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Earnings Quality and Resilience of Brazilian Financial Institutions: An Analysis of the Basel Index

ABSTRACT

Objective: Analyze the relationship between the Basel index and the earnings quality reported by entities in the Brazilian financial sector.


Method: Half-yearly data published on the Central Bank of Brazil (BACEN) website, from 105 financial institutions, from 2010 to 2018 were examined, totaling 1,889 observations. The earnings management used the account Loan Loss Provisions (LLP) to measure the earnings quality, which is used as a dependent variable in a regression model with panel data for fixed and random effects. Basel Index (BI) was used, as an independent variable, as a proxy for financial resilience.


Originality/Relevance: Analyzing the relationship between profit and resilience is original and relevant for providing insights into the reliability of the financial stability proxy of Brazilian banks, in contrast to the quality of accounting information.

Results: One of the regressions returned a negative and significant relationship between the Basel Index and LLP. The conclusion is that there is an inverse relationship between resilience and management, configuring evidence of the informational quality of the financial stability index.

Theoretical/Methodological contributions: The literature on accounting informational quality attests to banks' financial resilience as a reliable measure for many users.

Keywords: Financial Institutions; Basel Index; Earnings Quality; Earnings Management.

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1 INTRODUCTION

Banks are financial institutions that collect deposits and grant loans to individuals, companies, and other bodies to finance consumption, investment, and capital expenditure, thus substantially contributing to the economic growth of several countries (Ozili & Outa, 2017).

Therefore, the concern with the regular functioning of the global financial system has been evolving after the records of global severe economic crises, such as subprime credit in 2008 (Yanaka & Holland, 2010). The apprehension of the financial market is justified by the global interconnection of institutions, consolidating relationship networks and systemic organisms, where specific turbulence in a locality can radiate far and affect millions of people (Castro, 2007).

The difficulty of financial intermediaries in circumventing the adverse effects of past crises caused the emergence of solid regulation on financial stability. According to Santos, Macedo, and Rodrigues (2014), world regulatory bodies have consolidated what is known as prudential regulation. They instituted agreements, norms, recommendations, and control instruments to monitor banks' capital structure, restore confidence in investments in the sector, and financial intermediation, strengthening the institutions' transparency towards their users (Castro, 2007).

The international prudential regulatory body is the Basel Committee (Switzerland) for Banking Supervision (Basel Committee on Banking Supervision - BCBS), created in 1974 and currently formed by 45 monetary authorities, operating in 28 jurisdictions (BIS, 2019). In their compilation of norms and rules published during BCBS meetings, the Basel Accord treaties on prudential regulation and three editions.

Etymologically, the financial system shaped the concept of resilience to Financial Resilience, where a financial intermediation system between agents, which maintains its regular functioning over time, even in unfavorable economic scenarios, is considered resilient or stable (BACEN, 2019).

The capital index established to represent the resilience or stability of institutions is the Basel Index (BI). The index between the financial entity's reference equity and its risk-weighted assets generates this indicator, released quarterly by banks and with a minimum percentage required by the Central Bank of Brazil (BACEN), based on international standards (Silva & Ferreira, 2016).

Therefore, by seeking a focus beyond the minimum regulatory look that the Basel Index represents on bank capital, this study intends to analyze the BI also by its indicator character, that is, as a reference factor, comparator, which can explain specific situation or condition, considered in decision making, as are the results of banking institutions, especially in the case of profit.

In addition to the analysis made about the banking resilience of financial institutions, an important aspect to be observed refers to the entities' profits as helpful accounting information. Dechow, Ge, and Schrand (2010) argue that financial reports should adequately provide valuable data for decision-making by different users. Therefore, the information provided by these reports must have quality. Thus, different ways of measuring the quality of accounting information were listed in the literature, among them earnings management, as the presence of this practice in the accounting of financial institutions denotes a low informational earnings quality (Goulart, 2007).

In financial institutions generally manage the results through the discretion of the Loan Loss Provisions (LLP) account, which represents a measure widely used in studies on

management in banking entities (Carvalho, Pereira & Dantas, 2018; Cunha, Bezerra, Gubiani & Rengel, 2009; Fuji & Carvalho, 2005; Le, Tran & Nguyen, 2021; Macedo & Kelly, 2016). Cohen and Edwards (2017) warn about the danger of using judgment in the definition of provisions in banks, as they allow the use of this provisioning for earnings management, which results in a reduction in the transparency of accounts and the usefulness of information for the various accounting users.

Credit losses play a crucial role in assessing banks' risks and stability while retaining substantial economic significance (Marton & Runesson, 2017). Therefore, as explained on the relationship between banking resilience and earnings quality in financial institutions, the following research question was elaborated: is there a significant relationship between the Basel Index and the earnings quality reported by entities belonging to the Brazilian financial sector?

Because of this, according to the research question, this article aims to verify the relationship between the stability index of financial institutions and earnings management, which is one of the measures to assess the quality of accounting information analyzed in this paper. As the result of losses from bad debts of banks. Specifically, the study aims to identify whether the Basel Index presents an informational perspective through a negative relationship or presents an opportunistic perspective through a positive relationship with earnings management.

It is noteworthy that loan loss provision is relevant in helping many users who do not have access to internal data to evaluate the financial institution's profitability and value (Harris, Khan & Nissim, 2018). Therefore, it is essential to analyze this account as an indicator of accounting information quality instead of the financial stability index.

Analyzing the relationship between two attributes of information quality, Basel index and earnings management is relevant for providing insights into the reliability of the financial stability proxy of Brazilian banks associated with the quality of accounting information. In this way, several users will be able to attest whether this index is trustworthy or not for their judgments and decisions.

