EFFECT OF THE ECONOMIC CRISIS ON THE BUDGETARY FUNCTIONS IN THE INDUSTRIAL SECTOR

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ABSTRACT

The study aimed at evaluating the relationship of uncertainties, in an environment of economic crisis, and endogenous variables with the use of the budget in Santa Catarina industries. To this end, it has contingency theory as a theoretical framework. The research is characterized as a descriptive, survey, and quantitative, covering 258 industries in Santa Catarina/Brazil that use the budget as a management tool. It was found that the perception of uncertainty in an environment of economic crisis is related to the use of the budget, changing the use of budget functions. A positive relationship was noted for the planning and resource allocation functions, i.e., such budget functions have their relevance expanded in times of economic crisis. On the contrary, performance evaluation has obtained a negative relationship, being less used in the period of oscillations caused by the economic crisis. Finally, we conclude that in the context of Santa Catarina/Brazil industries, the uncertainties generated by the economic crisis environment, analyzed together with endogenous variables (strategy, size, and life cycle), modify the budget functions. The study contributed to the survey in managerial accounting by broadening the understanding of the use of budget functions in periods of economic crisis.

Keywords: Contingency theory. Planning. Resource allocation. Performance evaluation. Economic crisis.

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EFEITO DA CRISE ECONÔMICA NAS FUNÇÕES ORÇAMENTÁRIAS NO SETOR INDUSTRIAL

RESUMO

O estudo objetivou avaliar a relação de incertezas, em um ambiente de crise econômica, e variáveis endógenas com o uso do orçamento em indústrias catarinenses. Para tal, tem a teoria contingencial como arcabouço teórico. A pesquisa caracteriza-se como descritiva, survey e quantitativa, abrangendo 258 indústrias catarinenses que fazem o uso do orçamento como ferramenta gerencial. Constatou-se que a percepção de incerteza em um ambiente de crise econômica se relaciona com o uso do orçamento, modificando o uso das funções orçamentárias. Para as funções de planejamento e alocação de recursos apontou-se uma relação positiva, ou seja, tais funções orçamentárias têm sua relevância ampliada em momentos de crise econômica. De modo contrário, a avaliação de desempenho obteve uma relação negativa, sendo menos utilizada no período de oscilações causadas pela crise econômica. Por fim, conclui-se que no contexto das indústrias catarinenses, as incertezas geradas pelo ambiente de crise econômica, analisadas conjuntamente com variáveis endógenas (estratégia, tamanho e ciclo de vida), modificam as funções orçamentárias. o estudo contribuiu com a pesquisa em contabilidade gerencial ao ampliar o entendimento sobre o uso das funções orçamentárias em períodos de crise econômica.

Palavras-chave: Teoria contingencial. Planejamento. Alocação de recursos. Avaliação de desempenho. Crise econômica.

1 INTRODUCTION

Assuming that economic crises are the result of an imbalance between production and consumption (Sandroni, 1994), the consequence of which, according to Becker, Mahlendorf, Schäffer, and Thaten (2016), reduces the level of industrial production, raises the unemployment rate and causes changes in prices, results obtained in the period and the volume of investments. In this context, the environment affected by economic crises, according to Asel, Posch, and Speckbacher (2011), raises uncertainty and requires a reduction in the time available for decision making, requiring managers to take immediate and short-term actions to ensure the continuity of the organization. In addition, Asel et al. (2011) claim that economic crises increase the pressure on managers in the decision-making process in order to ensure that organizations achieve established strategic objectives.

As the environment affected by economic crises is more uncertain and strategic objectives become more difficult to achieve, it is assumed that the tools that make up the Management Control System (SCG) have changes in the purpose of monitoring management, losing or gaining relevance (Asel et al., 2011). Possibly, the change in the relevance or use of managerial tools, in contexts of economic crisis, resulting from the need to readapt the information generated, given the change in attributes such as timeliness and materiality (Van Der Stede, 2011).

Moreover, in unstable scenarios, such as those experienced by Brazil from 2015 onwards, the pressure on the functioning of management accounting systems is likely to increase in order to ensure the continuity of the organization. Schaaper, Mizoguchi, Nakamura, and Yamashita (2011) show that the increased need for information for the decision-making process of managers in an environment of economic crisis can be considered a determining factor for management change.

Among the various types of management tools, the budget stands out; according to Welsch (1983) and Weston and Brigmham (2000), the budget system is an important practice for management, due to planning and control needs, aiming at possible redirections to achieve goals and objectives of the organization. Through the budget, managers can project their expenditures and prospect the sources of resources, to be later compared with the data realized (Weston & Brigmham, 2000).

