EARNINGS MANAGEMENT PRACTICES IN THE BANKING INDUSTRY: THE ROLE OF BANK REGULATION AND SUPERVISION

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Abstract

The purpose of this research is to investigate earnings management purposes in the banking industry via loan loss provisions using a sample of 156 banks from 19 European countries under the Single Supervisory Mechanism (SSM) over the period 2006-2016. Using regression analysis, banks are tested for income smoothing, capital management, and signaling purposes. This study contributes to the literature exploring the relationship between accounting quality and earnings management objectives by analyzing which one of the latter is the most important determinant. The hypothesis of income smoothing and signaling are strongly approved since loan loss provisions consist as a tool for smoothing the amount of net profit and to convey private information to the market; on the contrary, the capital management purpose is not supported. Additionally, the analysis finds that non-discretionary components of loan loss provisions (essentially non-performing loans) have played an important role, especially during the financial crisis. Furthermore, the research is aimed at investigating the peculiar regulatory and supervisory environment in the banking industry on the basis of a set of indexes included in the "Bank Regulation and Supervision Survey", carried out by the World Bank. Differently, from previous literature, this study takes into account the last release of the survey, emphasizes the role of an on-site inspection as a main supervisory tool and extends the analysis of the interaction between bank regulation and supervision and earnings management. The results

demonstrate that such controls can influence the behavior of bank managers in terms of income smoothing and signaling practices. Therefore they can be considered as effective instruments able at reducing banks' management accounting discretion, making financial statements more reliable.

1. INTRODUCTION

Literature recognizes as a distinctive feature of the IAS-IFRS the 'principles-based' approach (Carmona & Trombetta, 2009). The issuance of generic accounting standards gives the opportunity to manage reported revenues and costs leading managers to consider earnings management purposes. Studies on financial and non-financial firms have proved earnings management purposes of income smoothing, signaling and capital management.

According to literature (Francis et al., 2016), the aforementioned purposes are realized through various practices generally attributable to real and accrual earnings management practices.

Taking into account literature on accruals-earnings management in the non-financial industry, studies follow the Jones model (1991) adopting an aggregated approach that considers the total amount of accruals. These studies have excluded financial firms from their sample due to the specific characteristics and the highly regulated nature of the banking industry.

On the contrary, banking literature has essentially adopted a specific approach focusing on loan loss provisions since they are the most relevant accrual and the discretionary component attached to them is rather relevant. Against this backdrop, this paper primarily intends to deepen which earnings management purposes is the most relevant in the banking industry.

Banks operate in a very highly regulated environment, where authorities have set up a range of devices, under the umbrella of regulation and supervision, in an attempt to control risk-taking incentives. Banking regulation and supervision is the most prominent institutional factor that affects accounting estimations of banks. Few scholars have examined the relationship between earnings management and banking regulation and supervision, essentially by means of indexes from the "Bank Regulation and Supervision Survey" developed by the World Bank.

The other purpose of this study is to investigate if banking regulation and supervision instruments reduce management accounting discretion, using indexes not yet applied by previous research.

The empirical model considers as the dependent variable the loan loss provisions out of total assets; the independent variables are aimed at separating the discretionary and non-discretionary component of the dependent variable. Detecting whether bank managers use discretion to manage earnings is based on the empirical model developed by Curcio and Hasan (2015). It is hypothesized that the most prominent determinant of loan loss provisions is associable to credit risk related

components, expected to be more significant during the last economic downturn; as to earnings management purposes, loan loss provisions should be significantly positively related to earnings and one-year-ahead changes in earnings while on the contrary banks should have little incentives to manipulate capital via loan loss provisions, so that a non-significant relationship between provisions and capital is expected.

By examining a sample of 156 European banks for the period 2006-2016, a panel data OLS regression with fixed effects has been run, showing as a critical non-discretionary explanatory variable the level of non-performing loans. Evidence supports the income smoothing and signaling hypothesis. The interaction between banking regulation and supervision explanatory variables and earnings management purposes demonstrates that banks are less likely to be involved in earnings management objectives if banking regulation and supervision regime are stricter.

The paper is organized in the following way. Section 2 presents the theoretical background behind earnings management policies applied in the banking industry summarizing the body of relevant academic literature and discusses the role of banking regulation and supervision in the background of the SSM. Section 3 explains the methodology and describes the data used in the analysis. Sections 4 and 5 present respectively the empirical results and the conclusions.

2. THEORETICAL BACKGROUND

2.1. Earnings management in the background of the international accounting standards

The adoption of IAS-IFRS as a set of single and global accounting language ensures the neutrality of financial statements, standardizing the accounting policies around the globe and the facilitation of high quality and comparable financial information. However the IAS-IFRS, as principle-based standards, give an opportunity to manage reported revenues and costs in order to change current period earnings or to consider other intentions, all included under the notion of "earnings management".

Earnings management has been defined in many different ways. According to Healy and Wahlen (1999), earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers.

2.2. Real and accruals-based earnings management

Two main forms of earnings management have been addressed in literature: real earnings management and accruals earnings

management. Roychowdhury (2006) provides an articulated framework of real earnings management, defined as management actions that deviate from normal business practices, undertaken with the primary objective of meeting certain earnings thresholds.

The same author has shown the existence of upward real-activity earnings management, which basically occurs when managers deviate from optimal business decisions. Francis et al. (2016) establish the existence of downward real earnings management by investigating several corporate events in which managers have incentives to temporarily deflate market valuations. Taking into account the banking industry, various studies (Cohen et al., 2014) have provided evidence of real earnings management practices through the discretionary realizations of security gains or losses.

