THE INFLUENCE OF THE BUDGETARY CONTROL SYSTEM ON THE ABSORPTIVE CAPACITY

INFLUÊNCIA DO SISTEMA DE CONTROLE ORÇAMENTÁRIO SOBRE A CAPACIDADE ABSORTIVA

INFLUENCIA DEL SISTEMA DE CONTROL PRESUPUESTARIO SOBRE LA CAPACIDAD ABSORTIVA

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ABSTRACT

This research aimed at analyzing the influence of the Budgetary Control System on the Absorptive Capacity in incubated companies in the west mesoregion of the state of Santa Catarina, Brazil. The sample contains 29 companies, which have answered the auto-fill form during the first semester of 2016. The survey with the quantitative method was supported by data analysis, studied through the Structural Equation Modeling technique (SME) with SEM-PLS. The results show the relationship between the Budgetary Control System and the Absorptive Capacity occurs in 33%, so the modeling shows a statistically significant relationship, according to Hair Jr *et al*. (2014).

Keywords: Absorptive capacity; Budgetary control system; Incubated companies.

RESUMO

Esta pesquisa buscou analisar a influência da capacidade absortiva no sistema de controle orçamentário das empresas incubadas na mesorregião do oeste de Santa Catarina (SC). A amostra teve 29 empresas que responderam o instrumento de autopreenchimento durante o primeiro semestre de 2016. A pesquisa *survey*, com método quantitativo, na análise dos dados utilizou a técnica de Modelagem de Equações Estruturais (MEE) com SEM-PLS. Os resultados apontam que o relacionamento entre Sistema de Controle Orçamentário e a Capacidade de Absorção ocorre na taxa de 33%, o modelo apresenta uma relação significante estatisticamente, de acordo com Hair Jr *et al*. (2014).

Palavras-chave: Capacidade Absortiva; Sistema de Controle Orçamentário; Empresas Incubadas.

RESUMEN

Esta investigación ha buscado analizar la influencia de la capacidad de absorción en el sistema de control presupuestario de las empresas incubadas en la meso región del oeste de Santa Catarina (SC), Brasil. La amuestra tuve 29 empresas que contestaron el instrumento de auto relleno durante el primero semestre de 2016. La investigación *survey*, con método cuantitativo, en el análisis de datos utilizó la técnica de Modelaje de Ecuaciones Estructurales (MEE) con SEM-PLS. Los resultados apuntan que el relacionamiento entre Sistema de Control presupuestario y la Capacidad de Absorción ocurre en la tasa de 33%, el modelo presenta una relación significante estadísticamente, de acuerdo con Hair Jr *et al*. (2014).

Palabras clave: Capacidad de Absorción; Sistema de Control presupuestario; Empresas Incubadas.

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1 INTRODUCTION

The turbulence in markets leads the companies to develop actions aiming to provide their clients something distinct, capable of creating competitive advantages.

In this perspective, an organization's ability to explore external knowledge is as a critical fact in innovative capacities and the skill of evaluating and using external knowledge refers mainly to the level of prior knowledge (COHEN; LEVINTHAL, 1990). In the most basic level, this knowledge relationship refers to basic skills or common language. In a higher level, this relationship includes recent scientific or technological development in a specific field of studies. Then, prior knowledge gives companies the capacity to recognize new information value, assimilate it, and apply it to commercial ends; that is company's Absorptive Capacity (COHEN; LEVINTHAL, 1990).

Absorptive Capacity, according to Lane, Koka and Pathak (2006) is one of the most relevant constructs derived from organizational research in the past decades. This topic introduction started with Cohen and Levinthal (1990) and refers to the learning process a company has, its capacity to identify, assimilate and explore environment knowledge. It means these three aspects, not only the capacity to imitate other companies' products or procedures, also the capacity to explore knowledge from scientific research.

To develop and to maintain Absorptive Capacity is essential to a company's survival and success, considering the absorptive can reinforce, complement or refocus the company's knowledge base (LANE; KOKA; PATHAK, 2006). Cohen and Levinthal (1990), Zahra and George (2002), Lane, Koka and Pathak (2006), and Teece (2009) show the Absorptive Capacity of an organization is a fundamental fact to create and maintain a competitive advantage.

Teece (2009) says companies are asset sets and idiosyncratic competences hard to negotiate. Therefore, there might be a competitive advantage from a firm's limited and difficult-to-imitate resources, mainly expertise. He also indicates that, in a dynamic business environment characterized by intense competitiveness and reduction of geographical barriers, retaining knowledge is necessary, and also to make use of the resources in a continuous way, aiming to create, extend, update, protect and maintain an exclusive assets

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base. Development and efficient management of intangible assets are the main points to company competitiveness (TEECE, 2009).