The budget assists organizations in the decision-making process, however Hopwood (2009) highlights the use specifically in times of economic crisis. According to Leite (2008), the use of the budget tends to increase the estimate of profits as well as the return on investment and thus improve the financial situation. In the view of Frezatti et al. (2010) the use of the budget assists organizational management in its activities and priorities, guiding them on performance, since the operationalization of the budget takes place through the confrontation between what is predicted and what is accomplished, in which variations are essential and therefore must be analyzed and adjusted to direct the organization to achieve its objectives. Similarly, Panosso et al. (2017) emphasize that the use of the budget impacts on the performance of organizations, since without the information and proper management control, they may have difficulties in acting in the market.

Faced with such a problem, Collins, Holzmann, and Mendoza (1997) stress that the budget plays a key role in dealing with moments of instability, as it helps the manager in the process of measuring threats and opportunities. Becker et al. (2016) point out that in a context of economic crises, the budget functions of planning, resource allocation, and performance evaluation may change compared to those for which they were planned, in the context of a stable economy. In turn, the study by Bourmistrov and Kaarbøe (2017) points out that the adoption of rigorous budget control was a response that resulted from managers' perceptions of the crisis, as well as demand from investors and the board of directors, with the aim of improving the organization's short-term financial situation. It also indicates that managers who observe the organizations' external information more have more chances of survival and continuity than those who analyze only the internal environment (Bourmistrov & Kaarbøe, 2017).

However, Pavlatos and Kostakis (2018) point out that little attention has been paid to research in managerial accounting regarding the way organizations deal with economic crises involving their environment. In the same sense, they complement that innovations in managerial accounting generate better quality and broader information to deal with the uncertainty generated by economic crises (Pavlatos & Kostakis, 2018). In view of the above, it is assumed that the factors that may influence the modification of budget functions (especially the functions of planning, resource allocation, and performance evaluation), should be

observed, also taking into consideration endogenous aspects, especially the strategy, the size of the organization and its life cycle stage.

Thus, the study focuses attention on the following research problem: what is the relationship between uncertainties in an environment of economic crisis and endogenous variables with the functions of the budget? The research problem aims at evaluating the relationship between uncertainties in an environment of economic crisis and endogenous variables with the functions of the budget in Santa Catarina/Brazil industries.

In the context of organizational research, economic crises are identified by Ury and Smoke (1991) as a substantial threat to organizations. Kunc and Bhandari (2011) highlight it as a moment of opportunity and expansion in the market. However, authors such as Hopwood (2009), Van der Stede (2011), Abernethy, and Mundy (2014) report that management accounting surveys have given little attention to organizational responses to times of economic instability. Thus, the topic represents an opportunity for research in managerial accounting and broadens the understanding of how the tools of managerial control, in particular, the use of segregated budget in their budgetary functions is remodeled to contribute to the process of facing crises.

The practical contribution of this study points to learning effects and a better perception of managers to face possible economic crises in the future and, according to Messner (2016), that there is room for studies around the practices adopted in the management of the industrial sector, especially the budget.

From the above, the study contributes to the literature; as suggested by authors such as Burns and Scapens (2000), Hopwood (2009), Van der Stede (2011), Abernethy, and Mundy (2014), it focuses on the SCG in a context of economic crises. This contribution is due to the fact that contingent variables (uncertainty, life cycle, size, strategy) are related to how they modify the budgetary functions in a context of economic crises, compared to their use at a time prior to the crisis. The study, following Hopwood's (2009) suggestion, highlights the budget guidelines adopted by industries in the face of economic crises. The contribution also stems from the confirmation, in the Brazilian context, of the findings of Becker et al. (2016) for European companies, regarding the increase of certain budgetary functions to the detriment of others, at times of economic crisis.

It also contributes to advance the study of Becker et al. (2016), since it incorporates in the analysis the effect of endogenous variables, indicating that the strategic positioning increases the intensity of the use of the budgetary functions; the early stages of the life cycle increase the importance of the budgetary function of performance evaluation and that larger companies tend to attach less importance to this budgetary function.

2 LITERATURE REVIEW

2.1 Economic Crisis and the Use of Budget Functions

The economic crisis is pointed out by Sandroni (1994) as an economic disturbance, which derives from scarcity and an imbalance between production and consumption, consequently there is a sudden drop in production and production capacity, leading to the bankruptcy of companies, an increase in the

unemployment rate, a decrease in wages, as well as a decrease in profit and prices, investment restrictions, high banking liquidity, among others. These economic crises are considered a substantial threat to organizations (Ury & Smoke, 1991) since they induce significant changes in consumer behavior, alter the demand for goods and services, which causes variations in the way organizations operate (. MoreoverAfthonidis & Tsiotras, 2014), the economic crises affecting countries and companies bring as consequences the unavailability of capital and the reduction in demand, in this context, according to Becker et al. (2016), the use of budget functions can play an essential role in dealing with such crises, facilitating organizational adaptation to the new dynamics of the environment and contributing to broadening managers' attention to threats and opportunities arising from an environment affected by economic crises.

