

REGULATION, SUPERVISION AND ACCOUNTING CONSERVATISM: THE INTERACTION OF THE THREE PILLARS OF BASEL II ON THE QUALITY OF REPORTED EARNINGS IN WORLDWIDE BANKS

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Abstract: This paper analyzes how regulatory and supervisory regimes in the banking industry interact with market discipline measures, such as listing status, ownership, and market concentration,.

Results show that the extent to which regulation and supervision are enforced is a strong mechanism to achieved accounting conservatism in countries or situations in which market discipline fails. Generally, the supervisory power reinforces the effect of market discipline, whereas the capital regulatory system mitigates the effect of market discipline on conservatism.

It contributes to the debate on the mechanism introduced by Basel III that strongly increases regulation, its enforcement, and supervisory power after a long period of deregulation.

I. INTRODUCTION

THE most recent financial crisis has pushed a number of institutional problems surrounding banking and financial regulation to the forefront of the academic debate. Financial regulation exists as a complement in financial markets' failure situations. Basel II establishes a theoretically compact model based on three pillars: regulation, supervision and market discipline. It is a globally accepted model and, nevertheless, it has failed due to the great international financial crisis that has impeded the stability of the markets and that has pushed the emergence of Basel III, based on the same three pillars, but with singularities. In fact, the Basel III recommendations have supported and reinforced the three pillars of regulation, supervision, and market discipline to reach financial stability.

That is why this paper is important: evidence why Basel II did not work and shows what the problem was. This paper evaluates the ways that these pillars affect accounting conservatism as a measure of accounting quality. The last financial crisis may have been the result of a worldwide systemic failure within the banking sector, so it is relevant to investigate its causes. An important deregulation process took place in the late 1980's, which generated a significant increase in the value-added generated by banks. This liberalization process fostered the consolidation of the industry, removed entry barriers and geographic constraints, and set up incentives that led to a nationwide expansion of banks. On the other hand, the nature of bank accounting systems around the world might have exacerbated the growth pattern of financial institutions in the last three decades. In particular, late recognition of loan loss provisions may have increased outstanding loans during the expansionary periods, and dramatically decreased lending activity in downturns (Beatty

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and Liao, 2011). Regulators pursue the stability of financial markets. However, certain accounting standards, such as loan impairments, have a cyclical component, that is, they accentuate periods of expansion and depression. Therefore, regulators try to control the effect of procyclicality. To mitigate the issue of procyclicality, academics and practitioners want an increase in accounting conservatism for banks in the form of timely loan loss recognition. In that vein, the Bank of Spain set up a dynamic loan loss provisioning system in the mid-2000s in which all banks had to build up loan loss reserves during the good years (Saurina, 2009) to act as a contra-cyclical buffer. Bank supervisors give banks considerable flexibility to recognize loan impairments, exploiting the ex-ante incentives of banks to engage in early recognition of loan losses. In Germany, banks also implement an opaque accounting reserve, which is widely used to smooth earnings (Domikowsky et al., 2014)].

Many of the weaknesses exposed by the financial crisis are the result not only of gaps in the regulatory framework, but also the result of inadequate implementation of existing risk management standards and guidance, such as the pre-crisis guidance on liquidity risk management. Thus, addressing deficiencies in implementation is just as important as addressing deficiencies in policies.

The Basel Committee encourages the use of prudent and conservative accounting in order to achieve financial stability. Unlike the accounting regulators' perspective, provisioning policies must be based on realized loan losses that can be objectively proven, since pursuing higher levels of accounting information transparency and quality, and developing a common set of accounting rules are the Basel Committee's main goals (Curcio and Hassan, 2015).

During the financial crisis, the delayed recognition of credit losses on loans and other financial instruments was identified as a weakness in existing international accounting standards before IFRS because it mitigated the procyclicality. As part of the IFRS 9 reform, a new loss impairment model has been introduced, which requires more timely recognition of expected credit losses (IFRS, 2014). The final version of IFRS 9 will be effective for annual periods beginning on or after January 1, 2018.

This paper uses the cross-sectional variation in supervisory regimes across the world to evaluate the effects of banks' supervision and specific characteristics of their level of conditional accounting conservatism. In particular, this paper uses a sample of 14,651 bank-year observations including banks from 54 countries from 1997 through 2009. Only active commercial and savings banks are considered. The ratio of the loan loss reserves to total nonperforming loans developed by Beatty and Liao (2011) is used as a measure of conservatism. This model does not require time series data.

The objective of this paper is to confront the pillars of Basel II (regulation, supervision, and market control) in order to evaluate whether the most robust control can be to market discipline or whether the system has opted to establish more traditional, rigid systems of regulation and supervision. To avoid the effects of procyclicality, the Basel III standards were proposed in 2010 to strengthen the stability of the banking system through more rigid regulatory and supervisory processes after the deregulation period that led to Basel II. This impetus to reinforce regulation and supervision motivates this study of whether Basel II has achieved its goals.

The findings suggest that stronger regimes of regulation and supervision are positively associated with conditional accounting conservatism. Regarding market discipline, the third component of Basel II, the empirical evidence in this paper indicates that conditional accounting conservatism is higher for unlisted or private commercial banks. Moreover, the timeliness of loan loss recognition increases with market competition. The indirect effects of regulation and supervision on conditional accounting conservatism are analyzed by studying their interactions with the determinants of market discipline. Results show that regulation and supervision mitigate the negative effects of weak market discipline on the extent of banks' accounting conservatism.

This work contributes to the existing literature on accounting conservatism by considering institutional variables that also constitute drivers of financial markets stability, such as country-specific regulation and supervision. Few papers have analyzed accounting conservatism while considering the effects of differences in financial, regulatory, and supervisory systems. Comparing the pre-crisis boom of 2002–2006 with the crisis period of 2007–2009, El Sood (2012) shows that banks use loan loss provisions more extensively during the crisis periods to smooth income upward, which is relevant to current concerns about accounting standard-setters and bank regulators about the current model of loan loss provisioning. Arguably,

banking supervisors may exert an influence on banks' level of accounting conservatism, since they are usually involved in the design of specific bank accounting standards. The strictness of regulations is expected to increase the timeliness of loan loss recognition. Along with the nature of the banking supervisory regime, this paper evaluates the impact of market discipline variables, such as listing status and ownership type evaluated at a firm level and market concentration evaluated at a country level, on accounting conservatism. The interaction of these variables with the regulation as joint determinants of accounting conservatism provides new insights into the determinants of the accounting policies implemented by banks.

The rest of the paper is organized as follows. Section 2 reviews prior research and develops the hypotheses. The sample selection, data sources and empirical methodology are detailed in Section 3. Results are discussed in Section 4, and Section 5 supplies robustness checks. Section 6 offers conclusions and suggestions for future research.

II. PRIOR RESEARCH AND DEVELOPMENT OF HYPOTHESES

Accounting information has broad implications for financial stability, so banks' accounting standards should consider any aspects of financial reporting with a direct impact on the risk-taking behavior of banks. From this perspective, Fonseca and González, F, (2008) and Bushman and Williams, (2012) establish a link between different characteristics of accounting information (earnings smoothing and conditional accounting conservatism) and the extent and nature of the market discipline of local bank supervisory systems.

The literature has established that loan provisions rise mainly during downturns, reinforcing the strong cyclical pattern of bank loans (Laeven and Majnoni, 2003; Bikker and Metzmakers (2005); Fonseca and González, (2008); Bouvatier, Lepetit, and Strobel, (2014). By engaging in higher accounting conservatism through earlier recognition of loan losses, banks mitigate the impact of non-performing loans during downturns. In that sense, early loan loss recognition might depend on bank regulation and supervision, as well as bank-specific incentives related to market discipline. Procyclicality implies that capital requirements are higher when economic conditions get worse and borrowers' defaults increase, but decrease during economic upturns (Curcio, De Simone, and Gallo, 2017).

Scala (2015) finds no evidence that banks smooth income with respect to business cycles. Instead, banks have been shown to act procyclically, with a significant and negative relationship between loan loss provision and economic growth. Since bank earnings cycles and business cycles are not perfectly synchronized, it is possible that reserves created when bank earnings are high do not cover credit losses suffered during macroeconomic downturns.

A. Regulation and Supervision

Conditional accounting conservatism is widely perceived as a driver of financial stability, but accounting regulators focus on the faithful representation of assets and liabilities, which is not necessarily compatible with conservative accounting. On the other hand, bank regulators and supervisors deal with all the issues that might affect bank stability, such as capital ratios, risk-taking strategies, and leverage. Whether the views of accounting regulators prevail over those of banking supervisors is an empirical question.