In the words of Volberda, Foss and Lyles (2010), a company's previous structure is relevant to its Absorptive Capacity development. However, aspects such as the organizational structure, rewards system, and human resources policies are constantly neglected. Aiming to contribute to this lack of theoretical discussion, the objective is to analyze the influence of the Budgetary Control System on the Absorptive Capacity. Based on it, the managers of companies must develop an effective management system, with constant development monitoring. According to Frow, Marginson and Ogden (2010), this development should align the company's goals, also identifying the risks and opportunities to realign the plans and resources in order to achieve the strategic objectives, with the aid of management instruments to monitor and/or control.

Carpes *et al.* (2008) state that budgetary control is a management instrument which acts directly on the business plan implementing the process. Furthermore, it provides people involved with synesthetic actions to reach organizations' goals and objectives. There are many ways to perform this monitoring, and control factor and supervision are essential to the company's activities. Frezatti *et al.* (2009) say the control must provide information availability conditions, which permit the company's management process development.

According to the literature, one of the widest models regarding budgetary control is *Levers of Control* (LOC), by Simons (1994). Oyadormari *et al.* (2009) studied the three most important management accounting journals (Accounting, Organizations and Society, Journal of Management Accounting Research e-Management Accounting Research), from 1995 to 2007, about the use of Simon's model and his results enable and validate the construct use in empirical research in Brazil.

More specifically, the study shows itself relevant as it relates the Budgetary Control System to the Absorptive Capacity in companies that aim for management and technological improvement. This innovative environment leads to thinking about companies in incubating processes. Miziara and Carvalho (2008, p. 4) define incubated companies as "companies which introduce new technologies, with low working capital investment, and their main

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objective is knowledge from people who compound the organization". This understanding modifies the way those incubated companies administrate the information flow; as well they draw strategies to their development.

According to Simons (1994), managing efficiency, maintaining control and production in an innovative, flexible and creative environment is a challenge to the managers. Cohen and Levintal (1990) acknowledge Absorptive Capacity closely relates to a company's ability to recognize new information value, assimilate it, and apply it to commercial ends, in order to obtain competitive advantage and organizational development. Flatten, Greve and Brettel (2011) show the necessity of studies related to Absorptive Capacity in small and medium enterprises or in start-ups.

This research aims to answer the following question: what is the influence of the Budgetary Control System on the Absorptive Capacity of the incubated companies? This study focuses on analyzing the influence of the Budgetary Control System on the Absorptive Capacity of incubated companies in the west mesoregion of the state of Santa Catarina, Brazil. Thereunto, these are the specific objectives: a) establish the incubated companies' profiles; b) examine the Budgetary Control System characteristics accordingly to Simons (1994); c) gauge the organizational Absorptive Capacity.

2 BUDGETARY CONTROL SYSTEM – SIMONS' MODEL (LEVERS OF CONTROL)

Budget is an administrative planning that involves, as a whole, the operation phases in a pre-determined period, and constitutes the formal expression of policies, plans, goals and objectives established by the senior management involving the whole company or one of its subdivisions (WELSCH, 1973).

In Welsch's words (1983, p. 30) "last-minute decisions are not based on studies, analysis, evaluations and preliminary consultations on appropriate terms". The processes of planning and budgeting seek to avoid decision-making based on improvisation or assumptions. In this sense, the planning and control of results fulfill an organization needs of planning as they provide tools to solve most of the guidance problems in the company, since the formulation of these goals, policies and their use will determine the effective participation of managers and involve all levels of government (WELSCH, 1983). Likewise,

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Macedo (2004) states budget positively influences the behavior of those involved when the managers' goals match the organization's goals, which motivates them to reach those goals and ensures consistency with the proposed objectives.

Frezatti (2007) considers budget the financial planning for implementation of the company's strategy in a particular year. Budgeting is more than just estimating since it requires the managers' involvement in order to succeed in goals achievement. Simons (1994) points out employees' creative contribution as relevant to the process improvement when companies use planning and corporate control, as decision-making instruments. In addition, he says managers should look for new methodologies and techniques to maintain efficient control.

In this context, to contribute with managers in the process of budgetary control as a way to maintain the balance between effective control and creativity of employees, Simons (1995) created four systems, called Levers of Control that must be aligned with the strategy, the need for innovation and the organizations' different interests.

In Simons' Levers of Control (1995), the first lever understands the beliefs or values' system, it considers if the organization's principles are communicated to its employees through mission, vision, values, culture, planning, among other instruments that the company uses. The second lever understands the boundary system control, which seeks opportunities or critical solutions to the company through the creation of minimum standards. In the third lever, there is the diagnosis system control that aims to achieve the goals set, once managers do not give much attention to this lever when they do not detect deviations and propose corrective measures, as part of the system used by the organization. Finally, the fourth lever corresponds to the interactive system control, which aims to foster research and learning, providing an opportunity to employees (SIMONS, 1995).

This research focuses on two lever systems proposed by Simons (1995), as shown in Table 1.