It is noteworthy that in periods of economic crisis, many organizations are confronted with serious threats, which require immediate, short-term actions to ensure survival that sometimes also damages long-term financial health (Asel et al., 2011). Moreover, they generally cause negative effects on the performance of organizations and innovative activities (Brzozowski & Cucculelli, 2016). Thus, Hopwood (2009) suggests that such crises put continuous pressure on the functioning of the SCG, regardless of the branch of activity, and influence the reformulation of budget functions, given the possibility of changing cost and revenue levels, among others. In view of this fact, the author indicates the need for constant reformulation of the SCG in light of the strategic positions adopted during periods of economic recession.

In the same direction, Claessens Djankov e Xu (2000)points out that the economic and financial crises cause impacts on the environment in which organizations are inserted and affect several sectors, changing credit conditions, demand for products, prices of inputs, relations between organizations and even the political sphere. Similarly, Collins, Almer, and Mendoza (1999) report that economic crises, the environment, and governmental aspects affect the strategic business posture of organizations and affect the use of budget functions.

On the other hand, the above conditions do not affect all organizations with the same intensity (Afthonidis & Tsiotras, 2014). For some, the environment is considered hostile and conceives of a threat; for others, it can be seen as an option to explore opportunities and develop in the market (Kunc & Bhandari, 2011). In this sense, Afthonidis and Tsiotras (2014) suggest that an essential factor in determining the appropriate strategic stance of an organization operating during economic crises is to understand the impact on the micro and macroeconomic environment. In the same direction, for Brzozowski and Cucculelli (2016), the moments of recession generated by economic crises can be seen as an opportunity to increase competitiveness, since while some companies, in the same sector of activity, cut spending, those that manage to "swim against the current" manage to obtain additional opportunities and benefits, especially after the economy recovers from the economic crises (Brzozowski & Cucculelli,). From 2016) Waal and Mollema's (2010) point of view, organizations whose managers are sensitive to the characteristics of the circumstances in which they operate manage to implement their actions in a well-structured and formulated strategic plan, consequently obtaining benefits from economic crises. However, to ensure these opportunities, it is also necessary to make sure of an investment plan for marketing or advertising, that is, areas that collaborate to add value to the

organization. The authors also point out that in periods of resection, organizations have the opportunity to insert new products in the market, solidify their position, carry out mergers and acquisitions, and recruit qualified personnel.

In short, economic crises can pose a threat to organizations operating in this environment, due to overproduction and lack of demand in the market, the economic recession induces a reduction in GDP and increases unemployment. In the Brazilian context, data from IBGE (2017) indicate that in 2015 the GDP fell by 3.8% compared to 2014 and in 2016 the fall was 3.6% (greater falls in the historical series begun in 1996). In turn, according to IBGE (2017), in the years 2015 and 2016, the balance between admissions and layoffs was negative, with a reduction in the number of formal jobs of approximately 1.54 million and 1.32 million, respectively. Finally, the oscillations that occur in times of economic crisis cause the inability to control factors such as inflation, reduce the volume of negotiations, and the profitability of organizations, among others. However, although the crisis represents a threat to some organizations, on the other hand, it offers opportunities, which vary with the branch of activity and management capacity.

Among the several theoretical lenses used to understand the use of management control tools, in the study the option for contingency theory is made. This predilection is based on statements such as that of Otley (2016), when reporting that in the context of research in managerial accounting, the role of contingential theory is to contribute to the understanding of the management practices used in specific circumstances, mainly due to the fact that there is no universality of the GSC.

Furthermore, based on Beuren and Fiorentin (2014) and Otley (2016), contingential theory seeks to understand and explain how contingential variables influence the growth and survival of organizations. Among the several contingential variables observed in the literature of managerial control, Chenhall (2003) highlights the environment (and the uncertainty resulting from it). The environment is an exogenous variable to the organization and has long been used to broaden the understanding of the adoption of economic and management evaluation methods that affect the way an organization is managed and its performance (Hayes, 1977, Waterhouse & Tiessen, 1978). In turn, endogenous variables such as the life cycle stage, strategy, and size are recurrently described as useful for investigations based on contingency theory (see for example Frezatti et al., 2010; Neitzke & Espejo, 2016).

Specifically, in relation to the impact that the uncertainty resulting from the economic crisis environment may have on the use of the budget, studies such as those of Campello, Graham, and Harvey (2010) and Becker et al. (2016) signal the importance of analyzing the functions of the budget (planning, resource allocation, and performance evaluation) in crisis contexts. Becker et al. (2016), when focusing on the 2008 European economic crisis, found that the planning budget function increases in periods of economic crisis, since in times of crisis the risks of failure may be greater, increasing the responsibility of the manager not to make mistakes in decision making and therefore reduce the impact caused by the crisis. These factors increase the attention of budget planning and precision in execution, which increases the pressure on managers to ensure the achievement of organizational objectives.

