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EU Banks' Accounting Policy Decisions and Market Influence

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This study investigates the impact that market discipline mechanisms have on European Union (EU) banks' accounting policy decisions. We investigate the association between the level of loan loss provisions (LLPs) with earnings before provisions and taxes when depositors appear to withdraw their funds and demand higher deposit rates. We examine whether market discipline motivates banks to adjust earnings through accounting accruals. Empirical findings suggest that the demand for higher deposit rates limits management's accounting discretion. By contrast, withdrawals appear to encourage managers to use income smoothing via LLPs. The observed associations appear to be conditioned by banks' systemic importance and capital adequacy levels.

1. Introduction

The aftermath of the financial crisis raised serious concerns about banks' financial strength and the ability of supervisors to monitor efficiently banks' risk-shifting incentives. Within this context, regulators and policymakers took initiatives to enhance market discipline (MD). MD is a process whereby private sector agents produce information that helps supervisors recognise problematic situations and implement appropriate corrective measures (Flannery & Nikolova, 2004). MD comprises a complementary regulatory tool for official supervision. The third Pillar of the Basel II Accord gave a formal role to MD as a bank's regulatory mechanism. In fact, Basel II requires banks to provide information that will facilitate market participants to exert discipline. Certain policymakers argue that MD can be a substitute for financial market supervision and regulation (Castagnolo & Ferro, 2013; Stephanou, 2010).

MD may influence banks' accounting decisions and consequently accounting quality. Depositors are critical market participants because their actions can restrain banks' excessive risk-taking (Berger & Turk-Ariss, 2015; Santos, 2001). Depositors' reactions may either trigger the intervention of supervisors or exercise pressure on a bank's liquidity. A bank run triggered by the release of information indicating poor performance is a source of discipline (Jacklin & Bhattacharya, 1988). Bank managers may use accounting accruals to mask excessive risk-taking incentives and adjust earnings and regulatory capital ratios.

LLPs are the most important accounting accrual used in the banking sector. This study examines whether MD prompts banks to engage in income-smoothing practices. We examined the income-smoothing hypothesis by using LLPs as the main accounting tool of banks. We studied how depositors' reactions – the demand for higher deposit rates and the withdrawal of depositors' funds – affect banks' accounting policy decisions. Furthermore, we investigated whether the decision of banks to use discretionary accruals is conditioned by the level of banks' capital ratio. In addition, we examined whether MD efficiency differs between globally systemically important banks (GSIBs) and other banks.

We found that depositors' decision to withdraw their funds are positively associated with income smoothing. However, the request for higher deposit rates limits managerial discretion and deters banks from income smoothing via LLPs. The efficiency of MD mechanisms appears to be associated with the level of banks' capital adequacy ratios. Finally, our results imply that MD is more influential on GSIBs than on other banks.

Our study contributes to the literature on banks' accounting discretionary behaviour. The banking sector is heavily regulated, and banks have special characteristics that require special examination (Levine, 2003). In addition, our analysis contributes to the existing body of research by focusing on how MD affects managements' accounting discretion, an issue that has attracted relatively limited attention. Our findings provide evidence that depositors' reactions may influence banks' accounting and financing decisions. The findings of this study can be useful to practitioners and regulators, since we examine the effectiveness of regulators' decision to assign MD an important role within EU banks' monitoring framework.

The rest of the paper proceeds as follows: the second section provides a concise literature review, while presenting the hypotheses examined within this study. The third section refers to the sample description and to the adopted research design. The fourth section presents and discusses the findings of this study, while the fifth section offers conclusions.

2. Hypotheses and Motivation

2.1 Literature Review

Bank managers use LLPs to smooth earnings, aiming to further their interests (Fonseca & González, 2008; Greenawalt & Sinkey, 1988; Kanagaretnam et al., 2004; Ozili, 2017a, 2017b; Wahlen, 1994). Alternatively, bank managers use LLPs to signal information to outsiders regarding the quality of bank portfolios (Beaver et al., 1989; Beaver & Engel, 1996; Kanagaretnam et al., 2005; Liu & Ryan, 1995; Wahlen, 1994). Furthermore, the restrictive regulation that has been imposed on the banking sector may prompt managers to smooth income and regulatory capital to avoid any potential regulatory intervention (Ahmed et al., 1999; Anandarajan et al., 2007; Collins et al., 1995; Kim & Kross, 1998; Leventis et al., 2011; Ozili, 2015).

Income smoothing distorts transparency and influences both financial stability and stakeholders' interests (Ahmed et al., 2013; Bhattacharya et al., 2003). Accordingly, the EU undertook initiatives to improve transparency and accounting quality by introducing the International Financial Reporting Standards (IFRS) accounting framework. The adoption of this new accounting framework appears to have limited banks' income-smoothing behaviour, but it has not eliminated it (Gebhardt & Novotny-Farkas, 2011;

Hamadi et al., 2016; Leventis et al., 2011). Realising the risks deriving from financial innovation and the complexity of banks' operations, the EU adopted the regulatory framework of the Basel II Accord.

The regulatory framework of Basel II focused on the improvement of banks' monitoring mechanisms by introducing official supervision and market discipline as regulatory tools of high importance. The Basel Committee on Banking Supervision (Basel Committee on Banking Supervision, 2001, p. 1) noted that "Market discipline imposes strong incentives on banks to conduct their business in a safe, sound and efficient manner, including an incentive to maintain a strong capital base as a cushion against potential future losses arising from risk exposures." In fact, official supervision and MD could be seen as complementary and self-reinforcing (Stephanou, 2010). As mentioned earlier, MD is a mechanism through which market participants monitor and discipline banks' risk-taking behaviour (Min, 2015). Depositors may play the most important role as an MD mechanism given that they are less sophisticated and may discipline risky banks by withdrawing their funds (Calomiris & Kahn, 1991).

The success of MD depends on two factors: effective monitoring and market influence (Bliss & Flannery, 2001). Effective monitoring occurs when market participants' perceptions about a firm's condition are reflected in changes in the firm's stock and bond prices (Bliss, 2004). Market influence is the ability of market participants to affect a firm's financial decisions. MD studies have mostly focused on examining the effective monitoring hypothesis.

MD can operate on either an *ex-ante* or *ex-post* form (Bliss, 2004). The *ex-ante* form of MD occurs when market participants discourage bank managers from engaging in excessive risk-taking activities, while *ex-post* MD occurs when MD results in bank runs, share price collapse, and lawsuits. Stephanou (2010) classified MD into direct and indirect forms. Direct MD occurs when market participants themselves can take actions against banks' risk-taking behaviour. For instance, MD is exerted when depositors decide to withdraw their funds or when investors sell their shares at low prices (Flannery & Nikolova, 2004). Previous research concluded that depositors could discipline banks either by withdrawing deposits (Billett et al., 1998; Davenport & McDill, 2006; Jordan et al., 2000; Shimizu, 2009) or by asking for higher deposit rates (Baer & Brewer, 1986; Ellis & Flannery, 1992; Hannan & Hanweck, 1988; Hess & Feng, 2007). Indirect MD is usually caused by regulatory intervention, when supervisors notice a market signal about a bank's probability of failure. In this case, regulators impose discipline through risk-based capital requirements and continued monitoring.

Within this context, a combination of regulatory and MD measures can be exercised upon banks. The results of these two forms of discipline determine the cost of risk-taking (Billett et al., 1998). If the costs of regulatory and market discipline differ, banks are expected to prefer the less costly option (Billett et al., 1998). An alternative approach suggests that MD is the main reason that banks maintain capital ratios that exceed the minimum capital requirements (Fonseca

& González, 2010). When bank liabilities are not fully insured, depositors will demand higher returns to limit managers' excessive risk-taking. Thus, if bankers deem that MD costs are higher, they will be encouraged to increase capital and reduce banks' risk and cost of debt.

The above arguments imply that when banks make financing decisions, they may take into consideration depositors' reactions (Fonseca & González, 2010). Banks can respond by increasing regulatory capital either through equity issuance or by reducing their asset levels. However, both decisions may convey negative signals to market participants (Fonseca & González, 2008).

Within this context, banks may prefer to adjust income through accounting accruals and avoid potential costs from an equity issuance or an asset reduction. Thus, in response to depositors' reactions (an MD mechanism), bankers may exploit the latitude provided by LLPs' accounting framework and overstate (or understate) LLPs and adjust both income and regulatory capital. The outcome of this interaction depends on management's incentives and the ability of depositors to discern managers' intentions.

2.2 Hypotheses Development

When depositors exert discipline, managers will try to distinguish their own 'strong' bank from other 'weak' banks (Kanagaretnam et al., 2004). LLPs constitute a credit signal because an increase in LLPs implies a management intention to convey private information (Beaver et al., 1989). Depositors who discern management's signal will stop withdrawing funds or stop asking for higher rates. On the other hand, depositors who fail to interpret managers' signals will keep disciplining banks, causing a liquidity shock and a subsequent run. Santos (2001) explained that a run can occur without the release of adverse information about the bank's assets and even when there is perfect information about the bank's assets.

Compared with their official supervisors, bank managers are better informed about their bank's risk (Santos, 2001); thus, banks are expected to analyse market signals faster than their official supervisors and other banks' monitors. Subsequently, managers may consider if they have to adjust LLPs in order to smooth income and regulatory capital ratios. In particular, if managers observe a decline in the current year's deposits, they will have to understate LLPs in order to improve the bank's equity through an income increase (Collins et al., 1995). When market confidence returns, they will reverse the discretionary amount of LLPs according to the mechanics of earnings management through accounting accruals (Guay et al., 1996). On the other hand, managers who observe high confidence from depositors may deliberately overstate LLPs and allocate a capital buffer for a "rainy day" (Moyer, 1990). It should be noted that within this study no distinction is made between wholesale and retail deposits. Deposit insurance in EU Member States amounted to €100,000 for the period under investigation. The behaviour of small depositors (less than €100,000) might have been different from that of large depositors (more than €100,000).