Table 1 - Comparison between Diagnosis System control and Interactive System control

	Diagnosis System	Interactive System Control
Purpose	Provide guidance and motivation to achieve goals	Encourages dialog and organizational learning
Objective	No Surprises	Creative solutions

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Analytical reasoning	Deductive method (from an instrument)	Inductive, Sensory (from the perception)
Complexity system	Complex	Simple
Window of time	Past and Present	Present and Future
Goals	Settled	Constantly Changing
Feedback	Negative Feedback	Positive Feedback
Adaptation to	Inputs or Processes	Continuous correction
Communication	Eliminate the need for dialog	Common language
Roles	Specialists	Facilitators

Source: Adapted from Simons (1995).

Table 1 shows the characteristics related to the Diagnosis and the Interactive System Control, both topics of analysis in this research. It is to emphasize the research tool used in this research was designed by Nascimento, Lavarda and Silveira (2009) and used as a pre-test at the study of Amorim *et al.* (2013).

In this sense, the use of the scale based on Simons (1995) corresponds to the assertion of Oyadormari *et al.* (2009) when they mention Simons' modeling use is enabled and valid to empirical research in Brazil. This research aims to extend Simons' Diagnosis and the Interactive System Control to the dimensions of preparing, monitoring and modifying, to validate this study, which enables it as a construct in empirical studies, in order to master studies and show directions to each step of the budgetary process.

3 ABSORPTIVE CAPACITY

Absorptive Capacity is the companies' capacity to identify new information, assimilate it, and apply it to commercial ends (COHEN; LEVINTAL, 1990), as previously mentioned. Absorptive Capacity closely relates to the companies' prior level of knowledge. The prior knowledge is based on imminent knowledge. This asserts come from individual cognitive and behavioral studies. Research on memory development suggests prior knowledge increases the capacity to acquire, remember and use new ones (COHEN; LEVINTAL, 1990).

Based on Cohen and Levintal (1990), Absorptive Capacity occurs at two different levels. The first one is an individual level, which considers that personal characteristics enhance development. The second one takes place in the company, which needs ways to use knowledge to commercial ends, aiming to create and keep a competitive advantage. Cohen and Levintal (1990) also mention Absorptive Capacity consists of both perspectives,

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individual and organizational, considering organization Absorptive Capacity depends on its members' individual Absorptive Capacity. However, they make it clear organizational Absorptive Capacity does not represent only their employees' individual absorptive capacities together.

Regarding organizational Absorptive Capacity, Cohen and Levintal (1990) say in this level, it is more important the company's ability to explore knowledge than just to acquire and assimilate it. To develop this capacity, it is necessary that the company can transfer knowledge throughout its units, besides external communication structure. To Mowery and Oxley (1995), Absorptive Capacity includes a set of skills that reflect the need to deal with the implicit components of technology transfer, as well as the need of frequently changing new technology for domestic applications.

Zahra and George (2002) identify Absorptive Capacity as the dynamic capacity related to creating, assimilating, transforming and exploring knowledge that enhances the company's ability to acquire and sustain competitive advantage. According to Lane, Koka, and Pathak (2006), Absorptive Capacity is the capacity a company has to use the external expertise by means of sequential learning processes, which are exploratory, transforming, and exploitative.

Zerwas (2014) identifies the Absorptive Capacity as an important lever for improving small and medium-sized businesses' performance that typically have a lack of internal resources, and therefore, tend to rely heavily on Absorptive Capacity, as absorbing external knowledge is a critical factor for competitiveness. The author uses a graph to show the Absorptive Capacity of organizations, as shown in Figure 1.

Figure1 - Organizations' Absorptive Capacity
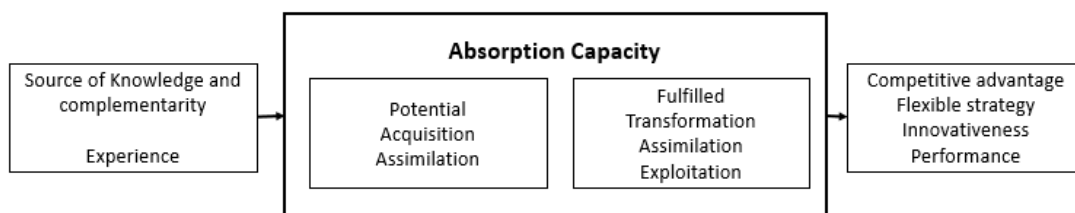
Source: Adapted from Zerwas (2014).

