Does board composition and ownership structure affect banks' systemic risk? European evidence

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Does board composition and ownership structure affect banks' systemic risk? European evidence

Abstract

In this paper, we expand the scarce literature regarding the effects of ownership structure and board composition on market measures of banks' systemic risk. Based on a sample of 87 European banks over the period 2010-2016, we provide evidence that ownership concentration has a non-monotonic (inverted u-shape) relationship with such risk. Additionally, we find that board characteristics (board size and the percentage of female directors) affect a bank's systemic risk, but for small banks only. Overall, our evidence suggests that the traditional banks' size approach to systemic risk study should be complemented with governance dimensions, especially in a context like the European one, where ownership concentration is high. Our results also imply that practitioners and politicians should promote better governance practices in banks in terms of maintaining an optimal ownership and board structures that are better able to control systemic risk.

1. Introduction

Systemic risk, the likelihood that a company event could generate severe instability or even collapse an entire industry or economy, has regained a prominent place in economic policy debates in recent years (Billio et al., 2010), as abundant evidence has been provided about the importance of controlling and containing such impactful events (Acharya et al., 2011). Nevertheless, the role played by banks in the recent global financial crisis (Díez et al., 2014) reveals that, considering that financial institutions manage the lifeblood of the global economy (and as such are systemically important), these entities require further oversight than other companies (Stulz, 2015)[1].

The on-going debate on what the determinants of a bank's systemic risk are questions whether only financial characteristics should be considered. It has been broadly argued by politicians, banking supervisors and academics that, to some extent, the roots of the global financial crisis can be found in the firm's risk mismanagement (Díez et al., 2014), this in turn being due to failings in the corporate governance practices of financial institutions (Anginer et al., 2018; Fernandes et al., 2016; Haldane, 2012; Basel Committee on Banking Supervision, 2010; Kirkpatrick, 2009). According to agency theory (Jensen and Meckling, 1976), internal mechanisms –especially the board of directors– should help to moderate top management opportunistic practices (Shleifer and Vishny, 1997). Thus, we consider that a bank's board of directors and ownership characteristics may have a significant influence on corporate decisions and, hence, be associated with changes in its systemic risk profile. Specifically, our study tries to identify in which governance context a financial institution's systemic risk would be more likely to be increased by managerial actions.

[1] In fact, Stulz (2015) concludes that the success of banks and the health of the financial system depend in a critical manner on their risk management.

From a risk-management perspective, financial firms' specific characteristics, in terms of governance and financial performance, have been observed to be responsible for the high correlation between past stock returns and the emergence of a financial crisis (Díez et al., 2014; Fahlenbrach et al., 2012). Moreover, such governance characteristics in a given bank may have externalities on other financial institutions and, hence, affect the overall banking systemic risk (Acharya and Volpin, 2010). Additionally, in a recent study, Anginer et al. (2018) found that shareholder-friendly corporate governance is associated with higher stand-alone and systemic risk in the banking sector.

In this paper we empirically examine the relation between banks' board characteristics, ownership structure and systemic risk. Using a sample of quoted financial institutions from 17 European countries for the period 2010-2016, we analyse to what extent the governance characteristics of banks are associated with higher systemic risk. Our results suggest that ownership concentration promotes banks' systemic risk to a certain threshold and that board size and the percentage of independent directors are not relevant in the long run as systemic risk determinants, while the presence of female directors matters but just for smaller financial institutions.

Our paper contributes to the existing literature in several ways. First, we provide a deeper insight on the factors affecting banks' systemic risk. Unlike previous literature, we focus on governance characteristics that may affect financial decisions and, hence, potentially influence banks' risk levels[2]. Previous literature in this field is relatively scarce. Stulz (2016) discusses how corporate governance and risk management should be designed to ensure that banks only take good risks that add value. In this paper, we propose that there is an optimal

[2] Banks' systemic risk literature has traditionally focused on two fields. On the one hand, how to measure this risk has been widely studied (some recent examples are Acharya et al., 2017; Brownlees and Engle; 2017; Moore and Zhou, 2014). On the other hand, the "too big to fail" principle has been incorporated into the study of certain corporate decisions by banks (see for instance Adachi-Sato and Vithessonthi, 2017; Laeven et al., 2016; Laeven et al., 2014).

level of risk for each financial institution from the perspective of its shareholders. The trend for a greater banking concentration due to the more restrictive capital requirements (Deli and Hasan, 2017) should also be taken into account by bank owners, considering the need to engage in the monitoring of management while simultaneously ensuring an adequate diversification strategy. Accordingly, Anginer et al. (2018) conclude that the positive effect of shareholder-friendly governance practices on banks' systemic risk is not relevant for all kinds of banks.

The Basel Committee on Banking Supervision in its final document "Principles for Enhancing Corporate Governance" assigns to the board of directors a relevant role in monitoring and guiding banks' strategies and risk policies (BCBS, 2010). Previous literature examining the role played by several board characteristics (such as independence or size) on different banks' financial dimensions has presented mixed results. Thus, a deeper analysis needs to consider the impact of (and interactions between) other bank dimensions in order to obtain a more comprehensive picture of the relation between board characteristics and banks' systemic risk. Moreover, the gender dimension should be considered also, as only a few studies focus on gender differences in banking (Beck et al., 2013; Ahern and Dittmar, 2012; Agarwal and Wang, 2009; Olivetti and Petrongolo, 2008; Almazan and Suarez, 2003), and with mixed results.

Second, we study a large sample of European banks[3], whereas most prior studies in bank systemic risk literature have focused on the United States. For instance, Pathan (2009) studied board characteristics for a sample of US bank holding companies, while Chen et al. (2006) analysed option-based executive compensation and market measures of risk for a sample of US commercial banks. Beyond that, DeYoung et al. (2013) related CEO risk-taking incentives and business policy decisions at US commercial banks, Calomiris and Carlson (2016) examined bank ownership and risk-taking at US banks in the 1890s, Berger et al. (2016) studied share

[3] In fact, the study of the European banking system seems to be particularly relevant, as banks' exposures to tail risks caused by shadow banking activities prior to the 2007 global financial crisis were later transformed into severe losses on their balance sheets (Acharya et al., 2013; Arteta et al., 2013).

ownership and the probability of default for US commercial banks over the 2007–2010 period, and Ellul and Yerramilli (2013) found a positive relation between independent risk management function and better performance during the 2007 financial crisis for US bank holding companies.