This section encompasses the first two pillars of Basel II: bank regulation and supervision. Previous literature emphasizes that investor protection, legal enforcement, accounting disclosures, restrictions on bank activities and officials, and private supervision reduce banks' incentives to smooth earnings (El Sood, 2012; Biurrun and Rudolf, 2010). Although earnings smoothing might be related to conservative accounting, the characteristics of the accounting information differ. Earnings smoothing consists of building a buffer during the good years that might be released in the bad years. By contrast, conditional accounting conservatism aims to recognize loan losses early, thereby increasing banks' incentives to curtail lending to less creditworthy borrowers.

Hence, rather than focusing on earnings smoothing, this paper identifies the institutional determinants of banks' conditional accounting conservatism. The characteristics of each country's bank regulations are incorporated into the analysis through measures developed by Barth, Caprio, and Levine (2006): Overall Activities Restrictiveness, Official Supervisory Power and the Capital Regulatory Index.

Overall Activities Restrictiveness (OAR) is a measure of regulatory restrictions on non-traditional bank activities, such as securities, insurance, real estate, and bank ownership and control of non-financial firms.

It constitutes an indicator of risk aversion. Values of OAR range from 4 to 12, and higher values indicate more restrictions on bank activities.

Official Supervisory Power index (OSP) captures the effect of direct government supervision, the power of supervisors to take prompt corrective actions to restructure and reorganize troubled banks and to declare a troubled bank insolvent. It is an index computed from answers to questions related to the body/agency that supervises banks: their responsibilities, appointments, and removals; differences from what is mandated by law; the number of supervisors and examinations; total budget for supervision; frequency of inspections conducted in large and medium size banks; average tenure of current supervisors; frequency of bank supervisors being employed by the banking industry once they quit; reports of infractions, mandatory actions, authorizations, and exceptions; and supervisors' legally liabilities for their actions. It ranges from 4 to 14 with higher values indicating greater power of supervisors.

The Capital Regulatory Index (CRI) measures capital-asset ratio requirements. It is an index computed from answers to questions related to the minimum capital-asset ratio required, Basel guidelines, individual bank's credit risk and market risk, their actual risk-adjusted capital ratio, subordinated debt, fraction of the banking system's assets, and book value of capital. It ranges from 3 to 10, with higher values indicating greater requirements. Thus, the first hypothesis is:

H₁ Strong bank regulation and supervision regimes are positively associated with more accounting conservatism.

All three measures (OAR, OSP, and CRI) are expected to have a positive impact on the timeliness of banks' loan loss recognition.

B. Market Discipline

In the Basel II framework, Pillar 3 is market discipline, which is theoretically a main driver of banks' stability. This paper uses three different proxies for market discipline: listing status, type of ownership, and market concentration.

1. Listing status

Arguably, the quality of accounting information and the degree of conditional accounting conservatism might depend on firms' listing status. Listed or public banks are likely to have more dispersed equity ownership, more information asymmetry, and greater potential for moral hazard and adverse selection problems (Jensen and Meckling, 1976). Therefore, public firms are expected to disclose high quality accounting information to reduce the cost of capital. Nichols, Wahlen, and Wieland (2009) and Ball and Shivakumar (2005) hypothesize that shareholders of public banks demand more timely loss recognition than those of private firms.

The alternative can also be argued. Due to higher equity dispersion in public banks, managers may face higher incentives to engage in opportunistic behavior, thereby reducing the quality of reported financial statements. By contrast, since the shareholders of private banks are usually involved in the management of the firm, they have access to private information, reducing management's incentives to manipulate earnings. In the US, Beatty and Harris (1999) suggest that public banks are more likely to engage in earnings management than private banks. Beatty, Ke, and Petroni (2002) provide empirical evidence supporting the idea that earnings manipulation to avoid small losses and earnings declines is more common in public banks than in private banks.

Givoly, Hayn, and Katz, (2010) acknowledge that the demand approach and the opportunistic-behavior approach are not mutually exclusive. They devise a research design that encompasses both hypotheses. Using a sample of US non-financial firms, they find different results depending on the earnings quality indicator. Although public or listed equity firms report more conservatively than closely held firms, earnings management tends to be higher in public firms than in private firms.

2. Ownership and governance

The financial crisis has emphasized differences in the risk-taking behavior of firms according to their ownership structure and corporate governance characteristics. Previous literature suggests that public banks tend to underperform compared to private banks. (La Porta, Lopez-de-Silanes, and Shleifer, 2006;

Barth, Caprio, and Levine, 2004; Beck, Demirgüç-Kunt, and Maksimovic, 2004).

Bouvatier, Lepetit, and Strobel (2014), Berger, Hasan, and Klapper (2004), Clarke and Cull (2002), Berger et al. (2005), Dinç (2005), Hau and Thum (2009), and Puri, Rocholl, and Steffe (2011) empirically examine whether banks' use of loan loss provisions is influenced by their ownership concentration and their regulatory environment. They find evidence that banks with more concentrated ownership use discretionary loan loss provisions to smooth their income.

This paper uses the dichotomy between commercial banks and savings banks to test the difference in financial accounting quality. Although episodes of political influence and rent seeking have recently arisen in some countries included in our sample (Sapienza, 2004; Illueca, Norden, and Udell, 2012), savings banks are not necessarily under government control. However, they are expected to exhibit a lower degree of conditional accounting conservatism because of their inability to issue shares and raise capital. For these institutions, annual growth depends on the amount of retained earnings.

3. Market concentration

A number of studies find that the wave of deregulation launched in the 1980s has led to an increase in competition (Stiroh and Strahan, 2003; Bertrand, Schoar, and Thesmar, 2007; Carbó, Humphrey, and Rodríguez, 2003; Salas and Saurina, 2002). Intense product market competition improves the flow of firm-specific information, thereby limiting managers' ability to conceal bad news (Ball and Shivakumar, 2005; Nalebuff and Stiglitz, 1983; Holmstrom, 1982). This information helps to mitigate agency problems by aligning managerial incentives with those of shareholders, resulting in lower levels of information asymmetry and agency problems (Giroud and Mueller, 2010; Chhaochharia et al., 2009). Moreover, by increasing liquidation risk, product market competition contributes to firms' demand for accounting conservatism in order to achieve more efficient contracting (Hou and Robinson, 2006; Ahmed and Duellman, 2007; Watts, 2003a). Hence, less concentrated markets should be associated with more conservative earnings. Hence, the second hypothesis posits:

H₂: Greater market discipline is associated with more accounting conservatism for banks.

In particular, conditional accounting conservatism is expected to be lower for savings banks than for commercial banks, and to increase with market competition. Since the empirical results from previous works are mixed, no prediction is made about the effects of listing status on the timeliness of loan loss provisions.

C. Supervision and Regulation versus Market Discipline: Complements or Substitutes

The relative importance of the three pillars of Basel II varies across countries. Although stringent supervisory regimes are expected to increase financial stability, a resilient banking industry may also result from relatively weak regulation and supervision, accompanied by strong market discipline. Arguably, the optimum weights allocated to the three dimensions stated in Basel II might depend on both the nature of the local financial system and its specific characteristics, such as the percentage of public versus private banks, and government owned versus non-government owned banks.

Previous literature suggests that the impact of regulation on the risk-taking behavior of banks is closely related to their corporate governance structures. Using a database of banks across different countries, Laeven and Levine (2009) show that bank regulations mitigate the negative effect of weak corporate governance on risk-taking. Illueca, Norden, and Udell (2012) suggest that the process of deregulating savings banks in Spain had a stronger negative impact on banks subject to higher political influence.

Overall, the timeliness of banks' loan loss recognition is expected to be determined by the interaction of the three pillars of Basel II, i.e. regulation, supervision and market discipline, not simply by the sum of their individual effects:

H₃: Bank supervisory and regulatory regimes have a stronger effect on conditional accounting under weaker market discipline.

III. SAMPLE SELECTION, DATA SOURCES AND EMPIRICAL METHODOLOGY

The dataset for this study comprises the financial statements of active commercial banks and savings banks from 54 countries for the period 1997-2009 from Bureau Van Dijk's BANKSCOPE database. Bank-year observations with missing total assets are dropped from the sample. For banks with consolidated and non-consolidated financial statements, only consolidated data are considered. Delisted firms are recoded as unlisted or private in order to avoid the loss of these observations. According to these selection criteria, the sample includes 14,651 bank-year observations.