However, information regarding the level of insured vs. uninsured deposits was not available in published financial statements under examination. We tested the following hypothesis.

> *H1: There is no difference in the association between LLPs and earnings before provisions and taxes between banks with an increased level of deposits and banks with a decreased level of deposits.*

Bank managers are likely to adjust income through LLPs when they observe investor demand for higher deposit rates. Depositors who anticipate an increased bank risk will demand higher deposit rates. Subsequently, official supervisors are expected to recognise the bank's increased risk and intervene in management operations. In order to avoid regulatory intervention, banks are expected to understate LLPs and increase income and regulatory capital upwards. When depositors feel certain about the bank's financial health, managers will reverse the capital buffer previously created through discretionary LLPs. Therefore, we formulate the following hypothesis.

> *H2: There is no difference in the association between LLPs and earnings before provisions and taxes between banks with an increased rate of deposits and banks with a decreased rate of deposits.*

Banks' capital adequacy may influence bank managers' income-smoothing decisions and subsequently the efficiency of MD. However, their decision to engage in discretionary accounting practices imposes costs on them because a bank's capital ratio may well differ from its target ratio (Fonseca & González, 2010). For instance, if banks deem that depositors are likely to withdraw their funds due to anticipated risk, managers will understate LLPs and increase both income and regulatory capital so that the bank's perceived risk is lessened. Banks with capital ratios lower than their target will face higher costs to achieve these adjustments. By contrast, banks with high capital ratios are less likely to attract supervisors' attention and will thus face lower costs.

The effectiveness of MD may also be influenced by a bank's size, since large banks may be deemed "too big to fail" (Thomson, 2009). Governments may provide guarantees of repayment to the large uninsured creditors of the biggest banks to ensure they do not suffer any loss (Mishkin, 1999). Large depositors have fewer incentives to monitor big banks since they are certain that they will not suffer any losses.

In the aftermath of the global financial crisis, both the Financial Stability Board (FSB) and the European Banking Authority (EBA) sought a solution for the ramifications of the too-big-to-fail problem. They developed a method of identifying GSIBs, to which a set of stricter capital requirements have been applied. These requirements will enhance the going-concern loss absorbency of GSIBs and reduce the probability of their failure.

The evidence supports the argument that size influences bank operations (Beatty & Liao, 2011; Olszak et al., 2016). Peterson and Arun (2018) found that income smoothing has been pronounced among GSIBs in the post-crisis period and was pronounced among non-GSIBs in the pre-crisis period. Empirical findings imply that the too-big-to-fail policy reduces MD (Kane, 2000; Penas & Unal, 2004). MD may differ between systemically important and not systemically important banks (Demirgüç-Kunt & Huizinga, 2013). If MD is greater for large banks, then managers' accounting discretion may differ depending on the bank's importance and the extent of market participants' discipline. In particular, governments' forbearance policies for GSIBs may deter depositors from withdrawing their funds from risky banks. Thus, GSIBs may not use accounting accruals to adjust income and capital and avoid supervisory intervention. By contrast, the other banks may have to offset this market reaction through accounting adjustments, attracting the attention of official regulators.

We investigated whether capital adequacy and systemic importance influence the association between managers' accounting discretion and depositors' decisions on funds withdrawal by testing the following hypotheses.

> *H1a: The impact of MD via the withdrawal of deposits on income smoothing through LLPs for banks with higher capital adequacy ratios is not significantly different from the impact of MD on income smoothing through LLPs for banks with lower capital adequacy ratios.*
>
> *H1b: The impact of MD via the withdrawal of deposits on income smoothing through LLPs for GSIBs is not significantly different from the impact of MD on income smoothing through LLPs for non-GSIBs.*

The capital structure may influence banks' accounting adjustments in the case of demands for higher rates. Banks with capital ratios higher than their target may easily absorb the losses from the provision of higher deposit rates. Thus, such banks may not decide to adjust capital through accounting accruals. On the other hand, banks with capital ratios lower than their target may face greater pressure when they have to compensate depositors with higher rates. Therefore, the managers of inadequately capitalised banks have greater incentives to understate LLPs and offset the negative impact of higher rates.

When GSIBs have to provide higher rates to depositors, they may use LLPs to adjust income and capital. However, GSIBs' importance may cause supervisory forbearance, which would increase GSIBs' incentives to smooth income through accounting accruals.

We investigated whether capital adequacy and systemic importance influence the association between managers' accounting discretion and depositors' requirements for higher deposit rates by testing the following hypotheses:

> *H2a: The impact of MD via increased deposit rates on income smoothing through LLPs for banks with higher capital adequacy ratios is not significantly different from the impact of MD on income smoothing through LLPs for banks with lower capital adequacy ratios.*
>
> *H2b: The impact of MD via increased deposit rates on income smoothing through LLPs for GSIBs is not significantly different from the impact of MD on income smoothing through LLPs for non-GSIBs.*

3. Research Design

Our sample consists of 1,064 annual observations drawn from 26 countries for the period 2006–2013. The sample comprises 133 banks. Banks domiciled in Luxembourg are not included in our sample due to missing data. We use 2006 as the base year for our analysis because the EU adopted IFRS on 1 January 2005. Many of the 2005 financial statements were prepared under *First-time Adoption of International Financial Reporting Standards* (IFRS 1), which allowed a number of exceptions for first-time adopters. Using 2005 as the base year would have included in our sample firms that did not operate in a completely uniform accounting environment. Our analysis ends in 2013 because reforms in the banking sector, which came into effect after that year, may have altered not only the incentives of managers but also the efficiency of monitoring by depositors. Thus, the banks included in our sample prepared their financial statements under a uniform accounting regulatory framework.

As in Gebhardt and Novotny-Farkas (2011) and Hamadi et al. (2016), our data was hand collected from the annual reports of EU banks. Table 1 describes our sample construction. Our initial database consisted of 8,019 active financial institutions according to the records of the European Central Bank (ECB) in 2014. We excluded all the financial institutions that were not assessed by a rating agency in order to include only the banks that attract the interest of independent market participants. In our initial sample, 2,021 financial institutions were rated by at least one agency. Furthermore, each selected bank had to provide data for all our variables during the study period in its annual report. Thus, we excluded every bank with at least one missing observation, creating a sample of 133 banks from 26 EU Member States (see Table 2).

Table 1. Sample Selection

Total number of credit institutions in the ECB record of 2014	8,019
Minus: Credit institutions without assessment from a rating agency	5,998
Banks that attract the interest of market independent participants	**2,021**
Minus: Total number of banks without full range of accounting data for the period of 2006–2013	1,888
Minus: Number of outliers	-
Total number of banks in the final sample	133

Table 2. Banks by Country

Country	Observations	Number of Banks
Austria	72	9
Belgium	24	3
Bulgaria	16	2
Cyprus	16	2
Czech Republic	24	3
Denmark	40	5
Estonia	24	3
Finland	16	2
France	80	10
Germany	128	16
Greece	40	5
Hungary	24	3
Ireland	40	5
Italy	144	18
Latvia	8	1
Lithuania	16	2
Malta	8	1
Netherlands	40	5
Poland	32	4
Portugal	40	5
Romania	8	1
Slovakia	24	3
Slovenia	48	6
Spain	48	6
Sweden	48	6
United Kingdom	56	7
Total	1,064	133

We tested our hypotheses using a multivariate model. The development of the model is based on the analysis of models presented in Beatty and Liao (2014). Those models examined the association between discretionary LLPs and income smoothing. We modified those models to examine the interaction between MD reactions and EU banks' income-smoothing behaviour. We used the following equations to investigate the impact of deposit withdrawal and increased deposit rates separately:

$$
\begin{aligned}
LLPt = {} & \beta_o + \beta_1 \times NPLt + \beta_2 \times \Delta NPL_t + \beta_3 \times Co_t \\
& + \beta_4 \times ALW_{t-1} + \beta_5 \times SIZE_{t-1} + \beta_6 \times \Delta GDP_t \\
& + \beta_7 \times \Delta UNEMP_t \times \beta_8 \times \Delta LOANt \times \beta_9 \times LOAN_t \\
& + \beta_{10} \times EBPT_t + \beta_{11} \times \Delta DEPOSITS_t \\
& + \beta_{12} \times CAPITAL_1 + \beta_{13} \times (EBPT_t \times \Delta DEPOSITS_t) \\
& + e_t \text{ (MODEL 1)}
\end{aligned}
$$

$$\begin{aligned} LLP_t = {} & \beta_o + \beta_1 \times NPL_t + \beta_2 \times \Delta NPL_t + \beta_3 \times Co_t \\ & + \beta 4 \times ALW_{t-1} + \beta_5 \times SIZE_{t-1} + \beta_6 \times \Delta GDP_t \\ & + \beta_7 \times \Delta UNEMP_t + \beta_8 \times \Delta LOAN_t + \beta_9 \times LOAN_t \\ & + \beta_{10} \times EBPT_t + \beta_{11} \times \Delta INTEREST_t \\ & + \beta_{12} \times CAPITAL1 + \beta_{13} \times (EBPT_t \times \Delta INTEREST_t) \\ & + e_t \text{ (MODEL 2)} \end{aligned}$$

Where:

