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To my beloved family

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GENERAL INTRODUCTION

According to the perspective of the OECD Principles on Corporate Governance[1], corporate governance covers the relationships and subsequent behavior between different stakeholders in a limited liability corporation. It, therefore, refers to the balance of interests between different stakeholders, such as shareholders, managers, the government, debtholders, customers, suppliers, and the community. Consequently, good corporate governance practices can only develop with the support of public policy with an adequate legal and regulatory framework. This is the reason why governments around the world need to pay due attention to corporate governance.

After the 2007-2008 crisis, in which poor corporate governance is to blame for the collapse and struggles of many banks and savings companies, corporate governance reform, especially in the financial sector, is expected to be an important solution in reducing the risk of future financial crises. Nearly 15 years after the crisis, jurisdictions around the world have, with some success, been pursuing a policy of strengthening company boards, increasing information flows, and encouraging institutional investor oversight to promote effective corporate governance practices. Two mechanisms are expected to promote good corporate governance in firms in general and banks in particular, namely promoting employee ownership and enhancing the role of market participants in overseeing corporate risk management.

This thesis has two main objectives: to evaluate the effectiveness of the promotion of employee share ownership in the banking sector to restrain excessive bank risk-taking and to propose and assess the effectiveness of an alternative mechanism of market discipline through the presence of bondholder-affiliated-directors on the board of banks. We focus our investigation on banks rather than non-banking firms because improving corporate governance of banks to increase their transparency and reduce their risk-taking has become an important goal of financial regulatory authorities to prevent the future financial crisis. Moreover, one of the biggest concerns of financial regulators is that the increasing complexity of large banking organizations makes them difficult to monitor and control using traditional supervisory tools (Bliss & Flannery, 2019). We, therefore, assess the role of employee ownership and the influence of bondholder representative on a bank's board as potential internal mechanisms to monitor bank risk-taking.

The European Commission, in December 2012, included the promotion of employee share ownership (ESO) in its Action Plan to reform European company law and corporate

[1] The OECD Principles of Corporate Governance, first issued in 1999 and updated in 2015.
See https://www.oecd-ilibrary.org/docserver/9789264236882-en.pdf?expires=1622463790&id=id&accname=guest&checksum=DDC8925BFACE7FECA4183515D60F33A0

governance. The Commission finds “links between employee shareholding and corporate governance” (European Commission, 2014). According to the Commission, there are three main contributions of ESO to the goal of good corporate governance. First, ESO increases the transparency of the remuneration policy. As knowledgeable insiders, employee shareholders can have a “say on pay” demanding executive compensation to be transparent, a step toward more sustainable remuneration policies. Second, ESO increases employee productivity and loyalty. As employee shareholders participate actively in the decision-making process, they are motivated to take on new responsibilities. As a result, firms are more competitive through productivity gains arising from increased employee identification with the company. Third, ESO switches management incentives from short-term to long-term. Since employee shareholders are risk-averse and have their job tied to the fate of their employer, they will have significant incentives to reduce risk and influence corporate risk tolerance (Bova et al., 2012). Employee shareholders, therefore, can use their voting rights to push the orientation of executive compensation toward the long-term, rather than a short-term variable compensation that rewards management risk-taking and short-term results. European policymakers insist that ESO broadens the role of employees and elevates their status. Thus, “engaging shareholders” can effectively improve corporate governance by enhancing transparency, responsibility, and competitiveness. The European Commission recommended that EU member states implement supportive policies, including developing a legal framework and the use of financial incentives to promote ESO.

The presence of employee ownership (including both managerial and non-managerial ownership), as recommended by the European Commission, might be an effective solution to enhance corporate governance. However, several concerns remain unresolved in the Commission's proposal. First, the literature on employee ownership mainly focuses on the impact of managerial ownership on firms’ risk-taking behavior and indicates mixed results. On the one hand, one can argue that since executive ownership aligns the interests of managers with those of shareholders, it might create a strong incentive for managers to adopt risky strategies, consistent with empirical studies of Saunders et al. (1990), Anderson & Fraser (2000), and Sullivan & Spong (2007). On the other hand, researchers based on the “employment and reputation risk” and “undiversified wealth” theories to predict that greater executive ownership leads to lower firms’ risk-taking. Because managers’ interest is to protect their reputation and position, managers' risk aversion behavior will be strengthened if they own shares, as shareholders may find it difficult to organize a vote against or replace shareholder-managers (Gordon & Pound,1990; Chang, 1990; Dhillon & Ramírez, 1994; Gamble, 2000).

Moreover, shareholder-managers also have incentives to take less risk to protect their undiversified personal portfolio. The negative relationship between executive ownership and firms' risk is supported by empirical studies of Agrawal & Mandelker (1987), May (1995), Chen et al. (1998), Jin (2002), and Sullivan & Spong (2007). Second, it remains unclear whether and how non-executive ownership can lead to lower firms' risk. The empirical literature examining the impact of non-executive employee ownership on firm risk-taking is scarce and only focuses on non-financial firms. Although Faleye et al. (2006) and Bova et al. (2015) find a negative link between risk and non-executive employee stockholding, the incentive and ability of non-executive employees to counteract the decisions of executive employees that aim to undertake risky strategies have not been thoroughly addressed. Third, the Commission's proposal does not distinguish between non-financial firms and banking firms. Since banks are more complex and opaque than firms due to their specific regulation and highly leveraged capital (Morgan, 2002), bank insiders have strong incentives to favor 'excessively' risky investments, with potential losses largely shifted to debtholders, the deposit insurer, and taxpayers (Galai and Masulis, 1976; Jensen and Meckling, 1976; Merton, 1977). If employee ownership can be an effective internal mechanism to enhance corporate governance in banking firms, it will help to reduce the risk of future financial crises. Last but not least, the European Commission recommended member states create supportive measures to promote ESO. However, policymakers do not consider the fact that ESO, which turns employees into shareholders, changes the balance of power between insiders (managers and majority shareholders) and outsiders (minority shareholders). Since the conflict of interest between different stakeholders in banks is more intense than that in non-banking firms, whether supportive measures recommended by the Commission are effective to promote ESO in banking firms needs to be addressed.

In **Chapter 1**, we investigate whether employee share ownership may influence the risk-taking behavior of European banks. Since no one, even non-executive directors, can better understand a bank's operations than its managers and employees, if employee ownership can increase managers' and employees' risk aversion, it will be an ideal mechanism to manage bank risk appetite and tolerance from inside. Therefore, understanding banks' risk-taking behavior under the effect of employee ownership can help policymakers create an additional tool to reduce banks' excessive risk-taking.

Using a sample of all European banks contained in the EFES (European Federation of Employee Share Ownership) database for the period from 2005 to 2017, we find that the total employee ownership, as well as each of its components (executive and non-executive

ownership), significantly reduce banks' insolvency risk. Still, they have a neutral effect on banks' profitability. Our paper is the first to investigate whether non-executive ownership, in addition to executive ownership, has an impact on bank risk-taking. Moreover, our results shed light on the channels through which employee ownership affects a bank's risk. We demonstrate that executive ownership and non-executive ownership lead to a lower level of non-performing loans ratio. Our findings provide evidence that employee ownership strengthens the motivation of bank employees (both executive and non-executive employees) to better monitor credit risk by reducing the adverse selection problem in granting loans.

Further investigation shows that employee ownership is not equally effective in reducing bank risk in all circumstances. We find that the effect of both executive and non-executive ownership is reduced in banks with higher numbers of employees, consistent with the free-rider problem theory. The effect of non-executive ownership is reinforced, but executive ownership is not influenced by employee representation on the board. However, the impact of executive ownership will be reduced if ESO grants stock options. This is consistent with the evidence from existing literature that while owning shares increases executives' risk-aversion, owning share options incentivizes them to take risks. Our further investigation also indicates that executive and non-executive employee ownership reduce bank risk but (i) only in countries with higher levels of minority shareholder protection and (ii) only in normal times but not during crisis times.

Chapter 2 complements Chapter 1 by examining the national supportive policy's effectiveness to promote employee share ownership programs (ESOP) in European banks. Since 2012, the Commission has included the promotion of employee share ownership in its action to reform European company law and corporate governance. Because the state incentives would be a significant breakthrough to promote ESOP in Europe (European Commission, 1997), the Commission recommended that EU member states focus on supportive measures such as constructing a legal framework to facilitate the implementation of different types of ESOP and increasing financial incentives to attract companies and employees to participate in ESOP.

Examining the ESOP adoption of listed banks in sixteen western European countries, our results show that supportive measures implemented by policymakers effectively promote ESOP in the banking sector. However, their effectiveness depends on the bank's ownership structure and opacity and the level of shareholder protection of the country where the bank is located. We find that supportive measures effectively promote ESOP in widely-held banks independently of bank opacity and shareholder protection. Still, they only promote ESOP in

closely-held banks if banks are transparent or located in countries with stronger shareholder protection. Our findings provide evidence for the role of ESOP as a game-changer in agency conflicts. ESOP that turns employees into shareholders will change the balance of power between insiders (managers in widely-held banks and majority shareholders in closely-held banks) and outsiders (minority shareholders). The complex interplay of agency problems faced by stakeholders in both widely-held and closely-held banks will then influence the effectiveness of the ESOP supportive measures. Our research provides practical implications for policymakers to improve bank transparency and shareholder protection to promote ESOP in banks.

Another solution to promote good corporate governance in banking firms, which policymakers have increasingly recognized, is to enhance the role of market discipline in safeguarding financial stability. Pillar 3 of the Basel 2 framework (Bank for International Settlements, 2006) and the new resolution mechanisms designed by the Financial Stability Board (FSB, 2013) emphasize that the goal of involving market discipline in the banking industry is to use private investors as monitoring agents, in an attempt to mitigate excessive risk-taking behavior. Indeed, policymakers are acutely aware that complex large banking organizations are increasingly difficult to monitor and control using the traditional supervisory toolkit**,** and therefore look towards market disciplinary forces as a complement to the monitoring provided by supervisory agencies (Bliss and Flannery, 2002, 2019).

Market players can exert discipline on banks via two channels: a direct channel, which corresponds to the direct influence of the market on bank's behavior; and an indirect channel corresponding to the fact that supervisors use the assessment of bank's risk by the market. The existing empirical literature on market discipline in the banking industry has focused mainly on evaluating the efficacy of indirect market discipline, i.e., the ability of market participants to price actual changes in bank risk. Most studies find that investors can accurately price risks (e.g., Longstaff et al., 2005; Curry et al., 2008; Balasubramnian and Cyree, 2011; Bennett et al., 2015; Cutura, 2018; Francis et al., 2019). Less research has been undertaken on the efficacy of direct discipline to shape bank risk-taking, and mixed results are documented. Some studies find that market participants are not able to influence managerial actions (Bliss and Flannery, 2002) while others provide evidence that market participants can discipline banks, with however the condition that banks do not benefit from implicit government guarantees (Nier and Baumann, 2006) or that market participants can control bank behavior, for example through either equity positions or restrictive covenants (Ashcraft, 2008). The existing literature

does not provide clear evidence that direct market discipline could effectively complement supervisory discipline.

Among bank stakeholders, bondholders' preferences are most clearly aligned with supervisors' for exerting direct discipline that could help prevent banks from taking such excessive risks (Bliss and Flannery, 2019). Unlike shareholders who have a residual claim on the company's income and assets, bondholders receive fixed interest payments regardless of the company's performance. Consequently, bondholders have high motivation in monitoring and reducing excessive bank risk-taking. However, one of the most critical challenges is determining which instruments are likely to help bondholders influence bank behavior and efficiently achieve this. Ashcraft (2008) finds that covenants provide subordinated debtholders with means to limit bank risk-taking ex-ante. This result is in line with the theoretical literature showing that debt covenants can reduce default risk ex-ante by better aligning the interests of shareholders and managers with those of bondholders and by prohibiting actions that might increase the likelihood of distress (Smith and Warner, 1979; Holmström and Myerson, 1983). However, existing literature also points to drawbacks of debt covenants. Because covenants impose potential costs on both lenders and borrowers ex-post, borrowers are often willing to accept higher interest rates in return for looser covenants. Consequently, covenants may imply inefficient outcomes in some states of the world and may increase default risk ex-post (Holmström and Myerson, 1983).

Chapter 3 proposes and assesses the effectiveness of an alternative mechanism of bondholders' market discipline. A potential alternative mechanism to boost the effectiveness of direct market discipline, which has not yet been addressed by existing literature or corporate reform initiatives, is the role of bondholders in influencing managerial decisions through their representatives on the company's board of directors. Since the board has ultimate responsibility for the bank's business strategy and financial soundness, as well as risk management and compliance obligations (BIS, 2015), if bondholders have their representatives on the board of directors, they could exert direct influence as they have the means to monitor and advise managers and ensure that the bank is run in their interest. Moreover, the presence in the boardroom should provide bondholders with more detailed, current, and forward-looking information about banks **(**Stearns and Mizruchi, 1993). This will alleviate information problems between bondholders and borrowing banks, thus improving the monitoring function of bondholders. Therefore, bondholders' direct discipline through their representatives on a bank's board should be considered a potential mechanism for strengthening corporate governance, particularly in overseeing risk management.

However, since Corporate Governance Codes in many countries have already relied on the presence of independent directors as a mechanism to improve corporate credibility and governance standards, one might question the relevance of the presence of bondholder representatives on a bank's board. Indeed, the presence of bondholder representatives on the board of directors of banks can be seen as an innovative corporate reform initiative to reduce bank risk only if it differs from the presence of independent directors suggested by Corporate Governance Codes.

Using a unique dataset of board ties between European listed financial institutions and their bondholders over the period 2017-2019, we find that the influence of bondholder representatives on the board of banks significantly reduces all dimensions of bank risk considered without a decrease in profitability. Further investigations show that the observed reduction of individual risk is independent of the competing interest of bondholder representatives, levels of capitalization, opacity, and complexity of banks, and the regulatory experience of directors. However, the influence of bondholder representatives on the banks' board has a stronger impact on both individual and systemic risk when banks display higher levels of opacity and global systemically important banks (G-SIBs). We furthermore find that having bondholder representatives without conflict of interest, with regulatory experience and a critical number of them also has a more significant reducing impact on individual bank risk. Moreover, we show that the independence of bondholder representatives from the management board or shareholders does not seem to be a critical factor in reducing bank risk we found previously. Therefore, directors' independence is not better for financial stability, but instead, those directors are affiliated with bondholders.

CHAPTER 1

Executive and non-executive ownership and bank risk: Evidence from European Banks

This chapter draws from the working paper “Executive and non-executive ownership and bank risk: Evidence from European Banks” co-authored with Laetitia Lepetit and Thu Ha Tran.

1.1. Introduction

Employee ownership has expanded considerably in Europe due to the European Union policy to encourage financial participation in enterprises by employees for nearly thirty years. This policy is based on the expected positive effects of employee ownership on corporate governance by increasing information sharing, company transparency, and employee participation in decision-making. In 2020, 88% of large European firms had employee share plans of all kinds, and 53% had broad-based plans allowing executive employees and non-executive employees to hold outstanding shares of a firm (European Federation of Employee Share Ownership, 2020). For most European firms, employee share ownership applies not only for executive directors and key managers but also for all other employees. Banking firms facing capital requirements make proportionally more use of employee ownership plans than non-financial firms as it can be a way to augment their capital, particularly for banks with limited access to external capital (Mercer Capital & Corporate Capital Resources, 2011). In this context, our objective is to empirically examine whether the possibility for banks to develop ownership plans not only for executives but also for non-executives employees does not contribute to increasing banking risk and, therefore, financial instability. Whether executive and non-executive employee ownership influence bank risk-taking is a question with important implications for the financial regulatory environment as the failure of a variety of internal governance mechanisms has been highlighted as a significant contributing factor to the last global financial crisis (Kirkpatrick, 2009; Basel Committee on Banking Supervision, 2010).

An extensive literature examines the influence of CEO and managerial stock ownership on firms' risk-taking behavior, providing mixed results in line with the two opposite hypotheses regarding executive stock holdings and risk. The first hypothesis posits that executive ownership aligns the interests of CEO and managers with those of shareholders, creating a strong incentive to implement risky strategies. The motivation to favor 'excessively' risky investments is stronger in the case of banking firms as potential losses are largely shifted to the deposit insurer and/or taxpayers (Jensen & Meckling, 1976; Merton, 1977). In contrast to the risk-taking hypothesis, however, executive ownership may be negatively related to risk. First, according to the "employment and reputation risk" theory, CEO/managers are risk-averse as they will lose their current employment and can be hurting in their future potential employment and earnings in case of bankruptcy (Jensen & Meckling, 1976; Amihud & Lev, 1981). Moreover, the management entrenchment theory indicates that CEO/managers' risk aversion behavior is strengthened if they own shares, as shareholders may find it challenging to organize a vote against management proposals (Gordon & Pound,1990; Chang, 1990; Dhillon &

Ramírez, 1994; Gamble, 2000). Second, the "undiversified wealth" theory indicates that shareholdings can make executives and managers more risk-averse than common shareholders. It is based on the argument that when ownership increases, the CEO/managers' portfolio becomes less diversified. They are more likely to foster strategies that mitigate risk than shareholders who hold well-diversified portfolios. Few empirical studies find results in line with the risk-taking hypothesis (Saunders et al., 1990; Anderson & Fraser, 2000; Sullivan & Spong, 2007), while several empirical studies support the alternative hypothesis of a reducing risk effect of executive ownership either for non-financial firms (Agrawal & Mandelker, 1987; May, 1995; Jin, 2002) or banking firms (Chen et al., 1998; Sullivan & Spong, 2007).

The consequences for banking risk of having broad-based ownership plans with non-executive employees holding shares are not a clear-cut issue conceptually, which has not been examined on a theoretical level to date. Non-executive employees could collectively have an advantage in monitoring bank risk by having access to timely information on their firms due to their participation in daily operations, the implementation of bank policies, and interactions with customers. If non-executive employees voluntarily decide to take an ownership stake, they hold a residual claim in addition to their fixed claims (their wage), and a voice in corporate governance. Non-executive employees can use their corporate governance voice to maximize their fixed claim and their equity-based claim. On the one hand, if non-executive employees' equity claims are smaller compared with their fixed claims, they are likely to press managers to take decisions that maximize in priority fixed claims (Jensen & Meckling, 1976). Non-executive employees might derive substantial incentives from job security to discourage managers from investing in projects with high levels of risk and reduce the likelihood of banks going into bankruptcy. On the other hand, if the level of their stockholding is relatively small and does not represent a large proportion of their wealth, non-executive employees might have incentives to take more risk. The incentive to favor risky investments could be reinforced in the case of banking firms where there is a strong wealth transfer from debtholders to stockholders. To date, the empirical literature analyzing the relationship between non-executive employee stockholding and firm risk-taking is very scarce and only focuses on non-financial firms. Faleye et al. (2006) prove that US non-financial firms with large employee ownership take fewer risks than other firms. Bova et al. (2015), also considering US non-financial firms, further find a negative link between risk and non-executive employee stockholding.

Whereas the European Commission and policy-makers in many other countries have recommended promoting broad-based ownership plans in non-financial and financial firms to

enhance firm productivity and performance, no relevant academic contributions underpin the impact of such recommendations on bank risk-taking behavior. A key question for banking regulators is to determine whether banks that have implemented an ownership plan with potentially both executive and non-executive stockholding can do so without increasing bank risk. To our knowledge, this is the first paper to investigate whether non-executive ownership, in addition to executive ownership, has an impact on bank risk-taking. Suppose both executive and non-executive ownership lead to an increase in bank risk-taking. In that case, implementing employee ownership plans in banks, especially broad-based plans, could reinforce the agency conflict between shareholders and debtholders/regulators. On the contrary, if executive and non-executive stockholding are associated with lower banking risk, the democratization of employee ownership plan could be an important internal corporate governance mechanism to help supervisors discipline and regulate banking risk.

We also explore two factors related to the ability of executive and non-executive employees with stockholding to influence banks' risk-taking behavior. First, the effect of employee ownership on bank risk could depend on their representation on the board of directors. If employees have board representation, they can ensure that the bank is run in their interest. Second, we examine whether the level of minority shareholder protection affects the impact of executive and non-executive employee ownership on risk. For that, we consider how strongly the legal system favors minority shareholders vis-a-vis large shareholders in the corporate decision-making process, including the voting process.

Next, we investigate whether the effect of executive and non-executive employee ownership on bank risk depends on their incentive to take more risk or to monitor the bank. First, a majority of banks offering ownership plans to their employees also have a stock option plan. Although both stock ownership and stock option plans are equity ownership, the former represents current ownership and the latter future ownership. As the eventual value of a stock option is tied to the value of the bank, stock option plans expose employees to a larger degree of risk than stock ownership plans. The existing literature provides evidence that stock option plans for executives lead to higher risk (e.g., Sanders, 2001 for non-financial firms and Chen et al., 2006 for banking firms). Chang et al. (2015) further find that non-executive employee stock options provide employees incentives to take more risk in the innovation process. Therefore, we need to explore if the presence of a stock ownership plan could modify the way employee ownership plan affects bank risk. Second, the existing literature suggests that non-executive ownership may increase cooperation or favorize mutual monitoring among employees (Baker et al., 1988; Drago & Garvey, 1998). Alternatively, broad-based employee

ownership plans are often accused of stimulating free-riding behaviors, especially in firms with a large number of employees (Oyer, 2004). We, therefore, examine whether the link between bank risk and employee ownership depends on the number of employees in banks. We also determine whether employee ownership played a particular role during the global financial crisis. The presence of executive and non-executive employee ownership could lead to lower levels of risk during crisis times if employees have incentives to pursue risk-reducing strategies because of their desire to maximize job security.

To investigate the effect of executive and non-executive employee ownership on bank risk, we use the information contained in the European Federation of Employee Share Ownership (EFES) database. This database provides detailed information on employee ownership plans for a sample of 153 banks from 25 European countries over the period 2005 to 2017. We are careful in allowing for the endogeneity issues pervading in all empirical studies relating corporate governance aspects to firm risk. One could argue that bank risk may impact a bank's employee ownership plan design. We deal with this potential reverse causality problem by employing an instrumental variables (IV) approach to model employee ownership in the first-stage regression. We propose a novel instrument variable that may have applications in future studies on employee ownership. We use an index measuring the long-term orientation of employees as an instrument for the proportion of employee ownership. The rationale for our instrument is that since shares in employee ownership programs are gradually vested to employees' accounts, the level of employee ownership depends on two factors: the accumulated employee ownership through the years and the employees' willingness to keep (not sell out) shares after being granted. We proxy these two factors respectively by the first year of employee ownership implementation and Hofstede's long-term orientation index that measures the extent to which society looks forward to the future rather than resorting to the past. Our instrument, therefore, exploits differences in the culture oriented towards future rewards, in particular perseverance and thrift of people in a country. Importantly, we conduct additional tests to assess the conceptual underpinnings of our IV approach.

Using the long-term orientation index as an instrument for the proportion of employee ownership in two-stage least squares (2SLS) regressions, we find that an increase in executive and non-executive employee ownership leads to a decrease in insolvency risk and overall bank risk. Therefore, our results provide evidence that holding outstanding shares gives incentives to both executive and non-executive bank employees to pursue strategies that reduce risk, in line with the "undiversified wealth" hypothesis. However, our results show that the risk-reducing effect of both executive and non-executive employee ownership exists only in banks

with a smaller number of employees, indicating that the free-rider effect intensifies as the number of employees increases. We further find that employee representation on the board of directors does not impact the risk-reducing impact of executive employee ownership. In contrast, it amplifies the risk-reducing effect of non-executive employee ownership. Our results also provide evidence that combining an employee ownership plan with a stock option plan provides incentives to pursue strategies that increase bank risk but only for executive employees. We furthermore only observe a decrease in bank risk for higher levels of executive and non-executive employee ownership in countries with higher levels of minority shareholder protection. Further investigations show that executive and non-executive employee ownership reduce bank risk in normal times but not during crisis times (except for the stock market volatility).

Our contributions to the literature are as follows. First, to the best of our knowledge, this study is one of the first to examine the impact of non-executive employee ownership in addition to executive ownership on bank risk. In contrast, the existing literature focuses on executive employee ownership. As some studies on non-financial firms suggest that non-executive employees should not be marginalized, our findings provide valuable empirical support that both executive and non-executive employees' incentives could help mitigate the agency conflict between debtholders/regulators and shareholders. Second, our paper points out the critical role of employee ownership in banks' internal corporate governance structure. Our findings highlight that both executive and non-executive ownership are an effective and economically important mechanism within the corporate governance framework of banks. Third, we contribute to the literature by proposing a new method to identify the causal effects of employee ownership on risk. Our novel IV approach can be used to complement and validate existing empirical evidence and provide a framework for future research on the impact of executive and non-executive employee ownership on risk.

The remainder of the paper is organized as follows. Section 2 describes our sample, defines the variables of interest, and provides some descriptive statistics. Section 3 presents the methodology used to conduct our empirical investigation and discusses our main results. Section 4 discusses further investigations; Section 5 contains robustness checks, and Section 6 concludes the paper.

1.2. Sample and data description

1.2.1. Data sources and sample selection

We use the information provided by the European Foundation of Employee Share Ownership (EFES) on employee ownership plans on European firms over the period 2005-2017. The EFES presents data on employee ownership based on information produced by firms themselves in Annual Reports. The data set comprises all listed companies whose market capitalization was 200 million euros or more in any one year between 2005 and 2017, regardless of whether these firms had any employee ownership or not. The EFES database also provides information for some non-listed companies whose employees own 50% or more of the company when employing 100 persons or more. In 2017, the EFES database covered 25% of all European listed companies, but 99% of the whole capitalization and 95% of employment.

The EFES database provides information on 153 commercial banks and bank holding companies from 25 European countries, all listed on the stock market. We assemble data on financial statements from Bloomberg for these 153 banks for the period 2005-2017. Table A1 in the Appendix presents a breakdown of banks by country. On average, our sample covers around 82.93% of banks' total assets of all listed banks covered by Bloomberg in 2017. The number of banks from Switzerland accounts for the most significant proportion, with 17.65% of the sample. The number of banks from each of the other countries represents less than 15% of the sample.[2]

1.2.2. Employee Ownership

We first measure the percentage of shares held by all employees; the total employee ownership, $EO_{i,j,t}$, is defined as the proportion of shares held by employees, including executives and non-executive employees. We then differentiate executive and non-executive employee ownership with the two following variables: (i) $EO\_Exe_{i,j,t}$ is the proportion of shares held by executive directors and key managers; and (ii) $EO\_NonExe_{i,j,t}$ is the proportion of shares held by non-executive employees. All variables are defined in Table 1 with corresponding descriptive statistics.

1.2.3. Risk measures

We consider five standard measures of individual bank risk. We first consider a measure of insolvency risk computed with accounting data: the logarithm of the traditional time-varying

[2] We test the robustness of our results by excluding banks from Switzerland and find similar results (see Section 5).

Z-score measure ($Zscore_{i,j,t}$).[3] We alternatively consider a measure of insolvency risk using market data: the distance to default ($DD_{i,j,t}$)[4] following the methodology developed by Merton (1977). Note that the higher the Z-score and the distance to default, the lower is default risk. We also consider another measure of risk using market data: the stock return volatility ($Volatility_{i,j,t}$). Finally, we consider two other measures of risk based on accounting data: the standard deviation of ROA ($SDROA_{i,j,t}$), and the ratio of non-performing loans to total assets ($NPL\_TA_{i,j,t}$) as a proxy of the quality of a bank's credit policy.

1.2.4. Descriptive statistics

We observe from Table 2 that, on average, around 75% of the European banks of our sample have an employee ownership plan (EOP), with a decreasing number of banks without official EOP over the period from 38% to 13%.[5] We further observe from Table 2 that on average, around 53% of banks have a broad-based EOP. In comparison, only 3% of banks have an EOP limited to executive directors, 12% to executive directors and key managers, and 8% to executive directors, key managers, and selected employees. The number of banks with a broad-based EOP substantially increases over the period 2005-2017 from 45% to 58%.