A. Dependent Variable: Conservatism

Earnings conservatism represents the differential ability of accounting earnings to reflect economic losses as opposed to economic gains (Basu, 1997). The degree of timeliness of loan loss recognition is a summary indicator of the speed with which adverse economic events are reflected in both income statements and balance sheets (Ball and Shivakumar, 2005). Wang, Xie, and Xin (2010) define financial reporting conservatism as the practice of applying more stringent verifiability requirements to recognizing economic gains than to recognizing losses. Watts (2003a) argues that accounting conservatism is a desirable attribute of earnings because it constrains managerial opportunistic behavior and offsets managerial biases with its asymmetrical verifiability requirement.

There are different approaches to measuring accounting conservatism in the banking industry. Nichols, Wahlen, and Wieland (2009) develop a measure based on the incremental explanatory power of future and contemporaneous nonperforming loans beyond that of past nonperforming loans in explaining the current loan loss provision. This method has the disadvantage of eliminating banks that lack sufficient time-series data. Khan and Watt's (2009) approach calculates bank-quarter loss recognition estimates according to Basu's (1997) method. These approaches are not used in the current study because the sample consists of listed or public and non-listed or private banks, and quarterly data are not available in the database used. Private firms do not supply quarterly information. Instead, this study uses a specific measure of conditional accounting conservatism following Beatty and Liao (2011), which does not require time-series data and gives similar results as the other approaches. Specifically, the dependent variable is the ratio of loan loss reserves to non-performing loans.

B. Econometric Models

The empirical findings reported in this paper are based on the following econometric model

$$CAC = \beta_0 + \beta_1 RS + \beta_2 MD + \beta_4 RS \times MD + \beta_6 Controls + \varepsilon$$

where the variables are defined as follows:

CAC is the measure of conditional accounting conservatism, defined as the ratio of loan loss reserves to non-performing loans.

RS refers to the Regulation and Supervision indicators developed by Barth, Caprio, and Levine (2006): Overall Activities Restrictiveness (*OAR*), Official Supervisory Power (*OSP*) and Capital Regulatory Index (*CRI*), defined above.

MD encompasses a set of market discipline indicators.

UNLISTED is a dummy variable that equals 1 if the bank is private and zero otherwise.

Among the private entities, *SB* is a dummy variable that equals 1 if the bank is a savings bank. *CONC* refers to market concentration, measured by using the Herfindahl concentration index (H_i) for the loans market by country and year:

where S_{ji} is the loans market share of firm j in country i , and n_i denotes the number of firms within the banking industry in country i . All other things being equal, the higher the number of firms in the industry, the lower the value of the index is. As a result of squaring the market share, H_i gives more weight to firms with large markets shares than to firms with small shares. This is in line with the economic notion that the higher the industry concentration (higher H_i), the weaker the competition. Indeed, H_i is extensively used in empirical research as a measure of bank market power (e.g. Petersen and Rajan, 1995; Cetorelli and Gambera, 2001; Cetorelli and Strahan, 2006).

In addition, the model considers the following control variables:

EBP/TA is the ratio of earnings before provisions to total assets, where earnings before provisions is the

sum of profit before tax and loan loss provisions, minus taxes.

EQ/TA is the ratio of equity divided by total assets. Bhat (1996) and Clair (1992) show that banks with higher *EQ/TA* tend to have less credit losses and hence, smaller loan loss provisions.

SIZE is the natural logarithm of total assets. Bank profitability is highly positively associated with size, reflecting the importance of economies of scale in banking (Nichols, Wahlen, and Wieland, 2009; Watts and Zimmerman, 1986; Moyer, 1990). Alali and Jaggi (2010) and Beatty, Ke, and Petroni (2002) find a positive relationship between loans loss provisions and bank size.

BANK_CREDIT, which is the ratio of domestic bank loans to gross domestic product (GDP), is used to control for the economic cycle and monetary conditions. This ratio is computed using the World Bank database. To compute total bank loans, all deposit-taking institutions recognized by the International Monetary Fund are considered. The *BANK_CREDIT* ratio excludes loans to the public sector (central and local governments, as well as government-owned firms). According to Bikker and Metzmakers (2005), provisioning turns out to be substantially higher when GDP growth is lower, reflecting the increased riskiness of credit portfolios in economic downturns. This effect is mitigated somewhat as provisions rise in times when earnings and loan growth are higher. The measure used in this study is based on purchasing power parity (PPP) in international dollars per capita. It is obtained from the International Monetary Fund database for each country and year. The median or 50th percentile is used for the whole period 1997-2009 in order to avoid distortion from outliers.

Finally, *DIFF* is the difference between the z-score for each bank-year combination, and the mean of z-score by country-year. The z-score measures the distance to insolvency by combining accounting indicators of profitability, leverage, and volatility. Specifically, the z-score indicates the number of standard deviations that a bank's return on assets has to drop below its expected value before equity is depleted. Hence, the z-score increases with bank solvency. A number of outliers are eliminated within the sample: observations smaller than the 1st percentile of the distribution are set to the value of the 1st percentile, and the observations larger than the 99th percentile of the distribution are set to the value of the 99th percentile. Introducing the variable *DIFF* in the model slightly improves R² in each regression.

TABLE I

DEFINITIONS OF VARIABLES

Variables Group	Variables	Description	Expected sign
<i>Dependent Variable</i>	<i>CAC</i>	Conditional Accounting Conservatism: ratio of loan loss reserves to non-performing loans.	
	<i>SB</i>	Savings Bank: dummy variable which equals 1 if the bank is a savings bank and 0 if it is a commercial bank	-
<i>Market Discipline (MD)</i>	<i>UNLISTED</i>	Unlisted: dummy variable which equals 1 if the bank is unlisted and 0 if it is listed	+
	<i>CONC</i>	Herfindahl Index of the loans market, which measures Market Concentration.	-
<i>Regulation and Supervision (RS)</i>	<i>OAR</i>	Overall Activity Restrictiveness	+
	<i>OSP</i>	Official Supervisory Power	+
	<i>CRI</i>	Capital Regulatory Index	+
<i>Interactions</i>	<i>UNLISTED*OAR, UNLISTED*OSP, UNLISTED*CRI, SB*OAR, SB*OSP, SB*CRI, CONC*OAR, CONC*OSP, CONC*CRI,</i>	Interaction between MD and RS variables	?
<i>Controls</i>	<i>EBP/TA</i>	Ratio of earnings before provisions to total assets	+
	<i>EQ/TA</i>	Ratio of equity to total assets	+
	<i>SIZE</i>	Natural logarithm of total assets	+
	<i>BANK_CREDIT</i>	Ratio of domestic bank credit to GDP	-
	<i>GDP</i>	Gross Domestic Product	+
	<i>DIFF</i>	Difference between the z-score by bank-year, and the mean of z-score by country-year ¹⁰	-
	<i>YEAR</i>	Year (1997-2009)	+

B. Data

Table 2 provides the mean of economic indicators by country: GDP, the ratio of bank loans to GDP, and bank market concentration. Financial ratios for banks, as well as the main regulation and market discipline indicators are included in Table 3, as well as their means, standard deviations, and percentiles. Data indicate significant heterogeneity across countries, which is partly attributable to the different number of banks considered in each country (e.g. more than 1,000 available observations for Italy, Switzerland and the US, but fewer than 30 observations for Austria, Belgium, Egypt or Finland). Some countries, such as Germany, have a considerable amount of financial information available, but turn out to have few observations that comply with the data requirements. In addition, there is substantial heterogeneity in terms of financial and economic development in the sample, which includes high per capita income countries like Norway, Singapore or the US and low-income countries like Kenya, Nigeria or Zimbabwe. The sample also includes both capital markets-oriented and bank-oriented financial systems.

Table 4 shows the Spearman correlations coefficients among the variables under scrutiny in this study. There are no significant correlations other than the obvious one between Bank Credit and its component GDP.