The remainder of this paper is organised as follows. Section 2 reviews previous research on systemic risk, ownership structure and board characteristics in banks in order to formulate our hypotheses. Section 3 describes the sample and variables and explains the empirical methodology. Section 4 shows the empirical results and assesses the degree to which our initial hypotheses are confirmed or not. The final section draws our major conclusions and suggests some directions for future research.

2. Governance and banks' systemic risk

2.1. What is systemic risk?

Banks create value for shareholders through the management of their assets and liabilities as part of their business model, which differs from other types of business. More precisely, liquid claims are produced by banks, and their success at producing such claims is what creates value for them. However, a bank's ability to issue claims that are valued because of their liquidity depends on its overall risk, so risk management becomes intrinsic to the business model of banks in a way that does not apply to nonfinancial firms (DeAngelo and Stulz, 2015).

Most previous research emphasises the economic arguments of systemic risk management in the banking industry (Bollard, 2011; Serwa, 2010; Allen and Carletti, 2009; Laeven and Valencia, 2008, 2010; Reinhart and Rogoff, 2008, 2009; Rancière et al., 2008; Von Hagen and Ho, 2007; Davis, 2007; Demirgüç-Kunt et al., 2006; Hutchison and Noy, 2005). On

the one hand, it is argued that banks play a major role in most western financial systems and economies[4]. On the other, due to the high frequency of banking crises[5], the economic consequences of those episodes (in terms of output losses and fiscal costs) and the effect of such crises on other financial crises (such as those related to public debt or currency) are particularly severe.

Nevertheless, there are many other reasons for paying attention to banks' systemic risk management. Ravalion (2008) focuses on the social consequences of banking crises, arguing that they have an impact on population psychological well-being and long-term human development. Besides this, the peculiarities of the banking business (ECB, 2009), the relevance of systemic risk in the banking industry (Kaufman, 2000) and the trends of modern banking practices (IISD, 2012; Kaufman, 2000) increase the importance of banks' systemic risk management.

However, a crucial issue has not yet been clearly solved that relates to the question of how systemic risk can be measured. An on-going debate is still taking place today between academics and practitioners where one perspective holds that systemic risk may refer to the system-wide risk in the financial sector (Bluhm and Krahnen, 2014; Acharya et al., 2009) or to the contribution to the system-wide risk by one single institution (Moore and Zou, 2014; De Bandt and Hartmann, 2000).

Another view, as stated by Gaspar (2012), holds that systemic risk could be defined as "*a risk of disruption in the financial system with potential to have negative consequences for the internal market and the real economy*"[6], while the ECB (2009) describes it as "*the risk of*

[4] For example, the ratio of top ten banks' assets to world GDP increased from 25.7 to 36.9 percent between 1985 and 2005, while the OCDE statistics (2010) show that banks control, on average, 75% of the financial assets.
[5] As reported by Laeven and Valencia (2010), there have been 145 banking crises all over the world in the period spanning 1975 to 2010.
[6] Closing session, Systemic Risk Conference (Lisbon, 3 February 2012).

experiencing a strong systemic event that adversely affects a number of systemically important financial intermediaries or financial markets including the infrastructures".

Given this disparity of definitions, and trying to incorporate all the relevant elements, we are going to follow the definition provided by the Basel Committee on Banking Supervision (BCBS), which stresses that "*systemic importance should be measured in terms of the impact that a failure of a bank can have on the global financial system and wider economy rather than the risk that a failure can occur*"[7]. The systemic risk measure provided by Acharya et al. (2011) incorporates this perspective in their calculations and has been previously used in former research (for example, Anginer et al., 2018). Hence, this is the one used as will be explained in the empirical development of the present study.

2.2. Corporate governance and banks' systemic risk

The failings in corporate governance practices of financial institutions are a relevant issue to be dealt with in order to prevent future banking crises (Haldane, 2012; Basel Committee on Banking Supervision, 2010; Kirkpatrick, 2009). Risk mismanagement before the 2007 financial crisis (Díez et al., 2014) is reflected in the banks' financial statements, but it has its origins in negligent corporate practices by both managers and owners.

A current phenomenon in the banking industry is the increased integration and interconnectedness of the financial systems (Bluhm and Krahnen, 2014), not only at a financial level but at a governance one too, which results in a complex network of contractual, behavior and informational links that amplify shocks. Thus, financial systemic risk is also characterised by cross-sectional dimensions that relate to the risk correlations across financial institutions due to direct and indirect linkages between them.

[7] See BCBS press release, "*Global systemically important banks: Assessment methodology and the additional loss absorbency requirement*", November 2011.

Hence, characterising a banks' governance system becomes relevant, as it is broadly considered to enable the set of mechanisms for addressing agency problems and controlling risk within the firm. Previous literature has demonstrated that the main differences between banks and nonfinancial firms (regulation, capital structure and the complexity and opacity of their business and structure) explain why the corporate governance in banks is different from the governance of nonfinancial firms[8] (Haan and Vlahu, 2016; Adams, 2012). Consequently, banks' ownership and board structure, among other governance mechanisms, may influence their systemic risk.

2.2.1. Banks ownership

Existing literature on the effects of banks' ownership structure on risk-taking reveals mixed results. On the one hand, and in line with agency theory, Laeven and Levine (2009) find that controlling owners have the power and incentives to induce bank managers to increase risk-taking. The idea is that when a bank has concentrated share ownership, the tendency of managers (with bank-specific human capital and private benefits of control) to engage in less risky activities may be capped by powerful shareholders (the resulting prediction is a positive relation between ownership concentration and bank risk). On the other hand, and contrary to the agency theory, Song and Li (2010) find a negative relation between concentrated ownership and bank insolvency risk. This evidence is consistent with Burkart et al. (1997), who suggest that the monitoring effect exerted by large shareholders deprives the managers of their private benefits, thereby reducing managerial incentives to engage in risky activities.

Consequently, we propose the existence of a critical level of ownership that maximises systemic risk for a bank from the perspective of its shareholders. Initially, as more powerful

[8] For instance, Haan and Vlahu (2016) find that some of the empirical regularities found in the literature on corporate governance of nonfinancial institutions, such as the positive (negative) association between board independence (size) and performance, do not hold for banks.

owners of large banks can exploit greater bargaining power with regulators and governments in the event of financial distress, we would expect concentrated ownership to be associated with higher systemic and tail risks than banks with dispersed ownership. However, after a critical threshold, very large shareholders can also impose better monitoring on managers and, in more general terms, obtain a better insight into the complex and opaque banking activities, which can lead to a better control over tail and systemic risk. Moreover, if concentration is too high, it is more likely that large shareholders will seek to reduce risk levels given that they will now bear a very large fraction of the potential costs associated with systemic risk.