In turn, according to Campello et al. (2010) and Becker et al. (2016), in periods of economic crisis, the budgetary function of resource allocation gains relevance, especially as a result of reduced revenues. This factor reduces the possibility of funding with resources from organizational activities, as well as increases the possibility of organizations needing to raise funds from third parties, generating an increase in debt, which may imply liquidity problems. Thus, Staw, Sandelands, and Duton (1981) and Hopwood (2009) suggest that securing resources from organizational activities to maintain liquidity is a key issue for organizations threatened by economic crises.

Another function of the budget pointed out in the study by Becker et al. (2016), which was affected by the context of economic crises, is performance evaluation, in which it suggests the use of the budget for the evaluation of subordinates and the business unit. In periods of economic crisis, this evaluation can be difficult due to budget objectives that become difficult to achieve. As a result, Haka and Krishnan (2005) and Becker et al. (2016) point out that the element of uncertainty in economic crises affects budget-based performance evaluation. As a result, three research hypotheses have been elaborated. Table 1 contains a description of the hypotheses and an indication of the expected relationships.

Table 1
Research assumptions

Hypotheses	**Expected Relationship**
H1: The greater the perception of economic crisis, the greater the use of the budget planning function.	Positive relationship (+)
H2: The greater the perception of economic crisis, the greater the use of the budgetary function of resource allocation.	Positive relationship (+)
H3: The greater the perception of economic crisis, the less use is made of the performance evaluation budget function.	Negative relationship (-)

Source: Prepared by the authors.

3 METHODOLOGICAL PROCEDURES

In order to achieve the proposed objective, this survey adopts a quantitative research approach and as for the procedures it is configured as a survey. The data collection period occurred between the months of May 2017 and June 2017. The population is composed of two thousand managers of industries from Santa Catarina with an active profile in the LinkedIn® relationship network, which from the search filter accepted connection with one of the authors of the survey. For the search filter, the terms: 'Santa Catarina' 'Industry' were used. Accompanied by the respondents' profiles as: 'Manager' 'Managing Director' 'Financial Director' 'Manager' 'Accountant' 'Controller' 'Coordinator' 'President' and 'Supervisor'. The process resulted in 1,300 connections, from this total, 258 valid questionnaires were obtained. Table 2 shows the sample of the survey.

Table 2
Sample Survey

Item	Total
Total respondents	296
Industries using the budget	260
Industries that have declared not using the budget	36
Exclusions due to invalid replies	2
Final sample	258

Source: Research data.

The choice of industries in the State of Santa Catarina as a sample is justified because it is the fourth State in terms of the number of companies, the fifth in terms of the number of workers and also the second State with the largest participation of the manufacturing industry in the Gross Domestic Product (GDP). Moreover, the Santa Catarina economy stands out for the diversification of its industrial hub (FIESC, 2017), being relevant to note that, according to the Brazilian Institute of Geography and Statistics (IBGE, 2017), the state of Santa Catarina suffered the effects of the Brazilian economic crisis more acutely in relation to the national average. Data indicate that in 2016, while the State of Santa Catarina suffered a GDP shrinkage of 4.2%, the national average was a decrease of 3.6%. This study also indicates that the economic crisis has hit the industrial sector of Santa Catarina more intensely since it represents 28.7% of the Santa Catarina GDP and 22.5% in the country.

Table 3 shows the position occupied by the respondents, as well as the proportion in relation to the total sample.

Table 3
Survey respondents, in alphabetical order of position

Position	ni	fi
Financial Analyst/Budget	16	6,20
Counter	10	3,88
Controller	12	4,65
Coordinator	34	13,18
managing director	25	9,69
Chief Financial Officer	15	5,81
Manager	85	32,95
Other*	8	3,10
President	24	9,30
Managing Partner/Owner	14	6,59
Supervisor	12	4,65
Total	**258**	**100,00**

Note: ni cumulative frequency; fi relative frequency.
* Others include respondents whose declared position was: Director (0.4%), Financial (0.4%), Engineer (0.8%), Industrial Director/Operations (1.6%).
Source: Research data.

The largest number of respondents refers to 85 industrial managers, representing 32.95% of the sample. Still, 34 coordinators, 25 administrative directors, 24 presidents, 15 financial directors, 12 controllers, 12 supervisors, 10 accountants, the remaining respondents correspond to the other categories of functions within the organizations. In the sequence, Table 4 shows the sample of the survey

segregated by the classification of the National Code of Economic Activities (CNAE) of the manufacturing industries, according to IBGE (2017).