TABLE II
DESCRIPTIVE STATISTICS BY COUNTRIES

Country	N (total assets)	Mean (GDP)	Mean (Bank credit)	Mean (bank competition)
<i>ARGENTINA</i>	226	9,326.57	40.06174	0.1038036
<i>AUSTRALIA</i>	183	30,033.29	109.86190	0.1560638
<i>AUSTRIA</i>	29	30,816.10	127.29740	0.2029270
<i>BELGIUM</i>	22	28,987.43	108.89970	0.2633760
<i>BRAZIL</i>	696	7,630.70	80.06957	0.0930037
<i>BULGARIA</i>	58	7,682.99	46.42834	0.0630483
<i>CANADA</i>	204	31,370.41	189.83870	0.1363417
<i>CHILE</i>	145	10,787.12	85.28065	0.1044109
<i>COLOMBIA</i>	99	6,328.83	45.48855	0.0667266
<i>CYPRUS</i>	50	22,091.81	215.63660	0.2186490
<i>CZECH REPUBLIC</i>	86	17,539.30	47.21824	0.1305982
<i>DENMARK</i>	247	29,978.23	155.79480	0.2316663
<i>ECUADOR</i>	274	5,275.87	24.37448	0.1170137
<i>EGYPT</i>	12	4,234.31	97.38739	0.1269206
<i>FINLAND</i>	22	26,867.88	68.05659	0.5741265
<i>FRANCE</i>	343	27,662.02	113.79420	0.0825294
<i>GERMANY</i>	55	27,692.50	132.84820	0.0628155
<i>GREECE</i>	45	21,779.26	110.47780	0.0945825
<i>HONG KONG</i>	117	28,348.30	135.90630	0.1823536
<i>HUNGARY</i>	51	14,032.09	62.66622	0.1158450
<i>INDIA</i>	304	1,735.70	58.82889	0.0677121
<i>INDONESIA</i>	336	2,730.09	46.96527	0.0921260
<i>IRELAND</i>	66	33,903.11	149.13980	0.1550660
<i>ISRAEL</i>	91	21,318.71	81.69991	0.1207028
<i>ITALY</i>	1.213	26,391.21	105.99960	0.1333546
<i>JAPAN</i>	997	27,211.70	304.98120	0.0616179
<i>JORDAN</i>	89	3,622.16	97.59466	0.2676428
<i>KENYA</i>	189	1,287.68	39.14568	0.1299919
<i>KOREA</i>	81	19,277.72	92.67905	0.0951534
<i>MALAYSIA</i>	189	9,766.51	128.30430	0.0905861
<i>MEXICO</i>	219	11,005.70	35.23595	0.1404297
<i>NETHERLANDS</i>	43	31,400.52	178.36780	0.2815486
<i>NEW ZEALAND</i>	54	21,938.80	124.06360	0.1244198
<i>NIGERIA</i>	130	1,527.63	16.16994	0.0374356
<i>NORWAY</i>	529	42,149.62	81.82837	0.2164682
<i>PAKISTAN</i>	158	1,908.77	44.20139	0.0933271
<i>PERU</i>	99	5,500.20	19.77105	0.2444725
<i>PHILIPPINES</i>	244	2,656.20	54.14808	0.0836515
<i>POLAND</i>	178	11,409.78	39.42092	0.0681076
<i>PORTUGAL</i>	120	19,412.83	135.57870	0.2225681
<i>SINGAPORE</i>	51	35,671.78	76.03306	0.2512668
<i>SOUTH AFRICA</i>	101	7,333.07	171.48700	0.1955399
<i>SPAIN</i>	568	24,741.08	145.22240	0.0792361
<i>SRI LANKA</i>	82	2,962.95	43.90271	0.0822282
<i>SWEDEN</i>	198	29,021.55	122.07620	0.3176717
<i>SWITZERLAND</i>	1.127	32,578.22	178.89660	0.3220604
<i>TAIWAN</i>	269	22,179.90	133.43800	0.0343177
<i>THAILAND</i>	140	5,761.87	125.02820	0.0544251
<i>TURKEY</i>	221	8,330.66	45.40011	0.0821886
<i>UNITED KINGDOM</i>	361	28,314.06	158.16770	0.1254763
<i>URUGUAY</i>	77	8,232.47	56.37838	0.2223094
<i>USA</i>	2.887	37,637.27	219.95630	0.0454636
<i>VENEZUELA</i>	246	8,884.60	15.46834	0.0764529
<i>ZIMBABWE</i>	30	452.26	73.94571	0.3194489

TABLE III
DESCRIPTIVE STATISTICS BY COUNTRIES

	<i>N</i>	<i>mean</i>	<i>st dev</i>	<i>p25</i>	<i>p50</i>	<i>p75</i>
<i>OAR</i>	14,315	7.048481	1.645134	5	8	8
<i>OSP</i>	14,096	11.17828	2.435161	9	12	13
<i>CRI</i>	12,659	6.316139	1.678515	5	6	7
<i>Comp</i>	14,639	0.1210994	0.0988051	0.0520389	0.0861388	0.144914
<i>ROA</i>	14,644	0.0086994	0.0176954	0.0029319	0.0077994	0.0133333
<i>ROE</i>	14,644	0.0768385	0.7169587	0.0416667	0.0934503	0.1515152
<i>EQ_TA</i>	14,632	10.06696	8.162493	5.895	8.23	11.47
<i>EBP_TA</i>	14,057	0.0150567	0.017505	0.0064772	0.0114723	0.0182815
<i>Size</i>	14,650	7.632365	2.09599	6.061457	7.539027	9.076923
<i>CAC_I</i>	14,651	1.530975	2.064368	0.5	0.875	1.69708

N is the number of observations per country where the ratio LLR/NPL is available; ROA stands for Return on Assets; ROE stands for Return on Equity; EQ/TA is the ratio of equity to total assets; EBP/TA denotes the ratio of earnings before provisions to total assets; SIZE is calculated as the natural logarithm of total assets and CAC denotes the measure of accounting conservatism, which is calculated as the ratio of loan loss reserves to non-performing loans.

TABLE IV
SPEARMAN CORRELATION COEFFICIENTS

	<i>OAR</i>	<i>OSP</i>	<i>CRI</i>	<i>Treg</i>	<i>Unlisted</i>	<i>SB</i>	<i>Conc</i>	<i>Disreq</i>	<i>EBP_TA</i>	<i>EQ_TA</i>	<i>Size</i>	<i>Bank Credit</i>	<i>GDP</i>	<i>Dif</i>
<i>OAR</i>	1,0000													
<i>OSP</i>	0.3149	1,0000												
<i>CRI</i>	-0.0771	0.3276	1,0000											
<i>Treg</i>	0.5617	0.8638	0.5960	1,0000										
<i>Unlisted</i>	-0.1385	-0.0634	-0.0389	-0,1110	1,0000									
<i>SB</i>	-0.1490	-0.1283	0.0169	-0,1297	0.2431	1,0000								
<i>Conc</i>	-0.0652	-0.1811	0.0553	-0,1101	-0.1031	-0.0829	1,0000							
<i>Disreq</i>	0.3518	0.1756	-0.4204	0,0658	0.0402	-0.1963	-0.1933	1,0000						
<i>EBP_TA</i>	0.0946	0.1670	0.0869	0,1753	-0.0705	-0.1731	0.0311	-0.0725	1,0000					
<i>EQ_TA</i>	0.0517	0.1045	0.0873	0,1209	0.0303	-0.1979	0.0376	0.0132	0.3445	1,0000				
<i>Size</i>	0.0115	-0.0449	-0.0855	-0,0590	-0.2036	-0.0687	-0.0689	0.1461	-0.1443	-0.4358	1,0000			
<i>Bank Credit</i>	0.1522	0.2554	-0.0337	0,1991	0.2121	0.1345	-0.2235	0.5962	-0.1598	-0.0988	0.1250	1,0000		
<i>GDP</i>	0.0029	-0.0011	-0.1214	-0,0520	0.2747	0.2307	-0.0817	0.4399	-0.2636	-0.1477	0.1282	0.7679	1,0000	
<i>Dif</i>	0.0362	0.0185	-0.0031	0,0244	0.0744	-0.0834	-0.0120	0.0297	0.2418	0.9268	-0.3935	0.0398	0.0340	1,0000

IV. RESULTS

Using the model and database discussed above, some conclusions can be drawn about the effects of regulation, supervision and market discipline on the degree of timeliness of loan loss recognition.

A. Regulation and Supervision

Hypothesis 1 posits a direct relationship between the stringency of the banking regulation and supervisory regimes and accounting conservatism. Table 5 provides the results of three different models that consider OAR (Overall Activity Restrictiveness), OSP (Official Supervisory Power), and CRI (Capital Regulatory Index) individually as determinants of the dependent variable CAC (Conditional Accounting Conservatism), along with a number of control variables. In addition, a fourth model, which includes these three variables together, is estimated.

