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Impacts of the Transition to the Expected Loss Model on the Portuguese Banking Sector

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Abstract: This study addresses the implementation of the International Financial Reporting Standard 9 (IFRS 9) in the European Union as of 1 January 2018, replacing the International Accounting Standard 39 (IAS 39) to introduce a new model for recognizing Loan Loss Provisions (LLP), based on Expected Credit Loss (ECL). This model responds to criticisms of the former Incurred Credit Loss (ICL) system for its inability to reflect credit losses in a timely manner, potentially exacerbating the effects of financial crises. This study focuses on the effects of adopting the ECL model on the level of Loan Loss Allowances (LLA) in loans, own equity, and the Common Equity Tier 1 (CET1) ratio across 13 Portuguese commercial banks. A mean comparison test is used to evaluate scenarios before and after the application of the ECL model, highlighting the importance of regulator actions and the adequacy of loss recognition policies, including the effects of European Union. The results obtained demonstrate significant negative impacts on the net values of loans, own equity, and the CET1 ratio upon adopting the IFRS 9 ECL model due to the widespread increase in LLAs.

Keywords: IFRS 9; expected credit loss; loan loss provision; loan loss allowances; day one; bank

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1. Introduction

On 1 January 2018, the International Financial Reporting Standard 9 (IFRS 9) came into effect within the European Union (EU), superseding the International Accounting Standard 39 (IAS 39) (Silva 2017). IFRS 9 introduced a new model for the recognition of Loan Loss Provisions (LLP)[1], named Expected Credit Loss (ECL). This standard responds to criticisms leveled at IAS 39 and its advocated Incurred Credit Loss (ICL) model. The Bank for International Settlements BIS (2011) highlights the ICL model's failure to timely reflect credit losses, which creates a cyclical effect on the economy, potentially exacerbating negative impacts in financial crisis contexts, like the one that began in 2007.

In recent decades, financial markets have undergone unprecedented development and have taken a significant stance in guiding corporate business, particularly for financial institutions (Ferreira 2011). The granting of credit by these institutions has been in the spotlight, with the financial sector being highly sensitive to economic cycle fluctuations (Gebhardt 2016). The excessive use of financial instruments by banks and the untimely recognition of LLPs can jeopardize the bank's continuity and, consequently, the financial sector, potentially spreading the crisis to other economic sectors (Novotny-Farkas 2016). This is exemplified by the last high-risk mortgage credit (subprime) crisis and, subsequently, the financial crisis and real economy crises worldwide, necessitating a reassessment of the approach to financial instruments (Pucci 2017).

Although risk management is a process developed by banking institutions, based on the organization's strategy with the primary aim of identifying potential impacting situations, the truth is, after one or more crises, new rules and impositions emerge for the financial sector to prevent new crises based on past events (retrospective vision). Even

before the 2007 crisis, Bikker and Metzemakers (2005) noted that LLPs were substantially higher when GDP growth was lower, reflecting the increased risk from the economic cycle downturn. Thus, by minimizing risks through the early recognition of LLPs, financial institutions can, to some extent, mitigate systemic impacts, avoiding affecting their continuity. Pucci (2017) states that, at the onset of the 2007 crisis, IAS 39 was blamed for leveraging the negative effects of the economic crisis by underestimating LLPs, leading various entities to demand significant changes, including the G20 and The Financial Stability Forum. The lack of timeliness in recognizing LLPs and its impact on the adequacy of capital reserves led to the contraction of balance sheets, contributing to the increase in systemic risk during the financial crisis (Bushman and Williams 2015; Gebhardt and Novotny-Farkas 2011).

After this financial crisis, both the International Accounting Standards Board (IASB), responsible for issuing international financial reporting standards, and the Financial Accounting Standards Board (FASB), with jurisdiction in the United States, considered the development of a new aggregate standard for highly complex financial instruments as a necessity but also a significant challenge (Ferreira 2011). The ECL model is divided into three phases, aiming to anticipate losses derived from granted credit, requiring LLPs to be recognized before defaults occur. This model also incorporates a new approach for recognizing financial assets based on cash flow characteristics and the business model inherent to the asset in question. This new approach results in a unique impairment model, applied to all financial instruments. The IASB and FASB designed similar models, however, the FASB model recognizes all expected losses from loan grants, while the IASB model only recognizes part of these losses initially, with the remaining loss recognized when a "significant increase" in credit risk occurs (Giner and Mora 2019).