Accruals earnings management basically reflect business transactions that affect future cash-flow although cash has not currently changed hands: hence they reflect the time allocation of revenues and expenses with a direct impact only on the P&L statement.

Accruals earning management studies on the non-financial industry have adopted an aggregated approach, based on the calculation of the total amount of accruals, as the difference between cash flow and earnings. The model adopted by Jones (1991) and its modified version by Dechow et al. (1995) is the most common empirical approach used to test accruals earnings management.

On the contrary, banking literature has essentially adopted a specific approach, focusing on a specific item that is loan loss provisions, and the level of its discretionary amount. Previous studies hypothesized that bank managers used partially discretion when they estimate the number of yearly provisions. To test empirically this hypothesis, Kwak et al. (2009), Garsva and Skuodas (2012), Curcio and Hasan (2015), have defined a regression on which loan loss provisions, as the dependent variable, is modelled as a function of various components, included in two different set of categories: 1) objective or non-discretionary accrual components, reflecting the credit-risk of the bank portfolio; 2) subjective or discretionary accrual components, considered as explanatory variables of income smoothing, capital management, and signaling purposes.

2.3. Earnings management purposes: income smoothing, signaling, and capital management

Under the umbrella of earnings management purposes, literature essentially refers to policies of income smoothing, signaling and capital management which are, respectively, aimed at: 1) reducing net income changes through financial years; 2) signaling private information about the amount of earnings that the management thinks the company will be able to reach in the future; 3) raising the amount of capital to be compliant with regulatory rules (and consequently to avoid costs

associated with the violation of specific requirements). Each purpose is detailed below.

Various definitions on income smoothing exist, but all seem to agree that managers use flexibility stemming from accounting principles both in the financial reporting process and in operating decisions to reduce net income changes through financial years.

Gebhardt and Novotny-Farkas (2011) recognize that a stable earnings stream may be useful to perceive the entity as less risky by investors and creditors, resulting in higher stock prices, lower borrowing costs and cost of capital.

Many studies related to income smoothing refer to the banking sector. Under the income smoothing behavior, banks choose accruals to minimize the variance of reported earnings.

Greenwalt and Sinkey (1988) suggest that managers smooth income in an attempt to reduce the perceived riskiness of their banks' earnings. Kanagaretnam et al. (2003) hypothesize that bank managers smooth income when there is a need for their banks to look to external financing for meeting customer loan demands.

The hypothesis of income smoothing within the banking sector has been developed essentially by examining the association between loan loss provisions and the pre-impairment operating profit. The mainstream, Collins et al. (1995), Laeven and Majnoni (2003), Gebhardt and Novotny-Farkas (2011) detect evidence of income smoothing by considering a strict correlation between loan loss provisions and earnings before taxes and loan loss provisions. However, a minority stream, Ahmed et al. (1999), conclude with no evidence of income smoothing.

Another managerial scope is to signal private information about the earnings that management thinks the company will be able to obtain in the future.

This hypothesis has been developed essentially by examining the association between loan loss provisions and one-year-ahead change in earnings before taxes and loan loss provisions. Kanagaretnam et al. (2004), Curcio and Hasan (2015) conclude that commercial bank managers do engage in signaling via loan loss provisions: this suggests that private investors can interpret increases in loan loss provisions as good news and not as the anticipated deterioration of credit portfolios' future quality. However, a contrary opinion is given by Ahmed et al. (1999), whose conclusion is of insufficient evidence to support the signaling hypothesis.

Capital management is a purpose referred to industries subjected to a strict regulation primarily expressed in terms of the minimum amount of capital to ensure that the related entities do not take on excess risk and become insolvent. This regards firstly the banking sector, where regulators require a minimum amount of capital to operate essentially because capital provides protection against risk-taking operations.

Considering previous studies, the relationship between loan loss provisions and capital adequacy ratios does not imply a clear prediction

of the sign of the association. Ahmed et al. (1999) conclude with negative association while Fonseca and Gonzalez (2008) find a significant positive association; Gebhardt and Novotny-Farkas (2011) do not reveal significant relation between loan loss provisions and capital ratios.

This study, focusing on the banking industry, contributes to the literature by exploring the relationship between accounting quality and earnings management objectives and analyzing which one is the most important determinant of earnings management. These arguments lead to the first research question: *Which earnings management purposes between income smoothing, capital management and signaling is the most relevant in the banking industry?*

The investigation of earnings management in the banking sector is based adopting a specific approach, considering as explanatory variable the loan loss provisions since traditional banks based their business on credit intermediation and have substantial latitude in determining the number of provisions, which is banks' main accrual.

Provisions for bank credit risk are commonly distinguished in a discretionary and non-discretionary component. The non-discretionary component is mainly due to problem loans and to the default risk of bank's credit portfolio; indicators such as the ratio of non-performing loans to total loans are able to capture the underlying portfolio credit risk. Thus the first hypothesis is mentioned as follows:

H1: The most prominent determinant of loan loss provisions is associable to credit risk related components, expected to be more significant during the last economic downturn.

As to discretionary components of loan loss provisions, the first driver of earnings management purposes is attributable to income smoothing. Managers adjust earnings figures for several subjective reasons: banks would recognize the underlying portfolio credit risk and build up loan-loss reserves in good times to be drawn on in bad times. Following the previous discussion, it is hypothesized a significant association between loan loss provisions and income smoothing. Hence, the second hypothesis is stated as follows:

H2: Loan loss provisions are significantly positively related to earnings.