TABLE V
REGULATION AND SUPERVISION

Variables	CAC	Pred.	Regressions			
			1	2	3	4
<i>OAR</i>	+		0.2043336*** (9.83)			0.0693788*** (3.14)
<i>OSP</i>	+			0.010957 (0.81)		0.0416782*** (2.63)
<i>CRI</i>	+				0.1197838*** (6.68)	0.0953762*** (5.07)
<i>EBP/TA</i>	+		15.79624*** (5.44)	18.44829*** (6.01)	16.09695*** (5.29)	16.14499*** (5.16)
<i>EQ/TA</i>	+		0.0743133*** (9.19)	0.0479459*** (7.80)	0.0172499** (2.34)	0.0168856** (2.49)
<i>Size</i>	+		0.0803513*** (5.01)	0.0845694*** (4.87)	-0.0030099 (-0.15)	0.0092384 (0.47)
<i>Bank Credit</i>	-		-0.0018219*** (-3.89)	-0.0008128 (-1.58)	-0.0044433*** (-8.93)	-0.0050645*** (-9.83)
<i>GDP</i>	+		.000064*** (17.34)	0.0000543*** (15.16)	0.0000832*** (19.62)	0.0000859*** (19.18)
<i>Year</i>			-0.0417763*** (-5.52)	-0.0545825*** (-7.15)	-0.0185345** (-2.38)	-0.0216004*** (-2.78)
<i>Dif</i>	-		-0.0013517*** (-8.85)	-0.0007431*** (-6.27)	-0.000262** (-2.05)	-0.0003015** (-2.24)
<i>Cons</i>			80.77266*** (5.31)	108.0989*** (7.05)	36.33022** (2.32)	41.57167*** (2.66)
<i>N</i>			13735	13528	12165	11958
<i>R2</i>			0.1146	0.0976	0.1220	0.1322

OAR denotes overall activity restrictiveness; OSP denotes official supervisory power; CRI denotes capital regulatory index; EBP/TA is the ratio of earnings before provisions to total assets (earnings before provisions are calculated as the sum of profit before tax and loan loss provisions, minus taxes); EQ/TA is the ratio of equity to total assets; SIZE is calculated as the natural logarithm of total assets; BANK CREDIT is the ratio of domestic bank credit to GDP; GDP denotes the Gross Domestic Product based on purchasing-power-parity (PPP) per capita (international dollars); YEAR indicates years between 1997 and 2009; DIF is the difference between the z-score by bank-year, and the mean of z-score by country-year. Standard errors are robust to heteroskedasticity and have been clustered by bank codes. ***, **, and * represent 1%, 5%, and 10% significance, respectively.

Taken together, the results are compatible with Hypothesis 1. The coefficients for the RS variables are significant at conventional levels and their signs are in accordance with expectations: Strong bank regulation and supervision regimes are positively associated with more accounting conservatism. Although the coefficient of the OSP indicator falls below the significance threshold in the second model, the variable turns out to be significant when the three RS variables are included in the regression model. These results are not only statistically significant, but also economically significant. One standard deviation increases in the OAR (CRI) indicator accounts for 17% (10%) of the standard deviation of the dependent variable.

These results are supported by Ahmed and Duellman (2007) and Alali and Jaggi (2010), who find that banks manage earnings in order to reach certain capital ratios. Within the institutional context, before the Basel II recommendations, one more euro of loan loss provision reduced earnings by $1-t$, where t is the effective tax rate. Nevertheless, the previous regulation in Basel I considered the loan loss reserve as a resource to be included in capital in such a way that the net effect of one more euro of provision in the numerator of the capital ratio is positive and equals $t: 1-(1-t)$. In that context, banks had incentives to increase the provisions (i.e. conservatism) with the aim to reach the capital ratios. When the Basel II recommendations were put into effect, incentives to manage provisions decreased. Loan loss reserve is not taken into account in TIER 1², so one more euro of provision makes earnings and TIER 1 decrease by $1-t$.

² The TIER 1 is a very important indicator for banks. It is a broader concept to the accounting value of the social capital. It is the CORE capital, or core of a bank. It consists of a basic capital represented by ordinary shares and retained earnings. Another less stringent definition of TIER 1 may include a type of preferred stock: those that are non-cumulative and, in turn, non-redeemable or non-maturing in addition to non-controlling interests in other companies (equivalent to long-term capital), a "permanent" capital).

However, loan loss reserve is taken into account in TIER 2³ with a limit of 1.25% of risk free assets, so banks still have an incentive to manage provisions upwards. In any case, incentives are now smaller since they are limited to banks that overtake the lower limit of TIER 1, and whose provisions do not reach 1.25% of free risk assets. In sum, banks operating in countries with more stringent regulation and supervisory regimes engage in more conservative accounting practices. However, since the discipline indicators are not considered in the models reported in Table 5, the results might be overstating the impact of the regulatory and supervisory indicators on conditional accounting conservatism.

B. Market Discipline: Listing Status, Ownership and Concentration

The previous results might be driven by countries with weak market discipline mechanisms where regulation and supervision is particularly important. Table 6 presents the estimation results of a more general model that combines both sets of variables, i.e. RS variables and MD variables. Furthermore, the coefficients for the interaction of both types of indicators are estimated to gain a better understanding of the determinants of conditional accounting conservatism in the banking industry.

As market discipline indicators, three different dimensions are considered: listing status, savings banks versus commercial banks, and market concentration. As discussed previously, commercial banks and banks operating in more competitive environments are expected to engage in more prudent accounting practices, but no prediction was made for the listing status.

Table 6 supplies evidence on the impact of each of the variables of market discipline in each column and the interaction with all regulation and supervision variables. In Column 4, all the variables are regressed together.

TABLE VI
LISTING STATUS, OWNERSHIP AND CONCENTRATION

³ TIER 2 capital is greater than TIER 1: in addition to TIER 1, it includes preferred shares with fixed maturity and long-term debt with a minimum maturity of more than five years. In addition, it includes accounting items that make capital even more lax: it includes supplementary capital incorporating items such as undisclosed reserves, revaluation reserves, general reserves for credit losses, hybrid instruments (debt / equity capital), equity instruments, capital and subordinated debt. Adding up everything we will talk about the TIER 2. The higher, the better in both cases.

CAC	Prediction	1	2	3	4	5
<i>Unlisted</i>	+	0.2314113*** (2.83)	-0.6685086 * (-1.76)			-0.60015 (-1.54)
<i>SB</i>	-	-0.3101456*** (-3.12)		-1.80144*** (-3.00)		-0.8800841 (-1.46)
<i>Conc</i>	-	-3.088759*** (-10.02)			-6.43538*** (-3.09)	-4.758661 ** (-2.37)
<i>OAR</i>	+		-0.0051389 (-0.15)	0.1022682*** (4.23)	0.0290687 (0.84)	-0.0186848 (-0.45)
<i>OSP</i>	+		-0.0139739 (-0.51)	0.064644*** (3.56)	0.0633638*** (2.95)	0.0328988 (1.15)
<i>CRI</i>	+		0.1740253 (4.84)	0.0080266 (0.33)	-0.0280272 (-0.97)	0.0104689 (0.25)
<i>Unlisted*OAR</i>	?		0.0963965** (2.39)			0.1190163*** (2.80)
<i>Unlisted*OSP</i>	?		0.0703581** (2.21)			0.1172931*** (3.43)
<i>Unlisted*CRI</i>	?		-0.1037572** (-2.53)			-0.2281073*** (-4.97)
<i>SB*OAR</i>	?			0.0759358 (1.11)		-0.0127574 (-0.19)
<i>SB*OSP</i>	?			-0.0990516** (-2.33)		-0.1425141*** (-3.21)
<i>SB*CRI</i>	?			0.3412389*** (7.89)		0.3855386*** (8.47)
<i>Conc*OAR</i>	?				0.2837752 (1.06)	0.2666823 (1.01)
<i>Conc*OSP</i>	?				-0.2567249* (-1.90)	-0.4224928*** (-3.39)
<i>Conc*CRI</i>	?				1.07927*** (4.39)	1.206426*** (4.96)
<i>EBP/TA</i>	+	15.532*** (5.50)	15.84766*** (5.09)	16.27182*** (5.29)	16.29172*** (5.22)	16.09948*** (5.30)
<i>EQ/TA</i>	+	0.0374303*** (5.04)	0.0128651* (1.83)	0.02131841*** (3.13)	0.0151385** (2.14)	0.0179918** (2.39)
<i>Size</i>	+	0.0391698** (2.15)	0.0189171 (0.90)	-0.0125742 (-0.63)	0.0040138 (0.21)	-0.008275 (-0.39)
<i>Bank Credit</i>	-	-0.0026013*** (-5.51)	-0.0046631*** (-8.97)	-0.0053884*** (-10.27)	-0.0052701*** (-10.52)	-0.0049119*** (-9.49)
<i>GDP</i>	+	0.0000599*** (14.66)	0.0000797*** (16.62)	0.000089*** (18.04)	0.0000852*** (19.15)	0.0000797*** (15.59)
<i>Year</i>		-0.0476101*** (-6.29)	-0.0227124*** (-2.89)	-0.0159102** (-2.04)	-0.0202231*** (-2.56)	-0.0142225* (-1.78)
<i>Dif</i>	-	-0.0006604*** (-5.19)	-0.000218 (-1.60)	-0.000405*** (-2.99)	-0.0002812** (-2.01)	-0.0003475** (-2.40)
<i>Cons</i>		95.18374*** (6.27)	44.41702*** (2.82)	30.33261* (1.94)	39.78563** (2.52)	28.18584* (1.76)
<i>N</i>		14,041	11,958	11,958	11,946	11,946
<i>R2</i>		0.1120	0.1357	0.1432	0.1374	0.1556