This study aims to contribute to the literature on accounting information quality by showing how earnings management in financial institutions is related to the resilience of these entities, attesting to whether financial stability is considered a reliable measure.

2 THEORETICAL FRAMEWORK

2.1 Prudential Regulation of Financial Institutions

According to BACEN (2019), prudential regulation is composed of financial security standards of the sector's institutions. Based on risk management and minimum capital parameters, the requirements seek to overcome occasional periods of economic "stress" inherent to its activities, increase transparency, and support external users' decision-making.

The prudential framework requires banking entities to account for financial health. The resource reserves they maintain must be sufficient to honor their commitments, even in unexpected or estimated losses. A minimum capital reserve is determined for these companies, always observing operational limits and risk management (Yanaka & Holland, 2010).

International banking prudential regulation has the BCBS as its normative entity (Santos *et al.*, 2014). BCBS seeks to harmonize the prudential measures adopted by its members to provide equality in the international competition of financial markets. BACEN has been a member of the committee since 2009, when it started to mediate and supervise the convergences of Brazilian regulation with the forum's rules (BACEN, 2019).

2.1.1 Basel Accords

The first Basel Accord, known as Basel I (B-I), was established in 1988 with recommendations and minimum capital requirements for financial institutions with international operations. In 1996, to further mitigate the risks, the recommendations were improved with the obligation to create reserves to cover risks to the minimum capital required (Leite & Reis, 2013).

Basel II (B-II) in 2004 addressed revisional aspects, emphasizing banking risks, with banks themselves being encouraged to measure their risky practices and improve internal controls (Santos *et al.*, 2014).

Basel III (B-III) emerged in 2010 to respond to the 2007/2008 international crisis. With it, the recommendations for strengthening bank resilience against possible "shocks" to the financial system, even originating in other sectors of the economy, were improved, reducing the worldwide spread or "domino effect" (Leite & Reis, 2013).

Pinheiro, Savóia, and Securato (2015) state that the recommendations were for more quality and quantity of regulatory capital and the improvement of the weighting factors of assets by risk. The innovations of this Agreement were in charge of liquidity requirements, additional capital, and leverage, depending on the scope: institution of global relevance or domestic relevance.

2.1.2 Basel Index

The base equity for analyzing banks' capital is called Reference Equity (RE), composed of two levels (or tiers). This level I corresponds to equity, plus the creditor income accounts, and is deducted from the accounts of debtor results, excluding some reserves and shares that will go to level II (Almeida, Bertucci, Souza & Amaral, 2012).

Level II of RE consists of regulatory capital and revaluation reserves, retentions for contingencies, special earnings savings related to mandatory undistributed dividends; cumulative preferred shares; redeemable preferred shares; subordinated debt, and hybrid capital and debt instruments (Silva, 2005).

The sum of all assets of a financial institution, whether credits, securities purchased, or leased, are multiplied by a weighting factor for credit, market, and operational risks, projecting into Risk-Weighted Assets (RWA). The index between RE and RWA, shown in equation 1, generates the financial stability index, currently called the Basel Index (BI) (Pinheiro *et al.*, 2015).

$$\text{Basel Index (BI)} = \frac{\text{Reference Equity (RE)}}{\text{Risk Weighted Assets (RWA)}} \tag{1}$$

BACEN, based on National Monetary Council (CMN) Resolution No. 4,193, of March 1, 2013, requires institutions to maintain, since the end of 2019, the Basel Index equal to or greater than 8%, the same percentage required, internationally, by Agreement B-III (BACEN, 2019).

The maintenance and level of supplementary reserves are other indications of a bank's financial health. These reserves, also known as buffers, emerged with the B-III and are additional to the principal capital, being constituted in periods of the excellent credit cycle and released in periods of "economic stress" or to avoid sudden fluctuations in RE (Reis, 2015). They are significant maintenance reserves for essential entities in the financial system. Traditional indicators for the analysis of financial statements are also observed, such as the

Liquidity Coverage Index (LCR), the Net Stable Funding Ratio (NSFR), and the leverage index (BACEN, 2019).

Basel's banking supervision committee values the quality of financial information disclosed by institutions. However, the increasing complexity of banking products and the difficulty in evaluating these new financial assets and liabilities, especially when there is no active secondary market with liquidity, increases subjectivity and measurement estimates, which can compromise the quality of information and enable the highest frequency of earnings management (Dantas, Galdi, Capalletto & Medeiros, 2013).

2.2 Information Quality and Accounting Earnings Management

Transparency and quality of information are the pillars of a solid financial system, as the financial statements, indicators, and reports disclosed by financial intermediaries must adequately demonstrate the institutions' economic, financial, and equity situation (Goulart, 2007).

The lack of quality accounting information provides more outstanding agency and capital costs, greater frequency of earnings management, deficiencies in investments and resource allocation (Bushman & Smith, 2001). This information asymmetry weakens the protection of shareholders and investors (Dyck & Zingales, 2004).

Dechow *et al.* (2010) list these parameters for measuring the quality of accounting information, such as earnings management, quality in measuring accruals, disclosure level, earnings persistence, opportunity, conservatism, relevance, and timeliness. Therefore, it is possible to note that earnings management is a theme that the academic accounting literature expressively addresses among the alternatives for researching information quality.

By performing its function of measuring and recording the economic events of entities, accounting generates as its product accounting valuable information to interested parties. Macedo and Kelly (2016) point out that on one side of this communication channel provided by accounting, there is the user of information that demands quality and, mainly, confidence for decision-making. On the other hand, the entity discloses the information and intends to convince investors and creditors about its good equity and financial situation.

In the fierce commercial dispute or judicious regulation to show good economic and financial conditions, institutions may end up using discretion in measuring or disclosing some data and thereby modifying the information in the financial statements according to their interests, without necessarily infringing norms (Martinez, 2008).