With respect to capital management, if the relationship is expected to be significantly positive, this means that there is banks' tendency to manage provisions on the basis of their proximity to the minimum regulatory capital levels. However, bank capital regulation has progressively reduced banks' incentives to adopt capital management strategies. In this respect, a part of literature (Bouvatier et al., 2014) provides support to the limited role of capital management on loan loss provisions. Thus the third hypothesis is mentioned as follows:

H3: Banks have little incentives to manipulate capital via loan loss provisions so that a non-significant relationship between provisions and capital is expected.

Banks can also use provisions to signal their financial strength. Loan loss provisions are used as a signaling tool for stakeholders; especially

investors regarding banks expected cash flows in the future year. Hence, the fourth hypothesis is stated as follows:

H4: Loan loss provisions are positively related to one-year-ahead changes in earnings.

2.4. Earnings management and the role of banking regulation and supervision

Previous studies have explored how banks' management estimations on loan loss provisions are affected by several institutional factors such as institutional ownership (Kwak et al., 2009), accounting and auditing requirements (Fonseca & Gonzalez, 2008; Fernandez & Gonzalez, 2005), financial structure (La Porta et al., 2002). Against this backdrop, the most relevant institutional factors are represented by banking regulation and supervision since credit intermediary operates in a very highly regulated environment, where authorities have set up a range of devices in an attempt to control risk-taking incentives.

In the Euro Area, the Single Supervisory Mechanism, the first pillar of the European Banking Union, is based on a common methodology for the ongoing assessment of credit institutions, the so-called Supervisory Review and Evaluation Process (in short SREP). SSM Supervision on a credit institution basically consists of both off-site supervision, which mainly relies on the information reported by a credit institution, and on-site supervision performed through inspections in order to check, among other things, the accurateness of the information used to conduct off-site supervision. Therefore, inspection is the natural complement of ongoing (i.e. off-site) supervision.

The way adopted by literature to explore the relation between earnings management and bank regulation and supervision is by means of the "Bank Regulation and Supervision Survey", carried out by the World Bank in four different releases. On the basis of the first release, Barth et al. (2001) have identified a set of indicators, to sum up, the most relevant features of banks' regulation and supervision practices. These indexes have been adopted by literature to study if banking regulation and supervision play a role, among others, in management accounting policies.

In this respect, Fonseca and Gonzalez (2008), Gebhardt and Novotny-Farkas (2011), Bouvatier et al. (2014), Curcio and Hasan (2015), on the basis of a part of those indexes, recognized that the use of loan loss provisions to smooth income is reduced through stricter regulation on bank activities, official supervision, and private monitoring.

From a prudential point of view, their empirical evidence points out that banks are less likely to be involved in income smoothing if restrictions in banking activity are higher; they conclude recognizing the need for a sound accounting framework since their findings support the probability that reported financial numbers may not reflect the underlying economic reality of European banks.

Differently from previous literature, this study on the SSM banking system takes into account the indexes included in Barth et al. (2013). The authors carried out data quality on the indexes previously developed: compared to their previous works, the authors perform a process of quality assurance, resolving a large part of inconsistencies and missing values of the four surveys by considering the time-series of answers given by Banking Authorities.

Additionally, it is worth noted that previous works do not emphasize the role of on-site inspection to influence, as the main supervisory tool, financial figures. In this respect, differently from previous literature, this study investigates the role of banking supervision by introducing the index of the frequency of on-site inspection.

Furthermore, this paper studies the role of banking regulation and supervision considering not only the association with income smoothing but expanding the focus on signaling and capital management as well. All that said, the relation between banking regulation and supervision and earnings management practices are based on the following research question: *Do banking regulation and supervision instruments reduce management accounting discretion? If yes, in which manner?*

As to bank regulation, tighter rules on bank activities should reduce both opportunities for taking risk and earnings management practices. A similar assumption refers to bank supervision. For these reasons, it is expected a negative influence of both banking regulation and supervision on earnings management practices. To sum up, the fifth hypothesis is developed.

H5: Bank regulation and supervision are effective instruments able to reducing banks' management accounting discretion.

3. RESEARCH METHODOLOGY

3.1. Methodology and variable definition

Detecting whether bank managers use their discretion to manage capital and/or earnings and to signal future earnings is in line with prior research, separating the discretionary and non-discretionary components of loan loss provisions.

The variables adopted derive from a vast majority of prior literature: Curcio and Hasan (2015), Ahmed et al. (1999), Bouvatier and Lepetit (2008), Fonseca and Gonzalez (2008), based on the regression of bank loan loss provisions on various explanatory variables.

A full list of variables and their definitions is provided below, as well as the rationale for a predicted relationship. In order to avoid the influence on the results due to the different size of credit institutions, variables referred to single banks have been scaled by average total assets; this is a way to mitigate potential estimation problems with heteroskedasticity.

1) Dependent variable. LLP: the ratio of loan loss provisions to total assets at time t for the bank i. In line with previous literature, the value of the ratio is believed to be able to identify the magnitude of earnings management practices in the banking industry.

2) Non-discretionary variables. The first group of independent variables could be defined as non-discretionary (or objective) components of loan loss provisions, intended as direct proxies for the default risk of the loan portfolio and aimed at distinguishing between general and specific provisions. They consist of NPL, the ratio of non-performing loans to total assets that occurred at the bank i at time t. It represents the current level of losses within the loan portfolio. NPL can be considered a proxy for the part of loan-loss provisioning regarding specific provisions; it appears as the best proxy for loan portfolio credit risk and it is expected to be positively related to changes in NPL.