***, ** and * represent 1%, 5% and 10% significance, respectively.

Unlisted is a dummy variable that equals 1 if the bank is private and 0 if it is public. SB stands for Savings Bank and is a dummy variable that equals 1 if the bank is a savings bank and 0 if it is a commercial bank; Conc is the Herfindahl Index of the loans market. OAR denotes overall activity restrictiveness, OSP denotes official supervisory power, and CRI denotes capital regulatory index. EBP/TA is the ratio of earnings before provisions to total assets (earnings before provisions are calculated as the sum of profit before tax and loan loss provisions, minus taxes). EQ/TA is the ratio of equity to total assets. SIZE is the natural logarithm of total assets. BANK CREDIT is the ratio of domestic bank credit to GDP. GDP denotes the Gross Domestic Product based on purchasing-power-parity (PPP) per capita in international dollars. YEAR indicates years between 1997 and 2009. DIF is the difference between the z-score by bank-year, and the mean of z-score by country-year.

Standard errors are robust to heteroskedasticity and have been clustered by bank codes.

The positive sign of the coefficient associated with UNLISTED in Column 1 suggests that public banks face stronger incentives to engage in income-increasing accounting policies than private banks do, as suggested by Givoly, Hayn, and Katz (2010) and La Porta, Lopez-de-Silanes, and Shleifer (2006). For savings banks, the results show that these financial institutions exhibit a lower degree of timeliness in loan loss recognition, which might be explained by their inability to raise capital to fund any expected increase in lending activity. Banks operating in less concentrated markets tend to exhibit a higher degree of conditional conservatism. Banks facing higher competition have stronger incentives to produce more conservative accounting because of contracting purposes. These findings support Hypothesis 2, in line with the idea that firms in less competitive industries create an opaque information environment due to high proprietary costs of disclosure. Countries with a higher level of concentration, which would have less conservative banks, have now more conservative banks to comply with capital ratios.

Interestingly, the interactions between the RS (regulation and supervision) and MD (market discipline) indicators tend to be significant, providing confirmatory evidence for the idea that conditional accounting conservatism is jointly determined by the three pillars of the Basel II Agreement, regulation, supervision and market discipline, and not merely by the sum of their individual effects. The estimated coefficients related to these interaction terms are reported in Columns 2 to 5 of Table 6, which disclose a joint estimation for each group of RS and MD indicators and a general model with the whole set of variables.

One interesting aspect of the interaction term analysis is to evaluate whether market discipline variables mitigate the effects of a weak supervisory regime on the set up of conservative accounting policies.

The results confirm that the role of regulation and supervision is complementary to market discipline. These findings suggest that, only when market discipline is weak, then robust regulation and supervision improve accounting conservatism.

Such is the relevance of market discipline that the OAR (overall activity restrictiveness) coefficient becomes non-significant when all of the market disciplines variables play a role together, except for non-quoted banks, suggesting that the impact of activity restrictions on conditional accounting conservatism is stronger for private banks. In other words, the regulator's risk aversion only has a positive impact on accounting conservatism for non-quoted firms. Overall, market discipline tends to offset the effect of activity restrictions on accounting policies.

Concerning OSP (official supervisory power), its general effect on market discipline is that it reduces the differences in accounting conservatism depending on market discipline variables. When the supervisory regime is more stringent, it is worse for the private segment of the market. The supervisor assumes that the capital markets will discipline financial entities themselves. The greater its power, the smaller is the difference between public and private entities regarding accounting conservatism. When the risk of intervention is higher, more stringent OSP has a greater impact on commercial banks than on savings banks, whose property rights are not clearly defined. The intervention of the supervisor would not expropriate wealth to an owner of a savings bank, so it is logical that commercial banks react to OSP changes more than savings banks do. The interaction between SB and OSP has a significant negative coefficient because savings banks are intrinsically less conservative. When the banking market is concentrated, individual firms have a larger market share and fewer incentives to be conservative. By contrast, if firms do not have a great power within the market, their intervention risk increases and they tend to be more conservative in order to avoid that possible intervention. If there is also a powerful supervisor in this situation, then the banks will be even more conservative since a strong supervisor increases the risk of intervention. This makes banks operating in competitive environments even more conservative: the interaction between CONC and OSP

strengthens the original sign of CONC.

The CRI (capital regulatory index) mitigates the effect of market discipline variables on conservatism. The variable CRI has a positive effect on bank conservatism. Public banks are inherently less conservative because they need to distribute dividends and avoid losses. However, higher capital requirements force banks to be more conservative, inhibiting the effect of the market variables. Savings banks, which originally are less conservative, are now more conservative, equilibrating the level of conservatism with commercial banks. Countries with a higher level of concentration, which would have less conservative banks, have now more conservative banks to comply with capital ratios. We appreciate that the supervisor role is not necessarily to compensate, but to strengthen the effect of market discipline.

V. ROBUSTNESS CHECKS

A. Disclosure Requirements

There may also be cross-country differences in legal institutions and transparency culture that affect accounting practices. Curcio and Hassan (2015) show evidence drawn from 1996 to 2006 that loan loss provisions do reflect changes in the expected quality of a bank's loan portfolio for Euro Area (EA) banks versus non-EA credit institutions.

This study uses the index of disclosure requirements elaborated by El Sood (2012) that constitutes an indicator of transparency and information asymmetry as intrinsic factors of the country.

The disclosure index measures the extent to which there is required disclosure of information for firms issuing securities through a prospectus, including information on the compensation of executives, shareholder ownership structure, inside ownership, unusual contracts, and related-party transactions. More disclosure creates greater protection for investors by reducing information asymmetry. This suggests that countries with higher levels of disclosure requirements need less conservatism for their financial entities. In fact, the more powerful the supervisory system is, the lower the level of required disclosure would be.

The results of the regression of disclosure requirements variable are presented under Table 7. Here, the effect of disclosure requirements is tested only on public companies; it would not make sense for private companies since they have no disclosure requirements.

It is reasonable that DIS_REQ, a measure of transparency and information asymmetry has a negative and significant coefficient (1%) in Column 1, since countries with higher levels of disclosure requirements are expected to require a lower level of conservatism to their financial entities.

After regressing the new variable together with the regulation and supervision variables, there is no difference between the behavior of OSP (official supervisory power) compared to the other regulation and supervision variables; they all have the same behavior when interacting with the disclosure index. This suggests that in a powerful regulatory system, more disclosure requirements result in less need of conservatism in financial entities.

Thus, the level of disclosure requirements has a positive effect on conservatism when there is also a proper regulation and supervision system.

TABLE VII
DISCLOSURE REQUIREMENTS

Variables	CAC	Pred.	Regressions			
			1	2	3	4
<i>Dis_req</i>	-		-1.297675*** (-3.65)	-4.044124*** (-2.93)	-10.09882*** (-3.90)	-4.992497*** (-3.90)
<i>OAR</i>	-			-0.2700888* (-1.77)		
<i>Disreq*OAR</i>	?			0.4163508 (1.85)		
<i>OSP</i>	-				-0.5943253*** (-4.14)	
<i>Disreq*OSP</i>	?				0.7558915*** (3.41)	
<i>CRI</i>	-					-0.3315987*** (-2.68)
<i>Disreq*CRI</i>	?					0.5691151*** (3.20)
<i>EBP/TA</i>	+		8.792123* (-1.75)	8.652893 (1.63)	11.70951** (2.20)	7.930831 (1.49)
<i>EQ/TA</i>	+		0.0207769 (1.09)	0.0298674 (1.39)	0.02773 (1.38)	0.0244332 (1.10)
<i>Size</i>	+		-0.1008218*** (-2.92)	-0.0920279** (-2.47)	-0.0935246** (-2.51)	-0.1218642*** (-2.99)
<i>Bank Credit</i>	-		0.006995*** (3.25)	0.0069115*** (3.20)	0.0089445*** (4.07)	0.0072777*** (2.85)
<i>GDP</i>	+		0.0000253*** (3.77)	0.0000284*** (4.01)	9.63e-06 (1.29)	0.0000371*** (4.02)
<i>Year</i>			-0.0551014*** (-3.28)	-0.0548787*** (-3.09)	-0.0503003*** (-2.92)	-0.0511722*** (-2.85)
<i>Dif</i>			-0.000072 (-0.37)	-0.0001821 (-0.89)	-0.0001733 (-0.87)	-0.0000638 (-0.28)
<i>Cons</i>			112.0009*** (3.33)	113.0601*** (3.19)	109.1146*** (3.14)	106.3307*** (2.96)
<i>N</i>			2423	2249	2249	2084
<i>R2</i>			0.1086	0.1181	0.1418	0.1500

