


EFFECTS OF CONTINGENCIAL ASPECTS ON THE LEVEL OF INTERNAL CONTROL ADOPTED BY BANKING INSTITUTIONS LISTED IN BRAZIL, BOLSA, BALCAO (B3)

MÉRCIA DE LIMA PEREIRA

Universidade Federal da Paraíba

Address: Postgraduate Program in Accounting Sciences – Center for Applied Social Sciences (CCSA) – UFPB | Campus I | Cidade Universitária | 58051-900 | João Pessoa/PB | Brazil.

 <https://orcid.org/0000-0003-1791-256x>
profa.mercialima@gmail.com

ÉGON JOSÉ MATEUS CELESTINO

Universidade Federal da Paraíba e Universidade Federal de Sergipe


Address: Postgraduate Program in Accounting Sciences – Center for Applied Social Sciences (CCSA) – UFPB | Campus I | Cidade Universitária | 58051-900 | João Pessoa/PB | Brazil.

 <https://orcid.org/0000-0003-3682-0791>
egonmateus@ymail.com

RENATA DE PAES DE BARROS CÂMARA

Universidade Federal da Paraíba

Address: Postgraduate Program in Accounting Sciences – Center for Applied Social Sciences (CCSA) – UFPB | Campus I | Cidade Universitária | 58051-900 | João Pessoa/PB | Brazil.

 <https://orcid.org/0000-0001-6953-9811>
rpbcamara@gmail.com

ABSTRACT

The purpose of this article was to verify how contingency aspects affect the level of internal control adopted by 19 banking institutions listed on B₃, from 2013 to 2021; which resulted in 171 observations per variable. The data on the level of internal control (dependent variable) were constructed based on the internal mechanisms viewed from the point of view of good Corporate Governance practices of the Brazilian Institute of Corporate Governance (IBGC), being the same obtained in the Reference Forms of the companies, via the B₃ website. On the other hand, data on organizational (or contingency) aspects, independent variables, size, age of the organization, diversification of credit products, corporate structure and geographic expansion, were obtained from the Economática® database, in the registration and Reference Forms and in the Explanatory Notes of banking companies, available on the B₃ website. From the multiple regression estimation for panel data, through the Generalized Least Squares (GLS) model, it was observed that age and geographic expansion are not significant to explain the level of internal control, but the size, diversification of credit products and the corporate structure of banking institutions are. However, only the corporate structure is significantly negative. Thus, these results demonstrate that the size and diversification of credit products make banking activities complex and voluminous, justifying the search for more internal controls, but also point out that the different geographical and cultural contexts of banking units can compromise the adoption of managerial controls.

Edited in Portuguese and English. Original Release in Portuguese

Article approved at the XV Anpcont Congress, online, December 4th-7th, 2021.

Received on 08/01/2022. Revised on 10/21/2022. Accepted on 11/25/2022 by Professor PhD. Rogério João Lunkes (Editor-in-Chief). Published on 12/22/2022.

Copyright © 2022 RCCC. All rights reserved. Part of the articles may be mentioned without prior authorization, provided that the source is identified.

Keywords: Contingency aspects. Internal control level. Banking institutions. B3.

1 INTRODUCTION

The constant changes, whether in the internal or external environment to companies, arising from the environment of economic regulation, changes of majority investors or agency conflicts have created the need for continuous monitoring and searching for information, in order to facilitate decision-making and/or to prevent deviations or poor conduct of internal agents, which may deviate from organizational objectives.

Moreover, internal controls are inserted in this context, because they are used to improve, monitor and analyze financial and property changes of a given company, with the purpose of directing it to achieve goals and favorable results, which also promote lower wastes (Custódio *et al.*, 2019).

In this scenario, considering mainly publicly traded companies, it can be indicated that Corporate Governance (CG) is relevant from the perspective of internal controls, since, according to Malacrida and Yamamoto (2006), this uses rules, good practices and the following principles: transparency, equity, accountability and corporate responsibility, to reduce agency conflicts and problems. Thus, Accounting interacts with the GC, including in relation to the application of Internal Controls.

Therefore, the *Committee of Sponsorship Organizations of the Treadway Commission* (Coso, 2013) is one of the most well-known internal control models in the world, and this indicates that because each company has its own set of purposes and ways to implement internal controls, it is a common system of internal control. there will always be distinctions in the responses to risks and control processes. Even if different organizations have equal goals and make similar decisions to achieve their goals, their internal controls are likely to be different.

Thus, it is pointed out that the characterization of Coso (2013) in relation to internal controls is in agreement with what the Contingency Theory (TC) proposes, which indicates that there is no optimal structure for all the organizations about a certain management practice. However, in order for companies to achieve better performance in their management practices, they must adjust to their contingency characteristics (Chapman, 1997; Chenhall, 2003). These can be understood as being organizational aspects that a company can have or seek to align, to achieve a better performance in its management practices. Among the most prominent in the literature of the TC, there are: the size of the company, the adoption of technology, strategies and uncertainties of the tasks (Freitag, Almeida & Lucena, 2021).

In addition, studies indicate that contingent variables, size, age and organizational complexity have an impact on the internal controls of companies (Akwaa-Sekyi & Gené, 2016; Andreatta, Olinquevitch & Silveira, 2009; Bruns & Waterhouse, 1975; Otley, 1980).

As they deal with significant amounts of money, banking institutions are often places of interest for people with bad intentions. Thus, it is verified that often these institutions have been suffering with the increase of fraud, both committed by external individuals and also by their own employees (Carvalho & Vieira, 2015), being relevant to deal with the issue in this sector.

Thus, considering the environment of banking companies in the Brazilian capital market, and the relationship between internal control systems and contingency aspects, the following research question is formulated: **What is the influence of the contingency aspects on the level of internal control adopted by bank institutions listed in B3?** Thus, this study aims to analyze how contingency aspects affect the level of internal control adopted by banking institutions listed in B3.

Besides reducing the risks, the Internal Controls help companies to ensure the reliability of Financial Statements and to act according to internal laws and regulations (Spira & Page, 2003). Thus, it is relevant to study aspects that may affect internal controls, because these allow the

achievement of purposes and goals planned by the entities (Carioca, De Luca & Ponte, 2010).

