IFRS 9 adoption and its impacts on banks' credit impairment: an international perspective[1]

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ABSTRACT

Objective: This paper analyzes the initial impacts of IFRS 9 adoption on banks' credit impairment level in an international perspective. Specifically, we analyze the impact on banks' financial position and performance, the bank- and country-specific determinants of the impairment magnitudes and the informational effects of the new standard.
Method: The study is based on a sample of 149 listed banks from 12 countries from G20 and bivariate and multivariate analyses are applied.
Results: Results indicate that credit impairment recognized under IFRS 9 is larger than under IAS 39, suggesting a more conservative accounting model and that the new standard affected banks' performance and financial position. We show that IFRS 9 implementation was significantly different among countries, especially between high- and low-income countries and the information under IFRS 9 is more value-relevant than IAS39.
Contributions: We add to the previous literature by documenting the initial impact of IFRS 9 implementation on financial statements and on value relevance, as well as the bank- and country-specific determinants of the level of this impact.

Keywords: IAS 39; IFRS 9; Credit Impairment; Bank; Value Relevance.

Adoção do IFRS 9 e seus impactos no 'impairment' das operações de crédito bancárias: uma perspectiva internacional

RESUMO

Objetivo: Este artigo analisa os impactos iniciais da adoção do IFRS 9 no nível de *impairment* das operações de crédito dos bancos em uma perspectiva internacional. Especificamente, analisamos o impacto na posição financeira e no desempenho dos bancos, os determinantes específicos ao nível do banco e do país dos montantes de *impairment* reconhecidos e os efeitos informacionais da mudança normativa.

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Método: O estudo é baseado em uma amostra de 149 bancos listados de 12 países do G20 e são aplicadas análises bivariadas e multivariadas.
Resultados: Os resultados indicam que as perdas esperadas de crédito reconhecidas pelo IFRS 9 são maiores do que pelo IAS 39, sugerindo um modelo contábil mais conservador e que a nova norma afetou o desempenho e a posição financeira dos bancos. Evidenciou-se que a implementação do IFRS 9 foi significativamente diferente entre os países, especialmente entre países com maior e menor renda, e que as informações do IFRS 9 são mais relevantes do que as do IAS 39.
Contribuições: Este estudo fornece evidências do impacto inicial da implementação do IFRS 9 nas demonstrações financeiras e na relevância das perdas reconhecidas, bem como os determinantes específicos do banco e do país do nível desse impacto.

***Palavras-chave*:** IAS 39; IFRS 9; Perdas esperadas de crédito; Bancos; Relevância da informação contábil.

1 INTRODUCTION

The discussion of whether the International Accounting Standard (IAS) 39's incurred impairment model has triggered or extended the 2008 financial crisis is not a consensus in the literature (Bischof, Laux & Leuz, 2021; Gornjak, 2017). The cause of criticism of the accounting system is often attributed to the incurred loss recognition model (Gebhardt, 2016, López-Espinosa *et al.*, 2021) and the procyclical effects of the IAS 39 (Novotny-Farkas, 2016), since under the IAS 39, the incurred credit loss model (ICL) must particularly be booked when there is objective evidence of a loss event related to the credit future cash flows (Bouvatier and Lepetit, 2012) and there is virtually 100% chance of credit default (Lloyd, 2017; Novotny-Farkas, 2016).

Specifically, the IAS 39 does not allow loss recognition related to future events after the balance sheet closing date, even if those events were already expected before the balance sheet closure. For that reason, the International Financial Reporting Standard (IFRS) 9 introduced a new credit impairment model based on expected losses (Novotny-Farkas, 2016). In this regard, if early loss recognition can provide timely disclosures and provide corrective actions early, it can also expose risks and weakness of assets and trigger a bank run, suggesting an adverse consequence of expected loss recognition (Bischof et al., 2021).

While most of the existing (recent) literature is concentrated in one single country or region, such as the US market (Bischof et al., 2021), the EU market (Loew, Schmidt & Thiel, 2019), Spain (Ortega et al., 2022), Slovenia (Groff & Morec, 2021) and Sub-Saharan African Banks (Taylor & Aubert, 2022), or analyze one specific financial segment such as mortgage (Gaffney & McCann, 2019), the literature has not provided substantial cross-country analysis that take into consideration the country characteristics in which the IFRS is being implemented.

Since the IFRS is not used identically among the countries that have adopted it (Nobes, 2011), the international scenario opens the possibility of assessing its effects in more economically and institutionally heterogeneous environments. Hence, it is necessary to understand the determinants of these differences and the reasons for the different effects on the quality of accounting information. In this regard, to the best knowledge of the authors, solely one study has provided only earlier cross-country evidence of IFRS9 implementation (López-Espinosa et al., 2021), but using country differences as control variables, rather than determinants of IFRS 9 adoption.

In this regard, considering the relevant and still open debate about the impacts of timely recognition of credit losses in financial statements (Groff & Mörec, 2021; López-Espinosa et al., 2021) and the lack of studies analyzing the effects of IFRS 9 implementation under economically and institutionally heterogeneous environments, this paper analyzes the impacts of the IFRS 9 adoption on loan loss accounting in the banks' financial figures in a cross-country sample of listed banks. Specifically, by using a sample of 149 listed banks operating in the G20 countries where the adoption of IFRS is mandatory, this paper analyzes: (1) whether the adoption of the IFRS 9, and its expected credit loss model (ECL), significantly changed banks' loan loss allowances (i.e. the accumulated impairment level of credit portfolio); (2) whether this change is related to significant changes in

financial position; (3) which are the bank-specific and country-specific determinants of the magnitudes of accumulated impairment differences between the two accounting rules; and, (4) whether there were informational effects of the new accounting standard in terms of value-relevance of accounting numbers between the loss estimations models.

In order to address these objectives, the analysis includes hand-collected and archival data of financial statements published before IFRS 9 initial adoption, which usually end on 31 December 2017, a period with credit impairment data available under IAS 39 and IFRS 9, since the amounts were first published under IAS 39 in the 2017's financial statements and later they were available under IFRS 9 in the 2018's financial statements as the opening balance of this period.

Overall, the results of our empirical analysis show that the change from IAS 39 to IFRS 9 produces a remarkable impact on bank's credit impairment levels as well as in their financial position and financial performance, suggesting a more conservative accounting and more value-relevant accounting information. However, the impact of the accounting standard was significantly different among countries, showing that larger differences in impairment level are associated with lower-income countries.