***, **, and * represent 1%, 5%, and 10% significance, respectively.

Dis_req is an indicator of transparency and information asymmetries; *OAR* denotes overall activity restrictiveness; *OSP* denotes official supervisory power; *CRI* denotes capital regulatory index; *EBP/TA* is the ratio of earnings before provisions to total assets (earnings before provisions are calculated as the sum of profit before tax and loan loss provisions, minus taxes); *EQ/TA* is the ratio of equity to total assets; *SIZE* is calculated as the natural logarithm of total assets; *BANK CREDIT* is the ratio of domestic bank credit to GDP; *GDP* denotes the Gross Domestic Product based on purchasing-power-parity (PPP) per capita (international dollars); *YEAR* indicates years between 1997 and 2009; *DIF* is the difference between the z-score by bank-year, and the mean of z-score by country-year.

Standard errors are robust to heteroskedasticity and have been clustered by bank codes.

B. Changes in Sample

The robustness of this paper's results is also checked by introducing changes in the sample and comparing the results to the original analysis. The first variation consists of dropping more outliers. The original sample encompasses the 1st to 99th percentiles, whereas the modified sample includes only the 25th to 75th percentiles. This sample gives similar results regarding signs and significances. The more significant the results are in the original sample, the more similar the results are in the modified sample.

Another robustness test consists of partitioning the sample. In one partitioning, the sample is divided into two subsamples, each covering the same number of years: 1997 to 2003, and 2003 to 2009. Another partitioning responds to the fact that in 2005 all public EU companies were required to use IFRS, so the sample is divided into data from 1997 to 2005 (pre-IFRS) and from 2006 to 2009 (post-IFRS). Apart from the obvious variances from changing the width of the sample and the time period, the general conclusions from both tests are the same. However, the second partitioning gets almost the exact results as the original

one, which suggests that the second half of the period analyzed is the one that contributes the most to the overall conclusions.

Obtaining such similar results even when the original sample is changed strengthens the previous analysis and supports the results.

VI. CONCLUSION

The main objective of the paper is to study the pillars of Basel II, bank regulation, supervision and market discipline, in relation to the quality of the accounting information and the loan loss provisioning. The matter is relevant since the financial crisis highlighted problems with the old incurred loss recognition system, which led to a revision of IAS 39 in order to introduce a new system based on expected losses.

This paper evaluates the effects of the three pillars of Basel II on the level of bank conservatism, measured by the timeliness of loan loss provisioning by banks. To analyze the role of market discipline in the search for stable financial system market discipline, measured by listing status, ownership, and bank concentration, is compared to regulation and conservatism, measured using indicators proposed by Barth, Caprio, and Levine (2006),.

The stricter recommendations of Basel III proposed in 2010 reinforced the first two pillars, i.e. regulation and supervision. This evokes questions about whether Basel II worked properly, whether its new market discipline pillar was sufficient, and whether regulation and supervision became more rigid and stricter in Basel III after the deregulation process that had led to Basel II,

Results show that banks with stronger and more stringent supervisory and regulatory regimes are associated with higher levels of conservatism than banks in countries with less enforcement. Furthermore, more robust market discipline is also positively associated with higher conservatism. Specifically, private banks and commercial banks are more conservative than public entities and savings banks, which supports the insights given by Beatty, Ke, and Petroni (2002) and the idea that savings banks exhibit relatively weaker governance than commercial banks. The evidence also supports the idea that banks operating in more concentrated markets are less conservative. This finding is consistent with the intuition that firms in concentrated industries tend to protect their competitive advantage and avoid political and public attention. Another major contribution of this paper is that regulation and supervision and the extent to which they are enforced control or complement other environmental factors, including listing status, ownership, and market concentration, in countries or situations where market discipline fails. Official supervisory power emphasizes the effect of market discipline on conservatism, whereas the capital regulatory index mitigates it. The level of disclosure requirements has a negative effect on conservatism, which is reinforced when there is a strict regulatory and supervisory system. Finally, additional analysis considers the cross-country transparency culture by including the level of disclosure requirements in the analysis to measure information asymmetries. Results show that transparency has a negative effect on conservatism, and this effect is reinforced when there is a strict system of regulation and supervision.

As far as we know, all the mechanisms which are able to guarantee accounting quality have been studied. These mechanisms coincide with the recommendations of Basel II to improve banks' quality and ensure their solvency. The results described in Section 4 suggest that the standards in Basel II worked properly, but were insufficient. Therefore, it makes sense to reinforce Pillar 1 (regulation) and Pillar 2 (supervision) in Basel III. The fact that Basel III stresses the establishment of higher standards matches the results obtained in this study, due to the insufficient power of market discipline. It is necessary to continue making progresses in stronger requirements. The unique European supervising organization, the ECB (European Central Bank), shares the same idea found in this paper's results that, despite the worldwide character of Basel II, differential institutional factors that may affect the implementation of the regulatory and supervisory regimes in each country.

It turns out that the view of the supervisors has prevailed, since their recommendations have led to Basel III and IFRS 9, which consider expected losses and promotes an anticyclic effect. In this sense, the new IFRS regime, may avoid the collapse of banks due to default rates on loans.

In a few months, Basel III will become part of the history of international financial regulation, since its implementation has concluded and it is time to give way to a new phase. The essence of the new proposals

of Basel IV continues to be the requirements of regulatory capital based on risk, but now in a framework of greater sensitivity, simplicity, and comparability among banks, complemented by indicators of indebtedness and liquidity. The goal is to measure risk more effectively and makes it more comparable among banks in order to simplify users' ability to read and interpret the information.

This paper's research contributes to Basel III on some of the most controversial issues and strongly supports its reaction to Basel II by reinforcing the traditional pillars of regulation and supervision.

However, this study is not exempt from limitations. The increase in the number of recent mergers and takeovers has reduced the amount of data available for the study. Furthermore, the calculation of conservatism is limited in terms of available data, so the alternative is to use the ratio LLR/NPL, developed by Beatty and Liao (2011). Moreover, although instrumental variables are used to control for simultaneity bias, banking-sector outcomes may influence regulatory and supervisory practices. In addition, information on regulatory and supervisory practices is available only for a point in time. Therefore, the OAR, OSP and CRI index data obtained from Barth, Caprio and Levine were last calculated in 2006 by the time this work was written.

In future research, the announcements of rating agencies could be included as a dependent variable to analyze the relationship between banks whose ratings are revised downwards or whose outlook was negative after the financial crisis and their estimated conservatism and capital ratio. This study focuses on private and public banks in general, but future studies could also extend this line of research by examining banks that switch organizational type. Finally, future studies with a wide enough sample in terms of the post-crisis period might be able to support and reinforce the results and conclusions in this study.