From the identification of different concepts and ways of measuring the Absorptive

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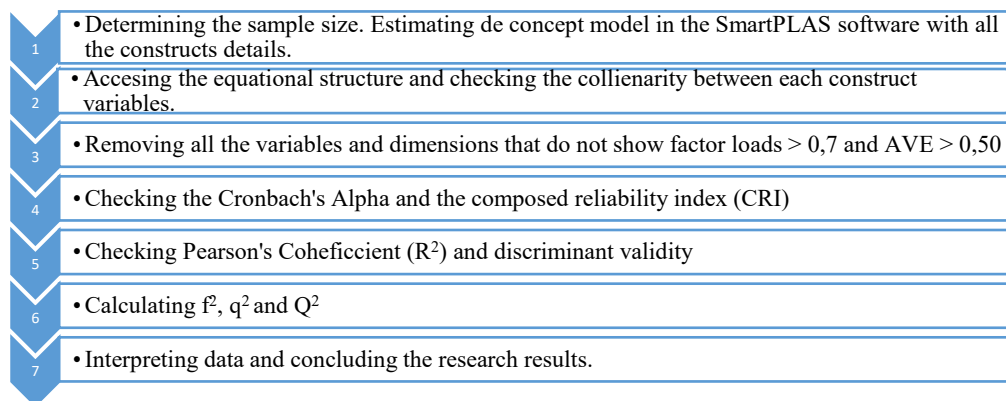
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Capacity, Flatten, Strike and Brettel (2011) developed a multidimensional instrument to measure the Absorptive Capacity at the organizational level. The authors aver the use of a concept and a common metric facilitates the comparison between studies and their relevance, regarding acquisition, assimilation, transformation and exploitation. This study theoretically relates to the instrument developed by Flatten, Strike and Brettel (2011) to measure the Absorptive Capacity at the organizational level.

4 MATERIAL AND METHODS

This is an applied research which aims to identify the relationship between the budgetary control and the Absorptive Capacity in a company. Initially, there has been done a literature study in order to determine which research instruments would be used. The budgetary control construct is Simons' (1995) theoretical model and to measure the Absorptive Capacity at the organizational level, the model is the one developed by Flatten, Strike and Brettel (2011). This is a descriptive cross-sectional survey, considering data collecting and analysis regarding a specific period, which is from January to May 2016.

The data analysis is quantitative approach, with survey technique and the collected data analysis resulted from the Structural Equation Modeling technique (SEM) with the support of the software SmartPLS in order to verify and assess the load factor, the samples' measures of suitability, the Cronbach's Alpha coefficient, and the relationship between the variables and constructs. The steps to develop this research are the ones in Figure 2.

Figure 2 - Structural equation steps description

1. • Determining the sample size. Estimating de concept model in the SmartPLAS software with all the constructs details.
2. • Accesing the equational structure and checking the collienarity between each construct variables.
3. • Removing all the variables and dimensions that do not show factor loads > 0,7 and AVE > 0,50
4. • Checking the Cronbach's Alpha and the composed reliability index (CRI)
5. • Checking Pearson's Coheficcient (R^2) and discriminant validity
6. • Calculating f^2, q^2 and Q^2
7. • Interpreting data and concluding the research results.

Source: Adapted from Nascimento (2016).

Concerning the minimum sample size, Silva (2015) says a small sample to a statistic test may show reality-distorting effects if they do not contain enough information to

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discover those effects as significant ones. To make sure the sample was sufficient, the software G*Power was used: parameter effect size f^2 = 0,35; error rate = 0,05; power = 0.9; number of predictors = 1; it resulted in a recommended sample of 33 cases.

Population corresponds to 51 incubated companies, set in the west of the state of Santa Catarina, Brazil, which were mapped in the first semester of 2016, by using the list of incubated companies provided by the *Associação Nacional de Entidades Promotoras de Empreendimentos Inovadores* (*ANPROTEC*) and the *Rede de Inovação* (*RECEPTI*) [1], so it was possible to access the incubators. By e-mail, they provided an updated list of the incubated companies. The sample comprises 34 incubated companies, which have answered the questionnaire sent by e-mail, during the first semester of 2016.

The Absorptive Capacity construct designed by Flatten, Greve and Brettel (2011) consists of four dimensions: acquisition, assimilation, transformation and exploitation. The questionnaire contains 14 questions. Nascimento, Lavarda and Silveira (2009) have revised the Budget Control construct by Simons (1995), and it now contains 15 questions. The questionnaire also contains control questions, as number of employees, age, gender, among others to establish who the participants are. It contains 36 questions and the companies that take part in the incubated technological base in the west of the State of Santa Catarina have answered it.

5 RESULTS AND DISCUSSION

The companies that have answered the questionnaires represent 65% of the target population. Regarding the gender, 64% are men and 36% are women. Concerning their occupations, 52% are CEOs, 39% are owners, 6% are analysts and 3% are computer programmers.