We add to the previous literature by documenting the initial impact of IFRS 9 implementation on financial statements and on value relevance, as well as the bank- and country-specific determinants of the level of this impact, which has not been covered by the previous literature in a substantial way and under similar approach. Hence, using a unique database developed to this research and based on financial statements` footnotes, this paper sheds some light on the effects of incurred versus expected credit loss impairment, which is relevant for academics, investors and regulators. Moreover, the analysis provides empirical evidence in economically and institutionally heterogeneous environments, since the IFRS is not identically implemented among the countries that have adopted it (Nobes, 2011).

Even though IFRS 9 must be applied by all companies that have credit assets (receivables), the choice of the bank industry is motivated by the relevance of credit assets for the financial industry. In fact, the IFRS 9 main target was to provide a methodology where banks were able to timely recognize financial asset losses (Gornjak, 2017; Remenarić *et al.*, 2018). Similarly, the sample choice of listed banks from G20 countries is justified by its relevance in the world economy, including 19 participant countries plus the European Union and represent the main advanced and emerging economies in the world.

2 LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 The effect of IFRS 9 implementation on impairment recognition

From its inception, IAS 39 was claimed to generate volatility in financial statements due to its incurred credit loss (ICL) model, since it fails in timely recognizing losses in financial statements (Bentley and Franklin, 2013). The IFRS 9, on the other hand, is based on expected credit loss (ECL) which should recognize losses timelier. However, the implementation of expected credit loss model can create several issues for financial sector companies, since the lack of available information regarding clients' credit risk, especially in countries where regulators do not require this sort of information, may demand substantial effort to gather the information necessary to calculate credit impairment under IFRS 9. This fact may drive subjective assumptions about clients' credit risk, leading to a lack of comparability and high volatility of financial assets and leading to earnings management (Gaston and Song, 2014).

In spite of increases in judgments, Gaston and Song (2014) suggest that IFRS 9 is expected to be more aligned with supervisory regulators due to the fact that the ECL model must better recognize credit impairment with a timelier and accelerated approach. In this regard, Onali and Ginesti (2014) suggest that the IFRS 9 adoption may (1) simplify credit impairment rules and improve financial statement comparability, (2) bring closer alignment between financial reporting and prudential standards than IAS 39, and (3) provide investors with more transparent, timely, and relevant information about a bank's expected credit losses.

Remenarić *et al*. (2018) explain that the main difference between the modes is in the moment when impairment must be recognized, since the impairment under IAS 39 must be recognized when

there is present and clear evidence that the loss will probably occur, while the impairment under IFRS 9 can be booked based on expected future evidence. Additionally, Gornjak (2017) claims that substantial differences between IAS 39 and IFRS 9 are restricted to the subsequent measurement of an asset and that changes introduced by IFRS 9.

The literature documents that the impairment under IFRS 9's ECL model is predicted to result in higher provisions of loan and credit loss, relatively to the impairment calculated under IAS 39 (Gaston and Song, 2014; Gebhardt, 2016; Lloyd, 2017; Novotny-Farkas, 2016). It is foreseen that the ECL leads to earlier recognition since it is based on expected evidence, which is booked before IAS 39's impairment based on incurred evidence (Novotny-Farkas, 2016). Thus, the IFRS 9 expected loss model is supposed to result in higher levels of impairment, which suggests the first hypothesis of this paper:

H_1: *Banks' impairment level of credit operations under IFRS 9 is higher than impairment booked under IAS 39.*

Effective loss occurs when credit is considered uncollectible and for this reason, the credit amounts and their impairment are written-off from the balance sheet. Hence, the impairment amounts booked under IAS 39 in one period are expected to be closer to the write-off amounts of the next period, in comparison to credit impairment recorded under IFRS 9. Therefore, IAS 39 leads to credit impairment that is closer to the effective losses recorded in the next period and the credit impairment recognized in the financial statements of 2017 with the effective losses (write-off) of the next period's Income Statement. This might occur because IAS 39 incurred approach considers as impairment only the credit that is about to be classified as uncollectible shortly, while IFRS 9 expected loss model also includes losses that might become effective only in later periods. Therefore, considering that IAS 39 has a more limited impairment recognition approach, its credit impairment might be closer to the effective losses record in the next period. Thus:

H_2: *Banks' impairment level of credit operations is closer to its effective loss when booked under IAS 39 compared to the values booked under IFRS 9.*

Due to the early recognition of economic losses, credit impairment under IFRS 9 is predicted to be more conservative than IAS 39 (Lloyd, 2017; Remenarić *et al*., 2018). Thus, this paper also tests whether the book value of equity under IFRS 9 is smaller than under IAS 39. Regarding this matter, the third hypothesis is:

H_3: *The book value of equity calculated under IFRS 9 expected credit loss model is smaller when compared to IAS 39 incurred credit loss model.*

The first three hypotheses are based on the exclusive differences in standards. In this sense, the analysis relies on descriptive analysis of the differences. Specifically, during the analysis, some banks provide small differences under IAS39 and IFRS9, and some provided increases and other decreases in impairment levels and effectiveness of loss levels. Thus, we tested if the change in standard significantly affected the impairment levels, on average.

2.2 The value relevance of earnings after IFRS 9 implementation

The mentioned possible consequences of the change from IAS 39 to IFRS 9 are strongly connected to the debate regarding timeliness versus verifiability and principle versus rules. The inclusion of timelier information into earnings through fair value practices may be costly when accounting choices are made for opportunistic reasons, which can be made possible through less verifiable accounting measures (Ball, 2006). Therefore, managers have opportunistic incentives regarding accounting choices. As IFRS 9 is claimed to be more principle-based, its implementation may facilitate managers' opportunism related to accounting choices. However, the risk of managers' suboptimal decisions is mitigated by strong country-level institutions.

The positive expected implications of impairment change models from IAS 39 to IFRS 9 are the mitigation of procyclicality problem, enhancement of financial stability, and improvement of

capabilities to timely capture future risks, which can contribute to a better understanding of risks faced by investors (Lloyd, 2017; Novotny-Farkas, 2016). On the other hand, the impairment based on expected evidence increases the dependence on more complex judgments, resulting in more volatility. Moreover, not all banks may have the technology required to implement IFRS 9 models and many of them do not have capable professionals available to properly conduct the standard transition (Novotny-Farkas, 2016). Hence, the IFRS 9 implementation is a challenging process with important impacts on credit impairment calculation and forward-looking analyses.

Previous studies demonstrated cross-sectional differences in banks and their regulation environment can be associated with different impacts on IFRS 9 adoption. Onali and Ginesti (2014) find that investors in countries with low enforcement and small differences between local GAAP and IFRS react in a positive way to the possible IFRS 9 adoption. Bentley and Franklin (2013) document that Anglo-cultures are more willing to disclosure than other cultures in the world. In this regard, DeLuca and Prather-Kinsey (2018) show that legitimacy deficit of IFRS may explain pseudo-adoption in several jurisdictions that incorporate IFRS as its national accounting standard and country-specific characteristics can significantly affect the level of accounting standard consistency.