REFERENCES

- Alali, F. y Jaggi, B., 2010. Earnings versus capital ratios management: role of bank types and SFAS 114, Review of quantitative Finance Accounting. Available at:
<http://www.springerlink.com/index/91xr42j865572271.pdf>
- Ahmed, A.S., Duellman, S., 2007. Accounting characteristics and Board of Directors characteristics: An empirical analysis. *Journal of Accounting and Economics* 43, 411-437.
- Ball, R., Shivakumar, L., 2005. Earnings quality in UK private firms: Comparative loss recognition timeliness. *Journal of Accounting and Economics* 39, 83-128.
- Barth, J.R., Caprio, G., Levine, R., 2001. The regulation and supervision of banks around the world: A new database. World Bank Working Paper No. 2588. The updated version is available from: <<http://econ.worldbank.org>>.
- Barth, J.R., Caprio, G., Levine, R., 2004. Bank regulation and supervision: What works best? *Journal of Financial Intermediation* 13, 205-248.
- Barth, J. R., Caprio, G. and Levine, R., 2006. Rethinking bank regulation- Till angels govern, Cambridge University Press.
- Basu, S., 1997. The conservatism principle and the asymmetric timeliness of earnings. *Journal of Accounting and Economics* 24, 3-37.
- Beatty, A.L., Harris, D.H., 1999. The effects of taxes, agency cost and information asymmetry on earnings management: A comparison of public and private firms. *Review of Accounting Studies* 4, 299-326.
- Beatty, A., Ke, B., Petroni, K.R., 2002. Earnings management to avoid earnings declines across publicly and privately held banks. *The Accounting Review* 77, 547-570.
- Beatty, A., Liao, S., 2011: Do delays in expected loss recognition affect banks' willingness to lend? *Journal of Accounting and Economics* 52, 1-20.
- Beck, T., A. Demirgüç-Kunt, and V. Maksimovic. 2004. Bank competition and access to finance: International evidence. *Journal of Money, Credit, and Banking* 36, 627-648.
- Berger, A., G. Clarke, R. Cull, L. Klapper, and G. Udell. 2005. Corporate governance and bank performance: A joint analysis of the static, selection, and dynamic effects of domestic, foreign, and state ownership. *Journal of Banking and Finance* 29, 2179-2221.
- Berger, A., I. Hasan, and L. Klapper. 2004. Further evidence on the link between finance and growth: An international analysis of community banking and economic performance. *Journal of Financial Services Research* 25, 169-202.
- Bertrand, M., A. Schoar, and D. Thesmar. 2007. Banking deregulation and industry structure: Evidence from the French Banking Reforms of 1985. *Journal of Finance* 62, 597-628.
- Bhat, V. N., 1996. Banks and income smoothing: an empirical analysis. *Applied Financial Economics* 6, 505-510.
- Bikker, J., Metzmakers, P., 2005. Bank provisioning behaviour and procyclicality. *Journal of International Financial*

Markets, Institutions and Money 15, 141-157.

Biurrun, V., Rudolf, M., 2010. Mitigating Bank Earnings Management: The Role of Regulation and Supervision. Available at SSRN:

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1600703

Bouvatier, V., Lepetit, L., Strobel, F., 2014. Bank income smoothing, ownership concentration and the regulatory environment. *Journal of Banking and Finance* 41 (1), pp. 253-270.

Bushman, R., Williams, C., 2012. Accounting discretion, loan loss provisioning, and discipline of Banks' risk-taking. *Journal of Accounting and Economics* 54 (1), 1-18.

Carbó, S., Humphrey, D., Rodríguez, F., 2003. Bank deregulation is better than bank mergers. *Journal of International Financial Institutions, Markets, and Money* 13, 429-449.

Cetorelli, N., Gambera, M., 2001. Banking market structure, financial dependence and growth: International evidence from industry data. *Journal of Finance* 56, 617-648.

Cetorelli, N., Strahan, P., 2006. Finance as a barrier to entry: Bank competition and industry structure in local U.S. markets. *Journal of Finance* 61, 437-461.

Chhaochharia, V., Grullon, G., Gristein, Y., Michaely, R., 2009. Product market competition and agency conflicts. Evidence from the Sarbanes Oxley law, available at SSRN: <http://.com/abstract=1109225>.

Clair, R.T., 1992. Loan growth and loan quality: Some preliminary evidence from Texas Banks. *Economic Review, Federal Reserve Bank of Dallas, Third Quarter*, 9-21.

Clarke, G., Cull, R., 2002. Political and economic determinants of the likelihood of privatizing Argentine public banks. *Journal of Law and Economics* 45, 165-97.

Curcio, D., De Simone, A., Gallo, A., 2017. Financial crisis and international supervision: New evidence on the discretionary use of loan loss provisions at Euro Area commercial Banks. *The British Accounting Review*, 49 (2), pp. 181-193.

Curcio, D., Hassan, I., 2015. Earnings and capital management and signaling: the use of loan-loss provisions by European banks. *European Journal of Finance*, 21 (1), pp. 26-50.

Domikowsky C., Duellmann, K., Bornemann, S., Pfungsten, A., 2014. Loan loss provisioning and procyclicality: evidence from an expected loss model. Discussion paper n° 39/2014. Deutsche Bundesbank.

Diñç, S. 2005. Politicians and banks: Political influences on government-owned banks in emerging markets. *Journal of Financial Economics* 75, 453-479.

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

Fonseca, A., González, F., 2008. Cross-country determinants of bank income smoothing by managing loan-loss provisions. *Journal of Banking and Finance* 32 (2), 217-228.

Giroud, X., Mueller, H., 2010. Does corporate governance matter in competitive industries? *Journal of Financial Economics* 95, 312-331.

Givoly, D., Hayn, C., Katz, S., 2010. Does Public Ownership of Equity Improve Earnings Quality?. *The Accounting Review* 85(1), 195-225.

Hau, H., Thum, M., 2009. Subprime-Related Losses and Board (In-)Competence: Private vs. Public Banks in Germany. *Economic Policy* 24, 701-752.

Hou, K., Robinson, D., 2006. Industry Concentration and Average Stock Returns. *The Journal of Finance*, 61, 1927-1956.

Holmstrom, B., 1982. Moral hazard in teams. *Bell Journal of Economics* 13, 324-340.

Illueca, M., Norden, L., Udell, G., 2011. Liberalization, Bank Governance, and Risk Taking. AEA 2012 & FIRS 2009 & EFA 2008 Meetings Paper.

Illueca, M., Norden, L., Udell, G., 2012: Do Changes in the Timeliness of Loan Loss Recognition Affect Bank Risk Taking? Available at SSRN:

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2022644

Jensen M., Meckling, W., 1976. Theory of the firm: managerial behavior agency costs and ownership structure. *Journal of Financial Economics* 3, 305-360.

Khan, M., Watts, R., 2009. Estimation and empirical properties of a firm-year measure of accounting conservatism. *Journal of Accounting and Economics* 48, 132-150.

La Porta, R., F. Lopez-de-Silanes, and A. Shleifer. 2002. Government ownership of banks. *Journal of Finance* 57:265-301.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 2006. What Works in Securities Laws?. *The Journal of Finance* 61 (1), 1-32.

Laeven, L., Majnoni, G., 2003. Loan Loss Provisioning and economic slowdowns: too much, too late? *Journal of Financial Intermediation* 12, 178-197.

- Levine, R., 2002. Bank-based or market-based financial systems: Which is better? Working paper 9138. Available at: <http://www.nber.org/papers/w9138>
- Moyer, S., 1990. Capital adequacy ratio regulations and accounting choices in commercial banks. *Journal of Accounting and Economics*, 13, 123-154.
- Nalebuff, B., Stiglitz, J., 1983. Prizes and incentives: Toward a general theory of compensation and competition. *Bell Journal of Economics* 15, 143-172.
- Nichols, D., Wahlen, J., Wieland, M., 2009. Publicly traded versus privately-held: implications for bank profitability, growth risk, and accounting conservatism. *Review of Accounting Studies* 14, 88-122.
- Petersen, M., Rajan, R., 1995. The effect of credit market competition on lending relationships. *Quarterly Journal of Economics* 110, 407-443.
- Puri, M., Rocholl, J., Steffe, S., 2011. Global Retail Lending in the Aftermath of the US Financial Crisis: Distinguishing between Demand and Supply Effects. *Journal of Financial Economics* 100, 556-578.
- Salas, V., Saurina, J., 2002. Credit risk in two institutional regimes: Spanish commercial and savings banks. *Journal of Financial Services Research* 22, 203-224.
- Saurina, J., 2009. Dynamic provisioning. *The Experience of Spain. Crisis Response* (ed. The World Bank). Note nº 9, July 2009.
- Sapienza, P. 2004. The effects of government ownership on bank lending. *Journal of Financial Economics* 72, 357-384.
- Skala, D., 2015. Saving on a Rainy Day? Income Smoothing and Procyclicality of Loan-Loss Provisions in Central European Banks. *International Finance*, 18 (1), pp. 25-46.
- Stiroh, K., and P. Strahan. 2003. Competitive dynamics of deregulation: Evidence from U.S. Banking. *Journal of Money, Credit, and Banking* 35, 801-828.
- Wang, C., Xie, F, Xin, X., 2010: Managerial Ownership of Debt and Accounting Conservatism. Available at SSRN: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1703478
- Watts, R., 2003. Conservatism in accounting part I: Explanations and implications. *Accounting Horizons* 17, 207–221.
- Watts, R.L. y Zimmerman, J.L., 1986. *Positive Accounting Theory*, Prentice Hall, New Jersey.