Earnings management occurs when managers make judgments about items recognized in financial reports that do not always match reality, thus generating misleading information for some users about the entity's economic performance (Healy & Wahlen, 1999). According to Goulart (2007), the presence of management affects the quality of information since there is an inverse relationship between quality and management.

Accounting information management uses accruals to leverage or disguise the value companies calculate when disclosing statements, directing their economic and financial situation to more attractive levels to stakeholders' eyes (Healy & Wahlen, 1999).

Accruals are classified into discretionary and non-discretionary. Goulart (2007) states that discretionary officers have a degree of freedom for the manager's decision, even within the norms. For non-discretionary accruals, the administration is bound by what the accounting standards determine, and they cannot manipulate the accruals. The earnings management intrinsically linked the discretionary accruals.

The account Loan Loss Provisions (LLP) is considered a measure of earnings management in the banking segment. Ozili and Outa (2017) comment that LLP represents a

crucial indicator of the informativeness of bank accruals. For Wahlen (1994), bank managers have significant discretion in determining LLP estimates, and managers use this discretion for particular purposes, making financial reports opportunistic rather than informational.

2.2.1 CMN Resolution No. 2682/1999

Regarding the relevance of LLP in Brazilian financial institutions, it is essential to highlight Resolution No. 2,692, of December 21, 1999, which provided rules for the constitution of allowance for doubtful accounts to financial entities and other authorized institutions operated by the Central Bank of Brazil.

Article 6 of the resolution above determines that the LLP must be constituted monthly by banking segment, and it cannot be less than the "[...] sum resulting from the application of the percentages mentioned below, without prejudice to the responsibility of the administrators of the institutions for the constitution of a provision in amounts sufficient to cover probable losses in the realization of credits" (CMN Resolution No. 2,692, 1999):

- I - 0.5% (half percent) on the value of operations classified as level A risk;
- II - 1% (one percent) on the value of operations classified as level B risk;
- III - 3% (three percent) on the value of operations classified as level C risk;
- IV - 10% (ten percent) on the value of operations classified as level D risk;
- V - 30% (thirty percent) on the value of operations classified as level E risk;
- VI - 50% (fifty percent) of the value of operations classified as level F risk;
- VII - 70% (seventy percent) of the value of operations classified as level G risk;
- VIII - 100% (one hundred percent) on the value of operations classified as level H risk (CMN Resolution No. 2,692, 1999).

CMN Resolution No. 2,692 (1999) also states that provision operations classified in this provision must remain registered in a memorandum account within a minimum of five years and as long as all procedures for their collection are not exhausted. However, it is noted through this resolution that financial institutions must observe particular rules on the LLP constitution.

2.3 Previous Studies on Management in Financial Institutions

Cunha *et al.* (2009) write that one of the first researches on earnings management in financial institutions operating in Brazil, the work of Fuji and Carvalho (2005), already pointed out signs of earnings management to avoid reporting losses, in which the analyzed banks sought to sustain the recent performance.

The research by Goulart (2007) pointed out accruals derivatives and credit operations, together with bonds and securities (TVM) in financial entities. The Result returned that the smoothing of the Result occurred more effectively by LLP. Derivatives were also studied by Dantas *et al.* (2013) in an analysis of Brazilian banks, concluding that they were managed for the practice of income smoothing, avoiding large fluctuations, with greater incidence in private sector companies.

Cunha *et al.* (2009) related LLP with independent audit, presenting the problem of earnings management in the years of rotation of companies responsible for auditing the statements of Brazilian banks. The conclusions showed that in the year that there was a change of audit companies, earnings management was softened compared to the previous one. In contrast, after the audit change, there was a new tendency to increase in the following year.

Carvalho *et al.* (2018) aimed to investigate whether Brazilian financial institutions would use the discretionary portion of LLP for capital management by controlling the level of the Basel index. In this research, the results did not reveal evidence that the banks in the sample used the discretionary portion of LLP.

The study by Le *et al.* (2021) showed that earnings management has a positive relationship with the LLP of Vietnamese banks, thus suggesting that losses on loan losses can be used as a management opportunism mechanism when managing earnings to meet particular interests.

3 RESEARCH METHODOLOGY

3.1 Delimitation of Research Hypotheses

Industry professionals argue that credit risk management for loan customers is an essential aspect of the banking business model (Cantrell, McInnis & Yust, 2014). Therefore, credit losses related to these operations involve judgments by managers and play a central role in assessing the stability of banks (Marton & Runesson, 2017).

For Cantrell *et al.* (2014), reliably recognizing terrible debt losses can provide more helpful information for decision-makers. According to Ozili and Outa (2017), the estimate of losses is the credit risk management tool used to mitigate expected losses in the bank loan portfolio, constituting a primary device in the future assessment of the business, helping the various users of the financial reports.

However, from another perspective, the judgment related to recording these losses can lead to opportunism on managers, resulting in fewer informational reports (Wahlen, 1994). It is understood that the loss provision could lead to earnings management, affecting the quality of accounting information (Cohen & Edwards, 2017).

Considering that the choice of the device to measure the quality of reported earnings as earnings management, a systematic endorsed by state of the art, and the opportunistic perspective, or not, of the resilience indicator, the following research hypothesis is presented:

H_{1a}: The Basel Index, released by financial institutions operating in Brazil, has a significant relationship with the LLP account, earnings management proxy.

Starting from the assumption of acceptance of hypothesis H_{1a}, considering the sign of the coefficient of the Basel Index, and given the informational perspective of the indicator, a complementary hypothesis is formed (H_{1b}):

H_{1b}: The Basel Index released by financial institutions shows a significant and adverse relationship with the LLP account, adding informational quality to the indicator.