LOA: the ratio of customer loans to total assets that occurred at the bank i at time t. It represents the dynamics of losses within the loan portfolio and it is intended as a proxy to capture general provisions. As regards its relations with LLP, the influence of LOA is supposed to be positive and depends on the quality of incremental loans; however, the association should be lower than the one between LLP and NPL since the less relevance of general provisions.

3) Discretionary variables. Three different bank-specific variables, namely current earnings before taxes and loan loss provisions, Tier 1 ratio and one-year-ahead change in earnings before taxes and loan loss provisions, capture the discretionary (i.e. subjective) component of loan loss provisions.

EAR: the ratio of current earnings before taxes and loan loss provisions to total assets that occurred at the bank i at time t. It consists of a pre-impairment operating profit, considered as a measure aimed at testing if income smoothing purposes have occurred. If the sign of the coefficient between LLP and EAR is positive, this means that banks with lower (higher) earnings tend to reduce (increase) loan loss provisions. According to the developed hypothesis, the adoption of income smoothing practices is verified and LLP is aimed at stabilizing EAR. Therefore, the expected association is positive.

T1: Tier 1 regulatory capital divided by risk-weighted assets that occurred at the bank i at time t. It is considered as the best variable aimed at testing capital management policies: based on prudential rules, T1 includes equity and retained earnings and loan loss provisions are subtracted. According to a part of previous studies (Bouvatier & Lepetit, 2008), financially distressed banks that have problems meeting capital requirements may have incentives to reduce their provision, since they have a constraint due to a tight solvency position. In light of this, T1 is supposed to be a proxy of capital management practices and the expected association between LLP and T1 could be positive. A different explanatory capital management variable would be the Total Capital Ratio, corresponding to the sum of Tier 1 and Tier 2 regulatory capital; if

banks under internal rating based model are considered, the second part of the total amount of the own funds (Tier 2 capital) include in a certain way the amount of loan loss provisions.

SIGN: the ratio of one-year-ahead change in earnings before taxes and loan loss provisions to total assets that occurred at the bank i at time t. It indicates the existence of signaling practices via loan loss provisions. In line with previous studies, if the coefficient between LLP and SIGN is positive, this means that changes in loan loss provisions are positively correlated to future changes in earnings: in this case, the adoption of signaling practices are verified.

Further additional control variables have been added on the right side of the regression equation. In this respect the study includes:

GDP: the annual growth rate in the gross domestic product at constant prices of country i at time t. Given that this is a cross-border study, GDP is supposed to be the most appropriate macroeconomic indicator as an indirect proxy for credit risk. Taking into consideration business cycle conditions, it could be seen as a control variable for procyclical effects of provisioning; a negative relationship with LLP is expected since a higher level of provisions should be observed if the economic situation declines. GDP data are from Eurostat.

SIZE: bank dummy variable. The intermediaries' categorization under the SSM is considered to take into account the dimension of the bank. Specifically, the banks in the sample have been distinguished in two groups, assuming the value of 0 if the bank is a less significant institution (meaning that it is supervised directly by a National Supervisory Authority), whereas 1 if it is a significant institution under the direct supervision of the European Central Bank. To the best of my knowledge, this is the first study investigating the relation of this variable and LLP; there is no clear evidence of the possible sign of the relation between SIZE and LLP.

COU: country dummy variable. It is a set of country dummy variables controlling for specific differences in the level of loan loss provisions across countries; they are included with an intention to assess if country-specific effects really matter.

YEAR: year dummy variable. It is a set of dummy time variables aimed at capturing the unobserved time-invariant effect that is not included in the regression. There is no clear evidence of the possible sign of the relation with LLP; a possible trend could be observed considering the impact of the last economic downturn.

Against this backdrop, it is worth noted that the accounting regime does not raise any issues since all the banks in the sample are under IFRS. Taken the variables altogether, the following model specification is applied to give an answer to the first research question.

$$LLP_{i,t} = \alpha_0 + \alpha_1 NPL_{i,t} \, LLP_{i,t} = \alpha_0 + \alpha_1 NPL_{i,t} + \alpha_2 LOA_{i,t} + \alpha_3 EAR_{i,t} + \alpha_4 T1_{i,t} + \alpha_5 SIGN_{i,(t+1,t)} + \alpha_6 GDP_{i,t} + \alpha_7 SIZE_t + \sum COU + \sum YEAR + \varepsilon \qquad (1)$$

4) Banking regulation and supervision variables. The second set of components represents explanatory variables of banking regulation and supervision, which may have either a positive or a negative effect on credit institutions' decisions to earnings management practices.

As said above, this profile is deepened using evidence from the "Bank Regulation and Supervision Survey", carried out by the World Bank. The survey is a source of comparable worldwide data on how banks are regulated and supervised by competent authorities; it is based on a list of questions sent to competent regulatory and supervisory authorities around the world and covers various aspects of banking, including entry requirements, ownership restrictions, capital requirements, activity restrictions, external auditing requirements, deposit insurance scheme characteristics, loan classification and provisioning requirements, accounting and disclosure requirements, troubled bank resolution actions, quality of supervisory personnel.

Four different release of the survey, involving many countries, have been performed in 2001, 2003, 2007 and 2012. The survey includes a set of indicators to sum up the most relevant features of banks' regulation and supervision practices and they can be used to study if banking regulation and supervision play a role in management accounting policies.

In this respect, the influence of banking regulation and supervision is developed by virtue of specific indexes developed by Barth et al. (2013). The study includes the following banking regulation and supervision variables.

