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By *F. Arnaboldi, B. Casu, E. Kalotychou, and A. Sarkisyan*

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JEL classifications: G21, G30

Keywords: corporate governance, board composition, board diversity, bank performance

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1 Introduction

This paper investigates whether board diversity impacts on bank performance, both in terms of profitability and risk. The global financial crisis emphasised flaws in bank corporate governance, which are thought to have played a key role in promoting and rewarding excessive risk-taking. These views prompted a discussion, both in academic and policy circles, about the role of bank corporate governance structures for financial stability. Bank governance has been at the centre of recent academic work which aimed at identifying the most effective bank governance structures (see, among others, Mehran et al., 2011; Adams and Mehran, 2012; Beltratti and Stulz, 2012). Policymakers have also responded to the perceived shortcomings of the existing governance structures with a series of initiatives, most of which included an emphasis on increased diversity. At the EU level, the crisis prompted a revision of the comprehensive corporate governance rules already in place, either in the form of directives or in the form of a European regulation, to promote a culture that does not reward excessive risk-taking.[2] CRD IV (a EU directive covering prudential rules for banks) includes changes to rules on corporate governance, including remuneration, and introduces standardised EU regulatory reporting. Among the enhanced corporate governance rules, CRD IV requirements promote diversity in board composition, although it falls short of imposing quotas.

The board of directors of a firm is responsible for its major strategic and financial decisions (for example, approval of mergers and acquisitions and changes in capital structure) and for ensuring that its franchise value can survive outside shocks. The literature identifies three main functions of the board: (i) the monitoring function; (ii) the advisory function; and (iii) the resource provision function (Adams et al., 2010; Oxelheim et al, 2013); and states that the ability of the board to perform the above-mentioned functions depends crucially on the complexity of the operational structure of the firm and on the conditions of the external environment.

To the extent that the board of directors plays a role, the evidence from the existing studies on the relationship between board characteristics and firm performance is mixed (Laeven and Levine, 2009; Faleye et al., 2011; Adams and Mehran, 2012; Beltratti and Stulz, 2012). Among board characteristics, diversity plays a crucial role in aligning the interest of management and shareholders and a vast literature supports the hypothesis of diversity enhancing the board of directors' monitoring and advising roles (Fields and Keys, 2003; Hermalin and Weisbach, 2003). The main argument to support diversity is that a more diverse management team tends to be more creative, more innovative and may consider a wider range of alternatives when making decisions. In addition, more diverse boards should protect minorities, guarantee differing opinions are considered, and be harder to manipulate. There appears to be a meaningful relationship between diverse boards and improved corporate financial performance, and

[2] The 2010 European Commission Green Paper on Corporate Governance in Financial Institutions was part of an increased effort to address the problem of corporate governance. The European Banking Authority (EBA) issued a set of guidelines, including Guidelines on Internal Governance (September 2011) and Guidelines on the Assessment of the Suitability of Members of the Management Body and Key Function Holders (22 November 2012). EBA Guidelines have since been implemented by Member States' banking supervisory authorities.

diverse boards can help companies more effectively recruit talent and retain staff (SEC, 2010). However, diversity may also bring costs: heterogeneous boards may be less efficient; the decision-making process may be slower and the likelihood of reaching consensus may be smaller (Carter et al., 2003; Carter et al., 2010).

Existing research has mostly focused on a single aspect of board diversity, for example, gender diversity (Adams and Ferreira, 2009; Carter et al., 2010; Adams and Funk, 2012; Mateo de Cabo et al, 2012) or the nationality of directors (Oxelheim et al., 2013). The overall impact of board diversity on performance remains relatively unexplored, and particularly in the case of financial firms. With some exceptions, most studies have excluded financial firms from their analysis due to their regulated nature. Further, the studies that have investigated the impact of board diversity on bank performance have focused mainly on the US (see, among others, Adams and Funk, 2012; Sila et al., 2016) or on a single country (Berger et al., 2014). The impact of board diversity on European banks' performance has received less attention, with a few exceptions (Mateos de Cabo et al., 2012; Garcia-Meca et al., 2015; Farag and Mallin, 2017).

The European case is of particular interest. Many of the post-crisis governance reforms explicitly emphasise the importance of diversity in the boardroom. Most of these initiatives are based on the view that more diverse boards, with an increased presence of women and ethnic minorities, would positively affect the governance of companies. One argument is that boards could enhance their effectiveness by tapping broader talent pools for their directors. Nevertheless, evidence suggests that these affirmative actions aimed at improving the participation of women and minorities in high profile roles have had little impact. This has led several EU regulators to go a step further and recommend gender quotas for publicly listed companies´ boards. An often-quoted example is the Norwegian case. In 2003, the Norwegian Parliament passed a law requiring all public limited companies to have at least 40 per cent of women on their boards of directors. After voluntary compliance failed, the requirement became law in 2006, with a two-year transition period and liquidation as a penalty for non-compliance. Following Norway's example, other European countries, including Belgium, France, Italy, the Netherlands, Spain and Germany, have since promoted legislation aiming to increase gender diversity on corporate boards via the imposition of quotas. In 2012, the European Commission (EC) proposed legislation with the aim of attaining a 40 per cent participation rate for the under-represented gender in non-executive board-member positions in publicly listed companies by 2020. However, the regulatory framework of EU member states is still very fragmented, with some countries arguing against mandatory quotas. In addition, sanctions for non-compliance with gender balance also vary substantially among EU member states.

We exploit this heterogeneity in board diversity in EU countries to test the impact on bank performance. Our aim is to provide evidence on whether board diversity, in aggregate and along different dimensions, increases boards' monitoring ability and promotes a culture that focuses both on increased profitability and decreased risk-taking. While the recent focus of both academic studies and legislative efforts has been on diversity in the context of gender, in fact diversity comes in many different forms. We therefore consider a broader range of diversity features such as gender diversity, employee representation, internationalisation, and age diversity, and investigate the effect of each one on bank performance. In

addition to examining each characteristic separately, we aggregate the diversity measures into an index to identify the overall level of board diversity.

More specifically, we aim to address the following research questions: (i) Do board characteristics (type, tenure, size and age of board members) impact on bank performance? (ii) Does board diversity, proxied by our diversity index, impact on bank performance? (iii) Do board diversity characteristics (gender, employee representation, internationalisation and age diversity) impact on bank performance?

To answer these questions, we collect detailed information on board characteristics of 77 publicly listed EU banks over the period 2007-2015. We focus on listed banks because of the assumption that these institutions are subject to more stringent regulatory controls and compliance requirements; it also augments data availability in terms of board composition and enhances cross-country comparability. In addition, publicly listed banks share internationally adopted accounting standards (IFRS). Finally, the recent changes to corporate governance regulation and codes of conduct affect mostly publicly listed companies, including banks. We collected data on the traditional board features including, type, size, tenure, and age, and diversity features, including gender diversity, employee representation, internationalisation, and age diversity.

Establishing a causal relationship between diversity and firm performance is challenging. The literature has documented that board characteristics are not exogenous random variables but are endogenously chosen by firms (Hermalin and Weisbach, 1998; Adams and Ferreira, 2007; Sila et al, 2016). Two sources of endogeneity are potentially likely to bias our estimates of how diversity affects bank performance: omitted variable bias and reverse causality. Omitted variable bias may arise because empirical models cannot possibly capture all the determinants of bank performance. In addition, the direction of the causal relation is unclear ex-ante. Female and minority directors can self-select into a particular type of bank, either a more profitable or a less risky bank whose existing management is more aligned with their views. On the other hand, more profitable banks may choose to appoint more women and, generally, more diverse boards. In our context, the above issues would imply that current boardroom diversity is determined by past performance. To account for these possible endogeneity issues, we take the following steps. First, we address endogeneity caused by omitted variable bias by using bank-specific controls (for example, size as larger banks may have more diverse boards) and by using fixed effects to account for unobserved country-specific characteristics that are time-invariant and may be correlated with the level of bank diversity (that is, a country corporate culture). Second, to mitigate endogeneity caused by reverse causality we use lagged values of the regressors. Finally, we use a dynamic panel data model, namely, the two-step dynamic panel system generalised method of moments (GMM), with instruments.

The results of this analysis are both relevant for policymakers and contribute to the academic debate. They can help shed some light on the effect of group composition on board effectiveness by evaluating the likely success of governance proposals fostering greater diversity or the possible failure of initiatives where tokenism prevents minority directors from having an impact on corporate outcomes. We find evidence that standard board characteristics impact on bank performance; specifically, we find that

board tenure and to a lesser extent board size have a positive impact on bank performance. Secondly, board diversity matters more for banks whose boards are less diverse and its impact is stronger in countries more open to diversity. In terms of diversity features, we find evidence that gender diversity and employee representation have a positive effect on bank performance, whereas age diversity has a negative impact on bank performance. Our results are consistent to a wide range of alternative proxies for bank performance, in terms of both profitability and risk.

Our paper contributes to the literature in several ways. First, it complements the literature on the impact of corporate governance on bank performance, which mostly focuses on either profitability or risk by examining both dimensions of bank performance. Further it contributes to the literature on board diversity by considering different dimensions of diversity, including gender diversity, employee representation, internationalisation, and age diversity. Finally, we also extend the prior literature on corporate governance by adding a cross-country dimension whereas most existing empirical evidence is based on single country studies.

The remainder of the paper is organised as follows. Section 2 discusses the data used for the empirical analysis and our variable definitions. Section 3 delineates the research design and Section 4 presents the results of our empirical analysis. Finally, Section 5 concludes.

2 Data and variable definition

2.1 Data

To examine the relationship between corporate governance and bank performance we use data on publicly listed commercial banks from EU countries over the period 2007-2015. Listed banks are subject to more stringent regulatory controls and compliance requirements and report following the internationally adopted accounting standards (IFRS), which enhances cross-country comparability. Our sample period starts in 2007, at the onset of the global financial crisis. This allows us to investigate the relationship between corporate governance and bank performance during the global financial crisis (2007-2010) and the following euro crisis (2011-2015).

The dataset is compiled from several sources. First, we collect data on corporate governance features of publicly listed banks in the 28 EU countries from BoardEx. We then match the BoardEx data with the banks' balance sheet and income statement data collected from Bankscope (Bureau van Dijk and Fitch Ratings) and stock market data retrieved from Datastream (now Thomson Eikon).

In constructing the sample, we exclude banks with missing total assets or board diversity data; we further drop observations with asset growth above 160 per cent; finally, we restrict the sample to banks with at least three years of observations over the sample period. This selection strategy yields a final

sample of 77 publicly listed banks from 20 EU countries over the period of 2007-2015, which covers around 50 percent of the total assets of these countries' banking systems.[3]

Descriptive statistics for the variables discussed in this section are reported in Table 1. All variables are defined in Appendix 1.

2.2 Variables

2.2.1 Bank performance

We capture bank performance in terms both of profitability and risk. Our main bank performance measure is a bank's stock returns. We use the stock market annualised daily return (*SR*) as our measure of bank profitability and its standard deviation (*SDSR*) as our proxy for bank risk. In additional tests, we consider alternative measures of bank performance, including the return on assets (*ROA*), the net interest margin (*NIM*), and a measure of bank solvency, the z-score (*LNZSCORE*).