Descriptive statistics from Table 1 show that, on average, the proportion of shares held by total employees in our sample is 2.59%. The average ownership stakes of executives and non-executive employees are 1.54% and 1.05%, respectively. We further observe from Table 2 that the proportion of shares held by non-executive employees is higher than those of executives in banks having broad-based EOP.

[3] The Z-score is defined as $(\mu_{ROA,t} + car_t)/\sigma_{ROA,t}$, where $\mu_{ROA,t}$ and $\sigma_{ROA,t}$ are the 3-year rolling windows average and standard deviation of return on assets, respectively, and *car* is the equity to total assets ratio at the date t. As the Z-score risk measure is highly skewed, we use its natural logarithm (Lepetit and Strobel, 2015).

[4] We use 10-year government bond rates of each country for the risk-free rate (as one-year rates are not consistently available); the volatility measure is constructed as the annual volatility of daily stock returns.

[5] Banks with no official ownership plan can apply phantom shares or share bonus plan that grant shares to employees with, however, no voting rights.

Table 1: Definitions, data sources and summary statistics for variables. This table provides all variables definition, summary statistics for the full sample over the period 2005-2017

Variable name	Definition	Source	Mean	Median	Min	Max	Std. Dev.
The dependent variable							
ZScore	The logarithm of the traditional time-varying Z-score. Measure of bank's solvency, defined as the logarithm of $(\mu_{ROA,t} + car_t)/\sigma_{ROA,t}$, where $\mu_{ROA,t}$ and $\sigma_{ROA,t}$ are the 3-year rolling windows average and standard deviation of return on assets, respectively, and *car* is the equity to total assets ratio at the date t. A higher Z-score indicates that a bank has a lower risk of insolvency. As the Z-score risk measure is highly skewed, we use its natural logarithm (Lepetit and Strobel, 2015).	Bloomberg	3.68	3.72	0.05	6.56	1.22
Volatility	Standard deviation of monthly stock returns over the previous twelve months (%)		7.83	0.04	0.0004	151.58	21.25
DD	Distance to default computed using the Merton (1977) model.		3.88	3.55	0.08	11.42	2.17
SDROA	Standard deviation of the return on assets		0.0064	0.0019	0.0001	0.0797	0.0304
NPL_TA	The non-performing loan ratio is measured by dividing non-performing loans by total assets to proxy bank credit risk		0.03	0.01	0.000015	0.31	0.05
TobinQ	Book value of assets minus the book value of equity plus the market value of equity, divided by the book value of assets. It reflects the market's assessment of the cost to replace a firm's assets.		1.02	1.00	0.88	1.42	0.08
ROA	Return on assets, net income divided by total assets (%)		0.007	0.005	-0.04	0.06	0.01

DD-naïve	Distance to default is computed in a simpler way as in Bharath and Shumway (2008).	Bloomberg	1.85	1.46	0.21	4.89	1.45
MDZ-score	$\frac{\bar{R}+1}{\sigma}$, where $\bar{R}$ and σ are respectively the mean and the standard deviation of the daily returns R_t for a given year	Bloomberg	56.70	53.00	25.77	99.48	23.44
The variables of interest							
EO	Total employees' stake in ownership structure (%)	EFES (European Federation of Employee Share Ownership) database	2.59	0.39	0	66.62	7.38
EO_Exe	Executives' stake in ownership structure (%)		1.54	0.03	0	65	6.97
EO_NonExe	Non-Executives' stake in ownership structure (%)		1.05	0.14	0	34.2	2.14
The instrumental variable							
LT Orientation index	Long term orientation index: Sum up the scale score of the two components (see below).		10.58	10.5	2	20	4.46
	The first component is the first year of employee ownership implementation. We scale banks in the sample using the first year of employee ownership implementation. The scale score varies from 1 to 10. A score of 1 is for the banks that have implemented employee ownership programs most recently. A score of 10 is for banks that have implemented employee ownership programs the longest.	EFES (European Federation of Employee Share Ownership) database	2000.79	2000	1973	2017	8.67
	The second component is the Hofstede's long-term orientation score by country. Hofstede's long-term orientation score, which is based on survey data, measures the willingness of people to delay short-term material or social success or even short-term emotional gratification to prepare for the future. The higher the score is, the	(Hofstede, 1980, 2001; Hofstede et al., 2010)	56.11	60	24	83	15.78

	more the country has a cultural perspective valuing persistence, perseverance, and saving. We scale countries in our sample by Hofstede's long-term orientation score. The scale score varies from 1 to 10. A scale score of 1 is for the banks in countries that are in the first decile of Hofstede's long-term orientation score. A scale score of 10 is for banks in countries that are in the 10th decile of Hofstede's long-term orientation score.						
Control variables							
Size	Natural logarithm of total assets	Bloomberg	10.29	9.94	6.16	14.74	2.11
GrowthTA	Annual growth rate of total assets (%)	Bloomberg	0.08	0.04	-0.26	1.04	0.21
Loan	Gross loans divided by total assets (%)	Bloomberg	60.03	64.53	3.07	94.51	21.50
Deposit	Deposits divided by total assets (%)	Bloomberg	55.05	55.85	6.34	94.15	19.05
Operating	Total operating expenses divided by total operating income (%)	Bloomberg	3.10	1.96	-19.48	44.52	7.16
Capital	Total equity divided by total assets (%)	Bloomberg	8.37	7.15	1.44	37.08	5.16
Opacity	Measure of four components of opacity: (EF) measures the disconnection between insiders' and outsiders' information about firms' financial condition by computing the analyst forecast error; (EM) measures accounting opacity and is computed by the degree of earnings management of banks; (MF) is the negative of the ratio of short term and long term market funding to total assets measuring banks' exposure to the market; (Loan) loans in total assets. Then, each component is associated with the value of 1 to 10 corresponding to the decile of 1 to 10. After that, we sum up the four proxies, then divide it by four to scale the composite index.	Bloomberg Following the methodology of Lepetit et al. (2017)	5.47	5.5	1.5	9	1.34

	This index ranges from 1 to 10. The most transparent bank has a value of 1 and the most opaque bank has a value of 10.						
d_Control	The dummy takes a value of 1 if a bank has at least one controlling shareholder; 0 otherwise. We follow the existing literature (La Porta et al., 1999; Claessens et al., 2000; Faccio & Lang, 2002) by using the controlling threshold of 20% of outstanding shares to distinguish between widely-held and closely-held banks. If a bank has at least one shareholder who owns at least 20% of its outstanding shares, it will be classified as a closely-held bank; it will be classified as a widely-held bank, otherwise.	S&P Capital IQ	0.35	0	0	1	0.47
GDP	The growth rate of the gross domestic product	World Bank	1.62	1.81	-5.69	8.49	2.55
Further variables							
d_BoardRepresentative	The dummy takes a value of 1 if a bank has employee representatives on its board; 0 otherwise.	EFES (European Federation of Employee Share Ownership) database	0.30	0	0	1	0.46
d_HighSHProtect	The dummy takes a value of 1 if a bank is located in a country with high level of shareholder protection (SHProtect index); 0 otherwise. The index SHProtect is the product of Revised Anti-Director Index (RADI) and index of Rule of Law (RoL). RADI: Index measuring shareholder protection, with range 0 to 5. RoL: Index measuring the quality of law enforcement.	Djankov et al. (2008) Worldwide Governance Indicators (World Bank)	0.49	0	0	1	0.50
d_Option	The dummy takes a value of 1 if a bank grants share options to its employees; 0 otherwise.	EFES (European Federation of Employee	0.52	1	0	1	0.49

		Share Ownership) database					
d_HighEmp	The dummy takes a value of 1 if a bank has the number of employees higher than the median of the group; 0 otherwise.	Bloomberg	0.49	0	0	1	0.50
d_Crisis	The dummy takes a value of 1 for the years during the global financial crisis (2008-2011); 0 otherwise.		0.31	0	0	1	0.46
Individualism	The individualism/collectivism dichotomy personifies the distinction between collective (group-based) and individual-based decision making. When individualism is low, there is priority for group effort to achieve success. When it is high, there is priority for individual needs and achievements. Individuals in an individualistic culture are likely to challenge authority and encourage a reduction of power differences between management and employees. However, individuals in a collectivist culture are likely to protect the well-being of the group and less challenge managers. We use the individualism score of each country constructed by Hofstede (2001). The higher the score is, the more individualism the country is.	Hofstede (2001)	65.80	68	27	89	13.67

Table 2. Executive employee ownership and non-executive employee ownership statistics broken down by year and employee ownership type

This table reports the proportion of banks without and with employee ownership. In the second group, this table displays the proportion of banks, the average of executive employee ownership and non-executive employee ownership broken down by employee ownership type. Type 1: Banks only grant shares for executive directors. Type 2: Banks grant shares for executive directors and key managers. Type 3: Banks grant shares for executive directors, key managers, and selected employees. Type 4: Banks grant shares for all employees (Broad-based).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average
%_Banks without EO	38	33	31	29	28	26	24	24	24	20	16	14	13	25
%_Banks with EO	62	67	69	71	72	74	76	76	76	80	84	86	87	75
%_Banks with Type 1	1	1	1	1	1	3	3	3	3	3	4	6	6	3
EO_Exe (%)	5.81	7.48	7.17	8.8s2	8.87	9.09	9.16	8.63	8.79	8.82	8.84	8.85	9.04	8.41
%_Banks with Type 2	10	11	11	11	11	11	11	11	11	14	15	15	15	12
EO_Exe (%)	2.01	2.03	1.83	2.23	1.29	1.52	1.11	1.14	1.09	1.08	0.95	0.94	0.48	1.36
%_Banks with Type 3	7	7	7	7	7	7	8	8	8	8	8	8	8	8
EO_Exe (%)	3.06	3.05	3.17	3.21	3.42	3.48	3.49	3.39	3.39	3.41	3.39	3.40	3.42	3 .33
EO_NonExe (%)	0.90	0.67	0.70	0.65	0.76	0.73	0.73	0.68	0.67	0.82	0.81	0.82	0.78	0.75
%_Banks with Type 4	45	48	50	52	52	53	54	54	55	56	57	58	58	53
EO_Exe (%)	1.13	1.53	1.07	1.11	0.98	1.17	1.21	1.09	0.92	0.63	0.61	0.61	0.59	0.97
EO_NonExe (%)	1.99	1.75	1.90	1.78	1.57	1.40	1.43	1.47	1.41	1.32	1.29	1.23	1.26	1.52
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	

1.3. Effect of employee ownership on risk

1.3.1. Empirical specification

To examine whether employee ownership impacts banks' risk-taking, we run two-stage least squares (2SLS) regressions by using the long-term orientation index of employees as an instrumental variable for the proportion of employee ownership. The equation of the second stage of the two-stage least squares (2SLS) regressions are as follows:

$$Y_{i,j,t} = \beta_0 + \beta_1 EmployeeOwnership_{i,j,t} + \sum_m \theta_m BankControl_{i,j,t} + \sum_n \Upsilon_n CountryControl_{jt} + \varepsilon_{i,j,t} \quad (1)$$

where the subscript *i* denotes the bank, *j* the country, *t* the time period, and $\varepsilon_{i,j,t}$ denotes the idiosyncratic error term. $Y_{i,j,t}$ is the dependent variable that stands for bank risk measured alternatively by the logarithm of the Z-score ($ZScore_{i,j,t}$), the Distance to Default ($DD_{i,j,t}$), the bank's stock return volatility ($Volatility_{i,j,t}$), the standard deviation of ROA ($SDROA_{i,j,t}$), and the non-performing loans ratio ($NPL\_TA_{i,j,t}$). $EmployeeOwnership_{i,j,t}$ denotes the proportion of employee ownership of the bank *i* in the year *t* that alternatively stands for the proportion of shares held by all employees ($EO_{i,j,t}$), the proportion of shares held by executive employees ($EO\_Exe_{i,j,t}$), and the proportion of shares held by non-executive employees ($EO\_NonExe_{i,j,t}$). In the same regression, we do not include ownership for executive and non-executive employees as these two variables are strongly correlated for banks having a broad-based employee ownership plan.

We expect the coefficient associated with $EmployeeOwnership_{i,j,t}$ to be significant and negative for the two default risk measures ($ZScore_{i,j,t}$ and $DD_{i,j,t}$) and positive for the ratio of non-performing loans to total assets ($NPL\_TA_{i,j,t}$), the standard deviation of ROA ($SDROA_{i,j,t}$) and the stock return volatility ($Volatility_{i,j,t}$) if an increase in employee ownership (executive and non-executive) leads to an increase in risk, in line with the risk-taking hypothesis. On the contrary, our findings will be consistent with the "undiversified wealth" hypothesis if increased employee ownership reduces bank risk.

We control for bank characteristics ($BankControl_{i,j,t}$) and countries' characteristics ($CountryControl_{jt}$) that can affect risk. For banks characteristics, we consider the size ($Size_{i,j,t}$), the growth of total assets ($GrowthTA_{i,j,t}$), the gross loans divided by total assets ratio ($Loan_{i,j,t}$), the total deposits divided by total assets ratio ($Deposit_{i,j,t}$), the total operating expenses divided by total operating income ratio ($Operating_{i,j,t}$), capital leverage ($Capital_{i,j,t}$), and degree of opacity ($Opacity_{i,j,t}$). We follow Lepetit et al. (2017) to construct an opacity index,

with transparent banks having an index value of 1 and the most opaque bank having 10. We also control for the ownership structure of banks as Laeven and Levine (2009) provide evidence that more powerful shareholders tend to take greater risks. For that, we use data provided by S&P Global Market Intelligence to identify the controlling shareholders for each bank and each year. We follow the existing literature (La Porta et al., 1999; Claessens et al., 2000; Faccio & Lang, 2002) by using a control threshold of 20% of outstanding shares to distinguish between widely-held and closely-held banks where at least one shareholder owns at least 20% of shares. We compute the dummy variable $d\_Control20_{i,j,t,}$ taking the value of one for closely-held banks and zero otherwise. Finally, we introduce GDP growth rate ($GDP_{,j,t}$) as a country-level control variable. All control variables are defined in Table 1 with corresponding descriptive statistics.

Table A.2 in Appendix A displays the correlation coefficients and collinearity diagnostics between our variables of interest (see Panel A). We ensure the absence of multicollinearity problems by computing the variance inflation factors (VIF), which have a mean value of 1.06 with a maximum of 1.92 (see Table A.2 Panel B).

1.3.2. Endogeneity issues and estimation methodology

One may be concerned that if employee ownership could affect bank risk-taking, it is also possible that the level of bank risk is a factor influencing employees' decision on whether or not to participate in an EOP. There is, therefore, a potential reverse causal relationship between employee ownership and bank risk that could produce biased results in an empirical analysis.

To address the potential endogeneity issue between bank risk and employee ownership, we perform an instrumental variable (IV) model using a two-stage least squares instrumental variable regression to model employee ownership in the first-stage regression. For that, we use a novel instrumental variable approach to tackle the challenge of capturing plausibly exogenous variation in the effect of employee ownership. We instrument the proportion of employee ownership of each bank by an index measuring the long-term orientation of employees.

The logic of our approach rests on the idea that since shares in EOPs are gradually vested to employees' accounts, two important factors should influence the level of employee ownership: the accumulated employee ownership through the years and the employees' willingness to keep and not sell out shares after being granted. First, we consider that the longer the EOP is, the higher the employee ownership should be. We then proxy this factor by the first year of employee ownership implementation of a bank. We scale banks in the sample using the first year of employee ownership implementation to obtain an index measuring the lifetime of

an EOP. We give a score of 1 for banks in the first decile that have most recently implemented EOPs, and 10 for banks in the last decile that have implemented EOPs for the longest time; we obtain an index varying from 1 to 10. Second, we proxy the willingness of employees to keep shares with Hofstede's long-term orientation score that refers to the time horizon people in a society display. More specifically, this index measures the willingness of people to delay short-term material or social success or even short-term emotional gratification to prepare for the future (see Table 1 for details). Countries with this cultural perspective value persistence, perseverance, and saving. For countries in our sample, Hofstede's long-term orientation score varies from 24 to 82; countries with higher scores have a more substantial long-term orientation. We scale this score to obtain an index per country that ranges from 1 to 10. We give the score of 1 for banks in countries in the first decile of Hofstede's long-term orientation score and a score of 10 for banks in countries in the 10^{th} decile of Hofstede's long-term orientation score. The higher the index, the more likely employees will hold shares as savings for the future. We then obtain an index measuring the long-term orientation of employees (*LT-OrientationIndex*$_{i,j,t}$) by summing up the index on the lifetime of EOPs and the index based on Hofstede's long-term orientation score. This index of the long-term orientation of employees varies by definition from 2 to 20. We expect that the higher this index is, the higher the level of employee ownership should be.

The first stage analysis of our instrumental approach explicitly tests this conjecture (see column (1) in Table 3 and column (1) and (2) in Table 4). Results show a strong positive relationship between the IV and the level of employee ownership when we consider either all employee ownership or executive and non-executive employee ownership.[6] This finding is consistent with our expectation that employees hold a higher proportion of shares in banks that have been implementing an EOP for a longer period of time and are located in countries with a stronger long-term orientation.

For each regression, we provide the first stage F-statistic on the instrument and the p-value related to the Anderson canonical correlation LM statistic for the instrument's relevance. We verify that all F-statistics are greater than 10, which passes the “weak instrument test” of Stock and Yogo (2005), and that we can reject the null of the Anderson canonical correlation LM test. This result, therefore, shows that our IV is empirically relevant.

[6] For brevity, these are only reported for *ZScore* as dependent variable; similar results are obtained for the other dependent variables considered in the second stage.

To address potential endogeneity issues caused by omitted variable bias, we use a large set of bank-level and country-level controls. We also introduce country and year fixed effects to control possible within-economy correlations that could bias our analysis.

1.3.3. Results

Table 3 presents the second stage regression results of our instrumental variables approach when we consider the total employee ownership (*EO*). Table 4 shows the results when considering alternatively executive employee ownership (*EO_Exe*), and non-executive employee ownership (*EO_NonExe*). These three employee ownership variables are instrumented with the index of the long-term orientation of employees presented above.

The three variables measuring the level of employee ownership (total employee ownership, executive and non-executive employee ownership) exhibit a significant positive association with the two measures of insolvency risks (*ZScore* and *DD*) and a negative association with the other measures of risk (*Volatility*, *SDROA*, and *NPL_TA*). Our results, therefore, show that both executive and non-executive employee ownership contribute to reducing bank risk, in line with the "undiversified wealth" hypothesis. These relationships are economically significant as well. Based on the Equation (1) results reported in column (5) of Table 4, the coefficient estimates imply that a one standard deviation increase in EO_Exe in the current period is associated with a (0.121*6.97)/2.17 = 0.388 percent increase in DD (i.e. a decrease in the default risk) in year t+1, expressed as a percent of mean levels of DD. A similar calculation based on the results reported in column (6) of Table 4 implies that a one standard increase in EO_NonExe increases DD by (0.478*2.14)/2.17 = 0.471 percent of the mean level of DD.

Overall, our results show that both executive and non-executive employee ownership are corporate governance mechanisms that can help to limit bank risk-taking. Both executives and non-executive bank employees seem to have incentives to reduce bank risk when they own shares. Therefore, our results do not support the risk-taking hypothesis that employee ownership creates a strong incentive to implement risky strategies, especially in the case of banking firms where potential losses could be largely shifted to the deposit insurer and/or taxpayers. Our results prove that policy-makers can reinforce their policy to democratize broad-based employee ownership plans for the banking industry without leading to more risk-taking.

However, this general result may conceal disparities in the effect of employee ownership across banks. Several factors related to the incentives and ability of executives and non-executive employees to reduce risk should be considered.

Table 3: The effects of the proportion of total Employee Ownership on bank risk (Equation (1))
This table reports 2SLS estimations of risk measures (ZScore, Distance to Default, Stock Volatility, Standard deviation of ROA, Non-performing loan ratio) on total employee ownership (EO) and control variables. The variable of interest EO is instrumented with the long-term orientation index. All regressions included country and year fixed-effects to control for possible within-economy correlations. All variables are as defined in Table 1. The corresponding t-statistics are reported in parentheses. Significance levels are indicated by ∗, ∗∗, and ∗∗∗ and correspond to the 10%, 5%, and 1% significance levels, respectively. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Dependent variable	EO	ZScore	DD	Volatility	SDROA	NPL_TA
	(1)	(2)	(3)	(4)	(5)	(6)
	1st Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage
EO		0.0505***	0.0969***	-0.0247***	-0.000217**	-0.00595***
		(2.74)	(3.41)	(-2.79)	(-2.33)	(-3.29)
LT-OrientationIndex	0.396***					
	(7.73)					
Size	-0.963***	0.0810**	-0.0380	-0.0219	-0.000630***	0.00171
	(-8.28)	(2.44)	(-0.78)	(-1.38)	(-3.77)	(1.12)
GrowthTA	2.260**	0.0978	-0.281	0.222**	-0.000697	-0.0103
	(2.43)	(0.50)	(-1.03)	(2.40)	(-0.71)	(-1.25)
Loan	-3.594***	0.751***	1.285***	-0.280***	-0.000501	0.0637***
	(-3.80)	(3.82)	(4.59)	(-2.93)	(-0.50)	(6.76)
Deposit	-5.227***	0.531**	0.892**	0.0977	-0.00255**	-0.0502***
	(-4.40)	(2.10)	(2.45)	(0.81)	(-2.00)	(-2.98)
Operating	0.0227	0.00914**	0.00220	-0.000233	-0.0000697***	-0.000417**
	(0.85)	(1.97)	(0.35)	(-0.10)	(-2.97)	(-2.46)
Capital	8.316*	-0.188	2.841**	0.170	0.0517***	0.351***
	(1.73)	(-0.22)	(2.45)	(0.42)	(12.10)	(5.01)
Opacity	0.649***	-0.233***	-0.648***	-0.0570***	0.000845***	0.00884***
	(4.56)	(-7.97)	(-15.32)	(-4.08)	(5.77)	(8.25)
d_Control	1.183***	0.0784	0.0421	-0.0563	0.00000140	-0.000945
	(3.07)	(1.09)	(0.43)	(-1.64)	(0.00)	(-0.35)
GDP	-0.222***	0.0369*	0.0426	-0.00183	-0.000512***	-0.00111
	(-3.08)	(1.84)	(1.49)	(-0.20)	(-5.26)	(-1.53)
Observations	1409	1409	1289	1425	1420	1216
Year fixed effects	No	Yes	Yes	Yes	Yes	Yes
Country fixed effects	No	Yes	Yes	Yes	Yes	Yes
IV F-stat		99.53	72.00	102.14	100.62	30.55
Anderson LM statistic (p-val)		<0.01	<0.01	<0.01	<0.01	<0.01

Table 4: The effects of the proportion of Executive Employee Ownership / Non-Executive Employee Ownership on bank risk (Equation (1))
This table reports 2SLS estimations of risk measures (ZScore, Distance to Default, Stock Volatility, Standard deviation of ROA, Non-performing loan ratio) on either executive (EO_Exe) or non-executive employee ownership (EO_NonExe) and control variables. The variable of interest EO_Exe/EO_NonExe is instrumented with the long-term orientation index. All regressions included country and year fixed-effects to control for possible within-economy correlations. All variables are as defined in Table 1. The corresponding t-statistics are reported in parentheses. Significance levels are indicated by ∗, ∗∗, and ∗∗∗ and correspond to the 10%, 5%, and 1% significance levels, respectively. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Dependent variable	EO_Exe	EO_NonExe	ZScore		DD		Volatility		SDROA		NPL_TA	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	1st Stage	1st Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage
EO_Exe			0.0620***		0.121***		-0.0305***		-0.000266**		-0.0114***	
			(2.69)		(3.28)		(-2.77)		(-2.30)		(-2.64)	
EO_NonExe				0.478***		0.478***		-0.131***		-0.00117**		-0.0125***
				(3.37)		(3.37)		(-2.68)		(-2.30)		(-3.40)
LT-OrientationIndex	0.267***	0.129***										
	(5.44)	(9.89)										
Size	-1.044***	0.0812***	0.104**	-0.0202	0.0104	-0.228***	-0.0335*	0.0281**	-0.000730***	-0.000195	-0.00252	0.00634***
	(-9.37)	(2.75)	(2.56)	(-0.79)	(0.17)	(-6.31)	(-1.73)	(2.16)	(-3.59)	(-1.49)	(-0.76)	(6.46)
GrowthTA	2.134**	0.126	0.0651	0.241	-0.348	-0.0164	0.239**	0.146	-0.000558	-0.00131	-0.000918	-0.0205***
	(2.40)	(0.53)	(0.33)	(1.22)	(-1.21)	(-0.06)	(2.54)	(1.50)	(-0.56)	(-1.30)	(-0.08)	(-2.79)
Loan	-3.443***	-0.151	0.800***	0.536***	1.392***	0.866***	-0.303***	-0.178*	-0.000712	0.000421	0.0541***	0.0742***
	(-3.79)	(-0.63)	(3.84)	(2.95)	(4.52)	(3.46)	(-3.03)	(-1.94)	(-0.68)	(0.45)	(3.84)	(9.43)
Deposit	-3.737***	-1.491***	0.545**	0.471*	0.928**	0.750**	0.0889	0.136	-0.00262**	-0.00227*	-0.0804***	-0.0171
	(-3.28)	(-4.94)	(2.10)	(1.88)	(2.43)	(2.09)	(0.72)	(1.09)	(-2.01)	(-1.78)	(-2.62)	(-1.57)
Operating	0.0140	0.00866	0.00943**	0.00785*	0.00283	-0.00252	-0.000385	0.000419	-0.000710***	-0.000639***	-0.000534**	-0.000288*
	(0.55)	(1.28)	(1.99)	(1.67)	(0.43)	(-0.04)	(-0.17)	(0.18)	(-3.00)	(-2.66)	(-2.45)	(-1.73)
Capital	10.04**	-1.723	-0.275	0.192	2.703**	3.385***	0.210	-0.00202	0.0520***	0.0501***	0.526***	0.159***
	(2.18)	(-1.41)	(-0.32)	(0.22)	(2.24)	(2.89)	(0.51)	(-0.00)	(12.03)	(11.49)	(3.60)	(3.92)
Opacity	0.785***	-0.135***	-0.240***	-0.203***	-0.665***	-0.584***	-0.0538***	-0.0710***	0.000874***	0.000719***	0.00975***	0.00784***
	(5.74)	(-3.74)	(-7.87)	(-7.05)	(-14.55)	(-13.98)	(-3.73)	(-4.95)	(5.77)	(4.92)	(6.79)	(7.60)
d_Control	1.545***	-0.361***	0.0354	0.267***	-0.0377	0.356***	-0.0356	-0.145***	0.000183	-0.000795*	0.00616	-0.00874**
	(4.18)	(-3.69)	(0.45)	(3.07)	(-0.35)	(2.81)	(-0.96)	(-3.38)	(0.47)	(-1.80)	(1.54)	(-2.33)
GDP	-0.266***	0.0441**	0.0379*	0.0325	0.0449	0.0336	-0.00242	0.000664	-0.000518***	-0.000489***	-0.00150	-0.000691
	(-3.85)	(2.41)	(1.85)	(1.62)	(1.51)	(1.16)	(-0.26)	(0.07)	(-5.24)	(-4.96)	(-1.58)	(-1.00)
Observations	1409	1409	1409	1409	1289	1289	1425	1425	1420	1420	1216	1216
Year FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IV F-stat			72.83	58.24	50.48	49.15	74.13	61.79	73.63	58.82	10.97	51.54
Anderson LM statistic (p-val)			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

1.4. Extensions to analysis

We now investigate several channels that could explain our results. We also explore whether executive and non-executive employee ownership of banks played a particular role during the financial crisis of 2007-2008 and had an impact on banks' performance.

1.4.1. Channels for the risk-reducing effect of employee ownership

We explore four channels that might explain why and how executive and non-executive employee ownership reduces bank risk: their representation on the board of directors, the level of minority shareholder protection, the presence of a stock option plan, and the number of employees in the bank.

Representation on the board of directors

An important factor that may influence the ability of employees to monitor and influence banks' decisions is their representation on the board of directors. The presence of employee representatives on the board reinforces their ability to impose their will on banks' risk-taking policies. The EFES database provides information on employee representation on boards, without indicating if these employees are among executive or on-executive employees. We compute the dummy variable *d_BoardRepresentative* taking the value of one if a bank has employee representatives on its board and 0 otherwise. The statistics in Table 1 show that, on average, around 30% of banks have at least one employee representative on their board.

