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INTERNATIONAL ACCOUNTING DIFFERENCES AND EARNINGS SMOOTHING IN THE BANKING INDUSTRY

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Abstract

This study provides empirical evidence on the propensity of bank managers to smooth earnings through loan-loss provisions. The analysis on a sample of international banks using both pooled time-series cross-sectional and panel-data regressions leads to three main conclusions. First, bank managers actively use loan-loss provisions either to smooth high earnings or as an income-reducing tool when earnings are abnormally low. This result is consistent with Healey's (1985) compensation theory. Second, all other things being equal, banks following IFRSs or non-US local GAAPs have a greater discretion to smooth earnings. US GAAP exhibit the highest accounting quality, as remarked in Barth, Landsman, Lang and Williams (2006). Finally, we observe that in 2008, when the financial crisis hit its most critical stage, banks seemed to reduce the extent of earnings smoothing because they could have been below the minimum threshold for carrying out smoothing practices.

*Key words***:** Income smoothing, Earnings management, multi-way cluster

*JEL Classification***:** C21, C22, C23, G21, M41

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1. Introduction

The Global Financial Crisis raised considerable concern about the quality of the information provided by banks and, particularly, over what extent reports, statements and other financial disclosing items accurately reflect the economic conditions of companies. A recent survey carried out by the accounting firm KPMG on a panel of senior executives in the United States (US) revealed that nearly a third of them expected some form of irregular behaviour (misappropriation of assets, fraudulent financial reporting, or other illegal or unethical acts) to occur in their organizations, mostly abetted by inadequate internal controls or by management override of these controls.[1] Among the different sectors surveyed, the proportion of executives who perceived the category of "Fraudulent Financial Report" as the most significant source of risk turned out to be the highest in the Financial Services industry. Although insiders' distrust may be caused by a variety of factors, it ultimately reveals the awareness of stronger incentives for misleading reporting in this sector. The importance of analysing the reliability and integrity of financial statements in the banking industry has never been greater.

Fraud or misconduct in financial reporting may manifest themselves in multiple ways. Among these, the activities framed within the category of earnings management have been of major concern to regulators and one of the most active areas of research in financial accounting over the last decades. In this paper, we aim to provide a better understanding of these practices by analyzing the discretionary use of loan loss provisions (LLP, hereafter) as a managerial tool for earnings smoothing in the banking industry. As in previous literature, our methodological approach characterizes the discretionary component of LLP and analyzes the sensitivity of the value allowance to earnings before taxes and other representative variables. We address the existence of non-linear or asymmetric dependences on earnings, as this may reflect different managerial incentives. The most distinctive feature of this paper

[1] The researcher can find more information in the KPMG Forensic 2009 Annual Fraud Report Advisory, available at *www.kpmg.com/aci/docs/insights/21001NSS_Fraud_Survey_082409.pdf*.

is the focus on the role that the general differences between the main accounting standards (US GAAP, IFRS and other local GAAPs) may have on the extent of earnings smoothing, and on whether the international financial crisis and the major changes that have been introduced in accounting policies internationally, such as the amendments issued by Financial Accounting Standards Board (hereafter, FASB) and International Accounting Standards Board (hereafter, IASB) to enable reclassification of financial instruments in 2008, may have influenced the propensity to smooth earnings in banking firms. To the best of our knowledge, the literature devoted to the analysis of earnings smoothing seems to have ignored or given little attention to these important questions. Another distinctive feature is the special attention given to robustness. In our analysis, we consider several model specifications as well as different econometric techniques seeking to reduce the estimation risk and the possibility of misleading inference. Estimation procedures include the novel cross-sectional time-series regressions with multi-way cluster-robust standard errors (Thompson, 2005; Cameron, Gelbach and Miller, 2009; Petersen, 2009) as well as random-effects and instrumental regressions in the panel data analysis. The empirical findings based on this thorough analysis are remarkably sharp and allow us to reach conclusions with regard to the empirical existence of earnings smoothing practices and the relevant role played by accounting standards.

Earnings smoothing is a special case of earnings management which involves the inter-temporal averaging of reported economic earnings to make net profits look less volatile. In the banking industry, the incentives for these practices include (but are not limited to) the manager's desire to influence the market's perception of risk and the will to attain personal objectives within the context of the agency and compensation theories; see Brady and Sinkey (1988) and Healy and Wahlen (1999) for a deeper discussion. Smoothing is mostly seen as a negative practice for the firm's value because it may undermine the credibility of financial statements and lead investors and other stakeholders to misleading conclusions. Our analysis focuses on (discretionary) LLP as reserves manipulation is the most likely tool for smoothing practices in financial firms (Nelson, Elliot and Tarpley, 2003). Although it has been extensively

documented that firms in general tend to smooth earnings and this fact has motivated great concerns in regulators and policy makers, the empirical evidence on earnings smoothing in the banking industry is somewhat inconclusive: prior research has reached contradictory conclusions concerning the extent and even the very existence of smoothing.

Setting apart the differences in the samples analyzed, the heterogeneous evidence in the extant literature is likely to stem from fundamental differences affecting the model specification and the subsequent econometric inference. As remarked in Lobo and Yang (2001), in spite of the large body of literature there does not seem to be a unique methodological approach or standard functional form generally accepted and used to model LLP dynamics. For instance, whereas only a few papers have recently considered the possibility of non-linear or asymmetric patterns in earnings smoothing, most studies have ignored this issue. From an econometric perspective, the considerations related to the correct specification in parametric modelling raise major concerns, as model misspecification can render inconsistent estimations. In addition, there are further differences regarding the particular econometric technique used to estimate the posited model and carry out inference. The most common approaches are pooled time-series cross-sectional regressions (with or without robust errors) and, more recently, panel-data techniques. Accurate inference not only requires the correct specification of the functional form but also suitable methods to take adequate account of the time-series and cross-sectional dependences that characterize banking data. Otherwise, inference may lead to biased conclusions even if the relevant parameters have been estimated consistently. All these concerns are tackled in this paper by combining different estimation methodologies and different model specifications. In particular, we correct simultaneously for cross-sectional and time-series dependences in the pooled regression analysis by using two-way and three-way cluster-robust standard errors, as suggested in Gow, Ormazabal and Taylor (2009) and Cameron et al. (2009). Moreover, the alternative panel-data methodology allows us to control for possible problems related to endogeneity and offers us a complementary view. Since a common picture emerges clearly from this analysis, the robust conclusions allow us to shed light on some of the

contradictory findings in the previous literature.

Our analysis focuses on an international panel formed by more than 17,000 banks operating in 39 countries in the period 1999-2008. Using the different estimation techniques we find empirical evidence largely supporting the premise that bank managers tend to use LLP as a discretionary tool for earnings management. The significant dependence of LLP on earnings survives several robustness checks. Our findings point to the existence of asymmetric responses depending on whether earnings are positive or negative: high earnings tend to be smoothed, whereas unusually low earnings incentivise managers to deliberately increase the reported losses through larger provisions. To the best of our knowledge, this empirical pattern has only been reported in a similar study in Laeven and Majnoni (2006) and Bouvatier and Lepetit (2008), although no economic interpretation of the origin of the asymmetries is given therein. The compensation theory offers a convincing explanation for understanding this feature. We hypothesize that asymmetric responses as a function of the level of earnings are likely to stem from different managerial incentives which result in bank managers seeking to optimize the present value of management bonuses subject to certain constraints; see Healey (1985). As argued by Gray and Clarke (2004), the size and the potential discretionary aspects of LLP offer incentives to bank managers either to smooth earnings or to use the “big bath” (i.e., income-decreasing) techniques. Our empirical results would support the coexistence of both forms of earnings management.

In addition, our analysis reveals that, after accounting for other relevant factors, banks that report using non-US local GAAPs and IFRSs tend to make greater use of their discretionary power to set larger provisions. Since the implementation of the IFRSs is a relatively recent process, the literature focused on the differences due to accounting standards is still growing and, to the best of our knowledge, this paper is the first study to report on this empirical feature. In comparison to US GAAP, the IFRS are not country-specific standards and they imply a much lower level of accounting regulation as IFRSs are principle-based standards. This implies certain advantages in terms of efficiency but it could also create a higher level of discretion. The evidence in this paper shows

that a strongly regulated accounting setting that emphasizes the quality of financial reporting reduces the discretional ability of bank managers to use earnings smoothing.

The rest of the paper is organized as follows. Section two discusses some preliminary arguments given by previous literature for modelling LLP. Section three introduces the dataset and discusses the characteristics of the econometric modelling and its economic justification. Section four discusses the main empirical findings from pooled regression analysis. Section five is devoted to alternative analyses aimed at checking the robustness of the results. Finally, Section six includes some policy recommendations and concludes.

2. Loan loss provisioning and earnings smoothing

LLP are a non-cash charge to earnings that increase the reserve account on the balance sheet. In the banking industry, this provision generally turns out to be the largest accrual relative to net income and book value. Normally, bank managers use their best judgment to cover potential credit default through the provision for loan losses, which must be set on the basis of historical experience (e.g., records of nonperforming or non-current loans) and future previsions based on current economic conditions. In most countries, LLP can be allowed for without systematically following a disciplined methodology or binding criteria, so loan reserves are not generally expected to accurately match the size of actual losses. The resulting margin for imprecision and the degree of subjectivity give rise to perverse incentives for bank managers, who can use this accrual discretionary to achieve managerial objectives, including, but not limited to, income smoothing. Brady and Sinkey (1988) discuss the “perfect nature” of LLP as a smoothing devise in the terms described in Copeland (1968).