Novotny-Farkas (2016) also highlights the role of regulators and the importance they can have in the proper application of the IFRS 9's ECL model. If regulators are overly conservative and excessively interventionist, they can jeopardize the consistency and integrity of financial reports. Consequently, European Union (2017) defines the transitional regime to reduce the impact of introducing that standard on the financial sector's own funds on the first day of application, termed day one. This regulation allows for deferring the impacts of introducing IFRS 9 on the financial sector for up to five years, necessitating the annulment of this transitional regime's adjustments. Thus, analyzing the effects of day one on financial stability and focusing on the ECL model and its impact on the regulatory capital of financial institutions reveals a relevant and highly interesting topic for banking regulators and the literature in the field. Considering the research already conducted on said day one, it is expected that the adoption of the IFRS 9's ECL model had a negative impact on the capitals of Portuguese banks, especially after the financial bailout of 2011 and the capital injection into the country's major banks (EBA 2018; EY 2018; Groff and Mörec 2021; Khan and Damyanova 2018; Löw et al. 2019).

This study aims to analyze the effect of applying the new ECL model of IFRS 9 on the level of Loan Loss Allowances (LLAs) in loans, own equity, and the Common Equity Tier 1 (CET1) ratio on the first day of January 2018 in Portuguese banks. The study highlights the negative impact of adopting the ECL model on 13 Portuguese commercial banks, showing that there was a significant increase in LLAs and, consequently, a reduction in the value of assets, own equity, and the CET1 ratio, taking into account the impact of European Union (2017). This research differs from previous studies by considering the impact of European Union (2017), adopting an innovative methodological approach, which can be useful for professionals and researchers in future studies. Indeed, the methodology used in previous research (Dantas et al. 2017; Groff and Mörec 2021), involving the comparison of means to assess the scenario before and after day one, was adapted to analyze the impacts on LLAs, own equity, and the CET1 ratio of banks in Portugal. With this approach, this study makes a significant contribution to the literature on the adoption of the ECL model of IFRS 9, highlighting the importance of regulators and standard setters in its implementation.

This study is divided into five chapters. Following this introductory chapter comes the literature review and hypothesis formulation. The third chapter presents the analysis

model and the variables used in the empirical study, as well as the sample and methods of data collection and processing. In the fourth chapter, the statistical analysis is carried out, data normality is tested, and the obtained results are discussed. Lastly, the fifth chapter presents the main conclusions of the study, its limitations, and identifies some proposals for future research.

2. Literature Review

2.1. Normative and Regulatory Frameworks

The study focuses on the normative and regulatory response to the challenges posed by the 2007 financial crisis, highlighting the development of IFRS 9 by the IASB as an innovative standard for the recognition and measurement of financial instruments. Ferreira (2011) and Silva (2017) acknowledge the IASB's effort to overcome complexities in formulating a comprehensive standard, introducing a logical model that incorporates the concept of expected losses. Bischof and Daske (2016) perceive IFRS 9 as a result of political compromise, balancing different perspectives.

Despite the economic and social consequences, financial crises provide institutions with an opportunity to correct and implement control and supervision mechanisms, contributing to the minimization of future crises' impacts. Indeed, as Figure 1 shows, regulation, particularly the Basel Accords, always follows financial crises, aiming to address existing failures, meaning regulators tend to act more reactively than from a preventive standpoint.

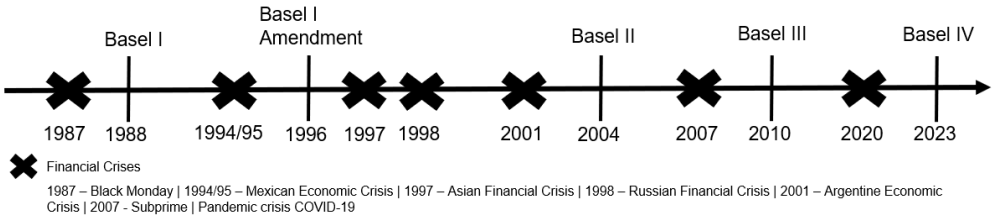

Figure 1. Global Financial Crises. Source: Author's creation.

In terms of loss recognition, the transition from the ICL model to the ECL model marks a significant change, anticipating the recognition of losses before their actual occurrence. Giner and Mora (2019) discuss the previous prohibition of recognizing losses based on future events to prevent the manipulation of results.

IFRS 9 introduces a new paradigm with three classification phases based on credit risk deterioration, determining the calculation of expected losses. Phase 1 involves operations without a significant increase in credit risk (IFRS 9, §5.5.3); Phase 2 addresses operations with a significant increase in risk without impairment (IFRS 9, §5.5.9); and Phase 3 includes impaired operations (IFRS 9, §B5.5.37), similar to the approach under IAS 39 (IAS 39, §§58–59).

In transitioning to IFRS 9, banks reclassified financial assets according to the new requirements, determined LLPs based on the new rules, and adjusted retained earnings and other comprehensive income accordingly. Prior to this, European Union (2017) was published to mitigate any potential impact on European banks' own funds from adopting the ECL model and, therefore, a sudden decrease in the CET1 ratio (§3 of the Regulation). This transitional regime has a maximum duration of five years, allowing part of the day one LLPs to be included in Tier 1 capital and gradually reduced to zero, ensuring the full application of IFRS 9 immediately after the transitional period ends (§5 of the Regulation). According to §9 of the Regulation, banks were required to publicly disclose in their reports and accounts, in a separate section of the Annex, their own funds, their capital ratios, and their leverage ratio, irrespective of the transitional regime's application, so that stakeholders could determine the impact of the IFRS 9 model.