In this regard, considering that IFRS 9 implementation can be affected by bank and country-level determinants, this study analyses, in an exploratory way, six bank-specific characteristics (size, profitability, leverage, auditor, market-to-book ratio, loan level and impairment level before IFRS9 adoption), two bank-specific accounting process characteristics (absolute total accrual and earnings persistence) and two country-specific variables (high- and middle-high income countries and code and common law countries) were analyzed. Therefore, assuming that the conformity of accounting standards can be driven by firm-specific and country-specific characteristics, this paper broadly hypothesizes, in an exploratory way, that:

H_4: *The magnitude of credit impairment changes with IFRS 9 adoption is affected by bank and country-specific.*

The specific expectation for each variable considered in the hypothesis above (size, profitability, leverage, auditor, market-to-book ratio, loan level, impairment level before IFRS9, absolute total accrual, earnings persistence high- and middle-high income countries and code and common law countries) is presented in Section 3.2.

The recognition of timelier information in financial reporting tends to decrease information asymmetry among shareholders (insiders versus outsiders) and between managers and debtholders (Roychowdhury & Watts, 2007). Also, timely loss recognition may be considered a governance mechanism since it performs a contracting role: monitoring managers' investment decisions (Ahmed & Duellman, 2011), improving the efficiency of compensation contracts (Brockman, Ma & Ye, 2015) and mitigating wealth expropriation of minority shareholders (Bona-Sánchez, Pérez-Alemán & Santana-Martín, 2011).

Hence, it is expected that IFRS 9 can enhance financial stability and improve capabilities to timely capture future risks, which can contribute to a better understanding of risks faced by investors (Lloyd, 2017; Novotny-Farkas, 2016). Hence, IFRS 9 is expected to be more informative about financial position and financial performance. As a consequence, accounting information should be more value-relevant for market agents than the previous standard based on the incurred credit loss model (Gaston and Song, 2014; Gebhardt, 2016; Lloyd, 2017; Novotny-Farkas, 2016). Thus, the fifth research hypothesis is:

H_5: *The bank's accounting information under IFRS 9 is more value-relevant than the same information under IAS 39.*

3 RESEARCH DESIGN

3.1 Univariate analysis and empirical hypothesis

The first step in the empirical test is to investigate, through an univariate analysis, if credit impairment levels (*IMPL*) and credit effective loss levels (*LOSS*) were systematically impacted by the

IFRS 9 adoption and understanding the impact on banks' book value of equity. Therefore, we performed tests comparing differences in credit impairment recognized under the different models (before and after IFRS 9 adoption).

3.1.1 Differences in credit impairment between IAS 39 and IFRS 9 (H1 and H2)

In the first hypothesis, ***H1,*** the impairment level (*IMPL*) is calculated as the bank's accumulated impairment divided by total loans and receivables. Thus, IMPL is computed under IAS39 and IFRS9 and compared by mean test, respectively calculated by equations (1) and (2):

$$IMPL_{IAS39_{it}} = IMP_{it}/L\&R_{it} \quad (1)$$

$$IMPL_{IFRS9_{it}} = IMP_{it}/L\&R_{it} \quad (2)$$

Where:

$IMPL_{IAS39_{it}}$ = impairment level under IAS 39 for the company *i* in the moment t (t equals to the transition date, from IAS 39 to IFRS 9);

$IMPL_{IFRS9_{it}}$ = impairment level under IFRS 9 for the company *i* in the moment t (t equal to the transition date, from IAD 39 to IFRS 9);

IMP_{it} = accumulated impairment booked on balance sheet for the company *i* in the moment t (t equal to the transition date, from IAD 39 to IFRS 9);

$L\&R_{it}$ = balance of loans and receivables in the financial statements for the company *i* in the moment t (t equal to the transition date, from IAD 39 to IFRS 9).

Using the Shapiro-Wilk test, we document that the credit variables are not normality distributed, and the nonparametric test of Wilcoxon sign rank test was applied for mean comparisons. Thus, if impairment level (IMPL) under IFRS 9 is higher and statistically significant, we conform the previous expectation of H1.

The second hypothesis compares the credit impairment booked in the financial statements of 2017 with the effective losses (write-off) of the next period's Income Statement. This hypothesis intends to assess how close the credit impairment is of one period with the effective losses recorded in the Income Statement of the next period, what we named as the adjustment degree of impairment level (AJIMPL), because we calculated how adjusted is the impairment level to the write-off amount. Effective loss occurs when credit is considered uncollectible and for this reason, the credit amounts and their impairment are written-off from the balance sheet.

For this hypothesis, the impairment amounts booked under IAS 39 in one period are expected to be closer to the write-off amounts of the next period, in comparison to credit impairment recorded under IFRS 9. This might occur because IAS 39 incurred approach considers as impairment only the credit that is about to be classified as uncollectible shortly, while IFRS 9 expected loss model also includes losses that might become effective only in later periods. Therefore, considering that IAS 39 has a more limited impairment recognition approach, its credit impairment might be closer to the effective losses record in the next period. Therefore, we calculate credit effective loss level (LOSS) under IAS 39 using equation (3) and under IFRS 9 by equation (4):

$$LOSS_{IAS39_{it}} = WOFF_{it+1}/L\&R_{it} \quad (3)$$

$$LOSS_{IFRS\ 9_{it}} = WOFF_{it+1}/L\&R_{it} \quad (4)$$

Where:

$LOSS_{IAS39_{it}}$ = effective loss level of IAS 39 for the company *i* in the moment t+1 (t equals to the transition date, from IAS 39 to IFRS 9);

$LOSS_{IFRS\,9_{it}}$ = effective loss level oF IFRS 9 for the company *i* in the moment t+1 (t equals to the transition date, from IAS 39 to IFRS 9);

$WOFF_{it+1}$ = Credit amount write-off from the financial statements for the company *i* in the moment t+1 (t equals to the transition date, from IAS 39 to IFRS 9). In cases where the write-off value not found even after exhaustive search, the variable WOFF was assumed equal to zero.

$L\&R_{it}$ = balance of loans and receivables in the financial statements for the company *i* in the moment t+1 (t equals to the transition date, from IAS 39 to IFRS 9).

Thereafter, the variables obtained from equations (3) and (4) are used to calculate the adjustment degree of impairment level (AJIMPL) under IAS 39 with equation (5) and IFRS 9 through equation (6):

$$AJIMPL_{IAS39} = IMPL_{IAS39_t} - LOSS_{IAS39_{t+1}} \quad (5)$$

$$AJIMPL_{IFRS9} = IMPL_{IFRS9_t} - LOSS_{IFRS9_{t+1}} \quad (6)$$

Where:

$AJIMPL_{IAS39}$: adjustment degree of impairment recognitions to the next period effective loss level under IAS 39;

$AJIMPL_{IAS39}$: adjustment degree of impairment recognitions to the next period effective loss level under IFRS 9.