2.2.2 Board characteristics

We collect unique data on board features of banks including: (i) standard board features, that is type, size, tenure, and age, and (ii) board diversity features, that is gender diversity, employee representation, internationalisation, and age diversity. Below we discuss the board features used in this study in detail.

2.2.2.1 Standard board features

Our first standard board feature is board type (*DBOARDTYPE*); we focus on the presence of a sole (or one-tier) versus a dual (or two-tier) board system. A sole board combines both the monitoring and the advising roles, whereas those are separated in a dual board system. While a one-tier structure is thought to favour information sharing, a two-tier structure can minimise interference from large shareholders (Adams and Ferreira, 2007).

The second standard board feature is board size measured as a logarithm of the number of members on the board (*LNBOARDSIZE*). Board size is another factor perceived to affect the board's ability to monitor and advise the management. On the one hand, several studies have hypothesised a negative relation between board size and firm performance (Lipton and Lorsch, 1992; Jensen, 1993; Hermalin and Weisbach, 2003). As board size increases, boards become less effective at monitoring management because of free-riding problems amongst directors, increased decision-making time and coordination issues. On the other hand, larger boards can potentially bring more experience and knowledge and hence offer better advice; they might also result in less extreme decisions as they have to reconcile various opinions in the decision-making process and hence lead to lower variability in firm performance. In the financial services industry, however, the results on the relationship between board size and performance are mixed; possible explanations refer to regulatory issues, informational asymmetries, and organisational structure (Eisenberg et al., 1998; Adams and Mehran, 2003, 2012;

[3] See Appendix 3 for the details of the sample composition.

Boone et al., 2007; Coles et al., 2008; Harris and Raviv, 2008; Andrés and Vallelado, 2008; Cheng 2008; Linck et al., 2008).

Our next standard board feature of interest is board tenure measured as a logarithm of the average board tenure length (*LNBOARDTEN*). Board stability plays a role in the execution of boards' duties. Longer tenure may have a positive effect, leading to managerial stability and deeper knowledge of the bank's business model. This, in turn, could help the board carry out both the advisory and the monitoring tasks better. In addition, as longer tenure is linked to higher entrenchment, an established board should be able to counterbalance more effectively a CEO's power. However, longer tenure can also signal lower board dynamism (Schleifer and Vishny, 1997).

Finally, we include board age measured as a logarithm of the average board members' age (*LNBOARDAGE*). The relationship between board age and firm performance is unclear, with the positive findings related to the use of age as a proxy for experience.

2.2.2.2 Board diversity features

Gender diversity

To examine the impact of gender diversity on bank performance, we use a ratio of the number of female directors on the board to the total number of board directors (*BOARDWOM2*). Despite the importance of gender diversity in the policy debate, women hold hardly any corporate board seats. Many proposals for governance reform explicitly refer to the importance of gender diversity in the boardroom, often suggesting the need for gender quotas. Most of these initiatives are based on the view that the presence of women could significantly affect the governance of companies. Arguments in favour are that boards should not exclude female talents and that women are less entrenched and more independent. However, the effect of gender diversity on performance is mixed (Adams and Ferreira, 2009; Dezso and Ross, 2011; Garcia-Meca et al., 2015). Ahern and Dittmar (2012) use the mandatory introduction of gender quotas in Norwegian listed firms as a natural experiment to analyse the impact of quota on firm valuation. The authors find a large negative impact of the mandated board changes on firm value, because younger and less experienced members enter the board, thus reducing the effectiveness of the board tasks. On the same case, Garcia-Lara et al. (2017) find that the changes in monitoring are not primarily driven by the introduction of gender quota, but by changes in the professional characteristics of board members, such as experience and age.

Employee representation

To assess the effect of employee representation on bank performance, we use a ratio of the number of employee representatives to the total board members (*BOARDEMPL2*). The presence of employees on the board is controversial, with some studies claiming it is detrimental to shareholder value. On the positive side, it may allow boards' preferences to be more aligned with those of managers (Adams and Ferreira, 2007). Employee representation provides workers and trade unions with reliable information about a firm's strategy and profits; this should reduce conflicts in the workplace thereby minimising the risk of strikes. However, excessive employee representation could lead firms to operate in

the employees' interest, against shareholders' interest. Seeking to maximise perks and payroll instead of stock prices, employees can become a source of agency costs.

Internationalisation

We capture board internationalisation by the ratio of foreign directors on the board to total board members (*BOARDNATMIX2*). A higher number of foreign directors is frequently recommended by corporate governance codes of good practice, based on the commonly held view that directors coming from different countries increase board independence and hence foster better performance. Foreign directors have weaker or no associations with senior executives and major shareholders and should therefore be less biased, particularly when evaluating existing business practices and monitoring management. While there has been a "pro-foreign shift" in board composition in recent years, the empirical evidence is mixed. The positive influence view of foreign directors is not shared by all, with arguments stating that foreign directors are not involved in the creation of a firm's long-term value; other critics claim their understanding of the firm's business might be limited and their contribution might be negligible at best or negative. Adams and Ferreira (2012) document that outside directors have more attendance problems at bank board meetings and find evidence of free-riding. Fallenbrach et al. (2014) document a dark side of outside directors and find evidence to suggest that they have incentives to resign to protect their reputation or to avoid an increase in their workload when they anticipate that the firm will perform poorly or disclose adverse news.

Age diversity

Finally, we consider the impact of board age diversity on bank performance. We use a coefficient of variation for board age (*CVBOARDAGE*) to capture the dispersion of age within the board. Age diversity has the potential to enhance board performance, because directors of different ages will, to some extent, have different backgrounds, skills, experiences, and social networks. By increasing the age diversity on the board of directors, the board's aggregated human and social capital can be maximised (Carter et al., 2010). On the other hand, Westphal and Zajac (1995) argue that CEOs prefer to work with demographically similar board directors. Thus, CEOs who can influence the director nomination process will try to hire directors who are demographically similar to themselves. However, corporate boards with similar demographics can be prone to group thinking and therefore be less efficient in their monitoring function, for instance aligning their compensation to (higher) CEO compensation (Westphal and Zajac, 1995). Empirical evidence relating to this type of diversity is limited and the results are mixed. While age diversity may be beneficial, its positive influence rests on the assumption that demographically different directors will hold differing perspectives (Li and Wahid, 2017).

Diversity index

In addition to investigating each dimension of diversity separately, we capture the overall degree of board heterogeneity by constructing a board diversity index (*BOARDDIVX*) based on gender diversity, employee representation, internationalisation, and age diversity. Specifically, we first convert our four board diversity variables (*BOARDWOM2, BOARDEMPL2, BOARDNATMIX2,* and *CVBOARDAGE)* into

discrete variables ranging from 1 to 10 based on the decile of the sample distribution they fall into (with 1 being the bottom and 10 the top decile). The diversity index for each bank-year is then computed as:

$$BOARDDIVX_{it} = \frac{1}{40}\sum_{j=1}^{4} D_{it}^{j}$$

where D_{it}^{j} is the decile that bank-year observation *it* on the j^{th} diversity variable (j =1,2,3,4) falls into and 1/40 standardises the index within the range of 0-1.

Hofstede index

Cultural differences may explain part of the heterogeneity in board diversity in different EU countries. For example, empirical studies focusing on firm demand for female directors underline the role of a country's socio-political beliefs and attitudes towards women, work and families, the gender historical role in the government, public and private initiatives in increasing the possibility of individual woman's career progression (Terjesen and Singh, 2008; Terjesen et al., 2016).

To account for differences in national culture in relation to a country's openness to diversity, we rely on the six cultural dimensions proposed by Hofstede (1983) and Hofstede et al. (1991), namely, power distance, individualism, masculinity, uncertainty avoidance, long-term orientation, and indulgence. To summarise these cultural differences, we derive an overall index (*HOF*) as the average value of the six Hofstede dimensions.[4] The values of our Hofstede index range from 0 to 100, with higher values indicating countries more open to diversity.

2.2.3 Bank balance sheet and income statement features

We control for a set of bank-level characteristics that are commonly related to bank performance. Specifically, we include bank size measured by a natural logarithm of total assets (*LNTA*). We also control for possible effect of bank growth on performance by including the total asset growth (*TAGA*). Next, we control for the asset composition using a loan ratio (*LOANTA*) and for the quality of the loan portfolio using a loan loss provision ratio (*LLPLOAN*). We also control for funding sources by including a deposit ratio (*TDTA*) measured as deposits and short-term funding to total assets. We account for the impact of capital on bank performance by including a capital ratio (*ETA*). Finally, we control for the bank operating efficiency proxied by the cost to income ratio (*CI*).

2.3 Descriptive statistics

Table 1 presents the descriptive statistics for selected board, bank, and country characteristics. Panel A reports data on the full sample for the entire period and for financial crisis and euro crisis sub-periods. On average, most boards have a two-tier structure and are formed by 16.3 directors who stay in charge for 5.9 years. On average, female directors are present in 82.2% of boards, whereas employee representatives are present on 30.2% and foreign directors on 65.5% of boards, respectively. However, on average, boards have only 2 female directors, or 12.7% of total board members, whereas employee

[4] For power distance, masculinity, and uncertainty avoidance, greater openness to diversity is indicated by lower values; hence we use (100 – Dimension's value) when constructing the Hofstede index.

representatives and foreign directors constitute 8% and 19.9% of the board, respectively. The average age of the board directors is 57.5 years, while the coefficient of variation for board age is around 15.3%. Looking at performance, the sample banks, on average, have a stock return of 8.4% with a yearly standard deviation of 42.8% and a return on assets of 0.4% with a 3-year standard deviation of 0.5%. In terms of balance sheet structure, they have an average size of around 335.1 billion euros, of which 57.1% is invested in loans; their main source of funding is deposit and short-term liabilities (65.2% of total assets), while only around 6.4% of their total assets is funded by equity capital.

< Insert Table 1 about here >

The data for the crisis sub-periods reveal some significant changes in the board features during the euro crisis. Specifically, boards decreased in size while tenure increased over the period. Interestingly, boards became more diverse in general as reflected by the diversity index. More specifically, gender diversity and internationalisation increased in the latter years of our sample period, as evidenced by more boards with female directors, the higher number and proportion of female directors, and by the higher proportion of foreign directors across the boards.

In Table 1, Panel B, we test for differences in board features between the top-quartile and bottom-quartile performing banks, based on their return on assets. The boards of the top performing banks are, on average, smaller in size and have longer tenure; they also appear to have fewer female directors, but a higher proportion of foreign directors; finally, they seem to have younger directors.

Panel C of Table 1 reports descriptive statistics on the board characteristics by country. We document significant cross-country heterogeneity in the boards of the sample European banks. Looking at the standard board features, the data show that banks in Germany have the largest boards (around 22.7 members), while the smallest boards are in the Netherlands (8 members). The longest board tenure is observed in Hungary (around 11.3 years), while the shortest in Ireland (around 3.2 years). Banks in Hungary also have the highest average board members' age (61.3 years), whereas those in Malta have the lowest (51.9 years).