CAP: index of the stringency of bank capital regulation. The index takes into account the number of capital banks must hold and the stringency of regulations on the nature and source of regulatory capital. Specifically, it is composed of the answers given from the regulators on the basis of 10 specific survey questions: as a consequence, the maximum possible value is 10, while the minimum is 0. Larger values indicate more stringent capital regulation; in this respect, it is supposed a positive relation between LLP and CAP.

EXA: frequency of on-site inspections performed by Supervisory Authority. To study the influence of banking supervision, the paper focuses on the frequency on which inspections are carried out by supervisory inspectors. The information has been derived from Barth et al. (2013), where specific information at a national level has been provided. In this perspective the index adopted, differently from the ones considered by previous studies, is supposed to be more strictly related to the amount of loan loss provisions.

5) Interaction variables. To test the interaction between banking regulation and supervision variables and earnings management purposes, it has been sequentially incorporated an interaction term for each banking variable (CAP and EXA) and the explanatory variable of earnings management (EAR, T1, and SIGN).

The interaction of banking regulation and supervision with each earnings management variables has been considered separately rather than at the same time. The coefficient of each interaction term measures the influence of banking regulation and supervision on bank income smoothing, capital management, and signaling practices; to that end, it is supposed a negative coefficient if the banking regime is stricter, meaning that banks are less likely to be involved in income smoothing, capital management and signaling practices.

Therefore, the following interaction between variables has been defined.

Banking regulation and earnings management purposes:

– CAP*EAR: interaction between banking regulation and income smoothing;

– CAP*T1: interaction between banking regulation and capital management;

– CAP*SIGN: interaction between banking regulation and signaling.

Banking supervision and earnings management purposes:

– EXA*EAR: interaction between banking supervision and income smoothing;

– EXA*T1: interaction between banking supervision and capital management;

– EXA*SIGN: interaction between banking supervision and signaling.

To develop the second research question, the following regression equations are applied.

$$LLP_{i,t} = \alpha_0 + \alpha_1 NPL_{i,t} + \alpha_2 LOA_{i,t} + \alpha_3 EAR_{i,t} + \alpha_4 T1_{i,t} + \alpha_5 SIGN_{i,(t+1,t)} + \alpha_6 CAP_{i,t} + \alpha_7 CAP^*EAR_{i,t} + \alpha_8 CAP^*T1_{i,t} + \alpha_9 CAP^*SIGN_{i,t} + \alpha_{10} SIZE_i \quad (2) + \alpha_{11} GDP_{i,t} + \sum COU + \sum YEAR + \varepsilon$$

$$LLP_{i,t} = \alpha_0 + \alpha_1 NPL_{i,t} + \alpha_2 LOA_{i,t} + \alpha_3 EAR_{i,t} + \alpha_4 T1_{i,t} + \alpha_5 SIGN_{i,(t+1,t)} + \alpha_6 EXA_{i,t} + \alpha_7 EXA^*EAR_{i,t} + \alpha_8 EXA^*T1_{i,t} + \alpha_9 EXA^*SIGN_{i,t} + \alpha_{10} SIZE_i \quad (3) + \alpha_{11} GDP_{i,t} + \sum COU + \sum YEAR + \varepsilon$$

3.2. Data and sample selection

The samples of countries and banks have been set out on the basis of the following criteria. From a geographical perspective, the population of countries included in the World Bank Survey (118, 151, 143 and 142 countries, respectively, in 2001, 2003, 2008 and 2012 surveys) has been reduced to the 19 Euro Area Countries in the context of the SSM.

In order to define a balanced sample of banks, a subset of credit institutions has been selected, considering both Significant Institutions (SI), the largest banks supervised in the SSM, and Less Significant Institutions (LSI). The cut-off date for ECB significance decisions dated 1 April 2017 has been considered. This significance decision includes 124 significant institutions; the sample has been set by dropping 31 banks since their financial figures are missing for at least one year of observation (data not available both on Bankscope/Orbis and the banks'

websites). Therefore, this procedure defines a sample of annual year-end information of 93 SI. Furthermore, the sample has been extended taking into account minor banks in terms of size. On the basis of the previous criterion, that refers to banks whose financials are available for the whole observation period in Bankscope/Orbis or banks' website, a list of 63 LSI has been also added, of which the large majority are Italian (No. 41).

One possible explanation of the lack of data on LSI in both Bankscope/Orbis and websites depends to the adoption of national accounting principles applied, that do not generally require specific accounting information (such as the amount of non-performing loans). Otherwise, as regards Italian financial system, since 2005 all the banks have to prepare their financial statements according to specific schemes in line with IAS-IFRS, requiring a more extensive set of financial information compared to national standards. As a whole, the total sample of banks consists of 156 banks: the representativeness essentially depends on the reporting quality of some of the indicators representing the bulk of this research (such as non-performing loans, loan loss provisions, Tier 1 ratio). The analysis is mainly driven by Italian banks that represent around 1/3 of the sample (54 out of 156), whereas Germany and France respectively the second and third country in terms of representation, counting for almost 20% of the sample banks.

The time frame of interest starts from 2006 to 2016 and the use of this specific time series are due to the financial crisis. Specifically, as the turmoil of the financial crisis can represent a source of noise in the data, the analysis has been performed before and after the crisis period. Furthermore, during the specific time frame, the banks were subjected to two major regulatory changes, i.e. the implementation of the Basel III Accord in 2014 and the change of supervision model through the launch of the SSM in November 2014.