The acceptance of hypothesis H_{1b} would signal the existence of evidence that institutions with higher Basel Indexes manage their accounting information less.

3.2 Sample and Data Collection

The research population comprises financial institutions operating in Brazil and provided information on the Central Bank website, *IF.data* platform, from 2010 to 2018. Institutions classified as "b1 - Commercial Bank, Multiple Bank with Commercial Portfolio or Caixa Econômica", "b2 - Multiple Bank without Commercial Portfolio or Investment Bank or Foreign Exchange Bank", and "b4 - Development Banks".

The other institutions were not selected: "b3S - Singular Credit Cooperatives", "b3C - Centrals and Confederations of Credit Cooperatives", "n1 - Non-bank Credit Institutions", and "n2 - Non-bank Capital Markets Institutions" and "n4 - Payment Institutions". These institutions were ignored from the sample because their accounting differs from other banking

institutions and because these companies do not report various information necessary to carry out this research, thus, not be comparable with the other selected institutions. Consequently, from this first filter, 138 financial intermediaries were identified.

The period analyzed covered nine years, with half-yearly data, with the choice of the beginning of the period, the year 2010, motivated both by coinciding with the date of the Basel III agreement and by the convergence to the norms of the International Financial Reporting Standards (IFRS), impacting the financial sector.

From the first sample, 28 banks did not provide complete semiannual information, thus being excluded. Finally, another 05 banks suffered cuts for not reporting any index or variable in the model. The sample resulted, for the period, in 1,889 observations with 105 financial institutions, as shown in Table 1.

Table 1

Definition of the research sample: companies listed on the BACEN website IF.data

Specification	Quantity
Population	138
(-) Institutions with no semiannual demonstration.	(28)
(-) Institutions with an index or variable, not informed in any period.	(05)
Final Sample	105

Source: Site IF.data<<https://www3.bcb.gov.br/ifdata>>.

The units were arranged in a panel with cross-sections and submitted to regression. The use of the Gretl® software operationalized statistical support and, spreadsheet editor software organized the data in a panel.

3.3 Quantitative Model for Earnings Management in Financial Institutions

To reach this research's objectives, it will be used as an adaptation to a specific regression model for the financial sector, which uses the Loan Loss Provisions expense account as a proxy. Fuji and Carvalho (2005) initially proposed this model for the banking sector. Equation 2 presents the Fuji and Carvalho (2005) model below:

$$LLP = \alpha_0 + \alpha_1 Res + \alpha_2 Liab + \alpha_3 Cred + \varepsilon \tag{2}$$

Where:

LLP: Expenses with allowance for loan losses; Res: Result, excluding expenses with allowance for loan losses; P: Liabilities Chargeable; and Cred: Credit Operations.

3.4 Variables and Regression Model Used in the Research

The model of this study was adapted from the model by Fuji and Carvalho (2005), using in turn account results with allowance for loan losses as a dependent variable and management proxy in the financial sector, together with the Basel index, as an independent variable to influence the behavior of the provision.

This model was chosen due to the specificity of the sector in accounting terms, the form of disclosure of information, the individual characteristics of operation and functioning, and the replication of the model, with adaptations by authors such as Carvalho *et al.* (2018), Cunha *et al.* (2009), Macedo and Kelly (2006), among others.

To minimize the robust standard errors, it was used Basel Index (BI) in decimal numbers with data natural logarithms: result between expenses and reversals of Loan Loss Provisions (LLP), Liabilities (LIAB), Result (RES), and Credit Operations (CRED).

According to the nature and balances of the accounts, the original sign (positive or negative) returned after calculating the logarithm of the values module.

Table 2 aims to expose the dependent and independent variables selected to compose the regression model of this study, according to previous works on the topic in the specific sector.

Table 2

Regression model variables and their expected signs of the coefficient

Variables	Definition	Expected Coefficient Signal
Natural logarithm of the Result of Loan Loss Provisions (LogLLP)	The dependent variable, earnings management proxy, specific accrual.	(+): Higher estimated losses are indications of earnings management.
Basel Index (BI)	Financial stability indexes of institutions.	(+) or (-): involves the search problem, which can result in an index with informational quality [-] or following discretionary manipulations [+].
Natural Logarithm of Result (LogRES)	Net result without the effect of LLP and Income Tax. Expenses with LLP are deductible and suffer the effect of losses (Macedo & Kelly, 2016).	(+): The greater the banks' results, the greater the accounting for losses on loan losses.
Natural Logarithm of Liabilities Chargeable (LogLIAB)	The variable LIAB (liabilities), in the results of the research by Cunha <i>et al.</i> (2009), an independent variable was shown to explain the variation in expenses with LLP.	(-) The greater the obligations with third parties, the smaller the balance in the reducing asset accounts to avoid sudden variations.
Natural Logarithm of Credit Operations (LogCRED)	The CRED variable has an intrinsic relationship with LLP, as it is natural that the greater the volume of credit operations, the greater the estimated losses (Macedo & Kelly, 2016).	(+) Higher volumes of credit operations tend to be accompanied by higher losses.

In summary, Equation 3, below, mathematically represents the regression model used in this study:

$$LogLLP_{i,t} = \alpha + \beta_1 BI_{i,t} + \beta_2 LogRES + \beta_3 LogLIAB + \beta_4 LogCRED + \varepsilon_{i,t} \tag{3}$$

Where:

LLP_{i,t} = Result of bad debts (group [71990307]+[71990352]+[71990400]+[71990503]+[71990606]+[81830309]+[81830354]+[81830402]+[81830505]+[81830608] of the Accounting Plan of Accounts of Institutions of the National Financial System - Cosif) of institution i, in period t; RES_{i,t} = Results for the semester, excluding the results with doubtful accounts, disclosed by institution i in a given period t; LIAB_t = Liabilities of the financial institution (i) in a certain period (t); CRED_{i,t}= Credit Operations disclosed in period t of institution i (group [16000001 – credit operations] + [16900008 – (-) provisions] of Cosif); α = regression model constant (intercept); β₁, β₂ e β₃ = Variable coefficients; and ε = regression error (residuals).