In this case, credit impairment level of period ***t*** will be subtracted from its corresponding effective loss level in period ***t+1***. Therefore, using the Shapiro-Wilk test, we document that the credit variables are not normality distributed, and the nonparametric test of Wilcoxon sign rank test was applied for mean comparisons. Thus, if the adjustment degree (*AJIMPL*) is statistically significantly closer to zero under IFRS 9 when compared to IAS39, we conform the previous expectation of H2, that impairment provision will be close to its effective losses (write-off) under IFRS9.

3.1.2 Gray index (H3)

Hypothesis ***H_3*** is tested using the Gray Index, designed by Gray (1980) to compare equity under different GAAPs. Widely used in the literature, the Gray Index is an essential method to assess how conservative a GAAP or accounting standard change is, based on changes in companies' equity and it also measures materiality of accounting figures (Visani, Lascio, and Gardini, 2020). Therefore, hypothesis ***H_3*** will be tested according to GI calculated by the following equation:

$$GI_{Equity} = 1 - \left(\frac{Equity_{IFRS9} - Equity_{IAS39}}{|Equity_{IFRS9}|}\right) \quad (7)$$

The results must be interpreted as stated by Gray (1980, p. 67)

"The resulting ratio can be termed a 'conservatism' index in that companies with a ratio of more than one would appear to employ accounting practices with outcomes which are relatively optimistic in relation to the yardstick, whereas companies with a ratio of less than one would appear to be relatively pessimistic or 'conservative'". Thus, a result smaller than 1 means equity under IFRS 9 expected credit loss is lower than equity under IAS 39 incurred credit loss, hence, more conservative. However, it is important to highlight a restriction on the Gray index, given that the equity is contaminated by other standards, making it very difficult to isolate the exclusive effect of IFRS 9.

3.2.3 The determinants of impairment level variation (H4)

This section explores the bank- and country-specific determinants of the magnitudes of accumulated impairment differences between the two accounting rules. The primary assumption of

such analysis is that the impact of IFRS 9 adoption is a function of both bank- and country-specific determinants. Specifically, previous literature documents that the compliance to the adoption of IFRS is significantly related to companies´ specific features of accounting processes and country regulatory and environmental characteristics (Bova and Pereira, 2012; Glaum *et al.*, 2013).

In this regard, we investigate whether bank- and country-level variables are related to the difference in the level of impairment after IFRS 9 adoption (IMPDIFF) and whether these country-level variables moderate the influence of the bank level variables. In order to do so, six bank-specific profiles (size, profitability, leverage, auditor, market-to-book ratio, loan level and impairment level before IFRS9 adoption), two bank-specific accounting process characteristics (absolute total accrual and earnings persistence) and two country-specific variables (high- and middle-high income countries and code and common law countries) were analyzed.

The choice of independent variables is based on previous studies. First, size (SIZE) is often positively associated with IFRS compliance (Bova and Pereira, 2012), since larger companies typically have more resources to apply new regulations. Second, more profitable banks (PROF) are likely to book increases in their credit impairment with IFRS 9 adoption since an impairment addiction could be less relevant and more acceptable by investors. Third, companies with high leverage are usually more monitored and, for this reason, leverage (LEV) is expected to be positively related to compliance with IFRS (Bova and Pereira, 2012). Fourth, considering that large audit companies have more resources and, therefore, more knowledge regarding new accounting regulations, such as IFRS 9, it is foreseen that banks audited by Bib Four companies (AUDIT) should record high impairment increase (Lloyd, 2017; Remenarić *et al*., 2018). Fifth, high levels of market-to-book ratio (MTB), used as a proxy for perceived future growth opportunities, are associated with more risks in banks' lending operations and, as consequence of high-risk profile, high change in impairment is expected. Sixth, banks with operations more concentrated in loans (LOAN) are expected to be more affected by changes in accounting rules than banks with a more diversified portfolio. Seventh, banks with high levels of impairment under IAS 39 (IMPIAS) are expected to have lower impact in the impairment level change after IFRS9 adoption. This expectation implies that banks that were more conservative before IFRS9 adoption should present a relatively lower impact in the regulation change.

Two variables related to accounting process and quality, the total absolute accrual (AACC) and earnings persistence (PER) before the IFRS 9 adoption, were analyzed. Providing that these two measures are well-accepted proxies for accounting quality, it is expected that, if prior accounting quality was high, the impact of IFRS 9 adoption should be lower than for banks with low prior accounting quality metrics.

Finally, the economic and regulatory environment of each country can affect the application of similar accounting standards (Barth *et al.*, 2008; Mardini *et al.*, 2019). First, we analyze country-income level classification (INC), which is a dummy variable coded 1 for high-income countries, and 0 for upper middle-income countries. Barth *et al.* (2008) argue that some economies may lack the infrastructure to enforce the application of IFRS. Second, we analyze the well-accepted common and code-law classification (LAW), which assumes 1 for common law countries and 0 where civil law (code law) is applicable (Ball *et al.*, 2000).

Based on the rationale discussed, variables described and previous literature, the empirical models implemented in this paper are:

$$IMPDIFF = \alpha_0 + \alpha_1 SIZE + \alpha_2 PROF + \alpha_3 LEV + \alpha_4 AUDIT + \alpha_5 MTB + \alpha_6 LOAN + \alpha_7 IMPIAS + \alpha_8 AACC + \alpha_9 PER + \alpha_{10} INC + \alpha_{11} LAW + \sum dcount + \varepsilon_i$$

$$IMPDIFF = \alpha_0 + \alpha_1 SIZE + \alpha_2 PROF + \alpha_3 LEV + \alpha_4 AUDIT + \alpha_5 MTB + \alpha_6 LOAN + \alpha_7 IMPIAS + \alpha_8 AACC + \alpha_9 PER + \alpha_{10} INC + \alpha_{11} LAW + \sum BankVariables * INC + \sum BankVariables * LAW + \sum dcount + \varepsilon_i$$

Where all variables and their source are described in Table 1 and $\sum BankVariables$ are all bank-specific variables, which are interacted with the country-specific variables and $\sum dcount$ is a set

of dummy variables to control for other country-specific aspects. The integration approach in Eq. 9 was conducted based on prior literature and early exploratory results documented in this paper, as presented in the next sections. That is, following Glaum *et al*. (2013), the integrated analysis evaluates whether country-level variables moderate the influence of the company level variables. The empirical model was conducted under OLS framework with robust corrections for heteroskedasticity (White, 1980) and an additional model integrating simultaneously country income level and common versus code law countries with other bank specific variables was estimated (results for the additional model not displayed).