LLPt:	Loan loss provisions at the end of year *t* scaled by lagged total loans
NPLt:	Non-performing assets at the end of the current year *t* divided by lagged total loans
ΔNPLt:	Change in non-performing assets at the end of the current year *t* divided by lagged total loans
COt:	Net charge-offs of the current year *t* scaled by lagged total loans
ALWt-1:	Loan loss allowance at the end of the previous year t-1 divided by total loans
SIZEt-1:	The natural log of total assets of the previous year t-1
ΔGDPt:	Change in GDP at the end of the current year *t*
ΔUNEMPt:	Change in unemployment rates at the end of the current year *t*
ΔLOANt:	Change in total loans at the end of the current year *t* divided by lagged total loans
LOANt:	Total loans at the end of the current year *t* divided by total assets
EBPTt:	Earnings before taxes and provisions at the end of the current year *t* scaled by lagged total loans
ΔDEPOSITSt	Dummy variable that takes a value of 1 if the change in a bank's deposits is negative at the end of the year and 0 otherwise
ΔINTERESTt:	Dummy variable that takes the value of 1 if the change in a bank's deposit rates is positive at the end of the year and 0 otherwise
CAPITAL1:	The reported Tier I ratio at the end of the year *t*
EBPTt × ΔDEPOSITSt:	Interaction term between earnings before taxes and provisions (EBPTt) and change of deposits (ΔDEPOSITSt)
EBPTt × ΔINTERESTt:	Interaction term between earnings before taxes and provisions (EBPTt) and change of deposit rates (ΔINTERESTt)

Our multivariate model assumes that LLPs are influenced by credit risk and management's incentives (Beaver & Engel, 1996). The first part of the model aims to capture the factors influencing LLPs' non-discretionary components (Beatty et al., 1995; Collins et al., 1995; Moyer, 1990) and is not associated with management's incentives. The second part of our model consists of variables that aim to capture the relation of LLPs with income smoothing and their interaction with MD factors.

Our dependent variable is the reported LLPs (LLPt) at the end of each period. LLPs reflect management's expectations about future loan losses arising from past due loans. Bank managers ought to recognise an LLP at each year-end. These provisions will be reversed during the next year, when actual loan losses will occur. Although banks recognise LLPs depending on their assets' credit risk, the unspecific guidelines in accounting standards allow them to adjust the level of LLPs and smooth income.

According to *Financial Instruments: Recognition and Measurement* (IAS 39), which was in effect in the period under investigation, banks should recognise LLPs after an assessment of their loan portfolio's credit risk. Banks should assess either their large individual loans or groups of smaller and homogeneous loans and compute loan losses and the probability of default based on past experience and statistical analysis of previous credit losses. Following previous studies (Gebhardt & Novotny-Farkas, 2011; Hamadi et al., 2016), we captured the credit risk of banks' loans by using the change of non-performing loans (ΔNPLt) and the amount of non-performing loans (NPLt) at the end of the current year. Non-performing loans of the current year (NPLt) and their change during the current year (ΔNPLt) are expected to be positively associated with LLPs. Furthermore, we used net charge-offs (COt) in the current year because, according to IAS 39, banks should recognise LLPs when there is a strong probability of the occurrence of a future loss. Within this context, banks will recover actual loan losses from charge-offs by reversing the LLPs of previous years (Gebhardt & Novotny-Farkas, 2011). Therefore, net charge-offs (COt) in the current year are expected to be negatively correlated with LLPs.

Past LLPs' accounting policies may have an impact on the current year's LLPs. The rationale for controlling for past allowances is that, if banks recognise sufficiently high provisions in the past, the current year's LLPs may be lower. However, if past allowance reflects the overall credit quality of the bank's clients, then lagged allowance and provision may be positively correlated (Beatty & Liao, 2014). We controlled for the impact of the loan loss allowance of the previous year (ALWt-1) on the current years' LLPs; we expected a positive correlation between LLPs and the loan loss allowance of the previous year (ALWt-1). We also controlled for bank size (SIZEt-1) because banks of different sizes may be subject to different levels of regulatory scrutiny or monitoring. Furthermore, Olszak et al. (2016) found that banks of different sizes follow different patterns with regard to LLP recognition. Although the 'political costs' hypothesis implies a positive association between accounting accruals and size (Watts & Zimmerman, 1986), we made no clear prediction about the association. Moyer (1990) found no evidence to support the political costs hypothesis, while Bishop (1996) suggested that regulators are reluctant to intervene in the operations of large banks.

We followed Laeven and Majnoni (2003) and Bikker and Metzemakers (2005) and controlled for a country's macroeconomic condition by including the annual growth of GDP (ΔGDPt), the annual growth of a bank's loans (ΔLOANt), annual unemployment rates (ΔUNEMPt), and banks' total lending (LOANt). During economic booms, GDP growth is expected to be positive and unemployment rates low. Consequently, the credit risk of a bank's loan portfolio will not require the recognition of high amounts of LLPs since borrowers will be able to repay their loans. By contrast, banks will recognise higher provisions during recessions due to the low credit quality of their counterparties. Therefore, we expected a negative association between LLPs with GDP growth (ΔGDPt) and a positive relation with unemployment rates (ΔUNEMPt). Regarding banks' loan growth (ΔLOANt) and total lending (LOANt), Laeven and Majnoni (2003) and Beatty and Liao (2011) argued that

LLPs may be higher when a bank extends credit to more clients with lower credit and vice versa. We thus predicted a positive association between our dependent variable and loan growth (ΔLOANt) and total lending (LOANt).

The income-smoothing hypothesis suggests that managers deliberately increase LLPs when earnings are high and create a buffer of capital. When earnings are low, managers can either deliberately understate LLPs or reverse the previous year's recognised provisions to offset unexpected losses (Greenawalt & Sinkey, 1988; Laeven & Majnoni, 2003). Given that the introduction of Basel II eliminated LLPs from the computation of regulatory capital, banks can use LLPs and simultaneously adjust income and regulatory capital (Kim & Kross, 1998). Therefore, we investigated the association between LLPs and income, which in turn influences regulatory capital. We included earnings before provisions and taxes (EBPTt) to investigate banks' income-smoothing incentives. If earnings before provisions and taxes are not positively associated with LLPs, the income-smoothing hypothesis has to be rejected.

We tested hypotheses H1 and H2 by constructing the variables ΔDEPOSITSt and ΔINTERESTt. H1 investigates whether negative deposit change induces banks to engage in income smoothing through LLPs. The independent variable ΔDEPOSITSt is a dummy variable that takes a value of 1 if the change of the bank's customer deposits is negative at the end of the year and 0 otherwise. Similarly with Berger and Turk-Ariss (2015) we computed the deposit growth rate on an annual basis. Thus, a change of deposits equals the difference between total deposits at the end of the year minus total deposits at the end of the previous year. We did not use the total amount of the deposit change to capture depositors' reactions because the absolute difference has different impacts on banks of different sizes and operations. We captured how depositors' reactions affect banks' income-smoothing behaviour using the interaction term EBPTt × ΔDEPOSITSt. If depositors exert MD and influence banks' accounting decisions, the association of LLPs with the interaction term will be negative.

H2 examines whether depositors exert MD and influence managers' incentives to smooth income by demanding higher deposit rates. The independent variable ΔINTERESTt is a dummy variable that takes a value of 1 if the change of a bank's deposit rates is positive at the end of the year and 0 otherwise. Given that a positive change in interest rates is consistent with the effect of MD, we examined whether the fact of a positive change influences banks' accounting decisions. Following Fonseca and González (2010), we computed deposit rates by dividing total interest expense by total deposits. We did not examine a direct association with the percentage change in deposits because this could not be interpreted for banks with different capital structures and sizes. We captured the impact of depositors' discipline using the interaction term EBPTt × ΔINTERESTt. If market participants exert MD, which influences managers' incentives to smooth income, we expected a negative association between LLPs and the interaction term.

Finally, we followed Berger and Turk-Ariss (2015) and control for the potential impact of bank risk on depositor actions. Berger and Turk-Ariss (2015) examined the association between depositor discipline and bank risk-taking behaviour, finding that depositors' discipline, proxied by the annual deposit growth rate, was related to the bank's equity-to-assets ratio. Accordingly, we used the variable CAPITAL1 to control for banks' risk level. Our control variable is the reported Tier I ratio at the end of the year.

H1a and H2a examined whether MD, exemplified by the demand for higher deposit rates or the withdrawal of deposits, has an impact upon the income-smoothing behaviour of banks operating under different levels of capitalisation. We classified sample banks into two groups: one group includes banks with higher capital adequacy ratios while the other group includes banks with lower capital adequacy ratios. We computed their target ratios as the difference between their reported Tier I ratio at the end of the current year minus the minimum capital requirement. We adopted this approach because most banks in our sample operate with capital ratios that substantially exceed the minimum requirements. Berger et al. (2008) argued that US banks hold capital in excess of the most stringent regulatory requirements and considered whether this is consistent with a 'pecking order' view of capital structure or an optimal capital structure based on market conditions. They concluded that banks actively manage their capital ratios, which is inconsistent with the pecking order view. Furthermore, the mechanics of income smoothing suggested the increase of discretionary LLPs when income is high and their reversal when income is low (Greenawalt & Sinkey, 1988). Therefore, the behaviour of a bank manager will be better captured if the group of banks with higher capital adequacy ratios and the group of banks with lower capital adequacy ratios remained steady. Within this context, a bank is classified in the group of banks with higher capital adequacy ratios if its average target ratio exceeds the median of our sample. All other banks are classified in the group of banks with lower capital adequacy ratios. The dummy variable CAP_CLASS takes a value of 1 if a bank is classified in the group of banks with higher capital adequacy ratios and 0 otherwise.