Table 4
Classification of industries, according to CNAE, in order of participation

Category	ni	fi	Fi
1. Manufacture of textile products	36	13,95	13,95
2. Manufacture of rubber and plastic products	32	12,40	26,35
3. Manufacture of various products	22	8,53	34,88
4. Metallurgy	21	8,14	43,02
5. Manufacture of machinery and equipment	20	7,75	50,77
6. Manufacture of clothing and accessories	18	6,98	57,75
7. Maintenance, repair and installation of machinery and equipment	18	6,98	64,73
8. Manufacture of food products	17	6,59	71,32
9. Manufacture of pulp, paper, and paper products	9	3,49	74,81
10. Manufacture of wood products	9	3,49	78,30
11. Manufacture of metal products, except machinery and equipment	9	3,49	81,79
12. Furniture manufacture	8	3,10	84,89
13. Manufacture of computer equipment, electronic and optical products	7	2,69	87,58
14. Manufacture of machinery, apparatus, and electrical materials	5	1,94	89,52
15. Manufacture of chemicals	5	1,94	91,46
Other groups (9 distinct groups)	22	8,50	100
Total	**258**	**100**	**-**

Note: $_{Fi}$ relative frequency; $_{Fi}$ absolute frequency; $_{ni}$ cumulative frequency
Source: Research data.

The segregation of the sample follows the classification of manufacturing industries which, according to the criteria established by IBGE, comprises 24 divisions. The predominant segment of the study is the manufacturing of textile products (13.95% of the sample) preceded by the manufacturing of rubber and plastic products, representing 12.40% of the sample, with 32 respondents.

For data collection, a questionnaire adapted from Becker et al. (2016) was used, which was measured by an interval scale from 0 to 10 points. The questionnaire was translated and revised from English into Portuguese by an English-speaking professional, and a pre-test was subsequently carried out with professors, Ph.D. students, and professionals with knowledge in the study area and with characteristics similar to the study population. It should be noted that the

respondents and the questionnaires applied in the pre-test were not included in the research sample.

The data was collected with the help of the Google Docs program online and sent via an electronic link. The questionnaire was sent via LinkedIn® to the previously contacted managers.

The variables used in the analysis procedures are summarized in Table 5, which includes the category of analysis, the questions corresponding to each variable, as well as the authors who have already used them in related studies.

Table 5
Research construction

Variable	Category	Questions	Authors
Crisis environment (CA)	Perception of the economic crisis	1 a 7	Gordon and Narayanan (1984); Janke, Mahlendorf and Weber (2014); Becker *et al.* (2016).
Environmental uncertainty (PEU)	Intensity of competition	20 a 31	Gordon and Narayanan (1984); Janke *et al.* (2014); Becker *et al.* (2016).
	Unpredictability of the environment		
	Elements of environmental change		
Budget functions (FO)	Planning	8 to 11 and 16; 17.	Becker *et al.* (2016).
	Resource Allocation	12 e 13	
	Performance evaluation	14;15; 18; 19.	
Strategy (EST)	Cost	32 a 53	Porter (1980); Janke *et al.* (2014); Becker *et al.* (2016).
	Differentiation		
Life cycle (CV)	Birth	54	Miller and Friesen (1986); Davila and Foster (2007); Moores and Yuen (2001); Janke *et al.* (2014); Becker *et al.* (2016).
	Growth		
	Maturity		
	Renaissance		
	Decline		
Size (TAM)	Gross Operating Revenue	Panel B	Janke *et al.* (2014); Becker *et al.* (2016); BNDES (2017).

Source: Research data.

To measure the Crisis Environment variable, the questionnaire contemplated seven questions, in which the respondent signaled his perception of the economic crisis environment. Since this is a scale of individual perception, even if the respondents are in the same unit as the federation, they have different perceptions in part due to the type of product of the company, customer relationship, market of operation, among others.

In the questionnaire, questions 8 to 19 (Budgetary Functions) provided for two answers - in the first moment (group 0) the respondents reported their perception of the use of budget functions for planning, resource allocation and performance evaluation in the economically stable period (before the economic crisis) to subsequently position themselves as using the same functions in the context of the 2016 economic crisis (group 1).

The data collected were tabulated in excel spreadsheets. In the data analysis stage, the t-test was performed through the SPSS® Statistical version 22 software, with the budget functions aiming to test whether the averages are equal or not for the previous period and during the crisis. Fávero, Belfiore, Silva, and Chan (2009) point out that the t-test is applied when it aims to verify whether the means of two related samples (X1, ..., Yn, Y1, ..., Yn) with normal distribution, being these extracted from the same population are significantly different or not. Subsequently, the canonical correlation test was carried out in order to analyze the relationship of uncertainties in an environment of economic crises and endogenous variables with the budgetary function of planning (a), resource allocation (b) and performance evaluation (c) in industries in Santa Catarina, in the period during the economic crisis, compared to the previous period.

