and developing a common vocabulary within the organization are actions practiced in the business incubator's internal and external scope.

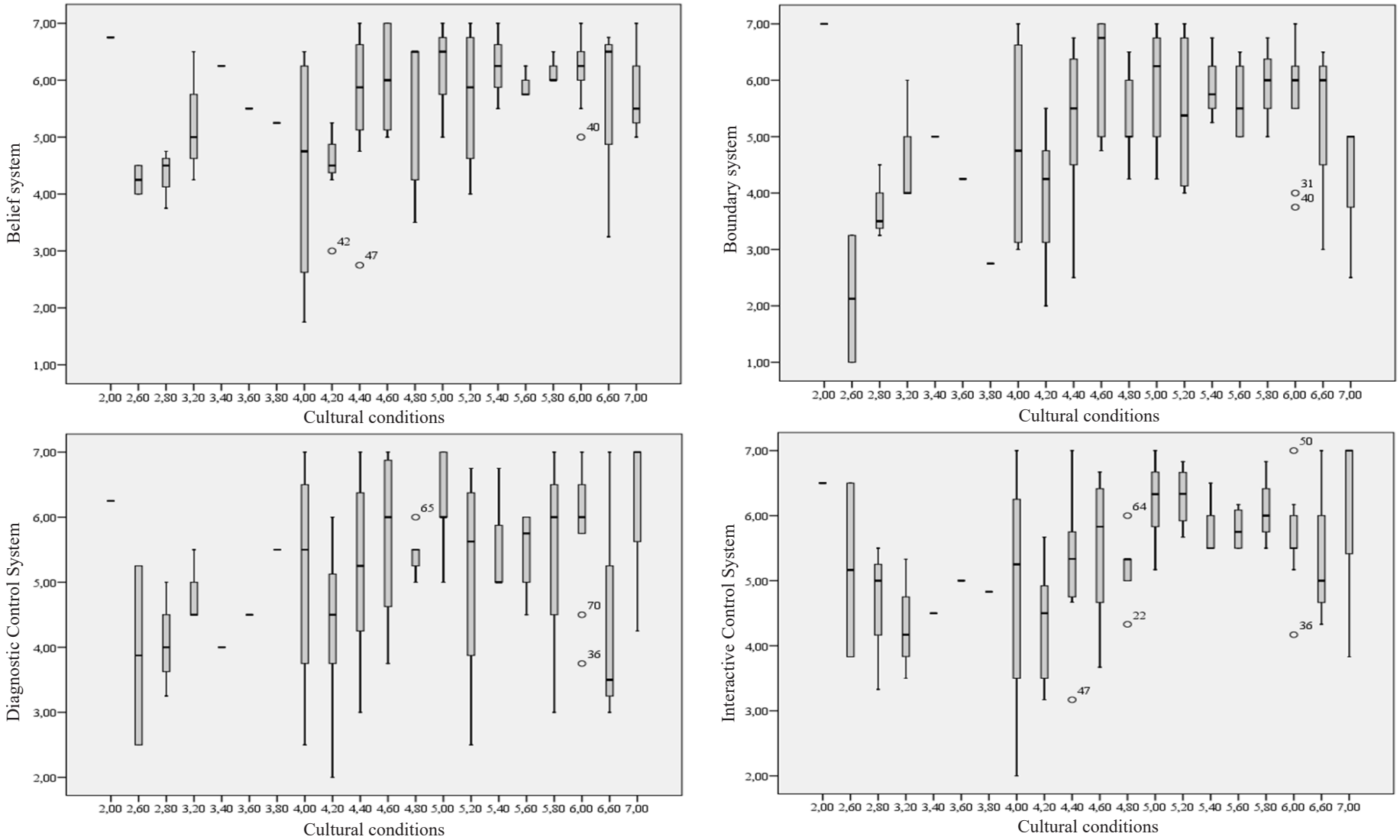
However, in observing the degree of incorporation of local Cultural Conditions into the business incubator, despite the strong general presence (Mean = 6.03; Standard Deviation = 1.36), there is a certain ambiguity among the respondents regarding the influence of historical values. Greater agreement is observed in relation to the influence of the environment where the business incubator is located. There is still influence both of the variation of the preferences of the business incubators' clients and of the capability to change the cultural values in the face of external events.

Figure 1 presents a boxplot of the relationship of the research constructs, each of the levers of control of the Management Control System with the incorporation of local Cultural Conditions.