Table 1.
Presentation and definition of determinant analysis variables.

Variable	Description	Data Source
Dependent Variable		
IMPDIFF	Is the difference in the level of impairment between IFRS 9 and IAS 39 ($IMPL_{IFRS9_{it}} - IMPL_{IAS39_{it}}$), as in Equations 1 and 2	Hand-collected, 2017 financial reports
Independent Variables		
Bank-specific profiles		
SIZE	Is the logarithm transformation of total assets	Capital IQ, 2017 financial reports
PROF	Is the bank performance measured by net income deflated by total asset	Capital IQ, 2017 financial reports
LEV	Is the total liability deflated by total assets	Capital IQ, 2017 financial reports
AUDIT	Dummy variable coded 1 for banks audited by Big 4 firms; 0 for others	Hand-collected, 2017 financial reports
MTB	The market-to-book ratio before the IFRS 9 adoption	Capital IQ, 2017 financial reports
LOAN	The loans level is defined as gross loans scaled by assets before IFRS 9 adoption, showing the concentration of loans in banks' operations	Hand-collected, 2017 financial reports
IMPIAS	Is the accumulated impairment level of loans before IFRS 9 adoption	Hand-collected, 2017 financial reports
Accounting process		
AACC	Absolute total accrual is the absolute value of the difference between earnings and cash flows from operation, scaled by assets, before the IFRS 9 adoption	Capital IQ, 2017 financial reports
PER	Persistence is the earnings persistence defined as the autoregressive parameter of earnings, scaled by assets, along the nine previous years	Capital IQ, 2017 financial reports
Country-specific variables		
INC	Dummy variable coded 1 if high-income country; 0 if upper middle-income country	World Bank website
LAW	Dummy variable coded 1 if common law country; 0 if civil law (code law) country	Central Intelligence Agency website

Source: Own construction.

3.2.4 Value relevance (H5)

Francis and Schipper (1999) define value relevance as the financial statements' characteristic of providing useful information capable to changing companies' share prices, using statistical association between share amount and accounting information disclosed, namely reported earnings and book value of equity. They argue that when an accounting change is implemented or even proposed there is a basis to apply value relevance methodology to assess whether it results in more economically relevant accounting information. In this regard, Barth *et al.*, (2001) show that value relevance methodology has the power to provide valuable insights to accounting standard setters and assess whether specific accounting information is used by investors.

Thus, we follow Barth *et al*. (2001) and the analyze value relevance of financial statements under IAS 39 and IFRS 9 are compared by applying a well-accepted model relating company's market value with its earnings, equity book value, and dividends and assuming a linear function of company's value and its equity and earnings. For the value relevance of IAS 39, we use the banks' share prices three months after the end of the last fiscal year reported under IAS 39. For the value relevance of IFRS 9, we use the share prices 3 months after the end of the first fiscal year reported under IFRS 9. Hence, the empirical implementation was conducted as follows.

$$SP_i^{IAS39} = \gamma_0 + \gamma_1 EPS_i^{IAS39} + \gamma_2 BVPS_i^{IAS39} + \varepsilon_{i,IAS39} \quad (10)$$

Where:

SP_i^{IAS39} = Is the closing share price of bank *i*, 3 months after the end of last reported under IAS39;
EPS_i^{IAS39} = Is the last earning per share of bank *i* reported under IAS39;
$BVPS_i^{IAS39}$ = Is the last book value of equity per share of bank *i* reposted under IAS39;
$\varepsilon_{i,IAS39}$ = Is the error.

$$SP_i^{IFRS9} = \gamma_0^* + \gamma_1^* EPS_i^{IFRS9} + \gamma_2^* BVPS_i^{IFRS9} + \varepsilon_{i,IFRS9} \quad (11)$$

Where:

SP_i^{IFRS9} = Is the closing share price of bank *i*, 3 months after the end of first fiscal reported under IFRS9;
EPS_i^{IFRS9} = Is the restated earnings per share of bank *i* reported (adjusted) under IFRS9;
$BVPS_i^{IFRS9}$ = Is the restated book value of equity per share of bank *i* reported (adjusted) under IFRS9;
$\varepsilon_{i,IFRS9}$ = Is the error.

The coefficients γ_1 and γ_2 represent the value relevance of retorted earnings and book value of equity under IAS 39, respectively, and the coefficients γ_1^* and γ_2^* represent the relevance of earnings and book value of equity under IFRS 9, respectively. Significant differences in the coefficients and/or in the R-square of the regressions indicate variation in perceived relevance of accounting figures between the two methodologies. Hence, after performing these regressions under OLS framework, the econometric outputs are compared to assess which standard is more value relevant.

3.2.5 Variables and data collection

The study was conducted based on the last financial statements published before IFRS 9 initial adoption, usually, the statements end on 31 December 2017. This period was chosen because it is the only one with credit impairment data available under IAS 39 and IFRS 9, because the amounts were first published under IAS 39 in the 2017's financial statements and later they were available under IFRS 9 in the 2018's financial statements as opening balance.

The main banks' variables required in this study and that were hand-collected in the financial statements as well as in their footnotes are:

- Balance of Loans and Receivables (L&R),
- Loans Accumulated Impairment Losses (IMPL),
- Write-off of Loans Receivables (WOFF),
- Net Profit (Profit)
- Book-value of Equity (Equity).

Data for the mentioned variables were hand-collected from footnotes of banks' consolidated financial statements, available on banks' investor relation websites. All data was gathered in the local currency and converted to Euro using the exchange rate at the balance sheet close date.

Financial variables were obtained from Capital IQ database and presented in Table1, except for the independent variables AUDIT, which was hand-collected in the financial statements, and INC and LAW, which were gathered from the World Bank's website and the Central Intelligence Agency website. All variables collected from Capital IQ were converted in Euro and individually analyzed for consistency with reported financial statements and footnotes.

3.2.6 Sample

The sample comprises listed banks available at the S&P Capital IQ database from the twelve G20 countries where IFRS is required for financial institutions. The sample choice intends to be world representative, including economically relevant countries from all regions and characteristics (developed and emerging).

The G20 countries where IFRS is required for listed financial institutions were identified according to IFRS (2018). Among the G20 countries, the full IFRS adoption is mandatory for: Australia, Brazil, Canada, France, Germany, Italy, the Republic of Korea, Russia, Saudi Arabia, South Africa, Turkey, the United Kingdom.

