Income Smoothing Management and Loan Loss Provisions in the Banking System

Abstract

Purpose: The "public interest" of financial institutions was used as an argument to intervene in accounting practices. The Bank of Spain's standard was not compatible with IAS 39 and the Spanish banking sector had become one of the most provisioned in Europe. This makes it an interesting case study of the relationship between provisioning and income smoothing. The 2008 financial crisis revealed that provisions were insufficient, and a reinforcement regulation process began in 2012. This paper aims to examine whether, since 2012, the Bank of Spain's regulatory effort on impairment accounting standards has induced less income smoothing, correcting its counter-cyclical effect.

Design/Methodology/Approach: A regression model is applied during the period 2005–2020, to test whether there is a trend change in the correlation between the level of provisions and annual earnings in 2012.

Findings: The results show that from 2012 onwards (when the Bank of Spain reinforced the regulation on provisioning), there was a correction in income smoothing behaviour.

Originality: This study provides empirical evidence that reinforces the claim that accounting policy can affect decision-making accounting practices, in this particular case, at the Bank of Spain.

Keywords: Banking; Loan loss provisions; Smoothing Management; Earnings Decisions; Cyclicality

Article classification: Applied research paper

1. Introduction

The banking system and its regulatory standards on provisions have sparked much debate among regulators, practitioners, and academics, leading to criticism from the media and continuous reviews by supervisors (Buesa *et al*., 2020; Cervera, 2015; Chen *et al*., 2022; Giner, 2014; Ibáñez-Hernández *et al*., 2014; Sánchez Serrano, 2018; Sanchidrián and García, 2017). According to García *et al*. (2019), the justification for this debate lies in the fact that, ultimately, financial transparency emanates from accounting standards and practices. Gazi *et al*. (2021) explain that a country's stability and economic growth depend on the soundness of its banking sector. This 'public interest' of financial institutions was used as an argument to intervene in accounting regulation and influence the accounting practices of these institutions (Giner and Mora, 2020).

As shown in the literature (Bischof *et al*., 2020; Christensen *et al*., 2013), the level of regulatory enforcement enhances the effect of accounting standards. Regarding the impairment model, the Bank of Spain's standard was not compatible with the traditional International Accounting Standard (henceforth IAS) 39, as it was based on prudential criteria to ensure the stability of the financial system. The Bank of Spain required provisions for transactions that were not by default. Additionally, the system was strengthened by a statistical provision encompassing generic coverage for normal risks. Thus, the Spanish banking sector is highly provisioned.

However, with the arrival of the 2008 crisis, the need for a higher level of provision or improvement in accounting criteria or models became explicit. The sector found a short-term solution by granting refinancing to prevent a client from entering default and generating immediate provision. The Bank of Spain began a gradual modification of the regulations on refinancing to give primacy to substances over the form of operations. In this regard, in 2012, two royal decree-laws were adopted to reduce the uncertainty that persisted regarding the valuations of bank balance sheets of assets associated with construction and real estate development (Banco de España, 2017a): Royal Decree-Law 2/2012, on 3 February on the reorganisation of the financial sector (RDL 2/2012); and Royal Decree-Law 18/2012, on 11 May on the reorganisation and sale of real estate assets of the financial sector (RDL 18/2012). Their goal was to reinforce the provisioning levels of credit institutions to address problems such as hidden non-performance loans (NPLs) and provisioning shortfalls identified after the crisis, which generated significant losses in the banking sector in 2012 and subsequent years.

On the other hand, with successive amendments to the Bank of Spain Circulars, the system of provisions and credit risk control was strengthened and reinforced, culminating in the adoption of International Financial Reporting Standard (henceforth, IFRS) 9 (International Accounting Standards Board (henceforth, IASB), 2014) and its expected loss model through the latest Circular 4/2017 (Banco de España, 2017b).

Therefore, this study aims to examine whether, since 2012, the Bank of Spain's regulatory effort on impairment accounting standards has induced less income smoothing, correcting its counter-cyclical effect.

The period analysed is from 2005 to 2020 and is affected by changes in accounting standardisation for the banking system from a national and international point of view. The convergence and implementation of IAS/IFRS in Spanish banks began in 2005 with the adoption of Circular 4/2004 (Banco de España, 2004). A regression model is applied during the period 2005–2020 to test whether there is a trend change in the correlation between the level of provisions and annual earnings in 2012. For this purpose, two periods were defined: before and after 2012, the year when the Bank of Spain's regulatory efforts began, as explained above.

The results show that from that time on, there has been a correction in income smoothing behaviour.

This paper contributes to providing empirical evidence that reinforces the claimed impact that accounting policy can have on accounting practice (Barth *et al*., 2008; Dal Maso *et al*., 2018; Li and Liu, 2022; Pandey *et al*., 2022), in this particular case at the Bank of Spain. This study highlights the need for central banks, supervisors, regulators and auditors to focus on the proper development of the standard, and not only its mere compliance. The compliance with the standard does not guarantee to be the best accounting practice, being as well necessary to apply comparative studies, over time and across countries, to provide benchmarking for regulators. This benchmarking may reflect other variables that condition accounting practice, such as the power of the national supervisor, the degree of convergence towards the international standard, the resources for implementation in the sector, etc., as demonstrated in this study on Spanish banks.

2. Theoretical background

2.1. Impairment model under IFRS perspective

Under the IAS 39 incurred loss model, a credit default event usually makes it mandatory to reflect the corresponding loan loss provisions (Pastiranová and Witzany, 2022). The IAS 39 model determines that losses are expected as a result of future events, regardless of how likely they are to be recognised (IASB, 2003).

According to Huizinga and Leaven (2019), loans are more likely to become impaired during economic downturns. Hence, the IAS 39 model implies that loan losses were concentrated during these periods. Provisions are set only once a loss is incurred. Thus, some authors argue that the IAS 39 accounting guidelines have a procyclical effect on lending standards (Agénor and Zilberman, 2015).

The 2008 financial crisis highlighted that the incurred loss model IAS 39 reflected losses at a late stage, and the unfavourable situation of the financial system was also reflected at a later stage (Cohen and Edwards, 2017; Sánchez Serrano, 2018), which may have led to a higher risk propensity for a longer period than desired. This model is defined as a 'too little, too late' model (Seitz *et al*., 2018). Other authors find that lenders using credit risk modelling are associated with more timely loan loss provisions (Bhat *et al*., 2019; Bushman and Williams, 2012).

For all the above, the devalued incurred loss model was replaced with a more forward-looking approach under IFRS (Buesa *et al*., 2020; Pucci and Skærbæk, 2020). The IFRS 9 expected loss model emerged as a solution to the problems detected in the previous model. IFRS 9 establishes that the assessment for recognising expected credit losses over the life of the asset is based on significant increases in the probability or risk of default since initial recognition and not on evidence that financial assets are impaired at the reporting date or the occurrence of an actual default. Generally, credit risk significantly increases before a financial asset becomes impaired or an actual default occurs (IASB, 2014).