It is interesting to note in the boxplots of Figure 1 that the tendency "the greater the incorporation of cultural conditions," the greater the adoption, usage and strength of levers of control, is more evident for Belief System, Boundary System and Diagnostic Control System. In the case of the Boundary System and Diagnostic Control System, there is a tendency that for low cultural influence, there will be low usage of these systems.

For the Belief System, increase in cultural influence raises the clarity and dissemination of this system, but the moderating effect is more modest when compared to the Diagnostic Control System and Boundary System. The Interactive Control System presents a higher level of usage, even in business incubators where there is low permeability with respect to the local environment. Still, for the Boundary System, Diagnostic Control System and Interactive Control System, high degrees of interaction with cultural factors present ambiguity in the adoption and usage of such systems, which does not happen for the Belief System.

Figure 1. Boxplot on the constructs of the research



Source: Prepared by the authors.

4.2 Research Hypotheses Testing

Table 4 presents the results of Structural Equation Modeling. Since the GoF test is not suitable for investigations using Structural Equation Modeling (Hair Jr. et al., 2014), Stone-Geisser test for Predictive Relevance and Pearson Coefficient of Determination (R^2) were employed. Additionally, there was verification of path coefficients and significance of the reflexes of the cultural conditions on the levers of control (Simons, 1995) by bootstrapping.

Table 4. Structural Model – Levers of Control and Cultural Conditions

Structural relationship	Structural Coefficient	Standard Error	T statistics	P value
Cultural Conditions → Belief System	0.313	0.093	3.375	**0.001***
Cultural Conditions → Boundary System	0.272	0.128	2.126	**0.034****
Cultural Conditions → Diagnostic Control System	0.259	0.105	2.462	**0.014****
Cultural Conditions → Interactive Control System	0.338	0.093	3.645	**0.000***
R^2 Belief System				0.098
R^2 Boundary System				0.074
R^2 Diagnostic Control System				0.067
R^2 Interactive Control System				0.114
Predictive Relevance – Belief System				0.068
Predictive Relevance – Boundary System				0.049
Predictive Relevance – Diagnostic Control System				0.035
Predictive Relevance – Interactive Control System				0.065

Source: Prepared by the authors.
Note: *Significant at 1%; **Significant at 5%.

In general, the test allows us to accept all hypotheses. However, a brief analysis of the limits of these results is needed. The incorporation of cultural conditions of the local environment is positively associated with the clarity and understanding of vision and mission statement, which would show a stronger effect of Belief System (H1 accepted). This result is similar to that found in Heinicke, Guenther and Widener (2016) for German companies.

The Belief System requires constant interaction with the local environment. According as the events in the business incubator environment occur and involve agents related to it, there is also need to monitor the preferences of the stakeholders in relation to the organizational values. Managers would take these values into account to use and adapt the Management Control System, as well as organizational processes (Henri, 2006b).

The code of conduct as a tool for controlling restrictions is also positively associated with the incorporation of local cultural aspects (H2 accepted). This result may be explained by the influence of local cultural conditions on the Boundary System, because the business incubator interacts with entrepreneurs, who have different visions on how to develop new products and businesses, which sometimes are not aligned with the conduct and limitations advocated by the business incubator. Thus, such behavioral restrictions direct the relationship between the business incubator and the startup company.

In this scenario, the Boundary System is an organizational attribute designed and redesigned by the environment so that the usage is intensified internally. Diagnostic Control System intends to monitor and compare expectations with results obtained, favoring the review of key performance measures (Simons, 1995). The business incubator is the product of multiple interactions with organizational agents, such as universities and development bodies (Lopes, 2017), which have different objectives in an environment where cultural conditions are not constant (Hall, 2004).

In an environment of fast changes in innovation and technology, employees would have to follow goals, monitor results, compare outcomes with expectations, and review performance measures to maintain competitiveness. Such competitiveness, in the case of providers of this type of service, demands meeting the expectations of customers and business partners.

This certainly makes the integration of local cultural conditions present in the relationships the business incubator maintains with partners and clients positively associated with the Diagnostic Control System (H3 accepted).

Regarding the Interactive Control System, an interesting result can be highlighted. The greater interaction between supervisors and employees, leading to a common vision and vocabulary, and a constant discussion of the directions to be taken, is more closely associated with the business incubator's internal environment. The statistical result of the test leads us to accept a positive association between the development of this more interactive environment and the incorporation of local culture, arising from the interaction with the business incubator's stakeholders (H4 accepted). Nevertheless, the emphasis is, as observed in Figure 1, on the fact that the Interactive Control System presents a higher level of usage, even in business incubators where there is low permeability in relation to the local environment.