4 RESULTS

4.1 Results of Descriptive Statistics

The descriptive statistics of the variables intend to inform, through Table 3, the data dispersion and the position measures by the mean, median, minimum, and maximum values, and the standard deviation and the coefficient of variation.

Table 3
Results of descriptive statistics of the sample

Variable	Mean	Median	Minimum	Maximum	Standard Deviation	Coefficient of Variation
LogLLP	3,8700	4,1869	0,0000	7,1731	1,6856	0,4355
BI	0,3314	0,1856	-0,2619	6,7644	0,4844	1,4614
LogRES	4,9524	5,3142	-5,2840	7,9508	2,0158	0,4070
LogLIAB	6,4313	6,5072	2,6474	9,1378	1,1736	0,1824
LogCRED	6,2219	6,3177	1,4150	8,9310	1,1792	0,1895

Source: Research Results (2020).

It is observed that, in general, the coefficient of variation showed small values for the model variables – LogLLP, BI, LogRES, LogLIAB, and LogCRED. The coefficient of variation expresses the variability of data that have different means. The standard deviation of the variables was reduced for the sample. The variable with the most excellent dispersion, translated by the highest coefficient of variation (1.4614), was the Basel Index, which, on the other hand, had the slightest standard deviation (0.48443).

4.2 Diagnostic Panel Tests and Regression Model Validation

To verify which regression model is most suitable for the research sample, panel diagnostic and validation tests were performed for 105 financial institutions (units) by cross-section, with residual variance analysis.

Table 4
Results of diagnostic tests and regression model validation

Test	Results	p-value
Chow Test	F (104, 1780) = 25,594	0 (zero) ^a
Breush-Pagan LM Test	LM = 3018,61	0 (zero) ^b
Hausman Test	H = 161,042	<0,0001 ^c
White LM Test	LM = 427,556	<0,0001 ^d
Normality Test	Chi-square = 284,964	<0,0001 ^e

Note. (a) Validates the alternative fixed-effects hypothesis rather than OLS. (b) Validates the alternative hypothesis of random effects against pooled OLS. (c) Accepts the alternative hypothesis of fixed effects as opposed to random effects. (d) Sample data are heteroskedastic and need correction for robust standard errors. (e) There is no normal distribution. However, due to the number of observations, it is assumed that there is normality.

The Chow test returned a p-value equal to 0 (zero), validating the alternative hypothesis of the existence of fixed effects. The comparison between pooled OLS and panel regression with random effects using the Breusch-Pagan test statistic obtained a p-value equal to 0, indicating that the random-effects model is most valuable.

This scenario needs to decide which of the two-panel models is more congruent in statistical terms: fixed effects or random effects. Therefore, the Hausman test was performed, with a p-value also equal to 0 (zero). In this case, the p-value validates the alternative hypothesis of the existence of fixed effects.

Thus, after performing the due test, the model that best represents the data is the Panel Regression with Fixed Effects.

Regarding the tests used for model validation, it is observed that the sample data are heteroskedastic, as according to White's test, the test statistic showed a p-value =0 (zero), thus rejecting the null hypothesis of absence heteroscedasticity. These results made it necessary to correct the residuals for robust standard errors by the HAC matrix.

The residual normality test returned a p-value = 0 (zero), not accepting the null hypothesis that the error would have a normal distribution. However, considering the number of observations in the sample, N = 1,889, the premise is that the average residuals can be adopted.

4.3 Correlation Matrix Analysis

Before proceeding with the analysis of the inferential statistics of the regression model by fixed effects, the results referring to the Pearson correlation matrix will be demonstrated. Table 5 shows the results relating to the interactions between the independent and dependent variables used in this research:

Table 5

Correlation Matrix of Research Variables

LogLLP	BI	LogRES	LogLIAB	LogCRED	
1	-0,3475***	0,4911***	0,6772***	0,7544***	LogLLP
	1	-0,2837***	-0,3765***	-0,4269***	BI
		1	0,7214***	0,7033***	LogRES
			1	0,9536***	LogLIAB
				1	LogCRED

Note. *** statistical significance at the 1% level.

From the results provided in the table above, it is noted that all existing interactions were significant at the 1% level. The primary interaction of this research involves the dependent variable, which refers to the number of loan losses (LogLLP). It is observed that the Basel Index (BI) negatively correlated with the companies' management proxy. There is evidence of an inverse relationship, which confirms the quality of the BI as a measure of bank resilience. However, the correlation obtained was not high, representing a value of 0.3475, or 34.75%, considered a low to moderate correlation.

The variables related to result (LogRES), liabilities (LogLIAB), and credit operations (LogCRED) showed a positive and significant relationship, at the level of 1%, with the Result of doubtful debts, that is, the variables if present relevant when explaining the changes in provisions in the sample's financial institutions, thus corroborating the model proposed by Fuji and Carvalho (2005).

Therefore, after disclosing the correlations obtained in the primary model, it is necessary to analyze the findings through the fixed effects regression model, which focuses on the inferential relationships between the independent and dependent variables.

4.4 Fixed Effects Regression Results

The independent variables of the specific model will have their values shown in Table 6, after panel regression, with cross-sections, with fixed effects, for a total of 1,889 observations.

