REVISTA DE CONTABILIDAD

SPANISH ACCOUNTING REVIEW

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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A B S T R A C T

Accounting conservatism is a quality of earnings positively associated with the strength of banking regulation and supervision and also high market discipline, but there still remains the unresolved question of the way these three pillars of Basel II interact with each other. We analyse how regulatory and supervisory regimes in the banking industry clearly interact with market discipline measures, such as listing status, ownership, market concentration and disclosure requirements between ten years before Basel II fails, drawing upon data from 14,651 bank year observations from 54 different countries.

According to our findings, there is a clear correlation between the strength of the enforcement of regulation and supervision and accounting conservatism success in countries where market discipline fails. That is to say, the supervisory power reinforces the effect of listing status, ownership and concentration on conservatism whereas the capital regulatory system mitigates the effect of market discipline on conservatism. We also evidence that in a powerful regulatory system, more disclosure requirements are associated in less conservatism policies in financial entities.

Strong increases in regulation, its enforcement and supervisory power introduced in the Basel III mechanism is subject to the debate posed in this paper. The quality of accounting earnings can be improved to prevent bank failures through the application of strong Pillars I and II, i.e., regulation and supervision. Having said that, market discipline still remains a key factor in achieving financial stability.

Regulación, Supervisión y Conservadurismo Contable: La Interacción de los Tres Pilares de Basilea II con la Calidad de los Resultados Reportados en la Banca Mundial

R E S U M E N

El conservadurismo contable es una cualidad de las ganancias asociada positivamente con la solidez de la regulación y supervisión bancaria y también con la alta disciplina del mercado, pero aún queda la cuestión sin resolver de la forma en que estos tres pilares de Basilea II interactúan entre sí. Analizamos cómo los regímenes regulatorios y de supervisión en la industria bancaria interactúan claramente con las medidas de disciplina del mercado, como si cotizan o no, la distinta estructura de propiedad, la concentración del mercado y los requisitos de divulgación en una muestra de 14.651 observaciones de 54 países diferentes durante los diez años anteriores al fallo de Basilea II.

Según nuestros hallazgos, existe una clara correlación entre la fortaleza de la regulación y la supervisión bancaria y el nivel del conservadurismo contable en países donde la disciplina de mercado es débil. Es decir, el poder de supervisión refuerza el efecto del estatus de cotización, la propiedad y la concentración sobre el conservadurismo, mientras que el sistema de regulación de capital mitiga el efecto de la disciplina de mercado sobre el conservadurismo. También evidenciamos que, en un sistema regulatorio poderoso, más requisitos de divulgación están asociados con políticas menos conservadoras en las entidades financieras.

Los resultados obtenidos contribuyen al debate sobre si los fuertes incrementos en la regulación bancaria, y el mayor poder de supervisión introducidos en el mecanismo de Basilea III están justificados ante fallos en la disciplina de mercado introducida por Basilea II. La calidad del resultado contable se puede mejorar para prevenir quiebras bancarias mediante la aplicación de fuertes Pilares I y II, es decir, regulación y supervisión. Dicho esto, la disciplina del mercado sigue siendo un factor clave para lograr la estabilidad financiera, pero sigue sin ser el más relevante.

1. Introduction

Banking and financial regulation is now at the forefront of academic debate in the aftermath of the most recent financial crisis. The Basel III model which reinforces the three pillars of regulation, supervision and market discipline to achieve financial stability has emerged due to the failure of the globally accepted Basel II model which, during this economic decline, could not stabilize the markets.

This paper provides the evidence of why Basel II did not work as expected and shows the underlying obstacles the model faced but was unable to overcome. This paper also evaluates the ways that these pillars affect accounting conservatism as a measure of accounting quality while taking into account the possible culprit of the last financial crisis; a global systemic failure within the banking sector.