To examine if board representation affects the relationship between employee ownership and bank risk, we augment Equation (1) with an interaction term between the dummy variable *d_BoardRepresentative* and alternatively the proportion of executive employee ownership ($EO\_Exe_{i,j,t}$) and the proportion of non-executive employee ownership ($EO\_NonExe_{i,j,t}$) as follows:

$$Y_{ijt} = \beta_0 + \beta_1 EmployeeOwnership_{ijt} + \beta_2 EmployeeOwnership_{ijt} \times d\_BoardRepresentative_{ijt} + \sum_m \theta_m BankControl_{i,j,t} + \sum_n \Upsilon_n CountryControl_{jt} + \varepsilon_{i,j,t} \quad (2)$$

Executive employee ownership ($EO\_Exe_{i,j,t}$), and non-executive employee ownership ($EO\_NonExe_{i,j,t}$) are instrumented with the employee long-term orientation index. The interaction term is instrumented with the product of the employee long-term orientation index and the dummy variable *d_BoardRepresentative*.

The results are displayed in Table 5. Our results show that the reduction in bank risk we found previously when executive employees hold more of the outstanding shares holds

independently of employee representation on the board of directors. The results also show that an increase in non-executive employee ownership leads to a decrease in insolvency risk and overall bank risk, with a more substantial effect when employees have at least one representative on the board. These results are in line with the argument that employee representation on the board of directors provides a means for non-executive employees to limit bank risk-taking. In contrast, executive employees are already involved in the strategic decisions by their function.

Table 5. The effect of employee representatives on the board

This table reports the second stage of 2SLS estimations of risk measures (ZScore, Distance to Default, Stock Volatility, Standard deviation of ROA, Non-performing loan ratio) on either executive (EO_Exe) or non-executive employee ownership (EO_NonExe) when the bank has employee representatives on board of directors. The dummy variable *d_BoardRepresentative* takes a value of one if a bank has employee representatives on its board. The variable EO_Exe/EO_NonExe is instrumented with the long-term orientation index. The interaction term is instrumented with the product of the long-term orientation index and the dummy variable *d_BoardRepresentative.* All regressions included country and year fixed-effects to control for possible within-economy correlations. All variables are as defined in Table 1. The corresponding t-statistics are reported in parentheses. Significance levels are indicated by ∗, ∗∗, and ∗∗∗ and correspond to the 10%, 5%, and 1% significance levels, respectively. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Panel A. Executive Employee Ownership

Dependent variable	ZScore (1)	DD (2)	Volatility (3)	SDROA (4)	NPL_TA (5)
EO_Exe (β1)	0.431***	0.488*	-0.101***	-0.000121**	-0.0293***
	(2.88)	(1.75)	(-4.68)	(-2.55)	(-3.15)
EO_Exe * d_BoardRepresentative (β2)	0.0556	0.430	-0.0215	-0.00724	-0.00130
	(0.18)	(0.96)	(-0.47)	(-1.62)	(-0.15)
Control variables	Yes	Yes	Yes	Yes	Yes
Observation	694	639	704	701	596
Year FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
IV F-stat	15.58	8.23	19.69	6.50	9.14
Anderson LM (p-val)	<0.01	<0.01	<0.01	<0.01	<0.01
Wald test					
β1 + β2 = 0	0.486**	0.918***	-0.122***	-0.00736*	-0.03063***
	(3.950)	(7.955)	(9.828)	(2.742)	(11.44)

Panel B. Non-Executive Employee Ownership

Dependent variable	ZScore (1)	DD (2)	Volatility (3)	SDROA (4)	NPL_TA (5)
EO_NonExe (β1)	0.447***	0.341*	-0.112***	-0.00158**	-0.0235***
	(2.67)	(1.79)	(-3.78)	(-2.18)	(-3.05)
EO_NonExe * d_BoardRepresentative (β2)	0.509***	0.805***	-0.125***	-0.00167**	-0.0174**
	(2.65)	(3.67)	(-3.56)	(-2.01)	(-2.41)
Control variables	Yes	Yes	Yes	Yes	Yes
Observation	694	639	704	701	596
Year FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
IV F-stat	14.87	14.27	15.98	14.92	10.18
Anderson LM (p-val)	<0.01	<0.01	<0.01	<0.01	<0.01
Wald test					

$\beta1 + \beta2 = 0$	0.956***	1.146***	-0.237***	- 0.00324***	-0.040***
	(11.82)	(12.60)	(22.68)	(7.349)	(13.09)

Levels of protection of minority shareholders

Next, we examine whether the level of minority shareholder protection affects how executive and non-executive employee ownership impact bank risk. We would expect that minority shareholders located in countries with higher levels of shareholder protection have the means to force insiders (controlling shareholders and managers) to avoid any opportunistic behavior that could lead to excessive risk-taking behavior.[7] In this case, we should observe a more substantial effect of non-executive employee ownership on risk for banks located in countries with higher levels of shareholder protection. For executive employee ownership, we could expect no specific effect of shareholder protection as they are already involved in the decision process.

To examine this potential channel of effect, we augment Equation (1) with an interaction term between employee ownership ($EO\_Exe_{i,j,t}$ and $EO\_NonExe_{i,j,t}$) and the dummy variable $d\_HighSHProtect_{i,j,t}$ that equals one if the bank is in a country with relatively high levels of shareholder protection. To measure the level of shareholder protection, we follow Rossi and Volpi (2004) and Dahya et al. (2008) and construct an index that combines two established indices: one measuring the level of shareholder rights (revised anti-director rights index of Djankov et al. (2007)) and one measuring the quality of law enforcement (the rule of law index from the Worldwide Governance Indicators (World Bank)). The anti-director rights index measures how strongly the legal system favors minority shareholders vis-a-vis controlling shareholders in corporate decision-making that includes voting. The rule of law index reflects the perceptions of the extent to which agents have confidence in and abide by the rules of society and, in particular, the quality of contract enforcement, property rights, the police, and the courts. The index $SHProtect_{j,t}$ is defined as the revised anti-director rights index multiplied by the rule of law index. A higher index indicates a higher level of shareholder protection. The dummy variable $d\_HighSHProtect_{j,t}$ equals one if the value of $SHProtect_{j,t}$ is higher than the sample median for a given year. The estimation results are shown in Table 6 and the associated Wald tests, in Panels A and B for executive and non-executive employee ownership, respectively.

[7] Insiders could engage in the expropriation of benefits to minority shareholders by pursuing their own through the diversion of assets and profits outside the firm (Johnson et al. 2000). For example, insiders can use related party transactions as a vehicle to transfer resources from the company to its related parties to the detriment of the other stakeholders (La Porta et al., 2002; Jiang et al., 2010).

The Wald tests show that both executive and non-executive employee ownership are linked to lower risk for all our risk measures, but only in countries with higher levels of shareholder protection. We also observe a risk-reducing effect of non-executive employee ownership for banks located in countries with lower levels of shareholder protection, but only for three measures of risk (distance to default, the stock market volatility, and the non-performing loan ratio).

Table 6. The effect of Shareholder protection

This table reports the second stage of 2SLS estimations of risk measures (ZScore, Distance to Default, Stock Volatility, Standard deviation of ROA, Non-performing loan ratio) on either executive (EO_Exe) or non-executive employee ownership (EO_NonExe) in countries with strong levels of shareholder protection. The dummy variable *d_HighSHProctect* takes a value of one if a bank is in country with high levels of shareholder protection. The variable EO_Exe/EO_NonExe is instrumented with the long-term orientation index. The interaction term is instrumented with the product of the long-term orientation index and the dummy variable *d_HighSHProtect.* All regressions included country and year fixed-effects to control for possible within-economy correlations. All variables are as defined in Table 1. The corresponding t-statistics are reported in parentheses. Significance levels are indicated by ∗, ∗∗, and ∗∗∗ and correspond to the 10%, 5%, and 1% significance levels, respectively. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Panel A. Executive Employee Ownership

Dependent variable	ZScore	DD	Volatility	SDROA	NPL_TA
	(1)	(2)	(3)	(4)	(5)
EO_Exe (β1)	0.00786	0.0752	-0.0192	0.00000674	-0.0127***
	(0.21)	(1.61)	(-1.18)	(0.08)	(-5.03)
EO_Exe * d_HighSHProtect (β2)	0.146*	0.0649	-0.0309	-0.000297*	0.00231
	(1.96)	(0.80)	(-0.92)	(-1.79)	(0.79)
Control variables	Yes	Yes	Yes	Yes	Yes
Observation	1409	1289	1425	1420	1216
Year FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
IV F-stat	13.77	11.50	13.75	13.90	24.00
Anderson LM (p-val)	<0.01	<0.01	<0.01	<0.01	<0.01
Wald test					
β1 + β2 = 0	0.154***	0.140***	-0.050**	-0.00029**	-0.010***
	(8.105)	(6.633)	(4.122)	(5.800)	(8.491)

Panel B. Non-Executive Employee Ownership

Dependent variable	ZScore	DD	Volatility	SDROA	NPL_TA
	(1)	(2)	(3)	(4)	(5)
EO_NonExe (β1)	0.126	0.420***	-0.0942*	-0.000654	-0.0142***
	(1.17)	(2.73)	(-1.80)	(-1.37)	(-3.66)
EO_NonExe * d_HighSHProtect (β2)	0.293**	0.0990	-0.0727	-0.000716	0.00405
	(2.47)	(0.63)	(-1.27)	(-1.37)	(1.06)
Control variables	Yes	Yes	Yes	Yes	Yes
Observation	1409	1289	1425	1420	1216
Year FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
IV F-stat	24.18	22.04	25.84	24.38	22.24
Anderson LM (p-val)	<0.01	<0.01	<0.01	<0.01	<0.01
Wald test					
β1 + β2 = 0	0.418***	0.518**	-0.166***	-0.00137**	-0.010**
	(10.59)	(9.580)	(7.387)	(5.848)	(5.595)

Stock option plans

An important factor that may influence the incentives of employees to take more risk is the possibility of participating in a stock option plan and a stock ownership plan. Stocks are endowed immediately with a stock ownership plan, whereas stock options are exercised only if the share price is at or above the strike price. Consequently, stock option plans could increase incentives of employees to take risks as the value of options increases with higher risk. The existing theoretical and empirical literature provide evidence that holding share options can increase employees' motivation to take more risks (e.g. DeFusco et al., 1990; Sanders, 2001 Chen et al., 2006; Bebchuk & Spamann, 2010).

To examine whether the presence of a stock option plan decreases the risk-reducing effect of employee share ownership, we compute the dummy variable $d\_Option_{i,j,t}$ taking the value of one if a bank grants stock options to its employees and zero otherwise. We use for that information provided by the EFES database. We observe from Table 1 that, on average, around 52% of banks grant a stock option plan in addition to a stock ownership plan.[8] We checked whether stock option plans are granted when there is only a stock ownership plan restricted to executive employees or also when there is a broad-based plan. We find that stock option plans exist for 63% of banks with a broad-based employee ownership plan against 56% for banks with an employee ownership plan limited to executive directors.

We augment Equation (1) with the interaction terms between the dummy variable $d\_Option_{i,j,t}$ and alternatively the proportion of executive employee ownership ($EO\_Exe_{i,j,t}$) and the proportion of non-executive employee ownership ($EO\_NonExe_{i,j,t}$). Results are displayed in Table 7 (Panel A for executive employee ownership and Panel B for non-executive employee ownership). We find that the risk-reducing effect associated with executive employee ownership is reduced when there is a stock option plan for the two measures of risk based on market data (the distance to default and the stock market volatility). We further observe that the combination of a stock option and a stock ownership plan neutralizes the effect of executive employee ownership on bank risk for the Zscore and standard deviation of ROA. On the contrary, our results show that the reduction in bank risk we found previously when non-executive employees hold more of the outstanding shares holds independently of the presence of a stock ownership plan. Taken all together, these results provide evidence that the combination of a stock ownership plan with stock options modifies the risk-taking incentives

[8] There is only one bank that does not have an employee ownership plan but has implemented a stock option plan.

of executive employees. In contrast, it does not affect the incentives of non-executive employees towards lower risk.

Table 7. The effect of stock option

This table reports the second stage of 2SLS estimations of risk measures (ZScore, Distance to Default, Stock Volatility, Standard deviation of ROA, Non-performing loan ratio) on either executive (EO_Exe) or non-executive employee ownership (EO_NonExe) when the bank issue share options for its employees. The dummy variable *d_Option* takes a value of one if a bank grants share options to its employees. The variable EO_Exe/EO_NonExe is instrumented with the long-term orientation index. The interaction term is instrumented with the product of the long-term orientation index and the dummy variable *d_Option* All regressions included country and year fixed-effects to control for possible within-economy correlations. All variables are as defined in Table 1. The corresponding t-statistics are reported in parentheses. Significance levels are indicated by ∗, ∗∗, and ∗∗∗ and correspond to the 10%, 5%, and 1% significance levels, respectively. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Panel A. Executive Employee Ownership

Dependent variable	ZScore	DD	Volatility	SDROA	NPL_TA
	(1)	(2)	(3)	(4)	(5)
EO_Exe (β1)	0.304***	0.778***	-0.0478***	-0.00446**	-0.00933
	(3.37)	(3.13)	(-3.93)	(-2.03)	(-1.57)
EO_Exe * d_Option (β2)	-0.292***	-0.665***	0.0308**	0.00420*	-0.00820
	(-3.01)	(-2.86)	(2.34)	(1.78)	(-1.49)
Control variables	Yes	Yes	Yes	Yes	Yes
Observation	1409	1289	1425	1420	1216
Year FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
IV F-stat	23.96	14.86	23.94	24.00	5.69
Anderson LM (p-val)	<0.01	<0.01	<0.01	<0.01	<0.01
Wald test					
β1 + β2 = 0	0.012	0.113***	-0.017***	-0.00026	-0.017***
	(0.232)	(9.564)	(23.54)	(0.176)	(9.321)

Panel B. Non-Executive Employee Ownership

Dependent variable	ZScore	DD	Volatility	SDROA	NPL_TA
	(1)	(2)	(3)	(4)	(5)
EO_NonExe (β1)	0.266***	0.455***	-0.0944***	-0.001000**	-0.00952**
	(3.12)	(3.86)	(-5.48)	(-2.31)	(-2.49)
EO_NonExe * d_Option (β2)	-0.0680	-0.102	-0.0205	-0.0000641	-0.0130***
	(-1.10)	(-1.41)	(-1.64)	(-0.20)	(-4.19)
Control variables	Yes	Yes	Yes	Yes	Yes
Observation	1409	1289	1425	1420	1216
Year FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
IV F-stat	21.50	20.94	23.01	24.00	20.20
Anderson LM (p-val)	<0.01	<0.01	<0.01	<0.01	<0.01
Wald test					
β1 + β2 = 0	0.198*	0.354**	-0.115***	-0.00106*	-0.022***
	(2.731)	(5.876)	(22.78)	(3.064)	(16.84)

Number of employees

The number of bank employees is another factor that might influence the relationship between employee ownership and risk. The democratization of share ownership to non-

executive employees may increase cooperation and favor mutual monitoring among employees. Conversely, the establishment of an employee ownership plan might reinforce free-riding behaviors, especially in banks with a large number of employees. The rewards from the individual effort are shared with other employees, and the direct incentive to monitor the bank may be weaker. Employees may feel they have little impact on the stock price and therefore be unwilling to alter their behavior in tasks requiring additional effort or sacrifice. We, therefore, investigate whether the link between bank risk and executive and non-executive employee ownership depends on the number of employees in the bank.

We use the information provided by the EFES on the number of employees to compute the dummy variable $d\_HighEmp_{i,j,t}$ that takes the value of one for banks with a number of employees higher than the sample median and zero otherwise. We then augment Equation (1) with an interaction term between the dummy variable $d\_HighEmp_{i,j,t}$ and alternatively the employee ownership variables $EO\_Exe_{i,j,t}$ and $EO\_NonExe_{i,j,t}$. Results are reported in Table 8 (Panels A and B for executive and non-executive ownership, respectively). We observe that the risk-reducing impact of executive and non-executive employee ownership found previously appears to only hold in banks with fewer employees. These results support the conjuncture that free-riding behaviors exist in banks with a relatively high number of employees and that establishing an employee ownership plan in this context might not help reduce bank risk.

Table 8. The effect of the number of employees

This table reports the second stage of 2SLS estimations of risk measures (ZScore, Distance to Default, Stock Volatility, Standard deviation of ROA, Non-performing loan ratio) on either executive (EO_Exe) or non-executive employee ownership (EO_NonExe) when the number of employees is high. The dummy variable *d_HighEmp* takes a value of 1 if a bank has the number of employees higher than the median of the group. The variable EO_Exe/EO_NonExe is instrumented with the long-term orientation index. The interaction term is instrumented with the product of the long-term orientation index and the dummy variable *d_HighEmp* All regressions included country and year fixed-effects to control for possible within-economy correlations. All variables are as defined in Table 1. The corresponding t-statistics are reported in parentheses. Significance levels are indicated by ∗, ∗∗, and ∗∗∗ and correspond to the 10%, 5%, and 1% significance levels, respectively. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Panel A. Executive Employee Ownership

Dependent variable	ZScore	DD	Volatility	SDROA	NPL_TA
	(1)	(2)	(3)	(4)	(5)
EO_Exe (β1)	0.101***	0.156***	-0.0517***	-0.000386***	-0.0378
	(3.13)	(2.85)	(-3.29)	(-2.74)	(-1.45)
EO_Exe * d_HighEmp (β2)	-0.179***	-0.759***	0.0931***	0.000696**	0.0281
	(-2.81)	(-5.11)	(3.04)	(2.52)	(1.44)
Control variables	Yes	Yes	Yes	Yes	Yes
Observation	1409	1289	1425	1420	1216
Year FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
IV F-stat	24.17	22.37	23.54	23.97	1.07
Anderson LM (p-val)	<0.01	<0.01	<0.01	<0.01	<0.01

Wald test β1 + β2 = 0	-0.077 (2.506)	-0.603*** (19.10)	0.041* (3.189)	0.00031 (2.155)	-0.00970 (1.207)

Panel B. Non-Executive Employee Ownership

Dependent variable	ZScore (1)	DD (2)	Volatility (3)	SDROA (4)	NPL_TA (5)
EO_NonExe (β1)	0.537*** (3.42)	1.328*** (5.11)	-0.264*** (-3.42)	-0.00202*** (-2.92)	-0.0294*** (-3.68)
EO_NonExe * d_HighEmp (β2)	-0.364*** (-3.32)	-1.192*** (-6.44)	0.186*** (3.39)	0.00139*** (2.87)	0.0183*** (3.34)
Control variables	Yes	Yes	Yes	Yes	Yes
Observation	1409	1289	1425	1420	1216
Year FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
IV F-stat	23.24	19.27	24.80	21.55	16.58
Anderson LM (p-val)	<0.01	<0.01	<0.01	<0.01	<0.01
Wald test β1 + β2 = 0	0.172* (3.377)	0.136 (0.860)	-0.077* (2.873)	-0.00062 (2.273)	-0.011*** (8.045)

1.4.2. Global financial crisis

We further examine if executive and non-executive employee ownership may have played a specific role during the global financial crisis. We explore whether the risk-reducing impact of executive and non-executive employee ownership found previously applies equally to both non-crisis and crisis periods. We compute the dummy variable $dCrisis_t$ that takes the value of one during the crisis years covered (2008-2011) to include the subprime and the sovereign debt crisis periods.

For this investigation, we augment Equation (1) with an interaction term the dummy variable $dCrisis_t$ and alternatively the proportion of executive employee ownership ($EO\_Exe_{i,j,t}$) and the proportion of non-executive employee ownership ($EO\_NonExe_{i,j,t}$). Results are reported in Table 9. We observe that both executive and non-executive employee ownership is associated with decreased bank risk in normal time. In contrast, we observe a neutral effect of employee ownership on bank risk during crisis time. However, our results show that an increase in executive or non-executive employee ownership leads to lower stock market volatility in normal and crisis times.

Table 9: The effect of global financial crisis (2008-2011)

This table reports the second stage of 2SLS estimations of risk measures (ZScore, Distance to Default, Stock Volatility, Standard deviation of ROA, Non-performing loan ratio) on either executive (EO_Exe) or non-executive employee ownership (EO_NonExe) during the global financial crisis. The dummy variable *d_Crisis* takes a value of one for the years during the global financial crisis (2008-2011). The variable EO_Exe/EO_NonExe is instrumented with the long-term orientation index. The interaction term is instrumented with the product of the long-term orientation index and the dummy variable *d_Crisis* All regressions included country and year fixed-effects to control for possible within-economy correlations. All variables are as defined in Table 1. The corresponding t-statistics are reported in parentheses. Significance levels are indicated by ∗, ∗∗, and ∗∗∗ and correspond to the 10%, 5%, and 1% significance levels, respectively. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the

instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Panel A. Executive Employee Ownership

Dependent variable	ZScore	DD	Volatility	SDROA	NPL_TA
	(1)	(2)	(3)	(4)	(5)
EO_Exe (β1)	0.295***	0.451***	-0.0647*	-0.00110***	-0.0340**
	(4.01)	(3.95)	(-1.90)	(-3.39)	(-2.21)
EO_Exe * d_Crisis (β2)	-0.373***	-0.333**	-0.0441	0.00141***	0.0343**
	(-3.52)	(-2.25)	(-0.88)	(3.01)	(2.02)
Control variables	Yes	Yes	Yes	Yes	Yes
Observation	1409	1289	1425	1420	1216
Year FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
IV F-stat	50.22	34.91	52.62	51.23	27.21
Anderson LM (p-val)	<0.01	<0.01	<0.01	<0.01	<0.01
Wald test					
β1 + β2 = 0	-0.078	0.117	-0.108**	0.00031	0.00032
	(0.740)	(0.814)	(6.574)	(0.600)	(0.0003)

Panel B. Non-Executive Employee Ownership

Dependent variable	ZScore	DD	Volatility	SDROA	NPL_TA
	(1)	(2)	(3)	(4)	(5)
EO_NonExe (β1)	0.373***	0.559***	-0.119**	-0.00139***	-0.0166***
	(3.48)	(3.76)	(-2.31)	(-2.91)	(-4.22)
EO_NonExe * d_ Crisis (β2)	-0.344***	-0.289**	-0.0386	0.00130***	0.0124***
	(-3.59)	(-2.20)	(-0.82)	(3.04)	(3.78)
Control variables	Yes	Yes	Yes	Yes	Yes
Observation	1409	1289	1425	1420	1216
Year FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
IV F-stat	29.04	24.55	30.82	29.33	25.71
Anderson LM (p-val)	<0.01	<0.01	<0.01	<0.01	<0.01
Wald test					
β1 + β2 = 0	0.028	0.270	-0.157***	-0.00008	-0.00414
	(0.059)	(2.660)	(7.581)	(0.028)	(0.930)

1.4.3. Employee ownership and bank performance

We further examine whether employee ownership has an impact on bank performance. Using large survey data on European firms, the European Commission has shown evidence that employee ownership plans enhance the productivity and employment of firms (European Commission, 2000; 2003; 2014). These results are in line with the existing empirical literature (e.g. Dhillon & Ramírez, 1994; Jones & Kato, 1995; Cin & Smith, 2002). We could, therefore, expect that an increase in employee ownership is associated with an increase in bank performance. However, the risk-reduction effect of employee ownership found previously could also be accompanied by a decrease in profitability. If the influence of employee ownership helps to reduce excessive risk-taking that could result in bank insolvency, we could also observe a neutral effect on profitability.

To determine if executive and non-executive employee ownership impact bank performance, we consider two measures of performance: one based on market data and another

based on accounting data. We use the Tobin's Q as a measure of market valuation ($Tobin\_Q_{i,j,t}$), computed as the book value of assets minus the book value of equity plus the market value of equity, divided by the book value of assets. We alternatively consider the return on assets (*ROA*) to measure bank profitability. Results in Table 10 show that the risk-reduction found previously is not accompanied by a decrease in profitability, as reflected by the non-significant impact of employee ownership on the Tobin's Q and the ROA.

Table 10. The effects employee ownership on bank performance (Equation (1))
This table reports the second stage of 2SLS estimations of performance measures (ROA, Tobin_Q) on either executive employee ownership (EO_Exe) or non-executive employee ownership (EO_NonExe) and control variables. The variable of interest EO_Exe/EO_NonExe is instrumented with the long-term orientation index. All regressions included country and year fixed-effects to control for possible within-economy correlations. All variables are as defined in Table 1. The corresponding t-statistics are reported in parentheses. Significance levels are indicated by ∗, ∗∗, and ∗∗∗ and correspond to the 10%, 5%, and 1% significance levels, respectively Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Dependent variable	ROA (1)	Tobin_Q (2)	ROA (3)	Tobin_Q (4)
EO_Exe	0.0000677	-0.00252		
	(0.11)	(-0.90)		
EO_NonExe			0.000292	-0.0108
			(0.11)	(-0.89)
Size	0.00126	-0.00936*	0.00113	-0.00426
	(1.18)	(-1.90)	(1.62)	(-1.32)
GrowthTA	-0.00414	0.0498**	-0.00393	0.0421*
	(-0.79)	(2.07)	(-0.75)	(1.74)
Loan	0.00275	-0.0527**	0.00246	-0.0423*
	(0.50)	(-2.06)	(0.50)	(-1.86)
Deposit	0.0155**	0.0832***	0.0154**	0.0871***
	(2.27)	(2.65)	(2.31)	(2.82)
Operating	-0.0000392	-0.000524	-0.0000410	-0.000458
	(-0.31)	(-0.91)	(-0.32)	(-0.78)
Capital	0.303***	0.916***	0.303***	0.898***
	(13.36)	(8.70)	(13.23)	(8.42)
Opacity	-0.000948	-0.00434	-0.000911	-0.00577
	(-1.19)	(-1.18)	(-1.19)	(-1.62)
d_Control	-0.000945	-0.00753	-0.000702	-0.0166
	(-0.46)	(-0.79)	(-0.30)	(-1.56)
GDP	0.00111**	-0.00206	0.00110**	-0.00180
	(2.12)	(-0.86)	(2.11)	(-0.75)
Observations	1429	1425	1429	1425
Year fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
IV F-stat	74.10	74.13	61.08	61.79
Anderson LM statistic (p-val)	<0.01	<0.01	<0.01	<0.01

1.5. Robustness tests

We subject our results to a range of robustness checks related to sample issues, and alternative empirical specifications.[9]

We rerun our regressions on different subsamples to test the robustness of our analysis. We first exclude Switzerland from the initial sample to ensure that our results are not driven by its inclusion, as we have a relatively high number of banks in this country (see Table A1 in the Appendix). Next, we exclude Estonia, France, and Sweden as the level of employee ownership of these countries is relatively high, with more than 5% of the outstanding shares held together by executive and non-executive employees (see Table A1). Finally, we exclude countries where the total assets of our sample of banks represent less than 50% of the total assets of all listed banks in Bloomberg for the year 2017 (Bulgaria, Cyprus and the Czech Republic; see Table A1). Even excluding these banks, our main conclusions prevail (see Tables A.3, A.4, and A.5 in the Appendix).

We verify our results using alternative measures of our dependent variables. We consider two alternative measures of bank insolvency risk. We first use the method developed by Bharath and Shumway (2008) to compute a "naïve" distance to default (*DD-Naïve*$_{i,j,t}$), which is relatively simpler to implement than the Merton model. We also consider a market data-based Z-score (*MDZScore*$_{i,j,t}$), defined as MDZ-score = $\frac{\bar{R}+1}{\sigma}$, where $\bar{R}$ and σ are respectively the mean and the standard deviation of the daily returns R_t for a given year. Results are displayed in Tables A.6 in the Appendix. Both of these two alternative risk measures confirm our results.