The final sample size consists of no. 1,716 banks' year observations. Financial figures, expressed in USD currency, are from Bankscope/Orbis database (Bureau van Dijk); in order to avoid any data inconsistencies and lack of information, where not available, data have been taken from banks' websites.[1] In some minor cases when data referred to specific variables (Non-performing loans, Total Capital Ratio, Tier 1 ratio) were not available, estimation has been performed, mainly on the basis of the average values observed in the past has been carried out.[2] Table 1 below highlights the final sample on a country basis.

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[1] Since financial figures from Bankscope/Orbis are in USD, data from banks' web sites have been converted according to the exchange rate of the euro to the USD (EUR-USD), available on the European Central Bank web site. The exchange rate EUR-USD reflects USD values as of end of each year, namely: 1.31 (2006), 1.47 (2007), 1.39 (2008), 1.44 (2009), 1.33 (2010), 1.29 (2011), 1.32 (2012), 1.38 (2013), 1.21 (2014), 1.09 (2015), 1.05 (2016).
[2] Non-performing loans is the only exception: taking into account the amount of loan loss reserves, it has been hypothesized a coverage ratio of 50%, therefore, loan loss reserves has been doubled.

Table 1. Distribution of banks and observations by country
(Sample statistics)

Countries	Number of banks	of which: number of SI	of which: number of LSI	Number of observations	Percentage of total observations
Austria	6	6	0	66	3,8%
Belgium	6	6	0	66	3,8%
Cyprus	1	1	0	11	0,6%
Estonia	2	2	0	22	1,3%
Finland	4	4	0	44	2,6%
France	10	10	0	110	6,4%
Germany	21	18	3	231	13,5%
Greece	6	4	2	66	3,8%
Ireland	3	3	0	33	1,9%
Italy	54	13	41	594	34,6%
Latvia	3	3	0	33	1,9%
Lithuania	6	3	3	66	3,8%
Luxembourg	2	0	2	22	1,3%
Malta	2	2	0	22	1,3%
Netherlands	8	5	3	88	5,1%
Portugal	3	2	1	33	1,9%
Slovakia	5	3	2	55	3,2%
Slovenia	7	3	4	77	4,5%
Spain	7	5	2	77	4,5%
Total	**156**	**93**	**63**	**1.716**	**100,0%**

Source: compiled by the author

3.3. Descriptive statistics and correlation

Table 2 below provides some descriptive statistics for the period 2006-2016 considering the whole sample of banks.

Table 2. Descriptive statistics

All banks	LLP	NPL	LOA	EAR	T1	SIGN
Observations	1,716	1,716	1,716	1,716	1,716	1,716
Mean	0.007	0.054	0.590	0.010	12.88%	0.001
Median	0.004	0.029	0.630	0.010	11.50%	0.0004
Std deviation	0.013	0.075	0.198	0.013	6.23%	0.017
Min	-0.011	0.000	0.008	-0.196	-6.10%	-0.159
Max	0.185	0.757	0.964	0.158	66.89%	0.291

Source: compiled by the author

The median ratio of loan loss provisions to total assets (LLP) is 0.4%, while the mean value is 0.7%. The difference is due to the weight of outlier observations; however, data are not curtailed in the upper and lower bound of the distributions in order to avoid loss of observations which could deteriorate the validity of the inferences. The value of the LLP median ratio confirms that loan loss provisions are a relatively important accrual for credit intermediaries.

With regard to the credit quality portfolio of the whole sample, non-performing loans (NPL) are, on average, 5.4% of total assets.

With reference to the business model, on average banks account a number of loans (LOA) above 50% of their total assets. As to profitability, the ratio of earnings before taxes and loan loss provisions to total assets (EAR) is circa 1%. Banks' capital endowment is measured by the ratio of primary quality capital to RWA (Tier 1 capital, T1), whose mean value is 12.88%. The ratio is well above the minimum amount required by Basel Accords 2 and 3 (respectively 4% and 6).

3.4. Descriptive statistics and correlation of the banking institutional environment

The selected indicators CAP and EXA identify the role played by specific features of existing regulation and supervision practices around SSM countries. As previously mentioned, these come from summary indices of key regulatory and supervisory banking policies on a country basis, giving the possibility to facilitate cross-country analysis.

It is worth noting that the aforementioned financial statement's aggregates are annual from 2006 to 2016, while the indexes are available 2 points in time, stemming from World Bank Survey III (2007) and Survey IV (2012); consequently, in line with previous research, the work is based on the assumption that the scores remain constant within these windows of time.

CAP is an index of the stringency of bank capital regulation ranging from 0 to 10 with a mean value of 5.7 (2007) and 7.1 (2012); the majority of SSM countries increased the stringency of their capital regulations following the crisis.

With reference to EXA, most of the countries do not indicate a significant difference in the frequency of on-site inspection from the two surveys. A number of on-site inspection provided by Slovakia Authority are quite divergent from 2007 to 2012 (from 40 to 2); therefore the mean value has been calculated not including Slovakia (3.5 in both 2007 and 2012 surveys).

4. EMPIRICAL RESULTS

4.1. Earnings management purposes: Income smoothing, capital management, and signaling hypothesis

The summary results of the first stage of the regression analysis are provided below (Table 3). A panel data regression with fixed effects based on YEAR as variable dummy has been performed (the reference year is 2006). This is the suitable approach as demonstrated by the Hausmann test. The goodness of statistics of the model is reasonable, particularly taking into account the adjusted R-squared of 66%; the F-test is significant at the level of 1%.