Turning to the board diversity, the greatest overall diversity is observed in banks in Austria (diversity index of around 0.7), closely followed by those in Germany, Czech Republic, and Sweden, while those in Hungary are the least diverse (diversity index of around 0.1). In terms of gender diversity, all banks in the Czech Republic, Denmark, Lithuania, and Sweden have at least one female director on the board; banks in Sweden also show the highest presence of female directors (31.6 per cent), while the lowest is observed in Hungary (around 1.1 per cent). In the Czech Republic and Denmark all banks have at least one employee representative on the board; however, the greatest employee representation is observed in Germany (33.9 per cent). The greatest board internationalisation is in Romania, where all banks have at least one foreign director on the board and the highest presence of foreign directors on the board (40 per cent); on the other hand, banks in Hungary, Lithuania, and Malta have only domestic directors on the board. Finally, the data show the greatest age diversity of the board in the Netherlands (20.5 per cent) and the lowest in Malta (8.3 per cent).

The last column of Panel C reports the value of the Hofstede index, our proxy for a country's openness to diversity. Sweden, Denmark, and the Netherlands show the greatest openness to diversity, whereas Romania, Portugal, and Poland appear to have a national culture least open to diversity.

3 Empirical strategy

Our main research question is whether board characteristics, primarily board diversity, play a role in explaining the performance of banks. We hypothesise that board characteristics such as type, size, tenure, and age impact on bank performance. In addition, we hypothesise that greater board diversity, proxied by the presence of female directors, employee representatives, foreign directors, and by the variability of age of board members influences bank performance. This section discusses our empirical specification that considers the two potential sources of endogeneity that are of concern in empirical studies on the relationship between board features and firm performance – unobserved heterogeneity and reverse causality.

3.1 Fixed effects model

The following baseline model is deployed as our main vehicle for empirically testing the hypothesis of whether board characteristics impact on bank performance:

$$P_{it} = \alpha + X_{i,t-1} \cdot \beta + Z_{i,t-1} \cdot \gamma + \eta_i + \varepsilon_{it} \qquad i = 1, 2,\ldots,N \quad t = 1, 2,\ldots,T \tag{1}$$

where P_{it} refers to the performance (profitability and risk) of bank i in year t, $X_{i,t-1}$ is a matrix containing the k board features, $Z_{i,t-1}$ is a matrix containing the m bank control variables. The $(1 + k + m)$ coefficient vector $(\alpha_0, \beta, \gamma)$ is to be estimated. The error term $u_{it} = \eta_i + \varepsilon_{it}$ is assumed to be independent from the k board-specific regressors and the m bank-specific controls. The noise ε_{it} is assumed identically and independently distributed, whereas the time-invariant component η_i represents unobserved firm-specific heterogeneity. The model controls for time effects through a full set of yearly dummies. Country-specific group heterogeneity is accounted for by using either country fixed effects or country-specific variables; the results are qualitatively similar therefore in the ensuing analysis we use country fixed effects. The use of fixed effects helps to mitigate biases caused by time-invariant omitted variables correlated with the regressors, which result in inconsistent parameter estimates. Country-specific effects capture the latent influence of country corporate culture that is likely to be correlated with bank board diversity. Country- as opposed to firm-level fixed effects is a trade-off between omitted variables biases and unreliable slope estimates caused by firm-specific fixed effects absorbing most of the variation across firms. The use of lagged regressors also helps to alleviate some of the endogeneity concerns. The covariance structure of the estimated coefficients is clustered at the firm level to allow for within-bank correlation over time.

In additional analyses, we investigate whether the effect of board characteristics on performance is non-linear and, in particular, whether a board diversity feature, such as the presence of foreign directors, has a disproportionately greater impact in boards that are already more international. We do so by considering thresholds computed as sample averages for each board feature.[5]

We also examine whether the impacts of the standard and diversity board features becomes more prevalent during the period of the euro crisis through the interaction of the board characteristics with a euro crisis dummy that takes the value of 1 over the period from 2011 to 2014.

Finally, we examine whether board diversity features play a bigger role in countries that are more open to diversity through the interaction of board diversity features with a Hofstede dummy that takes the value of 1 for countries with the Hofstede index value above the sample mean.

3.2 Two-step dynamic panel generalised method of moments

Another source of endogeneity when investigating the relationship between board diversity and performance is reverse causality stemming from the fact that the choice of board composition could rely on current and past realisations of performance and/or risk. For instance, better performing firms may have greater gender diversity or more complex firms with bigger boards may opt for more diversity. The extent of board diversity is a choice that can be influenced by bank- and board-specific characteristics, unobserved factors (fixed effects) and past realisations of performance and risk. As performance and risk are correlated over time this induces correlation between the residuals and the regressors and thus inconsistency of the fixed effects estimator in the case of fat (short-T, Large-N) panels.

Bearing in mind the aforementioned issues, the Dynamic Panel System – Generalised Method of Moments (DPS-GMM) proposed by Arellano and Bover (1995) and Blundell and Bond (1998) lends itself naturally as the appropriate empirical framework to estimate the relationship between board diversity and performance. The intuition is that in order to determine their board composition, banks rely on past performance as well as board and bank characteristics. As the information set underlying the decisions is not correlated with the unexpected error term, these variables can be used as instruments for board appointment decisions. The model augments that in equation (1) as follows:

$$\boldsymbol{P_{it} = \alpha + X_{i,t-1} \cdot \beta + Z_{i,t-1} \cdot \gamma + \sum_{j=1}^{q} \delta_j P_{it-j} + \eta_i + \varepsilon_{it}} \quad (2)$$

where q = 1 in our analysis. We deploy a two-step estimation approach. We report t-statistics based on standard errors clustered at the bank level.

[5] For instance, the average proportion of foreign directors on the board of our sampled banks over the period is 8%, which is used as a threshold to consider whether the role of foreign directors is more pronounced in banks whose boards are substantially more international (i.e., the number of foreign directors exceeds the threshold).

We also compute the Arellano-Bond (1991) test for no autocorrelation in the differenced residual series. Autocorrelation indicates that lags of the dependent variable (and any other variables used as instruments that are not strictly exogenous) are endogenous, thus bad instruments. The second order autocorrelation is the one of relevance as presence of first order autocorrelation in the residual first difference ($\Delta\varepsilon_{it}$) is guaranteed by definition through the common term ε_{it-1}. Finally, the joint validity of the instruments is assessed by using the Hansen and Singleton (1982) test. Given the challenges in identifying a unique truly exogenous instrument, our identification relies on the fact that all factors that affect the decision on board composition are either included in the board characteristics or in past values of performance.

4 Empirical results

4.1.1 Do board characteristics impact on bank performance?

We begin our analysis of the impacts of board characteristics on bank performance using the baseline regression (Equation (1)).[6] Table 2 reports the estimation results of the effects of board standard and diversity features on bank performance including profitability (that is, stock return, *SR*) and risk (that is, standard deviation of stock return, *SDSR*).

< Insert Table 2 about here >

We find that among the standard board features *LNBOARDSIZE* is positively associated with *SR* ($p < 0.05$), a result that is consistent across the specifications and suggests that having larger boards increases bank profitability. Turning to board diversity, the results show that the overall diversity of the board, as measured by the diversity index, is not related to bank performance. However, looking at the component board diversity features, we find that *BOARDEMPL2* is negatively associated with *SDSR* ($p < 0.05$), suggesting that employee representation on the board reduces bank risk, whereas *BOARDNATMIX2* is positively associated with *SDSR* ($p < 0.05$), suggesting that presence of foreign directors on the board increases bank risk. Looking at the control variables, the estimates show the expected signs.

Summarising the baseline regression results, board size and employee representation have a positive impact on bank performance, while board internationalisation has a negative effect on bank performance. Next, we run additional analyses to identify whether the relationship between board diversity and performance is robust.

4.1.2 Additional analyses

4.1.2.1 Is the relationship between board characteristics and bank performance non-linear?

We begin the additional tests by exploring non-linearity in the impacts of board features on bank performance through the use of thresholds for the board features. Table 3 reports the estimation results,

[6] Key correlations are reported in Appendix 2.

where a suffix *UP* or *DN* added to a board variable indicates a value above or below its threshold level, respectively. In Model (1) we use thresholds for the standard board features only and control for the board and bank-specific variables; in Models (2)-(3) we use thresholds for the diversity board features while controlling for the standard board features and bank-specific variables.

< Insert Table 3 about here >

Starting with the standard board features, the results show that the estimated profitability-increasing effect of board size is non-linear, with the above the threshold board size variable (*LNBOARDSIZEUP*) showing a positive and statistically significant association with the stock return. Looking at the board diversity, we find that *BOARDDIVXDN* is positively associated with *SR* ($p < 0.10$), suggesting that diversity has a profitability-increasing effect when the board is less diverse. The results also show non-linearity in the impact of employee representation on bank performance when the employee representation variable (*BOARDEMPL2*) is replaced with the above and below the threshold employee representation variables (*BOARDEMPL2UP* and *BOARDEMPL2DN*, respectively). In particular, we find a profitability-increasing effect of employee representation for boards with a lower presence of employee representatives; we also find that the estimated risk-reducing effect of employee representation holds only when the presence of employee representatives on the board is above its threshold level. Finally, we find non-linearity in the estimated risk effect of the board internationalisation, where the latter increases risk only when the presence of foreign directors on the board is significant (*BOARDNATMIX2UP* is positively associated with *SR* ($p < 0.10$)).

4.1.2.2 Is the relationship between board characteristics and bank performance affected by the euro crisis?

We next examine the impact of the euro crisis on the association between board features and bank performance. This is significant because the effectiveness of the board becomes more relevant during crisis times. The estimation results are reported in Table 4. In Model (1) we include our standard board features and their interactions with the euro crisis dummy (the latter is equal to 1 for years 2011-2014 and zero for the financial crisis years 2007-2010) and control for bank-specific characteristics; in Models (2)-(3) we examine our board diversity features and their interactions with the euro crisis dummy, while controlling for the standard board features and bank-specific characteristics.

< Insert Table 4 about here >

The results of Model (1) show a positive association between *LNBOARDSIZE* and *SR* ($p < 0.10$) and *LNBOARDTEN* and *SR* ($p < 0.10$), suggesting a profitability-increasing effect of board size and tenure during the financial crisis. The results also show that *LNBOARDAGE* is negatively associated with *SR* ($p < 0.05$), suggesting a profitability-reducing effect of board age during the financial crisis.

The results of Model (2) show no significant impact of the diversity index (*BOARDDIVX*) on bank performance in both crises. However, Model (3) shows a negative association between *ECBOARDWOM2* and *SDSR* ($p < 0.05$) and a positive association between *ECCVBOARDAGE* and *SDSR* ($p < 0.05$), suggesting that during the euro crisis gender diversity of the board had a risk-reducing

effect while age diversity increased risk during the same period. It also shows that *BOARDEMPL2* and *CVBOARDAGE* are negatively associated with *SDSR* ($p < 0.10$) whereas *BOARDNATMIX2* is positively associated with *SR* ($p < 0.05$); this suggests that during the financial crisis greater employee representation and age of the board reduced bank risk, while greater internationalisation of the board had an opposite risk-increasing effect.