The guidelines established under IFRS 9 require banks to record provisions during periods of economic expansion that reflect the probability of a change in the economic cycle (Huizinga and Laeven, 2019). Therefore, banks must consider information about the prospects of the macroeconomic environment when estimating credit losses (Pastiranová and Witzany, 2022). Therefore, in the process of transitioning to the expected credit loss model, an increase in impairment losses and a negative impact on bank equity were expected. Other authors

argue that forward-looking models provoke strong reactions to changes in the aggregate state of the economy (Seitz *et al*., 2018).

Bank of Spain's regulatory effort on provisions for convergence towards IFRS

As Otero-Iglesias *et al*. (2017) point out, there are particular characteristics in Spain that make the estimation of provisions a special case and require a different treatment than other countries due to its special regime of "statistical" or "dynamic" provisions (Curcio and Hasan, 2015). The level of provision was higher than in other European states. For example, in 2016, the European Central Bank placed Spain at 59.5% of its doubtful assets, compared to the Eurozone measure of 50.9% (Cruz-García and Maudos, 2016). Bustos-Contell *et al*. (2021) highlight that Spanish credit institutions should be better prepared because of the provisioning system regulated by the Bank of Spain. However, institutions have used these regulations inadequately, thus compromising their effectiveness.

The Bank of Spain was the first Spanish regulator to adopt internationally recognised standards in its Circulars (Doadrio *et al*., 2015). Regarding provisions, Annex IX of Circular 4/2004 (Banco de España, 2004) contemplates a schedule of provisions for assets with a default of more than three months and 100% coverage of the risk after 12 months of default, which could mean having a certain similarity to the model established in IAS 39. However, prudential criteria prevail over accounting criteria in guaranteeing financial system stability (Marín *et al*., 2019). Bank of Spain Circular 4/2004 and its traditional impairment model are incompatible with the incurred loss model of IAS 39, which generates adjustments in the preparation of consolidated accounts. This is because IAS 39 did not allow the estimation of impairment losses if there had not been an event denoting the risk of default, even if there was a high probability that the credit would default; therefore, it was even less likely to recognise unexpected losses (Mora, 2014). In particular, the Bank of Spain required a provision in spite of the fact that the client was not in default at that point (e.g. if the client had negative equity, even if a file was incorrectly documented). Additionally, the supervisor dictated a provisioning percentage depending on the sector and the difficulties to which it belonged.

This provisioning system was reinforced by the generic coverage of risks classified as normal, statistically estimated based on parameters calibrated by the supervisor, and thus became more similar to the countercyclical model justified under the principle of prudence. Generic coverage, also known as the dynamic component, is a countercyclical mechanism that aims to create a buffer during a boom period against future losses (Giner and Mora, 2019;

Jiménez *et al*., 2017). However, according to IAS 39, countercyclical effects should be covered by reserves and not through provisions that impact the results. This meant that the European Banking Authority (EBA) did not accept this item for calculating regulatory capital because its position on the balance sheet was incorrect, even though the interpretation of the balance sheet was the same (Mora, 2014).

Subsequent amendments to Circular 4/2004 (Banco de España, 2004), introduced by Circular 4/2016 (Banco de España, 2016), incorporate concepts that contemplate using estimation methodologies to prepare banks for the model proposed by IFRS 9. Therefore, after the entry into force of Circular 4/2017 (Banco de España, 2017b), Circular 4/2004 was repealed, culminating in the adoption of IFRS 9. Circular 4/2017 incorporates the expected credit loss model and offers an alternative to collective estimation models. Rocamora *et al*. (2017) show that applying IFRS 9 could bring Spanish financial institutions to the brink of insolvency from an accounting perspective. However, IFRS 9 arose precisely in response to the requirements in the accounting model and focused on the credit institution sector as far as provisions are concerned. Novotny-Farkas (2016) concludes that IFRS 9 incorporates more relevant information to estimate provisions earlier and thus complies with the requirements of supervisory bodies, as Groff and Mörec (2021) indicated in the requirements of the G20. This method of anticipating potential losses also makes it possible to mitigate the distribution of benefits.

2.2. Provisions procyclicality and bank smoothing

In general, the financial system reflects a pro-cyclical behaviour that is transmitted to the real economy through access to financing for spending and investment in good times and through financial restrictions in bad or more unfavourable times (Frait and Komarkova, 2013). Several studies investigate the relationship between pro-cyclicality and the behaviour of bank provisioning (Balboa *et al*., 2013; Bouvatier *et al*., 2014; Caporale *et al*., 2018; Norden and Stoian, 2013; Shala and Toçi, 2021). According to Bikker and Metzemakers (2005), an important aspect of provisions is their timing of occurrence in the business cycle. Bushman and Williams (2012, 2015) argue that banks that record provisions in a timely manner make good risk management decisions that reduce procyclicality. According to Olszak (2012), if banks behave procyclically during an economic downturn, the volume of provisions will grow. This is because banks in which the loan portfolio grows the most during

the expansionary phase are those in which profitability falls the most during the contractionary phase. Lending standards can be seen to be declining in banks where credit growth is higher, and these lower standards will lead to higher levels of non-performing loans in the downturn and further declines in profitability (Ibáñez-Hernández *et al*., 2014). In any case, from the view of Jayaraman *et al*. (2019), proactive recognition of unrealised losses reduces bank transparency but increases bank stability, should such losses materialize.

Numerous studies relate bank provisions and business cycle to this relationship in specific geographical areas. For example, Arpa *et al*. (2001) investigated the impact of the business cycle on provisioning in Austrian banks. This indicates that they record more provisioning when their net income increases, reflecting a countercyclical effect. Laeven and Majnoni (2003) find that banks delay provisions for impaired loans and reflect when a downturn in the business cycle has already occurred. Bikker and Metzemakers (2005) analyse European banks and detect patterns in the cyclical behaviour of provisions. Outside Europe, Packer and Zhu (2012) study 240 banks in 20 Asian countries. The authors explain the relationship between Gross Domestic Product (henceforth GDP) growth and profits with provisions, concluding countercyclical behaviour with respect to profits and a procyclical relationship with GDP, although not statistically significant. Skala (2015) analysed income smoothing and provision cyclicality for 179 commercial banks in 11 Central European countries. Caporale *et al*. (2018) analyse 400 Italian banks and find evidence of countercyclical provisioning from 2001 to 2015.