We investigated whether the MD impact is conditioned upon the level of banks' capital adequacy using the interaction terms EBPTt × ΔDEPOSITSt × CAP_CLASS and EBPTt × ΔINTERESTt × CAP_CLASS. The first interaction term examines the impact of MD through deposit withdrawal while the second interaction term examines the impact of MD through increased deposit rates. If MD mechanisms reduce income smoothing through LLPs for banks with higher capital adequacy ratios relative to banks with lower capital adequacy ratios, we expected the level of income smoothing to be significantly lower for the former group than for the latter.

H1b and H2b examine the effectiveness of MD on income-smoothing behaviour between GSIBs and non-GSIBs. The classification of banks into the above categories is based on the 2014 EBA's list, which classifies 35 EU banks into this category. All these banks are included in our sample. We use

Table 3. Expectations for the Signs of the Variables

Variable	*Sign*
LLPt	*N.A*
NPLt	+
ΔNPLt	+
COt	-
ALWt-1	+
SIZEt-1	+/-
ΔGDPt	-
ΔUNEMPt	+
ΔLOANt	+
LOANt	+
EBPTt	+
CAPITAL1	+/-
EBPTt × ΔDEPOSITSt	-
EBPTt × ΔINTERESTt	-
EBPTt × ΔDEPOSITSt × CAP_CLASS	+/-
EBPTt × ΔINTERESTt × CAP_CLASS	+/-
EBPTt × ΔDEPOSITSt × GSIB	+/-
EBPTt × ΔINTERESTt × GSIB	+/-

LLPt: Loan loss provisions at the end of year *t* scaled by lagged total loans; **NPLt**: Non-performing assets at the end of the current year *t* divided by lagged total loans; **ΔNPLt**: Change in non-performing assets at the end of the current year *t* divided by lagged total loans; **COt**: Net charge-offs of the current year *t* scaled by lagged total loans; **ALWt-1**: Loan loss allowance at the end of the previous year t-1 divided by total loans; **SIZEt-1**: The natural log of total assets of the previous year t-1; **ΔGDPt**: Change in GDP at the end of the current year *t*; **ΔUNEMPt**: Change in unemployment rates at the end of the current year *t*; **ΔLOANt**: Change in total loans at the end of the current year *t* divided by lagged total loans; **LOANt**: Total loans at the end of the current year *t* divided by total assets; **EBPTt**: Earnings before taxes and provisions at the end of the current year *t* scaled by lagged total loans; **CAPITAL1**: The reported Tier I ratio at the end of the current year *t*; **ΔDEPOSITSt**: Dummy variable that equals 1 if the change of annual deposits is negative and 0 otherwise; **ΔINTERESTt:** Dummy variable that equals 1 if the change of annual deposit rates is positive and 0 otherwise; **EBPTt * ΔDEPOSITSt**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔDEPOSITSt; **EBPTt *ΔINTERESTt**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔINTERESTt; **CAP_CLASS**: Dummy variable that equals 1 when a bank is classified as higher capitalised and 0 otherwise; **EBPTt * ΔDEPOSITSt *CAP_CLASS**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔDEPOSITSt and the dummy variable CAP_CLASS; **EBPTt *ΔINTERESTt*CAP_CLASS**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔINTERESTt and the dummy variable CAP_CLASS; **GSIB**: Dummy variable that equals 1 when a bank is classified as globally systemically important and 0 otherwise; **EBPTt * ΔDEPOSITSt *GSIB**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔDEPOSITSt and the dummy variable GSIB; **EBPTt *ΔINTERESTt* GSIB**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔINTERESTt and the dummy variable GSIB

the dummy variable GSIB, which takes a value of 1 if a bank is classified as a systemically important bank and 0 otherwise. We also use the dummy variable ΔDEPOSITSt, which takes a value of 1 if the change in a bank's total deposits is negative and 0 otherwise. The interaction term EBPTt × ΔDEPOSITSt × GSIB captures the influence of LLPs on the income-smoothing behaviour of each control group. Similarly, we examined the impact of the deposit rate mechanism by using the interaction term EBPTt × ΔINTERESTt × GSIB. Therefore, if MD reduces income smoothing through LLPs for GSIBs relative to non-GSIBs, we expected that the level of income smoothing is significantly higher for the former sample than for the latter.

Table 3 summarises our sign predictions for the association between LLPs and the independent variables.

3.1 The Impact of the Financial Crisis

Our study investigates data from a sample of EU banks covering the period 2006 to 2013. The financial crisis of 2007–2009 may have influenced the functioning of MD. Hasan et al. (2013) argued that the increased risk during recessions may increase the sensitivity of deposit volume and interest costs to accounting measures. Curcio et al. (2017) argued that the financial turmoil of 2007 might have created incentives to shift risk and consequently smooth income, for both private and listed banks. Consequently, during the crisis banks might have been more engaged in income smoothing relative to the pre-crisis period. On the other hand, the involvement of governments and the provision of guarantees may weaken the incentives of market participants to monitor banks. We thus tested the robustness of our results by using the dummy variable CRISIS as a control. This variable takes a value of 1 when the date falls within the 2007–2009 period and 0 otherwise. Furthermore, a group of countries (Portugal, Ireland, Italy, Greece, Spain, and Cyprus) faced an extended crisis period until 2011. Although our analysis does not contain country variables, we investigated the robustness of our results on the possible impact of this group of countries using the dummy variable PIIGSC, which takes a value of 1 when a bank is domiciled in one of the above countries and 0 otherwise.

Our study did not investigate potential differences between insured and uninsured depositors. Considering these types of depositors is constrained by a lack of related information in the annual reports of EU banks (Berger & Turk-Ariss, 2015). Besides, previous studies have shown that MD is exerted by both insured and uninsured depositors (Martinez Peria & Schmukler, 2001; Park & Peristiani, 1998).

In addition, our analysis investigates whether country-level fixed effects have an impact on the income-smoothing decisions of EU banks. Gebhardt and Novotny-Farkas (2011) found no country effects on EU banks' discretionary behaviour, whereas Ramanna and Sletten (2014) found variation within EU countries. Thus, our analysis investigates whether country-level effects influence our results.

4. Results

The results of the univariate analysis are presented in **Tables 4**, **5**, and **6**. **Table 4** presents the descriptive statistics for the pooled sample and the groups relating to banks' capitalisation and their systemic importance. The total number of observations for the pooled sample is 1,064. The mean LLPs (LLPt) is 0.008, while the average earnings before provisions and taxes (EBPTt) is 0.016, implying that our banks are relatively profitable in the period under investigation. The average GDP growth (ΔGDPt) is 0.007, implying that the EU economy showed positive growth, despite the inclusion of the financial crisis period. The group of banks with higher capital adequacy ratios consist of 529 observations while the group of banks with lower capital adequacy ratios includes 535 observations. The mean LLP for banks with lower capital adequacy ratios is 0.011, which is greater than the mean of 0.006 for banks with higher capital adequacy ratios. Banks of both groups appear profitable, since the mean of earnings before provision and taxes is positive (0.015 and 0.018 respectively). For the group of GSIBs, there are 271 observations. The remaining 793 observations were classified as all other banks. The mean of LLPs for GSIBs is 0.006 and is smaller than the average of LLPs for the panel of non-GSIBs (0.009). Finally, both panels appear to be profitable since the average earnings before taxes and provisions is 0.013 and 0.017 respectively.

Table 5 presents supplementary statistics about our pooled sample, the groups of banks with higher and lower capital adequacy ratios, and the groups of GSIBs and the rest of the banks. Table 5 presents the number of observations in each group and the means of LLPs (LLPt) and earnings before provisions and taxes (EBPTt). The supplementary analysis shows that the number of bank years with a decrease in deposits amounts at 370 observations. These banks have an average profitability (0.009) lower than that of the group of banks facing an increase in their deposits. Furthermore, 481 observations face an increase in deposit rates. The banks in this group of financial institutions present an average profitability (0.020) higher than that of banks facing reduced deposit rates (0.014). Table 6 presents the results of the Spearman rank-order correlations for the pooled sample.

The results of the multivariate analysis for the pooled sample are presented in **Tables** 7 and **8**. We use two models to isolate the individual impacts of each MD mechanism upon banks' income-smoothing behaviour. Model 1 captures the impact of deposit withdrawal on banks' accounting policy decisions. Model 2 captures the impact of deposit rate deviation. In our panel estimation, we control for fixed and random effects. Fixed effects treat the individual effects as fixed parameters that require estimation, while random effects treat them as independent random drawings from a particular distribution. We determine the most appropriate approach using a Hausman test examining the extent of the correlation between the unobserved effects and the explanatory variables. If the results imply significant correlations, then a fixed effects approach is consistent, while an absence of correlations implies that a random effects approach is preferable. The p-value for the first model is 0.000; we thus reject the null hypothesis that random effects constituted the preferred approach. Similarly, the p-value for the second model (see Table 8) is 0.000, implying that the estimates that assume random effects are biased and inconsistent. We thus adopt a fixed-effects approach for our analysis.