The onset of a nationwide expansion of banks in the late 1980's was due to a massive liberalization process which gave rise to the removal of entry barriers, geographic constraints and consequently the consolidation of industry. This fostered the value added of bank services and led to even greater expansion. Conversely, the nature of bank accounting systems around the world might well have exacerbated the growth pattern of financial institutions over the last three decades particularly the late recognition of loan loss provisions which may have increased outstanding loans during the expansionary periods, and dramatically decreased lending activity in downturns (Beatty & Liao, 2011). Although regulators pursue the stability of financial markets, certain accounting standards, such as loan impairments are cyclical, that is, they accentuate during periods of economic prosperity and are lower during downturn and contraction. Regulators therefore try to control this effect known as procyclicality. However, academics and practitioners want an increase in accounting conservatism for banks in the form of timely loan loss recognition to mitigate the effects of procyclicality, in accordance with this, the Bank of Spain set up a dynamic loan loss provisioning system in the mid-2000s whereby all banks had to accumulate loan loss reserves during the years of economic prosperity (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 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's main goals are to develop a common set of accounting rules which are designed to achieve increasingly higher levels of accounting transparency and quality so as to foster financial stability. Contrary to the regulatory perspective, provisioning policies must be based on objectively proven loan losses to ensure the objectives of the committee (Curcio & 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 due to the mitigation of procyclicality. As part of the IFRS 9 reform, a new loss impairment model has been introduced, which requires a timelier recognition of expected credit losses (IASB, 2014). The final version of IFRS 9 is effective for annual periods beginning after January 1, 2018.

In order evaluate the effects of bank supervision and the specific characteristics of their level of conditional accounting conservatism, this paper uses the cross-sectional variation in supervisory regimes throughout the world where only active commercial and savings banks are considered. The ratio of the loan loss reserves to total nonperforming loans developed by Beatty & Liao (2011) is used as a measure of conservatism. This model does not require time series data.

To date, very few papers have analyzed accounting conservatism while at the same time considered the effects of differences in financial, regulatory, and supervisory systems, hence, this work contributes to the existing literature on accounting conservatism by considering institutional variables that also constitute drivers of financial market stability, such as country-specific regulation and supervision. In accordance with the nature of the banking supervisory regime, this paper also evaluates the impact of market discipline variables such as listing status and ownership type which are evaluated at firm level and market concentration evaluated on accounting conservatism at country level. 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. Existing literature suggests that accounting standards and country-specific characteristics affect the level of earnings management (Pereira & Gaspar, 2017).

This paper challenges the pillars of Basel II (regulation, supervision, and market control) in order to evaluate whether the most robust control is market discipline or whether the system has opted to establish a more traditional, rigid system 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 effectively achieved the goals it set out to achieve.

The findings suggest that stronger regimes of regulation and supervision are positively associated with accounting conservatism and that market discipline, the third pillar of Basel II, indicates that conditional accounting conservatism is higher for unlisted or private commercial banks. In addition, 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 with reference to the banks' accounting conservatism.

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. Section 5 supplies robustness checks. Section 6 offers conclusions and suggestions for future research.

2. Prior research and development of hypotheses

Accounting information has broad implications for financial stability; therefore, 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 & González (2008) and Bushman & 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 & Majnoni, 2003; Bikker & Metzemakers, 2005; Fonseca & González, 2008; Bouvatier et al., 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 worsen and borrower defaults increase, but decrease during economic upturns (Curcio et al., 2017).

Banks have been shown to act procyclicality, with a significant and negative relationship between loan loss provision and economic growth. Since bank earnings cycles and business cycles are not perfectly synchronized, there is a strong possibility that reserves created when bank earnings are high do not cover credit losses suffered during macroeconomic downturns.

2.1. 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 official and private supervision reduce banks 'incentives to smooth earnings (El Sood, 2012; Biurrun & Rudolf, 2010). García Osma et al. (2019) confirm that political and industry independence of the supervisor are important determinants of income smoothing, suggesting that independence of prudential supervisors is a desirable governance characteristic, with positive impacts on financial transparency. 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 times of economic prosperity to be used during economic decline. 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 et al. (2006): Overall Activities Restrictiveness, Official Supervisory Power, and the Capital Regulatory Index.