Thus, we postulate our first hypothesis as follows:

Hypothesis 1: Ownership concentration has a non-linear effect (inverted U) on banks' systemic risk.

Following the agency theory, companies' assumption of risk may be conditioned by the different shareholders, managers or creditors' attitudes towards risk (Kubicek et al., 2013), as well as the possibility of obtaining private benefits arising from the adoption of such risk. In that sense, institutional investors such as investment funds may play an active role as shareholders (Díez et al., 2014; Erkens et al., 2012; Hansen and Hill, 1991; Wright et al., 1996), whereas other kinds of investors (e.g. other banks, families or the government) may maintain a more passive attitude, influenced by other commercial and/or investment relations in the banks in which they are also owners (Batacharya and Graham, 2007; Ferreira and Matos, 2008; Dalton et al., 2003; Brickley et al., 1988).

Growth in the euro area investment fund industry, underpinning much of the expansion of the non-bank sector over the previous years, recovered in the period 2015-16 amid volatile asset markets and continued net inflows. While euro area-domiciled investment funds have remained resilient to recent periods of market stress, increased risk-taking by institutional investors in the past decade has led to a shift towards investments with longer maturities and

higher credit risk. Thus, considering that in most European banks the importance of active institutional investors is relevant (García-Kuhnert et al., 2015), we postulate our second hypothesis.

Hypothesis 2: There is a positive relation between institutional investors' ownership and banks' systemic risk.

2.2.2. Board of directors

Board independence is a critical issue in the banking industry. Previous literature has studied how a greater independence affects banks' performance risk-taking, presenting mixed results. On one hand, Minton et al. (2010) and Fernandes et al. (2016) find a non-significant relationship between board independence and firm performance, while the empirical results of Aebi et al. (2012), Erkens et al. (2012) and Wang and Hsu (2013) show that the presence of independent directors is negatively related to their banks' performance measures. On the other hand, Beltratti and Stulz (2012) document that banks with more shareholder-friendly boards took more risks at the onset of the global financial crisis and performed significantly worse during the crisis. Beyond this, expert board members may be hired to justify and increase banks' risks to maximise short term profits instead of assisting in monitoring top managers (Mehran et al., 2012). One exception to the conclusion that independent directors may be associated with poorer performance is the study of Cornett et al. (2010), which explores the relation between several corporate governance mechanisms and the bank performance of all US publicly-traded bank holding companies. The authors find that a more independent board is positively related to bank performance during the crisis period, while that governance variable was not significant before the credit crisis.

To our knowledge, Anginer et al. (2018) is the first study that pays attention to board independence and its relationship with banks' systemic risk. They find that the regulations introduced by the NYSE and NASDAQ stock exchanges, forcing companies to have more than 50% of their board composed of independent directors, caused larger banks to increase stand-alone and systemic risk prior to the onset of the 2007 financial crisis.

We assume that board independence is not important on a day to day basis and propose that it should only matter for certain board actions, 'particularly those that occur infrequently or only in a crisis situation' (Hermalin and Weisbach, 2003). Accordingly, when the monitoring function is more crucial (as it occurs in the analysed period), we expect a negative link between the presence of independent directors and banks' systemic risk (Pathan, 2009).

Therefore, our third hypothesis is as follows:

Hypothesis 3: There is a negative relation between board independence and banks' systemic risk.

Regarding banks' board size, the trade-off between advantages (monitoring and advising) and disadvantages (coordination, control and decision-making problems) has to be considered. On one side, larger boards of directors could better supervise managers and bring more human capital to advise these. Moreover, increases in board size may add value because banks have grown in complexity over time (Adams and Mehran, 2012). However, boards with too many members may suffer from problems of coordination, control and flexibility in the decision-making process. Large boards also give excessive control to the CEO, harming efficiency (Yermack, 1996; Eisenberg et al., 1998). Given the post crisis period of our research, we expect coordination and control functions to gain considerable importance compared to monitoring and advising, and thus that bigger boards will be positively associated with financial institutions' systemic risk.

Hence, our fourth hypothesis is defined as follows:

Hypothesis 4: There is a positive relation between board size and banks' systemic risk.

Our last hypothesis faces a growing debate in economic and finance literature in terms of gender and its effect on economic outcomes (Croson and Gneezy, 2009). Corporate risk-taking behavior with respect to investment decisions and gender differences studies agree that women are more risk averse in financial decision making (Agnew et al., 2003; Sundén and Surett, 1998)[9]. Nevertheless, these studies do not fully support the results obtained for individual investment decisions. While Farrell and Hersch (2005) find an inverse link between firm risk and female directors, Adams and Funk (2012) show that female directors are more prone to take risks than men. The effect of female board representation on profitability and value is also negative (Ahern and Dittmar, 2012; Adams and Ferreira, 2009). This result suggests that female directors engage in excessive monitoring, which decreases shareholder value (Adams and Ferreira, 2007; Almazan and Suarez, 2003). In contrast, Liu et al. (2014) demonstrate that a higher proportion of female executives increases firm performance in China, and Levi et al. (2014) show that boards with female directors pursue less aggressive acquisition strategies.

Only a few studies focus on gender differences in banking. Agarwal and Wang (2009) and Beck et al. (2013) show that default rates for loans originated by female loan officers tend to be lower than for those originated by male loan officers. The possibility that female bank executives have fewer outside options (Olivetti and Petrongolo, 2008) and the evidence that women have strong monitoring incentives (Almazan and Suarez, 2003) suggests that bank risk is likely to decrease if more female executives are present. Beyond this, Ahern and Dittmar

[9] These findings are attributable to the observation of Barber and Odean (2001) and Niederle and Vesterlund (2007), who consider women to be less overconfident than their male counterparts.

(2012) found that female directors negatively influence firm value in Norway and attribute this result to the significantly lower job experience of women.

Since the effect of female directors is apparently unclear, we have formulated two alternatives for our gender hypothesis:

Hypothesis 5a: There is a positive relation between female directors and banks' systemic risk.

Hypothesis 5b: There is a negative relation between female directors and banks' systemic risk.

3. Data and methodology

3.1. Sample and data sources

Our sample consists of 87 publicly listed banks[10] from 17 European countries for the period 2010-2016, with a total of 590 firm-year observations. We have obtained data from financial statements (balance sheet and profit and loss statements), ownership structure and share prices from the THOMSON EIKON database. Data on board composition and characteristics has been extracted both from BoardEx and manually collected from each banks' annual reports. Lastly, banks systemic risk measures have been collected from V-Lab of the Leonard N. Stern School of Business (New York University). Table 1 provides a summary of the sample by country. In appendix (Table A.1) the list of banks per country is presented.