The target companies have, in general, 4.2 employees and their age rate is 27 years old. Regarding their Education level, 52% have university degree levels, 33% have graduation programs degrees, 6% have finished High School or have not completed it and 3% have master degrees. The sample showed that 42% of the companies are in the information
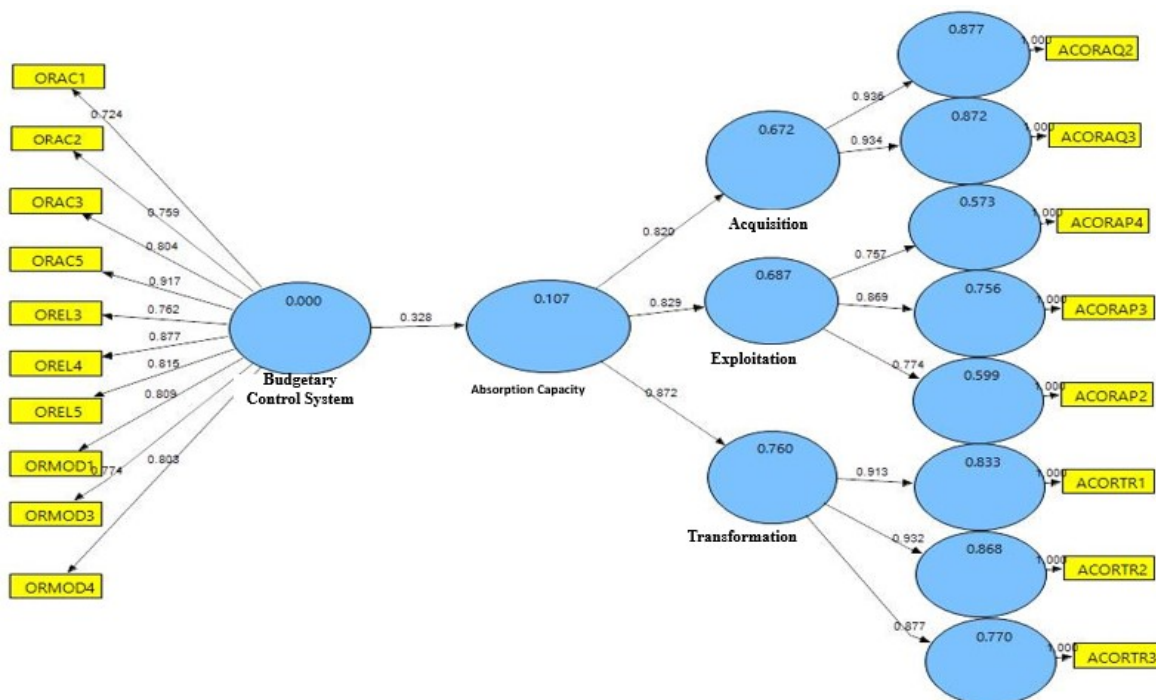
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[1] The Brazilian Portuguese aconyms correspond to *National Association of Innovative Entrepreneurial Entities* and *Innovativeness Newtwork*, respectively.

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technology/software field, 42% are in services, 27% automation, 6% relate to health and 3% are agro-industries or engineering companies.

Based on the sample, the data was applied to the SmartPLS software to estimate the theoretical modeling, according to the studied constructs. The Budgetary Control construct determined by Nascimento, Lavarda and Silveira (2009) contains 15 questions, as previously mentioned. The modeling has run with all the construct questions, with the conference of all the collinearity indexes among the variables and its Average Variance Extracted (AVE). The variables Orac4, Orel 1, Orel2 and Ormod 2 have been excluded from the Budgetary Control construct: Orel2 due to collinearity issues and the other ones because of low factor loadings. Factor loadings > 0.7 (Hair Jr *et al*., 2014) and AVE > 0.5 (FORNELL; LARCKER, 1981) must be excluded.

Concerning Absorptive Capacity, there are the dimensions of acquisition, assimilation, transformation and exploitation, in 14 questions. According to the literature, the AVE > 0.5 was excluded, which are the values inferior to the recommended ones, that occurred after removing the variables Acoras 3 and Acoras 4, due to their low factor loadings. After excluding them, the model has run once again and its values and factor loadings are in Figure 3. The dimensions of acquisition and exploitation have showed excluded variables (Acoraq1 and Acorap1, respectively), because of their low factor loadings, as shown in Figure 3.

Figure 3 - Structural equationSource: Research data.

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Source: Adapted from Nascimento (2016).

It is possible to observe in Figure 3 the relationship between the Budgetary Control System construct and the Absorptive Capacity construct demonstrated a correlation of 0.328, which means the Budgetary Control System relates to the Absorptive Capacity in 33%. In addition, it shows the values obtained in the modeling are aligned with the literature, which means all the factor loadings are above 0.7 (HAIR JR *et al*., 2014). Subsequently, Table 2 shows the modeling adjustment and its convergent validity, measured by the AVE and the factor loadings and the constructs' reliability, judged by Composite Reliability and the Cronbach's Alpha.