In Spain, authors such as Saurina and Trucharte (2017) and Jiménez *et al*. (2017) analyse dynamic provisions and their countercyclical effects, and the Bank of Spain is an international pioneer in the application of these provisions (Jiménez and Saurina, 2006; Saurina, 2009). Some authors point out that statistical provisioning in Spain did not seem to moderate the expansionary credit cycle but helped strengthen the Spanish banking sector and mitigate the problems associated with procyclicality in the early years of the 2008 crisis (Ibáñez-Hernández *et al*., 2014). Dynamic (or countercyclical) provisioning worked as expected in Spain, allowing Spanish banks to enter a crisis with significant reserves compared to their non-Spanish counterparts (Balla and McKenna, 2009). At the beginning of 2008, non-performing loans were 200% covered in Spain, while the European Union average was approximately 60%. However, the accumulated provisions were not sufficient to maintain the

stability of the banking system, as revealed by the developments in 2011 and 2012 (Frait and Komarkova, 2013).

The main purpose of dynamic provisioning is to build reserves during good economic times to absorb losses during downturns by providing a buffer of countercyclical provisions in the early years of the downturn (Ibáñez-Hernández *et al*., 2014). Some regulators have used methods based on the assessment of expected or potential losses and provisioning of such losses. However, it was not until 2000 in Spain that a comprehensive and mandatory system for the application of dynamic provisions was introduced to reduce the procyclicality of bank behaviour (Acharya and Ryan, 2016; Balla and McKenna, 2009; Wezel *et al*., 2012). From 2005 onwards, as a consequence of the introduction of IFRS, debates arose between the creators of international accounting standards and Spanish authorities.

According to Skala (2015), banks take advantage of periods of high profits to smooth earnings but also choose to build up more reserves during periods of large losses. This behaviour exacerbates existing losses and may obscure banks' underlying profitability. She argues that the introduction of regulatory measures, in line with the Bank of Spain's dynamic provisioning system, would make income smoothing in Central European banks more transparent and limit the scope of discretionary provisioning during periods of low profitability. This fact is confirmed in a study conducted by Garsva et al. (2012) in European Union countries, with Spain being one of the cases in which the relationship between the provisioning and smoothing of results was highly significant. Banks use loan loss provisions to smooth profits when they are positive (Balboa *et al*., 2013; El Sood, 2012). However, some authors support the idea that IFRS adoption improves the quality of accounting information because it discourages profit manipulation. Ozili (2022a) notes that the application of IFRS 9 is inversely related to the practice of smoothing results.

El Sood (2012) states that the IASB considered issuing IFRS 9 with a new provisioning model based on expected losses to avoid the procyclicality inherent in the existing model. However, since its entry into force, the debate on pro-cyclicality remains open and particularly relevant in the context of the current pandemic. Covid19 has raised concerns that IFRS 9 could exacerbate economic crises (Balboa *et al*., 2013). As explained by Abad and Suárez (2018), the expected loss model of IFRS 9 could decrease procyclicality by inducing banks to take action in the early stages of the downturn while decreasing loss recognition at the worst time of the crisis. Therefore, the IFRS 9 model may induce less

procyclicality than IAS 39 incurred loss model. Buesa *et al*. (2020) also find that IFRS 9 is less procyclical than IAS 39.

2.3. Formulation of hypotheses

Cañibano Calvo and Herranz (2016), examine whether the accounting model used for impairment estimation is adequate to guarantee the stability and solvency of financial sector entities.

The most widespread discussion is whether the provisions have been influenced by their annual earnings (Balboa *et al*., 2013; Ozili, 2022a; Skała, 2015; El Sood, 2012). These studies stated that, occasionally, accounting standards have been used to reflect lower profits and, on others, to soften possible losses. Specifically, under the application of IAS 39, Gebhardt and Novotny-Farkas (2011) stated that the incurred loss model considerably reduces the smoothing of income and implies a delay in the recognition of expected credit losses.

According to the Bank of Spain (2017a), the accounting framework of Spanish credit institutions had to adapt to the IAS/IFRS in 2004, thus maintaining the criteria of prudence that characterised Spanish regulations. Provisions in Spain traditionally maintained a countercyclical nature, with higher amounts set aside in times of economic boom to guarantee solvency or stability in times of crisis (Saurina and Trucharte, 2017; Skała, 2015). In 2000, the Bank of Spain introduced dynamic provisioning rules to create a dynamic provision fund using retained earnings during good times to cover credit losses during bad times (Acharya and Ryan, 2016; García Osma *et al*., 2019; Giner and Mora, 2019; Huizinga and Laeven, 2019). This practice, referred to in the doctrine as a dynamic provision (Jiménez *et al*., 2017; Repullo *et al*., 2010), is considered crucial for companies and banking institutions. For companies, the dynamic provision favours profitability (Jiménez *et al*., 2017), whereas for banking institutions, this practice allows them to anticipate losses arising from the procyclical behaviour of bank loans, thus maintaining their solvency (Repullo *et al*., 2010).

Based on the above, the present study proposes the following hypothesis:

H_0: Bank of Spain regulatory effort on impairment accounting standards induce less income smoothing correcting its counter-cyclical effect.

3. Methodology

3.1. Model definition and variables

As stated in the previous section, the regulatory effort carried out by the Bank of Spain to improve impairment estimation is expected to reduce the countercyclical effect and hence prevent banks from adopting income smoothing practices through loan loss provisions.

Hence, we aim to empirically analyse whether such regulatory efforts have been effective. We run an OLS regression to observe the variables that explain the impairment of loan loss provisions, focusing specifically on the effects of regulatory effort. Loan loss provisions are a function of factors that are discretionary for managers (mainly earnings before taxes) and other non-discretional factors that determine the level of provisions, irrespective of incentives for smoothing (Ozili, 2022b), such as the amount of non-performance loans or macroeconomic conditions. Henceforth, to analyse whether such a smoothing effect is conducted through banks' loan loss provisions, the main variables that determine such practices are discretional. By contrast, non-discretionary variables explain the rational expected level of provisions. In general, loan loss provisions reflect smoothing practices as a function of discretionary facts and other control variables that should determine the absence of smoothing incentives (non-discretionary facts):

Loan loss provisions = f (Earnings, Regulatory effort, Controls variables)

In our proposed model, the dependent variable is loan loss provisions (accumulated), which is explained by two independent variables. The main variable explaining such provisions is earnings. Earnings are variables with a higher extent of discretion for managers, thereby allowing them to manipulate their own benefits (Tucker and Zarowin, 2006). Smoothing practices are common attempts to reduce abnormal variations (Beidleman, 1973), even when companies lack strong incentives to manipulate. Loan loss provisions are also discretionary (Bushman and Williams, 2012), and earnings may be a proxy for their discretionary component because earnings are adjusted to minimise the negative impact of inflated provisions (Garsva *et al*., 2012). Therefore, if loan loss provisions are implemented for income smoothing, earnings are expected to be positively related to loan loss provisions, recognising more provisions when banks perform well and using the excess provisions when their performance fails (Bushman and Williams, 2012).