The results obtained by these measures are in consonance with the stricter recommendations of Basel III proposed in 2010, which reinforced the first two pillars, i.e., regulation and supervision. This raises 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.

Overall Activities Restrictiveness (OAR) is a measure of regulatory restrictions on non-traditional bank activities, such as securities, insurance, real estate, bank ownership and control of non-financial firms. It constitutes an indicator of risk aversion. Values of OAR range from 4 to 12; higher values indicating 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:

> H_1: *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.

2.2. 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, all three of which, as a whole, comprise all the angles of the concept market discipline.

2.2.1. 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 & Meckling, 1976). Therefore, public firms are expected to disclose high quality accounting information to reduce the cost of capital. Nichols et al. (2009) and Ball & 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 & Harris (1999) suggest that public banks are more likely to engage in earnings management than private banks. Beatty et al. (2002) provide empirical evidence supporting the idea that earnings manipulation to avoid small losses and earnings decline is more common in public banks than in private banks. According to Suarez (2015), Spanish public entities information is focused on public relations and used to build a specific image. So, when they suffer a deterioration in their financial performance, they are far less objective.

Givoly et al. (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.

2.2.2. 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 et al., 2006; Barth et al., 2004; Beck et al., 2004).

Bouvatier et al. (2014), Berger et al. (2004), Clarke & Cull (2002), Berger et al. (2005), Dinç (2005), Hau & Thum (2009), and Puri et al. (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.

Leventis et al. (2013) document convincing evidence that well-governed banks engage in significantly higher levels of conditional conservatism in their financial reporting practices. More specifically, El-Bannany (2017) indicates that intellectual capital performance, market structure, bank size, the level of protection against risk and bank profitability have a significant impact on the accounting conservatism for banks in the UAE.

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 et al., 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.

2.2.3. Market concentration

A number of studies find that the wave of deregulation launched in the 1980s has led to an increase in competition (Stiroh & Strahan, 2003; Bertrand et al., 2007; Carbó et al., 2003; Salas & Saurina, 2002). An increase in bank competition after deregulation weakens banks' bargaining power in credit negotiations, making them more likely to relax their demand for conservatism (Huang, 2021). Intense product market competition improves the flow of firm-specific information, thereby limiting managers' ability to conceal bad news (Ball & Shivakumar, 2005; Nalebuff & 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 & Mueller, 2010; Chhaochharia et al., 2012). Moreover, by increasing liquidation risk, product market competition contributes to firms' demand for accounting conservatism in order to achieve more efficient contracting (Hou & Robinson, 2006; Ahmed & Duellman, 2007; Watts, 2003). Hence, less concentrated markets should be associated with more conservative earnings. The second hypothesis posits:

H_2: *Greater market discipline is associated with more accounting conservatism for banks.*

In particular, accounting conservatism is expected to be lower for savings banks than for commercial banks, and to increase with market competition. More recently, Huang (2021) highlights the unintended impacts of banking competition on borrowing firms' financial reporting finding that the effect on conditional conservatism is stronger for firms in states with a greater increase in competition among banks, firms that are more likely to borrow from in-state banks, firms with greater financial constraints, and firms subject to less external monitoring. 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.

2.3. Disclosure requirements

Pillar III gives a great deal of importance to disclosure requirements; the guiding principles for disclosure on the third pillar by banks focus on the fact that disclosure must be clear, integral, significant for the readers, coherent in time and comparable between banks. In this sense, we include this additional analysis.

There may also be cross-country differences in legal institutions and transparency culture that affect accounting practices. Cabedo & Tirado (2016) show that Spanish public companies show greater levels of risk information during periods of crisis, although this increase does not mean a greater level of quality of this information. However, Curcio & 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:

H_3: *The level of disclosure requirements has a positive effect on conservatism when there is also a proper regulatory and supervisory system.*

2.4. 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 & Levine (2009) show that bank regulations mitigate the negative effect of weak corporate governance on risk-taking. Illueca et al. (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:

> H_4:   *Bank supervisory and regulatory regimes have a stronger effect on conditional accounting conservatism under weaker market discipline.*

3. 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.