Regarding the contribution to the market, the article develops an understanding of the relevant contingency aspects before the internal controls used by banks listed in Brazil, enabling a better understanding of these in the management, bringing means for investors to better choose their investments in institutions and, indicating to auditors, financial analysts and creditors, the behavior of the internal controls of the banks against their contingent characteristics.

In addition, as for the technical contribution, the research provides the understanding to society and regulators of banking institutions about how these act in adverse situations, since poor internal control can cause material impacts, thus collaborating with the evaluation and elaboration of regulation rules to improve the internal control of the Brazilian banking system.

Finally, in relation to originality, the study develops knowledge of Theory of Contingency applied to internal control systems of banks listed in Brazil, enabling the knowledge of the literature regarding the impact of contingent behavior on internal controls of banking institutions. In addition, contingent variables are used distinct from what is usually verified in studies (diversification of credit products, corporate structure and geographic expansion of banks), which were observed based specifically on the literature of the banking sector studied, promoting knowledge about aspects that favor or not a better adoption of internal controls in these places, since, according to Benli and Celayir (2014), the lack of internal control in the banking sector can cause material impacts, generating substantial losses that can also affect the economy and society.

2 THEORETICAL FRAMEWORK AND DEVELOPMENT OF HYPOTHESES

2.1 Internal controls

Internal controls refer to procedures directed by the administrative board, executives and other employees, in order to enable the organizational objectives to be achieved, regarding efficiency, effectiveness, confidence of financial statements and applicability of laws and standards (Coso, 2013). Similarly, it is indicated that internal control systems, in addition to reducing risks, help companies to ensure the reliability of financial statements and to act according to internal laws and regulations (Spira & Page, 2003; Santana & Silva, 2020).

One of the most widespread internal control models in the world is that of the *Committee of Sponsorship Organizations of the Treadway Commission* (Coso). Therefore, it is indicated that with the first publication of the study “*Internal Control: integrated framework*”, in 1992, the internal control model of Coso began to be widely accepted in the world, becoming a reference for the application of internal control (Custódio *et al.*, 2019).

The internal control model of Coso methodology is structured in five integrated components, namely: control environment; risk assessment; control activities; information and communication and monitoring activities. The Coso methodology provides a general orientation of internal controls, and it is necessary that companies disseminate ethical values and standards, establish ways to evaluate performance, determine the objectives and risks of operations, elaborate internal control actions, and communicate this information to internal and external members and periodically their monitoring (Coso, 2013).

As for the first internal control component of Coso, the control environment, it is denoted the dissemination of organizational values and attributions that allows the Board of Directors to fulfill its function, also indicates the design of appropriate performance measures and the provision of incentives to employees to achieve better operational results (Coso, 2013). Thus, it is observed that such component is prone to GC mechanisms.

There are two types of control mechanisms in the CG, internal and external. The internal controls, to which this study is based, are implemented internally and seek to improve Corporate Governance and reduce conflicts of interest among shareholders, employees and other *stakeholders*. The most cited mechanisms of internal controls in the literature are the Board of

Directors, the concentration of ownership, the remuneration of executives and the control carried out by supervisory bodies, such as the Fiscal Council, Audit Committee and Independent Audit (Jensen, 1993; Rossetti & Andrade, 2012).

The Board of Directors (B of D) is a collegiate body responsible for strategic decisions in an organization. In addition, it has the function of protecting the principles, values and governance system of the company, being one of its main elements. It is the role of the Board of Directors to supervise the directors, making a link between them and the owners of the business. It is indicated that the directors' term of office should not exceed 2 years, and there may be re-election, and the criteria for this must be included in the internal statute of the corporation (IBGC, 2015). In order for the B of D to have an internal control role, Correia, Amaral and Louvet (2014, p. 55) indicate that this should have the following aspects: "High participation of independent directors, external to the firm; separation of the functions of the company's general director and of the Board of Directors; and a small number of members". The evaluation of the board members contributes to the efficiency of the board, functioning as an accountability of such body, in order to improve management (IBGC, 2015).

The stock concentration, that is, the existence of shareholders with large shares may also be considered an internal control mechanism, since it provides greater monitoring of management, due to the concentration of power "in the hands" of majority shareholders (Denis & Mcconnell, 2003). The stock concentration can be constituted in three ways, namely: dispersed, dominant and majority. The dispersed occurs when the shareholder with the highest number of shares has less than 20% of control; the dominant one is when the largest shareholder has between 20% and 50% of the shares. Finally, the majority concentration occurs when the largest shareholder has more than 50% of the shares (Pedersen & Thomsen, 1997).

In this study, the majority concentration was adopted, because it can also designate that the company has control or voting decision in other companies, which increases its involvement with these, resulting in organizational complexity, because its operations may affect or be affected by other corporations.

The variable remuneration of the board "should serve as an effective tool for attraction, motivation and retention of directors, providing the alignment of their interests with those of the organization" (IBGC, 2015, p. 75). As for the Fiscal Council, this is an independent body, which can be permanent or installed by a general meeting via the request of shareholders. The Audit Committee has as its function the supervision of the board of directors and the board of directors of an organization. In addition, it provides opinions on the projects of the administrative bodies and evaluates the financial statements audited by the external audit, providing accounts of these to the shareholders at meetings (Baioco & Almeida, 2017).

The Audit Committee, in turn, is a body that advises the Board of Directors regarding the quality of Accounting Statements and Internal Controls, aiming to provide the trust and integrity of information, protect the organization and its users (IBGC, 2015). In the context of banking institutions, Resolution number 3.198/2004 of the Central Bank of Brazil (Bacen) indicates the characteristics that each bank must have in relation to the composition, selection, time of mandate and specifications for acting in the position. Therefore, because the Audit Committee has regulation and peculiar characteristics in the sector studied, it was disregarded from the analysis in this study.

The Independent Audit annually assesses compliance with the laws and reliability of the Accounting Statements of the contracting organization. It is indicated that this agency should be independent of the company and should not provide another service or be hired for more than five sequential fiscal years (IBGC, 2015; Rossetti & Andrade, 2012).

It is understood that the adoption of good practices of GC indicates the attitude of organizations regarding values, transparency, reliability of information and adequacy of the rules, as well as indicating a reliable model of management control (Rossetti & Andrade, 2012). Thus,

it is stated that the corporate governance practices that are in accordance with the principles of GC are internal control mechanisms (Assunção, De Luca & Vasconcelos, 2017).