Second, we specifically consider whether the regulatory efforts of the Bank of Spain have contributed to reducing banks' income-smoothing practices. Following other smoothing studies that investigate whether tightening of accounting standards that are associated with

regulatory changes affect smoothing practices (see, for example: Balla and Rose, 2015; García Osma *et al*., 2019; Kilic *et al*., 2013; Ozili, 2022b; Ozili and Outa, 2018), we create a dummy variable that reflects whether the effect of earnings on loan loss provision is statistically significant from 2012 onwards. After this moment, the Bank of Spain's regulatory effort began, with the adoption of Royal Decrees to reinforce the provisioning levels of credit institutions as well as the process of successive changes in the Circulars for convergence towards IFRS 9. A negative and statistically significant coefficient indicates the effectiveness of reducing income smoothing through loan loss provisions.

In any case, and being conscious that smoothing practices are not explained only by earnings and the effect of regulation, we include other facts that explain banks'smoothing through loan loss provisions as control variables.

Non-performing loans arise from defaults on loans that banks have as their assets. Consequently, if banks have more loans, a greater provision should be reflected in accounting to anticipate future losses, following the conservatism principle. Then, following several studies in smoothing in the banking literature (see, among others: García Osma *et al*., 2019; Garsva *et al*., 2012; Kilic *et al*., 2013; Ozili, 2022a, 2022b; Ozili and Outa, 2018; Peterson and Arun, 2018; Vasilakopoulos *et al*., 2018), we include non-performing loans to control the effect of loan default when banks reflect in accounting provisions, expecting a positive relationship between the amount of non-performing loans and the provision for those loans.

In addition, connected to the first control variable, and for the same reasons, the simple fact that banks offer a greater amount of loans increases the possibility that any of these loans will default, becoming a non-performing loan. Thus, banks with higher credit risk exposure (greater amounts of risky loans) tend to provision more (Bikker and Metzemakers, 2005; Shala and Toçi, 2021). Therefore, we also included the variation in the amount of loans that banks show as assets in their financial statements as a control variable, expecting a positive relationship between the variation in loans and loan loss provisions.

The second group of control variables refers to the macroeconomic conditions. In crisis periods, when companies face an economic downturn, their capacity to fulfil compliance is lower. Hence, there is a higher default risk and thus a greater likelihood that banks have to assume losses for non-performing loans. Consequently, on a procyclicality basis, the consequences of an economic crisis lead to an increase in the volume of provisions by banks to anticipate potential losses (Frait and Komarkova, 2013). Banks usually provide

less in economic expansion periods and increase provisions during downturn periods (Fonseca and González, 2008; Shala and Toçi, 2021). Such economic cycle conditions are reflected in two control variables commonly used in literature smoothing in the banking sector (Fonseca and González, 2008; Frait and Komarkova, 2013; García Osma *et al*., 2019; Ozili, 2022b): GDP growth (expressed as a variation in GDP on a yearly basis) and the unemployment rate (expressed as the year level of unemployment). Thus, GDP growth is expected to be negatively correlated with loan loss provisions, whereas the unemployment rate is expected to be positively correlated.

All those variables and their justification considered, the model to be analyzed is

$$LLP_{it} = \beta_0 + \beta_1 E_{it} + \beta_2 E_{it} \cdot Reg\_Effort + Controls + \varepsilon_{it},$$

where LLP_{it} is the accumulated loan loss provisions of company i at the end of fiscal year t.

E_{it} is the Earnings Before Taxes of company i at the end of fiscal year t.

Reg_Effort is a dummy variable that considers the effect of the BOS's regulatory effort to correct for income smoothing through loan loss provisions. Because regulatory effort, as exposed in the theoretical framework, has been especially important since 2012, we define *Reg_Effort* as a dummy variable with a value of one if the firm-year observation has been in 2012, and zero otherwise (2005 to 2011, inclusive).

We incorporated non-performance loans (*NPL*) as a control variable, given that it is a nondiscretionary determinant of impairments. We also include the variation in loans (*var_LOANS*). Additionally, to control for macroeconomic conditions in the cyclical effects of impairments, we include the variation in Gross Domestic Product (*GDP_Growth*) and unemployment rate (*UNEMP_Growth*).

To facilitate analysis of the model, we present a summary of the variables and their predicted signs in Table I.

(TABLE I HERE)

Our main variable of interest is the interaction between regulatory effort and earnings ($E_{it} \cdot Reg\_Effort$). It provides empirical evidence of whether the regulatory efforts carried out by the Bank of Spain from 2012 onwards have contributed to correcting income smoothing through the provision of loan loss impairments.

3.2. Sample selection

The selected sample corresponds to the 11 financial institutions with the largest volume of assets in Spain since 31 December 2020 accounting for 80% of the total assets of the credit institution sector (Banco de España, 2021): Banco Santander, BBVA, Caixabank, Bankia, Sabadell, Bankinter, Abanca, Unicaja Banco, Kutxabank, Ibercaja Banco, and Liberbank.

The analysis period is between 2005 and 2020 (both included) to investigate the evolution of credit risk and its coverage in a period affected by changes in accounting standardisation for the banking system from a national and international point of view. The choice of 2005 is because this was the year in which Circular 4/2004 (Banco de España, 2004), the Bank of Spain's accounting standard with which the adoption of IAS/IFRS begins, came into force. The end of the period corresponds to the latest available data from the publicly deposited annual accounts of the entities under study.

Table II summarises the number of observations of the selected entities and the period in which data were available for the variables. In total, 16 entities appeared instead of 11, as indicated above. This is due to the merging processes in some of the banks, which implies analysing the period in question in the entity operating at that time.

(TABLE II HERE)

Data were obtained from the individual annual financial statements of the bank's main parent company, available at the National Securities Market Commission.

Finally, we eliminated sample observations with empty values for any of the variables in the model (24 observations), resulting in 130 observations for the estimation.

After describing the model and the sample selection process, the next section presents and discusses the results of the OLS analysis of the proposed model.

4. Results and Discussion

Table III presents the main descriptive statistics of the variables in the defined model.

(TABLE III HERE)

When observing the statistics, it is noteworthy the high extent of standard deviation in all variables. The cause for such high standard deviation is twofold: Firstly, the sample comprises financial entities with different size. Secondly, the analyzed period includes a wide period (2005-2020, inclusive), with a great variability in the economic impact. Regarding

GDP growth, the mean variation in GDP was negative. This may be due to the inclusion of two periods of economic crisis: the financial crisis (2008 – 2014) and the crisis derived from the COVID-19 pandemic (2019 – 2020). In addition, as a reflection of economic crises, the mean unemployment growth is positive. Despite this, it is noteworthy that earnings before taxes had a positive mean during the entire analysis period.

After the descriptive statistics, we now analyse the results of the OLS regression, which are presented in Table IV.

(TABLE IV HERE)

In general, the variables show the expected behaviour. Looking at coefficient β1, earnings before taxes show a positive, statistically significant 1% relationship with loan loss provisions, thereby confirming that banks adopt income-smoothing practices through provisions because they provide more when they perform better and use this cushion when their performance is worse. However, when earnings are considered only after the 2012 regulatory effort (interaction term), this sign is the opposite (also statistically significant), showing that smoothed behaviour through loan loss provisions is corrected, with greater provisions when earnings fall. The *E*Reg_Effort* variable is negative and statistically significant at the 5% level.