Choosing Portugal as a jurisdiction for a study on the ECL model's impact is justified by various factors intrinsic to its banking sector and economic–financial context. Firstly, the high ratio of Non-Performing Loans, which reached 17.48% in 2015, posed a systemic risk

to the country's financial stability, underscoring the importance of credit risk management (Costa 2016). The stress tests conducted between 2011 and 2012, coordinated by the European Banking Authority (EBA), in cooperation with the ESRB and Banco de Portugal, focused on the country's main banking groups, revealing remarkable resilience to the imposed adverse conditions (Banco de Portugal 2011). This resilience is particularly notable given the deterioration in stock market capitalization and liquidity conditions during the financial and sovereign debt crisis in the Eurozone, requiring extraordinary public and private recapitalization measures.

The crisis highlighted the need for deleveraging in the Portuguese economy and the adjustment of strategies in the banking sector to ensure the banks' sustainability and solvency (Augusto and Félix 2014; Arias et al. 2020). In this context, Banco de Portugal set clear goals for the sector, including reducing indebtedness and ensuring sustainable banking business models, which are crucial for the effective implementation of the IFRS 9's ECL model. This standard imposes stricter disclosure requirements, with the potential for greater market discipline. However, there are risks of a contraction in the accounting for LLPs, which could compromise the integrity of financial reports, especially in jurisdictions with greater incentives for earnings management (Novotny-Farkas 2016; Marton and Runesson 2017; Resende et al. 2024). Gomaa et al. (2019) demonstrate that, although the replacement of the ICL model with the ECL model provides for higher reserves, these will be less than anticipated, not offsetting the potential positive effects of the new model. The COVID-19 crisis further tested the application of the ECL model, with banks adopting conservative approaches, partly due to guidance from the IASB, and facing challenges in assessing the increase in credit risk (IASB 2020; Salazar et al. 2023). In the Portuguese context, Resende et al. (2024) also found evidence of an increase in LLAs, but this was below expectations given the economic risks.

Thus, Portugal represents an important case study due to its unique experience with significant financial challenges, regulatory and economic policy measures adopted in response to recent crises, and the central role of credit risk management in the context of implementing the IFRS 9's ECL model.

2.2. Studies on the Impact of Adopting the IFRS 9 ECL Model in Financial Institutions

As previously mentioned, one of the topics that has received special attention in this field is the so-called "day one", related to the first day of applying IFRS 9 and the new ECL model due to its potential impact on financial stability. The focus on the regulatory capital of financial institutions proves to be a relevant and highly interesting subject for banking regulators and literature in the area (Nuss and Sattar 2014; EBA 2016; KPMG 2016; ESRB 2017). Although regulators initially expected significant reclassifications, banks assumed from the beginning that the classification and measurement requirements of IFRS 9 would not significantly impact capital requirements (EBA 2016). Furthermore, the results of preliminary studies on impairments resulting from the IFRS 9 ECL model varied widely among banks, revealing an anticipated average increase in day one financial asset impairments between 18% (EBA 2016) and 42% European Systemic Risk Board (ESRB) (2017), compared to IAS 39. Nuss and Sattar (2014) estimated that implementing IFRS 9 requirements would cause a significant increase in the level of LLPs, predicted to be around 50%. On the other hand, KPMG (2016) forecasted an increase in LLPs during the transition that could range between 30% and 250% for mortgage loans, and between 25% and 60% for other credits.

Thus, considering the study's goal, based on the results of predictive studies indicating that the adoption of the IFRS 9 ECL model would have a significant positive impact on LLAs (EBA 2016; EBA 2018; ESRB 2017; Groff and Mörec 2021; KPMG 2016; Nuss and Sattar 2014), the following hypothesis is formulated to be empirically tested:

H1. *The adoption of the ECL model had a positive impact on the level of LLAs on the credits of Portuguese banks.*

Although initial studies indicated that most of the major European banks recorded a negative impact on their net assets, which was in line with the predictions of the Basel Committee on Banking Supervision (2017) and the European Commission (2021), a more significant increase in banks' LLPs was expected, which would lead to a greater impact on net assets than what was observed with the implementation of the ECL model.

From the initial studies, the EBA (2018) gathered empirical evidence reported from the said day one, in which financial institutions felt the first effects of its application. That study confirmed the initial predictions of the transition to the ECL model, reporting additional LLPs and a reduction in banks' capitals. From the literature review, it was found that the studies already published differ in the methodologies used and show different results. The study by Ernst and Young EY (2018) focuses on changes in LLPs and coverage ratios. Khan and Damyanova (2018) focus on the aggregate impact of IFRS 9 on banks' equity, while Löw et al. (2019) detail the impact of this new model in various countries with different jurisdictions. On the other hand, Groff and Mörec (2021) focused on the IFRS 9 transition, noting an increase in the recognition of LLAs and a decrease in Slovenian banks' own capitals.