According to Coso (2013), companies have different objectives and particular ways of adopting internal controls and will always observe different responses in the face of the implemented tools. Even if different companies have similar activities or purposes and make similar decisions to achieve their goals, their internal controls will differ. In this context, it is indicated that the characterization of Coso (2013) in relation to internal controls is in agreement with what the Contingency Theory (TC) proposes, which indicates that there is no optimal structure for all the organizations about a certain management practice. Therefore, the explanation of such a Theory fits and the consequent relationship of this with the practices of internal controls.

2.2 Contingency Theory and hypothesis elaboration

The Contingency Theory reveals that there is not a single way for all companies to be organized, but, under certain conditions, a company can achieve better performance than another. In this sense, the researchers, especially in the field of Managerial Accounting, have sought to verify contingent aspects, both internal and external, capable of providing adjustments between the context of a company and the scope of performance (Otley, 1980; Chenhall, 2003).

Thus, the Contingency Theory indicates that the success of some management methodologies, such as internal control, depends on the structure and organizational context (Waterhouse & Tiessen, 1978). Thus, there is evidence that the variables contingencies *age, size, diversification of credit products, corporate structure* and *geographic expansion* have some impact on the internal control practices of companies (Akwaa-Sekyi & Gené, 2016; Andreatta, Olinquevitch & Silveira, 2009; Bruns & Waterhouse, 1975; Otley, 1980).

Organizational maturity is a factor that influences the design of management control systems (Auzair & Langfield-Smith, 2005). Thus, it is argued that organizations tend to develop over time, as a response to the dynamic environment in which they are inserted. Thus, the maturity of organizations helps to understand whether the different practices and/or management tools (management control systems, management information systems, decision-making, strategic, etc.) vary throughout the organizational evolutionary stages. Similarly, it is indicated that the organizations throughout their continuity undergo adaptations, which represent stages of development, which in the literature are also understood as organizational life cycles (Miller & Friesen, 1984).

There are numerous life cycle models at various stages, but the consensus is that changes in an organization follow a pattern, developing over time (Dodge, Fullerton & Robbins, 1994). That said, the time of existence or age of a company is a characteristic that shows its course in time, being this natural and expected.

The time of a company can cause changes in the management practices used, since for a certain period it is possible to maintain certain management methodologies, however, over time, the company must align with new conditions in order to maintain its survival (Greiner, 1998). In addition, the age of a company affects its type of investment and financing choices. A lot of experience is gained and companies now have access to more opportunities than new or future companies. Thus, it is evident that companies that have been operating for many years also have less weakness in their internal controls (Tang, Tian & Yan, 2015).

Thus, it is understood that, while companies become more mature, they tend to also have more developed internal controls, because in addition to adapting to the development process, they tend to shape themselves to the environment in which they are inserted, aiming to maintain their continuity. Thus, we aim to test the following research hypothesis:

H₁: The higher organizational age impacts a higher level of internal control in banks.

As an organization grows, communication and control problems intensify, which makes them adopt control practices to seek to adapt to the context. Thus, internal controls become more specialized and overelaborate (Bruns & Waterhouse, 1975). In addition, the larger the size of a company, there is more diversification and greater sophistication in control tools, as well as there is a tendency to use management controls more formalized than informalized, since with the size also grows the complexity of managing the business (Ghorbel, 2019). In addition, the size of an organization is related to the availability of resources and internal differentiation, bringing the need for more improved control systems (Jokipii, 2010). The larger size of a company also indicates more access to financial resources and investments, providing better management conditions (Sehnem *et al.*, 2021).

In this context, some research was conducted to verify the relationship between internal controls and size, such as those of Wallace and Kreutzfeldt (1995) and Duncan, Flesher and Stocks (1999), which found that smaller organizations have more limited control systems than larger entities. Thus, it is expected that the higher the company, the higher the level of internal controls used. Thus, the hypothesis was developed:

H₂: A higher organizational size impacts a higher level of internal control in banks.

It is argued that some organizational characteristics can also affect internal controls and, therefore, are also configured in contingent aspects, to which companies need to adapt to improve their internal management. Thus, it is cited as organizational aspects inherent to the banking sector, which can affect in its internal controls: the diversification of credit products, the corporate structure and the geographical expansion.

Thus, it is established that bank managers, seeking greater returns, diversify their products to obtain greater revenues (Haq *et al.*, 2014). Specifically as for the Brazilian banks, these “...usually diversify their activities in credit and leasing transactions, provision of banking services, exchange services, intermediation in the negotiation of securities and revenues of own investments” (Vieira *et al.*, 2020, p. 283).

One of the main reasons for banks to diversify their revenues refers to the size of the bank (Akwaa-Sekyi & Gené, 2016). In this sense, size can determine the variety of credit products available in these (Eling & Marek, 2009) and, as already mentioned, there is a tendency for large banks to be more attentive to internal controls than smaller banks, as well as the former to have more financial resources for such (Ghorbel, 2019; Sehnem *et al.*, 2021). Thus, the diversification of credit products also involves the diversity of operations, requiring these, greater monitoring, to reduce risks in organizations (Vieira & Girão, 2016).

Therefore, it can be indicated that banks with more diversified credit products also tend to have greater incentives to improve their internal controls and, therefore, have more successful internal controls. Thus, the following research hypothesis was formulated:

H₃: Higher diversification of credits products impacts a higher level of internal control in banks.

Another relevant aspect to be considered regarding internal controls is the corporate structure. In this context, it is mentioned that when organizations are structured through merger, acquisition or by any other nature, contracting rules may change, including internal controls. Thus, it is likely that after a corporate reorganization, internal control systems may improve or deteriorate (Akwaa-Sekyi & Gené, 2016).

The corporate structure also includes its investments in associates, controlled and jointly

controlled companies and while companies can benefit through gaps in laws to pay less taxes and the sharing of resources among their subsidiaries, difficulties arise in assessing the risk of each business (Damodaran, 2007). For this reason, often, the internal control system of companies is impaired. Thus, the following research hypothesis arises:

H4: A corporate structure impacts a lower internal control in banks.

Finally, a bank has an organizational complexity when it is geographically distributed by countries and/or localities (Vieira *et al.*, 2020), since the distance between the matrix and the branch can compromise the monitoring of senior management on the managers of the units, and it is difficult to follow the decisions made by branch managers (Deng & Elyasiani, 2008).