Canonical correlation can be seen as an extension of multiple regression. Through it, one can evaluate the interrelations between two sets of variables, composed of linear combinations of the various characters that constitute them, as pointed out by Hair Jr. Anderson, Tatham, and Black (2005). In the sequence, the results of the research are presented, which besides exposing the main findings and the analysis, describes specific aspects of the investigation process.

4 ANALYSIS OF RESULTS

The analysis begins by identifying the influence of the 2016 economic crisis environment on the budgetary functions in Santa Catarina industries obtained from the *t* test. Through this test, it was possible to identify the averages assigned by managers to each of the three budget functions investigated before and during the period of economic crisis, as well as whether these changes were significant. Table 6 summarizes the results.

Table 6
Test of averages of the budgetary functions

Data	Group*	Qty	Average	T	Sig.
Planning	0	258	48,43	22409,500	0,000
	1	258	54,17		
Resource Allocation	0	258	15,62	21659,000	0,000
	1	258	17,86		
Performance Evaluation	0	258	32,64	7763,000	0,000
	1	258	29,66		

Note: 0 for before the crisis; 1 for during the crisis.
Note: Group 0 - before the crisis period; Group 1 - during the economic crisis period.
Source: Research data.

In Group 0, respondents signaled how they were using the budget at stable times, and in Group 1, the same respondents signaled how they were using the budget at the time of the 2016 economic crisis. It can be seen that there was a statistically significant variation in the value of the averages for the periods before (Group 0) and during the economic crisis (Group 1) in the three budget functions, all with a significance level of 1%. From the results, it is possible to infer that the use

of the budget for planning, in Santa Catarina industries, was modified during the economic crisis of 2016.

When comparing the averages obtained, the results indicate that, during the period of economic crisis, the managers of Santa Catarina industries increased the importance attributed to the budgetary planning function. For the budget function of resource allocation, the results indicate that managers attach greater importance to the use of the budget as a tool to support the allocation of resources in the period of crisis observed. This result is consistent with the need for a better allocation of resources which, due to the economic crisis environment, may become scarce because it makes it possible to increase control over the power of decision for the realization of expenditures and authorization of expenditures.

In turn, for the performance evaluation budget function, in the previous period and during the economic crisis, there was a reduction in the declaration of its use and these results signal a decrease in its importance in times of crisis. It can be inferred that, in times of economic crisis, the industries observed consider the use of the performance evaluation budget function to establish the compensation of managers to be of less relevance, since reaching the budget goals becomes complex due to market oscillations. In summary, the results indicate that the use of budget functions in the companies in the sample is affected by the environment of the 2016 economic crisis, which was observed by the modification of budget functions in organizations. In the study Becker et al. (2016), it was found that such findings are aligned with the economic crisis in the context of European companies.

As for the results of canonical correlation analysis, the model evaluates the relationship of uncertainties in an environment of economic crisis and endogenous variables with budget functions. First, the correlation matrix among all variables of the study is presented, providing the visualization of possible associations among the variables used in the correlation models, as shown in Table 7.

Table 7
Canonical Correlation of Budgetary Functions with Contingency Variables

Number	AutoValue r	Canonical Correlation	Wilk Lambda	Chi-Square	D.F.	P-Value
1	0,12658700	0,3557900	0,832108	46,40770	15	**0,0000***
2	0,04519120	0,2125820	0,952708	12,23270	8	0,1411
3	0,00219987	0,0469028	0,997800	0,55608	3	0,9064

Source: Research data.

It is verified that three different linear combinations of the set of variables presented in table 9 were calculated. The first one was significant for the 5% level, with p-Value of 0.0000. The canonical correlation coefficient of 0.3557 of this linear combination, according to Hair Jr. et al. (2005) conceives a moderate association force between the variables of the model, obtaining an explanation power of 35.57% of the model. Table 9 shows the coefficients for the canonical

variables of the contingency variables group and the group that represents the three budgetary functions of this study.

Table 8
Canonical correlation

Groups	Variables	Coefficients
Contingency Variables (VC)	Size (TAM)	-0,116508
	Crisis Environment (AC)	-0,017931
	Perceived Environmental Uncertainty (PEU)	-0,646969
	Life Cycle (CV)	-0,173107
	Strategy (EST)	-0,598881
Budgetary Functions (FO)	Planning (PLA)	-0,474223
	Resource Allocation (RA)	-0,424084
	Performance Evaluation (AD)	1,410460

Source: Research data.