We next include other controlling variables that could affect bank risk. We firstly control for bank size by including the log of total assets (Size$_{i,j,t}$), but also examine additional inclusion of the square of the logarithm of total assets ((Size$_{i,j,t}^2$). Economies of scale and scope in information production might imply that larger banks should be less prone to falling into distress (Diamond, 1984; Boyd and Prescott, 1986). On the other hand, large banks might also have incentives to pursue higher asset risk relative to smaller banks in response to "too-big-to-fail" subsidies and government bailouts (e.g. Farhi and Tirole, 2012). Our results are again unchanged when we include this additional controlling variable (see Tables A.7 in the appendix).

[9] We only include in the Appendix the estimation results for the core regressions. Estimation results conducted to check the robustness of the results presented in the further analysis are not included in this Appendix but are available upon request; they generally lead to similar results.

We lastly re-estimate our regressions by including an index measuring the distinction between collective (group-based) and individual-based decision-making of a country. When individualism is low, there is a priority for group effort to achieve success. When it is high, there is a priority for individual needs and achievements. Individuals in an individualistic culture are likely to challenge authority and reduce power differences between management and employees. However, individuals in a collectivist culture are likely to protect the well-being of the group and fewer challenge managers. We use the individualism score of each country ($Individualism_j$) constructed by Hofstede (2001). The higher the score is, the more individualistic the country is. The existing literature proves that higher individualism leads to higher bank risk (e.g., Kanagaretnam et al., 2014). Results in Table A.8. in the Appendix show that our results are unchanged when we include an index measuring the degree of individualism.

1.6. Conclusion

Using a panel of European banks, we examined whether the possibility for executive and non-executive employees to hold outstanding shares when broad-based ownership plans are implemented, might not lead to an increase in bank risk-taking, intensifying the agency conflict arising for banks between shareholders and debtholders/regulators.

Reassuringly, we find that both executive and non-executive ownership is associated with generally lower bank risk. Our results support the "undiversified wealth" hypothesis that employees may not hold well-diversified portfolios and have, therefore, incentives to reduce the riskiness of banks. Executives could influence bank risk by selecting less risky projects to invest in, whereas non-executive employees can manage operational risk via careful implementation and execution of executives' decisions.

We investigate several channels that could explain how and why employee ownership reduces bank risk. We first examined the incentives of executive and non-executive employees to pursue strategies that decrease bank risk. Our results provide evidence that implementing a stock option plan in addition to a stock ownership plan gives incentives to executive employees to embrace strategies that increase risk. In contrast, it does not affect the incentives of non-executive employees towards lower risk. Next, we find that both executive and non-executive ownership is associated with a decrease in risk, but only in banks with fewer employees. These results support the argument that the free-rider effect intensifies as the number of employees increases, and establishing an employee ownership plan in this context might not help limit bank risk. Second, we explore factors related to the ability of executive and non-executive employees with stockholding to influence banks' risk-taking behavior. Our results provide

evidence that employee representation on the board of directors provides a means for non-executive employees to limit bank risk-taking. The risk-reducing effect of executive ownership is independent of employee representation on the board of directors; this result is not surprising as they directly contribute to determining strategic investment risk. We furthermore observe that both executive and non-executive ownership are associated with lower bank risk in countries with higher levels of minority shareholder protection. Strong legal protection and the quality of law enforcement complement employee ownership to provide them with rights to protect their interest and influence bank decisions.

We conduct further investigations and find that both executive and non-executive employee ownership have a neutral impact on bank performance. This result, taken together with the risk-reducing effect of employee ownership, indicates that employee ownership helps to reduce excessive risk-taking that could result in bank insolvency. We also observe that executive and non-executive employee ownership reduce bank risk in normal times but not during crisis times.

Our findings contribute to the current policy debate on what forms of corporate governance in banks could lead to the most efficient outcome for all stakeholders regarding financial stability. The possibility for banks to implement broad-based ownership plans that allow executive and non-executive employees to hold shares appears not to be detrimental to financial stability. Executive and non-executive employee ownership could help ensure that insiders' risk-taking incentives are better aligned with the interests of other stakeholders such as depositors, debtholders, and banking supervisors. Consequently, policy-makers should encourage the democratization of broad-based employee ownership plans for the banking industry, however, without stock options. Employee ownership is an effective mechanism of monitoring and governance by curbing bank risk-taking. Therefore, employee ownership can strengthen financial stability and be a valuable complement to safety-and-soundness supervision by bank regulators.

Appendix

Table A.1. Number of banks by country in 2017
This table displays, for the year 2017, the number of banks by country in our sample, the proportion of banks in each country in our sample, the total assets of our sample banks divided by total assets of all listed banks in Bloomberg, the proportion of shares held by executive employee ownership (EO_Exe), and the proportion of shares held by non-executive employee ownership (EO_NonExe).

Number	Country	Nb of banks in sample	% of sample	TA of sample banks divided by TA of all listed banks in Bloomberg (%)	Average EO_Exe (%)	Average EO_NonExe (%)
1	Austria	5	3.27	87.82	0.03	1.33
2	Belgium	2	1.31	52.71	0.00	1.33
3	Bulgaria	3	1.96	37.74	0.06	0.03
4	Cyprus	2	1.31	10.17	0.02	1.79
5	Czech Republic	2	1.31	47.52	0.01	0.00
6	Denmark	11	7.19	98.49	0.11	0.30
7	Estonia	1	0.65	82.68	13.68	2.89
8	Finland	1	0.65	97.16	0.26	0.57
9	France	4	2.61	95.92	0.01	5.23
10	Germany	6	3.92	97.04	0.03	1.12
11	Greece	6	3.92	67.43	0.74	0.16
12	Hungary	2	1.31	100	0.70	0.28
13	Ireland	2	1.31	90.33	0.02	0.35
14	Italy	19	12.42	94.79	3.52	0.38
15	Malta	3	1.96	95.83	0.14	1.10
16	Netherlands	4	2.61	100	0.14	1.26
17	Norway	11	7.19	84.22	0.59	0.73
18	Poland	11	7.19	64.80	0.41	0.40
19	Portugal	2	1.31	100	0.26	0.84
20	Romania	2	1.31	96.84	0.09	0.03
21	Slovakia	3	1.96	100	-	-
22	Spain	8	5.23	100	1.94	0.52
23	Sweden	7	4.58	100	1.09	4.00
24	Switzerland	27	17.65	72.99	0.46	1.39
25	United Kingdom	9	5.88	98.86	3.02	1.35
	Total	153	100	-	-	-
	Average	-	-	82.93	1.14	1.14

Table A.2. Matrix of correlations between control variables

This table reports the correlation matrix. All variables are defined in Table 1. *,**, and *** denote significance at 10%, 5% and 1% levels respectively.

	EO	EO_Exe	EO_NonExe	Size	GrowthTA	Loan	Deposit	Operating	Capital	Opacity	d_Control	GDP
EO	1											
EO_Exe	0.958***	1										
EO_NonExe	0.267***	-0.00491	1									
Size	-0.0283	-0.182***	0.346***	1								
GrowthTA	0.0800**	0.0768**	-0.0251	-0.155***	1							
Loan	-0.225***	-0.142***	-0.204***	-0.264***	-0.0654**	1						
Deposit	-0.162***	-0.0287	-0.269***	-0.528***	0.0455	0.307***	1					
Operating	0.0721**	0.0362	0.0277	0.0437	-0.0283	-0.163***	-0.00914	1				
Capital	-0.0214	0.113***	-0.248***	-0.581***	0.0754**	0.164***	0.390***	-0.0342	1			
Opacity	0.113***	0.149***	-0.106***	0.0161	-0.0192	-0.141***	-0.123***	0.0506*	0.0800**	1		
d_Control	0.0653**	0.118***	-0.137***	-0.133***	0.0139	-0.0485*	0.181***	0.0322	0.102***	0.00752	1	
GDP	-0.0696**	-0.0756**	0.0177	-0.107***	0.200***	-0.0381	0.173***	-0.0739**	0.121***	-0.0163	0.0862***	1

Collinearity Diagnostics*

Variable	VIF	SQRT-VIF	Tolerance	R-Squared
EO	1.09	1.04	0.9212	0.0788
Size	1.78	1.33	0.5622	0.4378
GrowthTA	1.07	1.04	0.9320	0.0680
Loan	1.20	1.10	0.8336	0.1664
Deposit	1.50	1.23	0.6650	0.3350
Operating	1.01	1.01	0.9858	0.0142
Capital	1.44	1.20	0.6922	0.3078
Opacity	1.05	1.02	0.9544	0.0456
d_Control	1.05	1.03	0.9504	0.0496
GDP	1.09	1.04	0.9207	0.0793

*. Collinearity Diagnostics indicate that all variance inflation factors (VIF) are smaller than 5. Thus, there is no serious collinearity problem between the variable of interest (EO) and control variables. For other two variables of interest (EO_Exe and EO_NonExe), the Collinearity Diagnostics show similar results. To make it short, we show here only the Collinearity Diagnostics of the variable of interest (EO).

Table A.3. Exclude Switzerland

This table reports 2SLS estimations of risk measures (ZScore, Distance to Default, Stock Volatility, Standard deviation of ROA, Non-performing loan ratio) on executive employee ownership (EO_Exe) / non-executive employee ownership (EO_NonExe). We exclude Switzerland from the sample as we have a high number of banks in this country. The variable of interest EO_Exe/EO_NonExe is instrumented with the long-term orientation index. All regressions included country and year fixed-effects to control for possible within-economy correlations. All variables are as defined in Table 1. The corresponding t-statistics are reported in parentheses. Significance levels are indicated by ∗, ∗∗, and ∗∗∗ and correspond to the 10%, 5%, and 1% significance levels, respectively. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Dependent variable	EO_Exe	EO_NonExe	ZScore		DD		Volatility		SDROA		NPL_TA	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	1st Stage	1st Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage
EO_Exe			0.0312*		0.0882***		-0.0226**		-0.000185*		-0.00647**	
			(1.66)		(2.99)		(-2.21)		(-1.78)		(-2.32)	
EO_NonExe				0.0959*		0.234***		-0.0697**		-0.000571*		-0.00503***
				(1.71)		(3.26)		(-2.22)		(-1.81)		(-2.62)
LT-OrientationIndex	0.431***	0.139***										
	(6.37)	(8.86)										
Size	-1.181***	0.0319	0.147***	0.0927***	0.0267	-0.123***	-0.0257	0.0138	-0.000848***	-0.000525***	0.000782	0.00569***
	(-8.97)	(1.05)	(3.96)	(4.08)	(0.48)	(-4.21)	(-1.28)	(1.09)	(-4.12)	(-4.14)	(0.32)	(5.84)
GrowthTA	1.940*	0.0457	0.00927	0.101	0.0342	0.285	0.217**	0.144	-0.000163	-0.000706	-0.0130	-0.0239***
	(1.94)	(0.20)	(0.05)	(0.52)	(0.12)	(1.13)	(2.05)	(1.35)	(-0.15)	(-0.65)	(-1.37)	(-3.17)
Loan	-2.683**	0.159	-0.208	-0.391*	0.00788	-0.550**	-0.269**	-0.135	0.00170	0.00279**	0.0848***	0.108***
	(-2.28)	(0.58)	(-0.93)	(-1.89)	(0.02)	(-2.10)	(-2.21)	(-1.17)	(1.36)	(2.40)	(5.91)	(12.12)
Deposit	-3.098**	-2.118***	0.738***	0.726***	1.074***	1.006***	0.0853	0.0961	-0.00367**	-0.00358**	-0.0559**	-0.0117
	(-2.34)	(-6.92)	(2.84)	(2.89)	(2.85)	(2.97)	(0.61)	(0.69)	(-2.55)	(-2.55)	(-2.30)	(-1.05)
Operating	0.0156	0.0112*	0.0105**	0.0100**	0.00549	0.00431	-0.000483	-0.0000891	-0.0000683***	-0.0000651***	-0.000501***	-0.000386**
	(0.54)	(1.68)	(2.29)	(2.23)	(0.89)	(0.76)	(-0.19)	(-0.04)	(-2.68)	(-2.59)	(-2.70)	(-2.36)
Capital	15.99**	-2.245	3.460***	3.646***	3.919***	4.441***	0.133	0.00333	0.0429***	0.0419***	0.344***	0.127***
	(2.55)	(-1.55)	(3.27)	(3.56)	(2.73)	(3.43)	(0.24)	(0.01)	(7.39)	(7.40)	(3.35)	(3.12)
Opacity	0.660***	-0.137***	-0.178***	-0.157***	-0.553***	-0.487***	-0.0687***	-0.0830***	0.000753***	0.000633***	0.00876***	0.00778***
	(4.12)	(-3.68)	(-5.95)	(-5.51)	(-12.76)	(-12.78)	(-4.27)	(-5.29)	(4.58)	(4.00)	(7.38)	(7.36)
d_Control	1.673***	-0.397***	0.156*	0.265***	0.276**	0.533***	-0.0655	-0.143***	0.0000752	-0.000564	0.00455	-0.00194
	(3.79)	(-3.88)	(1.94)	(3.34)	(2.55)	(5.00)	(-1.51)	(-3.25)	(0.17)	(-1.27)	(1.41)	(-0.61)
GDP	-0.272***	0.0530***	0.0482**	0.0452**	0.0379	0.0285	-0.000251	0.00234	-0.000594***	-0.000573***	-0.00142*	-0.000875
	(-3.52)	(2.96)	(2.45)	(2.37)	(1.37)	(1.13)	(-0.02)	(0.23)	(-5.65)	(-5.57)	(-1.80)	(-1.31)
Observations	1169	1169	1169	1169	1050	1050	1186	1186	1180	1180	1037	1037
Year FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IV F-stat			82.56	207.21	54.09	182.61	84.13	208.14	83.47	207.98	16.50	234.04
Anderson LM statistic (p-val)			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Table A.4. Exclude Estonia, France, and Sweden

This table reports 2SLS estimations of risk measures (ZScore, Distance to Default, Stock Volatility, Standard deviation of ROA, Non-performing loan ratio) on executive employee ownership (EO_Exe)/non-executive employee ownership (EO_NonExe). We exclude Estonia, France and Sweden from the sample as the average proportion of employee ownership in these countries is higher than the average of our sample (5%). The variable of interest EO_Exe/EO_NonExe is instrumented with the long-term orientation index. All regressions included country and year fixed-effects to control for possible within-economy correlations. All variables are as defined in Table 1. The corresponding t-statistics are reported in parentheses. Significance levels are indicated by *, **, and *** and correspond to the 10%, 5%, and 1% significance levels, respectively. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Dependent variable	EO_Exe	EO_NonExe	ZScore		DD		Volatility		SDROA		NPL_TA	
	(1) 1st Stage	(2) 1st Stage	(3) 2nd Stage	(4) 2nd Stage	(5) 2nd Stage	(6) 2nd Stage	(7) 2nd Stage	(8) 2nd Stage	(9) 2nd Stage	(10) 2nd Stage	(11) 2nd Stage	(12) 2nd Stage
EO_Exe			0.0557**		0.122***		-0.0285**		-0.000276**		-0.0117**	
			(2.37)		(3.14)		(-2.48)		(-2.24)		(-2.44)	
EO_NonExe				0.527**		1.197**		-0.254**		-0.00259**		-0.0390**
				(2.16)		(2.53)		(-2.15)		(-2.03)		(-2.19)
LT-OrienIndex	0.264***	0.109***										
	(5.09)	(10.37)										
Size	-1.106***	0.00979	0.0801*	-0.0699*	0.0141	-0.325***	-0.0348	0.0422**	-0.000771***	-0.0000270	-0.00316	0.00803***
	(-8.98)	(0.39)	(1.77)	(-1.82)	(0.19)	(-4.63)	(-1.57)	(2.13)	(-3.24)	(-0.13)	(-0.84)	(4.27)
GrowthTA	2.752***	0.0941	0.228	0.460*	-0.375	0.100	0.283***	0.159	-0.000865	-0.00199	-0.000185	-0.0222*
	(2.78)	(0.47)	(1.05)	(1.93)	(-1.15)	(0.25)	(2.70)	(1.32)	(-0.76)	(-1.59)	(-0.01)	(-1.94)
Loan	-3.876***	-0.161	0.758***	0.730***	1.483***	1.500***	-0.331***	-0.318**	-0.000814	-0.000657	0.0540***	0.0489**
	(-3.92)	(-0.80)	(3.41)	(3.07)	(4.33)	(3.50)	(-3.01)	(-2.57)	(-0.70)	(-0.52)	(3.50)	(2.58)
Deposit	-4.531***	-0.300	0.529*	0.614**	0.997**	1.269**	0.0923	0.0783	-0.00295**	-0.00330**	-0.0898**	-0.0521**
	(-3.62)	(-1.18)	(1.95)	(1.97)	(2.38)	(2.23)	(0.70)	(0.51)	(-2.07)	(-2.03)	(-2.49)	(-2.05)
Operating	0.0129	0.00130	0.0109**	0.00775	0.00360	-0.00519	-0.000514	0.00108	-0.0000771***	-0.0000611**	-0.000612**	-0.000164
	(0.47)	(0.23)	(2.21)	(1.38)	(0.51)	(-0.54)	(-0.21)	(0.37)	(-2.98)	(-2.06)	(-2.51)	(-0.58)
Capital	7.951	-2.120**	-0.372	0.418	3.013**	4.150**	0.0902	-0.261	0.0531***	0.0494***	0.535***	0.139**
	(1.63)	(-2.15)	(-0.42)	(0.40)	(2.38)	(2.57)	(0.21)	(-0.50)	(11.45)	(9.10)	(3.33)	(2.21)
Opacity	0.800***	-0.124***	-0.234***	-0.191***	-0.673***	-0.559***	-0.0546***	-0.0753***	0.000866***	0.000656***	0.00976***	0.00705***
	(5.51)	(-4.21)	(-7.47)	(-5.63)	(-13.82)	(-9.33)	(-3.58)	(-4.36)	(5.29)	(3.68)	(6.21)	(4.27)
d_Control	1.699***	-0.302***	0.0471	0.237**	-0.0579	0.333*	-0.0508	-0.142***	0.000254	-0.000662	0.00699	-0.0124*
	(4.17)	(-3.67)	(0.56)	(2.46)	(-0.48)	(1.92)	(-1.24)	(-2.93)	(0.58)	(-1.32)	(1.45)	(-1.80)
GDP	-0.277***	0.0242	0.0430**	0.0371	0.0500	0.0339	-0.00276	0.000704	-0.000556***	-0.000520***	-0.00157	-0.000841
	(-3.72)	(1.61)	(2.03)	(1.60)	(1.57)	(0.86)	(-0.28)	(0.06)	(-5.19)	(-4.42)	(-1.53)	(-0.79)
Observations	1285	1285	1285	1285	1167	1167	1301	1301	1296	1296	1110	1110
Year FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IV F-stat			66.54	16.59	46.35	10.67	68.09	19.27	67.46	17.07	9.08	7.39
Anderson LM statistic (p-val)			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Table A.5. Exclude Bulgaria, Cyprus, Czech Republic

This table reports 2SLS estimations of risk measures (ZScore, Distance to Default, Stock Volatility, Standard deviation of ROA, Non-performing loan ratio) on executive employee ownership (EO_Exe)/non-executive employee ownership (EO_NonExe). We exclude Bulgaria, Cyprus, Czech Republic from the sample as the representativity of banks in terms of total assets in these countries is low (less than 60%). The variable of interest EO_Exe/EO_NonExe is instrumented with the long-term orientation index. All regressions included country and year fixed-effects to control for possible within-economy correlations. All variables are as defined in Table 1. The corresponding t-statistics are reported in parentheses. Significance levels are indicated by ∗, ∗∗, and ∗∗∗ and correspond to the 10%, 5%, and 1% significance levels, respectively. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Dependent variable	EO_Exe	EO_NonExe	ZScore		DD		Volatility		SDROA		NPL_TA	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	1st Stage	1st Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage
EO_Exe			0.0614***		0.121***		-0.0303***		-0.000266**		-0.0119***	
			(2.66)		(3.28)		(-2.74)		(-2.30)		(-2.62)	
EO_NonExe				0.269***		0.478***		-0.130***		-0.00117**		-0.0128***
				(2.70)		(3.37)		(-2.65)		(-2.29)		(-3.44)
LT-OrientationIndex	0.268***	0.129***										
	(5.43)	(9.85)										
Size	-1.037***	0.0847***	0.103**	-0.0201	0.0104	-0.228***	-0.0330*	0.0282**	-0.000730***	-0.000195	-0.00296	0.00632***
	(-9.23)	(2.85)	(2.53)	(-0.78)	(0.17)	(-6.31)	(-1.70)	(2.16)	(-3.58)	(-1.48)	(-0.85)	(6.38)
GrowthTA	2.147**	0.134	0.0875	0.262	-0.348	-0.0164	0.238**	0.144	-0.000587	-0.00134	0.000919	-0.0201***
	(2.39)	(0.56)	(0.44)	(1.32)	(-1.21)	(-0.06)	(2.50)	(1.47)	(-0.58)	(-1.33)	(0.07)	(-2.69)
Loan	-3.466***	-0.166	0.791***	0.532***	1.392***	0.866***	-0.306***	-0.183**	-0.000643	0.000485	0.0545***	0.0750***
	(-3.80)	(-0.69)	(3.79)	(2.92)	(4.52)	(3.46)	(-3.04)	(-1.98)	(-0.61)	(0.52)	(3.76)	(9.42)
Deposit	-3.586***	-1.429***	0.551**	0.475*	0.928**	0.750**	0.0943	0.142	-0.00269**	-0.00233*	-0.0863***	-0.0190*
	(-3.11)	(-4.68)	(2.11)	(1.89)	(2.43)	(2.09)	(0.76)	(1.14)	(-2.05)	(-1.82)	(-2.66)	(-1.72)
Operating	0.0130	0.00827	0.00940**	0.00784*	0.00283	-0.000252	-0.000387	0.000413	-0.0000711***	-0.0000641***	-0.000540**	-0.000284*
	(0.50)	(1.21)	(1.98)	(1.66)	(0.43)	(-0.04)	(-0.17)	(0.17)	(-2.99)	(-2.66)	(-2.40)	(-1.69)
Capital	10.37**	-1.642	-0.314	0.153	2.703**	3.385***	0.199	-0.0143	0.0524***	0.0504***	0.550***	0.163***
	(2.24)	(-1.34)	(-0.36)	(0.18)	(2.24)	(2.89)	(0.48)	(-0.03)	(12.05)	(11.50)	(3.56)	(3.98)
Opacity	0.788***	-0.137***	-0.241***	-0.204***	-0.665***	-0.584***	-0.0546***	-0.0719***	0.000889***	0.000734***	0.0100***	0.00794***
	(5.72)	(-3.76)	(-7.87)	(-7.07)	(-14.55)	(-13.98)	(-3.75)	(-4.97)	(5.83)	(4.98)	(6.65)	(7.59)
d_Control	1.574***	-0.345***	0.0341	0.262***	-0.0377	0.356***	-0.0342	-0.143***	0.000170	-0.000805*	0.00588	-0.00923**
	(4.22)	(-3.49)	(0.43)	(3.01)	(-0.35)	(2.81)	(-0.91)	(-3.30)	(0.43)	(-1.81)	(1.43)	(-2.43)
GDP	-0.269***	0.0453**	0.0376*	0.0321	0.0449	0.0336	-0.00213	0.00101	-0.000529***	-0.000500***	-0.00159	-0.000720
	(-3.84)	(2.45)	(1.82)	(1.59)	(1.51)	(1.16)	(-0.22)	(0.10)	(-5.31)	(-5.02)	(-1.62)	(-1.03)
Observations	1394	1394	1394	1394	1289	1289	1410	1410	1405	1405	1201	1201
Year FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IV F-stat			71.98	57.71	50.48	49.15	73.27	61.24	72.78	58.29	10.41	50.85
Anderson LM statistic (p-val)			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Table A.6. Alternative risk measurements using DDNaive & MDZScore

This table reports 2SLS estimations of risk measures (ZScore, Distance to Default, Stock Volatility, Standard deviation of ROA, Non-performing loan ratio) on executive employee ownership (EO_Exe)/non-executive employee ownership (EO_NonExe). We use two alternative measures of bank insolvency risk which are market data-based ZScore (*MDZScore)* and *DDNaive*. The variable of interest EO_Exe/EO_NonExe is instrumented with the long-term orientation index. All regressions included country and year fixed-effects to control for possible within-economy correlations. All variables are as defined in Table 1. The corresponding t-statistics are reported in parentheses. Significance levels are indicated by ∗, ∗∗, and ∗∗∗ and correspond to the 10%, 5%, and 1% significance levels, respectively. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Dependent variable	EO_Exe	EO_NonExe	MDZScore		DDNaive	
	(1)	(2)	(3)	(4)	(5)	(6)
	1st Stage	1st Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage
EO_Exe			1.609***		0.139***	
			(3.61)		(4.08)	
EO_NonExe				6.909***		0.549***
				(3.67)		(3.87)
LT-OrientationIndex	0.263***	0.129***				
	(5.42)	(10.06)				
Size	-1.035***	0.0861***	-0.0650	-3.319***	0.0808	-0.192***
	(-9.38)	(2.94)	(-0.08)	(-6.62)	(1.39)	(-5.34)
GrowthTA	2.259**	0.162	-8.855**	-3.924	0.0869	0.471*
	(2.58)	(0.70)	(-2.32)	(-1.04)	(0.33)	(1.70)
Loan	-3.434***	-0.171	20.76***	14.15***	-0.0669	-0.669***
	(-3.80)	(-0.71)	(5.13)	(4.00)	(-0.24)	(-2.69)
Deposit	-3.570***	-1.419***	10.18**	7.715	0.554	0.353
	(-3.17)	(-4.76)	(2.05)	(1.61)	(1.57)	(0.99)
Operating	0.0139	0.00933	0.0203	-0.0222	-0.0160***	-0.0195***
	(0.54)	(1.38)	(0.22)	(-0.24)	(-2.65)	(-3.02)
Capital	9.760**	-1.496	-46.65***	-35.45**	11.20***	11.99***
	(2.15)	(-1.24)	(-2.79)	(-2.14)	(10.08)	(10.28)
Opacity	0.769***	-0.129***	-8.686***	-7.774***	-0.115***	-0.0221
	(5.72)	(-3.61)	(-14.87)	(-14.03)	(-2.73)	(-0.53)
d_Control	1.536***	-0.355***	-0.628	5.167***	-0.114	0.339***
	(4.20)	(-3.65)	(-0.42)	(3.11)	(-1.15)	(2.67)
GDP	-0.274***	0.0485***	0.632*	0.469	0.0355	0.0225
	(-4.13)	(2.75)	(1.66)	(1.25)	(1.30)	(0.78)
Observations	1425	1425	1425	1425	1288	1288
Year FE	No	No	Yes	Yes	Yes	Yes
Country FE	No	No	Yes	Yes	Yes	Yes
IV F-stat			74.13	61.79	50.27	48.66
Anderson LM statistic (p-val)			<0.01	<0.01	<0.01	<0.01