The empirical findings from the fixed effects approach for the first hypothesis are presented in Table 7. The left part of the table presents the multivariate analysis results without the presence of the moderation effect. These results imply that banks use LLPs (LLPt) to smooth income since there is a positive and significant association between the dependent variable and earnings before provisions and taxes (EBPTt). Consistent with our expectations and the results of the univariate analysis, our empirical model indicates that LLPs (LLPt) are positively and significantly associated with the change of non-performing loans (ΔNPLt), implying that LLPs increase when

Table 4. Descriptive Statistics

	Pooled Sample		PANEL A – HIGHER CAPITALISED		PANEL B – LOWER CAPITALISED		PANEL C – GSIBs		PANEL D – Non-GSIBs	
Variables	Mean	StDev	Mean	StDev	Mean	StDev	Mean	StDev	Mean	StDev
LLPt	0.008	0.012	0.006	0.038	0.011	0.015	0.006	0.006	0.009	0.033
COt	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001
NPLt	0.068	0.093	0.050	0.077	0.087	0.104	0.035	0.032	0.080	0.104
ΔNPLt	0.012	0.047	0.007	0.033	0.018	0.059	0.005	0.015	0.015	0.054
ALWt-1	0.031	0.033	0.025	0.032	0.037	0.035	0.020	0.015	0.035	0.037
LOANt	0.687	0.164	0.647	0.181	0.728	0.135	0.574	0.147	0.727	0.152
ΔLOANt	0.071	0.195	0.071	0.218	0.072	0.171	0.063	0.212	0.075	0.190
SIZEt-1	18.392	1.983	18.516	2.202	18.269	1.735	20.363	0.860	17.718	1.802
ΔGDPt	0.007	0.034	0.013	0.038	0.003	0.031	0.008	0.026	0.008	0.037
ΔUNEMPt	0.086	0.040	0.080	0.031	0.092	0.048	0.082	0.039	0.088	0.041
EBPTt	0.016	0.035	0.018	0.047	0.015	0.018	0.013	0.012	0.017	0.041
OBS	1,064		529		535		271		793	

LLPt: Loan loss provisions at the end of year *t* scaled by lagged total loans; **COt**: Net charge-offs of the current year *t* scaled by lagged total loans; **NPLt**: Non-performing assets at the end of the current year *t* divided by lagged total loans; **ΔNPLt**: Change in non-performing assets at the end of the current year *t* divided by lagged total loans; **ALWt-1**: Loan loss allowance at the end of the previous year t-1 divided by total loans; **LOANt**: Total loans at the end of the current year *t* divided by total assets; **ΔLOANt**: Change in total loans at the end of the current year *t* divided by lagged total loans; **SIZEt-1**: The natural log of total assets of the previous year t-1; **ΔGDPt**: Change in GDP at the end of the current year *t*; **ΔUNEMPt**: Change in unemployment rates at the end of the current year *t*; **EBPTt**: Earnings before taxes and provisions at the end of the current year *t* scaled by lagged total loans

Table 5. Descriptive Statistics for Market Discipline Effect

	Pooled Sample			PANEL A – HIGHER CAPITALISED			PANEL B – LOWER CAPITALISED			PANEL C – GSIB			PANEL D – Non-GSIB		
Variables	Obs	Mean LLPt	Mean EBPTt	Obs	Mean LLPt	Mean EBPTt	Obs	Mean LLPt	Mean EBPTt	Obs	Mean LLPt	Mean EBPTt	Obs	Mean LLPt	Mean EBPTt
Deposits Increase	694	0.007	0.020	336	0.006	0.008	358	0.008	0.009	178	0.005	0.015	516	0.007	0.022
Deposits Decrease	370	0.011	0.009	193	0.005	0.024	177	0.017	0.017	93	0.007	0.009	277	0.013	0.008
Interest Increase	481	0.008	0.020	228	0.006	0.025	253	0.009	0.015	117	0.004	0.014	364	0.009	0.021
Interest Decrease	583	0.009	0.014	301	0.006	0.013	282	0.013	0.014	154	0.007	0.012	429	0.010	0.014

LLPt: Loan loss provisions at the end of year *t* scaled by lagged total loans; **EBPTt**: Earnings before taxes and provisions at the end of the current year *t* scaled by lagged total loans

Table 6. Correlation Matrix (Spearman Correlations)

	LLPt	NPLt	ΔNPLt	COt	ALWt-1	LOANt	SIZEt-1	ΔGDPt	ΔLOANt	ΔUNEMPt	EBPTt	ΔDEPOSITSt	ΔINTERESTt	EBPTt *ΔDEPOSITSt	EBPTt *ΔINTERESTt	CAPITAL1
LLPt	1.000															
NPLt	**0.689**	1.000														
ΔNPLt	**0.488**	**0.500**	1.000													
COt	**-0.122**	0.045	0.003	1.000												
ALWt-1	**0.720**	**0.840**	**0.350**	0.028	1.000											
LOANt	**0.206**	**0.290**	**0.233**	0.055	**0.235**	1.000										
SIZEt-1	**-0.115**	**-0.245**	**-0.194**	-0.040	**-0.234**	**-0.436**	1.000									
ΔGDPt	**-0.410**	**-0.294**	**-0.306**	**-0.122**	**-0.249**	**-0.065**	0.000	1.000								
ΔLOANt	**-0.151**	**-0.142**	**0.075**	**-0.067**	**-0.244**	**0.099**	-0.048	**0.386**	1.000							
ΔUNEMPt	**0.254**	**0.294**	**0.174**	**-0.061**	**0.371**	**0.097**	-0.060	**-0.233**	**-0.216**	1.000						
EBPTt	**0.248**	**0.127**	**0.113**	**-0.167**	**0.165**	0.018	**-0.062**	**0.224**	**0.418**	**-0.004**	1.000					
ΔDEPOSITSt	**0.154**	**0.104**	**0.007**	0.016	**0.149**	-0.010	-0.024	**-0.251**	**-0.531**	**0.065**	**-0.281**	1.000				
ΔINTERESTt	**-0.098**	**-0.103**	**0.0143**	-0.039	**-0.1293**	**0.072**	-0.039	**0.286**	**0.237**	**-0.178**	**0.127**	-0.048	1.000			
EBPTt * ΔDEPOSITSt	**0.077**	**0.029**	**-0.027**	0.005	**0.056**	-0.030	-0.027	**-0.109**	**-0.288**	**0.001**	**0.109**	**0.687**	**-0.069**	1.000		
EBPTt *ΔINTERESTt	**-0.075**	**-0.114**	**0.004**	**-0.099**	**-0.125**	0.053	**-0.063**	**0.366**	**0.374**	**-0.200**	**0.463**	**-0.179**	**0.786**	**0.083**	1.000	
CAPITAL1	0.012	0.026	**-0.174**	**-0.135**	0.058	**-0.164**	0.031	**-0.108**	**-0.290**	**0.091**	0.020	**0.184**	**-0.267**	**0.168**	**-0.198**	1.000

**Bold coefficients are statistically significant*

LLPt: Loan loss provisions at the end of year *t* scaled by lagged total loans; **NPLt**: Non-performing assets at the end of the current year *t* divided by lagged total loans; **ΔNPLt**: Change in non-performing assets at the end of the current year *t* divided by lagged total loans; **COt**: Net charge-offs of the current year *t* scaled by lagged total loans; **ALWt-1**: Loan loss allowance at the end of the previous year t-1 divided by total loans; **LOANt**: Total loans at the end of the current year *t* divided by total assets; **SIZEt-1**: The natural log of total assets of the previous year t-1; **ΔGDPt**: Change in GDP at the end of the current year *t*; **ΔLOANt**: Change in total loans at the end of the current year *t* divided by lagged total loans; **ΔUNEMPt**: Change in unemployment rates at the end of the current year *t*; **EBPTt**: Earnings before taxes and provisions at the end of the current year *t* scaled by lagged total loans; **ΔDEPOSITSt**: Dummy variable that equals 1 if the change of annual deposits is negative and 0 otherwise; **ΔINTERESTt:** Dummy variable that equals 1 if the change of annual deposit rates is positive and 0 otherwise; **EBPTt * ΔDEPOSITSt**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔDEPOSITSt; **EBPTt *ΔINTERESTt**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔINTERESTt; **CAPITAL1**: The reported Tier I ratio at the end of the current year *t* non-performing loans are higher (Gebhardt & Novotny-Farkas, 2011; Hamadi et al., 2016). Furthermore, LLPs (LLPt) are negatively but not significantly associated with net charge-offs. LLPs are positively and significantly associated with the past year's loan loss allowance, which is consistent with the argument that current LLPs are influenced by earlier provisioning behaviour (Beatty & Liao, 2014). Similarly to the univariate analysis results, our results show a negative and significant association between LLPs and GDP growth (ΔGDPt), implying counter-cyclical provisioning behaviour (Laeven & Majnoni, 2003). Furthermore, the positive and significant association between LLPs and earnings before provisions and taxes (EBPTt) implies that banks use LLPs to smooth income (Greenawalt & Sinkey, 1988; Laeven & Majnoni, 2003; Leventis et al., 2011). Regarding bank risk, LLPs (LLPt) are negatively and significantly associated with Tier 1 ratio (CAPITAL1), implying that managers' intention to adjust income is offset by a negative change of the bank's primary capital. In particular, if banks increase LLPs when earnings are high, they will reduce income and subsequently their Tier I ratio, a development that may cause a supervisory intervention (Berger, 1991). Finally, our results suggested a positive and significant association between LLPs and the interaction term EBPTt × ΔDEPOSITSt. These results implied that, compared with banks facing an increase in deposits, banks facing a one (1) unit decrease in their deposits at the end of the year will adjust their income by 74.2% via LLPs. In other words, managers appear to engage more in income smoothing when depositors decide to withdraw their funds. This finding is in line with Billett et al. (1998), who suggested that, although the withdrawal of funds may not comprise a signal to supervisors, it will influence a bank's financial position. Bankers in financial distress may act opportunistically and use LLPs to increase income and regulatory capital to avoid both regulatory and monitoring costs.