The period 1997-2009 includes the pre- and during-Basel period. Despite some differences depending on the country and the approach, both EU, USA and Japan had implemented the new legislation between 2006 and the beginning of 2008. In addition, the stricter recommendations of Basel III, with which we compare our results in the conclusions of the paper, were proposed in 2010, so including this year in our range could make our study biased. Furthermore, companies introduced IFRS standards during this period.

Two major changes in accounting standards and regulatory measures for banks occurred at the same time as our sample period: the introduction of IFRS in 2005 and the new capital adequacy framework (Basel II) in 2008. In other words, the span of our sample includes the post implementation period of IFRS, post Basel II period and the beginning of the financial crisis period.

3.1. Dependent Variable: Conservatism

Accounting conservatism is a measure of the quality of financial information. 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 & Shivakumar, 2005). Wang et al. (2010) define financial reporting conservatism as the practice of applying more stringent verifiability requirements to recognizing economic gains than to recognizing losses. Watts (2003) 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. More recently, Joohyung Ha (2020) has confirmed that conservative reporting reduces banks' risk-taking when lending using a sample of publicly traded bank holding companies in the United States.

There are different approaches to measuring accounting conservatism in the banking industry. Nichols et al. (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 & Watts (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 & 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 nonperforming loans.

3.2. 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 nonperforming loans.

RS refers to the Regulation and Supervision indicators developed by Barth et al. (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:

$$H_i = \sum_{j=1}^{ni} S_{ji}^2$$

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. 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 & Rajan, 1995; Cetorelli & Gambera, 2001; Cetorelli & 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 et al., 2009; Watts & Zimmerman, 1986; Moyer, 1990). Alali & Jaggi (2010) and Beatty et al. (2002) find a positive relationship between loans loss provisions and bank size.

Table 1. Definitions of Variables

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

BANK_CREDIT, which is the ratio of domestic bank loans to gross domestic product (GDP), is used to control 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 & Metzemakers (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.

3.3. 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 relatively 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.

According to Bonito & Pais (2018), countries without a national set of financial accounting standards for SMEs and a common law legal system are more likely to adopt IFRS for SMEs. These results may be due to low transaction costs, the importance of having some knowledge in IFRS reporting.

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 2. Descriptive statistics by countries

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

Table 3. Descriptive statistics by countries

	N	mean	st dev	p25	p50	p75
OAR	14,315	7.048481	1.645134	5	8	8
OSP	14,096	11.17828	2.435161	9	12	13
CRI	12,659	6.316139	1.678515	5	6	7
Comp	14,639	0.1210994	0.0988051	0.0520389	0.0861388	0.144914
ROA	14,644	0.0086994	0.0176954	0.0029319	0.0077994	0.0133333
ROE	14,644	0.0768385	0.7169587	0.0416667	0.0934503	0.1515152
EQ_TA	14,632	10.06696	8.162493	5.895	8.23	11.47
EBP_TA	14,057	0.0150567	0 .017505	0.0064772	0.0114723	0.0182815
Size	14,650	7.632365	2.09599	6.061457	7.539027	9.076923
CAC_1	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 4. Spearman Correlation Coefficients