Table A.7. Add a control variable Size-squared

This table reports 2SLS estimations of risk measures (ZScore, Distance to Default, Stock Volatility, Standard deviation of ROA, Non-performing loan ratio) on executive employee ownership (EO_Exe)/non-executive employee ownership (EO_NonExe). We add an additional control variable as the square of the logarithm of total assets. The variable of interest EO_Exe/EO_NonExe is instrumented with the long-term orientation index. All regressions included country and year fixed-effects to control for possible within-economy correlations. All variables are as defined in Table 1. The corresponding t-statistics are reported in parentheses. Significance levels are indicated by ∗, ∗∗, and ∗∗∗ and correspond to the 10%, 5%, and 1% significance levels, respectively. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Dependent variable	EO_Exe	EO_NonExe	ZScore		DD		Volatility		SDROA		NPL_TA	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	1st Stage	1st Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage
EO_Exe			0.0567**		0.121***		-0.0296***		-0.000242**		-0.0114***	
			(2.54)		(3.39)		(-2.74)		(-2.16)		(-2.63)	
EO_NonExe				0.318***		0.481***		-0.128***		-0.00107**		-0.0124***
				(2.86)		(3.48)		(-2.66)		(-2.16)		(-3.39)
LT-OrientationIndex	0.247***	0.124***										
	(5.06)	(9.55)										
Size	-5.763***	-1.083***	1.154***	-0.0155**	0.0273	-0.333	-0.184*	-0.0848	-0.00517***	-0.00444***	-0.00392	0.0205***
	(-6.27)	(-4.44)	(5.46)	(-2.53)	(0.08)	(-1.20)	(-1.79)	(-0.89)	(-4.87)	(-4.60)	(-0.26)	(2.65)
Size2	0.215***	0.0532***	-0.0488***	0.932***	-0.000793	0.00480	0.00701	0.00519	0.000206***	0.000195***	0.0000630	-0.000638*
	(5.17)	(4.81)	(-5.34)	(4.81)	(-0.06)	(0.37)	(1.58)	(1.17)	(4.50)	(4.37)	(0.11)	(-1.83)
GrowthTA	1.673*	0.0121	0.158	-0.0452***	-0.347	-0.0226	0.224**	0.137	-0.000944	-0.00161	-0.000976	-0.0199***
	(1.89)	(0.05)	(0.80)	(-5.06)	(-1.21)	(-0.08)	(2.39)	(1.40)	(-0.96)	(-1.61)	(-0.08)	(-2.70)
Loan	-2.190**	0.159	0.645***	0.356*	1.389***	0.877***	-0.279***	-0.163*	-0.0000535	0.000946	0.0543***	0.0717***
	(-2.35)	(0.64)	(3.20)	(1.76)	(4.64)	(3.48)	(-2.84)	(-1.77)	(-0.05)	(1.03)	(4.11)	(9.08)
Deposit	-2.529**	-1.193***	0.267	0.348*	0.924**	0.773**	0.129	0.164	-0.00145	-0.00120	-0.0801***	-0.0203*
	(-2.19)	(-3.90)	(1.05)	(1.86)	(2.44)	(2.14)	(1.05)	(1.31)	(-1.13)	(-0.94)	(-2.74)	(-1.86)
Operating	0.00700	0.00692	0.0102**	0.200	0.00283	-0.000325	-0.000499	0.000319	-0.0000741***	-0.0000675***	-0.000535**	-0.000280*
	(0.28)	(1.03)	(2.21)	(0.79)	(0.43)	(-0.05)	(-0.22)	(0.14)	(-3.18)	(-2.86)	(-2.44)	(-1.69)
Capital	3.003	-3.460***	1.410	0.00834*	2.727**	3.240***	-0.0340	-0.178	0.0450***	0.0436***	0.524***	0.178***
	(0.63)	(-2.74)	(1.56)	(1.76)	(2.16)	(2.60)	(-0.08)	(-0.39)	(9.97)	(9.50)	(3.83)	(4.25)
Opacity	0.691***	-0.158***	-0.217***	1.833**	-0.665***	-0.585***	-0.0566***	-0.0728***	0.000781***	0.000645***	0.00972***	0.00814***
	(5.06)	(-4.37)	(-7.33)	(1.97)	(-14.79)	(-13.78)	(-3.96)	(-5.05)	(5.26)	(4.43)	(6.98)	(7.78)
d_Control	1.734***	-0.314***	-0.00782	-0.176***	-0.0382	0.362***	-0.0292	-0.138***	0.000362	-0.000542	0.00623	-0.00941**
	(4.72)	(-3.22)	(-0.10)	(-5.92)	(-0.35)	(2.92)	(-0.77)	(-3.25)	(0.92)	(-1.26)	(1.46)	(-2.55)
GDP	-0.261***	0.0454**	0.0342*	0.266***	0.0449	0.0339	-0.00171	0.00112	-0.000498***	-0.000473***	-0.00149	-0.000718
	(-3.81)	(2.50)	(1.71)	(2.83)	(1.51)	(1.17)	(-0.18)	(0.12)	(-5.12)	(-4.86)	(-1.59)	(-1.04)
Observations	1409	1409	1409	1409	1289	1289	1425	1425	1420	1420	1216	1216
Year FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IV F-stat			75.47	47.73	54.69	52.01	77.02	62.93	76.40	60.09	10.92	51.47
Anderson LM stat (p-val)			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Table A.8. Add a control variable Individualism

This table reports 2SLS estimations of risk measures (ZScore, Distance to Default, Stock Volatility, Standard deviation of ROA, Non-performing loan ratio) on executive employee ownership (EO_Exe)/non-executive employee ownership (EO_NonExe). We add a control variable *Individualism*. The variable of interest EO_Exe/EO_NonExe is instrumented with the long-term orientation index. All regressions included country and year fixed-effects to control for possible within-economy correlations. All variables are as defined in Table 1. The corresponding t-statistics are reported in parentheses. Significance levels are indicated by ∗, ∗∗, and ∗∗∗ and correspond to the 10%, 5%, and 1% significance levels, respectively. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Dependent variable	EO_Exe	EO_NonExe	ZScore		DD		Volatility		SDROA		NPL_TA	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	1st Stage	1st Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage
EO_Exe			0.159***		0.475***		-0.0282***		-0.000273**		-0.00592**	
			(2.62)		(3.40)		(-3.72)		(-2.29)		(-2.28)	
EO_NonExe				0.284***		0.779***		-0.0460***		-0.000450***		-0.00749**
				(3.69)		(6.07)		(-6.23)		(-2.83)		(-2.46)
LT-OrientationIndex	0.201***	0.130***										
	(3.93)	(9.50)										
Size	-0.976***	0.0802***	0.144**	-0.0137***	0.259*	-0.366***	-0.0251***	0.00632***	-0.000351***	-0.0000473	0.00355**	0.00723***
	(-8.71)	(2.69)	(2.56)	(-2.68)	(1.72)	(-8.39)	(-3.59)	(2.68)	(-3.19)	(-0.94)	(2.35)	(7.67)
Growth	2.141**	0.126	-0.220	-0.0478*	-1.533**	-0.295	0.130***	0.0478**	0.000124	-0.000631	-0.0101	-0.0199**
	(2.42)	(0.53)	(-0.74)	(-1.91)	(-2.24)	(-0.87)	(3.55)	(2.52)	(0.22)	(-1.52)	(-1.07)	(-2.48)
Loan	-3.015***	-0.157	1.045***	0.264	2.932***	0.903***	-0.118***	-0.0392**	-0.00155**	-0.000772**	0.0603***	0.0618***
	(-3.32)	(-0.65)	(3.26)	(1.32)	(3.30)	(3.10)	(-2.97)	(-2.32)	(-2.46)	(-2.14)	(6.12)	(7.04)
Deposit	-2.714**	-1.506***	0.814***	0.556***	1.833***	1.977***	0.00987	0.0146	-0.000854	-0.000810*	-0.0353*	-0.00802
	(-2.35)	(-4.88)	(2.67)	(3.23)	(2.63)	(4.98)	(0.27)	(0.66)	(-1.44)	(-1.70)	(-1.89)	(-0.79)
Operating	0.0136	0.00867	0.00763	0.796***	-0.00357	-0.00798	0.000308	0.000447	-0.0000296**	-0.0000282***	-0.000259	-0.0000901
	(0.53)	(1.28)	(1.20)	(3.49)	(-0.25)	(-0.99)	(0.39)	(0.95)	(-2.39)	(-2.80)	(-1.31)	(-0.50)
Capital	9.172**	-1.711	-2.352**	0.00704	-2.797	2.731*	0.204	-0.118	0.0205***	0.0173***	0.544***	0.325***
	(2.00)	(-1.40)	(-1.98)	(1.46)	(-1.02)	(1.89)	(1.40)	(-1.37)	(8.89)	(9.42)	(6.24)	(7.06)
Opacity	0.750***	-0.135***	-0.329***	-0.268	-0.973***	-0.560***	0.00737	-0.0193***	0.000592***	0.000333***	0.00746***	0.00484***
	(5.52)	(-3.72)	(-6.62)	(-0.30)	(-9.15)	(-10.92)	(1.21)	(-6.81)	(6.17)	(5.45)	(6.35)	(4.40)
d_Control	1.564***	-0.362***	-0.139	-0.162***	-0.532*	0.359***	0.0321**	-0.0285***	0.000185	-0.000401***	0.00599*	-0.000783
	(4.26)	(-3.70)	(-1.06)	(-5.36)	(-1.96)	(2.80)	(1.98)	(-3.94)	(0.73)	(-2.58)	(1.86)	(-0.25)
Individualism	0.0610***	-0.000906	-0.00428	0.236***	-0.0162	0.0211***	0.00156**	-0.000123	-0.000000306	-0.0000164***	-0.000920***	-0.000911***
	(4.29)	(-0.24)	(-0.74)	(3.12)	(-1.08)	(4.63)	(2.17)	(-0.48)	(-0.03)	(-2.97)	(-8.77)	(-9.31)
GDP	-0.262***	0.0440**	0.128***	0.00623**	0.282***	0.0224	-0.0190***	-0.00327*	-0.000273***	-0.000121***	-0.00564***	-0.00375***
	(-3.82)	(2.40)	(3.74)	(2.35)	(3.69)	(0.71)	(-4.52)	(-1.93)	(-4.14)	(-3.31)	(-6.40)	(-5.55)
Observations	1409	1409	1409	1409	1289	1289	1425	1425	1420	1420	1216	1216
Year FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IV F-stat			16.42	81.53	14.98	73.83	16.21	85.46	16.48	84.34	24.13	69.73
Anderson LM statistic (p-val)			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

CHAPTER 2

Effectiveness of policy measures to promote employee share ownership programs in banks

This chapter draws from the article "Effectiveness of policy measures to promote employee share ownership programs in banks", published in Journal of Behavioral and Experimental Finance, Volume 28, December 2020, 100401.

2.1. Introduction

Since 2012, the European Commission includes the promotion of employee share ownership programs (ESOP) in its action to reform European company law and corporate governance. The European Commission highlights the positive effects of employee shareholding on corporate governance by increasing information sharing, company transparency, and employee participation in decision making. The European Commission argues that, when employees hold an ownership stake, they demand full transparency on companies' accounts and decisions. Well-informed employees can make significant contributions to the effectiveness of company boards, especially their important function of monitoring and overseeing management (European Commission, 2014). Moreover, employee-shareholders can contribute to reduce firm risk-taking (Kolev et al., 2015) as they are risk-averse and have their job tied to the fate of their employer (e.g. Jensen & Meckling, 1976; Amihud & Lev, 1981). Based on these arguments, the European Commission recommends that EU member states should implement supportive policies to promote ESOP.

However, the studies conducted by the European Commission highlight challenges for the promotion of ESOP in Europe (The Catholic University of Brussels, 2000; European Commission, 2014). The first and foremost issue is a lack of a "*legal framework - being a premise for implementation schemes - is the most fundamental of the measures in place to promote employee financial participation. The presence or absence of specific regulations is directly related to conducive and non-conducive legal arrangements. Schemes approved through legislation give companies a distinct legal basis and provide them with a clear framework for decisions and actions*" (European Commission, 2014). Second, financial incentives (such as tax-deduction for the company's contributions to an ESOP and tax-free for ESOP participants; giving low-interest loans for companies and employees…) are important tools for enhancing and broadening employee financial participation. If financial incentives are properly designed, they will effectively promote the spread of ESOP. However, the uncertainty and complexity of a given country's tax system may diminish the effectiveness of these measures. As a result, the Commission recommends that EU member states focus on developing a legal framework to facilitate the implementation of different types of ESOP as well as increasing financial incentives to attract companies and employees to participate in ESOP. The state incentives therefore would be a significant breakthrough to promote ESOP in Europe (European Commission, 1997). In this context, the objective of this paper is to investigate the effectiveness of the different supportive policies – legal and financial incentives – implemented in Europe to promote ESOP in the banking industry.

In our investigation, we focus on banks rather than on non-banking firms for several reasons. First and foremost, improving the corporate governance of banks to increase their transparency and reduce their risk-taking has become an important goal of financial regulatory authorities around the world after the global financial crisis. According to the arguments presented by the European Commission, the promotion of ESOP in the banking sector should help to achieve that goal. Second, banks are different from non-banking firms due to their specific regulation, capital structure (deposit funding with high leverage) and their inherent complexity and opacity (Morgan, 2002). The conflict of interest between different stakeholders in banks is more intense than that in non-banking firms. Focusing on banks therefore allows us to gain better insights into the impact of the agency conflicts between stakeholders on the decision of a bank to adopt an employee share ownership program. This can help policymakers to adjust their supportive policies to make them more effective.

The adoption of an ESOP, which turns employees into shareholders, changes the balance of power between insiders (managers in widely-held banks and majority shareholders in closely-held banks) and outsiders (minority shareholders). Insiders and outsiders of banks vote for or against an employee share ownership program by taking into account the potential impact of the program on their bargaining power. The decision of a bank to adopt an employee share ownership program can therefore be driven by its inner conflicts of interest between stakeholders.

In widely-held banks, the agency conflict is between managers and shareholders. The managers' major interest is to maximize job security. They therefore behave in a risk-averse manner against the interest of shareholders who want more risk to maximize profits (Amihud & Lev, 1981). In such a situation, the presence of an employee share ownership program should be considered by shareholders as an effective mechanism to mitigate this agency conflict. However, Gamble (2000) argues that shareholders can also regard ESOP as a strategy of managers to protect their positions. When managers own shares via an ESOP, shareholders may find it difficult to organize a vote against management proposals or generate adequate momentum to replace top-level managers. In line with this argument, some studies find that the market reacts negatively when an ESOP is seen as a management entrenchment mechanism (Gordon & Pound, 1990; Chang, 1990; Dhillon & Ramírez, 1994).

In closely-held banks, the presence of large shareholders, who can act to replace ineffective managers if banks are not profitable, forces managers to become less risk-averse (Hill & Snell, 1988). As a result, the conflict of interest switches from managers vs. shareholders to majority vs. minority shareholders, as large shareholders have incentives to

maximize their benefits at the cost of minority shareholders (Shleifer & Vishny, 1997). The incentives of majority shareholders to implement an ESOP are ambiguous. On the one hand, majority shareholders have incentives to use ESOP to align the interests of managers with those of shareholders. In line with this argument, Park & Song (1995) find that the market reacts more favorably to an ESOP adoption in closely-held firms. On the other hand, majority shareholders are less likely to adopt an employee share ownership program as it will turn managers into minority shareholders. Managers will then defend the interest of minority shareholders, in particular by limiting any opportunist behavior of majority shareholders such as minority expropriation.

The existing literature examines the characteristics of firms that have adopted an ESOP and mainly focuses on US non-financial firms characterized by a widely-held ownership structure. To our knowledge, no paper examines the effectiveness of policies implemented by policy-makers to promote ESOP. Core and Guay (2001), examining the determinants of non-executive employee stock option holdings in US non-financial firms, find that the level of non-executives' option incentives is increasing in firms' growth opportunities, the relative importance of human capital as a factor of production, and firm size. Oyer and Schaefer (2005) further find that firms give stock options to all employees to increase employee efficiency and employee retention.

This paper aims to complete this literature by investigating whether the different measures implemented in the European countries to promote ESOP are effective to encourage banks to adopt such a program and if their effectiveness depend on bank ownership structure. In widely-held banks, supportive measures might be effective because they provide a legal framework that can reduce shareholders' concerns about managerial entrenchment as managers will receive extra remuneration and tax-saving with the adoption of an ESOP. Both managers and shareholders can therefore gain benefits from supportive measures for ESOP. On the contrary, supportive measures might be less effective to promote ESOP in closely-held banks if majority shareholders have an incentive to extract higher levels of private benefits at the cost of minority shareholders.

We further explore if the strength of the agency conflict, in both widely- and closely-held banks, might have an impact on the effectiveness of the ESOP supportive measures. We use the degree of bank opacity and the level of shareholder protection as proxies to measure the strength of conflict of interest between insiders and outsiders. Lepetit et al. (2017) find that the degree of bank opacity and the level of shareholder protection influence the opportunistic behavior of insiders. They prove that banks with concentrated ownership pay lower dividends

when they have high degrees of opacity, to extract higher levels of private benefits. They also find that higher shareholder protection helps to constrain this expropriation behavior of majority shareholders. Besides, La Porta et al. (2007) find that in countries with stronger levels of shareholder protection, minority shareholders use their legal powers to force companies to disgorge cash, thus precluding insiders to expropriate minority shareholders. We therefore examine the effectiveness of the supportive measures to promote ESOP in widely- and closely-held banks under the effects of bank opacity and shareholder protection.

We use a unique hand-collected dataset on the ESOP adoption in annual reports of 103 listed banks in sixteen western European countries. We use a broad definition of employee ownership, covering the variety of programs in which employees (top managers with/without selected employees) are granted shares and share options. We consider that a reverse causality can exist between the national supportive policy and ESOP adoption due to the endogenous nature of the policy-making process. Supportive measures provide incentives for firms and employees to participate in ESOP while the rate of firms adopting ESOP may affect the decision of legislators to create or modify supportive measures. To tackle the challenge associated with endogeneity bias, we propose a novel instrumental variable defined as the number of political parties supporting labor rights in parliament. The rationale for this instrument is that ESOP, by offering employees an ownership stake in the company they are working for, should be largely supported by political parties who promote labor rights. Therefore, the number of labor-support-parties in parliament should be mechanically correlated with the national supportive policy to promote ESOP, while it should not depend on or be influenced by the number of banks adopting ESOP.

Our results provide evidence that policies implemented by policy-makers in Europe are effective to promote ESOP in the banking sector. Further investigations show that the effectiveness of the ESOP supportive measures depend on the ownership structure of banks, as well as on their degree of opacity and the level of shareholder protection. More specifically, we find that supportive measures are effective to promote ESOP in widely-held banks independently of their degree of opacity and level of shareholder protection, while they are only effective to promote ESOP in closely-held banks when they have lower degrees of opacity or they are located in countries with stronger levels of shareholder protection.

This study makes several contributions to the literature. Firstly, it contributes to the literature on the determinants of ESOP in the banking industry. Secondly, it examines the effectiveness of the measures implemented at the national level in Europe to promote ESOP. To the best of our knowledge, no previous research has examined the effect of the national

supportive policy on ESOP promotion. Thirdly, it investigates the complex interplay of agency problems faced by stakeholders on the effectiveness of ESOP supportive measures in both widely-held and closely-held banks. Our findings have relevant practical implications, as they suggest that the supportive measures may not in itself be enough to promote ESOP in closely-held banks. It is also fundamental to force closely-held banks to become more transparent and to implement stronger legal shareholder protection.

The remainder of the paper is organized as follows. Section 2 describes our sample, defines variables and presents the instrumental variable used to address the endogeneity problem. Section 3 presents the effects of the national supportive policy on ESOP adoption. Section 4 examines the effectiveness of supportive measures by taking into account the type and the strength of agency conflicts between insiders and outsiders. Section 5 contains robustness checks. Section 6 concludes the paper.

2.2. Data, variables, and sample

2.2.1. Presentation of the sample

We use the report published in 2014 by the European Commission on "the classification of European Union Member States based on regulatory density and support measures for employee financial participation" to collect data on the ESOP supportive measures (European Commission, 2014). As such a report was only published once in October 2014, we limit our main analysis to the year 2015[10].

We manually collect data on ESOP in bank annual reports for the year 2015. We limit our analysis to listed commercial banks and bank holding companies in sixteen European developed countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom) where the code of corporate governance for the listed firms requires firms to disclose information on ESOP in their annual reports.

According to the European Commission, profit-sharing and employee ownership schemes are the two main types of employee financial participation. However, there is a fundamental difference between profit-sharing and employee ownership schemes. With profit-sharing, a portion of profit is distributed to employees in addition to their wages, while with employee ownership schemes, employees own stock in the company in which they work for (Pérotin & Robinson, 2003). In other words, profit-sharing grants "a monetary reward" to

[10] We use the data colleted for the year 2014 to test the robustness of our results to the year-to-year variation (see Section 5).

employees for their contributions to a company's achieved profit goal. Employee ownership schemes, however, turn employees into shareholders by granting them an ownership stake.

Profit-sharing may take the form of immediate cash bonuses, cash transfers to employee savings funds, or free equity shares. In principle, profit-sharing does not have to be associated with any form of employee input into company decisions at any level. In contrast, through employee ownership schemes, employees will have the right to vote and participate in the decision-making process of the company. In fact, employees are granted ownership through two channels of employee ownership schemes, including employee share ownership and employee share options. Employee share ownership may take the form of share purchase plans, free shares financed out of profits, or shares transferred to a collective trust financed by a loan secured against future profits. For employee share options, employees are granted a right to acquire shares at some future point at a price set when the right is granted.

Both profit-sharing and employee ownership schemes are used to enhance employee productivity. However, while profit-sharing does not change the balance of power between insiders (managers and majority shareholders) and outsiders (minority shareholders), employee ownership schemes may play an important role in reshaping a company's agency conflict. When employees hold an ownership stake through employee ownership schemes, they will demand full transparency on companies' accounts and decisions. Well-informed employee-shareholders can make significant contributions to the effectiveness of company boards, especially their important function of monitoring and overseeing management (European Commission, 2014). Employee ownership schemes, therefore, are expected to be a mechanism to not only boost employee productivity but also enhance corporate governance by increasing information sharing, company transparency, and employee participation in decision making.

Because profit-sharing and employee ownership schemes are fundamentally different, the European Commission quantifies different supportive measures. In our analysis, we only focus on examining the effectiveness of the supportive measures aiming to promote employee ownership schemes because employees can enhance corporate governance by actively monitoring and overseeing management. Our dependent variable is then a dummy variable to indicate whether a bank has an employee share ownership program in a year, taking the value of one if bank employees (top managers with/without selected employees) are granted shares or share options through employee share ownership or employee share options schemes, taking the value of 0 otherwise.

Having an ESOP scheme does not mean that a bank decides to apply ESOP in all years. When a bank declares that it has an ESOP program, it sets out the goals of the ESOP program,

the criteria for selecting employees, shares and/or share-options can be used in the scheme, the process to vet shares/share-options… Each year, in the general shareholders meeting, shareholders will decide whether or not to apply the ESOP scheme in the following year. The ESOP scheme may also be revised by the general shareholders meeting to fit the bank's specific goals for a given year. In our paper, we consider whether a bank adopted ESOP in 2015 but in fact, the bank may have already started its ESOP program since a long time ago. We also use banks' annual reports of 2014 to decide whether or not a bank has adopted an ESOP in 2014.

We extract financial data and ownership structure from the Bankscope database. The market data used to measure the degree of bank opacity are extracted from Bloomberg. After dropping observations with missing values for the financial variables, our final sample consists of 103 European listed banks (over 111 listed banks), including 66 commercial banks and 37 bank-holding companies see Table A.1 in Appendix for a breakdown by country.

2.2.2. The national supportive measures

We construct the variable *Country index* to measure the national supportive policy of a country to promote ESOP. The *Country index* comprises two components: *Legal index* and *Fiscal index*. These indices are based on scores used by the European Commission to quantify the degree of the legal framework and financial incentives of each European country to promote ESOP (The European Commission, 2014).[11] According to the European Commission, the scores of the legal framework and fiscal incentives are quantified as follows.

The legal score is an indicator that evaluates the presence or absence of regulations relating to the implementation of ESOP. It varies from 0 to 3. It equals to 0 if a country has no systematic regulation of ESOP and its general regulations neither promote nor inhibit the development of ESOP. It equals 1 if a country has an isolated regulation on one aspect of ESOP (usually company law). It equals 2 if a country has a systematic regulation of more than one aspect of ESOP (usually tax and company law). It equals 3 if a country has a systematic regulation of more than one aspect of ESOP and one or more additional aspects (connection to securities law, labor law, social legislation, etc.).

The fiscal score is an indicator that measures tax and financial incentives for companies and employees to adopt an ESOP. It varies from 0 to 4. It equals 0 if a country has no special

[11] The scores of the legal framework and fiscal incentives are presented in the Table "the classification of European Union Member States based on regulatory density and support measures for employee financial participation" in the report "*The Promotion of Employee Ownership and Participation"* of the European Commission published in October 2014, see https://op.europa.eu/en/publication-detail/-/publication/c184fcde-ecd7-11e5-8a81-01aa75ed71a1/language-en/format-PDF/source-search).

tax incentives and its general system of taxation neither promotes nor inhibits the development of ESOP. It equals 1 if a country has some tax incentives for companies and employees participating in ESOP, but their impact is not clear. It equals 2 if a country has some tax incentives and the difference between the effective tax rate on employee salary and firm income through ESOP is significant. It equals 3 if a country has tax incentives that are applicable to most enterprises and the criteria for these tax incentives are clearly defined and not restrictive. It equals 4 if a country has effective tax incentives and, additionally, other instruments of fiscal support such as government-backed loans for ESOP.

We use the scores of the legal framework and fiscal incentives as the *Legal index* and *Fiscal index,* respectively. We combine these two indices into the *Country index,* which measures the national supportive policy of each country to promote ESOP. The *Country index* is defined as the sum of legal index and fiscal index. It therefore varies from 0 to 7. The higher the *Country index,* the better the support from the government for the development of ESOP.

Table A.1 in Appendix provides descriptive statistics of the national supportive measures. We observe that there is a strong heterogeneity among the European countries we consider, with the legal and fiscal indices ranging from zero to their maximal value.

2.2.3. Widely-held vs. closely-held banks

We follow the existing literature (La Porta et al., 1998; Claessens et al., 2002; Faccio & Lang, 2002) by using the controlling threshold of 20% of outstanding shares to distinguish between widely-held and closely-held banks. We define a bank as a closely-held bank if it has at least one controlling shareholder who owns at least 20% outstanding shares. Banks without controlling shareholders are defined as widely-held banks. We also test the robustness of our results by using the control threshold of 10% instead of 20% (see Section 5).

Table A.2 in Appendix displays descriptive statistics of banks having ESOP among widely- and closely-held banks. We observe that around 53% and 59% of widely-held and closely-held banks have adopted an ESOP, respectively.

We compute the dummy variable D_Controlling, which equals 1 if banks are closely-held and equals 0 if banks are widely-held banks.

2.2.4. Proxies to measure of the strength of agency conflicts

The evidence from existing studies so far shows that opacity and shareholder protection influence the opportunistic behavior of insiders (majority shareholders and managers) in expropriating minority shareholders (e.g. Lepetit et al., 2017; Brockman & Unlu, 2011; Eije & Megginson, 2008; Li & Zhao, 2008).

We follow Lepetit et al. (2017) to construct an opacity index (Opacity). We measure four components of opacity: (EF) measures the disconnection between insiders' and outsiders' information about firms' financial condition by computing the analyst forecast error; (EM) measures accounting opacity and is computed by the degree of earnings management of banks; (MF) is the negative of the ratio of short term and long term market funding to total assets measuring banks' exposure to the market; (Loan) loans over total assets. Then, associating each component with the value of 1 to 10 corresponding to the decile of 1 to 10. After that, summing up four proxies, then divide it by four to scale the composite index. This index ranges from 1 to 10. The most transparent bank has a value of 1 and the most opaque bank has a value of 10.

We use the measurement of La Porta et al. (1998) and revised by Djankov et al. (2008) to measure the level of shareholder protection in each country. The index RADI measures the level of shareholder rights for each country, i.e. the legal protection of shareholders against expropriation by managers through several measures. This index varies from 0 (for weak protection countries) to 6 (for strong protection countries). For our sample, the index ranges from 2 (Greece and Italy) to 5 (UK).

2.2.5. Endogeneity and instrumental variables

In this section, we identify endogeneity problems and propose the instrumental variable approach to address this issue.

First, the causal effects between ESOP and bank financial characteristics can produce biased results. Firm performance and financial outcome ratios are factors that potentially influence the decision of shareholders on whether or not to adopt an employee share ownership program. However, existing studies show that ESOP have a significant impact on firm performance (e.g., Dhillon & Ramírez, 1994; Jones & Kato, 1995; Ding & Sun, 2001; Cin & Smith, 2002; Lampel et al., 2012). ESOP also have a negative curvilinear relationship with the cost of debt and the weighted average cost of capital (Aubert et al., 2017). Managerial ownership has a positive impact on firm value (Drakos & Bekiris, 2010). Moreover, ESOP can also lead to an increase in firm equity and total assets if the firm decides to take loans to finance its employee share ownership programs. In fact, an ESOP can be leveraged or non-leveraged, depending on how a bank finances its ESOP. A non-leveraged ESOP is when a bank uses its own funds to implement its ESOP schemes. A leveraged ESOP is when a bank borrows funds to purchase shares from itself, then distributes the shares to its employees. Therefore, non-leveraged ESOP programs will not result in an increase in a bank's total assets. However,

leveraged ESOP programs can increase a bank's total assets as well as inject capital into the bank through the acquisition of newly issued shares.