EY (2018) analyzed disclosures in reports and accounts on the transition to IFRS 9 of twenty large banks located in Europe, the United Kingdom, and Canada. All German banks and two Canadian banks reported an increase in financial asset losses in the transition to IFRS 9. However, banks assumed that the reported impact was less than expected before the transition, due to adopted policies of anticipating economic downturns, a forward-looking perspective already incorporated into impairment models, reflecting macroeconomic conditions and reclassifications to Fair Value Through Profit or Loss (FVTPL). Khan and Damyanova (2018) found similar results for a sample of 16 European banks with total assets over 300 billion euros. Also, Groff and Mörec (2021) investigated the day one impact of IFRS 9 on LLAs and equity of banks in Slovenia. The authors found evidence of an increase in LLAs and a decrease in the equity of banks in that country. Likewise, the EBA (2018), in a study covering 54 financial institutions from 20 Member States, confirms predictions regarding the increase in LLAs and the reduction in banks' own capital as a result of applying IFRS 9.

Hence, regulators, following various crises, have adopted a more preventive approach, as exemplified by the publication of the aforementioned regulation, establishing a five-year transitional regime to absorb the impact of introducing IFRS 9 in the financial sector. This regulation allowed banks to mitigate the impact of adopting IFRS 9. For this reason, to understand the real impacts on Portuguese banks resulting from the application of the new ECL model present in the said standard, it becomes necessary to cancel out the adjustments resulting from the said regulation.

According to the EBA (2016), the adoption of the IFRS 9 ECL model was not expected to have a significant impact on banks' own equity, possibly already anticipating the adoption of preventive measures by regulators and standard setters, such as European Union (2017). In turn, the studies reviewed in the literature review demonstrate an increase in financial asset losses with the adoption of IFRS 9 and the new ECL model having a negative impact on own equity (EBA 2018; EY 2018; Groff and Mörec 2021; Khan and Damyanova 2018; KPMG 2016). In this sense, to test the impact of adopting the ECL model on the own equity of Portuguese banks, the following hypothesis is formulated:

H2. *The adoption of the ECL model had a positive impact on the level of LLAs on the own equity of Portuguese banks.*

Löw et al. (2019), based on a sample of 78 systemically important banks supervised by the European Central Bank, observed an average impact on the CET1 ratio of minus twenty basis points, with a standard deviation of 145 basis points, mainly due to the increase in LLAs, reducing the net equity by 1.8% on average. The study also showed that banks reclassified only 4.6% of financial assets on average. Moreover, of the 78 banks analyzed,

only nine reported a combined positive effect of financial asset impairments and provisions for off-balance sheet exposures on the bank's equity. This study included one Portuguese bank in its sample (BCP), showing an impact on the CET1 ratio of −0.35% and on the own capital divided by the total asset of −3.8%.

Thus, another aspect to analyze is the effect of adopting the ECL model on the respective ratios required by regulators, in particular, the CET1 ratio. Regarding this ratio, the studies reviewed report significant negative impacts due to the increase in impairments on credits with the adoption of the ECL model (EY 2018; KPMG 2016; Löw et al. 2019). The empirical analysis of the impact of adopting the ECL model on the CET1 ratios of Portuguese banks will be based on the following research hypothesis:

H3. *The adoption of the ECL model as anticipated in IFRS 9 had a negative impact on the CET1 ratio of Portuguese banks.*

3. Methodology

3.1. Analysis Model and Variables

Research Table 1 illustrates the design of this initial study, outlining the objectives, hypotheses, and the methodology adopted for data collection and processing.

Table 1. Investigation Design.

Objectives: To analyze the impact of adopting the ECL model as anticipated in IFRS 9 on the level of LLAs in loans, on own equity, and the CET1 ratio of Portuguese banks.

Hypothesis H1	Hypothesis H2	Hypothesis H3
$IAS39_{CL} = \frac{LLA_{2017}}{CL_{2017}}$	$IAS39_{EQ} = \frac{LLA_{2017}}{EQ_{2017}}$	$CET1_{2017} = \frac{TOF_{2017}}{RWA_{2017}}$
$IFRS9_{CL} = \frac{LLA_{2017}+LLP_{day\ one}}{CL_{2017}}$	$IFRS9_{EQ} = \frac{LLA_{2017}+LLP_{day\ one}}{EQ_{2017}-LLP_{day\ one}}$	$CET1_{2018} = \frac{(TOF_{2017}-LLP_{day\ one})}{(RWA_{2017}-LLP_{day\ one})}$