To sum up, the results suggest that during the euro crisis gender diversity of the board had a positive impact on bank performance, whereas age diversity had a detrimental performance effect. The results differ for the financial crisis period. Specifically, we find that during the financial crisis banks with boards of greater size, longer tenure, greater employee representation and age diversity had a better performance, while those with older board members and a greater presence of foreign directors performed worse.

4.1.2.3 Is the relationship between board characteristics and bank performance affected by countries' cultural differences?

Next, we examine whether a country's openness to diversity has an impact on the association between board diversity features and bank performance. Table 5 reports the estimation results. In Model (1) we include the diversity index and its interactions with the Hofstede dummy (the latter is equal to 1 for countries more open to diversity and zero otherwise) while controlling for the standard board features and other bank-specific characteristics; in Model (2) we examine the component diversity features and their interactions with the Hofstede dummy, while controlling for the standard board features and bank-specific characteristics.

< Insert Table 5 about here >

We find that *HOFBOARDDIVX* is negatively associated with *SDSR* ($p < 0.10$), which suggests that the overall diversity of the board reduces bank risk in countries that are more open to diversity. We also find a negative association between *HOFBOARDNATMIX2* and *SDSR* ($p < 0.10$) and a positive association between *BOARDNATMIX2* and *SDSR* ($p < 0.01$); this suggests that a greater presence of foreign directors on the board reduces bank risk in countries that are more open to diversity, whereas it increases bank risk in the other countries. Overall, the results suggest that the national openness to diversity strengthens the impact of board diversity on bank performance.

4.1.2.4 Alternative performance measures

We further test whether the results of the baseline regression hold for alternative measures of bank performance. Specifically, we use accounting-based return on assets (*ROA*) and net interest margin (*NIM*) to measure profitability and standard deviation of return on assets (*SDROA*) and standard deviation of the net interest margin (*SDNIM)* to measure risk.[7] Finally, we use a distance to default measure, the z-score (*LNZSCORE*), which combines profitability and risk by estimating the number of standard

[7] We drop *LLPLOAN* from *NIM* and *SDNIM* regressions due to high correlation between the variables.

deviations that a bank's profits have to fall below its expected value before its equity becomes negative. The results are reported in Table 6.

< Insert Table 6 about here >

We find that *LNBOARDTEN* is negatively associated with *SDROA* (*p < 0.05*), *NIM (p < 0.10)*, and *SDNIM* (*p < 0.01*) and positively associated with *LNZSCORE* (*p < 0.05*). This shows that our finding of a risk-reducing effect of board tenure holds for the alternative risk measures; however, it also shows that board tenure decreases bank profitability measured by the net interest margin. Taken together, these results might suggest that boards with longer tenure tend to follow a more conservative (less risky) approach to lending (hence lower risk and lower interest earned) and borrowing (hence higher interest paid). On the contrary, *LNBOARDAGE* is found to be positively associated with *NIM* (*p < 0.10*) and *SDNIM (p < 0.01*), which might suggest that greater age of board members leads to greater risk-taking which in turn results in higher profitability. Finally, *CVBOARDAGE* is positively associated with *SDNIM* (*p < 0.01*) suggesting a risk-increasing effect of age diversity.

4.1.3 Two-step DPS-GMM

In this section, we attempt to address possible endogeneity concerns in the estimation of the impact of board characteristics on bank performance by employing a GMM estimation framework (Equation (2)). We conduct the analysis for our main performance measures (that is, *SR* and *SDSR*) and additional performance measures (that is, *ROA*, *SDROA*, *NIM*, *SDNIM*, and *LNZSCORE*).

Table 7 reports the estimation results for *SR* and *SDSR*. Overall, we find evidence consistent with our main findings. In particular, the GMM results confirm the risk-reducing effect of board tenure (*LNBOARDTEN* is negatively associated with *SDSR* ($p < 0.10$)). Further, we find supportive evidence that, while the overall diversity of the board captured by the diversity index is not related to bank performance, employee representation on the board has a risk-reducing impact (*BOARDEMPL2* is negatively associated with *SDSR* ($p < 0.05$)). The results further suggest that gender diversity also reduces bank risk (*BOARDWOM2* is negatively associated with *SDSR* ($p < 0.05$)).

< Insert Table 7 about here >

Lastly, Table 8 reports the results of the GMM estimation for our alternative performance measures. Overall, the evidence confirms our findings, including the risk-reducing impact of board tenure (*LNBOARDTEN* is negatively associated with *SDROA*, *SDNIM*, and *LNZSCORE*). Interestingly, the estimate for *BOARDDIVX* emerges positive and statistically significant ($p < 0.10$) in the *ROA* specification, suggesting that the overall diversity of the board captured by the index increases banks' accounting profitability and hence improves their performance.

< Insert Table 8 about here >

5 Conclusions

In this paper, we document the impact of board characteristics on the performance of EU listed banks in the years following the global financial crisis, a period of turbulence for European banks. In a comprehensive set-up, we consider a variety of board characteristics, including standard board features (type, tenure, size, and age of board members) and board diversity features (gender diversity, employee representation, internationalisation, and age diversity). In addition, we propose a diversity index, which summarises the different dimensions of diversity. In our empirical analysis, we control for unobserved heterogeneity and reverse causality.

We find that board size has a positive impact on bank performance and this impact is more pronounced for larger boards and during the financial crisis. Board tenure also has a positive impact on bank performance and the impact persisted during both crises. Board age appears to have a marked negative effect on bank performance, in particular during the financial crisis.

The overall diversity of the board has a positive impact on bank performance when the board is less diverse. Gender diversity improved bank performance during the euro crisis. Employee representation has a positive impact on bank performance and, while the impact is non-linear, it remains positive with greater and lower employee representation. Internationalisation has a negative effect on bank performance, particularly when the presence of foreign directors is dominant and during the euro crisis. The evidence for age diversity is mixed, with a positive impact during the financial crisis and a negative impact during the euro crisis. Finally, the results suggest that the national openness to diversity strengthens the impact of board diversity on bank performance.

The findings indicate that overall board diversity has a positive impact on bank performance. Board diversity matters more for banks whose boards are less heterogeneous and its impact is stronger in countries more open to diversity. Our results are consistent for a wide range of alternative proxies for bank performance, in terms of both profitability and risk. Our evidence therefore supports recent policy initiatives aiming to foster board diversity.

Table 1 Descriptive statistics

	No. of Obs.	Mean	Std. Dev.	Min	Max	No. of Obs.	Mean	No. of Obs.	Mean	Difference in means
			Full period 2007-2014			***Financial crisis period 2007-2010***		***Euro crisis period 2011-2014***		
Performance measures										
SR	562	0.084	0.808	-1.925	9.443	272	-0.044	290	0.205	-0.249***
SDDSR	562	0.428	0.271	0.011	3.202	272	0.441	290	0.413	0.028
ROA	559	0.004	0.014	-0.124	0.044	272	0.007	287	0.001	0.006***
SDROA	560	0.005	0.009	0.000	0.081	272	0.004	288	0.006	-0.002***
NIM	562	0.021	0.014	-0.003	0.122	272	0.021	290	0.021	-0.000
SDNIM	562	0.002	0.003	0.000	0.033	272	0.002	290	0.002	0.000
ZSCORE	559	54.400	74.181	-2.434	725.143	272	48.120	287	60.352	-12.232**
Board structure variables										
DBOARDTYPE	562	0.932	0.251	0.000	1.000	272	0.956	290	0.910	0.0046**
BOARDSIZE	562	16.315	5.919	6.000	34.000	272	16.849	290	15.814	1.035**
BOARDTEN	560	5.906	2.742	0.100	16.300	270	5.787	290	6.017	-0.230
BOARDAGE	562	57.475	4.434	35.800	69.500	272	57.437	290	57.510	-0.072
BOARDDIVX	562	0.467	0.174	0.100	0.875	272	0.445	290	0.488	-0.043***
DBOARDWOM	562	0.822	0.383	0.000	1.000	272	0.754	290	0.886	-0.132***
BOARDWOM	562	2.000	1.748	0.000	8.000	272	1.702	290	2.279	-0.577***
BOARDWOM2	562	0.127	0.107	0.000	0.600	272	0.103	290	0.149	-0.045***
DBOARDEMPL	562	0.302	0.460	0.000	1.000	272	0.301	290	0.303	-0.002
BOARDEMPL	562	1.477	2.764	0.000	14.000	272	1.496	290	1.459	0.037
BOARDEMPL2	562	0.080	0.133	0.000	0.600	272	0.077	290	0.083	-0.005
DBOARDNATMIX	539	0.655	0.476	0.000	1.000	263	0.662	276	0.663	-0.001
BOARDNATMIX2	539	0.199	0.197	0.000	0.800	263	0.187	276	0.210	-0.022*
CVBOARDAGE	562	0.149	0.049	0.013	0.905	272	0.147	290	0.152	-0.005
Bank-specific variables										
TA	562	335.136	534.521	0.368	2586.701	272	344.000	290	327.001	16.999
TAGA	562	0.061	0.176	-0.893	1.528	272	0.087	290	0.037	0.050***
LOANTA	562	0.571	0.194	0.025	0.904	272	0.569	290	0.573	-0.003
TDTA	562	0.652	0.159	0.020	0.988	272	0.628	290	0.674	-0.046***
ETA	562	0.064	0.034	-0.055	0.185	272	0.062	290	0.066	-0.003*
LLPLOAN	551	0.011	0.013	-0.007	0.125	267	0.008	284	0.014	-0.005***
CI	558	0.615	0.195	0.306	2.892	272	0.610	286	0.621	-0.011

Continued on next page

Table 1 (continued)

Panel B: Top and bottom by ROA (2007-2014)					
	No. of Obs.	Mean	No. of Obs.	Mean	Difference in means
		Top quartile		***Bottom quartile***	
Board structure variables					
DBOARDTYPE	141	0.919	135	0.957	-0.038*
BOARDSIZE	141	14.096	135	18.000	-3.903***
BOARDTEN	139	5.976	135	4.935	1.041***
BOARDAGE	141	55.540	135	58.080	-2.540***
BOARDDIVX	141	0.448	135	0.467	-0.019
DBOARDWOM	141	0.807	135	0.809	-0.001
BOARDWOM	141	1.504	135	2.050	-0.545***
BOARDWOM2	141	0.108	135	0.118	-0.010
DBOARDEMPL	141	0.230	135	0.206	0.023
BOARDEMPL	141	0.948	135	1.177	-0.229
BOARDEMPL2	141	0.060	135	0.051	0.008
DBOARDNATMIX	134	0.638	127	0.664	-0.026
BOARDNATMIX2	134	0.261	127	0.178	0.082***
CVBOARDAGE	141	0.153	135	0.156	-0.003
Bank-specific variables					
TA	141	87.39	135	437.3	-349.905***
LNTA	141	23.70	135	25.89	-2.193***
TAGA	141	0.112	135	0.031	0.080***
LOANTA	141	0.574	135	0.594	-0.020
TDTA	141	0.754	135	0.620	0.134***
ETA	141	0.095	135	0.050	0.044***
LLPLOAN	140	0.010	129	0.016	-0.005***
CI	137	0.530	135	0.691	-0.160***