Table 1. Composition of the sample by countries

[10] Thomson Eikon database provides market information about 203 banks from those 17 European countries. Nevertheless, our final sample is limited to 87 banks due to lack of enough both financial and governance information to construct the variables used in this study.

Country	# Banks	# Observations	% total assets
Austria	5	35	1.42
Belgium	1	7	1.03
Denmark	5	35	2.06
Finland	1	7	0.02
France	4	24	18.65
Germany	8	49	9.68
Greece	4	28	0.97
Ireland	3	17	1.11
Italy	11	83	8.33
Netherlands	2	14	4.34
Norway	3	21	1.21
Poland	6	36	0.60
Portugal	2	13	0.49
Spain	7	46	10.87
Sweden	4	28	5.43
Switzerland	15	105	7.88
United Kingdom	6	42	25.92
Total	**87**	**590**	**100.00**

On average, there are 84 banks per year. It should be noticed that our sample includes banks of different sizes. Thus, although Switzerland has more banks in our sample, they only represent 7.8% of the total sample in terms of assets, whereas the United Kingdom, with just 6 banks, represents more than a quarter. The biggest bank in our sample is the British HSBC (with an average of € 2,058,875 million total assets), and the smallest one is the Italian Banca Profilo (with an average of € 1,880 million total assets). That size diversity leads us to later analyse if the governance dimension may be biased by the banks' size or the country of origin.

3.2. Variables description and empirical framework

A. Banks' systemic risk

As mentioned before, according to BCBS, what is relevant for systemic risk is its importance, in terms of the impact that a failure of a bank can have on the global financial system and wider economy. Thus, in our research we follow two market-based systemic risk measures proposed by Acharya et al. (2012): systemic risk (*SRISK*) and long run marginal expected shortfall (*LRMES*). Both SRISK and LRMES are based on market data, specifically accounting for extreme events in the left tail, and show a higher predictive power in detecting a bank's contribution to a crisis than other measures of bank-level risk (Acharya et al., 2011).

SRISK is defined as the amount of capital that a firm is expected to need in case of a financial crisis. *SRISK* is estimated based on the marginal expected shortfall (*MES*), which is the expected equity loss per euro invested in a bank if the overall market declines by a certain amount, and it is computed as the average return of each bank during 5% of the worst days of the market. The estimated *MES* is further extrapolated to a market turmoil that is much more severe and lasts for a longer period to obtain the long run marginal expected shortfall (*LRMES*), which is calculated as follows:

$$LRMES_{i,t} = 1 - exp\,(-18 \times MES_{i,t}) \quad (1)$$

where *i* denotes the firm and *t* the time period. Based on *LRMES*, *SRISK* can be estimated as presented next:

$$SRISK_{i,t} = E_{i,t}[k\,(Debt_{i,t} + Equity_{i,t}) - Equity_{i,t}, \mid Crisis] \quad (2)$$

$$SRISK_{i,t} = k\,(Debt_{i,t}) - (1 - k)\,(1 - LRMES_{i,t})\,Equity_{i,t} \quad (3)$$

where *k* denotes the prudential capital ratio (8%) and Debt and Equity are the market values of debt and equity, respectively.

B. Banks' ownership and board

Banks' ownership concentration (*OWN1*) is measured as the proportion of shares held by the largest shareholder. We include the square of this variable (quadratic form) to assess the non-linearity of the variable with the systemic risk measure proposed in our first hypothesis.

To test the influence of active institutional investors, we use the variable *INSTIT*, a dummy that takes a value of 1 if the largest shareholder is an active institutional investor and 0 otherwise[11]. This is also interacted with the variable *OWN1* to test the role played by institutional owners.

Regarding board characteristics, we define board size (*BS*) as the natural logarithm of the number of directors on the board (Chen et al., 2016), independent directors (*IND*) as the percentage of independent directors on the board[12], and female directors (*FEM*) as the proportion of women on the board.

C. Control variables

To control for the financial situation of each bank, we introduce five variables based on the CAMEL rating system. The acronym *CAMEL* refers to five components used to assess the overall condition and supervisory rating of a bank. Past *CAMEL* ratings contain useful information on the future performance and condition of a bank (Hirtle and Lopez, 1999).

Thus, those variables are defined following the *CAMEL* components. First, *TIER1*, the Capital Ratio, measures the bank's capital adequacy. The asset quality is measured through *LTOA*, calculated as the ratio between gross loans to total assets. A third dimension considers management efficiency (*NII*) through the ratio between non-interest incomes to total income.

[11] Following previous literature, we have only considered those institutional investors that hold at least 5% of the shares.

[12] An independent director has only business relationship with the bank and his or her directorship, i.e. an independent director is not an existing or former employee of the banks nor its immediate family members and does not have any significant business ties with the bank.

Earnings quality is measured with the return on assets ratio (*ROA*) and, lastly, liquidity is calculated through the ratio between cast to total assets (*CASH*)

Finally, we also measure each bank's size (*SIZE*) as the logarithm of total assets (Peni and Vähämaa, 2012; Pathan, 2009).

D. Country level variables

Although our sample considers European banks, we must note that each country's banking system presents peculiarities that should be considered. Consequently, we include in our analysis banking concentration (*CONC*) as the aggregate market share of the five largest banks in a country, based on total assets. Following Pogghosyan and Cibak (2011), who show that banks operating in markets with greater concentration are more prone to experiencing distress, we expect a positive relation between systemic risk and banking concentration. This also agrees with the Caminal and Matutes' (2002) observation that enhanced market power arising from greater concentration may reduce banks' incentives to invest in reducing information asymmetries about project selection.

Thus, the empirical model is expressed as follows:

$$\begin{aligned}\text{Systemic Risk}_{i,t} = {} & \beta_0 + \beta_1\,\text{OWN1}_{i,t} + \beta_2\,\text{OWN1}_{i,t}^{\,2} + \beta_3\,\text{INSTIT}_{i,t} + \beta_4\,\text{BS}_{i,t} + \beta_5\,\text{IND}_{i,t} + \\ & + \beta_6\,\text{FEM}_{i,t} + \ + \beta_7\,\text{TIER1}_{i,t} + \beta_8\,\text{LTOA}_{i,t} + \beta_9\,\text{NII}_{i,t} + \beta_{10}\,\text{ROA}_{i,t} + \beta_{11}\,\text{CASH}_{i,t} \\ & + \beta_{12}\,\text{CONC}_{i,t} \ + \beta_{13}\,\text{EFIC}_{i,t} + \text{YEAR} + \eta_i + \varepsilon_{i,t}, \qquad (4)\end{aligned}$$

where *i* denotes the firm, *t* the time period, η_i is the unobservable and constant heterogeneity, and $\varepsilon_{i,t}$ is the stochastic error used to introduce possible errors in measurement of the independent variables and the omission of explanatory variables.