Table 6

Fixed Effects Regression Model - Dependent Variable: LogLLP

Variables	Coefficient	Standard Error	Ratio-t	P- value	Prob.
Constant	-2,50563	0,512265	-4,891	<0,0001	***
BI	-0,0484363	0,228830	-0,2117	0,8328	
LogRES	-0,0276766	0,0297041	-0,9317	0,3536	
LogLIAB	-0,636026	0,210594	-3,020	0,0032	***
LogCRED	1,70675	0,206924	8,248	<0,0001	***
F (p- value)	<0,0001	R ²	0,589501		

Note. * and *** statistical significance at the 10% and 1% levels, respectively.

Based on the results presented in Table 6, it is evident that the independent variables Basel Index (BI), Result in logarithm (LogRES), natural log of Liabilities (LogLIAB), and Credit Operations in natural logarithm (LogCRED) explained the model equation that manifests a coefficient of determination R^2 at fixed effects of 0.589501, which represents that 58.95% of LLP values. Furthermore, the p-value of the F test is below the 1% significance level, demonstrating that the equation is significant.

As a result, there is no significant relationship, with the non-acceptance of hypothesis H1a, between the dependent variable and the independent Basel Index (BI). Thus, concluding that the BI is not related to the Estimated Loan Loss Provisions in logarithm (LogLLP) of financial institutions prevents the acceptance of this research's hypothesis (H1b). Furthermore, the regression results showed that the variables LogLIAB and LogCRED had statistical significance, positively or negatively, at the level of 1%.

4.5 Results of Regression with Outlier Treatment

The winsorization technique was used to treat outliers. This process aims to reduce the incidence of values that stray too far or are outside a predetermined range.

The data were submitted to the cut-off of the outliers, at the level of 1% at the upper and lower limits, then performing the panel diagnoses, the respective robustness, and normality tests. Table 7 shows the test results:

Table 7

Pooled Diagnostic Test Results with winsorized data

Test	Results	p-value
Chow Test	F (104, 1780) = 20,8574	0 (zero) ^a
Breusch-Pagan LM Test	LM = 2570,31	0 (zero) ^b
Hausman Test	H = 158,238	0,034918 ^c
White LM Test	LM = 133,288	<0,0001 ^d
Normality Test	Chi-square = 142,219	<0,0001 ^e

Note. (a) Validates the alternative fixed-effects hypothesis rather than OLS. (b) Validates the alternative hypothesis of random effects against pooled OLS. (c) Rejects the alternative hypothesis of fixed effects as opposed to random effects. (d) Sample data are heteroskedastic and need correction for robust standard errors. (e) There is no normal distribution. However, due to the number of observations, it is assumed that there is normality.

Table 8 presents the statistical regression results by random effects for the data treated, translating the relationship between the independent and dependent variables of the model.

Table 8

Random Effects Regression Model - Dependent Variable: LogLLP.

Variables	Coefficient	Standard Error	t-ratio	p-value	Prob.
Constant	0,279274	0,247304	1,129	0,2588	
BI	-0,464824	0,202751	-2,293	0,0219	**
LogRES	-0,0459558	0,0522853	-0,8789	0,3794	
LogLIAB	-0,132139	0,103664	-1,275	0,2024	
LogCRED	0,782757	0,0968219	8,085	<0,0001	***
R^2	0,618204				

Note. *** statistical significance at the 1% level.

After excluding outliers, at 1%, the variable that constitutes credit operations (LogCRED) remains with a positive and significant correlation. The Basel Index (BI) started to show a negative relationship with LogLLP, with a statistical significance of 5%, against the previous analysis, thus not allowing the denial of the study hypothesis (H1b). Thus, it is observed that hypothesis H1a of this research was not rejected because of the relationship

between the earnings management proxy and the independent variable of interest - Basel Index (BI).

Data representing results (LogRES) and liabilities (LogLIAB), now winsorized, did not correlate significantly with the proxy of estimated losses in credit operations.

5 DISCUSSION OF RESULTS

According to previous studies, with emphasis on the works by Cunha *et al.* (2009), Goulart (2007), and Le *et al.* (2021), there is some evidence that financial institutions manage their results through LLP. State of the art ended up consolidating the estimated loss account with credit settlement as a proxy for handling accounting information. Therefore, LLP is the dependent variable of the regression model.

Regression results pointed to the variable LogCRED, which represents the number of the banks' credit operations in the period under study, with a positive and significant relationship, at the level of 1% for both analyses. These data align with the studies by Cunha *et al.* (2009) and Macedo and Kelly (2016), who argue that a higher volume of credit operations consequently generates higher estimated settlement losses.

Furthermore, Cunha *et al.* (2009) and Goulart (2007) pointed out earnings management of financial system intermediaries using LLP, especially income smoothing.

Moving to the core of this research, the Basel Index (BI) had no significant relationship with the results of loan losses, which is similar to the work of Carvalho *et al.* (2018), revealing that banks operating in Brazil do not usually use LLP for capital management. However, by the second model, without outliers, the BI was statistically significant, at the level of 5%, thus accepting hypothesis H_{1a} .

Regarding the H_{1b} hypothesis, the relationship with the LLP proxy was inverse, and it is impossible to refute the H_{1b} hypothesis. From this inference, one may conclude that the minimum capital structure index required for the financial sector reflects information quality. It represents financial resilience to crises, as it does not follow a possible growth of estimated losses and, consequently, does not align with increases in the manipulation of financial accounting results.

6 FINAL CONSIDERATIONS

The study sought to be relevant due to the representativeness of financial institutions in the global economy and the losses already experienced in periods of economic instability. The role of intermediary between deficit and surplus agents made these organizations intrinsically present in the lives of individuals and companies, with a relationship of dependency on many occasions. Therefore, the reliability of an index that represents a bank's ability to withstand unfavorable moments in the economy justifies the efforts used in this research.