There exists an important body of growing literature related to the empirical analysis of LLP dynamics and its determinants, particularly, in the banking industry. The main areas of interest include the extent of earnings and capital

smoothing, the impact of discretionary and nondiscretionary provisions on bank's returns, and the pro-cyclical effects of loan provisions on credit fluctuations, among others. The existing literature is considerable, and a detailed review is beyond the scope of this paper. With the aim of introducing the formal econometric specifications which are detailed in Section three, in the following subsections we briefly discuss several preliminary considerations and survey the main empirical findings of the literature devoted to earnings smoothing through LLP.

2.1. Modelling discretionary and nondiscretionary dynamics in LLP

There is a general agreement that LLP displays dynamics which originate in both nondiscretionary and discretionary factors. The nondiscretionary component arises as a consequence of provisioning reserves to cover the expected level of future credit losses (defaulted and doubtful loans) in the bank's loan portfolio. It is mainly driven by company-specific characteristics and the macroeconomic and general business conditions that determine the overall loan portfolio risk-taking and credit quality. As a result, the LLP typically exhibits a strong cyclical component which is negatively correlated to business cycle indicators; see, for instance, Bikker and Metzemakers (2005) and Laeven and Majnoni (2006). On the other hand, the discretionary (also known as unallocated) component may reflect the use of loan reserves for managerial objectives. Prior research cites three main motivations: earnings smoothing, regulatory capital management, and the signalling of future earnings (e.g., Kanagaretnam, Lobo and Yang, 2005). The literature has suggested some other motivations, such as tax minimization, but the empirical support for these is statistically weak.

Bank managers can discretionarily use loan reserves to reduce the volatility of the reported earnings or increase the size of their compensation packages, among other objectives. The basic strategy to smooth earnings is to understate (overstate) the provisions when earnings are low (high) in order to mitigate the adverse (positive) effects of other factors on earnings. If bank managers follow this behaviour systematically, we should be able to observe a

significant, positive on-average relation between LLP and earnings before taxes and LLP once other discretionary and nondiscretionary factors that are likely to affect LLP have been properly accounted for. This suggests a regression analysis of the general form:

$$LLP = f\left(Income, Control\ Variables\right) + error$$

given certain functional form $f(\bullet)$, a suitable set of control variables, and the standard assumptions that characterize the dynamics of the error term and enable the identification of the unknown parameters involved. This parametric approach has been the most common strategy applied in the studies focusing on the earnings-smoothing behaviour of bank managers. Nevertheless, it should be noted that the particular specification chosen in each paper can substantially differ in terms of the functional form, the set of control variables, and the estimation and inference technique used. This lack of consensus may not only be responsible for some of the contradictory findings reported in prior research, but also hinders a direct comparison of the results reported in different studies.

The central hypothesis that LLP dynamics can be related positively to income has been tested in a number of empirical studies. The results in Brady and Sinkey (1988), Ma (1988), Greenawalt and Sinkey (1988), Collins, Shackelford and Wahlen (1995), Bhat (1996), Anandarajan, Hasan and Lozano-Vivas (2003), Kanagaretnam, Lobo and Mathieu (2003), Bikker and Metzemakers (2005), Laeven and Majnoni (2006) and Pérez, Salas-Fumás and Saurina (2008), among others, are consistent with this hypothesis and provide evidence for smoothing practices. Most of these papers are concerned with earnings manipulation in the US, while recent papers tend to consider datasets that include international samples of banks. On the other hand, Scheiner (1981), Wetmore and Brick (1994), Beatty, Chamberlain and Magliolo (1995), Ahmed, Takeda and Thomas (1999) and Bouvatier and Lepetit (2008) do not find statistical evidence supporting the presumption that bank managers use LLP to reduce the volatility of earnings. As discussed previously, there are

considerable methodological differences in terms of model specification and econometric techniques which may help to explain this heterogeneity. We shall take all these considerations into account in Section three later on.

2.2. LLP and accounting standards

There are several reasons to emphasize the relevance of the accounting standards when analyzing accounting-based variables on a panel of international banks that follow local GAAPs and IFRSs. Nevertheless, the potential role played by the accounting standard, either as a determinant or as a sample characteristic, seems to have been ignored in previous literature. This is not very surprising, since, to a large extent the most relevant research up to the moment has been carried out on data from countries and/or periods for which all firms followed a single accounting standard. For instance, most applied papers devoted to the analysis of LLP dynamics have focused on banking data from the US, where firms follow US GAAP. The implementation of the IFRS benchmark in many countries in 2005, aiming at introducing less detailed rules and more principles in financial reporting, has significantly changed the accounting environment and introduced heterogeneity in the international context. In this subsection, we provide several arguments from the economic and statistical perspectives that recommend the monitoring of the clustering effects related to the accounting standards.

In the specific context of earnings management, it can be argued that the different managerial strategies and even the original motivations for manipulating income cannot be independent of the particularities of the accounting and regulatory environments. For instance, Wall and Koch (2000) discuss that income smoothing in the banking industry may result from accounting practices intended to meet minimum capital requirements. Pérez et al. (2008) exemplify this with the general differences between the accounting and regulatory frameworks in the US and Spain: while general loan loss reserves are currently included as part of Tier 2 regulatory capital in the former country, they are excluded in the latter, which logically implies different motivations for the discretionary use of LLP. Also, Goel and Thakor (2003)

distinguish between so-called real and artificial practices in earnings smoothing. Both practices can imply severe costs for the firm, but the latter is primarily achieved through the reporting flexibility provided by the accounting principles. As a direct example of the particular relevance of the accounting framework, Fonseca and González (2008) analyze empirically if disclosing accounting quality has effects on earnings smoothing, finding that smoothing tends to be smaller in countries with better disclosing practices; see also Shaw (2003). In a more general context, Nelson et al. (2003) discuss how the differences in the accounting standards can have substantial effects on how financial statements are made and how these statements are viewed by financial report users. Ball, Kothari and Robin (2000) find that the smoothing of earnings is higher in continental-countries. In short, there are sufficient reasons to accept that the particularities of the different accounting standards may have a major influence on the analysis of earnings smoothing.

From an econometric perspective, the accounting standards may generate a source of heterogeneity which should be properly controlled for in the econometric analysis of any accounting-related variable. The reason is that accounting standards are not necessarily a purely country-specific factor (firms may follow different standards in the same country) nor a time-series fixed effect (firms can switch from one standard to another in compliance of regulatory changes). As a result, the standard techniques which are routinely applied in cross-sectional and panel-data regressions (e.g., including country dummies, or using robust standard errors clustered by country) may not always ensure the intended coverage. For instance, in several countries, banks which are listed on a stock exchange follow IFRSs whereas non-listed banks follow local GAAPs. Also, the implementation of the IFRS in the European Union and other countries around the world constitutes an important regulatory change that may have had sizeable effects on the analysis involving data in the pre- and post-implementation periods. Omitting this source of heterogeneity in the econometric analysis may lead to biases and misleading inference. Consequently, we shall conduct our analysis conceding priority to the econometric methodologies which are able to account for these concerns.

3. Data and methodology

The dataset contains annual banking data from 39 different countries in the period 1999-2008, totalling 133,583 observations. The countries included in the sample are Australia, Austria, Bangladesh, Belgium, Brazil, Canada, Chile, Costa Rica, Denmark, Finland, France, Germany, Hong Kong, India, Indonesia, Ireland, Italy, Japan, Luxembourg, Malaysia, Mexico, Netherlands, New Zealand, Norway, Peru, Philippines, Poland, Portugal, Republic of Korea, Russia, Singapore, South Africa, Spain, Sweden, Switzerland, Taiwan, Thailand, United Kingdom and the US. The dataset is collected from Orbis Bureau Van Dijk and all the variables considered are measured in thousands of US dollars. Given the considerations exposed in the previous section, we collect observations for variables that may characterize the discretionary and nondiscretionary components of LLP. In particular, we observe financial statements for Total Assets, Loans, Impaired Loans, Loans Loss Provision, Shareholder's Equity, Profit before Tax, Total Capital Ratio and Cost to Income ratio. We can readily identify the particular accounting standard (IFRS or local GAAP) followed by any firm in the sample. Additionally, we observe macroeconomic data (Gross Domestic Product growth) available from the IMF database to capture the general influence of the business cycle on the LLP dynamics. Before introducing the usual descriptive analysis, it is worth clarifying the variables involved in the different econometric specifications we consider, and which are described in the sequel.

Our main purpose is to explain the cross-sectional differences in the LLP. Since there is no unique model in the existing literature which can be considered as canonical representation, we shall consider alternative specifications with increasing complexity to ensure robustness in the results. In particular, we consider further generalizations on a baseline specification aiming at characterising *i)* the existence of asymmetric responses as a function of the level of earnings, *ii)* the effects of the international crisis and the reclassification of financial instruments allowed by FASB and IASB in 2008, and *iii)* the specific analysis of whether differences clustered by IFRS and local GAAP standards

imply different levels of discretion to smooth earnings, once other possible factors have been controlled for. The economic justification for the interest on these effects as well as the precise specification of the suitable functional forms applied is described throughout the following subsections.

3.1. Baseline model

We first consider a model in the spirit of Ahmed et al. (1999) as a baseline specification (say Model I), in which the LLP dynamics of the *i*-th bank in the *j*-th country (*j=1,…,n*) in the *t*-th year obeys:

$$LLPTA_{ij,t} = \alpha + \beta_1 ILTA_{ij,t} + \beta_2 LTA_{ij,t} + \beta_3 GDPG_{j,t} + \beta_4 PBTLLPTA_{ij,t} + \beta_5 TCR_{ij,t} + \beta_6 SIZE_{ij,t} + \sum_{j=1}^{n} \zeta_j Country_j + \varepsilon_{ij,t} \quad (1)$$

where $\varepsilon_{ij,t}$ is a noise process assumed to obey fairly general, standard restrictions, and:

- $LLPTA_{ij,t}$ measures total LLP deflated by a firm's Total Assets.
- $ILTA_{ij,t}$ gauges Impaired Loans to Total Assets to proxy for the credit risk exposures.
- $LTA_{ij,t}$ represents Loans to Total Assets, widely considered as a proxy for the specialization of the bank and a measure of portfolio composition.
- $GDPG_{j,t}$ is the Gross Domestic Product (GDP, hereafter) growth, intended to proxy for the economic conditions and business cycle dynamics.
- $PBTLLPTA_{ij,t}$ is the Profit before Tax and LLP deflated by Total Assets.
- $TCR_{ij,t}$ is the Total Capital ratio and proxies for the bank's level of solvency.
- $SIZE_{ij,t}$ is the natural logarithm of total assets to control for potential size effects.
- $Country_j$ is a country dummy that attempts to capture fixed country-specific factors due, for instance, to fiscal and prudential regulation.