The coefficients presented in the first column of Table 7 were analyzed, as a result of which this represents a greater correlation between the three linear combinations of the budget functions, as shown in Table 8. Through *Statgraphics® software,* the coefficients of the first canonical equation were described between the contingent variables and the second equation the values of the budget function:

VC = -0.116508*TAM - -0.017931*AC - 0.646969*PEU - 0.173107*CV - 0.598881*EST, and FO = -0.474223*PLA - 0.424084*AR + 1.41046*AD

Thus, by relating the budget functions to the uncertainties in an environment of economic crisis and endogenous variables in the period during the 2016 economic crisis compared to the period before the economic crisis, it is clear that there is a directly proportional relationship between the planning and resource allocation variables and the contingential variables of size, crisis environment, perceived environmental uncertainty, life cycle and strategy. However, for the performance evaluation variable, the relationship with the other variables analyzed was inversely proportional.

Therefore, for the planning and resource allocation budget functions, which are directly proportional to the contingent variables, the strength of the relationship established between the variables is taken into consideration, since it can be seen in the following order of relevance that i) the perception of the managers of Santa Catarina industries, in relation to the level of uncertainty of the environment (PEU), is directly proportional to the intensity of the use of the planning and resource allocation budget functions; ii) the more inclined towards a strategic positioning (SST) of differentiation, the greater the intensity of the use of the budgetary functions of planning and allocation of resources; iii) the larger the size (TAM) of industries in Santa Catarina, measured by revenues, the greater the intensity of the use of the planning and resource allocation budget functions; iv) the more advanced the organization's life cycle stage (CV), the greater the use of the planning and resource allocation budget functions; v) with less strength in relation to the variables analyzed, it can be seen that the greater the perception

of the economic crisis (CA) environment, the greater the use of the companies' planning and resource allocation budget functions.

In turn, for the performance evaluation budget function, it is found that in the model is inversely proportional to the contingent variables, taking into account the strength of the relationship established between the variables, it is possible to establish, in the following order of relevance: i) the greater the perception of the managers of Santa Catarina industries, in relation to the level of uncertainty of the environment (PEU), the lower is the intensity of the use of the performance evaluation budget function; ii) the more the Santa Catarina industry tends to a strategic positioning (EST) of leadership in cost the greater is the intensity of the use of the performance evaluation budget function; iii) the larger the size (TAM) of industries in Santa Catarina, measured by revenues, the lower the intensity of use of the performance evaluation budget function; iv) companies in the stage of birth and growth (CV) tend to use the performance evaluation budget function more intensively, compared to those in stages of maturity, rebirth and decline; v) the greater the uncertainty regarding the economic crisis (CA) the lower the use of the performance evaluation budget function.

These findings allow us not to reject the three hypotheses of the survey, i.e., H1 - The greater the perception of economic crisis, the greater the use of the planning budget function (positive relationship); H2 - The greater the perception of economic crisis, the greater the use of the resource allocation budget function (positive relationship); H3 - The greater the perception of economic crisis, the lesser the use of the performance evaluation budget function (negative relationship). These findings contradict those established by Pavlatos and Kostakis (2018) who, when investigating management accounting practices during the period of economic crisis in Greece, concluded that during the period of economic crisis managers indicated they trusted in the development of annual budgets for cost control, as well as in performance evaluation and planning, prioritizing solutions and long-term action plans.

When evaluating the three budget functions, it is clear that the results are in line with Billings, Milburn and Schaalman (1980) which indicate that, in new and uncertain situations, managers have a more limited understanding of their environment. In addition, studies by Janke *et al.* (2014) have pointed to the economic crisis as one of the environmental variables with the greatest impact on the uncertainties of the organizational environment, in line with Gordon and Narayanan (1984) who indicated that organizations need more detailed and complete information when they are in an environment of high uncertainty.

In this context, the use of the budget planning function possibly contributes to reducing uncertainties. Palermo and Van Der Stede (2011) corroborate that the planning in organizations should be reassessed and updated in accordance with the environment in which they are inserted, for better decision making and positive results. In the view of Becker et al. (2016), they identified in their study that budget planning decreases uncertainties related to the decision making process and, still in a context of economic crisis, makes managers observe in more detail the organizational environment in order to predict the impact of the crisis, as well as the effects on sales, production, expenses, profits and liquidity.

The same applies to the budget function of resource allocation. The use of this function is increased or decreased as the perception of the crisis environment

increases or decreases and the uncertainties of these environments. This is also observed in the other variables of size, strategy and life cycle. One can conclude, therefore, that the perception of crisis, perceived environmental uncertainty, as well as endogenous variables (size, life cycle and strategy) have influence on the use of the budget function of resource allocation. These results corroborate Hopwood (2009) who highlighted the need to ensure the productive use of resources, in addition to liquidity management, as a necessary action for organizations threatened by the crisis. Also, according to Zona (2012), in uncertain economic crisis environments resource conservation is required, so managers need to centralize decisions around the most coherent way to allocate or reallocate resources, as well as expenditure.