Returning to the research objective, which was to verify the informational quality of the Basel Index (BI), the regression returned a negative and statistically significant relationship between the index and LLP. In this period, institutions with higher capital structure ratios estimated more minor losses from uncertain settlement credits. The conclusion is an inverse relationship between the index and earnings management, configuring evidence of informational quality.

The quality of the accounting information that the Basel index presented by the results of this research becomes a critical faculty, as this characteristic improves the reliability and, consequently, the efficiency of both the capital market and the financial market, contributing

to better risk management by reducing information asymmetry and economic uncertainties in the sector.

The conclusions of this study cooperate with a wide range of users who use both accounting reports and information regarding the resilience index of financial institutions. The findings also contribute to regulators by providing information on the reliability of the Basel Index by the information provided by accounting.

Earnings management as a consolidated metric for scaling informational quality accredits the empirical model chosen in this article. It induces the user credibility as to the quality of the capital structure index disclosed by banks and other institutions, since the hostile relationship with accounting discretion.

The research restrictions are related to the specificity of the financial sector, both in accounting terms and concerning the information disclosed. This particular condition limited the use of other regression models aimed at earnings management in non-financial companies, which use discretionary accruals.

REFERENCES

- Almeida, M. S., Bertucci, L. A., Souza, J. R., & Amaral, H. F. (2012). Influência da crise financeira mundial na estrutura econômica das instituições financeiras bancárias brasileiras e seus reflexos no Índice de Basiléia: uma abordagem comparativa. *Revista de Contabilidade e Organizações*, 6(16), 73-94. <https://doi.org/10.11606/rco.v6i16.52668>
- Banco Central do Brasil (2019). *Estabilidade financeira*. Brasília: BCB. Retrieved from <https://www.bcb.gov.br/estabilidadefinanceira>
- Bank for International Settlements (2019). *The Basel Committee – overview*. Retrieved from <https://www.bis.org/bcbs>
- Bushman, R. M. & Smith, A. J. (2001). Financial accounting information and corporate governance. *Journal of Accounting and Economics*, 32(3), 237-333. [https://doi.org/10.1016/S0165-4101\(01\)00027-1](https://doi.org/10.1016/S0165-4101(01)00027-1)
- Cantrell, B. W., McInnis, J. M., & Yust, C. G. (2014). Predicting credit losses: Loan fair values versus historical costs. *The Accounting Review*, 89(1), 147-176. <https://doi.org/10.2308/accr-50593>
- Carvalho, J. A., Pereira, J. V., & Dantas, J. A. (2018). As Instituições Financeiras Brasileiras Usam a PCLD para Gerenciamento de Capital?. *Enfoque: Reflexão Contábil*, 37(2), 127-140. <https://doi.org/10.4025/enfoque.v37i2.34077>
- Castro, L. B. de. (2007). Regulação Financeira – Discutindo os Acordos de Basiléia. *Revista do BNDES*, 14(28), 277-304. Retrieved from <http://web.bndes.gov.br/bib/jspui/handle/1408/12140>
- Cohen, B. H., & Edwards, G. (2017). The new era of expected credit loss provisioning. *BIS Quarterly Review, March*. Retrieved from https://www.bis.org/publ/qtrpdf/r_qt1703f.htm
- Conselho Monetário Nacional: resolução CMN nº 2.681, de 21 de dezembro (1999) Brasília: CMN.
- Conselho Monetário Nacional: resolução CMN nº 4.193, de 1º de março (2013) Brasília: CMN.
- Cunha, P. R. da, Bezerra, F. A., Gubiani, C. A. & Rengel, S. (2009). *Gerenciamento de resultados contábeis em instituições financeiras: Uma análise do rodízio de empresas de auditoria independente*. Congresso Brasileiro de Custos, XVI – Fortaleza-CE. Retrieved from <https://anaiscbc.emnuvens.com.br/anais/article/view/1075/1075>