Using the country and listing requirements in the S&P Capital IQ database, 160 banks were initially found and financial statements for each one was hand-collected in banks' investor relations websites. From the 160-initial sample, 11 banks did not provide the required information of credit impairments and loan loss allowances in their footnotes. Hence, with the restriction of data availability, 149 listed banks were included in the quantitative analysis.

4 EMPIRICAL RESULTS

4.1 Significance of credit impairment changes

In this paper, we first analyze any significant change in the bank's accumulated credit impairment level (IMPL) caused by the IFRS 9 adoption and the effective loss level is the credit write-off (the receivables recognized as unrecoverable). In this regard, Table 2 shows the summary statistics and results for the normality and Wilcoxon signed-rank test for the first (in Panel A) and second (in Panel B) hypotheses. Results displayed in Panel A show that, for all statistical significance levels, the accumulated credit impairment level in IFRS 9 model ($IMPL_{IFRS9}$) is larger than that in IAS 39 ($IMPL_{IAS39}$), suggesting that the standard change increased the bank's impairment level, on average. This result empirically supports previous expectations in the literature since credit impairment is expected to be early recognized under IFRS 9 framework (Gaston and Song, 2014; Gebhardt, 2016; Lloyd, 2017; Novotny-Farkas, 2016). Moreover, the increase in impairment level shows that the criteria of impairment recognition is more restrictive under incurred loss model, while under expected loss model the credit risk increase is early recognized in financial statements (Remenarić *et al*., 2018).

Table 2.
Summary Statistics, Normality Test and Wilcoxon Signed-ranked Test.

Panel A – Accumulated Credit Impairment Level (IMPL) - H1								
Variable	**N**	**mean**	**Min.**	**p25**	**p50**	**p75**	**Max.**	**Shapiro-Wilk (*z*) Normality**
$IMPL_{IAS39}$	149	0,0391	0,0000	0,0027	0,0163	0,0351	0,5720	9,149 ***
$IMPL_{IFRS9}$	149	0,0433	0,0000	0,0038	0,0200	0,0399	0,5720	9,038 ***
$IMPL_{DIFF}$	149	0,0042	-0,0100	0,0000	0,0005	0,0053	0,0574	
Wilcoxon signed-rank test (*z*) ($IMPL_{IFRS9}$ = $IMPL_{IAS39}$)					7,070 ***			
Panel B – Adjustment Degree of Impairment (AJIMPL) – H2								
Variable	**N**	**mean**	**Min.**	**p25**	**p50**	**p75**	**Max.**	**Shapiro-Wilk (*z*) Normality**
$AJIMPL_{IAS39}$	149	0,0253	-0,1950	0,0013	0,0092	0,0238	0,5720	9,356 ***
$AJIMPL_{IFRF9}$	149	0,0295	-0,1960	0,0021	0,0141	0,0284	0,5720	9,264 ***
$AJIMPL_{DIFF}$	149	0,0042	-0,0105	0,0000	0,0005	0,0053	0,0575	
Wilcoxon signed-rank test (*z*) ($AJIMPL_{IFRS9}$ = $AJIMPL_{IAS39}$)					6,909 ***			

Note: IMPL is the accumulated credit impairment level, which is equal to bank's accumulated impairment divided by total loans and receivables (IMPL= IMP/LR&) calculated under IAS39 and IFRS9 models. $IMPL_{DIFF}$ is the difference between $IMPL_{IAS39}$ and $IMPL_{IFRS9}$. According to H1, it is expected that $IMPL_{IFRS9}$ >$IMPL_{IAS39}$. AJIMPL is the adjustment degree of impairment, which is the accumulated credit impairment level minus the effective loss level (AJIMPL = IMPL-LOSS), where the effective loss level is the credit write-off divided by loans and receivables (LOSS= WOFF/L&R). According to H2, it is expected that $AJIMPL_{IFRS9}$ >$AJIMPL_{IAS39}$ ***, ** and * indicate statistically significant differences at 1%, 5% and 10% levels, respectively.

Panel B of Table 2 reports the tests for the adjustment degree of impairment as presented in the second hypothesis of this paper. Results show that for all accepted levels there is sufficient evidence to suggest the rejection of the null hypothesis that AJIMPL IFRS 9 is equal to AJIMPL IAS 39, which means the adoption of IFRS 9 results in a difference in how close the credit impairment is to the effective losses write-off in the next period.

The sum rank of positive sign represents the banks' adoption, hence the sum rank of negative sign represents the cases where there was a decrease in the adjustment degree of impairment level. As previously explained, the more the AJIMPL is near to zero, the more the impairment level will be adjusted and close to its effective loss (write-off).

Furthermore, the sum rank of positive signs is greater than the negative signs, indicating an increase in the AJIMPL after IFRS 9, which represents that credit impairment level becomes more distant from its effective loss.

The second hypothesis that banks credit impairments are closer to their effective losses when booked under IAS 39 comparatively to the values booked under IFRS 9 is suggested by this result. This is explained by the fact that IAS 39 considers purely incurred evidence, that is, considers solely credits that are virtually considered uncollectible in the near future, while IFRS 9 expected model considers all future risk, and, thus, might include risks that may not become a loss in the next periods. Hence, the results suggest that under IAS 39 credit impairment is closer to the write-off amounts.

4.2 Conservatism and Materiality of IFRS 9 Adoption

By using the Gray Index, this section analyzes the third hypothesis about how conservative and material the change from IAS 39 to IFRS 9 was. The book value of equity and net profit are used to calculate the Gray index, in which values smaller than one mean that the equity under IFRS 9 is lower than the equity under IAS 39, and, thus, more conservative.

The descriptive statistics for the Gray Index of equity are displayed in Table 3 Panel A, and the mean value for the entire sample is 0.9903, which indicates that, on average, the change to IFRS 9 yields a more conservative accounting process. The percentile analysis indicates that at least until the 50th percentile, the GI Equity was lower than one, meaning IFRS 9 adoption resulted in a conservative impact on these cases. Additionally, frequency distribution of GI Equity is presented in Panel B of Table 3 and shows 91 banks (61% of the sample) with GI Equity lower than one, which means the change to IFRS 9 was conservative, while for 29 other banks (20% of the sample) this change resulted in GI Equity higher than one, indicating the change was not conservative. For other 29 cases, the change does not influence equity, indicating, for those cases, that the equity was not changed with IFRS 9 adoption, therefore their GI Equity is equal to 1.

Table 3.
Descriptive Statistics and Frequency Distribution of Gray Index of Equity.