Table 2 – Adjustment indicators, convergent validity and constructs reliability

Variables	AVE	Composite Reliability (CR)	R^2	Cronbach's Alpha (CA)	Commonality	Redundancy
1- Budgetary Control System	0.65	0.95	-	0.94	0.65	-
2 – Absorptive Capacity	0.55	0.91	0.11	0.88	0.55	0.06
Acquisition	**0.87**	**0.93**	**0.67**	**0.86**	**0.87**	**0.59**
Transformation	**0.82**	**0.93**	**0.76**	**0.89**	**0.82**	**0.63**
Exploitation	**0.64**	**0.84**	**0.69**	**0.72**	**0.64**	**0.44**

Source: Research data.

Aiming at assessing convergent validity, the AVE is certified. To the Budgetary Control System, the score is 0.65 and to the Absorptive Capacity it is 0.55. According to Fornell and Larcker (1981), the modeling convergent validity is verified when the AVE values are above

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0.50, therefore the obtained values are aligned with the literature.

The constructs' reliability was measured considering the Composite Reliability (CR) and Cronbach's Alpha (CA) indexes. Hair Jr *et al*. (2014) mention to be considered reliable, the modeling must show CA > 0.7 and CR > 0.7. By observing the research data it is possible to see all the indexes are aligned with the theoretical assumptions, which demonstrates the modeling's reliability.

According to Babbie (1992), the CA is classified as very high when the results vary between 0.90 and 1.00; as high when they vary between 0.70 and 0.89; as moderate when they vary between 0.30 and 0.69 and as low when the values are lower than 0.30. In table 1 it is possible to observe the Budgetary Control construct shows the AC 0.94, which is considered high, according to Babbie (1992) and the Absorption Capacity shows 0.88, classified as moderate.

Next step is evaluating Pearson's determinant coefficient (R^2) and the discriminant validity. This coefficient evaluates how the endogenous variants vary, explained by the structural modeling, which indicates the quality of the adjusted modeling. In the words of Hair Jr *et al.* (2014), values of 0.75 are considered substantial, of 0.50 are moderate and 0.25 are weak to exact sciences. To social and behavioral sciences, the R^2 values suggested are 0.67 as a substantial modeling, 0.33 as moderate and 0.19 as weak (CHIN, 1998). Based on these assumptions, the modeling shows the weak quality of the adjusted modeling, considering its value was 0.11.

To determine the discriminant validity (DV) that represents the indicators with the highest scores in their respective latent variables (or constructs), according to Fornell and Larcker (1981) criterion, it is necessary to compare the square roots of the AVE's values to Pearson's correlations between the other constructs. To this criterion, the AVE's square roots must be superior to the correlation among the analyzed constructs, considering the discriminant validity shows to what extent the constructs, or latent variables, are independent of each other ones (HAIR JR *et al.,* 2014). The values obtained in this research show the discriminant validity, they are positive in 0.47.

The following step consists of verifying the path coefficients (Γ), by the Student's t

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test. According to Hair Jr *et al.* (2014), to estimate the significance of the path coefficients (Γ), one should perform the test to show the causal relationship between two constructs to see whether these are significant or not. In order to calculate the Student's t test, one should calculate the original samples from each variable or construct with the samples obtained with the bootstrapping technique (SILVA, 2015). The author mentions values above 1.96 are significant to 5% or 0.05, with a confidence rate of 95%, in which the constructs are related and independent. This research got 6.11 in the Student's t test, which shows the high causal relationship among the studied constructs.

At last, the Relevance or Predictive Validity (Q^2) and the Effect Size (f^2). According to Hair Jr *et al.* (2014), Predictive Validity (Q^2) aims at analyzing the modeling accuracy and it is also named Stone-Geisser Indicator. Ringle, Silva and Bido (2014, p.15) imply Q^2 "evaluates how close the modeling is to what it is expected to be (or the quality of the modeling prediction, or the adjusted modeling accuracy)". For Hair Jr *et al.* (2014), those values must be over zero. In this study, the modeling Predictive Validity showed $Q^2=0.058$. From this value, aligned with the literature, there is little prediction quality of the modeling, considering the literature defines the ideal Q^2 as 1, as suggested by Hair Jr *et al.* (2014).

The Effect Size (f^2), also known as Cohen's Indicator, occurs by adding or removing endogenous constructs from the modeling, it evaluates how much each construct can be useful to the concept modeling adequacy (HAIR JR *et al.*, 2014). The author mentions coefficients near 0.02 show little significance; coefficients of 0.15 show moderate significance and 0.35 show high significance. In this study, the relationship between the Budgetary Control System and the Absorptive Capacity showed little significance, considering its $f^2 = 0.003$.

6 FINAL CONSIDERATIONS

This research aimed at analyzing the influence of the Budgetary Control System on the Absorptive Capacity in incubated companies in the west mesoregion of the state of Santa Catarina, Brazil. Thereunto, here are the specific objectives of this research. The first one aimed at defining the incubated companies' profiles. From the collected data, it was possible to infer, regarding the gender, 64% are men and 36% are women. Concerning their

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occupations, 52% are CEOs, 39% are owners, 6% are analysts and 3% are computer programmers. The target companies have, in general, 4.2 employees and their age rate is 27 years old. Regarding their level of Education, the majority of them have university degree levels, 52%. The sample has also shown that, concerning their fields, 42% of the companies are in the information technology/software field, 42% are in services, 27% automation, 6% relate to health and 3% are agro-industries or engineering companies.