Regarding the controls, all except the variation in the unemployment rate were statistically significant and met the expected signs. First, the higher the number of nonperforming loans, the greater is the total amount of loan loss provisions recognised by the company. Second, the greater the number of loans, the greater is the likelihood that these loans will not be performed, thereby recognising more loan loss provisions. Third, in economic crises (negative GDP growth), companies must recognise greater loan loss provisions.

Finally, we observed the appropriateness and estimation power of our proposed model by analysing the general model fit with the F-statistic, R^2 and the adjusted R^2. If we observe that Prob > F, the p-value is 0.000, confirming that the model is admissible. Moreover, the estimation power of the model is considerably high because the variations in the explanatory variables and controls can explain more than 95% of the variation in loan loss provisions, as shown by the R^2 and adjusted R^2 values of approximately 95%. Furthermore, the fact that R^2 and adjusted R^2 are so close to each other indicates that the variables included in the model offer important information for explaining the behaviour of the explained variable.

5. Conclusions

The results indicate a trend change in the correlation between the level of provisions and annual earnings in 2012, as evidenced by the statistical significance of the coefficient of the interaction term. Thus, income-smoothing behaviour through loan loss provisions has been corrected since the Bank of Spain's 2012 regulatory effort, thereby confirming our hypothesis. Considering this, the contribution of this study is to reinforce the claim that accounting policy can affect accounting practices (Barth et al., 2008; Dal Maso et al., 2018; Li and Liu, 2022; Pandey et al., 2022), in this particular case at the Bank of Spain. This highlights the need to focus on the appropriate development of the standard and not only on its compliance, which is not a guarantee of a proper accounting practice. It may be useful for regulators having as a guidance the conclusions of comparative studies over time and across countries. These studies can help to identify other variables that may affect accounting practice, such as the power of the national supervisor or the degree of convergence towards the international standard, as demonstrated in this research.

Our results are in line with previous studies on smoothing in the banking sector, reasoned in the theoretical background section, which provides empirical evidence of accounting standards and regulations serving as a tightening system to prevent smoothing practices (see, among others: Balla and Rose, 2015; Kilic *et al*., 2013; Ozili, 2022b; Ozili and Outa, 2018). García *et al*. (2019) argued that powerful national supervisors induced a less strict standard application, leading to greater income smoothing. However, with the entry of a Single Supervisory Mechanism into operation in 2014, the power of the national supervisor was reduced (Chiti and Recine, 2018).

In this sense, the study is limited to testing how accounting policy affects accounting practice but specifically in the case of Spanish banks. To reinforce this conclusion, further research can include contrasts in other EU countries that are also part of the Single Supervisory Mechanism. Also, given that the study focuses exclusively on how accounting policy affects income smoothing, it could be considered to test other variables, such as transparency, efficiency, and solvency. In future studies, the contrast could be made by differentiating by bank size and age, expanding the sample by including banks from different countries.

On the other hand, the results obtained also reflect, for years before 2012, the countercyclical effect supported by many authors (see, for example, Cañibano Calvo and Herranz, 2016; Giner and Mora, 2019; Mora, 2014; Saurina and Trucharte, 2017). This effect generates greater hedges in times of economic boom to reduce the impact or cost of risk in times of recession or financial crisis. With the gradual changes and reinforcement of the estimation model that led the Bank of Spain Circulars to converge with IFRS 9, we can say that this effect has disappeared. This result supports Ozili's (2022a) assertion that IFRS 9 is inversely related to the practice of smoothing results.

Finally, it is worth noting that during the study, we observed that larger entities in 2020 significantly increased their coverage and impairment allowance due to the forecasts of the COVID-19 pandemic, which could trigger an accelerating effect in the economic crisis. In this regard, different entities, supervisors, and regulators have issued communications so that the interpretation and application of the accounting standard and the model for estimating impairment are cautious, and attempts are made to avoid what is known as the 'cliff' effect (European Central Bank, 2020; European Securities and Markets Authority, 2020; Gómez-Ortega *et al*., 2022; IASB, 2020). Pastiranová and Witzany (2022) recommend issuing regulatory guidance documents that mitigate the procyclical behaviour of IFRS 9 models. This singularity of the year 2020 may reinforce the idea that IFRS 9 is not countercyclical. A further study, with a longer time horizon of IFRS 9 application, would be necessary to analyze this situation and consolidate the conclusion on how IFRS 9 reflects the business cycle.

6. References

Abad, J. and Suárez, J. (2018), *The Procyclicality of Expected Credit Loss Provisions*.

Acharya, V.V. and Ryan, S.G. (2016), "Banks' Financial Reporting and Financial System Stability", *Journal of Accounting Research*, Vol. 54 No. 2, pp. 277–340.

Agénor, P.R. and Zilberman, R. (2015), "Loan Loss Provisioning Rules, Procyclicality, and Financial Volatility", *Journal of Banking and Finance*, Vol. 61, pp. 301–315.

Arpa, M., Giulini, A., Ittner, A. and Pauer, F. (2001), *The Influence of Macroeconomic Developments on Austrian Banks: Implications for Banking Supervision*, No. 1.

Balboa, M., López-Espinosa, G. and Rubia, A. (2013), "Nonlinear dynamics in discretionary accruals: An analysis of bank loan-loss provisions", *Journal of Banking and Finance*, Elsevier B.V., Vol. 37 No. 12, pp. 5186–5207.

Balla, E. and McKenna, A.B. (2009), "Dynamic provisioning: a countercyclical tool for loan loss reserves", *FRB Richmond Economic Quarterly*, Vol. 95, pp. 383–418.

Balla, E. and Rose, M.J. (2015), "Loan loss provisions, accounting constraints, and bank ownership structure", *Journal of Economics and Business*, Elsevier Inc., Vol. 78, pp. 92–117.

Banco de España. (2004), *Circular 4/2004, de 22 de Diciembre, a Entidades de Crédito, Sobre Normas de Información Financiera Pública y Reservada y Modelos de Estados Financieros*.

Banco de España. (2016), *Circular 4/2016, de 27 de Abril, Del Banco de España, Por La Que Se Modifican La Circular 4/2004, de 22 de Diciembre, a Entidades de Crédito, Sobre Normas de Información Financiera Pública y Reservada y Modelos de Estados Financieros, y La Circular 1/2013*.

Banco de España. (2017a), *Informe Sobre La Crisis Financiera y Bancaria En España, 2008-2014*.

Banco de España. (2017b), *Circular 4/2017, de 27 de Noviembre, Del Banco de España, a Entidades de Crédito, Sobre Normas de Información Financiera Pública y Reservada, y Modelos de Estados Financieros*.