The fixed effects estimation results regarding our second hypothesis are presented in Table 8. The left part of the table presents the multivariate analysis results without the presence of the moderation effect. There is a positive and significant association between the dependent variable and earnings before provisions and taxes (EBPTt), implying that banks use LLPs (LLPt) to smooth income. LLPs are positively and significantly associated with the loan loss allowance of the previous year (ALWt-1) and the annual change of non-performing loans (ΔLOANt). As in the case of Model 1, we observe a positive and significant association with earnings before provisions and taxes (EBPTt), which implies an income-smoothing pattern and a negative association with the Tier I ratio (CAPITAL1). In line with the results of Model 1, banks that engage in accounting adjustments through LLPs may be punished by a reduced Tier I ratio when they increase discretionary LLPs and vice versa. With regard to the interaction term EBPTt × ΔINTERESTt, the association with the dependent variable is negative and significant, implying that a demand for higher rates forces managers to decrease income smoothing through LLPs. In particular, relative to banks facing reduced deposit rates,

Table 7. Impact of Deposits Change on Income Smoothing

LLPt = β0 + β1 × NPLt + β2 × ΔNPLt + β3 × COt + β4 × ALWt-1 + β5 × SIZEt-1 + β6 × ΔGDPt + β7 × ΔUNEMPt + β8 × ΔLOANt + β9 × LOANt + β10 × EBPTt + β11 × ΔDEPOSITSt + β12 × CAPITAL1 + β13 × (EBPTt × ΔDEPOSITSt) + et (MODEL1)

	FIXED EFFECTS			FIXED EFFECTS		
	Sign	Coefficient	t-stat	Sign	Coefficient	t-stat
CONSTANT	-	-0.090**	(-2.404)	+	0.004	(0.277)
NPLt	-	-0.070***	(0.424)	-	-0.005***	(-5.840)
ΔNPLt	+	0.081***	(0.025)	+	0.046***	(4.458)
COt	+	5.586***	(4.073)	-	-0.307	(-0.556)
ALWt-1	+	0.302***	(5.049)	+	0.417***	(17.328)
LOANt	+	0.013	(0.918)	-	-0.001**	(-0.214)
SIZEt-1	+	0.004**	(2.372)	-	0.000	(0.366)
ΔGDPt	-	-0.265***	(-8.224)	-	-0.099***	(-7.710)
ΔLOANt	-	-0.020***	(-3.239)	-	-0.002	(-0.940)
ΔUNEMPt	-	-0.049	(-1.116)	+	0.041**	(2.330)
EBPTt	+	0.727***	(21.636)	+	0.174***	(6.938)
ΔDEPOSITSt	-	-0.006***	(-2.591)	-	-0.008***	(-7.686)
CAPITAL 1	-	-0.111***	(-4.050)	-	-0.058***	(-5.325)
EBPTt * ΔDEPOSITSt				+	0.706***	(25.884)
COUNTRY DUMMIES					-	
HAUSMAN (p-value)					0.000	
R-squared		0,45			0.84	
OBS		1064			1064	

***, **, and * represent 1%, 5%, and 10% significance (two-tailed or one-tailed, as appropriate), respectively

t-stat in parenthesis next to the coefficient

NPLt: Non-performing assets at the end of the current year *t* divided by lagged total loans; **ΔNPLt**: Change in non-performing assets at the end of the current year *t* divided by lagged total loans; **COt**: Net charge-offs of the current year *t* scaled by lagged total loans; **ALWt-1**: Loan loss allowance at the end of the previous year t-1 divided by total loans; **LOANt**: Total loans at the end of the current year *t* divided by total assets; **SIZEt-1**: The natural log of total assets of the previous year t-1; **ΔGDPt**: Change in GDP at the end of the current year *t*; **ΔLOANt**: Change in total loans at the end of the current year *t* divided by lagged total loans; **ΔUNEMPt**: Change in unemployment rates at the end of the current year *t*; **EBPTt**: Earnings before taxes and provisions at the end of the current year *t* scaled by lagged total loans; **ΔDEPOSITSt**: Dummy variable that equals 1 if the change of annual deposits is negative and 0 otherwise; **CAPITAL1**: The reported Tier I ratio at the end of the current year *t*; **EBPTt * ΔDEPOSITSt**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔDEPOSITSt; **COUNTRY DUMMIES**: Dummy variable that takes the value 1 for the country where our firm is domiciled

banks facing a one (1) unit increase in deposit rates will adjust their income by 77.6% via LLPs. Thus, MD appears to influence bank managers' accounting policy decisions. The demand for higher rates signals to official supervisors that some investors have noticed a change in a bank's risk levels (Berger, 1991). Given that regulatory discipline may be immediate, banks may abandon discretionary accounting practices that will increase regulatory risk.

Our results are robust when we control for the crisis period and the effects in countries that endured an extended recession (see Table 11). In particular our dummy variable CRISIS is not significant for all panels. This finding implies that bank managers' income-smoothing incentives were not influenced by the impact of the financial crisis. This result is in line with Abou El Sood (2012), who found that during the crisis US banks used provisions to smooth income upward. The results of the multivariate model are in line with the results of the Spearman rank-order correlations presented earlier (see Table 6).

Table 8. Impact of Deposit Interest Change on Income Smoothing

LLPt = β0 + β1 × NPLt + β2 × ΔNPLt + β3 × COt + β4 × ALWt-1 + β5 × SIZEt-1 + β6 × ΔGDPt + β7 × ΔUNEMPt + β8 × ΔLOANt + β9 × LOANt + β10 × EBPTt + β11 × ΔINTERESTt + β12 × CAPITAL1 + β13 × (EBPTt × ΔINTERESTt) + et (MODEL2)

	FIXED EFFECTS			FIXED EFFECTS		
	Sign	Coefficient	t-stat	Sign	Coefficient	t-stat
CONSTANT	-	-0.102***	(-2.705)	-	-0.001	(-0.099)
NPLt	-	-0.069***	(-2.853)	-	-0.043	(-4.861)
ΔNPLt	+	0.075***	(2.926)	+	0.035***	(3.748)
COt	+	5.451***	(3.975)	+	0.060	(0.119)
ALWt-1	+	0.287	(4.816)	+	0.364***	(16.689)
LOANt	+	0.011***	(0.753)	+	0.002	(0.391)
SIZEt-1	+	0.004***	(2.607)	-	0.000	(0.919)
ΔGDPt	-	-0.271***	(-8.207)	-	-0.097***	(-7.985)
ΔLOANt	-	-0.016***	(-2.671)	-	-0.006***	(-2.913)
ΔUNEMPt	-	-0.034	(-0.773)	+	-0.025	(1.525)
EBPTt	+	0.728***	(21.644)	+	0.922***	(66.694)
CAPITAL1	-	-0.110***	(-4.023)	-	-0.060***	(-5.990)
ΔINTERESTt	+	0.004**	(2.099)	+	0.012***	(15.040)
EBPTt *ΔINTERESTt				-	-0.741***	(-31.341)
COUNTRY DUMMIES					-	-
HAUSMAN (p-value)					0.000	
R-squared		0.45			0.87	
OBS		1064			1064	

***, **, and * represent 1%, 5%, and 10% significance (two-tailed or one-tailed, as appropriate), respectively
t-stat in parenthesis next to the coefficient
NPLt: Non-performing assets at the end of the current year *t* divided by lagged total loans; **ΔNPLt**: Change in non-performing assets at the end of the current year *t* divided by lagged total loans; **COt**: Net charge-offs of the current year *t* scaled by lagged total loans; **ALWt-1**: Loan loss allowance at the end of the previous year t-1 divided by total loans; **LOANt**: Total loans at the end of the current year *t* divided by total assets; **SIZEt-1**: The natural log of total assets of the previous year t-1; **ΔGDPt**: Change in GDP at the end of the current year *t*; **ΔLOANt**: Change in total loans at the end of the current year *t* divided by lagged total loans; **ΔUNEMPt**: Change in unemployment rates at the end of the current year *t*; **EBPTt**: Earnings before taxes and provisions at the end of the current year *t* scaled by lagged total loans; **CAPITAL1**: The reported Tier I ratio at the end of the current year *t*; **ΔINTERESTt:** Dummy variable that equals 1 if the change of annual deposit rates is positive and 0 otherwise; **EBPTt *ΔINTERESTt**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔINTERESTt; **COUNTRY DUMMIES**: Dummy variable that takes the value 1 for the country where our firm is domiciled

Table 9 presents the results of the multivariate analysis testing H1a and H2a examining the association between banks' capital adequacy and their responses to MD. The results for the interaction with the deposit withdrawal models show a positive association between LLPs (LLPt) and total lending (LOANt), change of non-performing loans (ΔNPLt), and loan loss allowances (ALWt-1). The LLPs are negatively associated with GDP growth and positively related with earnings before provisions and taxes (EBPTt). This positive association implies an income-smoothing pattern. In particular, bank managers who aim to smooth income will overstate LLPs when earnings before provisions and taxes are high. Later, when earnings are low, they will reverse the discretionary amount of LLPs (Greenawalt & Sinkey, 1988). The first modified model reveals a positive and significant association between LLPs and the triple interaction term EBPTt × ΔDEPOSITSt × CAP_CLASS. It seems that, when depositors decide to discipline banks by withdrawing deposits, banks with higher capital adequacy ratios appear to smooth income more than banks with lower capital adequacy ratios do. On the other hand, the results of the second model (H2a) provide evidence of a significantly negative association between LLPs and the triple interaction term EBPTt × ΔINTERESTt × CAP_CLASS. Thus, banks with higher capital adequacy ratios appear to decrease income smoothing when deposit rates increase. The above results are robust when we control for the financial crisis period and for countries (see Table 11). Our results are consistent with the finding in Billett et al. (1998) that risk-taking cost consists of regulatory and MD costs. In particular, banks with higher capital adequacy ratios may avoid regulatory intervention more easily and can respond to market reactions by adjusting income through accounting accruals. When market participants withdraw their funds, higher-capitalised banks can reduce their asset riskiness by increasing LLPs and creating capital buffers for future use. On the other hand, when deposit rates are higher, banks with higher capital adequacy ratios appear to recognise lower LLPs in order to boost income and increase their capital base (Fonseca & González, 2010).