The second specific objective has been reached by examining the Budgetary Control System characteristics according to Simons (1995) modeling. The construct shows factor loadings over 0.7 and AVE over 0.5 which, according to Hair Jr *et al*. (2014) indicates its explanatory power. Guided by the theoretical assumptions, the Budgetary Control construct presentation has shown itself study, the factor loadings indicate the questions were clear and the respondents have understood them well. However, there were some issues related to the collinearity, which was too close to the theoretical limit VIF = 5, showing the respondents were careful when answering the questionnaire.

The third specific objective has been achieved when the Absorptive Capacity was assessed. This construct faced some issues regarding factor loadings, even though there were no issues related to collinearity. In addition, the construct has not shown itself as robust as expected, even though it fit the established theoretical parameters, which are the composed reliability indicators, Cronbach's Alpha.

The research team has excluded the assimilation dimension, even though not theoretically determined in the literature, concerning the research target public, the incubated companies, due to the fact those companies are in general ran by their owners and CEO's, who get information and immediately apply it, considering the filed dynamicity and uncertainty. The fact there is a reduced number of people working (in general, the average number of people is 4 to each company) encourages this practice of using information.

The three specific objectives were achieved. So it is time to analyze the general objective, which consists in the influence of the Budgetary Control System on the Absorptive Capacity about the incubated companies. After analyzing the relationship between these

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two constructs, the Student's t test resulted in 6.11, which means the modeling shows a statistically significant relationship, according to Hair Jr *et al.* (2014). Its predictive capacity can be rated from low to average, as mentioned by Cohen (1988), regarding its R^2 =11. The modeling low predictive capacity indicates there is a distance between the constructs and there may be other factors that intensify this relation. Its relation was classified as a weak one and, because of that it is possible to see the sample comprises small companies, in the beginning of their history, their ideas are motivated to professionalization, defined in their answers. However, it is possible to observe through this research their Budgetary Control System and Absorptive Capacity are distant from each other, considering their entrepreneurs. We concluded it happens because of a lack of planning and business structure, as their budget obviously limit them to access new technology or knowledge. Another aspect not to take into consideration is these entrepreneurs are strongly connected to the informal economy, or university labs, their structure is small and they are not closely related to budgetary aspects.

In summary, it is possible to assess the Budgetary Control System and the Absorption Capacity are correlated in 33%, even though the Budgetary Control System only influences the Absorption Capacity on 11%, which is too little.

As suggestions to further research it is mentioned the research aims private companies with market stabilization, and also the questions regarding the Budgetary Control construct should be classified into dimensions, so the research can be multidimensional, what permits to verify the existence of different tendencies in various budget steps as elaborating, following and modifying.

REFERENCES

AMORIM, B. C., NASCIMENTO, S., PENZ, D. & ROSSETTO, C. R. Sistema de Controle Orçamentário e a Inovação: um estudo em Empresas de Base Tecnológica Incubadas. 8, 2013, São Paulo. **Anais...** IBEROAMERICAN ACADEMY CONFERENCE São Paulo: IAM, 2013. CD-ROM.

BABBIE, E. **The practice of social research**. Belmont: Wadsworth, 1992.

CARPES, A. M. da S.; ORO, I. M.; EIDT, J.; STERZ, R. Orçamento empresarial: uma investigação sobre as formas de acompanhamento orçamentário utilizadas pelas companhias

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catarinenses. In: CONGRESSO BRASILEIRO DE CUSTOS, 15, 2008, Curitiba. **Anais...** Curitiba: CBC, 2008. CD-ROM.

CHIN, W. W. The partial least squares approach for structural equation modeling. In.: MARCOULIDES, George A. **Modern methods for business research**. London: Lawrence Erlbaum Associates, p. 295-236, 1998. Disponível em: <https://books.google.com.br/books?hl=pt-BR&lr=&id=EDZ5AgAAQBAJ&oi=fnd&pg=PA295&dq=The+partial+least+squares+approach+for+structural+equation+modeling.+in+Marcoulides,+G.A.+(Ed.)&ots=47uD6vo5en&sig=iMiH5x3NQwhu4A7ICAKAXxwWwBs#v=onepage&q&f=false>. Acesso em: 26 jan. 2016.

COHEN, J. **Statistical Power Analysis for the Behavioral Sciences**. 2. ed. New York: Psychology Press, 1988.

COHEN, W. M.; LEVINTHAL, D. A. Absorptive Capacity: A New Perspective on Learning and Innovation. **Administrative Science Quarterly**, v. 35, n.1, p. 128-152, mar, 1990.