Therefore, some understand that when the same organization is dispersed from its units, the difficulties of control, coordination and communication increase, which will result in the demand for new and better control systems (Andreatta, Olinquevitch & Silveira, 2009). Thus, it can be indicated that the greater geographic expansion exists among banks, and the most difficult is to maintain the level of internal control, which can also negatively affect it. Thus, there is the hypothesis of research:

H5: The geographic expansion among the organizational units impacts in a lower internal control in banks.

3 METHODOLOGICAL PROCEDURES

3.1 Population and research sample

The study population refers to the banking institutions listed in B₃ in the period 2013 to 2021, which corresponds to 27 banking institutions, which in the nine years of analysis totals 216 observations per variable. Whereas the sample configured 19 organizations (171 observations per variable), which represents about 70% of the population.

Thus, the selected balanced sample is considered, since it contains only the companies that presented all data during the analysis period, resulting in 171 elements per variable in all analyzed years. It is noteworthy about the period of analysis, which initially sought to verify the data from 2011, as it is one year after adoption of the International *Financial Reporting Standards* (IFRS), in order to obtain data from companies that have already adapted to the required Accounting requirements. However, in 2011 and 2012, many missing data were observed in the banks analyzed, especially those disclosed in the Reference Form and in the data forming the dependent variable (Table 1), which made it impossible to start the study in these periods and made the analysis begin in 2013, extending to 2021, for this represents the most recent year of information disclosure on the B₃ *website*.

3.2 Research variables and collection procedures

The study variables are divided into dependent and independent. The dependent variable corresponds to the level of internal control of banking institutions. Whereas the independent variables correspond to contingency aspects, such as: size, age, diversification of credit products, corporate structure and geographic expansion.

Table 1
Study variables

Dependent variables: <i>Check-list</i> : evaluation of the level of Internal control of banking institutions.					
Item	Operationalization	Acquisition	Metric	Theoretical basis	Signal expected
Board of Directors	The positions of the CA president and the board are held by different people.	Item 12.5/6 of FR	Yes (1); no (0)	IBGC (2015)	N/A
	The AC is composed of, at least, of 50% of the Independent advisers.	Item 12.5/6 of FR	Yes (1); no (0)	IBGC (2015)	N/A
	The company uses mechanisms to assess the CA performance.	Item 12.1 of FR	Yes (1); no (0)	IBGC (2015)	N/A
	The mandate of the CA it is not higher than two (2) years and is unified.	Items 12.5/6 of FR	Yes (1); no (0)	IBGC (2015)	N/A
Variable remuneration to the executives	The company presents Variable remuneration to the executives	Item 13.3 of FR	Yes (1); no (0)	IBGC (2015)	N/A
Share concentration	More than 50% of the company's shares are concentrated "in the hands" of a single shareholder.	Item 15.1/2 of FR	Yes (1); no (0)	Denis and Mcconnell (2003) and Pedersen and Thomsen (1997)	N/A
Fiscal Council	Installation of the Fiscal council.	Item 12.1 of FR	permanently (1); not permanent (0.5); not installed (0)	IBGC (2015) and Rossetti and Andrade (2012)	N/A
Independent Audit	Contract time of the independent audit company.	Item 2 of FR	Up to 5 years (1); more than 5 years (0)	IBGC (2015) and Rossetti and Andrade (2012)	N/A
Independent variables (Contingent variables of the study)					
Variable	<i>Proxies</i>	Operationalization	Acquisition	Theoretical basis	Signal expected
Size (TAM)	Total asset	Asset Value of the company, in thousands of reais	Economática®	Lin and Lee (2008)	+
Organizational age (ID)	Time of existence	Time of the company existence in relation to the date of Constitution	Registration form	Greiner (1998)	+
Credit Products Diversification (DPC)	Quantity of credit products offered by banks	N.º credit products offered by banks	Explanatory Notes – Item Information by Segment and FR-Item 7.3	Haq <i>et al.</i> (2014)	+

Corporate Structure	Type of Corporate Structure	It has investment in associates, controlled or jointly controlled companies (1) to yes/ (0) to no	FR– item 15	Damodaran (2007)	-
Geographic Expansion (EG)	Countries where the bank operates	Number of countries where the bank operates with agencies	FR– item 7	Deng and Elyasiani (2008)	-

Note. N/A: Not applied; FR: Reference Form.
Source: Based on the authors (2021).

The variable “level of internal control” of banking institutions was built based on the internal control mechanisms visualized in the context of Good Corporate Governance Practices. Therefore, the level of adoption of internal controls (NCI) of banking institutions (dependent variable) was obtained through *the check-list* available in Table 1. To identify the level of internal control of each bank institution, an index was calculated through the sum of items of *check-list* that each bank obtained, dividing by the maximum total that could be obtained, that is, 8 points.

Thus, for example, a bank that attended with *dummy* equal to 1 to three of the eight items, had an internal control index or level of 0.375 or 37.5% (3/8), that is, each item in *the checklist* represents 12.5% of the total, of 100%. Whereas, each of the contingency variables (independent variables), size, age, diversification of credit products, corporate structure and geographic expansion, was measured individually, as described in Table 1.

3.3 Data analysis procedures

Initially, the variables were analyzed by descriptive statistics and, later, by estimating multiple regression in panel data, using the generalized least squares model. Before that, tests were carried out to verify the presence of multicollinearity, heteroscedasticity and to evaluate the most appropriate model for the panel. The model studied is as follows:

$$NCI = \beta_0 + TAM \beta_1X_1 + ID\beta_2X_2 + DIV \beta_3X_3 + ES \beta_4X_4 + EG \beta_5X_5 + \mu \text{ (Equation 1)}$$

To analyze multiple regression, the p-value of the Z-test and the Wald test were verified, in order to evaluate separately and combined whether the independent variables contribute significantly to predict the dependent variable.

3.4 Analysis technique

To determine whether the contingent variables (organizational age, company size, diversification of credit products, corporate structure and geographic expansion) influence the level of internal control of banks, the model indicated in Equation 1 was estimated by means of regression of generalized minimum squares (*generalized least square* - GLS).