LLA_{2017}: LLA as of 31 December 2017 (data collected through the consolidated reports and accounts of the year 2017).
CL_{2017}: gross value of customer loans as of 31 December 2017 (data collected through the consolidated reports and accounts of the year 2017).
$LLP_{day\ one}$: LLP derived from the adoption of the ECL model as anticipated in IFRS 9 (data collected through the consolidated reports and accounts of the year 2018).
EQ_{2017}: own equity of Portuguese banks as of 31 December 2017 (data collected through the consolidated reports and accounts of the year 2017).
TOF_{2017}: Total Own Funds (TOF) is a calculation performed in accordance with the rules defined in the Basel III agreement, considering capital elements such as shares, retained earnings, among other capital elements (data collected through the consolidated reports and accounts of the year 2017).
RWA_{2017}: Risk-Weighted Assets (RWA), calculated according to the rules defined by the Basel III agreement, weighted by the credit, market, and operational risk of each bank (data collected through the consolidated reports and accounts of the year 2017).

Approach adapted from studies like Dantas et al. (2017) and Groff and Mörec (2021).

Testing the equality of two population distributions. For variables that have a normal distribution, the *t*-test is used; for variables that do not follow a normal distribution, the non-parametric option—the Wilcoxon test—is used (Laureano 2020).

As outlined in Table 1, the study adopts a quantitative methodology to assess the impact of implementing the IFRS 9 ECL model on the level of LLAs in loans, own equity, and the CET1 ratio of Portuguese banks. The basis for this analysis is a comparative approach, adapted from the studies of Dantas et al. (2017) and Groff and Mörec (2021), focusing on the comparison of before and after the implementation of IFRS 9 and its ECL model. This method involves comparing averages of collected data, suitable for samples with fewer than 30 observations. Depending on the normality of the variables' distribution, the t-test is applied for variables with a normal distribution, and the Wilcoxon test is applied for those that do not follow this distribution (Laureano 2020). For the variables $IFRS9_{CL}$, $IFRS99_{EQ}$, and $CET1_{2018}$ it was necessary to cancel the adjustments of the transitional regime introduced by European Union (2017), which allows deferring the impacts of introducing IFRS 9 in the financial sector for up to five years, with $LLP_{day\ one}$ being added.

3.2. Sample and Data

The sample for this study was determined from the database of the Portuguese Banking Association, which, as of October 2020, listed 15 commercial banks with consolidated reports and accounts available for the years 2017 and 2018. It was from these reports and accounts that all necessary data for constructing the variables used in the study were manually collected. Two banks (CBI and Santander Consumer Finance) were excluded, due to the unavailability of all required elements for the study, resulting in a final sample of 13 commercial banks. Table 2 presents the identification and characterization of the Portuguese banks in the final sample, ordered by descending total assets as of 31 December 2017. As observed, on the last day of the year 2017, the total accumulated assets across all banks in the sample amounted to 348 billion euros.

Table 2. Sample Characterization.

Banks/ (in Thousands of Euros)	Total Assets 31 December 2017	% *	EQ_{2017}	% **	CL_{2017}	LLA_{2017}	$LLP_{day\ one}$	% ***
CGD	93,247,914	26.78%	8,274,316	25.84%	59,810,942	4,555,961	101,606	1.23%
BCP	71,939,450	20.66%	7,179,736	22.42%	50,955,423	3,321,931	241,414	3.36%
Santander	53,168,990	15.27%	4,032,232	12.59%	41,387,044	1,740,865	28,142	0.70%
Novo Banco	52,054,849	14.95%	4,832,174	15.09%	31,422,441	5,631,498	258,955	5.36%
BPI	29,640,209	8.51%	2,823,586	8.82%	22,243,689	584,907	34,611	1.23%
Montepio	20,200,024	5.80%	1,762,921	5.50%	14,063,139	1,033,821	145,403	8.25%
GCA	17,988,440	5.17%	1,449,365	4.53%	9,373,039	652,085	19,393	1.34%
Haitong	3,275,905	0.94%	533,766	1.67%	750,124	120,217	633	0.12%
Finantia	1,988,472	0.57%	454,951	1.42%	238,118	8238	531	0.12%
BIG	1,851,222	0.53%	339,534	1.06%	309,342	248	−98	−0.03%
Credibom	1,566,169	0.45%	160,275	0.50%	1,467,910	35,656	10,610	6.62%
CTT	720,792	0.21%	76,389	0.24%	79,393	118	869	1.14%
Alves Ribeiro	618,643	0.18%	106,392	0.33%	357,632	28,783	154	0.14%
TOTAL	348,261,079	100.00%	32,025,637	100.00%	232,458,236	17,714,328	842,223	29.57%

Notes: (+/−) Recognition/Reversal in LLA_{2017} * Bank asset divided by total asset of the sample ** EQ_{2017} of the bank divided by the total EQ_{2017} of the sample | *** $LLP_{day\ one}$ divided by EQ_{2017}.