Panel A – Gray Index Descriptive							
Variable	N	mean	min	p25	p50	p75	max
GI Equity	149	0,9903	0,5954	0,9776	0,9943	1,0000	1,2548

Panel B – Gray Index Frequency Distribution										
GI Equity: Class Limit	0.50 to 0.59	0.60 to 0.69	0.70 to 0.79	0.80 to 0.89	0.90 to 0.99	1.00 to 1.00	1.01 to 1.09	1.10 to 1.19	1.20 to 1.30	TOTAL
Frequency (Nr. Banks)	1	0	2	4	84	29	16	12	1	149
% of Banks	1%	0%	1%	3%	56%	19%	11%	8%	1%	100%
% Accumulated	1%	1%	2%	5%	61%	81%	91%	99%	100%	

Note: GI Equity is the Gray index defined as: $GI_{Equity} = 1 - [(Equity_{IFRS9} - Equity_{IAS39})/|Equity_{IFRS9}|]$

Overall, the equity Gray Index results indicate that equity calculated under IFRS 9 expected loss model is more frequently smaller than equity under IAS 39 incurred loss model. Although no previous study has approached the equity Gray index and the transition from IAS 39 to IFRS 9, these

findings support that IFRS 9 recognizes impairment losses earlier, resulting in a reduction of bank's results and equity. Consequently, IFRS 9 adoption leads to a more conservative accounting model, since under this standard the equity is on average smaller than it was under IAS 39.

4.3 The determinants of impairment level variation

Table 4 displays the results for the multivariate analyses in order to identify the bank-specific and country-specific determinants. Although the empirical model suggests significant relationships, only a few variables are associated with the change in impairment level from the IAS 39 and IFRS 9 in the banks analyzed: auditor, loan level and, specially, country income classification. The two banks' specific variables suggest that, first, banks audited by large audit companies presented a lower impact in impairment than banks audited by non-big four audit companies. These results differ from expectations since large audit companies are supposed to have more resources and knowledge regarding new accounting regulations (Lloyd, 2017; Remenarić *et al*., 2018). A possible explanation for this evidence is that banks audited by big four audit companies anticipated impairment losses in 2017 (even following IAS 39), in order to have lower impacts in adoption of IFRS 9. Second, as expected, the change in regulation affected proportionally more the banks with large loan portfolios than banks with more diversified activities.

The results related to country-specific variables are noteworthy, specifically regarding the country income classification, as also indicated earlier in this paper. The evidence reinforces the idea that high-income countries were less affected by the change from the IAS 39 to the IFRS 9, while middle-income countries in the sample concentrate, on average, the high levels of change in impairment. This finding supports the hypothesis by demonstrating that the credit impairment increase was smaller in more economically developed countries than it was in the less developed ones.

Table 4.
Impairment level difference with IFRS9 adoption.

	Coef. (Eq.8)	Robust t			Coef. (Eq. 9)	Robust t	
Constant	0.010	1.690		Constant	0.037	0.810	
SIZE	0.000	-0.300		SIZE	0.001	1.170	
PROF	-0.003	-0.350		PROF	-0.362	-2.930	***
LEV	0.005	1.160		LEV	-0.050	-1.950	**
AUDIT	-0.002	-1.750	*	AUDIT	-0.030	-1.230	
MTB	0.000	-1.050		MTB	-0.001	-0.990	
LOAN	0.001	1.890	*	LOAN	0.031	1.580	
IMPIAS	0.006	0.730		IMPIAS	-0.018	-0.280	
AACC	0.002	0.140		AACC	0.120	1.860	*
PER	-0.001	-0.710		PER	0.004	1.090	
INC	-0.008	-2.670	***	INC	-0.038	-0.590	
LAW	-0.002	-0.310		LAW	0.001	0.020	
				INC*SIZE	-0.002	-1.600	
				INC*PROF	-0.216	-0.950	
				INC*LEV	0.084	1.580	
				INC*AUDIT	0.027	1.100	
				INC*MTB	0.000	-0.210	
				INC*LOAN	-0.041	-1.760	*
				INC*IMPIAS	-0.008	-0.130	
				INC*AACC	-0.231	-2.910	***
				INC*PER	-0.008	-1.590	
				LAW*SIZE	0.001	0.770	
				LAW*PROF	0.577	2.430	**
				LAW*LEV	-0.035	-0.740	
				LAW*AUDIT	0.003	1.450	
				LAW*MTB	0.001	1.510	
				LAW*LOAN	0.011	0.820	
				LAW*IMPIAS	0.026	0.500	
				LAW*AACC	0.112	2.150	**
				LAW*PER	0.003	1.000	
Country dummies		*yes*		Country dummies		*yes*	
N		149		N		149	
R^2		0.214		R^2		0.518	
F		4.950	***	F		3.340	***

Note: this table presents the results of regression models that examine the relationship between impairment level difference with IFRS 9 adoption and independent variables according to Equations 8 and 9. IMPLDIFF = impairment level under IFRS 9 minus impairment level under IAS 39; SIZE = natural log of total assets; PROF = ratio of profit to total

assets; LEV = ratio of book value of long term debt to book value of total equity; AUDIT = 1 if clients of Big 4 auditing firms, 0 if clients of other auditing firms; MBT = the market-to-book ratio before the IFRS 9 adoption; LOAN = The loans level defined as gross loans scaled by assets before IFRS 9 adoption; IMPIAS = the accumulated impairment level of loans before IFRS 9 adoption; AACC = Absolute total accrual is the absolute value of the difference between earnings and cash flows from operation, scaled by assets, before the IFRS 9 adoption; PER = Persistence is the earnings persistence defined as the autoregressive parameter of earnings, scaled by assets, along the nine previous years; INC = 1 if high income country; 0 upper middle income country; LAW = 1 for common law countries, 0 where civil law is applicable. Estimations were conducted under OLS framework with White (1980) robust estimation. *** significant pb0,01 (two-tailed), ** significant pb0,05 (two-tailed), * significant pb0,10 (two-tailed).

We also evaluate whether country-level variables moderate the influence of the company level variables, by analyzing the interaction terms between country- and company-level variables, as expressed in Equation 9. Table 4 displays the R^2 of this model (0.518), the F-value of 3.340 which is highly significant but noticeably lower than for the model without interaction. The integrative analysis indicates that banks' profitability and leverage are negative and significant. This fact contradicts previous expectations that high profitable and leveraged banks are likely to book increases in their credit impairment after IFRS 9 adoption, because an additional impairment loss recognition could be more acceptable in moments of high profitability (Bova and Pereira, 2012) and due to the fact that high leverage entities are usually more monitored and are more encouraged to comply with accounting changes and new standards (Bova and Pereira, 2012). A possible rationale to explain these two negative relations is the incentive to maintain the financial situation of the company. This argument can explain the fact that high profitable banks tend to reduce the effect of impairment loss to stay profitable. The same explanation can work for the leverage level: if the bank books more impairment loss, the leverage level will rise; thus, there may be an incentive for high leverage banks to reduce its impairment loss, maintaining its previous position.