This method was used as a result of the presence of heteroscedasticity in the ordinary least square model - OLS, since in the presence of heteroscedasticity, the OLS is not as effective, resulting in biased estimators. Thus, the GLS model is an alternative, since it considers heteroscedasticity at the end of error, generating more effective estimators (Gujarati, 2011).

The study sample used 19 companies, distributed in 9 cross-sectional units, totaling 171 observations per variable, in a balanced panel (same amount of data for all variables). Thus, the data analysis is conducted by means of a longitudinal structure. This procedure allows the study of the behavior of variables of a company over time (in this case, from 2013 to 2021) and of several companies in the face of the same time cut-off established. Panel or longitudinal data analysis

allows to obtain several advantages, because it reduces the problems of omitted variables, allowing a greater number of observations and greater data variability, lower collinearity among variables, greater number of degrees of freedom and greater efficiency in estimates (Pindyck; Rubinfeld, 2004).

4 RESULTS

4.1 Descriptive statistics

This section presents the descriptive statistics of the dependent variable (internal control level) and the independent variables (size, age, diversification of credit products, corporate structure and geographic expansion) of 19 banks listed in B₃ during the nine-year period (2013 to 2021).

Table 2

Descriptive statistics (n=171)

Variables	Minimum	Maximum	Mean	Standard deviation
Internal Control Level	0.1250	0.8750	0.4947	0.1864
Size (Total Active)	75,491.00	2,166,019,000.00	295,720,844.00	540,131,351.00
Age	16	213	64	38
Credit Products Diversification	3	46	13	10
Corporate Structure	0	1	0.7895	0.4089
Geographic Expansion	1	12	3	3

Source: Research data (2021).

According to Table 2, it was observed that the lowest level of internal control was 0.1250 and the maximum was 0.8750. It was also noted that only three banks - Banco Mercantil de Investimentos (in 2014), Banco Mercantil do Brasil (in 2014) e Paraná S.A -, in the year 2017 to 2020, presented internal control level equal to 0.1250, that is, they attended only one of the eight items observed in *the check-list* available in Table 1. Regarding the maximum level of internal control observed among banking institutions, it was visualized that three banks reached it, Banco da Amazônia (in 2018), Banco do Brasil (in 2020) and Itaú Unibanco (in 2019 and 2020), which met seven of the eight requirements observed in the *check-list*. On average, it was noticed that the banking institutions had an internal control level of 0.4996, being visualized a standard deviation of 0.1864, that is, in general, the organizations met five internal control requirements analyzed and presented a low dispersion among themselves.

As for the independent variable *size*, the minimum value corresponding to a total asset of about R\$ 75.49 million was observed, the maximum being R\$ 2.17 trillion. On average, it was observed that banking institutions had a total asset of R\$ 295.72 billion and a standard deviation of 540.13 billion. In general, there were differences among the total assets of the companies, indicating different sizes among them.

Regarding *the age* variable, a minimum age of 16 years was observed in only one of the banks (Banco Pine, when in 2013) and the maximum age of 213 years, also seen in only one of the banking institutions (Banco do Brasil in 2021), on average, companies have 63 years of existence and a very high deviation, 38 years of age, which reveals coexistence of banks in very different phases of operation.

Given the diversification variable, which highlights the amount of credit products that banking institutions offer in their operations, it was noticed that at least one bank operates offering three credit products. And that one of the banks has the number of products of maximum credits identified, that is, forty-six types of products. The average is 13 credit products per bank and the standard deviation is approximately 10.

In relation to *the variable Corporate Structure*, it was sought to evaluate whether the bank has (attributing 1) or not (attributing 0) investment in associates, controlled or jointly controlled

companies. Thus, it was observed that, at least, there are four banking institutions that do not have this structure and a maximum of 15 banks that have it. Thus, the average is closer to one (0.7895) and the standard deviation, closer to zero (0.4089), indicating that most banks have a corporate structure formed by investment in associates, controlled and/or jointly controlled companies.

Finally, there is the variable *geographical expansion*, which indicates the number of countries in which banking institutions have branches. Based on the minimum value, it is indicated that 12 banks operate with agencies only in Brazil. And only one bank has maximum performance in 12 countries. On average, the banks operate in 3 countries and the standard deviation observed was approximately 3, which indicates that few banks have great geographic expansion of their agencies, while most concentrate them in Brazil.

In short, it can be indicated that the banking institutions analyzed have some divergent characteristics among themselves, mainly in relation to the size, age of the institution, number of credit products and number of countries of action with agencies (*geographical expansion*), since it was noted that relevant dispersions, although these are not characterized as *outliers* according to the analysis of the scatter plot. Thus, considering most of the contingent characteristics of banking institutions, it can be considered appropriate to the study in question, since it is important to conduct studies on the Contingency Theory among organizations in which social, economic and cultural aspects vary, for in some of these organizations adjustments will be necessary to obtain better results in managerial practices (Seliem, 2003).

4.2 Multiple Regression Analysis

This topic presents the estimation of multiple regression in panel data, considering the period from 2013 to 2021, in order to evaluate the effect of contingency aspects of 19 banking institutions (size, age and diversification of credit products, corporate structure and geographic expansion) on their internal control levels.

As a way to determine the multiple regression model most conducive to the data used, some validation tests were performed. Initially, the variance inflation factor (VIF) test was performed to test the multicollinearity of the data among the variables. The average value of the test was equal to 2.61, the variable that presented the highest VIF, the company's geographic expansion, equal to 4.30. As a result, the absence of multicollinearity was observed in the analyzed data, since the VIF was lower than 10 in all the variables and, therefore, in its average (Hair *et al.*, 2009). The *Wooldridge* test was also applied to evaluate autocorrelation: it indicated a p-value of 0.0021, as this is less than 1%, which is the level of significance, it was accepted the null hypothesis that the model does not have autocorrelation.

Subsequently, *Hausman's* test was adopted to test the multiple regression model (model 1), in order to evaluate the adequacy to the fixed effect model. The test indicated the model of fixed effects more appropriate than random effects. However, the existence of heteroscedasticity problems was noted in it by means of the *White* test. According to Fávero (2017), the problem of autocorrelation or heteroscedasticity can be treated by means of the generalized least square (GLS). Thus, heteroscedasticity was corrected from such a method, which was also used to test the hypotheses indicated in the study.