The sample analysis highlights the dominance of the four largest Portuguese banks (CGD, BCP, Santander, and Novo Banco), which together constitute 77.66% of the total assets in the sample, with CGD, BCP, and Novo Banco having undergone state intervention, as previously mentioned. Conversely, the four smallest banks (BIG, Credibom, CTT, and Alves Ribeiro) represent only 1.37% of the total assets, illustrating the size disparity within the Portuguese banking sector. The analysis of EQ_{2017} reveals differences relative to the asset size of the banks, particularly with Santander and Novo Banco, where the latter, benefiting from state aid, exhibits a higher EQ_{2017}, despite a smaller asset size compared to Santander. The LLA_{2017} also reflect significant differences, with Novo Banco showing the highest LLA_{2017}, while Santander has the lowest relative to its total assets. Montepio and other smaller banks, such as Credibom and Alves Ribeiro, demonstrate high LLA_{2017} in comparison to their size.

With the implementation of IFRS 9, a nominal overall negative impact was observed, marked by an increase in $LLP_{day\ one}$ by 842 million euros, predominantly in larger banks (Novo Banco, BCP, Montepio, and CGD), justified by their larger size. Conversely, smaller banks (GCA and Credibom) and the two largest banks (Santander and BPI) exhibited smaller impacts, highlighting the variation of impact according to scale and nature of banking operations. A distinct outcome was seen with BIG, being the only bank to register a negative impact in $LLP_{day\ one}$, possibly due to its business model focused on investments and capital markets, diverging from the typical credit risk exposure of other commercial banks. The proportion of $LLP_{day\ one}$ in relation to EQ_{2017} reveals that Montepio, Credibom, Novo Banco, and BCP were the most affected, aligning with the largest impacts observed, except for CGD which, benefiting from significant state capital injections, managed to mitigate the impact of the ECL model adoption better. The bank Credibom, specializing in

consumer credit, stands out among the most affected, reflecting its greater exposure to the new model due to its focus on consumer credit.

Following, Table 3 presents the assets of banks in the sample that were most impacted by the adoption of the IFRS 9 ECL model. It is important to note that $LLP_{day\ one}$ influenced three major asset groups, specifically: investments in credit institutions; customer loans; and debt instruments, measured at amortized cost.

Table 3. Assets with the Highest Impact on Day One. Source: Compiled from the 2018 annual reports and accounts.

Type of Impact	Item with the Highest Impact	Bank
Negative Impact	Customer Loans	BCP
Negative Impact	Investments in Credit Institutions	CTT
Positive Impact	Customer Loans	BIG
Negative Impact	Debt Instruments	Finantia
Negative Impact	Customer Loans	Alves Ribeiro
Negative Impact	Customer Loans	GCA
Negative Impact	Customer Loans	Montepio
Negative Impact	Customer Loans	CGD
Negative Impact	Customer Loans	Novo Banco
Negative Impact	Customer Loans	BPI
Negative Impact	Customer Loans	Credibom
Negative Impact	Customer Loans	Santander
Negative Impact	Investments in Credit Institutions	Haitong

It can be observed that for most banks, customer loans were the asset category most negatively influenced by the impact of adopting the IFRS 9 ECL model. However, the assets that suffered the greatest impact in CTT and Haitong banks were investments in credit institutions. In the case of Finantia bank, the most impacted assets were debt instruments. As previously mentioned, BIG was the only bank with a positive impact from the ECL model on its assets, specifically on customer loans. According to the information disclosed by the bank in its 2018 annual report, the positive impact was due to the positive revaluation of customer loans, stemming from the new ECL model.

4. Results and Discussion

4.1. Descriptive Statistics and Normality Tests

Table 4 presents the descriptive statistics of the variables under study, providing an overview of the basic characteristics of the data, including measures of central tendency such as mean and median, and measures of dispersion such as standard deviation.

Analyzing the descriptive statistics of the variables $IAS39_{EQ}$ and $IFRS99_{EQ}$, it is observed that the data dispersion for these is greater than for the other study variables, indicating a higher asymmetry regarding the impacts on own equity resulting from the increase in LLA levels with the adoption of the IFRS 9 ECL model. Conversely, the variables $IAS39_{CL}$ and $IFRS99_{CL}$ exhibit little dispersion, indicating some homogeneity regarding the impacts on LLA resulting from the adoption of the ECL model. Among the thirteen banks in the sample, it is noted that Novo Banco presents a value above 1 for the variables $IAS39_{EQ}$ and $IFRS99_{EQ}$, meaning that the LLA exceeds its own equity. As previously mentioned, Novo Banco underwent state intervention through the Resolution Fund and was recovering its own equity as of 31 December 2017.

In terms of the overall sample, it can also be verified that the mean of $CET1_{2017}$ is 0.183, while the mean of $CET1_{2018}$ is 0.179, suggesting a slight decrease in the quality of the banks' regulatory capital on day one.

To choose the most appropriate statistical test for the study's hypothesis testing, it is necessary to verify the data's normality.

Table 4. Descriptive Statistics.