Equation (1) is analogous to most of the empirical models used for testing income and/or capital management in the literature surveyed in the previous section. The variables $ILTA$ and LTA are firm-specific proxies of the credit risk which characterizes the nondiscretionary component in LLP. As discussed in the previous section, these variables are expected to have a positive effect on LLP, since bank managers increase provisions when the bank's credit portfolio increases or when credit quality deteriorates. The variable $GDPG$ proxies for the overall economic conditions as an external indicator of the credit risk. It is expected to have a negative effect on loan loss provisioning. Our main interest in this model is on the β_4 parameter, which relates the relative level of provisioning to before-provisions income. If this parameter is significant, provisions are discretionarily set as a linear function of earnings, thus suggesting that reported earnings result from earnings manipulation. Then, a significant positive value is consistent with the use of LLP to smooth earnings. The variable TCR aims to gauge the discretionary use of provisions to manage regulatory capital. If bank managers have incentives to manage regulatory capital via LLP (e.g., using LLP to reduce the expected regulatory costs associated with violating capital requirements), then we should be able to observe a negative relation between LLP and capital ratios. The variable $SIZE$ and the dummy variables $Country$ are included as control variables. We do not have any strong prior expectation about the impact of size on LLP: on the one hand larger banks may require larger provisions (positive relation), but on the other hand larger banks may be able to diversify their credit risk better (negative relation).

3.2. Non-linear responses on earnings

The main reason to be concerned about the existence of asymmetries as a potential driver of the discretionary component of LLP is that the incentives for earnings smoothing may vary depending on the expected size of the realized earnings. The empirical analysis in Healey (1985), and the theoretical models in Degeorge, Patel and Zechhauser (1999) and Koch and Wall (1999) provide convincing explanations for the existence of nonlinearities within the

compensation theory framework. Healey (1985) analyzed the effect of compensation packages that relate management bonus to accounting incentives through three basic schemes: *A)* bonuses that are conditioned to the managerial ability to generate earnings above a certain lower bound; *B)* a fixed bonus if the realized earnings exceed a certain upper threshold; and *C)* variable bonuses when realized earnings range between the lower and upper bounds. Any of these compensation schemes encourage managers to make decisions that attempt to maximize the present value of their bonus plan payments given the constraints, but also, as an unpleasant side effect, encourage them to manipulate reported earnings discretionarily in order to increase these compensations. Depending on the scheme involved and the size of the economic earnings, managers have incentives to use discretionary accruals to either decrease or increase reported earnings. For instance, LLP could be raised deliberately when economic earnings fall below the minimum bound necessary to receive any bonus. The rationale is that managers would be inclined, in this case, to follow the strategy known as “big bath”, meaning that they would increase the size of current losses by anticipating future accruals as this implies no managerial cost at present but it increases the chances to receive bonuses in the future, a strategy called “saving for a better tomorrow” in Degeorge et al. (1999). While earnings smoothing practices are intended to reduce the volatility of reported earnings and hence necessarily imply a positive relation between earnings and LLP, Healy’s compensation theory predicts a more complex, possibly non-linear relation between LLP and earnings in which provisions could be increased when earnings are particularly low.

A rough way of analyzing the existence of asymmetries as a consequence of nonlinearities in managerial incentives is by studying the average relation between LLP and positive/negative earnings (i.e., imposing a common threshold at the origin), in a straightforward extension of the baseline model. Hayn (1995), Burgstahler and Dichev (1997), and Degeorge et al. (1999) have also considered the zero-earnings threshold in a related but different empirical analysis on earnings management. Given that we lack precise information with which to identify the nature of the compensation packages, positive earnings are, to a certain extent, not very informative. By contrast, negative earnings

(which are obviously below any reasonable lower bound in a proper bonus incentive scheme) offer us a clear chance to discern whether the strategies of smoothing or downward-manipulations exist in the sample. On average, negative earnings could be either smoothed (in which case we should expect a conditional positive relation with LLP) or increased arbitrarily, consistent with the "take-a-bath" strategies (in which case we should expect a conditional negative relation with LLP). It should be noticed that both practices are particular cases of earnings management and imply the manipulation of reported earnings. However, they differ substantially in the underlying motivation and the economic implications, so are therefore worthy of empirical analysis attempting to document these features in the LLP dynamics.

Model I can be seen as a restricted specification that imposes a common response in LLP regardless of the size of earnings. If the restriction is wrong, the resultant estimates may be largely biased as a consequence of a potentially severe misspecification. The generalization allowing for asymmetric responses depending on whether earnings are positive or negative may provide a better representation and, in any case, permits data themselves to determine the empirical suitability of the model. Therefore, we consider the following extension of Model I, say Model II:

$$\begin{aligned} LLPTA_{ij,t} = {} & \alpha + \beta_1 ILTA_{ij,t} + \beta_2 LTA_{ij,t} + \beta_3 GDPG_{j,t} + \beta_4 PBTLLPTA_{ij,t} + \\ & \beta_5 TCR_{ij,t} + \beta_6 SIZE_{ij,t} + \gamma \left(D_{ij,t}^{PBTLLPTA>0} \times PBTLLPTA_{ij,t} \right) + \\ & \sum_{j=1}^{n} \zeta_j Country_j + \varepsilon_{ij,t} \end{aligned} \qquad (2)$$

All the variables involved except $D_{ij,t}^{PBTLLPTA>0}$ have been defined previously. The new variable is an indicator that takes value one if PBTLLPTA is greater than zero, and zero otherwise. The overall tendency to smooth positive earnings is captured through the coefficient $\beta_4^* = (\beta_4 + \gamma)$, while β_4 now approaches the smoothing propensity in banks with negative earnings. Hence, a significant value of γ gives statistical support for the existence of asymmetric

responses, with the sign and the significance of the β_4^* and β_4 coefficients determining whether smoothing and/or downward-management practices tend to predominate on average. For instance, if both parameters are positive and significant, we should conclude in favour of overall smoothing. A negative and significant value of β_4 would be consistent with "big-bath" strategies.

It is not evident a priori which type of managerial behaviour, if any, could dominate empirically. The empirical analysis in Holthausen, Larcker and Sloan (1995) casts doubts on Healey's conclusions, since no evidence that managers manipulate earnings downward is found in a more complete study than Healey's. The previous literature devoted to the analysis of LLP dynamics seems to have paid little attention to the possibility of asymmetric responses. Notable exceptions are the studies by Laeven and Majnoni (2006) and Bouvatier and Lepetit (2008), which find mixed empirical evidence. Whereas the results in both papers strongly support the existence of asymmetries (banks make statistically significantly higher provisioning when they incur losses than when generating positive earnings), the conclusions on the extent of earnings smoothing is contradictory. In particular, the estimates in Laeven and Majnoni (2006) suggest that, on average, positive earnings are smoothed, but Bouvatier and Lepetit (2008) report estimates that suggest a negative and significant relation between LLP and earnings, independently of the sign. Our paper also aims to shed light on these contradictory results by providing further empirical evidence from an international sample and a detailed analysis.

3.3. International financial crisis and regulatory changes in 2008

The sample we consider includes one of the periods of greatest distress in the modern history of the financial markets. Given that the economic turmoil and the credit crunch have had extreme consequences on the banking industry worldwide, this particular period should be isolated to avoid the possibility of statistical distortions in the overall results. Furthermore, there are additional reasons related to the accounting framework which raise concern about this specific period.

Under US GAAP, companies are permitted to reclassify securities and financial instruments in rare circumstances. Although there is no formal definition for this term, it is widely agreed that the current financial crisis and the dramatic deterioration of the financial markets in 2008 can be considered as a "rare circumstance". Thus, US banks have had the opportunity to make use of this accounting flexibility to avoid reporting massive losses originated in the financial markets. Aiming to reduce the differences between the IFRS and the US GAAP and the resulting comparative disadvantages, the IASB issued several amendments to IAS39 and IFRS7 with effect from 1 October 2008 that enabled firms to reclassify eligible financial assets from the trading category to the loan category in the same circumstances as US GAAP does. These amendments were endorsed for use in the European Union and several other countries. Several conditions must be met, including the company's intent and ability to hold the assets for the foreseeable future (e.g., loans) or until maturity (e.g., debt securities), allowing banks not to report market losses in 2008.[2]

Consequently, we consider a further generalization of Model II, say Model III, defined as:

$$\begin{aligned} LLPTA_{ij,t} = {} & \alpha + \beta_1 ILTA_{ij,t} + \beta_2 LTA_{ij,t} + \beta_3 GDPG_{j,t} + \beta_4 PBTLLPTA_{ij,t} + \\ & \beta_5 TCR_{ij,t} + \beta_6 SIZE_{ij,t} + \gamma \left(D_{ij,t}^{PBTLLPTA>0} \times PBTLLPTA_{ij,t} \right) + \\ & \sum_{j=1}^{n} \zeta_j Country_j + \delta_1 D_{ij,t}^{2008} + \delta_2 \left(D_{ij,t}^{2008} \times PBTLLPTA_{ij,t} \right) + \varepsilon_{ij,t} \end{aligned} \tag{3}$$

where the dummy variable $D_{ij,t}^{2008}$ takes value one in year 2008 and zero otherwise. Note that the coefficient $\alpha^* = (\alpha + \delta_1)$ measures the effects of the unconditional level of LLP in 2008, while δ_2 captures the incremental effect in the earnings smoothing propensity in that year.