OAR	1,0000													
OSP	0.3149	1,0000												
CRI	-0.0771	0.3276	1,0000											
Treg	0,5617	0,8638	0,5960	1,0000										
Unlisted	-0.1385	-0.0634	-0.0389	-0,1110	1,0000									
SB	-0.1490	-0.1283	0.0169	-0,1297	0.2431	1,0000								
Conc	-0.0652	-0.1811	0.0553	-0,1101	-0.1031	-0.0829	1,0000							
Disreq	0.3518	0.1756	-0.4204	0,0658	0.0402	-0.1963	-0.1933	1,0000						
EBP_TA	0.0946	0.1670	0.0869	0,1753	-0.0705	-0.1731	0.0311	-0.0725	1,0000					
EQ_TA	0.0517	0.1045	0.0873	0,1209	0.0303	-0.1979	0.0376	0.0132	0.3445	1,0000				
Size	0.0115	-0.0449	-0.0855	-0,0590	-0.2036	-0.0687	-0.0689	0.1461	-0.1443	-0.4358	1,0000			
Bank Credit	0.1522	0.2554	-0.0337	0,1991	0.2121	0.1345	-0.2235	0.5962	-0.1598	-0.0988	0.1250	1,0000		
GDP	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	
Dif	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

4. Results

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

4.1. 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 5. Regulation and Supervision

Variables			Regressions		
CAC	Pred	1	2	3	4
OAR	+	0.2043336***			0.0693788***
		(9.83)			(3.14)
OSP	+		0.010957		0.0416782***
			(0.81)		(2.63)
CRI	+			0.1197838***	0.0953762***
				(6.68)	(5.07)
EBP/TA	+	15.79624***	18.44829***	16.09695***	16.14499***
		(5.44)	(6.01)	(5.29)	(5.16)
EQ/TA	+	0.0743133***	0.0479459***	0.0172499**	0.0168856**
		(9.19)	(7.80)	(2.34)	(2.49)
Size	+	0.0803513***	0.0845694***	-0.0030099	0.0092384
		(5.01)	(4.87)	(-0.15)	(0.47)
Bank Credit	-	-0.0018219***	-.0008128	-0.0044433***	-0.0050645***
		(-3.89)	(-1.58)	(-8.93)	(-9.83)
GDP	+	.000064***	0.0000543***	0.0000832***	0.0000859***
		(17.34)	(15.16)	(19.62)	(19.18)
Year		-0.0417763***	-0.0545825***	-0.0185345**	-0.0216004***
		(-5.52)	(-7.15)	(-2.38)	(-2.78)
Dif	-	-.0013517***	-0.0007431***	-0.000262**	-0.0003015**
		(-8.85)	(-6.27)	(-2.05)	(-2.24)
Cons		80.77266***	108.0989***	36.33022**	41.57167***
		(5.31)	(7.05)	(2.32)	(2.66)
N		13735	13528	12165	11958
R2		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. In other words, when regressed in-

dependently, official supervisory power has no significant effect on conservatism. However, it is when all the regulatory and supervisory variables play a role together that the OSP has a real impact on the level of accounting quality (column 4 of Table 5). It is logical that the supervisor power has to be accompanied by specific measures such as capital requirements and activity restrictiveness. 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 & Duellman (2007) and Alali & 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 of reaching 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 1[1], so one more euro of provision makes earnings and TIER 1 decrease by 1-t. However, loan loss reserve is taken into account in TIER 2[2] 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.

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. It is evidenced that the strictness of regulations increases the timeliness of loan loss recognition.

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[1]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.

[2]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.

4.2. 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 column 1 and all regulation, supervision and market discipline variables regressed with their interactions in column 2.

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 et al. (2010) and La Porta et al. (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 Column 2 of Table 6, which discloses 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, will 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,