The detailed definition of variables and their expected sign are presented in Table 2.

Table 2. Summary of hypotheses

The table shows the summary of the hypotheses and the expected signs.

Variable	Definition	Construction	Expected sign
Panel A: dependent variables			
SRISK	Systemic risk		Dependent variable
LRMES	Long run marginal expected shortfall		Dependent variable
Panel B: key independent variables			
OWN1	Ownership concentration	% of shares hold by the first shareholder	H1: Positive
$OWN1^2$			H1: Negative
INSTIT	Institutional ownership	Dummy coded 1 if the first shareholder is an active institutional investor	H2: Positive
BS	Board size	Logarithm of number of directors on the Board	H4: Positive
IND	Independent directors	% of independent directors in the board	H3: Negative
FEM	Female directors	% of female directors in the board	H5: Ambiguous
Panel C: control variables			
TIER1	Tier 1 Capital Ratio	Core equity capital/Total risk-weighted assets	Negative
LTOA	Loans to assets	Gross Loans / Total Assets	Negative
NII	Business management	Non-interest Income / Total Income	Positive
ROA	Profitability	EBIT / Total Assets	Positive
CASH	Liquidity	Cash /Total Assets	Negative
SIZE	Bank's size	Logarithm of total assets	Positive
CONC	Bank concentration	% shares of the five largest banks / total assets	Positive

3.3. Methodology

The empirical analysis is divided into two stages. First, we offer a descriptive analysis to show the main characteristics of our sample and to examine the consistency of our data with the results of previous research. This step provides preliminary evidence about a possible differential impact of financial deregulation on corporate risk-taking and about potential differences between institutional investors.

Second, we test our hypotheses through an empirical analysis to validate the relation between banks' systemic risk and board and ownership structure, controlling for other bank characteristics.

Our database combines time series with cross-sectional data, allowing the formation of panel data, estimated with an appropriate panel data methodology (Arellano and Bond, 1991; Arellano and Bover, 1990; Bond, 2002). Using this technique has two advantages. First, we can control the so-called constant unobserved heterogeneity, since the peculiarities of each bank may affect their risk levels and these characteristics persist over time. Second, we can treat the possible endogeneity of the variables by using a generalised method of moments (GMM). We use a system estimator, an enhanced version of the estimator GMM, in which variable differences are also used as instruments in levels by equations (Blundell and Bond, 2000; Blundell et al., 2000; Bond 2002).

The consistency of the GMM estimators depends on the absence of a second order serial correlation in the error term and the validity of the instruments. For this reason, in Tables 5, 6, 7 and 8 we present the model specification tests. The validity of the instruments is assessed through the Hansen test of over-identifying restrictions, which evaluates the joint validity of the selected instruments. We also perform a test (AR2) to verify if the error terms in the regressions do not present a second-order serial correlation, since the definition of the model makes the existence of first-order correlation very likely.

4. Empirical Results

4.1. Descriptive Statistics

To characterise the sample under analysis, we present in Table 3 the descriptive analysis of the variables used.

Table 3. Descriptive statistics

This table shows the mean, standard deviation, median, minimum, and maximum values of the model variables. See table 2 for variable definitions.

Variable	Mean	Std. Dev	Median	Minimum	Maximum
Panel A: dependent variables					
SRISK	0.888	1.745	0.080	0.000	8.710
LRMES	40.326	17.500	44.045	-23.790	85.700
Panel B: key independent variables					
OWN1	0.344	0.284	0.249	0.008	0.998
BS	2.486	0.348	2.485	1.609	3.218
IND	0.611	0.251	0.625	0.000	1.000
FEM	0.204	0.129	0.200	0.000	0.600
Panel C: control variables					
TIER1	0.142	0.063	0.130	0.000	0.692
LTOA	0.585	0.181	0.621	0.013	0.901
NII	0.015	0.011	0.013	-0.009	0.067
ROA	0.002	0.011	0.004	-0.108	0.045
CASH	0.094	0.110	0.069	0.002	0.807
SIZE	24.999	1.806	24.665	21.295	28.446
CONC	0.502	0.146	0.536	0.305	0.973

Panel A shows that the banks' systemic risk (*SRIK)* has a mean of 0.888 during the sample period. The mean *LRMES* (40.326) is comparable to the one reported by Acharya and Steffen (2012).

The board structure variables in Panel B show that the mean BS is 2.486 (12 directors), with a minimum of 1.6 (5 directors) and a maximum of 3.2 (25 directors). As to the number of

independent directors, in absolute terms, *IND* varies from 0 to 100%, with a mean of 61%[13]. FEM is on average quite low, but with a high dispersion and a maximum value equal to 60%. In table 4, we report the proportion of female directors by country, where we can observe big differences between Scandinavian countries (with mandatory quotas) and the Mediterranean ones.

Table 4. Average percentage of female directors by country

Country	% female directors	Country	% female directors
Austria	18.92	Netherlands	25.58
Belgium	15.97	Norway	44.62
Denmark	20.73	Poland	11.47
Finland	24.15	Portugal	6.89
France	34.22	Spain	16.85
Germany	22.29	Sweden	37.96
Greece	9.53	Switzerland	17.37
Ireland	19.58	United Kingdom	20.47
Italy	18.66		

For brevity, the descriptive statistics of control variables presented in Panel C are omitted.

[13] The classification of independent is the one provided by both Boardex and the data we have manually collected. There are banks where all the directors are classified as independent (French saving banks for instance). In later robustness checks we run our experiments excluding such banks.

4.2. Multivariate analysis

Table 5 presents the results of estimation of equation (1).

Table 5. Results of the estimation of model 4.

*** significant at 99% confidence level; ** 95%; * 90%. Values in parenthesis are the standard deviations. See Table 2 for variable definitions.