Continued on next page

Table 1 (continued)

Panel C: Board characteristics by country

	DBOARDTYPE	*BOARDSIZE*	*BOARDTEN*	*BOARDAGE*	*BOARDDIX*	*DBOARDWOM*	*BOARDWOM2*	*DBOARDEMPL*	*BOARDEMPL2*	*DBOARDNATMIX*	*BOARDNATMIX2*	*CVBOARDAGE*	*HOF*
Austria	1.000	20.400	7.418	56.825	0.682	0.925	0.118	0.925	0.295	0.846	0.290	0.169	53
	(0.000)	(3.507)	(1.945)	(2.368)	(0.144)	(0.267)	(0.083)	(0.267)	(0.101)	(0.366)	(0.230)	(0.022)	
Belgium	1.000	17.250	4.084	56.310	0.430	0.850	0.100	0.000	0.000	0.800	0.290	0.144	50
	(0.000)	(6.315)	(1.976)	(3.037)	(0.169)	(0.366)	(0.074)	(0.000)	(0.000)	(0.410)	(0.177)	(0.035)	
Cyprus	1.000	14.273	5.173	55.400	0.423	0.818	0.078	0.000	0.000	0.636	0.191	0.176	n/a
	(0.000)	(3.197)	(3.152)	(6.351)	(0.107)	(0.405)	(0.061)	(0.000)	(0.000)	(0.505)	(0.164)	(0.045)	
Czech Republic	1.000	14.500	5.538	54.362	0.644	1.000	0.069	1.000	0.232	0.875	0.363	0.162	45
	(0.000)	(0.756)	(0.571)	(1.424)	(0.070)	(0.000)	(0.004)	(0.000)	(0.047)	(0.354)	(0.292)	(0.011)	
Denmark	0.750	13.750	7.528	54.909	0.570	1.000	0.176	1.000	0.289	0.350	0.155	0.137	70
	(0.440)	(3.802)	(1.599)	(1.832)	(0.125)	(0.000)	(0.069)	(0.000)	(0.085)	(0.489)	(0.250)	(0.032)	
France	0.850	17.825	5.345	58.432	0.542	0.825	0.192	0.875	0.145	0.775	0.113	0.146	48
	(0.362)	(5.310)	(1.292)	(4.181)	(0.169)	(0.385)	(0.137)	(0.335)	(0.088)	(0.423)	(0.111)	(0.127)	
Germany	1.000	22.719	4.659	52.603	0.649	0.844	0.158	0.969	0.339	0.688	0.159	0.146	54
	(0.000)	(8.368)	(1.093)	(2.994)	(0.163)	(0.369)	(0.090)	(0.177)	(0.104)	(0.471)	(0.181)	(0.042)	
Greece	0.900	15.833	6.347	59.070	0.368	0.867	0.097	0.100	0.018	0.333	0.057	0.156	36
	(0.305)	(3.185)	(2.481)	(3.836)	(0.119)	(0.346)	(0.071)	(0.305)	(0.060)	(0.479)	(0.110)	(0.046)	
Hungary	1.000	10.250	11.288	61.325	0.125	0.125	0.011	0.000	0.000	0.000	0.000	0.100	42
	(0.000)	(1.035)	(1.391)	(1.524)	(0.042)	(0.354)	(0.032)	(0.000)	(0.000)	(0.000)	(0.000)	(0.007)	
Ireland	1.000	12.375	3.231	57.713	0.419	0.875	0.106	0.000	0.000	0.938	0.238	0.137	55
	(0.000)	(2.473)	(1.198)	(1.485)	(0.080)	(0.342)	(0.057)	(0.000)	(0.000)	(0.250)	(0.102)	(0.023)	
Italy	0.979	18.990	5.179	61.308	0.332	0.639	0.070	0.000	0.000	0.356	0.070	0.160	45
	(0.143)	(7.051)	(2.542)	(3.755)	(0.111)	(0.483)	(0.081)	(0.000)	(0.000)	(0.481)	(0.108)	(0.031)	
Lithuania	1.000	14.667	5.200	52.033	0.408	1.000	0.227	0.000	0.000	0.000	0.000	0.153	55
	(0.000)	(0.577)	(0.700)	(1.528)	(0.029)	(0.000)	(0.035)	(0.000)	(0.000)	(0.000)	(0.000)	(0.023)	
Malta	0.000	9.000	7.533	51.900	0.200	0.333	0.037	0.000	0.000	0.000	0.000	0.083	45
	(0.000)	(0.000)	(1.401)	(1.418)	(0.100)	(0.577)	(0.064)	(0.000)	(0.000)	(0.000)	(0.000)	(0.096)	
Netherlands	1.000	8.000	4.914	54.357	0.354	0.143	0.032	0.000	0.000	0.143	0.029	0.205	68
	(0.000)	(0.577)	(1.652)	(2.765)	(0.099)	(0.378)	(0.084)	(0.000)	(0.000)	(0.378)	(0.076)	(0.026)	
Poland	1.000	16.786	4.919	52.214	0.470	0.810	0.107	0.000	0.000	0.667	0.374	0.156	34
	(0.000)	(1.718)	(1.862)	(4.390)	(0.132)	(0.397)	(0.080)	(0.000)	(0.000)	(0.477)	(0.279)	(0.024)	

Portugal	0.967	19.767	7.227	57.707	0.375	0.633	0.033	0.000	0.000	0.767	0.210	0.157	33
	(0.183)	(6.986)	(4.085)	(2.096)	(0.107)	(0.490)	(0.030)	(0.000)	(0.000)	(0.430)	(0.130)	(0.028)	
Romania	1.000	9.857	6.229	59.800	0.389	0.857	0.087	0.000	0.000	1.000	0.400	0.109	30
	(0.000)	(0.378)	(0.757)	(1.143)	(0.056)	(0.378)	(0.039)	(0.000)	(0.000)	(0.000)	(0.129)	(0.010)	
Spain	1.000	14.159	8.375	60.995	0.387	0.955	0.128	0.000	0.000	0.750	0.134	0.139	43
	(0.000)	(3.206)	(3.773)	(3.907)	(0.102)	(0.211)	(0.063)	(0.000)	(0.000)	(0.438)	(0.094)	(0.035)	
Sweden	0.625	11.225	6.333	54.687	0.639	1.000	0.316	0.600	0.125	0.974	0.316	0.137	73
	(0.490)	(2.224)	(2.021)	(3.191)	(0.107)	(0.000)	(0.122)	(0.496)	(0.113)	(0.162)	(0.155)	(0.040)	
United Kingdom	1.000	13.308	4.560	58.463	0.475	0.962	0.151	0.000	0.000	0.942	0.338	0.139	62
	(0.000)	(3.467)	(2.262)	(1.627)	(0.089)	(0.194)	(0.076)	(0.000)	(0.000)	(0.235)	(0.136)	(0.045)	

The table reports the mean values and standard deviations (in parentheses) for board characteristics by country. The characteristics include the board type (BOARDTYPE), size (BOARDSIZE), tenure (BOARDTEN), age (BOARDAGE), diversity index (BOARDDIVX), gender diversity (BOARDWOM2), employee representation (BOARDEMPL2), internationalisation (BOARDNATMIX2), and age diversity (CVBOARDAGE). The last column reports the Hofstede index (HOF) by country. Definitions of the variables are provided in Appendix 1.

Table 2 Do board characteristics impact on bank performance?

	SR				***SDSR***			
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (1)*	*Model (2)*	*Model (3)*	*Model (4)*
DBOARDTYPE	0.0249	0.0299	0.0340	0.1070	-0.0221	-0.0222	0.0501	-0.0279
	(0.24)	(0.29)	(0.44)	(0.82)	(-0.52)	(-0.52)	(1.22)	(-0.60)
LNBOARDSIZE	0.2593**	0.2365**	0.1113	0.2335**	0.0031	0.0034	0.0244	0.0114
	(2.14)	(2.02)	(1.10)	(2.01)	(0.08)	(0.09)	(0.65)	(0.32)
LNBOARDTEN	0.0126	0.0093	0.0741	0.0318	-0.0307	-0.0306	-0.0708**	-0.0321
	(0.17)	(0.13)	(1.55)	(0.43)	(-1.10)	(-1.10)	(-2.52)	(-1.10)
LNBOARDAGE	-1.0750	-1.0318	-0.2188	-1.5594**	0.0201	0.0195	-0.0441	0.0120
	(-1.63)	(-1.54)	(-0.47)	(-2.02)	(0.11)	(0.10)	(-0.21)	(0.06)
BOARDDIVX		0.3362	0.2760			-0.0052	-0.0212	
		(1.04)	(0.69)			(-0.07)	(-0.27)	
BOARDWOM2				-0.2673				0.0193
				(-0.82)				(0.17)
BOARDEMPL2				1.0417				-0.3277**
				(1.46)				(-2.23)
BOARDNATMIX2				0.4166				0.1177**
				(1.25)				(2.07)
CVBOARDAGE				-0.3580				-0.1793
				(-0.90)				(-0.92)
LNTA	-0.0629	-0.0618	-0.0477	-0.0558*	0.0138	0.0138	0.0156	0.0119
	(-1.42)	(-1.44)	(-1.15)	(-1.71)	(1.35)	(1.34)	(1.66)	(1.19)
TAGA	-0.1884	-0.1765	-0.1767	-0.1491	-0.0199	-0.0201	-0.0766	-0.0152
	(-1.19)	(-1.13)	(-1.09)	(-1.06)	(-0.42)	(-0.43)	(-1.37)	(-0.33)
LOANTA	-0.0988	-0.1270	-0.2156	-0.0369	-0.0746	-0.0741	0.0379	-0.0546
	(-0.51)	(-0.67)	(-1.33)	(-0.18)	(-1.15)	(-1.15)	(0.59)	(-0.79)
TDTA	-0.0688	0.0114	-0.0182	0.0227	-0.0866	-0.0879	-0.0053	-0.0598
	(-0.24)	(0.04)	(-0.07)	(0.08)	(-0.93)	(-0.93)	(-0.05)	(-0.60)
ETA	-0.9904	-1.1052	-0.1103	-0.7703	-2.4075***	-2.4058***	-1.9365***	-2.7268***
	(-0.54)	(-0.58)	(-0.10)	(-0.43)	(-3.97)	(-3.95)	(-3.96)	(-4.34)
LLPLOAN	1.9825	1.7625	3.4708	3.0867	6.6511***	6.6545***	8.2103***	6.5685***
	(0.45)	(0.40)	(0.76)	(0.72)	(2.84)	(2.83)	(3.81)	(2.82)
CI	-0.1302	-0.1199	-0.2236	-0.0867	0.0814	0.0813	0.0691	0.1045
	(-0.49)	(-0.46)	(-0.90)	(-0.34)	(1.05)	(1.05)	(1.14)	(1.27)
LEGAL			0.0265				0.0700	
			(0.30)				(1.06)	
LNCMC			0.0270				-0.0142	
			(0.81)				(-1.04)	
HHI			-2.1563*				1.3851***	
			(-1.97)				(3.65)	
LNGDPPC			0.1387				-0.0048	
			(1.66)				(-0.09)	
DHOF			0.0466				-0.0754	
			(0.48)				(-1.46)	
No. of Obs.	545	545	520	523	545	545	520	523
Adj. R-squared	0.270	0.271	0.270	0.302	0.578	0.578	0.544	0.583

The table reports the main regression results of the effects of board features on bank performance including profitability measured by the stock return (SR) and risk measured by the standard deviation of stock return (SDSR). Model (1) presents the results for the effects of banks' standard board features; Model (2) adds the board diversity index; Model (3) adds country-specific variables; Model (4) replaces the diversity index with the component diversity features. The models control for bank-specific characteristics, country fixed effects (except Model (3)) and year fixed effects. All independent variables are lagged one period. The t-statistics calculated using standard errors clustered at the bank level are reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively. Definitions of the variables are provided in Appendix 1.