[2] For instance, in the fourth quarter of 2008, the well-known financial group UBS recognized an impairment charge of CHF 1.3 billion as a credit loss expense on reclassified financial instruments. If reclassification had not occurred, the impairment charge would not have been recognized, but an additional trading loss of CHF 4.8 billion would have been recorded in the fourth quarter income statement. The researcher can find more detailed information in *http://www.ubs.com/1/e/investors/annualreporting/2008.htm* (UBS's Annual Report 2008).

3.4. IFRS vs local GAAP

The quality of the financial statements reported under different accounting standards has been a hot issue in accounting literature over the last ten years. The overall evidence in previous studies suggests that there may be major differences in several dimensions of the firm which are rooted in the particular accounting standard followed by the firm.

Harris and Muller (1999) were among the first in analyzing the impact of reconciliations between IFRS and US GAAP. Using international data, these authors noted that IFRS are more highly associated with price-per-share than US GAAP, while US GAAP amounts are more associated with security returns. Similarly, Barth, Landsman, Lang and Williams (2006) reported that IFRS firms tend to exhibit lower accounting quality relative to US firms in terms of earnings smoothing, correlation between accruals and cash flows, timely loss recognition, and the association between accounting amounts and share price. Also, although IFRS accounting numbers may not be of higher quality than those of US GAAP applied comprehensively, these seem to be of comparable quality to reconciled US GAAP amounts reported by cross-listed firms. Ernstberger (2008) found that comprehensive income under IFRS tend to provide more incremental value relevant information than comprehensive income under US GAAP. On the other hand, there is some controversy with regard to the overall predominance of US GAAP. Leuz (2003) showed that the level of information asymmetry between IFRS and US GAAP is similar, which does not support the idea that the latter produce financial statements of higher informational quality. Finally, with respect to IFRS and Local (non-US) GAAPs quality, Barth, Landsman and Lang (2008) find that firms applying IFRS from 21 countries generally witness less earnings management, more timely loss recognition, and more value relevance of accounting numbers than do a matched sample of firms applying their local GAAPs (non-US domestic standards).

Overall, the accounting literature has shown that IFRS and US GAAP tend to produce accounting numbers of higher quality than those from other local GAAPs, whereas there is not a unanimous consensus in relation to the US GAAP and IFRS. The lack of conclusive results or of a specific literature related to earnings smoothing in the banking industry prompted us to analyze the effects of accounting standards on these practices.

Models I to III are initially estimated using econometric procedures which ensure robustness against the heterogeneity or clustering effects related to the accounting standards in the regression analysis. In addition, we also consider two further extensions of Model II and III that include a dummy variable signalling IFRS-following banks so that we can identify the incremental effect on the propensity to smooth earnings in that group. More specifically, the most general specification in this paper, namely Model V, is defined as:

$$\begin{aligned} LLPTA_{ij,t} = {} & \alpha + \beta_1 ILTA_{ij,t} + \beta_2 LTA_{ij,t} + \beta_3 GDPG_{j,t} + \beta_4 PBTLLPTA_{ij,t} + \\ & \beta_5 TCR_{ij,t} + \beta_6 SIZE_{ij,t} + \gamma \left(D_{ij,t}^{PBTLLPTA>0} \times PBTLLPTA_{ij,t} \right) + \\ & \sum_{j=1}^{n} \zeta_j Country_j + \delta_1 D_{ij,t}^{2008} + \delta_2 \left(D_{ij,t}^{2008} \times PBTLLPTA_{ij,t} \right) + \\ & + \delta_3 D_{ij,t}^{IFRS} + \delta_4 \left(D_{ij,t}^{IFRS} \times PBTLLPTA_{ij,t} \right) + \varepsilon_{ij,t} \end{aligned} \tag{4}$$

where the dummy variable $D_{ij,t}^{IFRS}$ takes value equal to one if the bank follows IFRS and zero otherwise. Note that all the models discussed previously can be seen as restricted versions of this specification. Setting the restriction $\delta_1 = \delta_2 = 0$ in (4) leads to a slight generalization of Model III which we shall label Model IV.

4. Empirical results

4.1. Sample descriptive statistics

Having discussed all the econometric specifications and the variables involved, we now turn our attention to the descriptive analysis of the data in our

sample. Table 1 reports the distribution of the number of banks along with the total number of bank-year observations across the different countries in the sample. The whole sample is composed of 17,593 banks with a total number of 133,583 bank-year observations. Not surprisingly, the country with the largest banking sector is the US, followed by Germany, with a total of 9,442 and 2,323 banks, respectively. Attending to the specific accounting standard followed by a bank, 6,483 observations (4.85% out of the total) belong to banks that follow IFRS while 127,100 of them (95.15%) refer to banks that follow the corresponding local GAAP. Note that, since IFRSs were introduced in 2005, samples merging the pre and post-introduction periods are expected to have a growing proportion of IFRS-following firms in the years to come.

Table 1. Description of sample

		TOTAL	IFRS	LocalGAAP
	# Banks	#Bank-year obs.	#Bank-year obs.	#Bank-year obs.
Australia	63	368	161	207
Austria	282	1,880	138	1,742
Bangladesh	36	308	0	308
Belgium	66	441	53	388
Brazil	160	1,013	0	1,013
Canada	80	499	0	499
Chile	33	163	22	141
Costa Rica	35	198	0	198
Denmark	111	867	100	767
Finland	16	71	27	44
France	429	2,729	415	2,314
Germany	2,323	15,992	165	15,827
Hong Kong	69	374	150	224
India	90	569	0	569
Indonesia	81	499	0	499
Ireland	43	236	82	154
Italy	821	6,119	2,383	3,736
Japan	795	5,609	0	5,609
Luxembourg	123	656	39	617
Malaysia	81	419	11	408
Mexico	54	282	0	282
Netherlands	44	264	90	174
New Zealand	18	109	32	77
Norway	141	760	122	638
Peru	20	118	0	118
Philippines	51	278	139	139
Poland	56	315	105	210
Portugal	49	267	102	165
Republic of Korea	32	203	0	203
Russia	763	2,975	1,008	1,967
Singapore	32	142	59	83
South Africa	42	231	92	139
Spain	216	1,244	568	676
Sweden	105	779	63	716
Switzerland	477	2,880	14	2,866
Taiwan	66	413	0	413
Thailand	36	230	0	230
United Kingdom	212	1,515	343	1,172
United States	9,442	81,568	0	81,568
TOTAL	**17,593**	**133,583**	**6,483**	**127,100**

Number of bank and bank-year observations for the 39 countries considered in the sample. Data is broken down according to whether banks follow the IFRS or the local GAAPs accounting standards.

Table 2 provides the usual descriptive statistics for all the variables analyzed in the empirical analysis.

Table 2. Descriptive statistics

	Observ.	Mean	25%	Median	75%	Standard Deviation
Panel A: Whole sample						
$LLPTA_{ij,t}$	133,583	0.0037	0.0005	0.0018	0.0043	0.0112
$ILTA_{ij,t}$	104,042	0.0106	0.0004	0.0031	0.0097	0.0274
$LTA_{ij,t}$	133,583	0.6174	0.5234	0.6420	0.7421	0.1800
$GDPG_{j,t}$	133,583	2.5784	1.4135	2.4905	3.5733	1.6455
$PBTLLPTA_{ij,t}$	133,583	0.0143	0.0080	0.0132	0.0187	0.0260
$TCR_{ij,t}$	97,694	16.7772	11.8000	14.4000	19.4000	7.7861
$SIZE_{ij,t}$	133,583	12.5846	11.2861	12.2073	13.4719	1.8215
$D_{ij,t}^{PBTLLPTA>0} \times PBTLLPTA_{ij,t}$	126,475	0.0162	0.0089	0.0137	0.0190	0.0235
$D_{ij,t}^{2008} \times PBTLLPTA_{ij,t}$	10,907	0.0102	0.0049	0.0104	0.0159	0.0370
Panel B: IFRS						
$LLPTA_{ij,t}$	6,483	0.0040	0.0004	0.0023	0.0048	0.0110
$ILTA_{ij,t}$	4,021	0.0269	0.0052	0.0168	0.0372	0.0365
$LTA_{ij,t}$	6,483	0.6043	0.4762	0.6543	0.7689	0.2195
$GDPG_{j,t}$	6,483	2.9577	1.5318	2.2365	4.0488	2.4878
$PBTLLPTA_{ij,t}$	6,483	0.0165	0.086	0.0134	0.0191	0.0267
$TCR_{ij,t}$	4,591	16.7783	11.1000	13.5000	18.0000	12.9257
$SIZE_{ij,t}$	6,483	14.6667	12.7959	14.3632	16.3699	2.3917
$D_{ij,t}^{PBTLLPTA>0} \times PBTLLPTA_{ij,t}$	6,204	0.0185	0.0093	0.0137	0.0195	0.0230
$D_{ij,t}^{2008} \times PBTLLPTA_{ij,t}$	1,017	0.0125	0.0063	0.0118	0.0165	0.0192
$D_{ij,t}^{IFRS} \times PBTLLPTA_{ij,t}$	6,483	0.0165	0.086	0.0134	0.0191	0.0267
Panel C: Local GAAP						
$LLPTA_{ij,t}$	127,100	0.0037	0.0005	0.0018	0.0042	0.0112
$ILTA_{ij,t}$	100,021	0.0100	0.0004	0.0029	0.0090	0.0267
$LTA_{ij,t}$	127,100	0.6180	0.5250	0.6415	0.7406	0.1777
$GDPG_{j,t}$	127,100	2.5591	1.3126	2.4905	3.5733	1.5882
$PBTLLPTA_{ij,t}$	127,100	0.0142	0.0080	0.0131	0.0187	0.0260
$TCR_{ij,t}$	93,161	16.8280	11.8000	14.5000	19.5000	7.7890
$SIZE_{ij,t}$	127,100	12.4784	11.2493	12.1372	13.3373	1.7213
$D_{ij,t}^{PBTLLPTA>0} \times PBTLLPTA_{ij,t}$	120,271	0.0161	0.0089	0.0137	0.0190	0.0235
$D_{ij,t}^{2008} \times PBTLLPTA_{ij,t}$	9,890	0.0099	0.0047	0.0102	0.0158	0.0383
$D_{ij,t}^{GAAP} \times PBTLLPTA_{ij,t}$	127,100	0.0142	0.0080	0.0131	0.0187	0.0260