	SRISK			LRMES		
	Governance	Financial	Complete model	Governance	Financial	Complete model
Dep. Var. (t-1)	0.696 ***	0.684 ***	0.545 ***	-0.041 ***	-0.465 *	-0.285 ***
	(0.023)	(0.028)	(0.061)	(0.049)	(0.056)	(0.080)
OWN1	0.733 *		2.345 **	56.008 ***		100.235 ***
	(0.409)		(0.993)	(13.243)		(32.813)
$OWN1^2$	-1.206 ***		-3.909 ***	-76.257 ***		-138.741 *
	(0.446)		(1.341)	(12.460)		(27.841)
OWN1*INSTIT	3.148		3.008	-27.985 ***		-54.987 ***
	(0.741)		(2.823)	(4.004)		(14.834)
BS	0.363		-0.198	12.643		9.631
	(0.074)		(0.198)	(3.767)		(8.807)
IND	0.211		-0.021	-12.820		6.139
	(0.120)		(0.065)	(3.499)		(6.144)
FEM	0.890		0.001	49.648		-13.939
	(0.169)		(0.545)	(14.651)		(9.026)
TIER1		-4.931 ***	-5.747 ***		-149.182 ***	-78.398 **
		(0.948)	(1.284)		(35.887	(33.950)
LTOA		-2.934 ***	-1.663 *		-110.014 ***	-110.560 ***
		(0.465)	(0.969)		(16.263)	(33.562)
NII		6.123	14.715		-207.915	394.831
		(8.083)	(10.305)		(249.246)	(296.248)
ROA		0.320	-1.487		121.222 *	774.779 ***
		(1.979)	(3.456)		(73.143)	(180.266)
CASH		-2.504 ***	-5.767 ***		-38.531 *	-79.996 **
		(0.619)	(0.821)		(29.053)	(34.637)
SIZE		0.053	0.209 ***		3.166 **	6.659 **
		(0.054)	(0.074)		(1.278)	(3.180)
CONC	0.456 ***	1.036 **	0.352	11.846	51.109 ***	83.899 ***
	(0.145)	(0.444)	(0.735)	(8.059)	(8.702)	(14.432)
YEAR	YES	YES	YES	YES	YES	YES
Constant	-1.860 ***	0.530	-3.715	-6.382	41.324	-128.269
	(0.301)	(1.685)	(2.513)	(13.705)	(42.440)	(98.349)
Wald Test	2,391.39 ***	2,772.20 ***	1,279.74 ***	1,061.84 ***	355.39 ***	1,408.18 ***
(g.l.)	(12)	(12)	(18)	(12)	(12)	(18)
m1	-2.36 **	-2.81 ***	-2.85 ***	-2.26 **	-2.31 ***	-1.83 *
m2	-0.93	-0.89	-0.89	1.22	-0.99	-1.54
Hansen Test	54.51	29.01	28.99	35.32	30.93	33.87
(g.l.)	(26)	(26)	(26)	(26)	(26)	(26)

The results in table 5 reveal some interesting insights. First, as *SRISK* and *LRMES* measure systemic risk from two different perspectives (in the short run with the former, in the long run with the latter), the influence of the lagged dependent variable is different.

Our first hypothesis is confirmed, as we obtain an inverted U-shape for the relationship between ownership concentration and banks' systemic risk. Going further, we can also estimate where the critical ownership structure can be found by calculating the first partial derivative risk regarding ownership. In this way, we obtain the breakpoint calculated as $(-\beta_1/2\beta_2)$ (De Miguel et al., 2004). In the case of (*SRISK*) this point is 60%, whereas in the case of (*LRMES*) the value is 73%.

It is also remarkable that the influence of institutional investors is only relevant in the long term (*LRMES*), and not in the expected positive way, but reducing instead the banks' systemic risk, therefore contradicting our second hypothesis. This could be explained by the argument that institutional investors, in the long term, exercise a better monitoring activity in companies, trying to obtain a more sustainable performance over time, which may prevent excessively risky investments. This result is consistent with the findings by Bohjraj and Segupta (2003), who report that firms with greater ownership by institutional investors present lower risk levels.

Regarding board characteristics, we find that their influence on banks' systemic risk is not significant, which deserves deeper analysis. In fact, the importance of board characteristics on banks' risk behaviour has been debated in previous literature, and conclusive results have not been obtained so far. As the relevance of the board of directors may be influenced by bank size, in table 6 we tested our model 1 by dividing our sample into two groups, using the median of the size variable. As shown by the results in table 4, there are relevant differences that should be considered.

Table 6. Results of the estimation of model 1 for "big" and "small" banks.

*** significant at 99% confidence level; ** 95%; * 90%. Values in parenthesis are the standard deviations. See Table 2 for variable definitions.

	SRISK		LRMES	
	Big banks	Small banks	Big banks	Small banks
Dep. Var. (t-1)	0.768 ***	0.335 ***	-0.149 ***	-0.346 ***
	(0.020)	(0.072)	(0.051)	(0.123)
OWN1	1.402 **	1.365 **	47.003 ***	99.243 ***
	(0.475)	(0.553)	(15.819)	(32.813)
$OWN1^2$	-2.463 ***	-2.944 ***	-61.427 ***	-140.731 *
	(0.606)	(1.331)	(20.815)	(27.841)
OWN1*INSTIT	1.927	2.014	-9.531 *	-34.743 ***
	(1.334)	(2.223)	(10.525)	(12.833)
BS	0.660	0.148 *	-4.716	9.631 **
	(0.092)	(0.122)	(6.410)	(8.421)
IND	0.000	-0.121 **	6.273	-6.256 *
	(0.065)	(0.033)	(4.945)	(4.984)
FEM	1.036	0.042 *	16.944	13.542 **
	(0.316)	(0.076)	(8.684)	(5.321)
TIER1	-4.931 ***	-3.347 ***	-56.402 *	-32.54 **
	(0.948)	(1.232)	(31.998)	(33.320)
LTOA	-2.933 ***	-1.593 *	-90.623 ***	-88.3432 ***
	(0.465)	(1.746)	(18.971)	(54.442)
NII	6.122	11.745	-209.532	394.831
	(8.083)	(8.563)	(103.172)	(296.248)
ROA	0.320	1.337	389.412 ***	433.597 ***
	(1.979)	(2.446)	(57.291)	(176.438)
CASH	-2.504 ***	-4.733 ***	-52.687 ***	-68.143 **
	(0.821)	(0.831)	(17.143)	(32.637)
SIZE	0.053 *	0.779 ***	5.979 **	7.449 **
	(0.054)	(0.124)	(2.067)	(3.880)
CONC	1.036 **	0.333 *	10.893 *	63.549 ***
	(0.444)	(0.532)	(5.671)	(4.443)
YEAR	YES	YES	YES	YES
Constant	0.530	0.715	27.151	28.439
	(1.685)	(1.518)	(77.278)	(65.349)
Wald Test	25,276.20 ***	14,279.74 ***	10,296.73 ***	14,309.48 ***
(g.l.)	(12)	(12)	(18)	(18)
m1	-2.60 ***	-2.23 ***	-2.62 **	-2.76 *
m2	-1.54	-1.64	0.63	0.54
Hansen Test	25.75	22.99	18.22	25.62
(g.l.)	(26)	(26)	(26)	(26)