The Interactive Control System is developed even under these conditions of low permeability. Organizational culture attributes, associated with the type of organization in question, such as innovation, results orientation and rigid control versus flexible control, explain the adoption of managerial practices (Baird, Harrison & Reeve, 2004). Thus, the development of the Interactive Control System could be derived from the very activity developed by the business incubator.

In the case in question, business incubators have specific characteristics of the sector in which they operate, being demanded to offer customized solutions to the companies under their tutelage, dealing with different business models, creating an environment of innovation and flexibility. Such internal characteristics, associated with the startup development, demand specific characteristics of the levers of control (Baird, Harrison & Reeve, 2004).

5 CONCLUSIONS

The results of the research reveal that the incorporation of cultural conditions intensifies the usage of levers of control proposed by Simons (1995). The local cultural conditions of organizations should be considered as contingent factors for a better understanding of how organizations, operating in a development and technology environment, such as business incubators, manage, control and create a flexible environment for technological innovation.

The study presents a proposal to measure the local cultural conditions of these organizations. The concept was composed by questioning employees on how much the organization would incorporate and would be influenced by historical values such as race, religion, ethnicity, and population displacement. In addition, it was necessary to consider the environment in which the business incubator is located, the preferences of the clients (startup companies and their entrepreneurs), and the capability to change values given external events.

The results show that the incorporation of such conditions is positively associated with the extent of influence of the levers of control, or with their usage. Clarity of mission and vision transmitted to employees in the Belief System, knowledge of the restrictions of codes of conduct, use and review of performance measures by the teams, and the greater interaction of teams in the discussion of strategies and solutions are more present in business incubators which are more likely to be open to the external environment. This shows certain permeability to the environment, highlighting the effect of the local cultural as a relevant contingent factor.

The study also provides practical implications. The managers of business incubators should pay attention to the cultural conditions present in the environment. For example, it may be easier to create a flexible, conducive environment for research, development, and innovation by considering variations of tastes and preferences of startup companies (Badri, Davis & Davis 2000). Thus, before intensifying the usage of levers of control, business incubators are stimulated to review their degree of permeability to the environment, in order to increasingly consider the present contingencies.

REFERENCES

Abernethy, M. A., & Lillis, A. M. (1995). The impact of manufacturing flexibility on management control system design. *Accounting, Organizations and Society*, 20(4), 241-258. DOI: https://doi.org/10.1016/0361-3682(94)E0014-L.

Amato Neto, J. (2007). As políticas industriais e tecnológicas e as pequenas e médias empresas: iniciativas na história recente da economia brasileira. *Revista Gestão Industrial*, 3(1), 87-102. DOI: 10.3895/S1808-04482007000100008.

Anthony, R. N. (1995). *Management planning and control systems: A framework for analysis*. Boston: *Harvard Business School Press.*

Anzilago, M., Beuren, I. M., & Dal Vesco. (2015). O uso dos sistemas de controle gerencial nas medidas de desempenho está associada com a diminuição da ambiguidade de papéis e aumento de empowerment psicológico? *Anais do Congresso ANPCONT*, Curitiba, PR, Brasil, 9.

Associação Nacional de Entidade Promotoras de Empreendimentos Inovadores (ANPROTEC). (2016). Estudo de impacto econômico: segmento de incubadoras de empresas do Brasil. Brasília: *ANPROTEC: SEBRAE*. Recuperado em 12 janeiro, 2017, de http://www.anprotec.org.br/Relata/18072016%20Estudo_ANPROTEC_v6.pdf

Badri, M. A., Davis, D., & Davis, D. (2000). Operations strategy, environmental uncertainty and performance: a path analytic model of industries in developing countries. *Omega*, 28(2), 155-173. DOI: https://doi.org/10.1016/S0305-0483(99)00041-9.

Baird, K. M., Harrison, G. L., & Reeve, R. C. (2004). Adoption of activity management practices: a note on the extent of adoption and the influence of organizational and cultural factors. *Management Accounting Research*, 15(4), 383-399. DOI: https://doi.org/10.1016/j.mar.2004.07.002.

Barros, H. M., Claro, D. P., & Chaddad, F. R. (2009). Políticas para a inovação no Brasil: efeitos sobre os setores de energia elétrica e de bens de informática. *Revista de Administração Pública*, 43(6), 1459-1486.