Descriptive statistics of the following variables: $LLPTA_{ij,t}$: total loan loss provisions deflated by firm's total assets; $ILTA_{ij,t}$: impaired loans to total assets; $LTA_{ij,t}$: loans to total assets; $GDPG_{j,t}$: Growth of local GDP; $PBTLLPTA_{ij,t}$: profits before tax and loan loss provision deflated by total assets; $TCR_{ij,t}$: total capital ratio; $SIZE_{ij,t}$: natural logarithm of total assets; $D_{ij,t}^{PBTLLPTA>0} \times PBTLLPTA_{ij,t}$: interaction between a dummy variable (1: PBTLLPTA is greater than zero; 0: otherwise) and $PBTLLPTA_{ij,t}$; $D_{ij,t}^{2008} \times PBTLLPTA_{ij,t}$: interaction between a dummy variable (1: year 2008; 0: otherwise) and $PBTLLPTA_{ij,t}$; $D_{ij,t}^{IFRS} \times PBTLLPTA_{ij,t}$: interaction between a dummy variable (1: banks follow IFRS; 0: otherwise) and $PBTLLPTA_{ij,t}$; $D_{ij,t}^{GAAP} \times PBTLLPTA_{ij,t}$: interaction between a dummy variable (1: banks follow local GAAPs; 0: otherwise) and $PBTLLPTA_{ij,t}$. Data on the last three variables are reported considering only the cases where the corresponding dummy takes the value of 1.

LLP represent around a 0.37% of total assets, this figure being similar for banks whether following IFRS or local GAAPs. Impaired loans relative to total assets are much higher for banks following IFRS. However, the total amount of loans relative to total assets is rather similar for all banks, which may indicate

that banks tend to maintain a similar policy regarding their asset structure, regardless of the accounting standards they follow. The profits before taxes and LLP and the total capital ratio are also similar for all banks. Banks following IFRS have a slightly higher size than those following local GAAPs. As already mentioned, the former are usually composed of listed banks, which are, on average, larger banks. Finally, all banks present similar values regarding the interactions of the dummy variables with the profits before taxes and LLP.

The correlations among all the variables considered in the empirical analysis are shown in Table 3.

Table 3. Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12
1	1.00											
2	**0.04**	1.00										
3	**0.02**	**-0.02**	1.00									
4	0.00	**0.02**	**-0.11**	1.00								
5	**0.15**	**-0.13**	-0.00	**0.10**	1.00							
6	-0.00	-0.00	**-0.01**	0.00	-0.00	1.00						
7	**0.02**	**0.02**	**-0.02**	**-0.02**	**0.01**	0.00	1.00					
8	**0.26**	0.00	**-0.06**	**0.14**	**0.72**	-0.00	**-0.03**	1.00				
9	**0.04**	0.01	**0.06**	**-0.23**	**-0.03**	**0.01**	**0.06**	**-0.04**	1.00			
10	**0.01**	**-0.01**	**0.01**	**-0.04**	**0.28**	0.00	**0.03**	**0.32**	**0.29**	1.00		
11	**0.03**	**0.02**	**-0.06**	**0.18**	**0.04**	-0.00	**0.23**	**0.06**	**0.06**	**0.03**	1.00	
12	**0.08**	**0.01**	**-0.04**	**0.18**	**0.22**	-0.00	**0.09**	**0.27**	**0.01**	**0.06**	**0.54**	1.00

Correlations between the variables included in the empirical analysis: 1) $LLPTA_{ij,t}$: total loan loss provisions deflated by firm's total assets; 2) $ILTA_{ij,t}$: impaired loans to total assets; 3) $LTA_{ij,t}$: loans to total assets; 4) $GDPG_{j,t}$: Growth of local GDP; 5) $PBTLLPTA_{ij,t}$: profits before tax and loan loss provision deflated by total assets; 6) $TCR_{ij,t}$: total capital ratio; 7) $SIZE_{ij,t}$: natural logarithm of total assets; 8) $D_{ij,t}^{PBTLLPTA>0} \times PBTLLPTA_{ij,t}$: interaction between a dummy variable (1: PBTLLPTA is greater than zero; 0: otherwise) and $PBTLLPTA_{ij,t}$; 9) $D_{ij,t}^{2008}$: dummy variable (1: year 2008; 0: otherwise); 10) $D_{ij,t}^{2008} \times PBTLLPTA_{ij,t}$: interaction between $D_{ij,t}^{2008}$ and $PBTLLPTA_{ij,t}$; 11) $D_{ij,t}^{IFRS}$: dummy variable (1: banks follow IFRS; 0: otherwise); 12) $D_{ij,t}^{IFRS} \times PBTLLPTA_{ij,t}$: interaction between $D_{ij,t}^{IFRS}$ and $PBTLLPTA_{ij,t}$.

Values in bold are significant at the 5 percent level.

As expected, there is a positive relation between LLP and impaired loans, as a proxy of credit risk exposure, and total loans, as a measure of credit portfolio. The relation between LLP and profits before taxes and LLP is also positive, but is stronger for the variable that considers non-linear responses on earnings, which indicates the relevance of considering asymmetries between earnings and LLP. There is also a positive relation between LLP and the

variables that represent the interaction between the dummy of the year 2008 or the dummy of IFRS and profits before taxes and LLP.

4.2. Estimation results

Models I-III and IV-V are estimated using two different econometric techniques. In this section, we report the results from pooled time-series cross-sectional regressions with two-way cluster-robust standard errors and three-way cluster-robust standard errors following the theoretical derivation developed in Cameron et al. (2009). In addition, we shall consider panel-data techniques as an alternative procedure with which to check the robustness of the results later on.

The distinctive characteristic of multi-way clustered errors in the pooled regression setting is that it allows us to carry out statistical inference which is robust by design to simultaneous dependences of unknown form in both the cross-sectional and time-series dimensions of the panel. Regression errors are assumed to be independent but not identically distributed across a number of clusters and can have fairly general patterns of within cluster correlation and heteroskedasticity. As discussed previously, analyzing accounting data drawn from firms which exhibit differences in the accounting standards between and within countries makes it advisable to correct, at least, for cross-sectional dependences originating from this source of heterogeneity. We construct an auxiliary qualitative variable that takes different values depending on the particular accounting standard to correct for this type of cross-sectional dependence, and use year clusters to simultaneously correct for time-series dependences.[3] In addition, we use three-way cluster-robust standard errors to correct simultaneously for within-year (time-series) dependence, within-accounting standards (cross-sectional) dependence and within-countries (cross-sectional) dependences.

[3] Alternatively, we also computed robust errors clustered by country and year. In our sample, the results (not presented but available upon request) remain qualitatively unaltered.

Table 4 reports the main statistical outcomes from the estimation of Models I to V using pooled time-series regressions with two-way clustered robust errors controlling for accounting standards and years. The results presented are the estimated parameters, the robust *p*-values of the Wald tests for individual significance, and the adjusted goodness of fit (we do not report the estimates for the country control variables in order to save space).

Table 4. Estimation with two-way clusters

	Pooled Regression Double Cluster				
Variable	**M. I**	**M. II**	**M. III**	**M. IV**	**M. V**
$Constant_{ij,t}$	0.000 (0.97)	0.001 (0.72)	-0.002 (0.25)	0.001 (0.65)	-0.001 (0.59)
$ILTA_{ij,t}$	0.084 (0.06)	0.078 (0.07)	0.078 (0.01)	0.078 (0.07)	0.078 (0.07)
$LTA_{ij,t}$	0.004 (0.00)	0.005 (0.00)	0.005 (0.00)	0.006 (0.00)	0.006 (0.00)
$GDPG_{j,t}$	-0.000 (0.08)	-0.000 (0.00)	-0.000 (0.43)	-0.000 (0.00)	-0.000 (0.03)
$PBTLLPTA_{ij,t}$	0.081 (0.00)	-0.127 (0.00)	-0.112 (0.00)	-0.130 (0.00)	-0.125 (0.00)
$TCR_{ij,t}$	0.000 (0.67)	-0.000 (0.50)	-0.000 (0.17)	-0.000 (0.23)	-0.000 (0.00)
$SIZE_{ij,t}$	0.000 (0.82)	0.000 (0.64)	0.000 (0.69)	0.000 (0.44)	0.000 (0.58)
$D_{ij,t}^{PBTLLPTA>0} \times PBTLLPTA_{ij,t}$	-	0.236 (0.00)	0.242 (0.00)	0.235 (0.00)	0.230 (0.00)
$D_{ij,t}^{2008}$	-	-	0.003 (0.00)	-	0.002 (0.00)
$D_{ij,t}^{2008} \times PBTLLPTA_{ij,t}$	-	-	-0.090 (0.06)	-	-
$D_{ij,t}^{IFRS}$	-	-	-	-0.004 (0.00)	-0.004 (0.00)
$D_{ij,t}^{IFRS} \times PBTLLPTA_{ij,t}$	-	-	-	0.102 (0.00)	0.107 (0.00)
$Country\ Dummies_{j}$	Yes	Yes	Yes	Yes	Yes
R2 adjusted	0.135	0.170	0.184	0.180	0.192
Number observations	97274	97274	97274	97274	97274