FLATTEN, T. C.; GREVE, G. I.; BRETTEL, M. Absorptive capacity and firm performance: the mediating influence of strategic alliances. **European Management Review**, v. 8, p.137 -152, 2011.

FORNELL, C.; LARCKER, D. F. Evaluating structural equation models with unobservable variables and measurement error. **Journal of Marketing Research**, Estados Unidos, v. 18, n. 1, p.39-50, fev.1981.

FREZATTI, F. **Orçamento empresarial, planejamento e controle gerencial**. São Paulo: Atlas, 2007.

FREZATTI, F.; ROCHA, W.; NASCIMETO, A. R.; JUNQUEIRA, E. **Controle Gerencial:** Uma Abordagem da Contabilidade Gerencial no Contexto Econômico, Comportamental e Sociológico. São Paulo: Atlas, 2009.

FROW, N.; MARGINSON, D.; OGDEN, S. ''Continuous" budgeting: Reconciling budget flexibility with budgetary control. **Accounting, Organizations and Society**, v.35, p.444–461, 2010.

HAIR JR., J. F. et al. A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Los Angeles: SAGE, 2014.295p.

LANE, P. J.; KOKA, B.; PATHAK, S. The reification of absorptive capacity: A critical review and rejuvenation of the construct. **Academy of Management Review**, v.31, p.833–863, 2006.

MACEDO, A. C. Um enfoque do orçamento empresarial como ferramenta de controle e avaliação de desempenho. In: CONGRESSO BRASILEIRO DE CONTABILIDADE, 17, 2004. **Anais...** Santos: CBC, 2004. CD-ROM.

MIZIARA, G. N.; CARVALHO, M. Críticos de sucesso em incubadoras de Empresas de software. **Revista Produção Online**, v.8, n.3, p.1-20, 2008.

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MOWERY, D. C.; OXLEY, J. E. Inward technology transfer and competitiveness: The role of national innovation systems. **Cambridge Journal of Economics**, v.19, n.1, p.67-93, 1995.

NASCIMENTO, S. **Características Empreendedoras dos gestores de Empresas Incubadas e o Efeito Moderador do Estilo Cognitivo.** 163 f. Tese (Doutorado em Administração e turismo) – Programa de Pós-Graduação em Administração e Turismo Universidade do Vale do Itajaí, Biguaçu, SC, 2016. Disponível em: < http://www.univali.br/ensino/pos-graduacao/doutorado/doutorado-em-administracao/teses-defendidas/Paginas/default.aspx> Acesso em: 12 maio 2016.

NASCIMENTO, S.; LAVARDA, C. E. F.; SILVEIRA, A. O controle orçamentário num ambiente inovador: estudo de multicasos em empresas de base tecnológica incubadas. In: CONGRESSO BRASILEIRO DE CUSTOS, 16., 2009, Fortaleza. **Anais...** Fortaleza: CBC, 2009. CD-ROM.

OYADOMARI, J. C. T.; FREZATTI, F.; CARDOSO, R. L.; AGUIAR, A. B. Análise dos Trabalhos que Usaram o Modelo Levers of Control de Simons na Literatura Internacional no período de 1995 a 2007. **Revista de Contabilidade e Organizações**, v.3, n.7, p.25-42, set-dez. 2009.

RINGLE, C. M.; SILVA, D. da; BIDO, D. de S. Modelagem de equações estruturais com utilização do SmartPLS. **REMARK: Revista Brasileira de Marketing**, São Paulo, v.13, n.2, p.56-73, maio 2014. Disponível em: <http://www.revistabrasileiramarketing.org/ojs-2.2.4/index.php/remark/article/view/2717/pdf_167>. Acesso em: 27 jan. 2016.

SILVA, D. **Modelagem de equações estruturais usando o Smart PLS**. 17 de abr. 2015. 290 p. Notas de Aula.

SIMONS, R. **Levers of Control.** Boston: Harvard Business School Press, 1994.

SIMONS, R. **Levers of control:** how managers use innovative control systems do drive strategic renewal. Boston: Harvard Business School, 1995.

TEECE, D. J. **Dynamic Capabilities and Strategic Management.** Oxford University Press, New York, 2009.

WELSCH, G. A. (1973). **Orçamento Empresarial.** São Paulo: Atlas.

WELSCH, G. A. (1983). **Orçamento Empresarial.** São Paulo: Atlas.

WETZELS, M.; ODEKERKEN-SCHRÖDER, G. Using PLS path modeling for assessing hierarchical construct models: guidelines and empirical illustration. **MIS Quarterly,** Estados Unidos, v.33, n.1, p.177-195, 2009.

ZAHRA, S. A.; GEORGE, G. Absorptive Capacity: A Review, Reconceptualization, and Extension. **Academy Management Review**, v.27, n. 2, p.185-203, April 1, 2002.

ZERWAS, D. **Organizational Culture and Absorptive Capacity The Meaning for SMEs.** Koblenz-Landau, Germany. Springer Gabler, 2014.