Bhimani, A. (2003). A study of the emergence of management accounting system ethos and its influence on perceived system success. Accounting, *Organizations and Society*, 28(6), 523-548. DOI: https://doi.org/10.1016/S0361-3682(02)00025-9.

Chenhall, R. H. (2003). Management control systems design within its organizational context: findings from contingency-based research and directions for the future. *Accounting, Organizations and Society*, 28(2), 127-168. DOI: https://doi.org/10.1016/S0361-3682(01)00027-7.

Cruz, A. P. C., Frezatti, F., & de Souza Bido, D. (2015). Estilo de liderança, controle gerencial e inovação: Papel das alavancas de controle. RAC. *Revista de Administração Contemporânea*, 19(6), 772-794. DOI: http://dx.doi.org/10.1590/1982-7849rac2015150099.

Curtis, E., & Sweeney, B. (2017). Managing different types of innovation: mutually reinforcing management control systems and the generation of dynamic tension. *Accounting and Business Research*, 47(3), 313-343. DOI: https://doi.org/10.1080/00014788.2016.1255585.

Davila, A., & Foster, G. (2005). Management accounting systems adoption decisions: evidence and performance implications from early-stage/startup companies. *The Accounting Review*, 80(4), 1039-1068. DOI: https://doi.org/10.2308/accr.2005.80.4.1039.

Davila, A., Foster, G., & Jia, N. (2015). The valuation of management control systems in start-up companies: international field-based evidence. *European Accounting Review*, 24(2), 207-239. DOI: https://doi.org/10.1080/09638180.2014.965720.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41(4), 1149-1160. DOI: https://doi.org/10.3758/BRM.41.4.1149.

Ferreira, A. & Otley, D. (2006). Exploring inter and intra-relationships between the design and use of management control system. *SSRN*.

Ferreira, A., & Otley, D. (2009). The design and use of performance management systems: An extended framework for analysis. *Management Accounting Research*, 20(4), 263-282. DOI: https://doi.org/10.1016/j.mar.2009.07.003.

Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of Marketing Research*, 18(3). 382-388. DOI: 10.2307/3150980.

Freitas, M. E. (1991). *Cultura organizacional: formação, tipologias e impacto*. São Paulo: McGraw-Hill.

Hair Jr., J. F., Hult, G. T. M., Ringle, C. M. & Sarstedt, M. (2014). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Thousand Oaks: Sage.

Hair Jr,, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2009). *Análise multivariada de dados*. São Paulo: Bookman.

Hall, R. H. (2004). *Organizações: estruturas, processos e resultados*. São Paulo: Pearson Prentice Hall.

Heinicke, A., Guenther, T. W., & Widener, S. K. (2016). An examination of the relationship between the extent of a flexible culture and the levers of control system: The key role of beliefs control. *Management Accounting Research*, 33(s/n), 25-41. DOI: https://doi.org/10.1016/j.mar.2016.03.005.

Henri, J. F. (2006a). Management control systems and strategy: A resource-based perspective. *Accounting, Organizations and Society*, 31(6), 529-558. DOI: https://doi.org/10.1016/j.aos.2005.07.001.

Henri, J. F. (2006b). Organizational culture and performance measurement systems. *Accounting, Organizations and Society*, 31(1), 77-103. DOI: https://doi.org/10.1016/j.aos.2004.10.003.

Jordão, R. V. D., & de Souza, A. A. (2012). Efeitos da cultura corporativa no sistema de controle gerencial pós-aquisição: um estudo de sucesso numa empresa brasileira. REGE. *Revista de Gestão*, 19(1), 55-71. DOI: http://dx.doi.org/10.5700/issn.2177-8736.rege.2012.49848.

Kaplan, D. (1965). The superorganic: science or metaphysics. *American Anthropologist*, 67, 958–976. DOI: https://doi.org/10.1525/aa.1965.67.4.02a00060.

Leblebici, H., & Shah, N. (2004). The birth, transformation and regeneration of business incubators as new organisational forms: understanding the interplay between organisational history and organisational theory. *Business History*, 46(3), 353-380. DOI: https://doi.org/10.1080/0007679042000219175a.

Lopes, I. F. (2017). *Influência de pressões ambientais na formação de redes mediada pelo sistema de controle gerencial em incubadoras de empresas.* Dissertação de Mestrado, Universidade Federal de Santa Catarina, Florianópolis, SC, Brasil.