Table 3
Regression for panel data (Generalized Least Squares)

Explanatory Variables.	Dependent variables: NCI
Size	0.000*** (1.67e-10)
Age	0.784 (0.0001027)
Credit Products Diversification	0.000***

	(0.0057856)
Corporate Structure	0,068* (-0.0591045)
Geographic Expansion	0.961 (-0.0003156)
Constant	0.000 (-0.4070504)
N	171
Wald Prob > chi2	0.0001***

Note. (1) Coefficients in parentheses/ (2) $p < 0.10^*$; $p < 0.05^{**}$; $p < 0.01^{***}$.

Source: Research data (2021).

According to Table 3, considering the Wald test, the rejection of the null hypothesis is noticed at the level of significance of 1%, that all estimated parameters are statistically equal to zero, which reveals that, in general, independent variables contribute significantly to predict the dependent variable. To analyze the significance of independent (or explanatory) variables individually, the p-value of the Z test was analyzed

It was noted that the size variable is significantly positive to explain the model at a significance level of 1%, which indicates that the greater the organizational size, the greater the level of internal control of banking institutions. Thus, this study found similar aspects to the studies of Jokipii (2010) and Wallace and Kreutzfeldt (1995), which observed a statistically positive relationship between company size and internal control structure, indicating that larger organizations tend to have more sophisticated internal controls, since, according to Bruns and Waterhouse (1975) and Ghorbel (2019), when the company develops, communication problems and management difficulties grow, and it is necessary to adopt more specialized internal control practices.

Moreover, it can be said that large companies also have more financial resources and higher levels of investments, which make them direct some efforts to improve management (Sehnen *et al.*, 2021).

Regarding the diversification of credit products offered by banking institutions, a positive and significant relationship with the degree of internal control was also noted at a significance level of 1%, indicating that the higher the number of credit products in a financial institution, the higher the level of internal control. Thus, this study is in agreement with what Vieira and Girão (2016) indicate, who claim that diversification of operations is associated with a higher level of operational monitoring, in order to reduce risks in companies.

Regarding the corporate structure, another variable that allows the evaluation of complexity, a negative and significant relationship with the internal control level was observed, but at a significance level of 10%. Thus, when banking institutions have a corporate structure, their internal controls have lower levels. Therefore, companies with greater internal control do not have associated controlled and jointly controlled companies. This aspect can be explained, because when companies structure themselves, through corporate reorganization, hiring rules can cause changes in companies, including their internal controls, and these can then deteriorate (Akwa-Sekyi & Gené, 2016). Another variable is geographical expansion, but differently from the corporate structure, because although it has a negative relationship, it is not significant.

Thus, the negative relationship of the variables 'corporate structure' and 'geographic expansion' with the level of internal control can be explained as a result of the matrix not having the effective control over its subsidiaries, both in the case of geographical expansion (although this variable was not statistically significant) as when the company has affiliates and subsidiaries, since they are geographically separated from the headquarters. Similarly, Deng and Elyasiani (2008) explain that the distance between the headquarter and the branch compromises the monitoring of the unit managers, making it more difficult to maintain internal control of the business, which can also deteriorate it.

Finally, there was no positive and significant relationship between the variable age and the level of internal control, as proposed in hypothesis 1, which may also indicate that the maturity of the banking institutions studied may not necessarily be linked only to age, but also to forms of centralization, formalization of organizational structure, recognition in the market and greater innovation, characteristics evaluated by Miller and Friesen (1984) in their model of life cycle stages to indicate the stages of the organizations development.

In general, it is possible to indicate the rejection of hypothesis 1 and hypothesis 5, because age and geographic expansion were not significant to explain the level of internal control of the studied banks. In addition, the confirmation of hypotheses 2, 3 and 4 is revealed, since the size and diversification of credit products explain the level of internal control in a significant and positive way and the corporate structure, as predicted by hypothesis 4, it is negatively related to the levels of internal organizational controls of banking institutions.

5 CONCLUSION

The objective of the study was to verify how the contingency aspects (size, age, diversification of credit products, corporate structure and geographic expansion) affect the level of internal control adopted by 19 banking institutions listed in B₃, from 2013 to 2021. Based on the results, it was observed the positive and significant relationship between size and level of internal control of organizations, which indicates the non-rejection of hypothesis 2, and reflects that larger companies have more developed internal controls, given that these entities, in addition to having more financial resources for this, they also deal with a greater increase in operations, which also end up demanding greater internal controls.

Regarding the diversification of credit products, a significant expected (positive) relationship with the level of internal control was noted, which also indicated the acceptance of hypothesis 3. Whereas regarding *the variable corporate structure*, significant relevance was observed to explain the level of internal control, but the relationship is opposite. Thus, hypothesis 4 has been accepted, which also showed that banks are more likely to adopt adequate internal controls when their units are within the context or locality of the headquarter, being more difficult to adopt these when the opposite is verified, since it increases the monitoring difficulty. Finally, regarding the effect of age and geographical expansion on the level of internal control, there was no significant relationship. Therefore, hypothesis 1 and hypothesis 5 were rejected.

These findings, in relation to age, contradict the idea of Greiner (1998), who states that over time organizations tend to promote improvements in their management practices, in order to maintain their survival, which can also attest, according to Tang, Tian and Yan (2015), that, over time and consequently age, more experiences are acquired, and organizations have more access to opportunities than new and potential ones, and therefore less weakness in their internal controls.

Moreover, the results found in the study are similar to that indicated by Andreatta, Olinquevitch & Silveira (2009), which indicate that when companies are geographically dispersed among their units, the difficulties of monitoring, this may result in more difficult-to-manage internal control systems, although in this study, this relationship was not significant.

In short, the size and diversification of credit products of banks make their activities complex and voluminous, justifying, according to the Contingency Theory, the search for more internal controls; which is also in accordance with Resolution number 4.557/2017, which indicates that financial institutions, which according to the body, range from segment 1 (largest size) to segment 4 (smaller size), must perform risk management according to the complexity of their activities and processes (Bacen, 2017), since risk management is, according to Santana and Silva (2020), intrinsically linked to internal controls .

Thus, it is concluded that banking institutions should better pay attention to their internal controls, especially in the face of corporate structures, since this can modify the whole routine of

a company, because new organizational cultures are inserted and hinder certain mechanisms of corporate governance, also provoking more deficient and flawed internal controls. The size and diversification of credit products also denote risk prevention needs to banks, and should be focused to have internal controls that work.