Banco de España. (2021), *Boletín Estadístico 6/2021*.

Barth, M.E., Landsman, W.R. and Lang, M.H. (2008), "International accounting standards and accounting quality", *Journal of Accounting Research*, Vol. 46 No. 3, pp. 467–498.

Beidleman, C.R. (1973), "Income smoothing: The role of management", *The Accounting*

Review, Vol. 48, pp. 653–667.

Bhat, G., Ryan, S.G. and Vyas, D. (2019), "The implications of credit risk modeling for banks' loan loss provisions and loan-origination procyclicality", *Management Science*, Vol. 65 No. 5, pp. 2116–2141.

Bikker, J.A. and Metzemakers, P.A.J. (2005), "Bank provisioning behaviour and procyclicality", *Journal of International Financial Markets, Institutions and Money*, Vol. 15 No. 2, pp. 141–157.

Bischof, F., Daske, H., Elfers, F. and Hail, L. (2020), *A Tale of Two Supervisors: Compliance with Risk Disclosure Regulation in the Banking Sector*.

Bouvatier, V., Lepetit, L. and Strobel, F. (2014), "Bank income smoothing, ownership concentration and the regulatory environment", *Journal of Banking and Finance*, Vol. 41 No. 1, pp. 253–270.

Buesa, A., Javier, F., García, P. and Tarancón, J. (2020), *Measuring the Procyclicality of Impairment Accounting Regimes: A Comparison between IFRS 9 and US GAAP.*, No. 2247.

Bushman, R.M. and Williams, C.D. (2012), "Accounting discretion, loan loss provisioning, and discipline of Banks' risk-taking", *Journal of Accounting and Economics*, Vol. 54 No. 1, pp. 1–18.

Bushman, R.M. and Williams, C.D. (2015), "Delayed Expected Loss Recognition and the Risk Profile of Banks", *Journal of Accounting Research*, Vol. 53 No. 3, pp. 511–553.

Bustos-Contell, E., Climent-Serrano, S. and Labatut-Serer, G. (2021), "A fuzzy-set qualitative comparative analysis model to predict bank bailouts: a study of the Spanish financial system", *Economic Research-Ekonomska Istrazivanja*, Vol. 34 No. 1, pp. 2555–2571.

Cañibano Calvo, L. and Herranz, F. (2016), "De la 'prudencia' en las normas contables", *Consejeros*, Vol. 112, pp. 59–62.

Caporale, G.M., Alessi, M., Di Colli, S. and Lopez, J.S. (2018), "Loan loss provisions and macroeconomic shocks: Some empirical evidence for italian banks during the crisis", *Finance Research Letters*, Vol. 25, pp. 239–243.

Cervera, M. (2015), *Impacto de La Normativa Contable Del Banco de España En El Resultado de Las Entidades de Crédito. El Efecto de La Provisión Genérica*, Universidad de Valencia.

Chen, Y., Yang, C. and Zhang, C. (2022), "Study on the influence of IFRS 9 on the impairment of commercial bank credit card", *Applied Economics Letters*, Vol. 29 No. 1,

pp. 35–40.

Chiti, E. and Recine, F. (2018), "The single supervisory mechanism in action: Institutional adjustment and the reinforcement of the ECB position", *European Public Law*, Vol. 24 No. 1, pp. 101–124.

Christensen, H.B., Hail, L. and Leuz, C. (2013), "Mandatory IFRS reporting and changes in enforcement", *Journal of Accounting and Economics*, Vol. 56 No. 2–3, pp. 147–177.

Cohen, B.H. and Edwards, G. (2017), "The new era of expected credit loss provisioning", *BIS Quarterly Review*, pp. 39–56.

Cruz-García, P. and Maudos, J. (2016), "La situación del sector bancario español en el contexto europeo: retos pendientes", *Cuadernos Económicos Del ICE*, Vol. 92, pp. 81–108.

Curcio, D. and Hasan, I. (2015), "Earnings and capital management and signaling: the use of loan-loss provisions by European banks", *European Journal of Finance*, Vol. 21 No. 1, pp. 26–50.

Dal Maso, L., Kanagaretnam, K., Lobo, G.J. and Terzani, S. (2018), "The influence of accounting enforcement on earnings quality of banks: Implications of bank regulation and the global financial crisis", *Journal of Accounting and Public Policy*, Vol. 37 No. 5, pp. 402–419.

Doadrio, L., Alvarado, M. and Carrera, N. (2015), "The reform of the Spanish accounting standards: An analysis of the institutional framework | Reforma de la normativa contable española: análisis de su entramado institucional", *Revista de Contabilidad-Spanish Accounting Review*, Vol. 18 No. 2, pp. 200–216.

European Central Bank. (2020), *IFRS 9 in the Context of the Coronavirus (COVID-19) Pandemic*, available at: https://www.bankingsupervision.europa.eu/press/letterstobanks/shared/pdf/2020/ssm.2020_letter_IFRS_9_in_the_context_of_the_coronavirus_COVID-19_pandemic.en.pdf.

European Securities and Markets Authority. (2020), *Accounting Implications of the COVID-19 Outbreak on the Calculation of Expected Credit Losses in Accordance with IFRS 9*, available at: https://www.esma.europa.eu/sites/default/files/library/esma32-63-951_statement_on_ifrs_9_implications_of_covid-19_related_support_measures.pdf.

Fonseca, A.R. and González, F. (2008), "Cross-country determinants of bank income smoothing by managing loan-loss provisions", *Journal of Banking and Finance*, Vol. 32 No. 2, pp. 217–228.

Frait, J. and Komarkova, Z. (2013), "Loan loss provisioning in selected European banking

sectors: Do banks really behave in a procyclical way?", *Journal of Economics and Finance*, Vol. 63 No. 4, pp. 308–326.

García Osma, B., Mora, A. and Porcuna-Enguix, L. (2019), "Prudential supervisors' independence and income smoothing in European banks", *Journal of Banking and Finance*, Vol. 102, pp. 156–176.

Garsva, G., Skuodas, S. and Rudzioniene, K. (2012), "Earnings management in European banks: The financial crisis and increased incentives for manipulation through loan loss provisions", *Transformations in Business and Economics*, Vol. 11 No. 2 A, pp. 504–526.

Gazi, M.A.I., Rahaman, M.A., Hossain, G.M.A., Ali, M.J. and Mamoon, Z. (2021), "An Empirical Study of Determinants of Customer Satisfaction of Banking Sector: Evidence from Bangladesh", *Journal of Asian Finance, Economics and Business*, Vol. 8 No. 2, pp. 497–503.

Gebhardt, G. and Novotny-Farkas, Z. (2011), "Mandatory IFRS Adoption and Accounting Quality of European Banks", *Journal of Business Finance and Accounting*, Vol. 38 No. 3–4, pp. 289–333.