Lopes, I. F., & Beuren, I. M. (2016). Evidenciação da Inovação no Relatório da Administração: uma análise na perspectiva da Lei do Bem (Lei Nº. 11.196/2005). *Perspectivas em Gestão & Conhecimento*, 6(1), 109-127.

Lowe, A. (2001). After ANT-An illustrative discussion of the implications for qualitative accounting case research. Accounting, Auditing & Accountability Journal, 14(3), 327-351. DOI: https://doi.org/10.1108/EUM0000000005519.

Malmi, T., & Brown, D. A. (2008). Management control systems as a package—Opportunities, challenges and research directions. *Management Accounting Research*, 19(4), 287-300. DOI: https://doi.org/10.1016/j.mar.2008.09.003.

Marôco, J. (2010). *Análise de equações estruturais: fundamentos teóricos, software & aplicações*. Pêro Pinheiro: ReportNumber.

Otley, D. (1999). Performance management: a framework for management control systems research. *Management Accounting Research*, 10(4), 363-382. DOI: https://doi.org/10.1006/mare.1999.0115.

Ribeiro, J. A., & Scapens, R. W. (2006). Institutional theories in management accounting change: contributions, issues and paths for development. *Qualitative Research in Accounting & Management*, 3(2), 94-111. DOI: https://doi.org/10.1108/11766090610670640.

Ringle, C. M., Silva, D., & Bido, D. D. S. (2014). Modelagem de equações estruturais com utilização do SmartPLS. *REMark*, 13(2), 54. DOI: 10.5585/remark.v13i2.2717.

Simons, R. (1995). *Levers of control*. Cambridge: Harvard Business School Publishing.

Simons, R. (2000). *Performance measurement and control systems for implementing strategy*. New Jersey: Prentice Hall.

Widener, S. K. (2007). An empirical analysis of the levers of control framework. *Accounting, Organizations and Society*, 32(7), 757-788. DOI: https://doi.org/10.1016/j.aos.2007.01.001.

How to cite this article

Lopes, I. F. & Beuren, I. M. (2018). Reflexes of local culture on the business incubators' control systems. *Revista de Contabilidade e Organizações*, 12:e142273. DOI: http://dx.doi.org/10.11606/issn.1982-6486.rco.2018.142273

REFLEXES OF LOCAL CULTURE ON THE BUSINESS INCUBATORS' CONTROL SYSTEM

COMPLEMENTARY MATERIAL

Below, questions of the questionnaire and how they were applied, segregated by construct. All items were answered on a 7-point Likert scale.

Constructs and Questions
Indicate your degree of agreement on the contribution of each assertion to the internal and external organizational development of the business incubator. Assign notes from "1" to "7," where 1 = Totally disagree, 7 = Totally agree.
Belief System 1. Top managers communicate the organization's core values. 2. The organization's workforce is aware of the core values. 3. The organization's mission statement inspires our workforce. 4. The organization's mission statement clearly communicates the core values.
Boundary Systems 1. The organization's code of conduct informs our workforce about behaviors that are off-limits. 2. The organization has a system that communicates to our workforce the risks that should be avoided. 3. Our workforce is aware of the organization's code of conduct. 4. The organization is based on a code of conduct to define the appropriate behavior of its workforce.
Indicate the intensity of usage of the Management Control System and/or Administrative Control Measures in the business incubator's internal and external environments. Assign notes from "1" to "7," being: 1 = It does not exist in the business incubator; 7 = Widely used in general.
Diagnostic Control Systems 1. Monitor progress of activities toward goals. 2. Monitor the results. 3. Compare the outcomes with expectations. 4. Review key performance measures.
Interactive Control System 1. Promote discussion at meetings between superiors, subordinates and peers. 2. Provide continuous challenge and discuss the underlying data, assumptions, and action plans. 3. Provide a common view of the organization. 4. Enable the organization to focus on common issues. 5. Enable the organization to focus on critical success factors. 6. Develop a common vocabulary within the organization.
In the assertions below, point out how much each cultural condition is incorporated by the business incubator in general and in particular to provide information in internal scope. Assign notes from "1" to "7," where 1 = little present, 7 = very present.
Cultural Conditions 1. Historical values (race, religion, ethnicity and population displacement) 2. Environment in which the organization is located. 3. Variation of taste and preferences of clients. 4. Organizations with capability to change cultural values. 5. Values and rules that change according as events affect the population involved.

Chart 1 Research constructs and questions
Source: Prepared by the authors.