On the other hand, the relationship between the performance evaluation budget function and the crisis environment contingential variables, perceived environmental uncertainty, endogenous variables (size, life cycle and strategy) was not statistically significant for the context analyzed, as a result, it is not possible to infer such relationships. Although, previous studies (Haka & Krishnan; Becker, 2005 et *al.* , 2016) indicate that uncertain and crisis economic environments generate constant changes, which make it difficult to apex the goals and objectives proposed in the budget and in the performance evaluation of the manager or organization. In agreement, the above-mentioned authors add that in contexts of high uncertainty in relation to the environment the measurement of performance or evaluation of managers/business units may be inaccurate, that is, the use of the budget function of performance evaluation would be unfeasible.

5 CONCLUSION

This research aims to evaluate the relationship of uncertainties in an environment of economic crisis and endogenous variables with the functions of the budget in Santa Catarina industries. It was characterized as quantitative and has as base theory the contingential theory. As a result, it was found that the uncertainty caused by the economic crisis influences the change in the use of budget functions for planning, resource allocation, and performance evaluation in Santa Catarina's industries.

Considering that the environment of economic crises increases the level of uncertainty in the decision-making process, managers should raise their attention to the continuity of organizations and the achievement of results. In this context, it was noted that the planning function helps to reduce the level of uncertainty surrounding decision making, favoring a more assertive prediction of the impact and effects caused by economic crises, aiming at short, medium and long term future actions.

Likewise, the budget function of resource allocation contributes, in times of economic crisis, to help managers increase control and decision-making related to resources and spending, preventing inefficiency and increasing the power of decision and authorization of spending, providing better management of the resources available in the organization. In this way, managers can improve short- and medium-term liquidity management. The survey also found that the performance evaluation budget function tends to be used more cautiously and to a lesser extent in periods of oscillations caused by economic crises, given the

difficulty pointed out in measuring the performance of the manager and the company itself.

The findings indicate that in the context investigated, the use of the budgetary functions of planning and resource allocation is influenced by the size of the industry, its life cycle stage, and the strategic posture used (differentiation), which does not occur in the performance evaluation function. Moreover, when their managers have a greater perception of uncertainty in relation to the environment in general and, specifically, to the environment of economic crises.

It is concluded that the perception of the managers of Santa Catarina industries regarding the level of uncertainty of the environment is directly proportional to the intensity of the use of the budgetary functions of planning and resource allocation. It is also observed that the greater the tendency for strategic positioning of differentiation, the greater the intensity of the use of the budgetary functions of planning and allocation of resources. This result contradicts the literature, especially the studies on beyond budgeting for two reasons. First, the significant number of companies that declared they use the budget, compared to those that do not, indicating that the budget, in Santa Catarina industries, is a widely used management tool. Secondly, because it indicates that, for the context analyzed, the budgeting functions of planning and resource allocation have been widely used by companies.

In turn, regarding the functions of the budget for performance evaluation for the context under analysis, the strategic positioning of leadership in cost intensifies the use of this function. In the early stages of the life cycle (birth and growth), industries in Santa Catarina also tend to increase the importance of the performance evaluation budget function, compared to those in stages of maturity, rebirth, and decline. On the contrary, larger companies give less importance to this budget function. It is also noted that the increase in managers' perception of the uncertainties arising from the environment, and specifically those arising from the context of economic crises, reduce the intensity of use of the performance evaluation budget function.

It is concluded that the use of budget functions in Santa Catarina's industries is affected by the environment of economic crises, that is, there is a change in the use of budget functions in organizations. In the period of economic crisis, the managers of Santa Catarina's industries have increased the importance assigned to the budget functions of planning and allocation of resources. On the contrary, due to the increased instability of the environment, the performance evaluation budget function is diminished in periods of economic crisis, both to measure the performance of managers and the company.

In addition to the results presented, the theoretical relevance of these findings is highlighted, as well as the contribution to the area of management accounting research. This brought answers to the literature and broadened the understanding of the use of budgetary functions that can be remodeled in order to contribute to organizational management in the process of facing economic crises, in which attributes were verified both in the internal and external environment. From a practical perspective, the findings contribute by indicating to managers that the budget functions should be used in accordance with the context. In particular, the planning and resource allocation functions should be sensitive to endogenous factors, such as the stage of evolution (life cycle) and the

strategy adopted, as well as industries tend to reduce the importance of budget functions for performance evaluation, suggesting attention from managers to the positive and negative effects of their use, both in times of crisis and during the expansion/growth process.

In this way, the study contributes to presenting data for the formation of the first opinions on the functions of the budget in Santa Catarina's industries in environments of economic crisis. As a research limitation, the respondents' perception of the questions observed and the transversality of the study stand out. In this sense, longitudinal studies can initiate and monitor budget functions in the context of economic crisis and determine possible changes in the post-crisis period. Case studies may broaden the understanding of how such changes occur in specific contexts, and the study may be extended to other economic sectors and geographic contexts.

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