Giner, B. (2014), "Institutions and conflicts of interests in the international accounting regulation: The Spanish financial industry case", *Revista de Contabilidad-Spanish Accounting Review*, Vol. 17 No. 2, pp. 143–152.

Giner, B. and Mora, A. (2019), "Bank loan loss accounting and its contracting effects: the new expected loss models", *Accounting and Business Research*, Vol. 49 No. 6, pp. 726–752.

Giner, B. and Mora, A. (2020), "Political interference in private entities' financial reporting and the public interest: evidence from the Spanish financial crisis", *Accounting, Auditing and Accountability Journal*, Vol. 34 No. 7, pp. 1581–1607.

Gómez-Ortega, A., Gelashvili, V., Delgado Jalón, M. L., and Rivero Menéndez, J. Á. (2022). "Impact of the application of IFRS 9 on listed Spanish credit institutions: Implications from the regulatory, supervisory and auditing point of view". *The Journal of Risk Finance*, Vol 23 No. 4, pp. 437-455.

Groff, M.Z. and Mörec, B. (2021), "IFRS 9 transition effect on equity in a post bank recovery environment: the case of Slovenia", *Economic Research-Ekonomska Istrazivanja*, Vol. 34 No. 1, pp. 670–686.

Huizinga, H. and Laeven, L. (2019), "The Procyclicality of Banking: Evidence from the Euro Area", *IMF Economic Review*, Vol. 67 No. 3, pp. 496–527.

International Accounting Standards Board. (2003), *IAS 39 - Financial Instruments: Recognition and Measurement*.

International Accounting Standards Board. (2014), *IFRS 9 - Financial Instruments*.

International Accounting Standards Board. (2020), *Accounting for Expected Credit Losses Applying IFRS 9 Financial Instruments in the Light of Current Uncertainty Resulting from the Covid-19 Pandemic*.

Ibáñez-Hernández, F.J., Peña-Cerezo, M. and De La Mata, A.A. (2014), "Identificación de procesos de prociclicidad crediticia e impacto de la provisión estadística en España: Análisis de estados financieros bancarios", *Revista Espanola de Financiacion y Contabilidad*, Vol. 43 No. 4, pp. 380–403.

Jayaraman, S., Schonberger, B. and Wu, J.S. (2019), "Good buffer, bad buffer: Smoothing in banks' loan loss provisions and the response to credit supply shocks", *Journal of Law, Finance, and Accounting*, Vol. 4 No. 2, pp. 183–238.

Jiménez, G., Ongena, S., Peydró, J.L. and Saurina, J. (2017), "Macroprudential policy, countercyclical bank capital buffers, and credit supply: Evidence from the spanish dynamic provisioning experiments", *Journal of Political Economy*, Vol. 125 No. 6, pp. 2126–2177.

Jiménez, G. and Saurina, J. (2006), "'Credit cycles, credit risk and prudential regulation'", *International Journal of Central Banking*, Vol. 2, pp. 65–98.

Kilic, E., Lobo, G.J., Ranasinghe, T. and Sivaramakrishnan, K. (2013), "The impact of SFAS 133 on income smoothing by banks through loan loss provisions", *Accounting Review*, Vol. 88 No. 1, pp. 233–260.

Laeven, L. and Majnoni, G. (2003), "Loan loss provisioning and economic slowdowns: Too much, too late?", *Journal of Financial Intermediation*, Vol. 12 No. 2, pp. 178–197.

Li, Q. and Liu, S. (2022), "Can third-party online sales disclosure help reduce earnings management? Evidence from China", *Journal of Accounting and Public Policy*, Vol. 41 No. 6, p. 106977.

Marín, S., Gras, E. and Ortiz, E. (2019), "Prudential regulation and financial information in Spanish banks: 1995–2015 | Regulación prudencial e información financiera en la banca española: 1995-2015", *Revista Espanola de Financiacion y Contabilidad*, Vol. 48 No. 3, pp. 363–385.

Mora, A. (2014), "Usos y abusos contables: el 'saneamiento' financiero", *Consejeros*, pp. 55–60.

Norden, L. and Stoian, A. (2013), *Bank Earnings Management through Loan Loss*

Provisions: A Double-Edged Sword?, No. 404.

Novotny-Farkas, Z. (2016), "The Interaction of the IFRS 9 Expected Loss Approach with Supervisory Rules and Implications for Financial Stability", *Accounting in Europe*, Vol. 13 No. 2, pp. 197–227.

Olsak, M. (2012), "Procyclicality of Loan Loss Provisions – The Case of Poland", *Advances in Business-Related Scientific Research Journal*, Vol. 3 No. 2, pp. 20–32.

Otero-Iglesias, M., Royo, S. and Wechsler, F.S. (2017), "War of attrition and power of inaction: The spanish financial crisis and its lessons for the European banking union | La guerra de trincheras y el poder de la inacción: La crisis financiera española y sus lecciones para la unión bancaria Europea", *Revista de Economia Mundial*, Vol. 2017 No. 46, pp. 191–214.

Ozili, P.K. (2022a), "Determinants of bank income smoothing using loan loss provisions in the United Kingdom", *Journal of Economic and Administrative Sciences*.

Ozili, P.K. (2022b), "Banking sector earnings management using loan loss provisions in the Fintech era", *International Journal of Managerial Finance*, Vol. 18 No. 1, pp. 75–93.

Ozili, P.K. and Outa, E.R. (2018), "Bank income smoothing in South Africa: role of ownership, IFRS and economic fluctuation", *International Journal of Emerging Markets*, Vol. 13 No. 5, pp. 1372–1394.

Packer, F. and Zhu, H. (2012), *Loan Loss Provisioning Practices of Asian Banks*, No. 375.

Pandey, A., Tripathi, A. and Guhathakurta, K. (2022), "The impact of banking regulations and accounting standards on estimating discretionary loan loss provisions", *Finance Research Letters*, Vol. 44, available at:https://doi.org/10.1016/j.frl.2021.102068.

Pastiranová, O. and Witzany, J. (2022), "IFRS 9 and its behavior in the cycle: The evidence on EU countries", *Journal of International Financial Management and Accounting*, Vol. 33 No. 1, pp. 5–17.

Peterson, O.K. and Arun, T.G. (2018), "Income smoothing among European systemic and non-systemic banks", *British Accounting Review*, Vol. 50 No. 5, pp. 539–558.

Pucci, R. and Skærbæk, P. (2020), "The co-performation of financial economics in accounting standard-setting: A study of the translation of the expected credit loss model in IFRS 9", *Accounting, Organizations and Society*, Vol. 81, available at:https://doi.org/10.1016/j.aos.2019.101076.

Repullo, R., Saurina, J. and Trucharte, C. (2010), "Mitigating the Pro-ciclicality of Basel II", *Economic Policy*, Vol. 25, pp. 659–702.