Throughout our analysis, we therefore use one-year lagged values of the control variables for bank financial characteristics to avoid any potential reverse causal effects between bank financial characteristics and ESOP adoption. It is clear that if a bank decides to adopt an employee share ownership program in a given year, this program cannot reversely affect the banks' financial outcomes one year ago.

Second, and most importantly, the reverse causality between the national supportive policy and ESOP adoption could afflict our analysis due to the endogenous nature of the policy-making process. The European Commission recommends that the national supportive policy promotes ESOP adoption. Reversely, the number of firms adopting ESOP may also affect the decision of legislators to create, modify or abolish supportive measures. If more and more firms adopt ESOP, it increases the need to have a comprehensive legal framework for different implementations of ESOP. Moreover, it is worth noting that the national supportive policy provides tax-deduction and other financial incentives for firms and employees participating in ESOP, a higher rate of ESOP acceptance in the business community, therefore, strengthens motivation of interest groups (such as business associations and labor unions) to pursue legal lobbying activities to create more supportive measures. This argument is consistent with the existing political studies such as Nelson and Yackee (2012) and Yackee (2012) which find that, in the policy-making process, interest groups commonly join together to promote or thwart government policy change.

Therefore, we use a novel instrumental variable approach to tackle the challenge of capturing plausibly exogenous variation in the national supportive policy. We instrument the national supportive policy by the total number of political parties in parliament who support labor rights, including socialist (except the green party)[12], communist and labor parties.

The logic of our approach relies on the argument that political parties in parliament create and support laws that are consistent with their political ideology. Political parties who support labor rights can regard ESOP as a positive method to grant employees an ownership stake of the company where they are working for. Therefore, the greater the number of labor-

[12] Thirty-four Green parties from all over Europe have joined to form The European Green Party since 2004. The party commits to basic tenets of Green politics, such as environmental responsibility, individual freedom, inclusive democracy, diversity, social justice, gender equality, global sustainable development and non-violence. However, labor rights are not mentioned in the party's motto.

support-parties in parliament, the more the national supportive measures for ESOP could be approved.

The conceptual premise for the relevance of our IV is that the number of labor-support-parties in parliament is mechanically correlated with the national supportive measures for ESOP. In contrast, the number of labor-support-parties in parliament does not depend on or is influenced by bank characteristics.

2.3. The national supportive policy and ESOP adoption

In this section, we discuss our evidence about the effect of the national supportive policy on ESOP adoption. We then discuss the effect of each type of supportive measures on promoting ESOP.

2.3.1. Does the national supportive policy promote employee share ownership programs?

We conduct a cross-sectional regression analysis to examine the effect of the national supportive policy (*Country index*) on ESOP. We use two models for this test. First, we use the probit model. Second, we run two-stage least squares (2SLS) regressions in the ivprobit model by using the number of labor-support-parties in parliament as an instrumental variable for the national supportive policy.

The equation for the probit model is as follows:

$$\text{Pro}\{ESOP_i = 1\} = \Phi\,(\beta_0 + \beta_1 * \text{Country Index}_i + \textstyle\sum_m \theta_m \text{Control}_i) \qquad (1)$$

The equations of the first and second stage of the two-stage least squares (2SLS) regressions in the ivprobit model are as follows:

$$\text{Country Index}_i = \beta_0 + \beta_1 * \text{LaborSupportParties}_i + \sum_m \theta_m \text{Control}_i + \varepsilon_i \quad (2.1)$$

$$\text{Pro}\{ESOP_i = 1\} = \Phi\,(\beta_0 + \beta_1 * \text{Instrumented\_Country Index}_i + \textstyle\sum_m \theta_m \text{Control}_i) \quad (2.2)$$

The *Instrumented Country index* in Equation (2.2) is the predicted values of the *Country index* in the equation (2.1).

We use a set of control variables including bank characteristics as well as institutional characteristics which can potentially affect the decision of banks to adopt an employee share ownership program. We follow Core and Guay (2001) and Oyer and Schaefer (2005) to expect that bank size, bank growth opportunities and bank risk influence ESOP adoption. We use the natural logarithm of total assets (*Size*) and the growth of total assets (*Growth_TA*) to measure

bank size and bank growth opportunities, respectively. We measure bank risk by using *Zscore* following Laeven and Levine (2009), Lepetit and Strobel (2013), and Lepetit and Strobel (2015). We also measure bank profitability by the return on equity ratio (*ROE*); bank capital leverage by the equity to total assets ratio (*Equity_TA*); and bank funding structure by the ratio of total deposits to total assets (*Deposit_TA*). We expect that bank financial characteristics affect the decision of shareholders and managers to participate in ESOP. However, the magnitude and the sign of the relation between bank financial characteristics and ESOP adoption is not clear. On the one hand, larger banks with higher growth opportunities and lower risk may have more financial resources to implement ESOP. These banks also are more likely to use ESOP to increase employee efficiency and employee retention. This argument is consistent with the study of Oyer and Schaefer (2005) in which they find that firms give stock options to all employees to increase employee efficiency and employee retention. On the other hand, smaller banks with lower growth opportunities and higher risk may also use ESOP as a mechanism to increase bank equity without diluting outstanding shares, consistent with the study of Core and Guay (2001) finding that firms use greater stock option compensation when facing capital requirements and financing constraints. We also include the dummy variable *D_controlling* that takes the value 1 for closely-held banks and 0 for widely-held banks. As explained above, we expect the ownership structure to influence banks' decision to adopt an ESOP. We also use an index (*individualism*) based on the work of Hofstede[13] (2001) to measure the distinction between collective (group-based) and individual-based decision making of a country. According to Caramelli and Briole (2007), some different adaptations in the employee share ownership program's design and communication are recommended to improve its attitudinal effects in collectivistic societies and individualistic societies. Thus, the effectiveness of the national supportive policy to promote ESOP can be influenced by country culture.

Table 1 shows definitions, data sources and summary statistics for variables. Extreme bank-year observations are winsorized (1% lowest and highest values). We analyze the

[13] Hofstede's cultural dimensions theory is a framework for cross-cultural communication, developed by Geert Hofstede. It shows the effects of a society's culture on the values of its members, and how these values relate to behavior, using a structure derived from factor analysis. In the book Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations, Geert Hofstede has scored indices of five major cultural dimensions of a given country: power distance; uncertainty avoidance; individualism versus collectivism; masculinity versus femininity; and long term versus short-term orientation. We adopt the individualism index in our analysis.

correlation coefficients between our control variables and find that all variance inflation factors (VIF) are smaller than 5 (see Table A.3. in Appendix).[14]

[14] Appendix B shows that the correlation coefficients among control variables are low except the coefficients between: *Size - EQ_TA; Size - Deposit_TA; Size* – Opacity; and ZScore – ROE. However, Collinearity Diagnostics indicate that all variance inflation factors (VIF) are smaller than 5. Thus, there is no serious collinearity problem among our control variables. Moreover, in section 5, we use orthogonalized variables to re-conduct our analysis. Our results are unchanged. We therefore use original values of control variables in our main analysis.

Table 1: Definitions, data sources and summary statistics for variables

Variable name	Definition	Source	Min	Max	Median	Mean	Std. Dev.
The dependent variable							
D_ESOP	The dummy variable equals one if bank employees (top managers with/without selected employees) are granted shares or share options through employee share ownership or employee share options schemes in the year 2015, and equals 0 otherwise.	Annual reports	0	1	1	0.56	0.49
The variables of interest							
Country Index	Country Index = Legal index + Fiscal index Country Index measures the total supportive policies of a country to promote Employee Share Ownership Programs. It varies from 0 to 7. The higher the index is, the more the supportive policies are created to promote Employee Share Ownership Programs.		1	7	4	3.59	2.09
Legal index	Measure of the legal framework regarding the implementation of ESOP. The Legal index varies from 0 to 3. It equals to 0 if a country has no systematic regulation of employee financial participation programs and its general regulations neither promote nor inhibit the development of employee share ownership programs. It equals 3 if a country has a systematic regulation of more than one aspects of employee share ownership programs (usually tax and company law).	The report "The promotion of employee ownership and participation" of the European Commission, published in October 2014.	0	3	2	1.85	0.75
Fiscal index	Measure of tax and financial incentives for companies and employees participating in employee share ownership programs. The Fiscal index varies from 0 to 4. It equals 0 if a country has no special tax incentives and its general system of taxation neither promotes nor inhibits the development of employees. It equals 4 if a country has effective tax incentives and, additionally, other instruments of fiscal support for employee share ownership programs.	The report "The promotion of employee ownership and participation" of the European Commission, published in October 2014.	0	4	2	1.74	1.41

Variable name	Definition	Source	Min	Max	Median	Mean	Std. Dev.
The instrumental variable							
Labor-support-parties	The total number of political parties in parliament supporting labor rights, including socialist (except the green party), communist and labor parties.	Government websites and internet	2	8	3	4.16	2.09
Control variables							
Size	Natural logarithm of Total Assets.	Bankscope	12.11	21.64	17.26	17.15	2.70
Equity ratio	Total equity divided by total assets.	Bankscope	0.03	0.32	0.07	0.08	0.05
ROE	Return on equity ratio.	Bankscope	-0.89	0.27	0.06	0.03	0.16
Growth of total assets	The growth of total assets = (Total assets in 2014 – Total assets in 2013)/Total assets in 2013.	Bankscope	-0.35	0.82	-0.09	-0.06	0.15
Deposit over total assets	Total deposits divided by total assets.	Bankscope	0.03	0.93	0.73	0.69	0.17
Opacity	Measure of four components of opacity: (EF) measures the disconnection between insiders' and outsiders' information about firms' financial condition by computing the analyst forecast error; (EM) measures accounting opacity and is computed by the degree of earnings management of banks; (MF) is the negative of the ratio of short term and long term market funding to total assets measuring banks' exposure to the market; (Loan) loans in total assets. Then, each component is associated with the value of 1 to 10 corresponding to the decile of 1 to 10. After that, we sum up the four proxies, then divide it by four to scale the composite index. This index ranges from 1 to 10. The most transparent bank has a value of 1 and the most opaque bank has a value of 10.	Lepetit et al. (2017)	1.5	9.5	5.5	5.47	1.63

Variable name	**Definition**	**Source**	Min	Max	Median	Mean	Std. Dev.
D_Opacity	The dummy variable *D_Opacity* takes the value one if the bank has a degree of opacity higher than the median of the sample; it takes the value zero otherwise.		0	1	0	0.49	0.50
Z-Score	Measure of bank's solvability. Z-score is computed by three-year moving window to compute the standard deviation of asset returns for each bank each year. A higher Z-score indicates that a bank has a lower risk of insolvability. Formula to calculate: Z-Score = $\frac{\mu_{ROA}(3)+EQ\_TA}{\delta_{ROA}(3)}$ Where $\mu_{ROA}(3)$: moving mean for 3 observations of ROA EQ_TA: current value of capital-asset ratio $\delta_{ROA}(3)$: moving standard deviation for 3 observations of ROA	Laeven and Levine (2009); Lepetit and Strobel (2013); and Lepetit and Strobel (2015).	-0.22	6.28	3.66	3.51	1.50
D_Controlling	The dummy takes the value of one if the bank has at least one controlling shareholder; 0 otherwise. We follow the existing literature (La Porta et al., 1999; Claessens et al., 2000; Faccio & Lang, 2002) by using the controlling threshold of 20% of outstanding shares to distinguish between widely-held and closely-held banks. If a bank has at least one shareholder who owns at least 20% of its outstanding shares, it will be classified as a closely-held bank; it will be classified as a widely-held bank, otherwise.	Bankscope	0	1	1	0.52	0.50
RADI	This index measures the level of shareholder rights for each country, i.e. the legal protection of shareholders against expropriation by managers through several measures; it takes 1 for each following component of the commercial laws of a country including (1) vote by mail is allowed; (2) shareholders are not required to deposit shares before annual shareholders' meeting; (3) cumulative voting is allowed; (4) minority shareholders have legal mechanisms against perceived oppression by the board; (5) shareholders have pre-emptive rights that can be waived only by shareholders' vote, and (6) the	Porta et al. (1998) and revised by Djankov et al. (2008)	2	5	3.5	3.43	1.00

	minimum percentage of share capital that allows a shareholder to call for a special shareholders' meeting is no more than 10%. The shareholder protection index (RADIj) varies from 0 (for weak protection countries) to 6 (for strong protection countries).						
D_RADI	The dummy variable *D_RADI* takes the value one if the level of shareholder protection of a country is lower than the median of the sample; it takes the value zero otherwise.		0	1	1	0.60	0.49
Individualism	The individualism/collectivism dichotomy personifies the distinction between collective (group-based) and individual-based decision making. When individualism is low, there is priority for group effort to achieve success. When it is high, there is priority for individual needs and achievements. Individuals in an individualistic culture are likely to challenge authority and encourage a reduction of power differences between management and employees. However, individuals in a collectivist culture are likely to protect the well-being of the group and less challenge managers. We use the individualism score of each country constructed by Hofstede (2001). The higher the score is, the more individualism the country is.	Hofstede (2001)	27	89	71	68.66	13.52

Table 2 presents the results of our baseline test. The dependent variable is the dummy variable *D_ESOP*. All control variables for bank financial characteristics are lagged values. Columns 1 reports regression estimates for the probit model without using the instrument variable. Columns 2 and 3 report the first and the second-stage results for our IV estimations. The national supportive policy (*Country index)* is instrumented with the number of labor-support-parties presented in parliament. Column 4 reports the marginal effects of the ivprobit model.

The probit estimates in Column 1 show that the national supportive policy has a significant (at the 1% level) and positive impact on ESOP adoption. This result, however, can be biased because of the reverse causal effects between the national supportive policy and ESOP adoption.

As previously explained, we propose a novel approach to tackle the reverse causal effect problem. Columns 2 and 3 in Table 2 report the first and the second-stage results for our IV estimation, respectively. The first-stage estimates show that there is a significant (at the 1% level) and positive relationship between the number of political parties in parliament who support labor rights and the national supportive policy. Both the Anderson-Rubin test and the Wald test have p-values smaller than 0.05, indicating that our IV passes the "weak instrument test". This confirms that our IV is empirically relevant.

The second-stage estimates of the relation between the national supportive policy and ESOP adoption are quantitatively in line with the original probit model. The results in Column 3 shows that the national supportive policy instrumented with the number of labor-support-parties has a statistically significant and positive effect on ESOP adoption. Column 4 shows the economic effects of the national supportive policy on ESOP adoption. It implies that a one-unit increase in the country support index is associated with an increase in the probability of a bank adopting ESOP of 0.111.

Overall, the results in Table 2 show that a higher level of the national supportive policy is significantly associated with higher ESOP adoption. It provides evidence that national supportive measures are effective to influence the decision of banks to adopt an ESOP and supports therefore the recommendation of the European Commission that the state members should create supportive measures to promote ESOP.

Table 2: Is the national supportive policy effective to promote employee share ownership programs?

	(1) Probit	(2) ivprobit 1st Stage	(3) ivprobit 2nd Stage	(4) ivprobit Marginal Effects
Country index	0.444***			
	(4.63)			
Instrumented Country index			0.579**	0.111***
			(2.58)	(0.0176)
Labor-support-parties		0.414***		
		(4.19)		
Size_lag(1)	0.0771	0.285***	0.0215	0.00410
	(0.76)	(2.73)	(0.16)	(0.0259)
Equity_TA_ lag(1)	-2.303	9.608**	-4.213	-0.805
	(-0.58)	(2.19)	(-0.85)	(0.854)
ROE_ lag(1)	0.584	-0.398	0.599	0.114
	(0.42)	(-0.32)	(0.42)	(0.276)
Growth_TA_ lag(1)	-0.0728	1.490	-0.265	-0.0506
	(-0.06)	(1.29)	(-0.22)	(0.224)
Deposit_TA_lag(1)	-1.941	1.150	-2.219	-0.424*
	(-1.45)	(0.94)	(-1.58)	(0.250)
Opacity_ lag(1)	-0.0219	-0.262**	0.0176	0.00336
	(-0.17)	(-2.08)	(0.12)	(0.0267)
Z-Score_ lag(1)	0.102	0.175	0.0965	0.0184
	(0.83)	(1.30)	(0.77)	(0.0244)
D_Controlling	-0.331	0.456	-0.380	-0.0726
	(-0.92)	(1.31)	(-1.02)	(0.0688)
RADI	-0.443**	0.652***	-0.490**	-0.0935***
	(-2.44)	(2.98)	(-2.45)	(0.0330)
Individualism	0.0200	0.00846	0.0153	0.00293
	(1.45)	(0.56)	(1.00)	(0.00322)
Observations	103	103	103	103
Weak instrument robust tests and confidence sets for ivprobit				
Anderson-Rubin test			5.13	
(p-value)			(0.0236)	
Wald test			6.06	
(p-value)			(0.0138)	

The t-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

2.3.2. Which type of supportive measures matter?

We find that the national supportive policy is significantly correlated with ESOP adoption. However, this result can reflect only the dominant effect of one component of the national supportive policy. In the next set of tests, we breakdown the country support index by its components to examine the impact of each component on ESOP adoption. Because we focus on the impact of each index, we repeat the baseline test for each component (*Legal index* and *Fiscal index*) one by one. Moreover, we also test the validity of our IV for each component of the national supportive policy.

We alternately replace *Country index* by *Legal index* and *Fiscal index* in Equations (2.1) and (2.2). Table 3 reports regression estimates of the ivprobit models. Columns 1 and 2 report 1st and 2nd stage ivprobit regression estimates obtained when *Legal index* is instrumented with the number of labor-support-parties. Columns 3 and 4 report 1st and 2nd stage ivprobit regressions obtained when *Fiscal index* is instrumented with the number of labor-support-parties.

The results show that each component of the national supportive policy affects significantly and positively ESOP adoption. This result implies that the effect of the national supportive policy does not reflect only one dominant effect among its components but it is a combined effect of all different supportive measures. Consistent with the logic of our IV, the Anderson-Rubin test and the Wald test have p-values smaller than 0.05 in all cases, this confirms that our IV passes the "weak instrument test".

Table 3: Which types of supportive policies matter?

Dependent variable:		*D_ESOP*		*D_ESOP*
	(1) ivprobit 1st Stage	(2) ivprobit 2nd Stage	(3) ivprobit 1st Stage	(4) ivprobit 2nd Stage
Instrumented Legal index		2.275**		
		(2.47)		
Instrumented Fiscal index				0.756**
				(2.54)
Labor-support-parties	0.109***		0.305***	
	(3.01)		(4.58)	
Size_lag(1)	0.0791**	-0.0196	0.206***	0.0375
	(2.07)	(-0.14)	(2.93)	(0.29)
Equity_TA_ lag(1)	3.981**	-8.378	5.628*	-2.588
	(2.48)	(-1.33)	(1.90)	(-0.56)
ROE_ lag(1)	0.0118	0.371	-0.409	0.639
	(0.03)	(0.25)	(-0.49)	(0.44)
Growth_TA_ lag(1)	0.412	-0.338	1.078	-0.219
	(0.98)	(-0.27)	(1.39)	(-0.19)
Deposit_TA_lag(1)	0.230	-2.304	0.920	-2.048
	(0.51)	(-1.53)	(1.12)	(-1.51)
Opacity_ lag(1)	-0.144***	0.198	-0.118	-0.0433
	(-3.13)	(1.05)	(-1.39)	(-0.33)
Z-Score_ lag(1)	0.0646	0.0464	0.111	0.110
	(1.31)	(0.34)	(1.21)	(0.88)
D_Controlling	0.0808	-0.334	0.375	-0.389
	(0.63)	(-0.86)	(1.59)	(-1.06)
RADI	0.0996	-0.356*	0.552***	-0.532**
	(1.25)	(-1.83)	(3.74)	(-2.56)
Individualism	0.0132**	-0.0134	-0.00472	0.0258*
	(2.39)	(-0.60)	(-0.46)	(1.79)
Observations		103		103
Anderson-Rubin test		5.99		5.65
		(0.0144)		(0.0174)

Wald test	6.10 (0.0135)	6.47 (0.0110)

The t-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

2.4. The role of the ownership structure, the degree of opacity and the level of shareholder protection

Our results reported in Table 2 show that the degree of opacity and the ownership structure has a negligible direct impact on the bank's decision to apply an ESOP while the proportion of banks with ESOP is significantly higher in countries with lower levels of shareholder protection. We now examine their impacts on the effectiveness of the national supportive measures. First, we examine the effect of ownership structure on the effectiveness of the ESOP supportive policy. We then focus on exploring whether the strength of the conflict of interest between insiders and outsiders, measured either by the degree of opacity or the level of shareholder protection, has an impact on the effectiveness of the ESOP supportive measures in both widely- and closely-held banks.

2.4.1. Agency conflicts and effectiveness of ESOP measures

Our evidence to this point shows that the national supportive policy and each of its components have a significant and positive impact on ESOP adoption. However, as the agency conflict of interest between managers vs. shareholders in widely-held banks is different with the principal – principal conflict of interest between majority vs. minority shareholders in closely-held banks, we examine whether the effectiveness of the national supportive policy and each of its component is driven by bank ownership structure.

In widely-held banks where the conflict of interest is between managers vs. shareholders (Hill and Snell, 1988), shareholders have the incentive to adopt ESOP to make managers less risk-averse. However, the risk of managerial entrenchment might reduce their motivation to adopt ESOP (Gamble, 2000). In closely-held banks where the conflict of interest is between majority vs. minority shareholders (Shleifer and Vishny, 1997), minority shareholders will vote for an ESOP proposal while majority shareholders are more likely to be "anti-ESOP". We conjecture that supportive measures are more effective to promote ESOP in widely-held banks as they provide a legal framework that can reduce shareholders' concerns about managerial entrenchment. Majority shareholders in closely-held banks might vote against the adoption of an ESOP as it will turn managers into minority shareholders.

We analyze how the ownership structure of banks has an impact on the effectiveness of ESOP measures by expanding Equation (2.2) with an interaction term between the *Instrumented Country index* and *D_Controlling* as follows:

$$\text{Pro}\{ESOP_i = 1\} = \Phi(\beta_0 + \beta_1 * IV\_\text{Country Index}_i + \beta_2 * \text{IV\_Country Index}_i * \text{D\_Controlling}_j + \sum_m \theta_m \text{Control}_i) \quad (3)$$

We alternately replace the *Instrumented Country index* by the *Instrumented Legal index* and the *Instrumented Fiscal index* in Equation (3).

Table 4 reports regression estimates of the 2nd stage of the ivprobit models where the dependent variable is *D_ESOP*. Columns 1, 2, 3 report the results when *Country index, Legal index,* and *Fiscal index* is instrumented with the number of labor-support-parties, respectively. The results show that the coefficients of *Instrumented Country index*, *Instrumented Legal index,* and *Instrumented Fiscal index* are significant (at the 1% level) and positive. These results indicate that, in widely-held banks, the national supportive policy and each of its components have a significant and positive impact on ESOP adoption, consistent with our conjecture. On the contrary, the results of the Wald tests show that the coefficients of the indices are insignificant in the case of closely-held banks. It indicates that all supportive measures are ineffective to promote ESOP in closely-held banks.

Overall, we find that the supportive measures are only effective to promote ESOP in widely-held banks but they are ineffective for closely-held banks.

Table 4: Ownership structure and effectiveness of national supportive measures

Dependent variable:	D_ESOP	D_ESOP	D_ESOP
	(1) ivprobit 2nd Stage	(2) ivprobit 2nd Stage	(3) ivprobit 2nd Stage
Instrumented Country index (b1)	0.463***		
	(4.68)		
Instrumented Country index * D_Controlling (b2)	-0.242		
	(-1.08)		
Instrumented Legal index (b1)		1.274***	
		(4.30)	
Instrumented Legal index * D_Controlling (b2)		-0.352	
		(-0.52)	
Instrumented Fiscal index (b1)			0.652***
			(4.63)
Instrumented Fiscal index * D_Controlling (b2)			-0.401
			(-1.28)
D_Controlling	0.540	0.353	0.377
	(0.61)	(0.28)	(0.57)
Size_lag(1)	0.101	0.100	0.110
	(0.96)	(0.96)	(1.05)
Equity_TA_ lag(1)	-0.954	-2.246	-0.128
	(-0.23)	(-0.50)	(-0.03)
ROE_ lag(1)	0.557	0.482	0.574
	(0.39)	(0.36)	(0.40)
Growth_TA_ lag(1)	0.185	0.163	0.240
	(0.15)	(0.15)	(0.20)

Deposit_TA_lag(1)	-1.623	-1.729	-1.454
	(-1.22)	(-1.23)	(-1.15)
Opacity_ lag(1)	-0.0766	0.00720	-0.111
	(-0.56)	(0.05)	(-0.85)
Z-Score_ lag(1)	0.119	0.0836	0.125
	(0.95)	(0.67)	(1.01)
RADI	-0.394**	-0.346**	-0.409**
	(-2.11)	(-1.97)	(-2.15)
Individualism	0.0255*	0.0105	0.0327**
	(1.69)	(0.64)	(2.20)
Observation	103	103	103
Wald test			
b1 + b2 = 0	0.221	0.922	0.251
	(0.952)	(1.630)	(0.661)

The t-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

2.4.2. Strength of the agency conflicts

We next explore whether the strength of the conflict of interest between insiders and outsiders, measured either by the degree of opacity or the level of shareholder protection, has an impact on the effectiveness of the ESOP supportive measures in both widely- and closely-held banks. Again, we conjecture that supportive measures are more effective to promote ESOP in widely-held banks, independently of the strength of the agency conflict. In closely-held banks, existing studies show evidence that opacity and shareholder protection affect significantly the opportunistic behavior of majority shareholders (Lepetit et al., 2017; La Porta et al., 2007). We therefore expect the degree of bank opacity and the level of shareholder protection to have an impact on the decision of majority shareholders to adopt an ESOP.

We create the dummy variable *D_Opacity*, which takes the value one if the bank has a degree of opacity higher than the median of the sample; it takes the value zero otherwise. We also create the dummy variable *D_RADI* which takes the value one if the level of shareholder protection of a country is lower than the median of the sample; it takes the value zero otherwise.

We augment Equation (3) with triple-interaction terms between the national supportive policy (*Instrumented Country Support Index*), the ownership structure (*D_Controlling*); and either bank opacity (*D_Opacity)* or shareholder protection *(D_RADI)* as follows:

$$\text{Pro}\{ESOP_i = 1\} = \Phi\,(b_0 + b_1 * \text{IV\_Country index}_i + b_2 * \text{IV\_Country index}_i * \text{D\_Controlling}_j + b_3 * \text{IV\_Country index}_i * \text{D\_High\_conflict}_j + b_4 * \text{IV\_Country index}_i * \text{D\_Controlling}_j * \text{D\_High\_conflict}_j + + \sum_m \theta_m \text{Control}_i) \quad (4)$$

Where D_High_conflict represents the strength of the agency conflicts, measured either *D_Opacity* or *D_RADI*. We alternately replace the *Instrumented Country Index* with the

Instrumented Legal index and the *Instrumented Fiscal index* to examine the effectiveness of each type of supportive measures.

We first examine the effect of bank opacity on the effectiveness of supportive measures in both widely-held banks and closely-held banks. Table 5 reports regression estimates of the 2nd stage of the ivprobit models. Column 1, 2, 3 report the results when *Country index, Legal index,* and *Fiscal index* is instrumented with the number of labor-support-parties, respectively. The results of the Wald tests in Table 6 show that the national supportive measure and each of its components are effective to promote ESOP adoption in widely-held banks, independently of their degree of opacity. This result is consistent with our conjecture that in widely-held banks, both parties of the conflict of interest (managers vs. shareholders) gain benefits from the ESOP supportive measures. The results in Table 6 further show that, although supportive measures are not effective to promote ESOP in closely-held banks having higher degrees of opacity, they become effective when these banks have lower degrees of opacity. As majority shareholders can take advantage of higher degrees of opacity to extract private benefits, they have no incentive to approve an employee share ownership program which can reduce their advantages. However, if banks are transparent, it will be difficult for majority shareholders to hide any opportunistic behavior. In such a situation, the benefits from the ESOP supportive measures can motivate majority shareholders to adopt an ESOP.