H1b and H2b examine the impact of MD mechanisms upon GSIBs' income-smoothing behaviour. Our results implied that banks use LLPs to smooth income, since the coefficient of earnings before provisions and taxes is positive and significant for both models. Furthermore, the loan loss allowance of the previous year (ALWt-1) and the annual growth of GDP (ΔGDPt) appeared to influence banks' accounting policies (see Table 10). Regarding the impact of MD mechanisms on management's accounting discretion, our results showed that LLPs are negatively and significantly associated with the interaction terms EBPTt × ΔDEPOSITSt ×GSIB (see Table 10) and EBPTt × ΔINTERESTt × GSIB (see Table 10). These results are robust when we controlled for the possible impact of the financial crisis and countries with extended crisis periods (see Table 11). The above findings indicate that MD's influence on income-smoothing behaviour is greater for GSIBs than for non-GSIBs. Both MD mechanisms appear to have a negative impact on banks' accounting policy decisions. GSIBs may attract the attention of market participants who perceive their significant role and discipline them by exerting monitoring more efficiently.

5. Conclusions

Our study investigated the association between MD and EU banks' accounting policy decisions. We focused on the role of MD as an income-smoothing explanatory factor. In particular, we assumed that depositors' discipline, as implemented through deposit withdrawal and deposit rate increases, may influence bank managers' incentives to smooth income via LLPs.

Our findings indicate that management's decision to engage in accruals adjustments is influenced by certain depositors' reactions. We find that EU banks appear to reduce income smoothing when depositors demand higher rates, whereas banks increase income smoothing through LLPs when they face reduced deposits. These results remain robust when we examined whether banks' regulatory capital differentiates bank behaviours. Multivariate analysis shows that banks with higher capital adequacy ratios increase income

Table 9. Impact of MD on Income Smoothing between Higher Capitalised and Lower Capitalised Banks

LLPt = β0 + β1 × NPLt + β2 × ΔNPLt + β3 × COt + β4 × ALWt-1 + β5 × SIZEt-1 + β6 × ΔGDPt + β7 × ΔUNEMPt + β8 × ΔLOANt + β9 × LOANt + β10 × EBPTt + β11 × ΔDEPOSITSt + β12 × CAPITAL1 + β13 × CAP_CLASS + β14 × (EBPTt X ΔDEPOSITSt × CAP_CLASS) + et

LLPt = β0 + β1 × NPLt + β2 × ΔNPLt + β3 × COt + β4 × ALWt-1 + β5 × SIZEt-1 + β6 × ΔGDPt + β7 × ΔUNEMPt + β8 × ΔLOANt + β9 × LOANt + β10 × EBPTt + β11 × ΔINTERESTt + β12 × CAPITAL1 + β13 × CAP_CLASS + β14 × (EBPTt X ΔINTERESTt × CAP_CLASS) + et

	Impact of TOTAL DEPOSITS CHANGE			Impact of INTEREST CHANGE		
	Sign	Coefficient	t-stat	Sign	Coefficient	t-stat
CONSTANT	-	-0.017***	(-3.834)	-	-0.031***	(-5.208)
NPLt	-	-0.025***	(-4.594)	+	0.005	(0.732)
ΔNPLt	+	0.032***	(3.907)	+	0.014	(1.322)
COt	-	-1.133***	(-3.375)	-	-0.166	(-0.362)
ALWt-1	+	0.325***	(21.323)	+	0.245***	(11.914)
LOANt	+	0.007***	(3.362)	+	0.011***	(3.480)
SIZEt-1	+	0.000***	(4.177)	+	0.000***	(2.869)
ΔGDPt	-	-0.099***	(-9.287)	-	-0.130***	(-8.779)
ΔLOANt	-	0.000	(0.085)	-	-0.014***	(-5.240)
ΔUNEMPt	-	-0.008	(-0.902)	-	-0.000	(-0.006)
EBPTt	+	0.082***	(5.072)	+	0.764***	(49.733)
CAPITAL1	-	-0.015**	(-2.548)	-	-0.027***	(-3.315)
ΔDEPOSITSt	-	-0.003***	(-4.935)		-	
CAP_CLASS	-	-0.002***	(-2.921)	+	0.005***	(5.095)
EBPTt * ΔDEPOSITSt* CAP_CLASS	+	0.849***	(41.828)		-	
ΔINTERESTt		-		+	0.006***	(6.223)
EBPTt *ΔINTERESTt* CAP_CLASS		-		-	-0.601***	(-21.153)
R-squared		0.86			0.74	
OBS		1064			1064	

***, **, and * represent 1%, 5%, and 10% significance (two-tailed or one-tailed, as appropriate), respectively

t-stat in parenthesis next to the coefficient

NPLt: Non-performing assets at the end of the current year *t* divided by lagged total loans; **ΔNPLt**: Change in non-performing assets at the end of the current year *t* divided by lagged total loans; **COt**: Net charge-offs of the current year *t* scaled by lagged total loans; **ALWt-1**: Loan loss allowance at the end of the previous year t-1 divided by total loans; **LOANt**: Total loans at the end of the current year *t* divided by total assets; **SIZEt-1**: The natural log of total assets of the previous year t-1; **ΔGDPt**: Change in GDP at the end of the current year *t*; **ΔLOANt**: Change in total loans at the end of the current year *t* divided by lagged total loans; **ΔUNEMPt**: Change in unemployment rates at the end of the current year *t*; **EBPTt**: Earnings before taxes and provisions at the end of the current year *t* scaled by lagged total loans; **CAPITAL1**: The reported Tier I ratio at the end of the current year *t*; **ΔDEPOSITSt**: Dummy variable that equals 1 if the change of annual deposits is negative and 0 otherwise; **CAP_CLASS**: Dummy variable that equals 1 when a bank is classified as higher capitalised and 0 otherwise; **EBPTt * ΔDEPOSITSt *CAP_CLASS**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔDEPOSITSt and the dummy variable CAP_CLASS; **ΔINTERESTt:** Dummy variable that equals 1 if the change of annual deposit rates is positive and 0 otherwise; **EBPTt *ΔINTERESTt*CAP_CLASS**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔINTERESTt and the dummy variable CAP_CLASS

smoothing when depositors remove their funds and reduce income smoothing when deposit rates increase. Moreover, MD mechanisms appeared more effective for banks of global systemic importance, since GSIBs reduce income smoothing when market participants aim to discipline them.

Our focus on the interrelationship between MD and banks' accounting policy decisions contributes to the literature because it examines an understudied issue. In particular, we shed light on the association of market influence with bank managers income-smoothing incentives. Our results should help regulators and policymakers protect market participants from banks' excessive risk-taking and management's opportunistic incentives. These

Table 10. Impact of MD on Income Smoothing between GSI Banks and Rest of Banks

LLPt = β0 + β1 × NPLt + β2 × ΔNPLt + β3 × COt + β4 × ALWt-1 + β5 × SIZEt-1 + β6 × ΔGDPt + β7 × ΔUNEMPt + β8 × ΔLOANt + β9 × LOANt + β10 × EBPTt + β11 × ΔDEPOSITSt + β12 × CAPITAL1 + β13 × GSIB + β14 × (EBPTt × ΔDEPOSITSt × GSIB) + et

LLPt = β0 + β1 × NPLt + β2 × ΔNPLt + β3 X COt + β4 × ALWt-1 + β5 × SIZEt-1 + β6 × ΔGDPt + β7 × ΔUNEMPt + β8 × ΔLOANt + β9 × LOANt + β10 X EBPTt + β11 × ΔINTERESTt + β12 × CAPITAL1 + β13 × GSIB + β14 × (EBPTt × ΔINTERESTt × GSIB) + et

	Impact of TOTAL DEPOSITS CHANGE			Impact of INTEREST CHANGE		
	Sign	Coefficient	t-stat	Sign	Coefficient	t-stat
CONSTANT	-	-0.045***	(-6.156)	-	-0.043***	(-5.830)
NPLt	+	0.001	(0.131)	+	0.002	(0.221)
ΔNPLt	+	0.015	(1.168)	+	0.016	(1.211)
COt	+	0.611	(1.133)	+	0.658	(1.212)
ALWt-1	+	0.215***	(8.810)	+	0.226***	(9.260)
LOANt	+	0.021***	(5.753)	+	0.020***	(5.321)
SIZEt-1	+	0.001***	(3.711)	+	0.001***	(3.612)
ΔGDPt	-	-0.141***	(-8.241)	-	-0.146***	(-8.272)
ΔLOANt	-	-0.018***	(-5.726)	-	-0.021***	(-6.693)
ΔUNEMPt	+	0.007	(0.495)	+	0.005	(0.338)
EBPTt	+	0.625***	(38.459)	+	0.619***	(38.029)
ΔDEPOSITSt	+	0.004***	(3.414)		-	
GSIB	+	0.004**	(2.515)	+	0.004**	(2.430)
CAPITAL1	-	-0.032***	(-3.497)	-	-0.029***	(-3.160)
EBPTt * ΔDEPOSITSt* GSIB	-	-0.563***	(-3.774)		-	
ΔINTERESTt		-		+	0.001	(1.344)
EBPTt *ΔINTERESTt* GSIB		-		-	-0.274***	(-2.700)
R-squared		0.63			0.63	
OBS		1064			1064	

***, **, and * represent 1%, 5%, and 10% significance (two-tailed or one-tailed, as appropriate), respectively

t-stat in parenthesis next to the coefficient

NPLt: Non-performing assets at the end of the current year *t* divided by lagged total loans; **ΔNPLt**: Change in non-performing assets at the end of the current year *t* divided by lagged total loans; **COt**: Net charge-offs of the current year *t* scaled by lagged total loans; **ALWt-1**: Loan loss allowance at the end of the previous year t-1 divided by total loans; **LOANt**: Total loans at the end of the current year *t* divided by total assets; **SIZEt-1**: The natural log of total assets of the previous year t-1; **ΔGDPt**: Change in GDP at the end of the current year *t*; **ΔLOANt**: Change in total loans at the end of the current year *t* divided by lagged total loans; **ΔUNEMPt**: Change in unemployment rates at the end of the current year *t*; **EBPTt**: Earnings before taxes and provisions at the end of the current year *t* scaled by lagged total loans; **ΔDEPOSITSt**: Dummy variable that equals 1 if the change of annual deposits is negative and 0 otherwise; **GSIB**: Dummy variable that equals 1 when a bank is classified as globally systemically important and 0 otherwise; **CAPITAL1**: The reported Tier I ratio at the end of the current year *t*; **EBPTt * ΔDEPOSITSt *GSIB**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔDEPOSITSt and the dummy variable GSIB; **ΔINTERESTt:** Dummy variable that equals 1 if the change of annual deposit rates is positive and 0 otherwise; **EBPTt *ΔINTERESTt* GSIB**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔINTERESTt and the dummy variable GSIB

stakeholders could assess the current regulatory framework and provide market participants with further bank-monitoring incentives. They should also reconsider their minimum capital requirements and too-big-to-fail policies for GSIBs and banks operating with high regulatory ratios.