Banks/Variables	$IAS39_{CL}$	$IFRS9_{CL}$	$IAS39_{EQ}$	$IFRS9_{EQ}$	$CET1_{2017}$	$CET1_{2018}$
BCP	0.065	0.070	0.463	0.514	0.119	0.114
CTT	0.001	0.012	0.002	0.013	0.265	0.262
BIG	0.001	0.000	0.001	0.000	0.451	0.451
Finantia	0.035	0.037	0.018	0.019	0.230	0.230
Alves Bandeira	0.080	0.081	0.271	0.272	0.213	0.213
GCA	0.070	0.072	0.450	0.470	0.148	0.146
Montepio	0.074	0.084	0.586	0.729	0.116	0.105
CGD	0.076	0.078	0.551	0.570	0.139	0.138
Novo Banco	0.179	0.187	1.165	1.288	0.128	0.120
BPI	0.026	0.028	0.207	0.222	0.123	0.121
Credibom	0.024	0.032	0.222	0.309	0.099	0.089
Santander	0.042	0.043	0.432	0.442	0.142	0.140
Haitong	0.160	0.161	0.225	0.227	0.203	0.202
Descriptive Statistics						
N	13	13	13	13	13	13
Minimum	0.001	0.000	0.001	0.000	0.099	0.089
Maximum	0.179	0.187	1.165	1.288	0.451	0.451
Mean	0.064	0.068	0.353	0.390	0.183	0.179
Median	0.065	0.070	0.271	0.309	0.142	0.140
Standard Deviation	0.054	0.054	0.316	0.352	0.095	0.098

As observed in Table 5, the variables $IAS39_{CL}$, $IFRS99_{CL}$, $IAS39_{EQ}$ and $IFRS99_{EQ}$ exhibit a normal distribution and are, thus, suitable for the *t*-test (Laureano 2020, p. 42). Conversely, the variables $CET1_{2017}$ and $CET1_{2018}$ do not follow a normal distribution, requiring the use of the Wilcoxon test (Laureano 2020, p. 173).

Table 5. Normality Tests.

	Kolmogorov–Smirnova			*Shapiro–Wilk*		
	Statistic	***df***	**Sig.**	**Estatística**	***df***	**Sig.**
$IAS39_{CL}$	0.231	13	0.057	0.879	13	0.069
$IFRS99_{CL}$	0.231	13	0.056	0.887	13	0.089
$IAS39_{EQ}$	0.154	13	0.200 *	0.877	13	0.064
$IFRS99_{EQ}$	0.151	13	0.200 *	0.885	13	0.085
$CET1_{2017}$	0.258	13	0.018	0.765	13	0.003
$CET1_{2018}$	0.249	13	0.027	0.786	13	0.005

*. This is a lower bound of the true significance.

4.2. Analysis and Discussion of Results

Table 6 provides a summary of the statistical tests used and their respective results.

Table 6. Hypothesis Test Results.

	Hypothesis H1	**Hypothesis H2**	**Hypothesis H3**
t-Statistic (parametric)	−3.55	−2.73	
z-Statistic (non-parametric)			1.00
p-value	0.002	0.009	<0.001
Student's *t*	H_a μ Measure 1 − Measure 2 > 0	H_a μ Measure 1 − Measure 2 > 0	
Wilcoxon's W			H_a μ Measure 1 − Measure 2 < 0

From the analysis of the presented results, Hypothesis H1 is validated, concluding that there was a significant positive impact with the adoption of the IFRS 9 ECL model on the level of LLA over customer loans, resulting from the increase in LLAs of Portuguese banks. This demonstrates higher reserves for future events compared to the ICL model of

IAS 39 (p-value < 0.05). In other words, the positive impact on LLAs implied a significant decrease in the net value of loans resulting from the adoption of the IFRS 9 ECL model. The obtained result is in line with the expectations of previously analyzed studies, which estimated increases in LLAs with the adoption of the ECL model of IFRS 9 (EBA 2016, 2018; ESRB 2017; Groff and Mörec 2021; KPMG 2016; Nuss and Sattar 2014).

Hypothesis H2 is also validated, concluding that there was a positive impact on the level of LLAs over the own equity of Portuguese banks with the adoption of the new ECL model (p-value < 0.05). The obtained result confirms the expectations and findings of analyzed studies, where negative impacts on the levels of own equity in European banks were observed with the transition to the ECL model of IFRS 9 (EBA 2018; EY 2018; Groff and Mörec 2021; Khan and Damyanova 2018; KPMG 2016).

Finally, Hypothesis H3 is also validated, concluding that there was a significant negative impact with the adoption of the IFRS 9 ECL model on the CET1 ratio of Portuguese banks (p-value < 0.05). The obtained result aligns with the literature review, where negative impacts on the CET1 ratio in European banks were expected with the adoption of the new ECL model of IFRS 9 (EY 2018; KPMG 2016; Löw et al. 2019).