Table 3 Additional analyses: Is the relationship between board characteristics and bank performance non-linear?

	SR			***SDSR***		
	Model (1)	*Model (2)*	*Model (3)*	*Model (1)*	*Model (2)*	*Model (3)*
DBOARDTYPE	0.0064	0.0349	0.1046	-0.0086	-0.0211	-0.0269
	(0.06)	(0.34)	(0.81)	(-0.19)	(-0.50)	(-0.57)
LNBOARDSIZE		0.2216*	0.2170*		0.0003	0.0138
		(1.84)	(1.86)		(0.01)	(0.38)
LNBOARDTEN		0.0021	0.0236		-0.0321	-0.0331
		(0.03)	(0.30)		(-1.15)	(-1.12)
LNBOARDAGE		-0.9232	-1.5766*		0.0423	0.0138
		(-1.36)	(-1.92)		(0.22)	(0.06)
LNBOARDSIZEUP	0.3145*			0.0184		
	(1.79)			(0.38)		
LNBOARDSIZEDN	0.3325			0.0252		
	(1.60)			(0.46)		
LNBOARDTENUP	0.0137			-0.0300		
	(0.19)			(-1.05)		
LNBOARDTENDN	-0.0192			-0.0172		
	(-0.20)			(-0.48)		
LNBOARDAGEUP	-0.9282			0.2354		
	(-1.01)			(1.34)		
LNBOARDAGEDN	-0.9151			0.2474		
	(-0.98)			(1.39)		
BOARDDIVXUP		0.4584			0.0206	
		(1.39)			(0.27)	
BOARDDIVXDN		0.7047*			0.0724	
		(1.73)			(0.63)	
BOARDWOM2UP			-0.1635			0.0257
			(-0.48)			(0.21)
BOARDWOM2DN			0.7215			0.0946
			(0.71)			(0.33)
BOARDEMPL2UP			0.9918			-0.3293**
			(1.44)			(-2.21)
BOARDEMPL2DN			6.9824**			0.0465
			(2.27)			(0.07)
BOARDNATMIX2UP			0.4123			0.1151*
			(1.29)			(1.98)
BOARDNATMIX2DN			0.0817			0.0033
			(0.09)			(0.01)
CVBOARDAGEUP			-0.5352			-0.1798
			(-1.07)			(-0.78)
CVBOARDAGEDN			-0.7114			-0.1707
			(-0.72)			(-0.49)
Bank-specific controls	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE (bank)	Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs.	545	545	523	545	545	523
Adj. R-squared	0.267	0.271	0.299	0.581	0.577	0.580

The table reports the results of the effects of board features on banks' performance including profitability measured by the stock return (SR) and risk measured by the standard deviation of stock return (SDSR) with the use of thresholds for the board feature variables, where suffixes UP and DN indicate a board variable value above and below its threshold level, respectively. Model (1) presents the results for the effects of banks' standard board features; Model (2) adds the board diversity index; Model (3) replaces the diversity index with the component diversity features. The models control for bank-specific characteristics, country fixed effects and year fixed effects. All independent variables are lagged one period. The t-statistics calculated using standard errors clustered at the bank level are reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively. Definitions of the variables are provided in Appendix 1.

Table 4 Additional analyses: Is the relationship between board characteristics and bank performance affected by the euro crisis?

	SR			***SDSR***		
	Model (1)	*Model (2)*	*Model (3)*	*Model (1)*	*Model (2)*	*Model (3)*
DBOARDTYPE	-0.1008	0.0395	0.1407	0.0237	-0.0208	-0.0229
	(-1.29)	(0.38)	(0.91)	(0.43)	(-0.49)	(-0.48)
ECDBOARDTYPE	0.1746			-0.0824		
	(1.28)			(-1.05)		
LNBOARDSIZE	0.2987*	0.2073*	0.2105*	-0.0227	-0.0009	0.0028
	(1.74)	(1.85)	(1.80)	(-0.51)	(-0.02)	(0.08)
ECLNBOARDSIZE	-0.0684			0.0584		
	(-0.34)			(1.17)		
LNBOARDTEN	0.1451*	0.0025	0.0250	-0.0385	-0.0316	-0.0357
	(1.78)	(0.03)	(0.31)	(-1.33)	(-1.16)	(-1.27)
ECLNBOARDTEN	-0.1999			0.0118		
	(-1.42)			(0.29)		
LNBOARDAGE	-1.5055**	-1.0505	-1.7413**	-0.1493	0.0167	0.0565
	(-2.05)	(-1.60)	(-2.16)	(-0.66)	(0.09)	(0.27)
ECLNBOARDAGE	0.5716			0.3156		
	(0.62)			(1.64)		
BOARDDIVX		0.7652			0.0576	
		(1.06)			(0.64)	
ECBOARDDIVX		-0.8448			-0.1236	
		(-0.94)			(-1.25)	
BOARDWOM2			-1.0862			0.1818
			(-1.50)			(1.30)
ECBOARDWOM2			1.1460			-0.3176**
			(1.39)			(-2.15)
BOARDEMPL2			2.0535			-0.3336*
			(1.63)			(-1.78)
ECBOARDEMPL2			-1.5082			-0.0435
			(-1.53)			(-0.36)
BOARDNATMIX2			0.9701			0.1687**
			(1.27)			(2.34)
ECBOARDNATMIX2			-0.9013			-0.0936
			(-1.15)			(-1.07)
CVBOARDAGE			0.9916			-0.6325*
			(0.57)			(-1.68)
ECCVBOARDAGE			-1.8621			0.6306*
			(-0.88)			(1.70)
Bank-specific controls	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE (bank)	Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs.	545	545	523	545	545	523
Adj. R-squared	0.269	0.277	0.327	0.580	0.578	0.590

The table reports the results of the impact of the euro crisis on the association between board features and bank performance including profitability measured by the stock return (SR) and risk measured by the standard deviation of stock return (SDSR). Model (1) includes standard board features and their interactions with the euro crisis dummy (the latter is equal to 1 for years 2011-2014 and zero for the financial crisis years 2007-2010); Model (2) includes the board diversity index and its interaction with the euro crisis dummy; Model (3) replaces the diversity index and its interaction with the euro crisis dummy with the component diversity features and their interactions with the euro crisis dummy. The models control for bank-specific characteristics, country and year fixed effects. The t-statistics calculated using standard errors clustered at the bank level are reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively. Definitions of the variables are provided in Appendix 1.

Table 5 Additional analyses: Is the relationship between board characteristics and bank performance affected by countries' cultural differences?

	SR		***SDSR***	
	Model (1)	*Model (2)*	*Model (1)*	*Model (2)*
DBOARDTYPE	0.0069	0.1347	-0.0253	-0.0231
	(0.07)	(0.87)	(-0.59)	(-0.50)
LNBOARDSIZE	0.1989*	0.1507	0.0122	0.0154
	(1.80)	(1.26)	(0.32)	(0.38)
LNBOARDTEN	0.0733	0.1011*	-0.0422	-0.0439
	(1.44)	(1.82)	(-1.46)	(-1.45)
LNBOARDAGE	-0.6295	-0.9690**	-0.0838	-0.1370
	(-1.44)	(-2.12)	(-0.46)	(-0.66)
BOARDDIVX	0.1762		0.1163	
	(0.77)		(1.52)	
HOFBOARDDIVX	0.2988		-0.2674*	
	(0.50)		(-1.67)	
BOARDWOM2		0.2300		0.0189
		(0.59)		(0.16)
HOFBOARDWOM2		-0.8572		-0.0219
		(-1.30)		(-0.10)
BOARDEMPL2		-0.1179		-0.2600
		(-0.13)		(-1.34)
HOFBOARDEMPL2		1.6994		-0.0578
		(1.08)		(-0.20)
BOARDNATMIX2		0.0970		0.2383***
		(0.48)		(2.99)
HOFBOARDNATMIX2		0.5656		-0.2483*
		(1.01)		(-1.99)
CVBOARDAGE		-0.3356		-0.1424
		(-0.95)		(-0.91)
HOFCVBOARDAGE		1.3805		-0.3550
		(0.90)		(-0.58)
Bank-specific controls	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Clustered SE (bank)	Yes	Yes	Yes	Yes
No. of Obs.	534	512	534	512
Adj. R-squared	0.281	0.318	0.596	0.601

The table reports the results of the impact of the countries' openness to diversity on the association between board diversity features and bank performance including profitability measured by the stock return (SR) and risk measured by the standard deviation of stock return (SDSR). Model (1) includes the diversity index and its interaction with the Hofstede dummy (the latter is equal to 1 for countries more open to diversity and zero otherwise); Model (2) replaces the diversity index and its interaction with the Hofstede dummy with the component diversity features and their interactions with the Hofstede dummy. The models control for bank-specific characteristics, country and year effects. The t-statistics calculated using standard errors clustered at the bank level are reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively. Definitions of the variables are provided in Appendix 1.