Pooled regression time-series with robust errors computed on double cluster (accounting standard and year). Dependent variable $LLPTA_{ij,t}$: total loan loss provisions deflated by firm's total assets. Independent variables: $ILTA_{ij,t}$: impaired loans to total assets; $LTA_{ij,t}$: loans to total assets; $GDPG_{j,t}$: Growth of local GDP; $PBTLLPTA_{ij,t}$: profits before tax and loan loss provision deflated by total assets; $TCR_{ij,t}$: total capital ratio; $SIZE_{ij,t}$: natural logarithm of total assets; $D_{ij,t}^{PBTLLPTA>0} \times PBTLLPTA_{ij,t}$: interaction between a dummy variable (1: PBTLLPTA is greater than zero; 0: otherwise) and $PBTLLPTA_{ij,t}$; $D_{ij,t}^{2008}$: dummy variable (1: year 2008; 0: otherwise); $D_{ij,t}^{2008} \times PBTLLPTA_{ij,t}$: interaction between $D_{ij,t}^{2008}$ and $PBTLLPTA_{ij,t}$; $D_{ij,t}^{IFRS}$: dummy variable (1: banks follow IFRS; 0: otherwise); $D_{ij,t}^{IFRS} \times PBTLLPTA_{ij,t}$: interaction between $D_{ij,t}^{IFRS}$ and $PBTLLPTA_{ij,t}$.
Robust *p*-values in brackets.

Table 5. Estimation with three-way clusters

	Pooled Regression Three-Way Cluster				
Variable	**M. I**	**M. II**	**M. III**	**M. IV**	**M. V**
$Constant_{ij,t}$	-0.002 (0.16)	-0.004 (0.00)	-0.004 (0.00)	-0.004 (0.00)	-0.004 (0.00)
$ILTA_{ij,t}$	0.087 (0.02)	0.084 (0.02)	0.082 (0.02)	0.084 (0.02)	0.082 (0.02)
$LTA_{ij,t}$	0.003 (0.00)	0.005 (0.00)	0.005 (0.00)	0.005 (0.00)	0.004 (0.00)
$GDPG_{j,t}$	0.000 (0.32)	0.000 (0.28)	0.000 (0.91)	0.000 (0.16)	0.000 (0.72)
$PBTLLPTA_{ij,t}$	0.083 (0.00)	-0.131 (0.00)	-0.127 (0.00)	-0.133 (0.00)	-0.129 (0.00)
$TCR_{ij,t}$	0.000 (0.12)	0.000 (0.00)	0.000 0.15)	0.000 (0.00)	0.000 (0.11)
$SIZE_{ij,t}$	0.000 (0.36)	0.000 (0.08)	0.000 (0.07)	0.000 (0.03)	0.000 (0.01)
$D_{ij,t}^{PBTLLPTA>0} \times PBTLLPTA_{ij,t}$	-	0.243 (0.00)	0.240 (0.00)	0.242 (0.00)	0.239 (0.00)
$D_{ij,t}^{2008}$	-	-	0.003 (0.00)	-	0.003 (0.00)
$D_{ij,t}^{2008} \times PBTLLPTA_{ij,t}$	-	-	-[4]	-	-
$D_{ij,t}^{IFRS}$	-	-	-	-0.003 (0.00)	-0.003 (0.00)
$D_{ij,t}^{IFRS} \times PBTLLPTA_{ij,t}$	-	-	-	0.131 (0.00)	0.126 (0.00)
$Country\ Dummies_{j}$	No	No	No	No	No
R2 adjusted	0.129	0.165	0.170	0.169	0.174
Number obsservations	97274	97274	97274	97274	97274

Pooled regression time-series with robust errors computed on three-way cluster (country, accounting standard and year). Dependent variable $LLPTA_{ij,t}$: total loan loss provisions deflated by firm's total assets. Independent variables: $ILTA_{ij,t}$: impaired loans to total assets; $LTA_{ij,t}$: loans to total assets; $GDPG_{j,t}$: Growth of local GDP; $PBTLLPTA_{ij,t}$: profits before tax and loan loss provision deflated by total assets; $TCR_{ij,t}$: total capital ratio; $SIZE_{ij,t}$: natural logarithm of total assets; $D_{ij,t}^{PBTLLPTA>0} \times PBTLLPTA_{ij,t}$: interaction between a dummy variable (1: PBTLLPTA is greater than zero; 0: otherwise) and $PBTLLPTA_{ij,t}$; $D_{ij,t}^{2008}$: dummy variable (1: year 2008; 0: otherwise); $D_{ij,t}^{2008} \times PBTLLPTA_{ij,t}$: interaction between $D_{ij,t}^{2008}$ and $PBTLLPTA_{ij,t}$; $D_{ij,t}^{IFRS}$: dummy variable (1: banks follow IFRS; 0: otherwise); $D_{ij,t}^{IFRS} \times PBTLLPTA_{ij,t}$: interaction between $D_{ij,t}^{IFRS}$ and $PBTLLPTA_{ij,t}$.
Robust *p*-values in brackets.

Similarly, Table 5 reports the estimated coefficients of Models I-V with no country dummies when the multi-way cluster controls simultaneously for countries, accounting standards, and years. It should be noted that for the conventional OLS standard errors, all the estimated coefficients in these tables

[4] It was not possible to estimate the model with this interaction term. Note that the computational intensity of three-way clustering may cause problems when the data set is large or includes many indicator variables.

are highly significant. We do not report these results because it is widely known that ignoring cluster dependences in estimating standard errors can considerably underestimate the true variability of the slope estimates when the regression residuals are not independent or identically distributed.

As expected, the LLP is positively and significantly related to the variables that proxy for the credit risk conditions that characterize the nondiscretionary component. Increments in the relative level of impaired loans and/or in the credit portfolio lead to increments of LLP. As expected, the cyclical pattern of LLP is confirmed through the negative dependence on the GDP growth. This relation is negative and, apart from Model III, statistically significant for all the models considered, which agrees with the usual findings in previous literature. The analysis on the estimated slope on the capital variable shows mixed evidence. The estimated coefficient is not significant in Models I, II, III and IV, as in Collins et al. (1995). For the most general specification, Model V, the estimated coefficient is negative and highly significant. The latter agrees with the empirical evidence reported in, among others, Moyer (1990), Beatty et al. (1995) and Ahmed et al. (1999) and suggests that managers use LLP to reduce the expected regulatory costs associated with violating capital requirements. The estimated coefficient related to the SIZE control variable is positive in all the estimated models, but the tests cannot reject the null of no significance.

We now turn our attention to the coefficients related to the income variable and the related conditioning variables that capture non-linear patterns and other cross-effects. First, when analyzing the results from the simplest Model I, the results strongly support the earnings smoothing hypothesis. The estimated coefficient is about 0.08 and the *p*-value of the individual *t*-statistic largely rejects the null hypothesis. The results in Model II that allow for non-linear effects possibly originated by the heterogeneity in the managerial incentives are consistent with Healey's compensation theory and would indicate the complexity of managers' activities and their incentives. The estimated coefficient related to the earnings variable is nearly -0.13, whereas the estimated slope of signed (positive) earnings is almost 0.24, both of which are highly significant. As a result, negative earnings lead managers to increase

discretionary LLP and reduce the size of the reported earnings, whereas positive earnings are smoothed through a net coefficient of 0.11, which is statistically significant and much larger than the value estimated under the simplest model. These results do not vary significantly across the different models estimated and qualitatively agree with the evidence shown by Laeven and Majnoni (2006). Therefore, the main conclusion at this point is that bank managers manipulate reported earnings through both “big bath” and smoothing strategies. Kirschenheiter and Melumad (2002) have discussed how both strategies may coexist in an equilibrium model.

It should be noted that including asymmetry increases the goodness of fit of the model from 13% to 17%, which nearly represent an enhancement of 30%. Among all the specifications we have considered, this provides the largest relative increment in the overall fitting, thus indicating the importance of accounting properly for nonlinear patterns on earnings. Interestingly, the absolute value of the estimated coefficients under the asymmetric specification is much larger than the corresponding coefficient under the restricted model. Since the non-linear model provides a much better fitting in statistical terms and its suitability cannot be rejected, we must conclude that the results in the restricted specification (i.e., Model I) suffer from biases due to model misspecification. Similar qualitative evidence can be observed in the results of Laeven and Majnoni (2006, Table 4, p.188). This feature provides a statistical argument to justify, at least partially, why most papers that neglect the non-linear response of LLP to earnings often find it difficult to reject the null hypothesis that earnings are not smoothed. The restricted model *i)* tends to bias the size of the estimated coefficient downwards, as it is defined on a weighted sum that mixes effects with opposite signs, and *ii)* neglected asymmetries increase unnecessarily the residual variance of the model. Both effects work jointly to reduce the significance of the overall estimated coefficient.