Our results are subject to certain limitations. Due to the lack of the available data for the period under examination, we have not investigated the role that the type of deposits (insured vs. uninsured deposits, wholesale vs. retail deposits) can have as an MD mechanism upon banks' accounting policy decisions. These limitations could be taken into consideration as opportunities for future research. Future research could examine the significance of subordinated debt as a factor that can improve market discipline (Blum, 2002).

Table 11. Robustness of Results

		IMPACT OF ΔDEPOSITS (H1)			IMPACT OF ΔINTEREST (H2)			CAP_CLASS IMPACT OF ΔDEPOSITS (H1A)			CAP_CLASS IMPACT OF ΔINTEREST (H2A)			GSIB IMPACT OF ΔDEPOSITS (H1B)			GSIB IMPACT OF ΔINTEREST (H2B)	
		Coef.	t-stat		Coef.	t-stat		Coef.	t-stat		Coef.	t-stat		Coef.	t-stat		Coef.	t-stat
CONSTANT	-	-0.027***	(-5.000)	-	-0.018***	(-3.573)	-	-0.016***	(-3.549)	-	-0.029***	(-4.736)	-	-0.043***	(-5.809)	-	-0.041***	(-5.480)
NPLt	-	-0.017**	(-2.547)	-	-0.005	(-0.921)	-	-0.026***	(-4.659)	+	0.004	(0.612)	+	0.000	(0.074)	+	0.001	(0.141)
ΔNPLt	+	0.029***	(2.945)	+	0.018	(1.857)	+	0.032***	(3.958)	+	0.015	(1.394)	+	0.016	(1.208)	+	0.016	(1.258)
COt	-	-0.828**	(-1.982)	-	-0.463	(-1.180)	-	-1.138***	(-3.377)	-	-0.216	(-0.470)	+	0.528	(0.975)	+	0.576	(1.056)
ALWt-1	+	0.305***	(15.950)	+	0.254***	(14.334)	+	0.323***	(20.922)	+	0.238***	(11.489)	+	0.209***	(8.510)	+	0.220***	(8.923)
LOANt	+	0.013***	(4.526)	+	0.008***	(2.963)	+	0.008***	(3.548)	+	0.011***	(3.710)	+	0.021***	(5.646)	+	0.020***	(5.295)
SIZEt-1	+	0.001***	(4.704)	+	0.000	(1.440)	+	0.000***	(3.868)	+	0.000**	(2.527)	+	0.001***	(3.650)	+	0.001***	(3.511)
ΔGDPt	-	-0.118***	(-8.111)	-	-0.104***	(-7.096)	-	-0.102***	(-8.661)	-	-0.145***	(-8.675)	-	-0.153***	(-8.068)	-	-0.162***	(-8.148)
ΔLOANt	-	-0.001	(-0.514)	-	-0.009***	(-4.039)	+	0.000	(0.002)	-	-0.013***	(-4.718)	-	-0.017***	(-5.234)	-	-0.019***	(-6.105)
ΔUNEMPt	+	0.004	(0.381)	-	-0.016	(-1.394)	-	-0.003	(-0.385)	+	0.002	(0.149)	-	-0.000	(-0.105)	-	-0.000	(-0.007)
EBPTt	+	0.096***	(4.251)	+	0.854***	(61.664)	+	0.082***	(5.018)	+	0.765***	(49.777)	+	0.627***	(38.442)	+	0.621***	(38.036)
ΔDEPOSITSt	-	-0.007***	(-7.037)		-	-	-	-0.004***	(-5.001)		-	-	+	0.004***	(3.445)		-	-
ΔINTERESTt		-	-	+	0.012***	(13.531)		-	-	+	0.006***	(6.541)		-	-	+	0.002	(1.781)
EBPTt * ΔDEPOSITSt	+	0.737***	(27.719)		-	-		-			-	-		-	-		-	-
EBPTt *ΔINTERESTt		-	-	-	-0.774***	(-31.773)		-	-		-	-		-	-		-	-
CAP_CLASS		-	-		-	-	-	-0.002***	(-3.204)	+	0.005***	(4.325)		-	-		-	-
EBPTt * ΔDEPOSITSt* CAP_CLASS		-	-		-	-	+	0.849***	(41.770)		-	-		-	-		-	-
EBPTt * ΔINTERESTt * CAP_CLASS		-	-		-	-		-	-	-	-0.601***	(-21.178)		-	-		-	-
GSIB		-	-		-	-		-	-		-	-		0.004**	(2.454)	+	0.004**	(2.391)
EBPTt * ΔDEPOSITSt* GSIB		-	-		-	-		-	-		-	-	-	-0.566***	(-3.792)		-	-
EBPTt * ΔINTERESTt * GSIB		-	-		-	-		-	-		-	-		-		-	0.028***	(-2.808)
CAPITAL1	-	-0.016**	(-2.267)	-	-0.022***	(-3.293)	-	-0.016***	(-2.603)	-	-0.030***	(-3.578)	-	0.034***	(-3.653)	-	0.032***	(-3.426)
CRISIS	-	-0.001	(-1.126)	+	0.000	(0.239)	-	0.000	(-0.212)	-	-0.001	(-1.496)	-	-0.002	(-1.579)	-	-0.002*	(-1.783)
PIIGSC	-	-0.001	(-1.110)	-	-0.000	(-0.732)	-	-0.001	(-1.368)	-	-0.001	(-1.457)		0.000	(0.004)	-	0.000	(0.415)
R-squared		0.78			0.81			0.86			0.73			0.63			0.63	
OBS		1064			1064			1064			1064			1064			1064	

***, **, and * represent 1%, 5%, and 10% significance (two-tailed or one-tailed, as appropriate), respectively

t-stat in parenthesis next to the coefficient

NPLt: Non-performing assets at the end of the current year *t* divided by lagged total loans; **ΔNPLt**: Change in non-performing assets at the end of the current year *t* divided by lagged total loans; **COt**: Net charge-offs of the current year *t* scaled by lagged total loans; **ALWt-1**: Loan loss allowance at the end of the previous year t-1 divided by total loans; **LOANt**: Total loans at the end of the current year *t* divided by total assets; **SIZEt-1**: The natural log of total assets of the previous year t-1; **ΔGDPt**: Change in GDP at the end of the current year *t*; **ΔLOANt**: Change in total loans at the end of the current year *t* divided by lagged total loans; **ΔUNEMPt**: Change in unemployment rates at the end of the current year *t*; **EBPTt**: Earnings before taxes and provisions at the end of the current year *t* scaled by lagged total loans; **ΔDEPOSITSt**: Dummy variable that equals 1 if the change of annual deposits is negative and 0 otherwise; **ΔINTERESTt:** Dummy variable that equals 1 if the change of annual deposit rates is positive and 0 otherwise; **EBPTt * ΔDEPOSITSt**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔDEPOSITSt; **EBPTt *ΔINTERESTt**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔINTERESTt; **CAP_CLASS**: Dummy variable that equals 1 when a bank is classified as higher capitalised and 0 otherwise; **EBPTt * ΔDEPOSITSt *CAP_CLASS**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔDEPOSITSt and the dummy variable CAP_CLASS; **EBPTt *ΔINTERESTt*CAP_CLASS**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔINTERESTt and the dummy variable CAP_CLASS; **GSIB**: Dummy variable that equals 1 when a bank is classified as globally systemically important and 0 otherwise; **EBPTt * ΔDEPOSITSt *GSIB**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔDEPOSITSt and the dummy variable GSIB; **EBPTt *ΔINTERESTt* GSIB**: Interaction term between earnings before taxes and provisions at the end of the current year *t* and the dummy variable ΔINTERESTt and the dummy variable GSIB; **CAPITAL1**: The reported Tier I ratio at the end of the current year *t*; **CRISIS**: Dummy variable that takes the value 1 if the observations belong to the period of 2007–2009 and 0 otherwise; **PIIGSC:** Dummy variable that takes the value 1 when a bank is domiciled in Portugal, Italy, Ireland, Greece, Spain or Cyprus and 0 otherwise

In addition, future research could also investigate alternative factors that might have affected banks' accounting policy decisions regarding LLPs. In particular, it could examine the endogeneity between depositors' behaviour and banks' accounting policy since both might be driven by the same underlying economic factors. Furthermore, matters relating to banks' dividend policy and corporate governance issues can be analysed as factors that explain banks' accounting policy decisions.

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