Table 6 Additional analyses: Alternative performance measures

	ROA			***SDROA***			***NIM***			***SDNIM***			***LNZSCORE***		
	Model (1)	*Model (2)*	*Model (3)*	*Model (1)*	*Model (2)*	*Model (3)*	*Model (1)*	*Model (2)*	*Model (3)*	*Model (1)*	*Model (2)*	*Model (3)*	*Model (1)*	*Model (2)*	*Model (3)*
DBOARDTYPE	-0.0006	-0.0006	0.0006	-0.1778	-0.1835	-0.1768	0.0007	0.0008	-0.0008	0.5934	0.6175	0.1180	0.0502	0.0485	0.1349
	(-0.49)	(-0.46)	(0.59)	(-1.05)	(-1.06)	(-1.12)	(0.43)	(0.46)	(-0.54)	(1.19)	(1.21)	(0.26)	(0.17)	(0.17)	(0.41)
LNBOARDSIZE	-0.0023	-0.0026	-0.0021	0.2584	0.2848	0.3031	-0.0010	-0.0013	-0.0014	-0.5177	-0.6269	-0.8185	-0.1626	-0.1513	-0.1629
	(-0.87)	(-0.93)	(-0.70)	(0.94)	(0.99)	(0.98)	(-0.43)	(-0.55)	(-0.64)	(-0.90)	(-1.06)	(-1.29)	(-0.54)	(-0.50)	(-0.54)
LNBOARDTEN	0.0004	0.0004	0.0007	-0.2956**	-0.2932**	-0.3181**	-0.0036	-0.0036	-0.0042*	-1.5612***	-1.5683***	-1.6814***	0.1962	0.1961	0.2793**
	(0.19)	(0.17)	(0.26)	(-1.99)	(-2.02)	(-2.07)	(-1.58)	(-1.62)	(-1.87)	(-4.15)	(-4.37)	(-4.86)	(1.60)	(1.59)	(2.10)
LNBOARDAGE	-0.0056	-0.0049	-0.0101	0.7285	0.7249	0.9265	0.0249*	0.0251*	0.0364**	7.6668**	7.7752***	10.6453***	-0.0761	-0.0890	-1.4212
	(-0.40)	(-0.35)	(-0.59)	(0.58)	(0.58)	(0.66)	(1.67)	(1.68)	(2.00)	(2.58)	(2.72)	(3.77)	(-0.08)	(-0.09)	(-1.27)
BOARDDIVX		0.0054			-0.3843			0.0041			1.6111			-0.1713	
		(0.88)			(-0.79)			(0.59)			(1.29)			(-0.32)	
BOARDWOM2			-0.0002			-0.3001			0.0081			1.0263			-0.4355
			(-0.03)			(-0.48)			(1.16)			(0.80)			(-0.48)
BOARDEMPL2			0.0120			-0.9753			-0.0101			-3.1757			1.3520
			(1.63)			(-1.36)			(-0.98)			(-1.46)			(1.23)
BOARDNATMIX2			0.0017			0.1364			-0.0036			0.5356			0.1969
			(0.60)			(0.67)			(-0.87)			(0.60)			(0.52)
CVBOARDAGE			-0.0028			-0.9194			0.0225			6.7870***			-1.3389
			(-0.23)			(-0.50)			(1.52)			(3.12)			(-1.11)
Bank-specific controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE (bank)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs.	537	537	515	469	469	448	544	544	522	544	544	522	524	524	502
Adjusted R-squared	0.321	0.321	0.307	0.505	0.506	0.509	0.684	0.684	0.689	0.405	0.408	0.421	0.389	0.388	0.383

The table reports the results of the effects of board features on banks' performance using alternative profitability (ROA, NIM) and risk (SDROA, SDNIM, LNZSCORE) measures. Model (1) presents the results for the effects of banks' standard board features; Model (2) adds the board diversity index; Model (3) replaces the diversity index with the component diversity features. The models control for bank-specific characteristics, country and year fixed effects. The t-statistics calculated using standard errors clustered at the bank level are reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively. Definitions of the variables are provided in Appendix 1.

Table 7 Two-step DPS-GMM: Do board characteristics impact on bank performance?

	SR			***SDSR***		
	Model (1)	*Model (2)*	*Model (3)*	*Model (1)*	*Model (2)*	*Model (3)*
DBOARDTYPE	0.0330	-0.0258	0.0879	0.0459	0.0284	-0.0593
	(0.11)	(-0.09)	(0.21)	(0.44)	(0.25)	(-0.48)
LNBOARDSIZE	0.1510	0.1465	0.1543	0.0545	0.0651	0.0416
	(0.54)	(0.73)	(0.57)	(0.87)	(0.96)	(0.38)
LNBOARDTEN	-0.0067	-0.0235	-0.0137	-0.0723*	-0.0623*	-0.0296
	(-0.06)	(-0.19)	(-0.08)	(-1.77)	(-1.77)	(-0.65)
LNBOARDAGE	-0.5489	-0.3136	-0.4497	0.1588	-0.0182	-0.1342
	(-0.74)	(-0.31)	(-0.38)	(0.53)	(-0.06)	(-0.31)
BOARDDIVX		0.1507			-0.2120	
		(0.34)			(-1.36)	
BOARDWOM2			0.2240			-0.4661**
			(0.42)			(-2.51)
BOARDEMPL2			0.5695			-0.5725**
			(0.64)			(-2.36)
BOARDNATMIX2			0.2291			0.1417
			(0.58)			(1.01)
CVBOARDAGE			0.6940			0.0658
			(0.52)			(0.14)
Bank-specific controls	Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs	545	545	523	545	545	523
Hansen (df)	69.61	73.45	64.86	70.79	70.31	64.39
	(256)	(280)	(273)	(281)	(280)	(273)
AR(1)	-5.057***	-5.101***	-5.029***	-3.339***	-3.292***	-3.448***
AR(2)	-2.002**	-2.015**	-2.830***	0.314	0.480	1.219

The table reports the results of the two-step Dynamic Panel System GMM estimations of profitability measured by the stock return (SR) and risk measured by the standard deviation of stock return (SDSR) on standard and diversity board features, bank-specific and country-specific control variables. Model (1) presents the results for the effects of banks' standard board features; Model (2) adds the board diversity index; Model (3) replaces the board diversity index with the component diversity features. All independent variables are treated as endogenous. Endogenous variables are instrumented by one of their past values. The t-statistics calculated using standard errors clustered at the bank level are reported in parentheses. The null hypothesis for the Hansen test of overidentification is that all instruments are exogenous. AR(1) and AR(2) are test statistics for the null hypothesis that there is no serial correlation of order 1 and 2 in the first-difference residuals. *, **, *** denote statistical significance at 10%, 5% and 1% respectively. Definitions of the variables are provided in Appendix 1.

Table 8: Two-step DPS-GMM: Alternative performance measures

	ROA			***SDROA***			***NIM***			***SDNIM***			***LNZSCORE***		
	Model (1)	*Model (2)*	*Model (3)*	*Model (1)*	*Model (2)*	*Model (3)*	*Model (1)*	*Model (2)*	*Model (3)*	*Model (1)*	*Model (2)*	*Model (3)*	*Model (1)*	*Model (2)*	*Model (3)*
DBOARDTYPE	-0.0013	0.0001	0.0016	0.0171	0.0826	-0.5184	0.0025	0.0039	0.0017	0.8273	1.2661*	0.5671	-0.7262	-0.41	-0.2981
	(-0.45)	-0.05	-0.41	-0.05	-0.19	(-1.43)	(0.66)	(1.07)	(0.60)	(1.01)	(1.69)	(0.92)	(-1.28)	(-0.65)	(-0.40)
LNBOARDSIZE	-0.002	-0.0014	-0.0012	0.1171	0.1255	0.2608	-0.0028	-0.0036	-0.0039	-0.8995	-1.2672*	-1.0527	-0.3643	-0.0599	-0.4018
	(-0.94)	(-0.65)	(-0.37)	-0.52	-0.39	-0.8	(-0.70)	(-1.15)	(-0.84)	(-1.21)	(-1.99)	(-1.63)	(-0.77)	(-0.12)	(-0.98)
LNBOARDTEN	0.0016	0.0004	0.0008	-0.5573**	-0.4268*	-0.2658	-0.0033	-0.0028	-0.0020	-1.6891*	-1.7812**	-1.6091**	0.4187*	0.3820*	0.4130*
	-0.86	-0.22	-0.41	(-2.49)	(-1.71)	(-0.87)	(-0.97)	(-0.80)	(-0.61)	(-1.88)	(-2.17)	(-2.23)	-1.72	-1.8	-1.9
LNBOARDAGE	-0.0093	0.0113	0.0035	2.7160*	2.408	1.7713	0.0218	0.0375	0.0281	7.5725	9.3132	8.5254	0.1793	-0.2401	-0.8311
	(-0.68)	-0.79	-0.21	-1.79	-1.26	-1.07	(0.83)	(1.36)	(1.56)	(1.02)	(1.34)	(1.31)	-0.07	(-0.12)	(-0.46)
BOARDDIVX		0.0096*			-0.4406			0.0081			2.9694			0.8014	
		-1.68			(-0.90)			(0.89)			(1.09)			-0.93	
BOARDWOM2			0.0075			-0.2337			-0.0017			0.8316			0.6629
			-1.02			(-0.26)			(-0.20)			(0.38)			-0.51
BOARDEMPL2			0.0066			-1.682			0.0082			-1.3867			1.6356
			-1.05			(-1.61)			(0.67)			(-0.77)			-0.84
BOARDNATMIX2			0.0022			0.0657			0.0063			0.9354			0.1467
			-0.4			-0.13			(1.08)			(0.53)			-0.15
CVBOARDAGE			-0.0038			1.8541			0.0094			7.0526			-1.1597
			(-0.24)			-0.77			(0.50)			(1.50)			(-0.66)
Bank-specific controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs	537	537	515	469	469	449	533	533	512	533	533	512	524	524	502
Hansen (df)	63.75	65.16	62.88	61.92	63.87	57.48	66.74	70.46	64.76	64.66	61.20	55.76	67.89	66.03	64.55
	(228)	(278)	(271)	(207)	(206)	(202)	(228)	(278)	(271)	(279)	(278)	(271)	(228)	(278)	(271)
AR(1)	-2.287***	-2.322***	-2.272***	-2.004***	-1.989***	-2.012***	-1.602	-1.910***	-1.852***	-2.648***	-2.574***	-2.547***	-3.345***	-3.604***	-3.668***
AR(2)	-1.704*	-1.752*	-1.739*	0.76	0.893	0.929	-1.370	-1.413	-1.394	-2.829***	-2.876***	-2.666***	-0.0187	0.021	0.551

The table reports the results of the two-step Dynamic Panel System GMM estimations of profitability measured by the return on assets (ROA) and net interest margin (NIM) and risk measured by the standard deviation of the return on assets (SDROA), standard deviation of the net interest margin (SDNIM), and z-score (ZSCORE) on standard and diversity board features, bank-specific and country-specific control variables. Model (1) presents the results for the effects of banks' standard board features; Model (2) adds the board diversity index; Model (3) replaces the board diversity index with the component diversity features. All independent variables are treated as endogenous. Endogenous variables are instrumented by one of their past values. The t-statistics calculated using standard errors clustered at the bank level are reported in parentheses. The null hypothesis for the Hansen test of overidentification is that all instruments are exogenous. AR(1) and AR(2) are test statistics for the null hypothesis that there is no serial correlation of order 1 and 2 in the first-difference residuals. *, **, *** denote statistical significance at 10%, 5% and 1% respectively. Definitions of the variables are provided in Appendix 1.