- Dantas, J. A., Galdi, F. C., Capalletto, L. R. & Medeiros, O. R. (2013). Discricionariedade na mensuração de derivativos como mecanismo de gerenciamento de resultados em bancos. *Rev. Bras. Finanças (Online)*, 11(1), 17–48. Retrieved from <http://www.spell.org.br/documentos/ver/10050>
- Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of accounting and economics*, 50(2), 344-401. <https://doi.org/10.1016/j.jacceco.2010.09.001>
- Dyck, A. & Zingales, L. (2004). Private benefits of control: an international comparison. *Journal of Finance*, 59(2), 537-600. Retrieved from <https://www.jstor.org/stable/3694907>
- Fuji, A. H., & Carvalho, L. N. G. de (2005). *Earnings management no contexto bancário brasileiro*. Anais do Congresso da USP, São Paulo, SP, Brasil, 5. Retrieved from <https://congressousp.fipecafi.org/anais/artigos52005/7.pdf>
- Goulart, A. M. C. (2007). *Gerenciamento de resultados contábeis em instituições financeiras no Brasil*. 219 fls. Tese (Doutorado em Ciências Contábeis), Departamento de Contabilidade e Atuaria da Faculdade de Economia, Administração, e Contabilidade da Universidade de São Paulo, São Paulo. <https://doi.org/10.11606/T.12.2008.tde-17032008-124153>
- Harris, T. S., Khan, U., & Nissim, D. (2018). The expected rate of credit losses on Banks' Loan Portfolios. *The Accounting Review*, 93(5), 245-271. <https://doi.org/10.2308/accr-52012>
- Healy, P. M. & Whalen, J. M. (1999). A review of the earnings management literature and its implications for standard setting. *Accounting Horizons*, 13(4), 365-383. <https://doi.org/10.2308/acch.1999.13.4.365>
- Le, T. D., Tran, S. H., & Nguyen, L. T. (2021). Loan loss provisions, earnings management, capital management, and signalling: The case of Vietnamese banks. *Afro-Asian Journal of Finance and Accounting*. 1-26.
- Leite, K. V. B. & Reis, M. (2013). O Acordo de capitais de Basileia III: Mais do mesmo? *Revista EconomiaA*. 14(1), 159–187. Retrieved from http://www.anpec.org.br/revista/vol14/vol14n1p159_187.pdf
- Macedo, M. A. da S. & Kelly, V. L. de A. (2016). Gerenciamento de resultados em instituições financeiras no Brasil: Uma análise com base em provisões para crédito de liquidação duvidosa. *Revista Evidenciação Contábil & Finanças*. 4(2), 82-96. Retrieved from <https://periodicos.ufpb.br/ojs2/index.php/recfin/article/view/29260>
- Martinez, A. L. (2008). Detectando *earnings management* no Brasil: Estimando os *accruals* discricionários. *Rev. Contabilidade & Finanças*, 19(46), 7-17. <https://doi.org/10.1590/S1519-70772008000100002>
- Marton, J., & Runesson, E. (2017). The predictive ability of loan loss provisions in banks—Effects of accounting standards, enforcement and incentives. *The British Accounting Review*, 49(2), 162-180. <https://doi.org/10.1016/j.bar.2016.09.003>
- Ozili, P. K., & Outa, E. (2017). Bank loan loss provisions research: A review. *Borsa Istanbul Review*, 17(3), 144-163. <https://doi.org/10.1016/j.bir.2017.05.001>
- Pinheiro, F. A. P. Savóia, J. R. F. & Securato, J. R. (2015). Basileia III: Impacto para os Bancos no Brasil. *Revista Contabilidade e Finanças*. 26(69). <https://doi.org/10.1590/1808-057x201500720>
- Reis, M. (2015). O acordo de Basileia III e a pró-ciclicidade da regulação financeira. *Nova Economia*, 25(3), 691-716. Belo Horizonte/MG. <http://dx.doi.org/10.1590/0103-6351/2455>
- Santos, L. J., Macedo, M. A. S. & Rodrigues, A. (2014). Determinantes do nível de divulgação das recomendações do Pilar 3 do acordo de Basileia 2 nas demonstrações

- financeiras das instituições bancárias que atuam no Brasil. *Brazilian Business Review*, 11(1), 26-50. Retrieved from <http://www.spell.org.br/documentos/ver/27073/determinantes-do-nivel-de-divulgacao-das-recomendacoes-do-pilar-3-do-acordo-de-basileia-2-nas-demonstracoes-financeiras-de-instituicoes-bancarias-que-atuam-no-brasil/i/pt-br>
- Silva, D. B. R. e (2005). *O impacto de requerimentos de capital na oferta de crédito bancário no Brasil*. 2005. 74 f. Dissertação (Mestrado em Economia) –Programa de Pós-Graduação em Economia, Universidade de São Paulo, São Paulo, 2005. <https://doi.org/10.11606/D.12.2005.tde-08082005-085631>
- Silva, S. E. D., & Ferreira, B. P. (2016). Relações entre o Índice de Basiléia e o Nível de Endividamento das Famílias Brasileiras. *Sociedade, Contabilidade e Gestão*, 11(2). https://doi.org/10.21446/scg_ufrj.v11i2.13377
- Wahlen, J. (1994). The nature of information in commercial bank loan loss disclosures. *The Accounting Review*, 1, 455-478. Retrieved from <https://www.proquest.com/openview/bcd4f20a60d3e46239f7a67f74b663dc/1?pq-origsite=gscholar&cbl=18750&diss=y>
- Yanaka, G. M., & Holland, M. (2010). Basileia II e exigência de capital para risco de crédito dos bancos no Brasil. *Revista Brasileira de Finanças*, 8(2), 167-195. <https://doi.org/10.12660/rbfin.v8n2.2010.1419>

Qualidade dos Lucros e Resiliência de Instituições Financeiras Brasileiras: uma Análise do Índice de Basileia

RESUMO

Objetivo: Analisar a relação entre o índice de Basileia e a qualidade dos lucros reportados por entidades do setor financeiro brasileiro.


Método: Foram examinados dados semestrais, divulgados no site do BACEN, de 105 instituições financeiras, entre os anos de 2010 a 2018, totalizando 1.889 observações. O método escolhido para a aferição da qualidade dos lucros foi o gerenciamento de resultados, mediante a conta Perdas com Crédito de Liquidação Duvidosa (PCLD), sendo esta utilizada como variável dependente em modelo de regressão com dados em painel por efeitos fixos e aleatórios. Como variável independente utilizou-se o Índice de Basileia (IB) como proxy de resiliência financeira.

Originalidade/Relevância: Analisar a relação entre lucro e resiliência é original e relevante por fornecer insights sobre a confiabilidade da proxy de estabilidade financeira dos bancos brasileiros, em contrapartida com qualidade da informação contábil.

Resultados: Uma das regressões retornou relação negativa e significativa do Índice de Basileia com a PCLD. A conclusão é a de uma relação inversa entre a resiliência e o gerenciamento, configurando-se evidência de qualidade informacional do índice de estabilidade financeira.

Contribuições teóricas/metodológicas: Contribui com a literatura sobre qualidade informacional contábil ao atestar a resiliência financeira dos bancos como uma medida confiável para diversos usuários.

Palavras-chave: Instituições Financeiras; Índice de Basileia; Qualidade do Lucro; Gerenciamento de Resultados.

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