Table 3. Test of capital management, income smoothing, and signaling hypothesis during the period 2006-2016

Explanatory variables	Coefficient	t-Value	P>|t|	Std. Error
NPL	0.11971 ***	35.05	0.000	0.0034
LOA	-0.00301 ***	-2.84	0.005	0.0010
EAR	0.15384 ***	8.05	0.000	0.0191
T1	-0.00784 **	-2.15	0.031	0.0036
SIGN	0.11144 ***	7.46	0.000	0.0149
SIZE	0.00242 ***	5.36	0.000	0.0004
GDP	-0.07747 ***	-7.99	0.000	0.0096
COU	0.00022 ***	5.36	0.000	0.0004
Year dummies				
2007	0.00150	1.58	0.114	0.0009
2008	-0.00099	-1.02	0.307	0.0009
2009	-0.00235*	-1.89	0.058	0.0012
2010	0.00059	0.59	0.553	0.0009
2011	0.00050	-0.51	0.608	0.0009
2012	-0.00184*	-1.76	0.079	0.0010
2013	-0.00011	-0.11	0.914	0.0010
2014	-0.00179*	-1.75	0.080	0.0010
2015	-0.00139	-1.34	0.182	0.0010
2016	-0.0042***	-4.05	0.000	0.0042
Adjusted R^2	0,661			
F-test	177.20***			
Number of observations	1,715			
Number of banks	156			

*Source: compiled by the author; ***, **, and * represent significance at the 1%, 5% and 10% level, respectively. For year dummies the reference year is 2006.*

The discretionary and non-discretionary explanatory variables demonstrate predicted relationships with LLP in terms of a sign; LOA is the only exception. Confirming the first hypothesis, the critical non-discretionary explanatory variable is NPL, the coefficient of the ratio of non-performing loans to total assets is positive and significant (0.1197).As regards the other non-discretionary explanatory variable, LOA, the association with LLP is very weak (-0.0030) is not a predicted result. As explained above, LOA reflects the number of loans. The sign observed, different from the correlation index, mostly depends on its interaction with NPL; if NPL is dropped, the relation between LLP and LOA becomes positive (0.0051).

As to the first research question to be developed, confirming the second hypothesis, EAR is positively associated with LLP with a coefficient of 0.1538.

The coefficient of T1 is negative (-0.0078), entailing that the banks in the sample do not use loan loss provisions to manage their capital ratios; therefore the capital management purpose (hypothesis no. 3) is not supported by evidence.

As to the signaling hypothesis, the coefficient of the variable SIGN is positive (0.1114) and significant at 1% level, consequently, the expected association between SIGN and LLP (see hypothesis 4) is confirmed.

4.2. Earnings management practices: The role of banking regulation and supervision

The summary results of the second stage of the regression analysis are provided below (Tables 4 and 5).

Table 4. Test of interaction between earnings management and banking regulation during the period 2006-2016

Explanatory variables	Coefficient	t-Value	P>|t|	Std. Error
NPL	0.12100 ***	35.61	0.000	0.003
LOA	-0.00387 ***	-3.37	0.001	0.001
EAR	0.59753 ***	6.62	0.000	0.090
T1	-0.05487 ***	-4.30	0.000	0.012
SIGN	0.32791 ***	4.05	0.000	0.081
CAP	0.00023	1.28	0.202	0.000
CAP*EAR	-0.06399***	-5.00	0.000	0.012
CAP*T1	0.00643***	3.45	0.001	0.001
CAP*SIGN	-0.03256***	-2.62	0.009	0.012
SIZE	0.00192***	3.86	0.000	0.000
GDP	-0.08351***	-8.50	0.000	0.000
COU	0.00020***	3.94	0.000	0.009
Year dummies				
2007	0.00125	1.22	0.223	0.001
2008	-0.00152	-1.37	0.170	0.001
2009	-0.00324**	-2.34	0.020	0.001
2010	-0.00018	0.17	0.867	0.001
2011	-0.00082	-0.75	0.454	0.001
2012	-0.00240**	-2.06	0.040	0.001
2013	-0.00061	-0.53	0.598	0.001
2014	-0.00228**	-2.04	0.042	0.001
2015	-0.00172	-1.53	0.126	0.001
2016	-0.00474***	-4.17	0.000	0.001
Adjusted R^2	0,642			
F-test	140.84***			
Number of observations	1,715			
Number of banks	156			

Source: compiled by the author; ***, **, and * represent significance at the 1%, 5% and 10% level, respectively. For year dummies the reference year is 2006.

The regression models are basically in line with the previous one, apart from the addition of the specific variables referred to banking regulation and supervision and the interaction variables. The goodness of statistics of the empirical model remains reasonable, taking into account in both cases an adjusted R-squared of 64%; the F-test is significant at the level of 1%.

On the basis of the results, the hypothesis on income smoothing and signaling are confirmed; in line with first-stage regression, firstly managers give relevance to current economic performance (i.e. income smoothing), then next year results (i.e. signaling). The hypothesis of capital management needs to be rejected in this case as well. The coefficient of the variable measuring banking regulation (CAP) is positive, meaning that the higher the regulation regime, the higher the amount of loan loss provisions accounted. The interaction terms CAP*EAR and CAP*SIGN are both negative and significant at 1% level, meaning that banks are less likely to be involved in income smoothing and signaling practices if restrictions in banking regulation are higher.