Once the statistical prevalence of the model with asymmetric effects has been accepted, the next interesting result to comment upon is the relative effect associated to the differences in the accounting standards in Models IV and V. All other factors being equal, and after accounting for a number of factors, we

observe that banks that follow IFRS in our sample tend to provision smaller *unconditional* expenses than local GAAP banks (the coefficient related to the IFRS constant dummy is negative and significant), but on the other hand, they have a greater propensity to smooth earnings through the discretionary use of LLP. In other words, banks following IFRSs seem to have larger facilities to use the discretionary component of LLP, when controlling for a number of different factors. As a robustness check, we also analyzed the overall evidence when excluding the data from the US in the sample (the complementary results are not presented in order to save space, but are available upon request). For the comparison between non-US GAAP and IFRS firms, the estimations showed a negative value of the smoothing propensity of IFRS firms (estimated coefficients of -0.013 and -0.011 for Models IV and V, respectively) which was not statistically significant at conventional levels (the three-way cluster robust *p*-values are 0.85 and 0.87, respectively). The lack of significance in this auxiliary analysis remained present when using alternative estimation methods based on panel-data approaches. Therefore, as in Barth et al. (2006), we conclude that IFRS accounting systems seem to exhibit lower accounting quality in earnings smoothing terms than US GAAP. In our sample, and given our econometric approach, we cannot reject the hypothesis that the quality of IFRSs is not higher, from a statistical viewpoint, than non-US local GAAPs in the banking industry. It seems that there exists a global pattern in terms of smoothing in the banking industry and accounting and regulation environment allows a higher level of smoothing for countries other than the US.

Finally, Models III and V also allow us to address whether, as a consequence of the financial crisis and/or the accounting changes in 2008, the propensity to smooth earnings have experienced significant changes. The coefficient of the unconditional dummy variable in 2008 is positive and significant, showing increments in loan-loss provisioning as a consequence of the financial crisis. More interestingly and less obvious is the fact that the propensity to smooth earnings drops significantly in this period. It seems clear that, on average, banks increased LLP during 2008 using mechanisms other than earnings smoothing. A possible explanation for this fact is that, since the credit risk has aroused considerable concern and consequent attention from

investors and regulators with regard to the industry's reporting practices, bank managers would have had incentives to act more prudently. Alternatively, Healey's (1985) compensation theory provides another reason to explain this decline. As a consequence of the credit crisis in 2008 and the need for setting higher nondiscretionary loan-loss provisioning, economic earnings fell dramatically in the banking industry. For instance, the Federal Deposit Insurance Corporation reported that LLP in the US commercial banks surpassed $50 billion for the second quarter of 2008, when the financial crisis hit its most critical stage, absorbing almost one-third of the total industry's net operating revenue and causing a massive decline in reported earnings. Hence, bank managers who have compensation schemes with variable bonuses are less inclined to artificially reduce the size of reported earnings.

5. Robustness checks

5.1. Panel data estimation

As an alternative to the cross-sectional approach, we re-estimate Models I to V using panel-data procedures, specifically, random effects and instrumental estimation; see Laeven and Majnoni (2006). The main advantage of the panel-data methodology is that it allows us to control for the unobservable individual heterogeneity, i.e., the individual characteristics that are not explicitly included in the empirical regressions. In addition, instrumental estimation renders consistent estimates even if some of the explanatory variables present problems of endogeneity or simultaneity, a likely scenario given the nature of the regressors involved in our analysis. On the other hand, the panel data methodology controls for individual heterogeneity across banks, but not for differences in accounting standards, which reinforces the use of the dummy variables related to accounting standards in Models IV and V. Also, when panel data is estimated by GMM in an applied setting, it is often the case that the selection of instruments cannot be justified by any rigorous theoretical discussion, as discussed by Larcker and Rusticus (2010) in different fields of accounting research. As in the previous literature on earnings smoothing (e.g.,

Laeven and Majnoni, 2006; Bouvatier and Lepetit, 2008; Fonseca and González, 2008; Pérez et al., 2008) the instruments used in the GMM estimation of the panel data model are defined through the lagged values of the regressors.

Table 6 reports the results from the random effects estimation, including estimated coefficients and individual Wald tests' *p*-values computed from robust errors to serial correlation and heterogeneity of unknown form according to the Hubert-White procedure. The main outcomes show that the point estimates of the slope coefficients differ considerably from the estimates based on pooled regressions, but the qualitative evidence that emerges is essentially the same. We observe the positive and significant dependence of LLP on the main variables that characterize the nondiscretional component of the allowance, the negative correlation to the business cycle conditions, and the strong influence of income on the LLP dynamics. As before, the overall evidence supports the existence of smoothing patterns and "big-bath" techniques depending on the size of earnings, and a higher propensity to smooth earnings for banks following IFRSs. The most relevant difference refers to the significance of the dummy variables related to 2008. As in pooled regressions, the estimated coefficient for the marginal propensity to smooth earnings during the toughest period of the financial crisis turns out to be negative, but it is not significant at any of the conventional levels under the panel-data econometric approach.

Table 6. Estimation with panel data-random effects

	Panel data with random effects				
Variable	**M. I**	**M. II**	**M. III**	**M. IV**	**M. V**
$Constant_{ij,t}$	0.007 (0.00)	0.002 (0.22)	0.003 (0.11)	0.001 (0.38)	0.002 (0.20)
$ILTA_{ij,t}$	0.105 (0.00)	0.101 (0.00)	0.099 (0.00)	0.102 (0.00)	0.100 (0.00)
$LTA_{ij,t}$	0.003 (0.00)	0.005 (0.00)	0.004 (0.00)	0.005 (0.00)	0.004 (0.00)
$GDPG_{j,t}$	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)
$PBTLLPTA_{ij,t}$	0.053 (0.05)	-0.097 (0.00)	-0.087 (0.00)	-0.101 (0.21)	-0.090 (0.00)
$TCR_{ij,t}$	0.000 (0.36)	0.000 (0.21)	0.000 (0.43)	0.000 (0.43)	0.000 (0.44)
$SIZE_{ij,t}$	-0.000 (0.00)	-0.000 (0.30)	-0.000 (0.01)	-0.000 (0.88)	-0.000 (0.11)
$D_{ij,t}^{PBTLLPTA>0} \times PBTLLPTA_{ij,t}$	-	0.181 (0.00)	0.184 (0.00)	0.182 (0.00)	0.185 (0.00)
$D_{ij,t}^{2008}$	-	-	0.003 (0.00)	-	0.003 (0.00)
$D_{ij,t}^{2008} \times PBTLLPTA_{ij,t}$	-	-	-0.052 (0.14)	-	-0.051 (0.13)
$D_{ij,t}^{IFRS}$	-	-	-	-0.003 (0.00)	-0.003 (0.00)
$D_{ij,t}^{IFRS} \times PBTLLPTA_{ij,t}$	-	-	-	0.110 (0.00)	0.110 (0.11)
$Country\ Dummies_{j}$	Yes	Yes	Yes	Yes	Yes
R2 adjusted	0.133	0.170	0.179	0.171	0.182
Number observations	97274	97274	97274	97274	97274

Panel data methodology with random effects. Dependent variable $LLPTA_{ij,t}$: total loan loss provisions deflated by firm's total assets. Independent variables: $ILTA_{ij,t}$: impaired loans to total assets; $LTA_{ij,t}$: loans to total assets; $GDPG_{j,t}$: Growth of local GDP; $PBTLLPTA_{ij,t}$: profits before tax and loan loss provision deflated by total assets; $TCR_{ij,t}$: total capital ratio; $SIZE_{ij,t}$: natural logarithm of total assets; $D_{ij,t}^{PBTLLPTA>0} \times PBTLLPTA_{ij,t}$: interaction between a dummy variable (1: PBTLLPTA is greater than zero; 0: otherwise) and $PBTLLPTA_{ij,t}$; $D_{ij,t}^{2008}$: dummy variable (1: year 2008; 0: otherwise); $D_{ij,t}^{2008} \times PBTLLPTA_{ij,t}$: interaction between $D_{ij,t}^{2008}$ and $PBTLLPTA_{ij,t}$; $D_{ij,t}^{IFRS}$: dummy variable (1: banks follow IFRS; 0: otherwise); $D_{ij,t}^{IFRS} \times PBTLLPTA_{ij,t}$: interaction between $D_{ij,t}^{IFRS}$ and $PBTLLPTA_{ij,t}$.

Robust *p*-values in brackets computed according the Huber-White asymptotic covariance matrix.

Table 7. Estimation with panel data-GMM

	GMM Panel data				
Variable	**M. I**	**M. II**	**M. III**	**M. IV**	**M. V**
$Constant_{ij,t}$	-	-	-	-	-
$ILTA_{ij,t}$	0.336 (0.00)	0.324 (0.00)	0.197 (0.00)	0.312 (0.00)	0.152 (0.00)
$LTA_{ij,t}$	0.014 (0.00)	0.015 (0.00)	0.012 (0.00)	0.014 (0.00)	0.012 (0.00)
$GDPG_{j,t}$	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)
$PBTLLPTA_{ij,t}$	0.019 (0.02)	-0.059 (0.00)	-0.030 (0.00)	-0.050 (0.00)	-0.045 (0.00)
$TCR_{ij,t}$	0.000 (0.00)	0.000 (0.00)	0.000 (0.70)	0.000 (0.00)	0.000 (0.67)
$SIZE_{ij,t}$	-0.003 (0.00)	-0.002 (0.00)	-0.002 (0.00)	-0.002 (0.00)	-0.001 (0.00)
$D_{ij,t}^{PBTLLPTA>0} \times PBTLLPTA_{ij,t}$	-	0.087 (0.00)	0.047 (0.00)	0.067 (0.00)	0.072 (0.00)
$D_{ij,t}^{2008}$	-	-	0.002 (0.00)	-	0.002 (0.00)
$D_{ij,t}^{2008} \times PBTLLPTA_{ij,t}$	-	-	-0.015 (0.09)	-	-0.017 (0.04)
$D_{ij,t}^{IFRS}$	-	-	-	-0.004 (0.30)	-0.022 (0.00)
$D_{ij,t}^{IFRS} \times PBTLLPTA_{ij,t}$	-	-	-	0.119 (0.00)	0.097 (0.00)
$Country\ Dummies_j$	Yes	Yes	Yes	Yes	Yes
m1	0.000	0.000	0.000	0.000	0.000
m2	0.258	0.211	0.266	0.234	0.275
Number observations	83640	83640	83640	83640	83640