Our results confirm that board size, the percentage of independent directors and the presence of women in the board are only significant in small banks (in our sample, those which hold less than €57.4 million in assets). Thus, our set of hypotheses related to banks' boards of directors are only confirmed for small banks. These results may shed a light on previous

inconclusive research findings on the impact of bank's board characteristics on risk-taking, as this size dimension has not been considered properly.

5. Additional tests and robustness checks

In order to make our findings more consistent and insightful, we have carried out a number of additional tests and robustness checks. In table 7 we introduce alternative measures of board independence. First, columns 1 and 3 present the results of the estimation of the proposed model, including a dummy variable (*DIND5*) that takes the value of one for boards with at least five independent directors (the 50^{th} percentile of the number of independent directors in the sample) and zero otherwise. Proceeding in this way, we find that the negative relationship between banks' systemic risk and board independence is only relevant when there are more than five independent directors, confirming the prevalence of the monitoring function (Pathan, 2009).

Second, columns 2 and 4 show the results when we drop banks that present 100% of independent directors. In this case, our sample moves from 87 to 80 banks. Again, the estimation of the model reveals a negative and significant relationship between board independence and banks' systemic risk.

Table 7. Results of the estimation of model 1 for alternative measures of board independence.

*** significant at 99% confidence level; ** 95%; * 90%. Values in parenthesis are the standard deviations. See Table 2 for variable definitions.

	SRISK		LRMES	
	> 5 independent directors	< 100% independent directors	> 5 independent directors	< 100% independent directors
Dep. Var. (t-1)	0.521 ***	0.798 ***	-0.685 ***	-0.211 **
	(0.060)	(0.027)	(0.066)	(0.136)
OWN1	2.575 ***	1.984 **	77.833 ***	104.238 ***
	(0.791)	(0.864)	(23.450)	(33.962)
$OWN1^2$	-4.508 ***	-2.158 **	-103.838 ***	-50.534 *
	(0.984)	(0.990)	(27.143)	(30.272)
OWN1*INSTIT	2.627	0.245	-9.441 **	-94.196 ***
	(2.741)	(0.284)	(15.654)	(25.737)
BS	-0.190	0.085	2.655	-3.341
	(0.185)	(0.154)	(4.991)	(6.837)
DIND5	-0.144 **		-5.858 **	
	(0.069)		(2.682)	
IND		-0.154 **		-19.737 **
		(0.076)		(8.332)
FEM	0.384	0.239	-85.376	3.333
	(0.440)	(0.210)	(15.214)	(8.619)
TIER1	-6.239 ***	-1.555 **	-58.038 *	-141.657 **
	(1.121)	(0.752)	(32.011)	(65.378)
LTOA	-1.787 **	-0.202 *	-99.095 ***	-101.332 ***
	(0.730)	(0.406)	(21.796)	(30.205)
NII	12.071	1.809	-280.510	-341.071
	(10.102)	(4.386)	(165.537)	(191.014)
ROA	-0.587	0.134	444.827 ***	632.568 ***
	(3.495)	(1.363)	(65.992)	(170.082)
CASH	-5.717 ***	-2.318 ***	-4.789 *	-153.695 ***
	(0.796)	(0.572)	(26.432)	(39.397)
SIZE	0.162 **	0.178 ***	7.435 ***	8.152 ***
	(0.074)	(0.041)	(1.773)	(2.770)
CONC	0.159 *	0.561 *	43.181 ***	29.542 ***
	(0.717)	(0.373)	(9.056)	(11.273)
YEAR	YES	YES	YES	YES
Constant	-2.199	-5.383 ***	-63.268	-74.506
	(2.342)	(1.393)	(53.253)	(91.701)
Wald Test	2,812.11 ***	17,835.49 ***	1,160.35 ***	681.50 ***
(g.l.)	(18)	(18)	(18)	(18)
m1	-2.74 ***	-2.50 **	0.20	-2.15 **
m2	-0.86	-1.35	-1.35	-1.06
Hansen Test	26.82	26.42	31.23	28.43
(g.l.)	(26)	(26)	(26)	(26)

A last robustness test relates to the role of female directors. Our previous results show a significant influence of this variable only for small banks. In table 8 we perform an additional

estimation by splitting our initial sample between banks that have three or more women in the board and the remaining ones.

Table 8. Results of the estimation of model 1 for female directors.

*** significant at 99% confidence level; ** 95%; * 90%. Values in parenthesis are the standard deviations. See Table 2 for variable definitions.

	SRISK		LRMES	
	>= 3 female directors	< 3 female directors	>= 3 female directors	< 3 female directors
Dep. Var. (t-1)	0.600 ***	0.711 ***	-0.164 ***	-0.356 ***
	(0.042)	(0.031)	(0.053)	(0.064)
OWN1	0.602 **	0.095 *	48.734 *	59.706 ***
	(1.047)	(0.268)	(28.600)	(20.106)
$OWN1^2$	-1.130 **	-0.018 *	-54.668 *	-42.798 **
	(1.280)	(0.309)	(31.945)	(21.589)
OWN1*INSTIT	0.379	-0.185	-24.930 *	-13.387 *
	(1.305)	(0.135)	(13.174)	(6.963)
BS	-0.214	0.060	-2.113	-18.623
	(0.252)	(0.091)	(5.102)	(6.832)
IND	-0.122	-0.301 ***	-11.183 ***	-14.848 ***
	(0.148)	(0.057)	(3.675)	(4.142)
FEM	-0.362	0.810 ***	3.589	28.498 ***
	(0.539)	(0.288)	(5.013)	(7.474)
TIER1	-3.810 ***	-1.960 ***	-0.422 *	-102.816 ***
	(1.413)	(0.304)	(39.977)	(21.036)
LTOA	-0.538 *	-1.975 ****	-5.097 **	-115.293 ***
	(0.900)	(0.160)	(12.374)	(21.263)
NII	43.810	-2.064	188.026	-186.204
	(8.453)	(2.941)	(83.828)	(287.759)
ROA	-13.013	-1.677	683.703 ***	487.226 ***
	(6.752)	(0.888)	(123.472)	(121.401)
CASH	-4.670 **	-0.990 **	-50.797 **	-135.922 ***
	(0.868)	(0.477)	(21.980)	(26.396)
SIZE	0.294 ***	0.062 *	4.758 ***	5.449 *
	(0.096)	(0.035)	(0.868)	(4.123)
CONC	-0.711	0.877 ***	39.576 ***	45.615 ***
	(0.758)	(0.182)	(7.705)	(11.036)
YEAR	YES	YES	YES	YES
Constant	-6.152 *	3.360 ***	-84.571 ***	38.587
	(3.421)	(0.810)	(28.196)	(105.197)
Wald Test	17,097.41 ***	84,019.27 ***	967.08 ***	328,628.00 ***
(g.l.)	(18)	(18)	(18)	(18)
m1	-2.11 **	-1.15	-3.38 ***	-0.01
m2	-1.21	1.39	1.43	-1.36
Hansen Test	18.02	24.62	31.34	32.43
(g.l.)	(26)	(26)	(26)	(26)