In summary, the results obtained for Portuguese banks show significant negative impacts on the net values of loans, own equity, and the CET1 ratio upon the adoption of the IFRS 9 ECL model, due to the widespread increase in LLAs. Thus, Portuguese banks exhibit higher reserves with the ECL model compared to the ICL model, being better prepared for economic downturns.

5. Conclusions, Limitations, and Future Studies

This study represents an initial approach to the impact of adopting the IFRS 9 ECL model on the level of LLAs in loans, own equity, and the CET1 ratio of Portuguese banks. The financial sector is crucial in any jurisdiction, especially for Portugal, which sought external assistance in 2011 and underwent a financial adjustment program. Portuguese banks have been subjected to stress tests and state aids, with five out of the thirteen banks analyzed resorting to help for recapitalization, and one bank still receiving state aids for capitalization.

The study aims to analyze the impact of adopting the IFRS 9 ECL model on the level of LLAs in loans, own equity, and the CET1 ratio of Portuguese banks, on 1 January 2018, designated day one. The study focused on thirteen Portuguese commercial banks, selected from a pool of fifteen banks from the Portuguese Banking Association, excluding two due to lack of data. All data were manually collected from the consolidated reports and accounts for 2017 and 2018. The adopted methodology was based on approaches adapted from previous studies, such as Dantas et al. (2017) and Groff and Mörec (2021), comparing means of the same sample in different contexts. The results suggest that the impact is negative and statistically significant on the values of customer loans, own equity, and the CET1 ratio due to a widespread increase in LLA levels, thus, enhancing the reserves improving the capacity of Portuguese banks to deal with future economic downturns.

The results of this study are relevant and make a significant contribution to the literature on the adoption of the IFRS 9 ECL model by considering not only the $LLP_{day\ one}$ but also the impact of European Union (2017), offering this study an innovative analysis compared to previous studies. The confirmation of significant negative impacts on the values of customer loans (due to a significant increase in LLAs), own equity, and the CET1 ratio, as a result of day one by Portuguese banks, demonstrates the commitment and effort of these institutions in applying the requirements of the IFRS 9 ECL model. Moreover, this study provides empirical evidence on the impact of adopting the IFRS 9 ECL model on the in banks of a specific jurisdiction. Portugal, which had not been studied before, considering the impacts of European Union (2017). This approach is innovative and can be useful for sector professionals and researchers in future studies, offering important insights to understand the effects of adopting the IFRS 9 ECL model and the significant contributions by regulators and standard setters for its successful implementation.

This study significantly contributes to the knowledge about the IFRS 9 ECL model by exploring the direct implications of adopting this standard in Portuguese banks, with particular attention to the $LLP_{day\ one}$ and the integration of the effects of European Union (2017). By showing that Portuguese banks had reductions in the values of customer loans, own equity, and CET1 ratios right at the beginning of the model's application, aligning with the results found in the literature review, it confirms the importance of regulators in the application of new accounting rules, by allowing the deferral of the IFRS 9 and its ECL model impact for five years. Indeed, with that regulation, regulators contributed to a smooth transition of the IFRS 9 impacts, avoiding potential systemic risks such as non-compliance with CET1 ratios due to their reduction, which could cause constraints on the Portuguese banking sector. Additionally, by demonstrating an increase in reserves in line with expectations, this study reinforces the importance of the normative change to the ECL model, enabling higher reserves for economic downturns, contributing to a more resilient economy and a more transparent and prudent banking sector.

The primary limitation of this study stems from its reliance on a relatively small sample of banks, a deliberate choice to enable a detailed exploration within a single jurisdiction—Portugal. This focused approach facilitated a nuanced analysis of Portuguese banks' transition to the IFRS 9 ECL model against a backdrop of uniform European regulatory and supervisory context provided by the EBA, while also taking into account the unique economic and political landscape of Portugal. Nevertheless, this limitation highlights the indicative nature of our findings, rather than their generalizability across different contexts or jurisdictions.

Future research should aim to explore comparative analyses between the fair value model and the current ECL model regarding LLP recognition, investigating the long-term impacts of the ECL model across varying economic cycles and assessing the quality and transparency of financial disclosures by banks, both from the initial implementation phase and in subsequent periods. Additionally, examining the extent to which regulatory and standard-setting interventions have influenced the successful adoption and application of the IFRS 9 ECL model will provide valuable insights into the interplay between regulatory policies and accounting practices. Such studies will not only expand our understanding of the ECL model's efficacy but also its broader implications for financial stability and transparency in the banking sector.

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Note

[1] In the specialized literature on the subject, it is common to encounter the terms Loan Loss Provisions (LLPs) and Loan Loss Allowances (LLAs) to designate credit impairment losses. For the sake of uniformity in the terminology used in studies, this research will use the abbreviation LLP to express credit impairment losses recognized in the period, and LLA for the accumulated credit impairment losses, following the approach of Salazar et al. (2023).

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