Thus, these findings contribute to the literature on Contingency Theory, as it visualizes important aspects to achieve better performance in the context of internal controls, serving as a basis for managers, shareholders, auditors and creditors, in the face of their decision analysis. In addition, the study collaborates for investigations that deal with *the theme of internal controls*, allowing them to go through the following paths: (i) to evaluate the internal controls of companies based on corporate governance mechanisms; (ii) to measure the levels of internal controls of companies; and (iii) to visualize how internal controls can become more effective.

It can be highlighted as innovation of work, the use of internal controls arising from Corporate Governance, often disregarded within this theme. Moreover, according to Abba, Yahava and Suleiman (2018), a criticism raised to the Contingency Theory is in relation to *the Size* factor, in which larger companies are studied, but the size variations among these are not evaluated. Thus, this study evaluated publicly traded companies, which in essence are large companies, and verified, within the size variation, how they adopt internal controls, contributing in a new way to the Contingency Theory. The study also contributes as it seeks to determine the circumstances in which banking institutions are more likely to adopt better levels of internal controls, indicating ways to follow these organizations.

As limitations of the research, it is possible to include other contingent variables, *such as environmental uncertainty, organizational structure, uses of technologies and strategies*, due to the absence of data on these variables in the reports explored, as well as the restriction of data in relation to Internal Controls, which did not allow a more holistic view of internal control practices and structural characteristics existing in corporations. For future studies, it is suggested to perform not only documentary research, but also the application of questionnaires with managers of organizations and indirect observations, in order to verify more characteristics of internal controls and contingency aspects, such as *organizational structure, strategies, environmental uncertainty and use of technology*.

REFERENCES

- Abba, M., Yahaya, L., & Suleiman, N. (2018). Exploring and Critique of Contingency Theory for Management Accounting Research. *Journal of Accounting and Financial Management*, 4(5), 40-50.
- Akwaa-Sekyi, E. K., & Gené, J. M. (2016). Effect of internal controls on credit risk among listed Spanish banks. *Intangible Capital*, 12(1), 357-389.
- Andreatta, A., Olinquevitch, J. L., & Silveira, A. (2005). A controladoria nas grandes indústrias têxteis do Vale do Itajaí/SC. *Anais do Congresso USP de Controladoria e Contabilidade*, São Paulo, SP, Brasil, 5.
- Assunção, R. R., De Luca, M. M. M., Vasconcelos, A. C. (2017). Complexidade e governança corporativa: uma análise das empresas listadas na BM&FBOVESPA. *Revista Contabilidade e Finanças da USP*, 28(74), 213-228.
- Auzair, S.M., & Langfield-Smith, K. (2005). The effect of service process type, business strategy and life cycle stage on bureaucratic MCS in service organizations. *Management Accounting Research*, 16(4), 1-17.

- Baioco, V. G., & Almeida, J. E. F. (2017). Efeitos do comitê de auditoria e do conselho fiscal na qualidade da informação contábil no Brasil. *Revista Contabilidade e Finanças da USP*, 28(74), 229-248.
- Banco Central do Brasil (BCB). (2004). *Resolução n. 3.198, de 27 de maio de 2004*, altera e consolida a regulamentação relativa à prestação de serviços de auditoria independente para as instituições financeiras, demais instituições autorizadas a funcionar pelo BACEN e para as câmaras e prestadores de serviços de compensação e de liquidação. Recuperado em 08 junho, 2021, de https://www.bcb.gov.br/pre/normativos/res/2005/pdf/res_3271_v2_L.pdf
- Brasil, Bolsa Balcão (B3) (2021). *Empresas listadas*. Recuperado em 25 abril, 2021, de http://www.b3.com.br/pt_br/produtos-e-servicos/negociacao/renda-variavel/empresas-listadas.htm
- Benli, V. F., & Celayir, D. (2014). Risk based internal auditing and risk assessment process. *European Journal of Accounting Auditing and Fianance Research*, 2(7),1-16.
- Bruns, W., & Waterhouse, J. Budgetary control and organization structure. (1975). *Journal of Accounting Research*, 13(2), 177-203.
- Carioca, K. J. F., De Luca, M. M. M., & Ponte, V. M. R. (2010). Implementação da lei Sarbanes-Oxley e seus impactos nos controles internos e nas práticas de governança corporativa: um estudo na Companhia Energética do Ceará – Coelce. *Revista Universo Contábil*, 6(4), 50-67.
- Carvalho, A. R., & Vieira, E. T. V.(2015). A importância da auditoria interna e do controle interno, na redução de fraudes nas instituições financeiras. *REPAE – Revista Ensino e Pesquisa em Administração e Engenharia*, 1(2), 229-246.
- Chapman, C. S. (1997). Reflections on a contingent view of accounting. *Accounting, Organizations and Society*, 22(2), 189-205.
- Chenhall, R. (2003). Management control systems design with in its organizational context: Findings from contingency-based research and directions for the future. *Accounting, Organizations and Society*, 28(2-3),127-168.
- Correia, L. F., Amaral, H. F., & Louvet, P. (2014). Determinantes da eficiência de conselhos de administração de empresas negociadas na BM&FBovespa. *Revista de Contabilidade e Organizações*, 8(21), 46-57.
- Coso (2013). *Committee of Sponsoring Organizations of the Treadway Commission*. Internal control – integrated framework. 2013. Recuperado em 17 abril, 2021, de <https://www.Coso.org/Documents/990025P-Executive-Summary-final-may20.pdf>
- Custódio, J. J., Fukuro, T. Y., Pavão, J.A., & Ferreira, J. L. D. (2019). Análise do controle interno no setor de almoxarifado de uma empresa de transporte à luz da metodologia COSO. *REUNIR: Revista de Administração, Ciências Contábeis e Sustentabilidade*, 9(2),1-10.