Our results reveal that the influence of female directors is only relevant when there are less than three women in the board, and in this case in a positive way. These findings are not in line with prior studies on the field of gender diversity in the banking industry but agree with

some research that shows that female directors are more prone to taking risks than men (Adams and Funk, 2012).

We have also conducted an estimation for a quadratic relation for independent director and female director percentages. Although the obtained coefficients show some statistical significance, they lack economic meaningfulness as the associated critical levels fall outside of our sample observations for these variables, and hence we cannot suggest the existence of an optimal amount of independent or women directors.

6. Conclusions

We analysed the relation between board of directors' characteristics, ownership structure and banks' systemic risk for a sample of 87 European banks for the period 2010-2016. We specifically examined if there were other relevant variables for measuring the systemic importance of a bank apart from its size.

First, we found that ownership concentration exercises an inverted U-shaped impact on banks' systemic risk, i.e., strong reference shareholders seem to promote risky investments until a certain critical threshold (according to our results, 60%), after which their high ownership concentration leads them to control excessive risk-taking. Regarding institutional ownership, we find that its effect on banks' systemic risk is only relevant in the long run, and, in that case, with the effect of reducing the systemic risk levels, consistent with a monitoring role exercised by such shareholders.

Second, board characteristics only seem to matter in small banks. In fact, we find that board size and the percentage of independent and female directors influences banks' systemic risk, albeit only in small financial institutions.

This study may have promising implications for practitioners, policy makers and academia. Primarily, our results are informative for practitioners regarding how to promote an

ownership structure that can be effective in controlling systemic risk. Second, policy makers may encourage the formation of ownership structures that are more prone to controlling systemic risk levels and rethink the role of the board of directors. Finally, our paper adds to the growing field of academic research on the factors affecting banks' systemic risk, especially those which stress the importance of qualitative characteristics in explaining financial institutions' decisions.

Future research could shed a light on the potential reasons for the impact of these variables being felt only in smaller banks. One may however speculate that organisational complexity arising with bank size could play a role as well as the differences between the career paths and recruitment processes for directors in larger versus smaller banks.

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Table A.1. Composition of the sample by countries

Country	Banks
Austria	Bank fuer Tirol und Vorarlberg AG
	BKS Bank AG
	Erste Group Bank AG
	Oberbank AG
	Raiffeisen Bank International AG
Belgium	KBC Groep NV
Denmark	Danske Bank A/S
	Jyske Bank A/S
	Ringkjoebing Landbobank A/S
	Spar Nord Bank A/S
	Sydbank A/S
Finland	Alandsbanken Abp
France	BNP Paribas SA
	Caisse Regionale de Credit Agricole Mutuel de Normandie Seine SC
	Credit Agricole SA
	Societe Generale SA
Germany	Aareal Bank AG
	Comdirect Bank AG
	Commerzbank AG
	Deutsche Bank AG
	Dvb Bank SE
	HSBC Trinkaus & Burkhardt AG
	MLP AG
	Oldenburgische Landesbank AG
Greece	Alpha Bank SA
	Attica Bank SA
	Eurobank Ergasias SA
	National Bank of Greece SA
Ireland	Allied Irish Banks PLC
	Bank of Ireland
	Permanent TSB Group Holdings PLC

Italy	Banca Carige SpA Cassa di Risparmio di Genova e Imperia
	Banca Intermobiliare di Investimenti e Gestioni SpA
	Banca Monte dei Paschi di Siena SpA
	Banca Popolare dell'Emilia Romagna Sc
	Banca Popolare di Milano Scarl
	Banca Profilo SpA
	Credito Emiliano SpA
	Intesa Sanpaolo SpA
	Mediobanca Banca di Credito Finanziario SpA
	Unicredit SpA
	Unione di Banche Italiane SpA
Netherlands	ING Groep NV
	Van Lanschot NV

(…continues)

Norway	DNB ASA
	Sparebank 1 SMN
	Sparebank 1 SR Bank ASA
Poland	Bank Millennium SA
	Bank Zachodni WBK SA
	Getin Noble Bank SA
	ING Bank Slaski SA
	mBank SA
	Powszechna Kasa Oszczednosci Bank Polski SA
Portugal	Banco Bpi SA
	Banco Comercial Portugues SA
Spain	Banco Bilbao Vizcaya Argentaria SA
	Banco de Sabadell SA
	Banco Popular Español SA
	Banco Santander SA
	Bankia SA
	Bankinter SA
	Caixabank SA
Sweden	Nordea Bank AB
	Skandinaviska Enskilda Banken AB
	Svenska Handelsbanken AB
	Swedbank AB

Switzerland	Bank Coop AG
	Banque Cantonale de Geneve
	Banque Cantonale Vaudoise
	Basler Kantonalbank
	Berner Kantonalbank AG
	Credit Suisse Group AG
	Edmond de Rothschild Suisse SA
	EFG International AG
	Graubuendner Kantonalbank
	Julius Baer Gruppe AG
	Luzerner Kantonalbank AG
	St Galler Kantonalbank AG
	UBS Group AG
	Valiant Holding AG
	Zuger Kantonalbank
United Kingdom	Barclays PLC
	Close Brothers Group PLC
	HSBC Holdings PLC
	Lloyds Banking Group PLC
	Royal Bank of Scotland Group PLC
	Standard Chartered PLC