Appendix 1 Variable definitions

Variable	Definition	Source
Performance variables – Profitability		
SR	Daily stock return (annual average)	Datastream (now Thomson Eikon)
ROA	Return on assets (annual data)	Bankscope
NIM	Net interest margin (annual data)	Bankscope
Performance variables – Risk		
SDDSR	Standard deviation of *SR* (t, t-1, t-2)	Authors' calculation using Datastream data (now Thomson Eikon)
SDROA	Standard deviation of ROA (t, t-1, t-2)	Authors' calculation using Bankscope data
SDNIM	Standard deviation of NIM (t, t-1, t-2)	Authors' calculation using Bankscope data
ZSCORE	(3-year average return on assets + 3-year average equity capital ratio)/3-year standard deviation of return on assets	Authors' calculation using Bankscope data
LNZSCORE	Ln(*ZSCORE*)	Authors' calculation using Bankscope data
Board variables - Standard		
DBOARDTYPE	Dummy equal to 0 if board is one tier and 1 if two tier	BoardEx
BOARDSIZE	Board size = Number of board members	BoardEx
LNBOARDSIZE	Ln(*BOARDSIZE*)	Authors' calculation using BoardEx data
BOARDTEN	Board tenure (years)	BoardEx
LNBOARDTEN	Ln(*BOARDTEN*)	Authors' calculation using BoardEx data
BOARDAGE	Board age = Average age of board members (years)	BoardEx
LNBOARDAGE	Ln(*BOARDAGE*)	Authors' calculation using BoardEx data
Board variable s - Diversity		
BOARDDIVX	Diversity index = (1) The board diversity variables (*BOARDWOM2*, *BOARDEMPL2*, *BOARDNATMIX2*, and *CVBOARDAGE*) are converted into discrete variables ranging from 1 to 10 based on the decile of the sample distribution they fall into (with 1 being the bottom and 10 the top decile); (2) the diversity index for each bank-year is computed as $\text{BOARDDIVX}_{it} = \frac{1}{40}\sum_{j=1}^{4} D_{it}^{j}$. The index ranges from 0 (low diversity) to 1 (high diversity).	Authors' calculation using BoardEx data
DBOARDWOM	Dummy equal to 1 if both genders are represented on the board and 0 if the board is formed exclusively by men	Authors' calculation using BoardEx data
BOARDWOM	Number of women on the board	BoardEx
BOARDWOM2	Fraction of women on the board	Authors' calculation using BoardEx data
DBOARDEMPL	Dummy equal to 1 if employees are present on the board and 0 otherwise	Authors' calculation using BoardEx data
BOARDEMPL	Number of employees on the board	BoardEx
BOARDEMPL2	Fraction of employees on the board	Authors' calculation using BoardEx data
DBOARDNATMIX	Dummy equal to 1 if percentage of foreign members on the board greater than 0 and 0 if the board is formed exclusively by domestic members	Authors' calculation using BoardEx data
BOARDNATMIX2	Nationality mix = Percentage of foreign members on the board	BoardEx
BOARDAGE	Board age = Average age of board members (years)	BoardEx
LNBOARDAGE	Ln(*BOARDAGE*)	Authors' calculation using BoardEx data
CVBOARDAGE	Coefficient of variation of board members' age = Standard deviation of board age/*BOARDAGE*	Authors' calculation using BoardEx data
Bank-specific variables		
TABL	Total assets (euro billions)	
LNTA	Ln(*TABL*)	Authors' calculation using Bankscope data
TAGA	Total asset growth	Authors' calculation using Bankscope data
LOANTA	Loan ratio = Gross loans to total assets	Authors' calculation using Bankscope data
TDTA	Deposit ratio = Deposit and short-term funding to total assets	Authors' calculation using Bankscope data
ETA	Equity to total assets	Bankscope
LLPLOAN	Quality of loan portfolio = Loan loss provisions to gross loans	Authors' calculation using Bankscope data

CI	Cost to income ratio (%)	Bankscope
Country-specific variables		
LEGAL	Dummy equal to 1 if country has a common law legal system and 0 otherwise	Authors' calculation using data from CIA, Commonwealth network, NYU Law Global and Hatzimihail (2013)
LNGDPC	Ln(GDP per capita)	Authors' calculation using Eurostat data
HHI	Banking sector concentration	ECB statistical data warehouse
LNCMC	Ln(Country market capitalisation)	Authors' calculation using World Federation of Exchanges (WFE) and ECB data
EUROCRISIS	Euro crisis dummy equal to 1 for years 2011-2014	Authors' calculation
HOF	Hofstede index = The average value across the six Hofstede dimensions of national culture (i.e., (100 - power distance), individualism, (100 - masculinity), (100 - uncertainty avoidance), long-term orientation, and indulgence)	Authors' calculation using the Hofstede Insight data
DHOF	Hofstede dummy equal to 1 if *HOF* is above the sample mean (higher national openness to diversity) and zero otherwise (lower national openness to diversity)	Authors' calculation
Interactions		
ECDBOARDTYPE	*EUROCRISIS * DBOARDTYPE*	Authors' calculation
ECLNBOARDSIZE	*EUROCRISIS * LNBOARDSIZE*	Authors' calculation
ECLNBOARDTEN	*EUROCRISIS * LNBOARDTEN*	Authors' calculation
ECLNBOARDAGE	*EUROCRISIS * LNBOARDAGE*	Authors' calculation
ECBOARDDIVX	*EUROCRISIS * BOARDDIVX*	Authors' calculation
ECBOARDWOM2	*EUROCRISIS * BOARDWOM2*	Authors' calculation
ECBOARDEMPL2	*EUROCRISIS * BOARDEMPL2*	Authors' calculation
ECBOARDNATMIX2	*EUROCRISIS * BOARDNATMIX2*	Authors' calculation
ECCVBOARDAGE	*EUROCRISIS * CVBOARDAGE*	Authors' calculation
HOFBOARDDIVX	*DHOF * BOARDDIVX*	Authors' calculation
HOFBOARDWOM2	*DHOF * BOARDWOM2*	Authors' calculation
HOFBOARDEMPL2	*DHOF * BOARDEMPL2*	Authors' calculation
HOFBOARDNATMIX2	*DHOF * BOARDNATMIX2*	Authors' calculation
HOFCVBOARDAGE	*DHOF * CVBOARDAGE*	Authors' calculation

The table defines the variables used in the study and the source of the data. (*) first introduction during the sample period (same thereafter).

Appendix 2 Correlation matrix

	DBOARDTYPE	*LNBOARDSIZE*	*LNBOARDTEN*	*LNBOARDAGE*	*BOARDDIVX*	*BOARDWOM2*	*BOARDEMPL2*	*BOARDNATMIX2*	*CVBOARDAGE*	*LNTA*	*TAGA*	*LOANTA*	*TDTA*	*ETA*	*LLPLOAN*	*CI*
DBOARDTYPE	1															
LNBOARDSIZE	0.2290*	1														
	0															
LNBOARDTEN	0.0155	0.0883*	1													
	0.714	0.0367														
LNBOARDAGE	0.1497*	0.2129*	0.3369*	1												
	0.0004	0	0													
BOARDDIVX	-0.1190*	0.1552*	0.0473	-0.2720*	1											
	0.0047	0.0002	0.2639	0												
BOARDWOM2	-0.2913*	-0.0807*	0.029	-0.1373*	0.6170*	1										
	0	0.056	0.4932	0.0011	0											
BOARDEMPL2	-0.1983*	0.2006*	0.1401*	-0.2358*	0.6544*	0.3217*	1									
	0	0	0.0009	0	0	0										
BOARDNATMIX2	-0.0016	0.0703	-0.0728*	-0.1196*	0.5367*	0.1984*	0.0719*	1								
	0.9699	0.103	0.092	0.0054	0	0	0.0955									
CVBOARDAGE	0.0084	0.0132	-0.0236	-0.2685*	0.2543*	-0.1009*	0.0208	-0.0551	1							
	0.8419	0.7551	0.5767	0	0	0.0167	0.6229	0.2015								
LNTA	-0.0249	0.3884*	-0.0639	0.2476*	0.1504*	0.2973*	0.0613	0.1410*	-0.2455*	1						
	0.5554	0	0.1313	0	0.0003	0	0.1464	0.001	0							
TAGA	-0.0045	-0.1163*	0.0179	-0.0908*	-0.0436	-0.0457	-0.0634	-0.0036	0.0311	-0.1621*	1					
	0.9149	0.0058	0.6721	0.0315	0.3022	0.2791	0.1332	0.9342	0.4624	0.0001						
LOANTA	0.0154	0.1388*	0.1330*	0.2294*	-0.1996*	-0.1753*	-0.2147*	-0.1019*	0.0984*	-0.1670*	-0.0013	1				
	0.7152	0.001	0.0016	0	0	0	0	0.0179	0.0196	0.0001	0.9748					
TDTA	0.0575	-0.1465*	0.0937*	-0.1777*	-0.1523*	-0.3010*	-0.0125	-0.1385*	0.1308*	-0.5865*	0.063	0.3486*	1			
	0.1736	0.0005	0.0265	0	0.0003	0	0.7674	0.0013	0.0019	0	0.1357	0				

ETA	0.0292	-0.1051*	0.0202	-0.0246	-0.1108*	-0.1921*	-0.1390*	0.1220*	0.0939*	-0.4895*	0.063	0.2030*	0.3258*	1		
	0.4895	0.0126	0.633	0.5606	0.0086	0	0.001	0.0046	0.026	0	0.1361	0	0			
LLPLOAN	0.0877*	-0.1369*	-0.1522*	0.1157*	-0.1811*	-0.1058*	-0.1950*	-0.1105*	0.0138	-0.0989*	-0.1226*	0.2545*	0.2566*	-0.046	1	
	0.0396	0.0013	0.0003	0.0066	0	0.0129	0	0.011	0.746	0.0203	0.004	0	0	0.2806		
CI	0.0894*	0.0349	-0.2325*	0.0071	-0.0364	-0.0491	0.051	-0.1367*	0.0112	0.1147*	-0.1371*	-0.2264*	-0.1625*	-0.2389*	0.0523	1
	0.0347	0.4109	0	0.8665	0.3907	0.2464	0.2291	0.0015	0.7927	0.0067	0.0012	0	0.0001	0	0.2219	

The table reports correlations for the regressors used the analysis. * indicates significant at 10 per cent level. Definitions of the variables are provided in Appendix 1.

Appendix 3 Sample composition by country in 2014

Country	*Number of banks*	*Total asset in 2014 (Euro million)*
Austria	5	352,100
Belgium	3	591,467
Cyprus	2	39,788
Czech Republic	1	31,296
Germany	4	2,850,389
Denmark	5	534,706
Spain	6	2,567,366
France	5	5,539,100
Greece	4	301,115
Hungary	1	34,694
Ireland	2	270,500
Italy	13	2,361,156
Lithuania	1	852
Malta	1	7,049
Netherlands	1	2,998
Poland	6	147,277
Portugal	4	231,986
Romania	1	11,036
Sweden	5	1,452,367
United Kingdom	7	6,987,164
Total	77	24,314,406

The table shows the number of banks in the sample by country and their size in 2014..

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