- Damodaran, A. (2007). Information transparency and valuation: can you value what you cannot see? *Managerial Finance*, 33(11), 877-892.
- Denis, D. K., & McConnell, J. J. (2003). International corporate governance. *Journal of Financial and Quantitative Analysis*, 38(1), 1-36.
- Deng, S., & Elyasiani, E. (2008). Geographic diversification, bank holding company value, and risk. *Journal of Money, Credit and Banking*, 40(6), 1217-123.
- Dodge, R. H., Fullerton, S., & Robbins, J. E. (1994). Stage of the organisational life cycle & competition as mediators of problem perception for small businesses. *Strategic Management Journal*, 15(2), 21-134.
- Duncan, J., Flesher, D., & Stocks, M. (1999). Internal control systems in US churches. An examination of the effects of church size and denomination on systems of internal control. *Accounting, Auditing and Accountability Journal*, 12(2), 142-163.
- Eling, M., & Marek, S. (2009). *Corporate Governance and Risk Taking: Evidence from the U.K. and German Insurance Markets*. University of ULM.
- Fávero, L. P. (2017). *Manual de análise de dados*. (1a ed.). Rio de Janeiro: Elsevier.
- Freitag, V.C., Almeida, K. K. N., & Lucena, W. G.L. (2021). Teoria da Contingência. In: K. K. N. A. Almeida, & R. D. França (orgs.). *Teorias aplicadas à pesquisa em contabilidade: uma introdução às teorias econômicas, organizacionais e comportamentais*. (Vol. 1, Capítulo 4, pp. 85-105). João Pessoa: Editora UFPB.
- Ghorbel, J. (2019). A Study of Contingency Factors of Accounting Information System Design in Tunisian SMIs. *Journal of the Knowledge Economy*, 10(1), 74-103.
- Greiner, L. E. (1998). Evolution and revolution as organizations grow. *Harvard Business Review*, 76(3), 55-67.
- Gujarati, D. N. (2011). *Econometria básica*. (5a ed.). Porto Alegre, RS, Brasil: McGraw Hill.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2009). *Análise multivariada de dados* (6a ed.). Porto Alegre, RS: Bookman.
- Haq, M., Faff, R., Seth, R., & Mohanty, S. (2014). Disciplinary tools and bank risk exposure. *Pacific-Basin Finance Journal*, 26, 37-64.
- Instituto Brasileiro De Governança Corporativa (IBGC). (2015). *Código das melhores práticas de governança corporativa*. (5a ed.). São Paulo, SP, Brasil. Recuperado em 05 junho, 2021, de <https://conhecimento.ibgc.org.br/Lists/Publicacoes/Attachments/21138/Publicacao-IBGCCodigo-CodigodasMelhoresPraticasdeGC-5aEdicao.pdf>
- Jensen, M. C. (1993). The modern industrial revolution exit and the failure of internal control systems. *The Journal of Finance*, 48(3), 831-880.

- Jokipii, A. (2010). Determinants and consequences of internal control in firms: a contingency theory-based analysis. *Journal of Management & Governance*, 14(2), 115-144.
- Kazanjian, R. K., & Drazin, R. (1990). A stage-contingent model of design and growth for technology-based new ventures. *Journal of Business Venturing*, 5(3), 137-150.
- Lin, T. T., & Lee, Y. C. (2008). Organizational characteristics, board size and corporate performance. *Journal of Global Business Management*, 4(2), 338-347.
- Malacrida, M. J. C., & Yamamoto, M. M. (2006). Governança Corporativa: Nível de Evidenciação das Informações e sua Relação com a Volatilidade das Ações do Ibovespa. *Revista Contabilidade e Finanças da USP*, edição Comemorativa, 65-79.
- Miller, D., & Friesen, P. (1984). A longitudinal study of the corporate life cycle. *Management Science*, 30(10), 1161-1183.
- Otley, D. (1980). The contingency theory of management accounting: Achievement and prognosis. *Accounting, Organization and Society*, 5(4), 428-431.
- Pedersen, T., & Thomsen, S. (1997). European patterns of corporate ownership: a twelve-country study. *Journal of International Business Studies*, 28(4), 759-778.
- Pindyck, R. S., & Rubinfeld, D. L. (2004). *Econometria: modelos & previsões* (4a ed.). Rio de Janeiro, RJ: Elsevier.
- Rossetti, J. P., & Andrade, A. (2012). *Governança corporativa: fundamentos, desenvolvimento e tendências*. (6a ed.). São Paulo: Atlas.
- Santana, E.P., & Silva, F.F. (2020). A Estruturação das Áreas de Controle Interno e *Compliance* em Empresas Estatais Brasileiras conforme a Lei nº 13.303/2016. *Teoria e Prática em Administração*, 11(1), 32-44.
- Sehnem, S. et al.(2021) Capacidade de adaptação das empresas em um cenário de crise. *RGO - Revista Gestão Organizacional*, 14(1), 33-53.
- Seliem, A. A., Ashour, A.S., Khalil, O. E., & Millar, S. J.(2003). The relationship of some organizational factors to information systems effectiveness: a contingency analysis of Egyptian data. *Journal of Global Information Management (JGIM)*, 11(1), 40-71.
- Silva, A., & Klann, R. C. (2020). Efeito da complexidade empresarial no gerenciamento de resultados de empresas brasileiras. *Revista Contabilidade Vista & Revista*, 31(1), 1-28.
- Spira, L., & Page, M. (2003). Risk management: The reinvention of internal control and the changing role of internal audit. *Accounting, Auditing and Accountability Journal*, 16(4), 640-661.
- Tang, D., Tian, F., & Yan, H. (2015). *Internal Control Quality and Credit Default Swap Spreads*. (In-Press).

Vieira, C. A. M., & Girão, L. F. D. A. P. (2016). Diversificação das receitas e risco de insolvência dos bancos brasileiros. *Revista de Contabilidade e Organizações*, 10(28), 3-17.

Vieira, C.A.M., Gomes e Silva, M.C., Silva, R.R., & Florêncio, D. B. (2020). Complexidade e Risco dos Conglomerados Financeiros Operantes no Brasil. *BASE – Revista de Administração e Contabilidade da Unisinos*, 17(2), 277-308.

Wallace, W., & Kreutzfeldt, R. (1995). The relation of inherent and control risks to audit adjustment. *Journal of Accounting, Auditing and Finance*, 10(1), 459-483.

Waterhouse, J., & Tiessen, P. (1978). A contingency framework for management accounting systems research. *Accounting, Organizations and Society*, 3(1), 65-76.

ACKNOWLEDGEMENT

To the Research Support Foundation of the State of Paraíba (FAPESQ), public notice N° 07/2021, term number 1221/2021, for providing financial and material conditions for the study.