Similarly, a significant positive relation was documented between absolute accrual and impairment change, suggesting that high accruals banks are those with high impairment variation.

In addition, four interaction terms are significant. Income classification level (INC) interacts significantly with two company-level variables, LOAN and AACC. In both cases, the coefficients on the interaction terms are negative and significant. In other words, the adoption of IFRS 9 has a particularly low impact on banks in high-income countries, and potentially, in countries with high levels of legal enforcement. The significant coefficient of the interaction term LAW*PROF and LAW*AACC indicates that banks profitability and total accruals have a relatively strong impact on banks located in common law countries. A substitution effect appears to exist between the strength of the country and bank-level variables.

Additional analysis (not reported) was conducted segregating the sample in upper-middle-income countries and the results confirm that the impairment level difference was higher or more relevant in countries classified as upper middle-income, that is, the impairment increase was smaller in more economically developed countries than it was in the less developed ones. This evidence corroborates the idea that developing economies lack the infrastructure to enforce the application of IFRS (Barth *et al.*, 2008) or are more suitable for market volatility movements and high exposure to risk. Moreover, as documented by Mardini *et al.* (2019), we provide evidence that although high-quality international standards can improve accounting quality in emerging economies and bring additional benefits, their mere adoption does not ensure higher accounting quality in countries with a weaker enforcement mechanism. Note that, the analysis is based on the impact of the change in accounting standard. So, even if less developed countries have higher difficult in receiving credits, the analysis relies in the changing in the level impairment recognition. Therefore, if less developed countries have higher difficult in receiving credits, if their local GAAP is more conservative in the pre-adoption, they will be less impacted with the new standard, and the other way around.

4.5 Value relevance (H5)

In this section, we presented the results of value relevance comparison between financial statements published under IAS 39 and IFRS 9 to assess under which standard accounting information has more value relevance to equity investors. Value relevance OLS regression results under both standards are displayed in **Erro! Fonte de referência não encontrada.** 5. The share price

values 3 months after the end of the last fiscal year reported under IAS 39 and 3 months after the end of the first fiscal year reported under IFRS 9 were used.

Table 5.
Value Relevance regression results: comparison between models under IAS 39 and IFRS 9.

Independent Variables	Coefficients	
	IAS 39 Model (Eq. 10)	IFRS 9 Model (Eq. 11)
Intercept	6.863***	3.475***
	(5.02)	(4.02)
EPS	2.655***	5.648***
	(6.87)	(13.08)
BVPS	0.227***	0.127***
	(11.17)	(6.20)
F	296.57	1025.04
Prob. (F)	0.0000	0.0000
R^2	0.8124	0.9374
Root MSE	14.81	9.06
N	149	149

Note: this table presents results of value relevance OLS regression models under IAS 39 and IFRS 9. IAS 39 Model includes data from the last time financial statements were disclosed under IAS 39, while the IFRS 9 Model includes amounts of first financial statements published under the new IFRS 9 version. The dependent variable is S = Share price from 3 months after balance sheet close date. Independent variables are EPS = Earnings per share; and BVPS = Book value of equity per share. *** significant pb0.01 (two-tailed), **significant pb0.05 (two-tailed), *significant pb0.10 (two-tailed). Variables estimated coefficients are presented with t-statistics below in parentheses.

As expected, Table 5 shows that the independent variables (net income and book value of equity) are highly significantly and positively related to the dependent variable share price. It is possible to observe a nominal and significant increase in the earnings coefficients and a decrease in the book value of equity under IFRS. This evidence suggests an increasing focus on performance than on financial position in the very first period of adoption. This analysis should be conducted cautiously, since it represents only two points in time (before and after the IFRS 9 adoption) and cannot be interpreted as a long-term trend. However, the R-squared form IAS 39 Model is 0,8124 and from IFRS 9 Model is 0,9344, suggesting that financial statements under IFRS 9 were more value-relevant in comparison with the ones under IAS 39 in the first moment of its implementation. A long-term analysis requests additional information that will be available in the years to come.

These initial results suggest additional support to the view that IFRS 9 can enhance financial stability and improve the timely capture of future risks, which can contribute to a better understanding of risks faced by investors (Lloyd, 2017; Novotny-Farkas, 2016). The findings likewise support the expectations that the credit impairment booked under IFRS 9 results in higher provisions (Gaston and Song, 2014; Gebhardt, 2016; Lloyd, 2017; Novotny-Farkas, 2016), and could indicate this methodology better captures the credit impairment and has more value relevance for investor's analyses. Moreover, the results corroborate earlier additional evidence in López-Espinosa *et al.* (2021), showing that expected credit loss provisions are more predictive of future bank risk than incurred loss provisions, indicating additional information to assess bank risk.

5 CONCLUSIONS

In this paper we analyzed the impact of IFRS 9 adoption on loan loss accounting in the financial figures of banks by using an international sample of 149 listed banks operating in the G20 countries where the adoption of IFRS is mandatory. Specifically, we analyze whether the adoption of IFRS 9 significantly associated with change in banks' impairment level and, consequently, banks' financial position and performance. Additionally, we analyze the bank- and country-specific determinants of the magnitudes of impairment level variation and whether there were informational effects of the new accounting standard.

The results showed that the change from IAS 39 to IFRS 9 remarkably impacts bank's credit impairment levels as well as their financial position and financial performance. The findings confirm the prediction of credit impairment increase as well as a more conservative accounting model and more value-relevant accounting information after IFRS 9 application. However, this study documents that

the impact of the accounting standard was different among countries, showing that larger differences in impairment level are associated with lower-income countries.

The determinant analysis highlights the importance of country-level variables as determinant factors to banks' credit impairment change; specifically, banks from high-income countries or where common law is applicable show minor changes in their impairment level in comparison with banks placed in middle-income countries or with civil law systems. Finally, IFRS 9 has more information power to investor's analyses and decision-making processes.

Thus, our study suggests that the adoption of IFRS 9 was consistent with IASB objectives, because it brings more quality information to the users, considering that IFRS 9 figures were more conservative and more value-relevant. Nevertheless, the bank- and country- specific determinant analysis showed that the specific characteristics of the institution and the environment can influence the way the accounting standard is applied.

Overall, the evidence in this study provides is an input for academia and practitioners and claims for additional analyses, mainly those that relate economic development and the quality of institutions and governance mechanisms in countries to the quality of accounting information. These results are of interest of regulators, specially from Central Banks, which have in new accounting methodologies an additional (and more conservative) tool for banking supervision. Additionally, the results provide a cross-country view for managers and the impact of accounting standards in accounting figures, specially those related to profitability and asset valuation.

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