Table 5: Ownership structure, degrees of opacity, and effectiveness of national supportive measures

Dependent variable:	D_ESOP	D_ESOP	D_ESOP
	(1)	(2)	(3)
	ivprobit	ivprobit	ivprobit
	2nd Stage	2nd Stage	2nd Stage
IV_Country index (b1)	1.791***		
	(3.27)		
IV_Country index * D_Controlling (b2)	-1.237***		
	(-2.71)		
IV_Country index * D_Opacity (b3)	-0.928**		
	(-1.99)		
IV_Country index * D_Controlling * D_Opacity (b4)	0.622**		
	(2.36)		
IV_Legal index (b1)		4.081***	
		(2.75)	
IV_Legal index * D_Controlling (b2)		-2.208*	
		(-1.79)	
IV_Legal index * D_Opacity (b3)		-1.463	
		(-1.31)	
IV_Legal index * D_Controlling * D_Opacity (b4)		1.003**	
		(2.29)	
IV_Fiscal index (b1)			2.970***
			(2.94)
IV_Fiscal index * D_Controlling (b2)			-2.266***

			(-2.59)
IV_Fiscal index * D_Opacity (b3)			-1.821**
			(-1.96)
IV_Fiscal index * D_Controlling * D_Opacity (b4)			1.431**
			(2.14)
D_Opacity	2.106	2.142	1.535
	(1.64)	(1.19)	(1.57)
Control variables	Yes	Yes	Yes
Observation	103	103	103

The t-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

Table 6: Ownership structure, degrees of opacity, and effectiveness of national supportive measures, Wald test from Table 5

	Country Support index	Legal index	Fiscal index
Widely-held banks, low opacity			
b1 = 0	1.791***	4.081***	2.970***
	(3.27)	(2.75)	(2.94)
Widely-held banks, high opacity			
b1 + b3 = 0	0.862***	2.617**	1.148***
	(6.731)	(4.882)	(6.884)
Closely-held banks, low opacity			
b1 + b2 = 0	0.553**	1.873**	0.704*
	(4.288)	(5.791)	(3.216)
Closely-held banks, high opacity			
b1 + b2 + b3 + b4 = 0	0.247	1.412	0.313
	(0.663)	(2.045)	(0.537)

The t-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

We next examine whether the effectiveness of supportive measures depend on the level of shareholder protection to promote ESOP adoption in both widely-held banks and closely-held banks. Lower levels of shareholder protection indicate that the strength of the agency conflict between insiders and outsiders is higher. Table 7 reports regression estimates of the 2nd stage of the ivprobit models where the dependent variable is *D_ESOP*. Columns 1, 2 and 3 report the results when *Country index, Legal index,* and *Fiscal index* is instrumented with the number of labor-support-parties, respectively. Table 8 reports the Wald tests from Table 7. Consistent with the results drawn from the previous sections, we find that the national supportive policy and each of its components are effective to promote ESOP in widely-held banks independently of the level of shareholder protection. This result, once again, confirms that both parties of the agency conflict in widely-held banks gain benefits from supportive measures and thus, they have the incentive to adopt ESOP.

The results also show that supportive measures are only effective to promote ESOP in closely-held banks if they are located in countries with higher levels of shareholder protection. This result is consistent with the study of La Porta et al. (2007) which states that, in countries

with stronger levels of shareholder protection, minority shareholders use their legal powers to force companies to disgorge cash, thus precluding insiders to expropriate minority shareholders. Our results indicate that in countries with higher levels of shareholder protection, minority shareholders have the legal power to force majority shareholders to adopt ESOP.

Table 7: Ownership structure, levels of of shareholder protection, and effectiveness of national supportive measures

Dependent variable:	ESOP	ESOP	ESOP
	(1) ivprobit 2nd Stage	(2) ivprobit 2nd Stage	(3) ivprobit 2nd Stage
IV_Country index (b1)	1.591***		
	(3.61)		
IV_Country index * D_Controlling (b2)	-0.614**		
	(-1.96)		
IV_Country index * D_RADI (b3)	-0.570		
	(-1.13)		
IV_Country index * D_Controlling * D_RADI (b4)	-0.238		
	(-0.96)		
IV_Legal index (b1)		4.814***	
		(2.96)	
IV_Legal index * D_Controlling (b2)		-1.383	
		(-1.36)	
IV_Legal index * D_RADI (b3)		-1.441	
		(-1.05)	
IV_Legal index * D_Controlling * D_RADI (b4)		-0.313	
		(-0.69)	
IV_Fiscal index (b1)			2.055***
			(3.74)
IV_Fiscal index * D_Controlling (b2)			-0.795*
			(-1.96)
IV_Fiscal index * D_RADI (b3)			-0.632
			(-0.91)
IV_Fiscal index * D_Controlling * D_RADI (b4)			-0.543
			(-1.16)
D_RADI	-4.229**	-4.100*	3.498***
	(-2.48)	(-1.76)	(2.92)
D_Controlling	1.881	2.216	1.107
	(1.60)	(1.25)	(1.41)
Control variables	Yes	Yes	Yes
Observation	103	103	103

The t-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

Table 8: Ownership structure, levels of of shareholder protection, and effectiveness of national supportive measures , Wald test from Table 7

	Country Support index	Legal index	Fiscal index
Widely-held banks, low shareholder protection			
b1 + b3 = 0	1.022**	3.372***	1.423**
	(5.761)	(7.395)	(5.395)
Widely-held banks, high shareholder protection			

b1 = 0	1.591***	4.814***	2.055***
	(3.61)	(2.96)	(3.74)
Closely-held banks, low shareholder protection			
b1 + b2 + b3 + b4 = 0	0.169	1.676	0.0841
	(0.499)	(0.0492)	(0.0635)
Closely-held banks, high shareholder protection			
b1 + b2 = 0	0.977**	3.431**	1.259**
	(5.993)	(5.943)	(6.107)

The t-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

Overall, the evidence in this section shows that supportive measures are effective to promote ESOP adoption in widely-held banks independently of the degree of bank opacity and the level of shareholder protection. However, they are only effective to promote ESOP adoption in closely-held banks when they are more transparent and/or located in countries with higher levels of shareholder protection.

2.5. Robustness tests

In this section, we conduct several tests to assess the robustness of our results.

2.5.1. The year-to-year variation

We use "the classification of European Union Member States based on regulatory density and support measures for employee financial participation" of the European Commission (European Commission, 2014) which is only published once in October 2014 to measure the national supportive policy. We therefore limit our main analysis to the year 2015. To test the robustness of our results for the year-to-year variation, we collect data on ESOP in bank annual reports for the year 2014 to re-conduct our analysis.

Tables A.4 to A.7 in Appendix report the regression estimates of the ivprobit models. Our results are unchanged. We find that all supportive measures are effective to promote ESOP in widely-held banks independently of bank opacity and shareholder protection. However, they are only effective to promote ESOP in closely-held banks if the banks are transparent and/or located in countries with higher levels of shareholder protection. The IV also passes the IV tests.

2.5.2. Alternative ownership threshold of controlling shareholder

To test whether our results are affected by the ownership threshold used to distinguish between widely-held banks and closely-held banks, we use an alternative ownership threshold at 10% of outstanding shares to re-conduct our analysis following the existing literature (La Porta et al., 1999, 2002; Lepetit et al., 2015). The results displayed in Tables A.8 to A.11 in Appendix show again that our main results are unchanged.

2.5.3. Orthogonalizing variables

Table A.3 shows the correlation matrix of the independent variables. The correlation coefficients are low except the coefficients between Size - EQ_TA, Size - Deposit_TA, Size – Opacity, and ZScore – ROE. To test whether the correlations between these variables affect our results, we orthogonalize EQ_TA, Deposit_TA, and Opacity with Size. We also orthogonalize ROE with ZScore. We then re-conduct our analysis by using orthogonalized variables.

The results in Tables A.12 to A.15 in Appendix show that these specifications lead to results quantitatively similar to our previous inferences. We still find that all supportive measures are effective to promote ESOP in widely-held banks independently of bank opacity and shareholder protection. However, they are only effective to promote ESOP in closely-held banks if the banks are transparent and/or located in countries with higher levels of shareholder protection. The IV passes the IV tests.

2.5.4. Over-representation of observations

One may concern that the number of banks from Denmark is overrepresented in our sample. We therefore exclude all Danish banks from our sample to test whether the national supportive measures and each of its components (legal and fiscal measures) still impact significantly the ESOP adoption.

The results in Table A.16 in Appendix show that our main results still hold when we use a subsample without banks from Denmark. The results from both models: the probit and ivprobit model show evidence that the supportive measures are effective to promote ESOP. However, after excluding all Danish banks, the number of observations is significantly reduced and not sufficient to test the effects of opacity and shareholder protection on the effectiveness of the supportive measures in closely- and widely-held banks.

Overall, the evidence from the tests in this section demonstrates that our results are robust to variations in model specifications, alternative ownership threshold to distinguish between widely-held and closely-held banks, and the year-to-year variation.

2.6. Conclusion

Since 2012, the European Commission includes the promotion of ESOP in its action to reform European company law and corporate governance. According to the Commission, through ESOP, employees are encouraged to actively contribute to good corporate governance by increasing company transparency and reducing risk (European Commission, 2014). Because enhancing banking corporate governance is an important goal of financial regulators all over

the world after the global financial crisis, the promotion of ESOP in banks is therefore particularly important. We investigate how the effectiveness of the national supportive measures suggested by the European Commission to promote ESOP is influenced by bank ownership structure, bank opacity and the level of shareholder protection.

We find that the national supportive policy plays an important role in promoting ESOP adoption in banks. Our results show that all supportive measures (legal and fiscal measures) have a significant and positive impact on the probability of a bank adopting ESOP. We find that supportive measures are effective to promote ESOP adoption in widely-held banks independently of their degree of opacity and the level of shareholder protection. On the contrary, supportive measures are only effective to promote ESOP in closely-held banks if they are more transparent or located in countries with higher levels of shareholder protection.

Our findings have an important implication for policymakers to promote ESOP in the European banking industry. As highly concentrated ownership are prevalent in banking firms in continental Europe (La Porta et al., 1998), our results indicate that the supportive measures implemented at the national level might be ineffective to promote ESOP if bank transparency is not improved and if the level of shareholder protection is not reinforced.

Appendix

Table A.1. Number of banks with employee share ownership programs (ESOP) and values of the supportive measures indexes by country in 2015.

	Country Name	Total number of banks	Number of banks having ESOP	Legal index	Fiscal index	Country index
1	Austria	6	3	2	3	5
2	Belgium	2	0	2	2	4
3	Denmark	22	1	1	0	1
4	Finland	3	3	1	1	2
5	France	4	3	2	3	5
6	Germany	7	3	2	1	3
7	Greece	5	1	1	1	2
8	Ireland	2	0	2	3	5
9	Italy	13	13	2	2	4
10	Netherlands	4	3	2	0	2
11	Norway	1	0	0	1	1
12	Portugal	2	0	1	0	1
13	Spain	7	5	2	3	5
14	Sweden	3	2	1	0	1
15	Switzerland	12	11	3	3	6
16	United Kingdom	10	10	3	4	7
	Total	103	58			
	Average			1.85	1.74	3.59
	Median			2	2	4
	Min			0	0	1
	Max			3	4	7
	Std. Dev.			0.759	1.414	2.093

Table A.2. Statistic of banks having ESOP among widely- and closely-held banks.

	Widely-held banks	Closely-held banks
Number of banks	49	54
% of banks having ESOP by country		
Mean	53.06	59.25
Min	0	0
Max	100	100
Std.	50.42	49.59

Table A.3. Matrix of correlations between control variables

	Size	EQ_TA	ROE	Growth_TA	Deposit_TA	Opacity	ZScore	D_Controlling	RADI	Individualism
Size	1									
EQ_TA	-0.586***	1								
ROE	-0.0180	0.143	1							
Growth_TA	0.0700	-0.00585	0.229*	1						
Deposit_TA	-0.491***	0.102	-0.0917	-0.249*	1					
Opacity	-0.450***	0.360***	0.297**	0.00625	0.103	1				
ZScore	-0.0261	0.273**	0.464***	0.123	-0.0683	0.0624	1			
D_Controling	0.0286	0.0970	0.0270	0.0188	-0.0838	-0.112	0.0369	1		
RADI	0.0225	0.113	0.186	0.150	-0.0351	0.126	0.155	-0.176	1	
Individualism	-0.0750	0.0829	0.189	0.256**	-0.221*	0.0810	0.231*	-0.0587	0.294**	1

*All variables are defined in Table 1. *,**, and *** denote significance at 10%, 5% and 1% levels respectively.*

Collinearity Diagnostics

Variable	VIF	SQRT-VIF	Tolerance	R-Squared
Size	2.68	1.64	0.3730	0.6270
EQ_TA	1.93	1.39	0.5189	0.4811
ROE	1.51	1.23	0.6620	0.3380
Growth_TA	1.17	1.08	0.8547	0.1453
Deposit_TA	1.67	1.29	0.5985	0.4015
Opacity	1.51	1.23	0.6642	0.3358
ZScore	1.46	1.21	0.6868	0.3132
D_Controlling	1.09	1.04	0.9187	0.0813
RADI	1.21	1.10	0.8245	0.1755
Individualism	1.31	1.14	0.7629	0.2371

Robustness test 1 using data of the year 2014

Table A.4. Is the national supportive policy effective to promote employee share ownership programs?

This table reports the results of the regression estimates models where the dependent variable is the dummy variable *D_ESOP*. Columns 1 and 2 report 1st and 2nd stage ivprobit regression estimates obtained when the *Country index* is instrumented with the number of labor-support-parties presented in parliament. Columns 3 and 4 report 1st and 2nd stage ivprobit regression estimates obtained when the *Legal index* is instrumented with the number of labor-support-parties presented in parliament. Columns 5 and 6 report 1st and 2nd stage ivprobit regression estimates obtained when the *Fiscal index* is instrumented with the number of labor-support-parties presented in parliament. For main results: the corresponding t-statistics are reported in parentheses. For weak instrument robust tests: p-values in parentheses. With *, **, and *** denoting significance at 10%, 5% and 1% levels.

	(1) ivprobit 1st Stage	(2) ivprobit 2nd Stage	(3) ivprobit 1st Stage	(4) ivprobit 2nd Stage	(5) ivprobit 1st Stage	(6) ivprobit 2nd Stage
IV_Country index		0.571***				
		(2.66)				
IV_Legal index				2.182**		
				(2.56)		
IV_Fisclal index						0.762***
						(2.64)
Labor-support-parties	0.439***		0.117***		0.322***	
	(4.34)		(3.20)		(4.70)	
Size_lag(1)	0.204*	0.0580	0.0485	0.0398	0.156**	0.0643
	(1.88)	(0.47)	(1.23)	(0.31)	(2.12)	(0.52)
Equity_TA_ lag(1)	5.973	-3.354	2.634*	-6.469	3.339	-2.069
	(1.39)	(-0.79)	(1.70)	(-1.29)	(1.15)	(-0.51)
ROE_ lag(1)	0.261	0.337	0.0853	0.393	0.176	0.302
	(0.23)	(0.31)	(0.21)	(0.35)	(0.23)	(0.28)
Growth_TA_ lag(1)	-0.808	1.239	-0.388	1.572	-0.420	1.042
	(-0.62)	(0.92)	(-0.82)	(1.09)	(-0.48)	(0.79)
Deposit_TA_lag(1)	0.501	-2.560*	-0.0237	-2.492	0.524	-2.421
	(0.40)	(-1.65)	(-0.05)	(-1.51)	(0.61)	(-1.63)
Opacity_ lag(1)	-0.252**	0.0227	-0.132***	0.173	-0.120	-0.0311
	(-2.07)	(0.18)	(-3.00)	(1.07)	(-1.45)	(-0.26)
Z-Score_ lag(1)	0.204	0.0894	0.0838*	0.0141	0.120	0.111
	(1.52)	(0.73)	(1.72)	(0.10)	(1.32)	(0.92)
D_Controlling	0.535	-0.374	0.119	-0.363	0.416*	-0.375
	(1.49)	(-0.99)	(0.91)	(-0.94)	(1.72)	(-1.01)
RADI	0.728***	-0.476**	0.127	-0.361*	0.601***	-0.515**
	(3.30)	(-2.39)	(1.59)	(-1.92)	(4.03)	(-2.48)
Individualism	0.00714	0.0167	0.0123**	-0.00967	-0.00511	0.0267*
	(0.47)	(1.08)	(2.21)	(-0.46)	(-0.49)	(1.82)
Observations	102	102	102	102	102	102
Weak instrument robust tests and confidence sets for ivprobit						
Anderson-Rubin test		6.06		6.25		6.01
(p-value)		(0.0138)		(0.0124)		(0.0142)
Wald test		7.10		6.58		6.95
(p-value)		(0.0077)		(0.0103)		(0.0084)

Table A.5. Ownership structure and effectiveness of national supportive measures

This table reports regression estimates of the 2nd stage of the ivprobit models where the dependent variable is *D_ESOP*. Colum 1, 2, 3 report the results when the *Country index*, the *Legal index* and the *Fiscal index* is instrumented with the number of labor-support-parties, respectively.

Dependent variable:	*D_ESOP*	*D_ESOP*	*D_ESOP*
	(1)	(2)	(3)
	ivprobit	ivprobit	ivprobit
	2nd Stage	2nd Stage	2nd Stage
Instrumented Country index (b1)	0.464***		
	(4.62)		
Instrumented Country index * D_Controlling (b2)	-0.154		
	(-0.69)		
Instrumented Legal index (b1)		1.210***	
		(4.04)	
Instrumented Legal index * D_Controlling (b2)		0.00451	
		(0.01)	
Instrumented Fiscal index (b1)			0.656***
			(4.57)
Instrumented Fiscal index * D_Controlling (b2)			-0.298
			(-0.96)
D_Controlling	0.253	-0.290	0.227
	(0.28)	(-0.20)	(0.34)
Size_lag(1)	0.113	0.125	0.120
	(1.08)	(1.18)	(1.16)
Equity_TA_ lag(1)	-1.475	-2.519	-0.559
	(-0.39)	(-0.58)	(-0.16)
ROE_ lag(1)	0.156	0.135	0.122
	(0.15)	(0.13)	(0.12)
Growth_TA_ lag(1)	1.212	1.522	1.101
	(0.92)	(1.13)	(0.86)
Deposit_TA_lag(1)	-2.237	-1.861	-2.054
	(-1.49)	(-1.14)	(-1.45)
Opacity_ lag(1)	-0.0413	0.0793	-0.0832
	(-0.33)	(0.59)	(-0.69)
Z-Score_ lag(1)	0.122	0.0276	0.137
	(0.99)	(0.21)	(1.14)
RADI	-0.385**	-0.732*	-0.398**
	(-2.10)	(-1.92)	(-2.13)
Individualism	0.0247	0.0109	0.0327**
	(1.64)	(0.62)	(2.19)
Observation	102	102	102
Wald test			
b1 + b2 = 0	0.309	1.215	0.357
	(1.935)	(2.193)	(1.394)

The t-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

Table A.6. Ownership structure, degrees of opacity, and effectiveness of national supportive measures

This table reports regression estimates of the 2nd stage of the ivprobit models where the dependent variable is *D_ESOP*. Colum 1, 2, 3 report the results when *Country index*, *Legal index* and *Fiscal index* is instrumented with the number of labor-support-parties, respectively.

Dependent variable:	*D_ESOP*	*D_ESOP*	*D_ESOP*
	(1) ivprobit 2nd Stage	(2) ivprobit 2nd Stage	(3) ivprobit 2nd Stage
IV_Country index (b1)	1.629***		
	(3.14)		
IV_Country index * D_Controlling(b2)	-1.073**		
	(-2.47)		
IV_Country index * D_Opacity (b3)	-0.903*		
	(-1.96)		
IV_Country index * D_Controlling* D_Opacity (b4)	0.578**		
	(2.26)		
IV_Legal index (b1)		3.412***	
		(2.65)	
IV_Legal index * D_Controlling(b2)		-1.584	
		(-1.45)	
IV_Legal index * D_Opacity (b3)		-1.352	
		(-1.26)	
IV_Legal index * D_Controlling* D_Opacity (b4)		0.958**	
IV_Fiscal index (b1)			2.737***
			(2.86)
IV_Fiscal index * D_Controlling(b2)			-2.021**
			(-2.44)
IV_Fiscal index * D_Opacity (b3)			-1.735*
			(-1.93)
IV_Fiscal index * D_Controlling* D_Opacity (b4)			1.295**
D_Opacity	1.982	1.832	1.438
	(1.56)	(1.05)	(1.51)
D_Controlling	2.081*	1.597	1.555*
	(1.79)	(0.87)	(1.91)
Control variables	Yes	Yes	Yes
Observation	102	102	102
Wald tests			
b1 + b2 = 0	0.556**	1.828**	0.716*
	(4.376)	(5.656)	(3.428)
b1 + b3 = 0	0.726**	2.061*	1.002**
	(5.036)	(3.341)	(5.461)
b1 + b2 + b3 + b4 = 0	0.231	1.435	0.277
	(0.638)	(2.295)	(0.464)

The t-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

Table A.7. Ownership structure, levels of of shareholder protection, and effectiveness of national supportive measures

This table reports regression estimates of the 2nd stage of the ivprobit models where the dependent variable is *D_ESOP*. Colum 1, 2, 3 report the results when *Country index*, *Legal index* and *Fiscal index* is instrumented with the number of labor-support-parties, respectively.

Dependent variable:	*D_ESOP*	*D_ESOP*	*D_ESOP*
	(1) ivprobit 2nd Stage	(2) ivprobit 2nd Stage	(3) ivprobit 2nd Stage
IV_Country index (b1)	1.308***		
	(3.38)		
IV_Country index * D_Controlling(b2)	-0.504*		
	(-1.66)		
IV_Country index * D_RADI (b3)	-0.396		
	(-0.85)		
IV_Country index * D_Controlling* D_RADI (b4)	-0.234		
	(-0.98)		
IV_Legal index (b1)		4.054***	
		(2.92)	
IV_Legal index * D_Controlling(b2)		-0.931	
		(-1.00)	
IV_Legal index * D_RADI (b3)		-1.202	
		(-0.99)	
IV_Legal index * D_Controlling* D_RADI (b4)		-0.348	
		(-0.81)	
IV_Fiscal index (b1)			1.712***
			(3.51)
IV_Fiscal index * D_Controlling(b2)			-0.707*
			(-1.75)
IV_Fiscal index * D_RADI (b3)			-0.353
			(-0.52)
IV_Fiscal index * D_Controlling* D_RADI (b4)			-0.543
			(-1.13)
D_RADI	3.425**	3.668*	2.815***
	(2.22)	(1.74)	(2.60)
D_Controlling	1.567	1.467	1.023
	(1.35)	(0.88)	(1.28)
Control variables	Yes	Yes	Yes
Observation	102	102	102
Wald tests			
b1 + b2 = 0	0.803**	3.124**	1.005**
	(4.985)	(5.905)	(4.839)
b1 + b3 = 0	0.912**	2.852**	1.359**
	(5.054)	(6.603)	(4.706)
b1 + b2 + b3 + b4 = 0	0.173	1.573	0.109
	(0.589)	(0.046)	(0.116)

The t-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

Robustness test 2 using ownership threshold at 10% of outstanding shares.

Table A.8. Does the national supportive policy is effective to promote employee share ownership programs?

This table reports regression estimates models where the dependent variable is the dummy variable *D_ESOP*. Columns 1 and 2 report 1st and 2nd stage ivprobit regression estimates obtained when the *Country index* is instrumented with the number of labor-support-parties. Columns 3 and 4 report 1st and 2nd stage ivprobit regression estimates obtained when the *Legal index* is instrumented with the number of labor-support-parties. Columns 5 and 6 report 1st and 2nd stage ivprobit regression estimates obtained when the *Fiscal index* is instrumented with the number of labor-support-parties. For main results: the corresponding t-statistics are reported in parentheses. For weak instrument robust tests: p-values in parentheses. With *, **, and *** denoting significance at 10%, 5% and 1% levels.

	(1) ivprobit 1st Stage	(2) ivprobit 2nd Stage	(3) ivprobit 1st Stage	(4) ivprobit 2nd Stage	(5) ivprobit 1st Stage	(6) ivprobit 2nd Stage
IV_Country index		0.604**				
		(2.54)				
IV_Legal index				2.364**		
				(2.41)		
IV_Fisclal index						0.798**
						(2.52)
Labor-support-parties	0.407***		0.106***		0.300***	
	(4.08)		(2.94)		(4.44)	
Size_lag(1)	0.293***	-0.00311	0.0790**	-0.0437	0.214***	0.0155
	(2.77)	(-0.02)	(2.06)	(-0.29)	(2.99)	(0.11)
Equity_TA_ lag(1)	10.52**	-4.945	4.156**	-9.264	6.360**	-3.197
	(2.40)	(-0.95)	(2.62)	(-1.40)	(2.14)	(-0.66)
ROE_ lag(1)	-0.322	1.196	0.0611	0.885	-0.383	1.236
	(-0.25)	(0.75)	(0.13)	(0.55)	(-0.44)	(0.78)
Growth_TA_ lag(1)	1.534	-0.344	0.414	-0.406	1.119	-0.295
	(1.32)	(-0.28)	(0.98)	(-0.31)	(1.42)	(-0.24)
Deposit_TA_lag(1)	1.070	-2.627*	0.219	-2.742*	0.852	-2.371
	(0.87)	(-1.71)	(0.49)	(-1.70)	(1.02)	(-1.62)
Opacity_ lag(1)	-0.282**	0.0129	-0.149***	0.208	-0.133	-0.0540
	(-2.23)	(0.09)	(-3.25)	(1.05)	(-1.55)	(-0.40)
Z-Score_ lag(1)	0.173	0.0715	0.0630	0.0156	0.110	0.0897
	(1.26)	(0.54)	(1.27)	(0.11)	(1.18)	(0.69)
D_Controlling_10	0.0624	-0.885*	-0.0439	-0.723	0.106	-0.914*
	(0.16)	(-1.81)	(-0.31)	(-1.47)	(0.41)	(-1.92)
RADI	0.600***	-0.505**	0.0888	-0.365*	0.512***	-0.547**
	(2.76)	(-2.43)	(1.13)	(-1.82)	(3.47)	(-2.55)
Individualism	0.00842	0.0153	0.0131**	-0.0147	-0.00464	0.0264*
	(0.55)	(0.97)	(2.36)	(-0.64)	(-0.45)	(1.77)
Observations	103	103	103	103	103	103
Weak instrument robust tests and confidence sets for ivprobit						
Anderson-Rubin test		5.60		5.84		5.52
(p-value)		(0.0180)		(0.0157)		(0.0188)
Wald test		6.46		5.83		6.33
(p-value)		(0.0110)		(0.0157)		(0.0119)

Table A.9. Ownership structure and effectiveness of national supportive measures

This table reports regression estimates of the 2nd stage of the ivprobit models where the dependent variable is *D_ESOP*. Colum 1, 2, 3 report the results when the *Country index*, the *Legal index* and the *Fiscal index* is instrumented with the number of labor-support-parties, respectively.