Rocamora, M., Plata García, C.T., Villar Burke, J. and Rubio González, A. (2017), *IFRS 9: Pro-Cyclicality of Provisions. Spanish Banks as an Illustration*.

Sánchez Serrano, A. (2018), "Financial stability consequences of the expected credit loss model in IFRS 9", *Revista de Estabilidad Financiera*, Vol. 34, pp. 81–99.

Sanchidrián, J.P. and García, C.J.R. (2017), "Unveiling the Expected Loss Model in IFRS 9 and Circular 4/2017", *Revista de Estabilidad FInanceira*, No. 36, pp. 147–164.

Saurina, J. (2009), "Loan loss provisions in Spain. A working macroprudential tool", *Revista de Estabilidad Financiera*, Vol. 17, pp. 11–26.

Saurina, J. and Trucharte, C. (2017), *Las Provisiones Contracíclicas Del Banco de España, 2000-2016*, Banco de España, available at: https://www.bde.es/f/webbde/INF/MenuHorizontal/Publicaciones/OtrasPublicaciones/Fich/Las_provisiones_contraciclicas_del_BE_2000_2016.pdf.

Seitz, B., Dinh, T. and Rathgeber, A. (2018), "Understanding loan loss reserves under IFRS 9: A simulation-based approach", *Advances in Quantitative Analysis of Finance and Accounting*, Vol. 16, pp. 311–357.

Shala, A. and Toçi, V. (2021), "Bank provisioning behavior, procyclicality and capital management in south-eastern Europe", *Ekonomicky Casopis*, Vol. 69 No. 1, pp. 3–17.

Skała, D. (2015), "Saving on a Rainy Day? Income Smoothing and Procyclicality of Loan-Loss Provisions in Central European Banks", *International Finance*, Vol. 18, pp. 25–46.

El Sood, H.A. (2012), "Loan loss provisioning and income smoothing in US banks pre and post the financial crisis", *International Review of Financial Analysis*, Vol. 25, pp. 64–72.

Tucker, J.W. and Zarowin, P. (2006), "Does Income Smoothing Improve Earnings Informativeness?", *The Accounting Review*, Vol. 81 No. 1, pp. 251–270.

Vasilakopoulos, K., Tzovas, C. and Ballas, A. (2018), "The impact of corporate governance mechanisms on EU banks' income smoothing behavior", *Corporate Governance (Bingley)*, Vol. 18 No. 5, pp. 931–953.

Wezel, T., Chan-Lau, J.A. and Columba, F. (2012), *Dynamic Loan Loss Provisioning: Simulations on Effectiveness and Guide to Implementation*, No. 12/110.

Table 1. Summary of the variables

Variable	Type of variable	Predicted sign
LLP_{it}	Dependent	
E_{it}	Independent	+
$E_{it} \cdot Reg\_Effort$	Independent	-
NPL	Control	+
var_LOANS	Control	+
GDP_Growth	Control	-
UNEMP_Growth	Control	+

This table presents a summary of the variables in the estimation model, indicating for each one the type of variable and its predicted sign according to the theoretical background.

Table 2. Sample selection

ENTITY	PERIOD	Nº OBS
Banco Santander, S.A.	2005 - 2020	16
BBVA	2005 - 2020	16
Caja de Ahorros y Pensiones de Barcelona	2005 - 2010	6
Caixabank	2011 - 2020	10
Caja de Ahorros y Monte de Piedad de Madrid	2005 - 2010	6
Bankia	2011 - 2020	10
Sabadell	2005 - 2020	16
Bankinter	2005 - 2020	16
Nova Caixa Galicia	2011 - 2013	3
Abanca	2014 - 2020	7
Montes de Piedad y Caja de Ahorros de Ronda, Cadiz, Almeria, Malaga y Antequera (Unicaja)	2005 - 2007	3
Unicaja banco	2011 - 2020	10
Kutxabank	2012 - 2020	9
Caja de Ahorros y Monte de Piedad de Zaragoza, Aragón y Rioja	2005 - 2010	6
Ibercaja Banco	2011 - 2020	10
Liberbank	2011 - 2020	10
TOTAL		***154***

This table describes sample selection indicating the name of the financial entities, as well as the periods with complete available data for estimation and the number of entity-year observations.

Table 3. Descriptive statistics

variable	N	mean	sd	p25	p50	p75	min	max
LLP	130	3769.716	3538.2	942	2437.802	5664	414	14472.12
E	130	593.4563	2406.125	145.919	379.728	1011	-21545	4883
NPL	130	6478.161	6626.602	1454	3128	10657	151	28619
Var_LOANS	130	1662.717	152304.4	-2645	529	4030.41	-1079789	1083852
GDP_Growth	130	-0.2984124	4.030333	-1.111899	1.357963	2.732361	-11.23353	3.915768
UNEMP_Growth	130	0.0341076	0.1846657	-0.1104651	-0.0482984	0.0992908	-0.122449	0.5840708

This table shows the main descriptive statistics (number of observations (N), mean, standard deviation (sd), and percentiles 25 (p25), 50 (p50), and 75 (p75)) for all variables used in the estimation model. The variables *LLP*, *E*, *NPL*, and *Var_LOANS* are expressed in thousands of euros. The variables *GDP_Growth* and *UNEMP_Growth* are expressed in percentages.

Table 4. Estimation results

	Coefficients
E	0.2462***
	(0.001)
*E*Reg_Effort*	-0.1652**
	(0.046)
NPL	0.5254***
	(0.000)
Var_LOANS	0.0013***
	(0.007)
GDP_Growth	-39.1951*
	(0.071)
UNEMP_Growth	-416.8844
	(0.412)
Constant	255.1612**
	(0.015)
Nº obs	130
Prob > F	0.0000
R^2	0.9528
Adjusted R^2	0.9505

This table displays the estimation results, indicating for each variable the estimated coeffient with the star significance indicator (please, note that significance is 1% for ***, 5% for **, and 10% for *), and below, betwee brackets, the p-value.

Additionally, the number of observations, F statistic for model general validity, and estimation power of the model (R^2 and Adjusted R^2) are also displayed.

editage

Editing Certificate

This document certifies that the manuscript listed below has been edited to ensure language and grammar accuracy and is error free in these aspects. The logical presentation of ideas and the structure of the paper were also checked during the editing process. The edit was performed by professional editors at Editage, a brand of Cactus Communications. The author's core research ideas were not altered in any way during the editing process. The quality of the edit has been guaranteed, with the assumption that our suggested changes have been accepted and the text has not been further altered without the knowledge of our editors.

MANUSCRIPT TITLE

Income Smoothing Management and Loan Loss Provisions in the Banking System

AUTHORS

Alba Gómez Ortega Ana Licerán Gutiérrez María de la Paz Horno Bueno

ISSUED ON

July 19, 2023

JOB CODE

LBEZO_1

THE EDITAGE Promise QUALITY GUARANTEE

Vikas Narang

Vikas Narang
Chief Operating Officer - Editage