Table 6. Listing Status, Ownership and Concentration

Variables CAC	Prediction	1	2
Unlisted	+	0.2314113***	-0.60015
		(2.83)	(-1.54)
SB	-	-0.3101456***	-0.8800841
		(-3.12)	(-1.46)
Conc	-	-3.088759***	-4.758661**
		(-10.02)	(-2.37)
OAR	+		-0.0186848
			(-0.45)
OSP	+		0.0328988
			(1.15)
CRI	+		0.0104689
			(0.25)
Unlisted*OAR	?		0.1190163***
			(2.80)
Unlisted*OSP	?		0.1172931***
			(3.43)
Unlisted*CRI	?		-0.2281073***
			(-4.97)
SB*OAR	?		-0.0127574
			(-0.19)
SB*OSP	?		-0.1425141***
			(-3.21)
SB*CRI	?		0.3855386***
			(8.47)
Conc*OAR	?		0.2666823
			(1.01)
Conc*OSP			-0.4224928***
			(-3.39)
Conc*CRI			1.206426***
			(4.96)
EBP/TA	+	15.532***	16.09948***
		(5.50)	(5.30)
EQ/TA	+	0.0374303***	0.0179918**
		(5.04)	(2.39)
Size	+	0.0391698**	-0.008275
		(2.15)	(-0.39)
Bank Credit	-	-0.0026013***	-0.0049119***
		(-5.51)	(-9.49)
GDP	+	0.0000599***	0.0000797***
		(14.66)	(15.59)
Year		-0.0476101***	-0.0142225*
		(-6.29)	(-1.78)
Dif	-	-0.0006604***	-0.0003475**
		(-5.19)	(-2.40)
Cons		95.18374***	28.18584*
		(6.27)	(1.76)
N		14,041	11946
R2		0.1120	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 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 risk of intervention is higher, more strin-

gent 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 certain 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.

Table 7. Disclosure Requirements

Variables		Regressions			
CAC	Pred	1	2	3	4
Dis_req	-	-1.297675***	-4.044124***	-10.09882***	-4.992497***
		(-3.65)	(-2.93)	(-3.90)	(-3.90)
OAR	-		-0.2700888*		
			(-1.77)		
Disreq*OAR	?		0.4163508		
			(1.85)		
OSP	-			-0.5943253***	
				(-4.14)	
Disreq*OSP	?			0.7558915***	
				(3.41)	
CRI	-				-0.3315987***
					(-2.68)
Disreq*CRI	?				0.5691151***
					(3.20)
EBP/TA	+	8.792123*	8.652893	11.70951**	7.930831
		-1,75	(1.63)	(2.20)	(1.49)
EQ/TA	+	0.0207769	0.0298674	0.02773	0.0244332
		(1.09)	(1.39)	(1.38)	(1.10)
Size	+	-0.1008218***	-0.0920279**	-0.0935246**	-0.1218642***
		(-2.92)	(-2.47)	(-2.51)	(-2.99)
Bank Credit	-	0.006995***	0.0069115***	0.0089445***	0.0072777***
		(3.25)	(3.20)	(4.07)	(2.85)
GDP	+	0.0000253***	0.0000284***	9.63e-06	0.0000371***
		(3.77)	(4.01)	(1.29)	(4.02)
Year		-0.0551014***	-0.0548787***	-0.0503003***	-0.0511722***
		(-3.28)	(-3.09)	(-2.92)	(-2.85)
Dif		-0.000072	-0.0001821	-0.0001733	-0.0000638
		(-0.37)	(-0.89)	(-0.87)	(-0.28)
Cons		112.0009***	113.0601***	109.1146***	106.3307***
		(3.33)	(3.19)	(3.14)	(2.96)
N		2423	2249	2249	2084
R2		0.1086	0.1181	0.1418	0.1500

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

4.3. Market Discipline: Disclosure requirements

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. Our results (Table 7) show that countries with higher levels of disclosure requirements are expected to require a lower level of conservatism to their financial entities.

The impact of disclosure requirements on the dependent variable, conservatism, is not only very significant but also negative. Furthermore, even when we interact it with the rest of regulatory and supervisory variables, we obtain the same result. No difference is found 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, which confirms our third hypothesis.

5. Robustness Checks

The robustness of this paper's results is 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 sub-samples, 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.

6. 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.

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 et al. (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. 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 may affect the implementation of the regulatory and supervisory regimes in each country.

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

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 make it more comparable among banks 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 & Liao (2011). Moreover, although instrumental variables are used to control for simultaneity bias, banking-sector outcomes may influence regulatory and supervisory practices.

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 as well as 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.

Funding

Conflict of interests

The authors declare no conflict of interests.

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