Panel data methodology with two-step difference GMM (Arellano and Bond, 1991). Dependent variable $LLPTA_{ij,t}$: total loan loss provisions deflated by firm's total assets. Independent variables: $ILTA_{ij,t}$: impaired loans to total assets; $LTA_{ij,t}$: loans to total assets; $GDPG_{j,t}$: Growth of local GDP; $PBTLLPTA_{ij,t}$: profits before tax and loan loss provision deflated by total assets; $TCR_{ij,t}$: total capital ratio; $SIZE_{ij,t}$: natural logarithm of total assets; $D_{ij,t}^{PBTLLPTA>0} \times PBTLLPTA_{ij,t}$: interaction between a dummy variable (1: PBTLLPTA is greater than zero; 0: otherwise) and $PBTLLPTA_{ij,t}$; $D_{ij,t}^{2008}$: dummy variable (1: year 2008; 0: otherwise); $D_{ij,t}^{2008} \times PBTLLPTA_{ij,t}$: interaction between $D_{ij,t}^{2008}$ and $PBTLLPTA_{ij,t}$; $D_{ij,t}^{IFRS}$: dummy variable (1: banks follow IFRS; 0: otherwise); $D_{ij,t}^{IFRS} \times PBTLLPTA_{ij,t}$: interaction between $D_{ij,t}^{IFRS}$ and $PBTLLPTA_{ij,t}$.
Robust *p*-values in brackets computed according the Huber-White asymptotic covariance matrix.

Table 7 reports the results from the panel data with instrumental estimation performed on Models I to V through the Generalized Method of Moments (GMM), put forward by Arellano and Bond (1991). This methodology performs estimation by taking first differences, which eliminates any bias caused by the

unobserved bank specific characteristics.[5] In order to avoid the simultaneity bias, one-year lags of the explanatory variables are used as instruments. The GDP growth and the country dummies are the only variables considered exogenous, as in Fonseca and Gonzalez (2008). This table reports the estimated coefficients, *p*-values, and the *p*-values of two standard tests to check the consistency of the GMM estimator. The first test (namely, m1) examines whether there is first-order serial correlation in the difference of the residuals, which will be necessarily autocorrelated by construction. The second test (m2) focuses on the absence of second-order serial correlation. The null hypothesis of the second test has to be rejected to accept the validity of the instruments. As in the case of random effects, we observe large differences in the estimated size of the coefficients in relation to pooled regressions, but the qualitative evidence matches perfectly the original results.

5.2. Other robustness checks

In addition, we have considered a number of checkpoints in an effort to gain further insight and validate the overall empirical evidence. In order to save space, we report a brief description of the analysis and the main conclusions for the most general Models IV and V. Complete results are available upon request.

A) *Subsample analysis*. Models I to V were also estimated after removing the data corresponding to the US banks, as the relative weight of this country over the size of the total sample represents a sizeable proportion. Some remarks are worth commenting upon. As discussed previously, the differences between IFRS and Local (non-US) GAAP are not statistically significant. The estimated coefficients reveal again the existence of income-decreasing strategies for negative earnings and smoothing patterns when earnings are positive. The size of the estimated coefficient β_4 related to negative income is very similar to the estimates using the whole sample and, interestingly enough, the differences

[5] This technique has only been used in a relatively few number of recent papers, which refer to data based on an international context (Laeven and Majnoni, 2006; Bouvatier and Lepetit, 2008; and Fonseca and Gonzalez, 2008) or on an individual country (Pérez et al., 2008).

between the different estimation techniques (pooled regression and panel-data) tend to disappear. The statistical evidence, however, is less conclusive: whereas pooled regressions with three-way cluster robust errors cannot reject the null of non-significance of the estimated β_4 slope, the panel-data approach with random effects finds marginal evidence at the 90% confidence level, and the panel-data procedure with GMM estimation largely supports the significance of the estimated coefficient. The estimated value of the coefficient related to the positive earnings, γ, is positive and highly significant and renders a larger estimate of the β_4^* coefficient, thus suggesting a higher propensity to smooth earnings in non-US countries. Therefore, we can conclude in favour of nonlinear patterns and smoothing practices in large incomes, with the statistical evidence on earnings-decreasing strategies being less conclusive than when the US firms are analyzed.

B) *Dynamic patterns*. Some authors have argued for the inclusion of a number of lags of the dependent variable to take into account a dynamic adjustment of the LLP through an autoregressive-type representation. It is interesting to note, however, that there is not a unanimous agreement in practice on whether these patterns should be included in the main equation. The lagged values of LLP include the effects of the (unobservable) discretionary and nondiscretionary components, which in practice, may exhibit different dynamic adjustments. If so, the estimate of the overall autoregressive coefficient may be biased. Also, Pérez et al. (2008) consider a general accounting framework which explicitly models the process that drives LLP with the aim of providing a certain theoretical foundation, from which a reduced-form equation is derived. The resulting specification (similar to Model I) does not include dynamic effects. The inclusion of AR(1)-type dynamics do not lead to qualitative changes in the main conclusions.

C) *Other variables*. In addition to the main results, we have considered other variables as potential drivers (or control variables) in the LLP main equation. For instance, following Pérez et al. (2008), we included the annual return from a

stock market index in those countries for which this information was available. The overall evidence did not change.

D) *Two-staged estimation (accrual modelling)*. Several papers have considered an alternative approach that attempts to split explicitly the total LLP into its discretionary and nondiscretionary components. This approach is strongly influenced by the literature devoted to discretionary-accruals models. In the two-staged procedure, the nondiscretionary portion of LLP is explicitly modelled in terms of a number of observable loan-related variables. The resulting equation is estimated by Least-Squares procedure and the resulting residuals (which are, by construction, orthogonal to the nondiscretionary component) are seen as a proxy for the unobservable discretionary portion of LLP. Then, the residuals are regressed onto different variables attempting to determine the drivers of the discretionary component. In our application, we first projected LLP on a constant, the $ILTA$ variable, and two variables representative of the change in impaired loans and change in loans. The estimated residuals from this multivariate regression were then regressed on the earnings variable and the remaining control variables considered in the previous section (size, capital, GDP growth, etc.) The qualitative conclusions from this analysis do not differ in a significant way from those reported in the previous sections.

6. Concluding remarks and policy recommendations

This paper has focused on an international sample of banks from 39 countries to analyze whether differences in the accounting standards result in differences in the extent of earnings smoothing in the banking industry. The empirical results provide remarkably clear evidence supporting the hypothesis that bank managers tend to apply discretionary policies to manage earnings: on average, LLP are used to smooth large earnings or as an income-reducing tool when earnings are abnormally low. Furthermore, after controlling for other effects, we observe that bank managers in banks following non-US GAAPs would exhibit a significantly larger propensity to use their discretionary power to smooth earnings. This result continues to hold true after several robustness

checks. Barth et al. (2006) have reported that firms following IFRSs tend to exhibit lower accounting quality relative to US firms, while Fonseca and González (2008) and Shaw (2003) note that firms with better disclosing practices tend to have a smaller propensity to smooth earnings. The strongest degree of accounting regulation and the greater emphasis on disclosing practices favoured by the US GAAP would contribute to reducing the discretional ability of bank managers for earnings smoothing. In our empirical analysis, we observe a smaller discretion to smooth earnings in IFRS-following firms with respect to non-US local GAAPs, although this difference is not statistically significant. Therefore, US GAAP seems to provide a better accounting and regulatory framework to prevent, or at least mitigate, earnings smoothing practices. In conclusion, the main results of this paper clearly indicate that earnings smoothing has been a global practice over the last years and that it has been more intense outside the US. Since it is accepted that US GAAP tend to be better than IFRSs in terms of smoothing, the accounting quality of financial statements could be improved through explicit rules intended to reduce the level of accounting discretion.

Artificial smoothing practices, such as the ones reported in this study, seek to reduce the volatility of the reported earnings, but tend to generate a lower value relevance of the accounting numbers and a smaller correlation between the firm's statements and the economy. As a result, investors cannot infer how the economic cycle is affecting the firm merely by taking into account the figures from financial statements. Therefore, accounting standards setters should consider the empirical evidence and require higher disclosures with regard to the link between LLP and macroeconomic conditions. Ideally, each bank should disclose and explain carefully, in the notes, the model they follow for estimating future macroeconomic conditions and how they aim to manage the next crisis. Smoothing affects the quality of earnings, but it is also true that expected future losses should be analyzed if supervisors aim to develop adequate capital requirements. In this sense, a macro-financial perspective should be taken into consideration. A possible solution that would not affect the quality of earnings would be to create a certain level of reserves – not provisions – based on general macroeconomic conditions. These "anti-cyclical reserves" would only

affect the structure of capital of the entity but not the accounting standards, because the reserves would act as a buffer for economic downturns. Future expected losses are not a current obligation and, therefore, should not be recognized in financial statements as a provision. With this, the level of earnings management would decrease and earnings quality would improve. The solution with solvency requirements explained above, where a higher level of reserves would be required depending on the growth of credit, would reduce the return on equity of the bank and this would discourage excessive credit growth.

In conclusion, the overall empirical evidence suggests that accounting standard setters may increase the quality of accounting numbers in the banking industry, while regulators may take specific actions aimed at reducing the systemic risk in the banking industry. Both objectives are connected to earnings smoothing. The expected future losses should not be an accrual for banks. Instead, these types of losses should be allocated to reserves if we want to limit the incentives for executives to manage earnings. The creation of anti-cyclical reserves taking into account expected future macroeconomic conditions would reduce the incentives to take excessive credit growth, affecting negatively the return on equity, and would make it possible to reveal how the bank views the future and how the bank could manage the next crisis.

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