Table 5. Test of interaction between earnings management and banking supervision during the period 2006-2016

Explanatory variables	Coefficient	t-Value	P>|t|	Std. Error
NPL	0.11542 ***	32.60	0.000	0.003
LOA	-0.00296 ***	-2.68	0.007	0.001
EAR	0.17006 ***	5.24	0.000	0.032
T1	-0.00825 *	-1.79	0.073	0.004
SIGN	0.11011 ***	7.45	0.000	0.014
EXA	0.00013	0.94	0.348	0.000
EXA*EAR	-0.00785	-1.60	0.110	0.004
EXA*T1	0.00005	0.07	0.945	0.000
EXA*SIGN	-0.26323***	-6.79	0.000	0.038
SIZE	0.00218 ***	4.81	0.000	0.000
GDP	-0.06456 ***	-6.60	0.000	0.000
COU	0.00019 ***	3.64	0.000	0.009
Year dummies				
2007	0.00116	1.23	0.219	0.000
2008	-0.00088	-0.91	0.365	0.000
2009	-0.00141	-1.13	0.259	0.001
2010	0.00046	0.47	0.636	0.001
2011	-0.00116	-1.18	0.239	0.001
2012	-0.00142	-1.35	0.178	0.001
2013	-0.00009	0.09	0.929	0.001
2014	-0.00155	-1.51	0.131	0.001
2015	-0.00143	-1.37	0.170	0.001
2016	-0.00392***	-3.70	0.000	0.001
Adjusted R^2	0,646			
F-test	143.84***			
Number of observations	1,715			
Number of banks	156			

*Source: compiled by the author; ***, **, and * represent significance at the 1%, 5% and 10% level, respectively. For year dummies the reference year is 2006.*

As to banking supervision similar conclusion can be defined: the positive relation between EXA and LLP means that banks with more frequent on-site inspection on average account higher loan loss provisions. Furthermore, bank managers' incentives to smooth income and to signal future financial information are reversed: this is demonstrated by virtue of the interaction variable EXA*EAR and EXA*SIGN, which shows a negative coefficient in both cases, significant at the conventional confidence levels.

4.3. Robustness tests

In this section, we have performed some additional tests to check the robustness of primary results. First, we examine the association between LLP and another definition of the regulatory capital, total capital ratio (defined as TCR), rather than the one adopted in the previous section (T1) to check if capital management hypothesis continues to be rejected. Evidence shows that the adoption of this new measure of capital does not alter the overall results previously discussed.

Second, in order to support the relevance of the supervision index used in the model (EXA), the model has been performed replacing EXA

with the banking supervision index adopted by previous studies, that is the Official Supervisory Power Index (SUP) representing the Official Supervisory Power Index included in the World Bank Surveys; it ranges from 0 to 14 and captures the power of supervisors to take prompt corrective action, to restructure and reorganize troubled banks, and to declare a troubled bank insolvent. Compared to EXA, results stemming from the adoption of SUP are counterintuitive; the coefficient of the interaction variables SUP*EAR and SUP*SIGN show positive values. Thus, results confirm that EXA is strictly connected to the amount of loan loss provisions accounted by each bank, while we do not have the same evidence by using SUP.

Finally, we exclude from the sample all the Italia banks, because Italy has the largest number of observations, representing 1/3 of the banks in the sample. The results remain qualitatively similar to those discussed in the previous. However, some changes are reflected in terms of earnings management, essentially: 1) higher value of EAR coefficient, meaning a more significant relevance of income smoothing practices; 2) conversely, signaling does not reveal significant relevance. Additionally, the table confirms that stricter regulations on bank and stricter official supervision reduce the use of loan loss provisions to smooth earnings.

4.4. Limitation of the analysis and future researches

There are several limitations to this study. The estimation of the accruals into the banking system is basically based taking into account the amount of loan loss provisions. In this respect, there is a relative paucity of research with reference to the estimation of discretionary accruals by virtue of an aggregate approach.

As regards banking regulation and supervision indexes, they are available two points in time, while the financial statement's aggregates are annual. In line with previous studies, the work is under the assumption that the scores remain constant within these windows of time.

The research could address further studies on the relationship between discretionary accruals and the regulatory and supervisory regime, taking into account a recent strengthening of the prudential framework.

From another perspective, a natural extension to the analysis developed is the role of an inspection performed by supervisory authorities per intermediary.

5. CONCLUSIONS

Academic research suggests that accounting quality is not necessarily determined only by accounting standards; several studies (Leuz et al., 2003; Garsva et al., 2012) find that the quality of financial reporting is shaped by various firms' reporting incentives.

This study examines earnings management purposes, in terms of income smoothing, capital management and signaling for a sample of 156 banks from the 19 European countries under the SSM over the period 2006-2016. Data are from Bureau Van Dijk's Bankscope and Orbis database (in some minor cases figures are from single banks' websites). A panel data OLS regression with fixed effects has been run.

In the present study, the attention is first directed to assess if earnings management purposes occur in the banking industry and which one is the most relevant. Loan loss provision is a key accounting choice that significantly influences the reported earnings of banks.

Overall, the study evidences that loan loss provisions are linked to the credit portfolio quality, showing as a critical non-discretionary explanatory variable the level of non-performing loans.

As to earnings management objectives, in line with previous studies, primarily the hypothesis of income smoothing and then signaling are strongly approved. On the contrary, capital management purpose is not supported, in line with Ahmed et al. (1999).

Furthermore, the research is aimed at investigating the peculiar regulatory and supervisory environment in the banking industry; some previous studies (Fonseca & Gonzalez, 2008; Bouvatier et al., 2014) demonstrate that such controls can influence the behavior of bank managers in terms of income smoothing strategies.

In this respect, the study extends the impact of bank regulation and supervision assessing the role of capital management and signaling purposes. The results obtained show that bank supervision and regulation systems impact on income smoothing and signaling practices, in the sense that they reduce incentives for realizing these purposes in the banking system.

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