Dependent variable:	*D_ESOP*	*D_ESOP*	*D_ESOP*
	(1)	(2)	(3)
	ivprobit	ivprobit	ivprobit
	2nd Stage	2nd Stage	2nd Stage
Instrumented Country index (b1)	0.468***		
	(4.53)		
Instrumented Country index * D_Controlling_10 (b2)	-0.116		
	(-0.52)		
Instrumented Legal index (b1)		1.167***	
		(3.90)	
Instrumented Legal index * D_Controlling_10 (b2)		0.213	
		(0.24)	
Instrumented Fiscal index (b1)			0.662***
			(4.46)
Instrumented Fiscal index * D_Controlling_10 (b2)			-0.223
			(-0.73)
D_Controlling_10	-0.484	-1.121	-0.543
	(-0.54)	(-0.67)	(-0.80)
Size	0.0864	0.0625	0.105
	(0.72)	(0.48)	(0.90)
Equity over total assets	-1.525	-3.931	-0.195
	(-0.33)	(-0.65)	(-0.04)
ROE	1.131	0.587	1.136
	(0.73)	(0.44)	(0.73)
Growth of total assets	-0.0466	0.136	-0.00213
	(-0.04)	(0.11)	(-0.00)
Deposit over total assets	-2.133	-1.926	-1.852
	(-1.41)	(-1.18)	(-1.31)
Opacity	-0.0640	0.0960	-0.111
	(-0.45)	(0.59)	(-0.83)
Z-Score	0.0903	0.0166	0.105
	(0.69)	(0.12)	(0.81)
RADI	-0.424**	-0.741*	-0.440**
	(-2.16)	(-1.80)	(-2.19)
Individualism	0.0236	0.00499	0.0324**
	(1.48)	(0.22)	(2.08)
Observation	103	103	103
Wald test			
b1 + b2 = 0	0.352	1.380	0.439
	(2.440)	(2.079)	(2.179)

The t-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

Table A.10. Ownership structure, degrees of opacity, and effectiveness of national supportive measures

This table reports regression estimates of the 2nd stage of the ivprobit models where the dependent variable is *D_ESOP*. Colum 1, 2, 3 report the results when *Country index*, *Legal index* and *Fiscal index* is instrumented with the number of labor-support-parties, respectively.

Dependent variable:	*D_ESOP*	*D_ESOP*	*D_ESOP*
	(1) ivprobit 2nd Stage	(2) ivprobit 2nd Stage	(3) ivprobit 2nd Stage
IV_Country index (b1)	2.435***		
	(3.04)		
IV_Country index * D_Controlling_10 (b2)	-1.723**		
	(-2.44)		
IV_Country index * D_Opacity (b3)	-0.992*		
	(-1.77)		
IV_Country index * D_Controlling_10 * D_Opacity (b4)	0.713*		
	(1.77)		
IV_Legal index (b1)		6.804**	
		(2.43)	
IV_Legal index * D_Controlling_10 (b2)		-4.549*	
		(-1.75)	
IV_Legal index * D_Opacity (b3)		-1.650	
		(-1.45)	
IV_Legal index * D_Controlling * D_Opacity (b4)		1.144*	
IV_Fiscal index (b1)			4.085***
			(2.83)
IV_Fiscal index * D_Controlling_10 (b2)			-3.096**
			(-2.38)
IV_Fiscal index * D_Opacity (b3)			-2.287*
			(-1.84)
IV_Fiscal index * D_Controlling_10 * D_Opacity (b4)			1.868*
D_Opacity	1.773	2.031	1.344
	(1.48)	(1.24)	(1.49)
D_Controlling_10	3.099*	5.802	1.711*
	(1.93)	(1.44)	(1.78)
Control variables	Yes	Yes	Yes
Observation	103	103	103
Wald tests			
b1 + b2 = 0	0.713***	2.255***	0.989**
	(6.840)	(7.946)	(6.064)
b1 + b3 = 0	1.443**	5.153**	1.798***
	(6.629)	(4.097)	(6.915)
b1 + b2 + b3 + b4 = 0	0.434	1.749	0.570
	(2.557)	(0.051)	(2.304)

The t-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

Table A.11. Ownership structure, levels of of shareholder protection, and effectiveness of national supportive measures

This table reports regression estimates of the 2nd stage of the ivprobit models where the dependent variable is *D_ESOP*. Colum 1, 2, 3 report the results when *Country index*, *Legal index* and *Fiscal index* is instrumented with the number of labor-support-parties, respectively.

Dependent variable:	*D_ESOP*	*D_ESOP*	*D_ESOP*
	(1) ivprobit 2nd Stage	(2) ivprobit 2nd Stage	(3) ivprobit 2nd Stage
IV_Country index (b1)	2.903***		
	(3.58)		
IV_Country index * D_Controlling_10 (b2)	-1.646**		
	(-2.36)		
IV_Country index * D_RADI (b3)	-0.448		
	(-0.61)		
IV_Country index * D_Controlling_10 * D_RADI (b4)	-0.519		
	(-1.01)		
IV_Legal index (b1)		11.70**	
		(2.38)	
IV_Legal index * D_Controlling_10 (b2)		-7.312	
		(-1.53)	
IV_Legal index * D_RADI (b3)		-1.493	
		(-0.83)	
IV_Legal index * D_Controlling_10 * D_RADI (b4)		-0.839	
		(-0.82)	
IV_Fiscal index (b1)			3.267***
			(3.51)
IV_Fiscal index * D_Controlling_10 (b2)			-1.666**
			(-2.23)
IV_Fiscal index * D_RADI (b3)			-0.505
			(-0.43)
IV_Fiscal index * D_Controlling_10 * D_RADI (b4)			-0.820
			(-0.84)
D_RADI	5.059***	5.392**	4.007***
	(2.87)	(2.21)	(3.29)
D_Controlling_10	4.586**	11.77	1.676
	(2.01)	(1.44)	(1.63)
Control variables	Yes	Yes	Yes
Observation	103	103	103
Wald tests			
b1 + b2 = 0	1.257***	4.383***	1.600***
	(9.097)	(8.011)	(9.764)
b1 + b3 = 0	2.455**	10.20*	2.762**
	(5.387)	(3.228)	(4.644)
b1 + b2 + b3 + b4 = 0	0.290	2.052	0.276
	(1.406)	(0.023)	(0.659)

The t-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

Robustness test 3 using orthogonalized variables

Table A.12. Does the national supportive policy is effective to promote employee share ownership programs?

This table reports regression estimates models where the dependent variable is the dummy variable *D_ESOP*. Columns 1 and 2 report 1st and 2nd stage ivprobit regression estimates obtained when the *Country index* is instrumented with the number of labor-support-parties. Columns 3 and 4 report 1st and 2nd stage ivprobit regression estimates obtained when the *Legal index* is instrumented with the number of labor-support-parties. Columns 5 and 6 report 1st and 2nd stage ivprobit regression estimates obtained when the *Fiscal index* is instrumented with the number of labor-support-parties. For main results: the corresponding t-statistics are reported in parentheses. For weak instrument robust tests: p-values in parentheses. With *, **, and *** denoting significance at 10%, 5% and 1% levels.

	(1) ivprobit 1st Stage	(2) ivprobit 2nd Stage	(3) ivprobit 1st Stage	(4) ivprobit 2nd Stage	(5) ivprobit 1st Stage	(6) ivprobit 2nd Stage
IV_Country index		0.579***				
		(2.58)				
IV_Legal index				2.275**		
				(2.47)		
IV_Fisclal index						0.765**
						(2.54)
Labor-support-parties	0.414***		0.109***		0.305***	
	(4.19)		(3.01)		(4.58)	
Size_lag(1)	0.208***	0.137	0.0647***	0.0982	0.143***	0.146*
	(3.26)	(1.61)	(2.78)	(1.03)	(3.33)	(1.76)
oEquity_TA_ lag(1)	0.414**	-0.182	0.172**	-0.361	0.243*	-0.112
	(2.19)	(-0.85)	(2.48)	(-1.33)	(1.90)	(-0.56)
oROE_ lag(1)	-0.0582	0.0876	0.00172	0.0543	-0.0599	0.0936
	(-0.32)	(0.42)	(0.03)	(0.25)	(-0.49)	(0.44)
Growth_TA_ lag(1)	1.490	-0.265	0.412	-0.338	1.078	-0.219
	(1.29)	(-0.22)	(0.98)	(-0.27)	(1.39)	(-0.19)
oDeposit_TA_lag(1)	0.178	-0.343	0.0355	-0.356	0.142	-0.317
	(0.94)	(-1.58)	(0.51)	(-1.53)	(1.12)	(-1.51)
oOpacity_ lag(1)	-0.380**	0.0255	-0.209***	0.287	-0.171	-0.0628
	(-2.08)	(0.12)	(-3.13)	(1.05)	(-1.39)	(-0.33)
Z-Score_ lag(1)	0.155	0.127	0.0652	0.0653	0.0900	0.142
	(1.27)	(1.11)	(1.46)	(0.52)	(1.09)	(1.25)
D_Controlling	0.456	-0.380	0.0808	-0.334	0.375	-0.389
	(1.31)	(-1.02)	(0.63)	(-0.86)	(1.59)	(-1.06)
RADI	0.652***	-0.490**	0.0996	-0.356*	0.552***	-0.532**
	(2.98)	(-2.45)	(1.25)	(-1.83)	(3.74)	(-2.56)
Individualism	0.00846	0.0153	0.0132**	-0.0134	-0.00472	0.0258*
	(0.56)	(1.00)	(2.39)	(-0.60)	(-0.46)	(1.79)
Observations	103	103	103	103	103	103
Weak instrument robust tests and confidence sets for ivprobit						
Anderson-Rubin test		5.74		5.99		5.65
(p-value)		(0.0166)		(0.0144)		(0.0174)
Wald test		6.64		6.10		6.47
(p-value)		(0.0100)		(0.0135)		(0.0110)

Table A.13. Ownership structure and effectiveness of national supportive measures

This table reports regression estimates of the 2nd stage of the ivprobit models where the dependent variable is *D_ESOP*. Colum 1, 2, 3 report the results when the *Country index*, the *Legal index* and the *Fiscal index* is instrumented with the number of labor-support-parties, respectively.

Dependent variable:	*D_ESOP*	*D_ESOP*	*D_ESOP*
	(1) ivprobit 2nd Stage	(2) ivprobit 2nd Stage	(3) ivprobit 2nd Stage
Instrumented Country index (b1)	0.463***		
	(4.68)		
Instrumented Country index * D_Controlling (b2)	-0.242		
	(-1.08)		
Instrumented Legal index (b1)		1.274***	
		(4.30)	
Instrumented Legal index * D_Controlling (b2)		-0.352	
		(-0.52)	
Instrumented Fiscal index (b1)			0.652***
			(4.63)
Instrumented Fiscal index * D_Controlling (b2)			-0.401
			(-1.28)
D_Controlling	0.540	0.353	0.377
	(0.61)	(0.28)	(0.57)
Size_lag(1)	0.185***	0.180***	0.189***
	(2.67)	(2.69)	(2.74)
oEquity_TA_ lag(1)	-0.0412	-0.0969	-0.00553
	(-0.23)	(-0.50)	(-0.03)
oROE_ lag(1)	0.0815	0.0705	0.0840
	(0.39)	(0.36)	(0.40)
Growth_TA_ lag(1)	0.185	0.163	0.240
	(0.15)	(0.15)	(0.20)
oDeposit_TA_lag(1)	-0.251	-0.267	-0.225
	(-1.22)	(-1.23)	(-1.15)
oOpacity_ lag(1)	-0.111	0.0104	-0.161
	(-0.56)	(0.05)	(-0.85)
Z-Score_ lag(1)	0.147	0.108	0.155
	(1.29)	(0.96)	(1.37)
RADI	-0.394**	-0.346**	-0.409**
	(-2.11)	(-1.97)	(-2.15)
Individualism	0.0255*	0.0105	0.0327**
	(1.69)	(0.64)	(2.20)
Observation	103	103	103
Wald test			
b1 + b2 = 0	0.221	0.922	0.251
	(0.952)	(1.630)	(0.661)

The t-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

Table A.14. Ownership structure, degrees of opacity, and effectiveness of national supportive measures

This table reports regression estimates of the 2nd stage of the ivprobit models where the dependent variable is *D_ESOP*. Colum 1, 2, 3 report the results when *Country index*, *Legal index* and *Fiscal index* is instrumented with the number of labor-support-parties, respectively.

Dependent variable:	*D_ESOP*	*D_ESOP*	*D_ESOP*
	(1) ivprobit 2nd Stage	(2) ivprobit 2nd Stage	(3) ivprobit 2nd Stage
IV_Country index (b1)	1.791***		
	(3.27)		
IV_Country index * D_Controlling (b2)	-1.237***		
	(-2.71)		
IV_Country index * D_Opacity (b3)	-0.928**		
	(-1.99)		
IV_Country index * D_Controlling * D_Opacity (b4)	0.622**		
	(2.36)		
IV_Legal index (b1)		4.081***	
		(2.75)	
IV_Legal index * D_Controlling (b2)		-2.208*	
		(-1.79)	
IV_Legal index * D_Opacity (b3)		-1.463	
		(-1.31)	
IV_Legal index * D_Controlling * D_Opacity (b4)		1.003**	
IV_Fiscal index (b1)			2.970***
			(2.94)
IV_Fiscal index * D_Controlling (b2)			-2.266***
			(-2.59)
IV_Fiscal index * D_Opacity (b3)			-1.821**
			(-1.96)
IV_Fiscal index * D_Controlling * D_Opacity (b4)			1.431**
D_Opacity	2.106	2.142	1.535
	(1.64)	(1.19)	(1.57)
D_Controlling	2.535**	2.638	1.801**
	(2.09)	(1.32)	(2.12)
Control variables	Yes	Yes	Yes
Observation	103	103	103
Wald tests			
b1 + b2 = 0	0.553**	1.873**	0.704*
	(4.288)	(5.791)	(3.216)
b1 + b3 = 0	0.862***	2.617**	1.148***
	(6.731)	(4.882)	(6.884)
b1 + b2 + b3 + b4 = 0	0.247	1.412	0.313
	(0.663)	(2.045)	(0.537)

The t-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

Table A.15. Ownership structure, levels of of shareholder protection, and effectiveness of national supportive measures

This table reports regression estimates of the 2nd stage of the ivprobit models where the dependent variable is *D_ESOP*. Colum 1, 2, 3 report the results when *Country index*, *Legal index* and *Fiscal index* is instrumented with the number of labor-support-parties, respectively.

Dependent variable:	*D_ESOP*	*D_ESOP*	*D_ESOP*
	(1) ivprobit 2nd Stage	(2) ivprobit 2nd Stage	(3) ivprobit 2nd Stage
IV_Country index (b1)	1.591***		
	(3.61)		
IV_Country index * D_Controlling (b2)	-0.614**		
	(-1.96)		
IV_Country index * D_RADI (b3)	-0.570		
	(-1.13)		
IV_Country index * D_Controlling * D_RADI (b4)	-0.238		
	(-0.96)		
IV_Legal index (b1)		4.814***	
		(2.96)	
IV_Legal index * D_Controlling (b2)		-1.383	
		(-1.36)	
IV_Legal index * D_RADI (b3)		-1.441	
		(-1.05)	
IV_Legal index * D_Controlling * D_RADI (b4)		-0.313	
		(-0.69)	
IV_Fiscal index (b1)			2.055***
			(3.74)
IV_Fiscal index * D_Controlling (b2)			-0.795*
			(-1.96)
IV_Fiscal index * D_RADI (b3)			-0.632
			(-0.91)
IV_Fiscal index * D_Controlling * D_RADI (b4)			-0.543
			(-1.16)
D_RADI	4.229**	4.100*	3.498***
	(2.48)	(1.76)	(2.92)
D_Controlling	1.881	2.216	1.107
	(1.60)	(1.25)	(1.41)
Control variables	Yes	Yes	Yes
Observation	103	103	103
Wald tests			
b1 + b2 = 0	0.977**	3.431**	1.259**
	(5.993)	(5.943)	(6.107)
b1 + b3 = 0	1.022**	3.372***	1.423**
	(5.761)	(7.395)	(5.395)
b1 + b2 + b3 + b4 = 0	0.169	1.676	0.084
	(0.499)	(0.049)	(0.064)

The t-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

Robustness test 4 using a subsample without banks from Denmark

Table A.16. Does the national supportive policy is effective to promote employee share ownership programs?

This table reports regression estimates models where the dependent variable is the dummy variable *D_ESOP*. We use two models: the probit model and the ivprobit model to investigate the impact of the *Country index*. Columns 1 reports the probit regression estimates. Columns 2 and 3 report 1st and 2nd stage ivprobit regression estimates obtained when the *Country index* is instrumented with the number of labor-support-parties. We use the ivprobit model to investigate the impact of the *Legal* and *Fiscal index*. Columns 4 and 5 report 1st and 2nd stage ivprobit regression estimates obtained when the *Legal index* is instrumented with the number of labor-support-parties. Columns 6 and 7 report 1st and 2nd stage ivprobit regression estimates obtained when the *Fiscal index* is instrumented with the number of labor-support-parties. For main results: the corresponding t-statistics are reported in parentheses. For weak instrument robust tests: p-values in parentheses. With *, **, and *** denoting significance at 10%, 5% and 1% levels.

	(1) Probit model	(2) ivprobit 1st Stage	(3) ivprobit 2nd Stage	(4) ivprobit 1st Stage	(5) ivprobit 2nd Stage	(6) ivprobit 1st Stage	(7) ivprobit 2nd Stage
IV_Country index	0.415***		0.603**				
	(3.69)		(2.05)				
IV_Legal index					2.326**		
					(2.02)		
IV_Fisclal index							0.817**
							(2.01)
Labor-sup-parties		0.331***		0.0921***		0.239***	
		(3.29)		(2.48)		(3.48)	
Size_lag(1)	0.0410	0.293***	0.208*	0.0499	-0.0377	0.158**	-0.0147
	(0.38)	(2.77)	(1.90)	(1.24)	(-0.26)	(2.12)	(-0.10)
Equity_TA_ lag(1)	-1.957	10.52**	8.505*	3.791**	-8.461	4.713	-2.768
	(-0.47)	(2.40)	(1.98)	(2.39)	(-1.22)	(1.61)	(-0.56)
ROE_ lag(1)	0.509	-0.322	-0.812	-0.186	0.613	-0.626	0.648
	(0.37)	(-0.25)	(-0.67)	(-0.41)	(0.41)	(-0.76)	(0.45)
Growth_TA_ lag(1)	1.509	1.534	3.243**	1.022**	0.881	2.221**	1.296
	(0.68)	(1.32)	(2.35)	(2.00)	(0.34)	(2.36)	(0.55)
Deposit_TA_lag(1)	-1.932	1.070	0.431	0.140	-2.386	0.291	-1.858
	(-1.21)	(0.87)	(0.32)	(0.28)	(-1.37)	(0.32)	(-1.15)
Opacity_ lag(1)	0.0342	-0.282**	-0.231*	-0.143***	0.262	-0.0884	0.0106
	(0.25)	(-2.23)	(-1.75)	(-2.92)	(1.21)	(-0.98)	(0.08)
Z-Score_ lag(1)	0.0642	0.173	0.243*	0.0998*	-0.0576	0.143	0.0590
	(0.48)	(1.26)	(1.74)	(1.94)	(-0.34)	(1.50)	(0.42)
D_Controlling_10	-0.482	0.0624	0.649*	0.154	-0.589	0.495**	-0.582
	(-1.25)	(0.16)	(1.79)	(1.15)	(-1.34)	(2.00)	(-1.38)
RADI	-0.400**	0.600***	0.654***	0.130	-0.392*	0.524***	-0.519**
	(-2.03)	(2.76)	(3.02)	(1.63)	(-1.75)	(3.55)	(-2.10)
Individualism	0.0133	0.00842	0.00652	0.0119**	-0.0194	-0.00539	0.0174
	(0.92)	(0.55)	(0.42)	(2.10)	(-0.78)	(-0.51)	(1.15)
Observations	81	81	81	81	81	81	81
Weak instrument robust tests and confidence sets for ivprobit							
Anderson-Rubin test			3.87		4.37		3.80
(p-value)			(0.0492)		(0.0367)		(0.0511)
Wald test			4.20		4.07		4.04
(p-value)			(0.0405)		(0.0437)		(0.0444)

CHAPTER 3

Bondholder representatives on bank boards: a mechanism for market discipline

This chapter draws from the working paper "Bondholder representatives on bank boards: a mechanism for market discipline" co-authored with Isabelle Distinguin, Laetitia Lepetit, and Frank Strobel.

3.1. Introduction

The use of market discipline for prudential purposes has gained importance in recent years, especially after the financial crisis of 2007-2008. Policymakers have increasingly recognized its significance in safeguarding financial stability and incorporated it in regulatory frameworks such as Pillar 3 of the Basel 2 and 3 frameworks and the new resolution mechanisms designed by the Financial Stability Board (FSB, 2013). The idea behind market discipline in the banking industry is to use private investors as monitoring agents to mitigate excessive risk-taking behavior driven by financial safety nets (Bliss and Flannery, 2019). Among bank stakeholders, bondholders' preferences are most clearly aligned with supervisors' for exerting direct discipline that could help prevent banks from taking such excessive risks (Bliss and Flannery, 2019).[15] However, one of the most critical challenges is determining which instruments are likely to help bondholders influence bank behavior and achieve this most efficiently.

In this context, the focus of our study is to examine the impact of board representation of bondholders through directors who are affiliated with them, e.g., by being one of their employees or on their board. In particular, we examine whether the inclusion of such directors (referred to as bondholder representatives from here on) on bank boards can be an effective mechanism to apply bondholders' market discipline and limit excessive bank risk-taking.

Two key roles of the board of directors are monitoring and advising. As monitors, bondholder representatives could ascertain that manager actions are aligned with the interests of bondholders. As advisors, bondholder representatives can convey their views and guide managers concerning critical strategic business decisions. The existing literature stresses the crucial role of more effective monitoring by boards of directors in the banking sector (De Haan and Vlahu, 2015; John et al., 2016, Nguyen et al., 2016). Tight regulation combined with restrictions on bank entry and activities limits the effectiveness of many mechanisms intended to address corporate governance problems (Billett et al.1998; Levine, 2004). Furthermore, external governance mechanisms such as takeovers hardly exist in banking, unlike other industries (Levine, 2004; De Haan and Vlahu, 2015). Moreover, banks are characterized by a highly leveraged capital structure, inherent complexity and opacity, and the fact that the

[15] The market might help to discipline banks through two mechanisms (Bliss and Flannery, 2002; Ashcraft, 2008). First, the market could reveal information about default risk that helps supervisors to correctly allocate supervision resources, or might keep supervisors from engaging in forbearance against problem banks (indirect market discipline). Second, market participants can also influence a bank's risk-taking behavior, for example by including covenants on debt issues or by recognizing franchise value in a bank's stock price (direct discipline). In this paper, we focus on direct market discipline.

interests of their shareholders and those of their debtholders and regulators often diverge. In particular, bank shareholders have strong incentives to favor 'excessively' risky investments, with potential losses largely shifted to debtholders, the deposit insurer, and taxpayers (Galai and Masulis, 1976; Jensen and Meckling, 1976; Merton, 1977).

Our paper argues that if bondholders have affiliated directors on the board of directors of a bank, they could exert influence as they can monitor and advise managers and ensure that the bank is managed in their interest. Moreover, having affiliated directors should provide private information about banks that might be more detailed, current, and forward-looking than infrequent financial information (Stearns and Mizruchi, 1993). Therefore, access to the boardroom should help alleviate information problems between bondholders and borrowing banks, thus improving the monitoring function of bondholders. Consequently, we expect that the discipline bondholders impose upon banks through these affiliated directors can limit excessive risk-taking that might lead to bank insolvency.

We further investigate whether the influence of bondholder representatives on the board of banks impacts bank profitability. We could expect shareholders to appoint directors affiliated with bondholders on boards if the benefits of their presence are likely to exceed associated costs, particularly if it does not lead to a decrease in profitability. If the influence of bondholder representatives on bank boards helps to reduce excessive risk-taking that could result in bank insolvency with however a neutral effect on profitability, we can conclude that such inclusion contributes to mitigating the agency cost of debt without the negative impact on profitability observed with other market discipline mechanisms such as debt covenants (Kahan and Yermack, 1998).

We also explore several factors related to the incentives and ability of bondholders and their representatives to monitor banks. The incentives of bondholders to curb bank risk through their board representatives could be influenced by the bank's capital structure, particularly its level of capitalization. Incentives of bondholder representatives to monitor bank risk could depend on the conflict of interest they might face if they are not independent or affiliated with a shareholder and on the reputation they want to build in the market for directorships. Furthermore, we investigate whether bondholder representatives' ability to limit excessive risk-taking depends on the complexity of banks and bondholder representatives' expertise to grasp this complexity.

Empirical evidence that the influence of bondholder representatives on bank boards contributes to reducing bank risk would have important policy implications. First, financial regulators are acutely aware that ever more complex large banking organizations are

increasingly challenging to monitor and control using the standard supervisory toolkit**,** and therefore look towards market disciplinary forces as a complement to the monitoring provided by supervisory agencies (Bliss and Flannery, 2002, 2019). Second, the failure of a variety of internal governance mechanisms has been highlighted as a major contributing factor to the global financial crisis of 2008 (Kirkpatrick, 2009; Basel Committee on Banking Supervision, 2010). One of the recommendations of the Basel Committee on Banking Supervision (2015), OECD (2010), and European Union (2010) is that corporate governance of banks should have multi-faceted objectives of enhancing welfare, not only of shareholders but also of debtholders and regulators. Similarly, IMF (2014, p.7) suggests that "the potential merits (and possible unintentional consequences) of including representation for debtholders on bank boards should be studied".

Our analysis of these issues is based on a unique dataset of board ties between listed European financial institutions and their bondholders after the effective implementation of the Banking Recovery and Resolution Directive (BRRD) in 2016. Our analysis focuses on European banks for two reasons. First, one of the objectives of the BRRD, through the implementation of a bail-in tool that allows to write down debt owed by a bank to creditors or to convert it into equity, is to strengthen market discipline. The fact that bailed in bondholders suffered losses at several European banks (three Italian banks and Banco Popular in Spain) in 2017 established the credibility of the BRRD bail-in mechanism.[16] Second, and of equal importance, a large number of European banks have at least one bondholder representative on their board. Our final dataset includes 105 European banks (out of 155 banks listed on the stock market), for which we were able to collect data for 1381 directors and 82,503 bondholders for the year 2017.

Establishing causality between the influence of bondholder representatives and bank risk is particularly challenging due to the endogenous nature of board composition (e.g., Hermalin and Weisbach 1998; Adams et al. 2010). To do so, we propose a novel instrumental variable that builds on the work of Bernile et al. (2018), Bernstein et al. (2016), and Giroud (2013), which may have wider applications in future studies of European bank board composition. Our instrument exploits the number of direct scheduled airline flights from bank headquarters to the headquarters of firms in the S&P 350 European index. The rationale of our instrument rests in the potential director supply argument of Knyazeva-et-al (2013) and Bernile et al. (2018). With more abundant travel opportunities, the ease and thus the likelihood of being

[16] Cutura (2018) confirms that the BRRD credibility diminished bail-out expectations, with European bank bonds carrying a 10 basis points bail-in premium in terms of the yield spread.

able to recruit directors from companies in the S&P 350 European index increases. With almost all debtholders in our sample being financial institutions, but the latter making up less than one fifth of the firms in the S&P 350 European index, one could expect a smaller likelihood of recruiting bondholder-related directors to the board having the higher the degree of flight connectivity, for otherwise equal qualification levels of director candidates. Consistent with the relevance condition of our instrument, we show that presence of bondholder representatives is negatively related to the flight connectivity from bank headquarters to the headquarters of S&P 350 European firms.

Using the flight connectivity from bank headquarters to the headquarters of S&P 350 European firms as an instrument in two-stage least squares (2SLS) regressions, we find that the influence of bondholder representatives on the board of banks significantly reduces all dimensions of bank risk considered without a decrease in profitability. Therefore, our study provides strong evidence that the influence of directors affiliated with bondholders on the banks' board is an effective market discipline mechanism to limit bank risk. Further investigations show that the influence of bondholder representatives on the board of banks has a more substantial impact on risk when banks display higher opacity levels and for global systemically important banks (G-SIBs). We also find that having bondholder representatives with regulatory experience has a stronger impact on reducing individual bank risk. On the other hand, we find that the influence of bondholder representatives has a lower impact on bank risk when they have a competing interest by being related to shareholders and for banks with lower capitalization levels. Additional investigations show that the influence of bondholder representatives on banks' boards also contributes to reducing systemic risk.

Our study complements the existing literature on the efficacy of bondholders' market discipline, being the first to consider bondholder representatives as a market discipline device to limit excessive firm risk-taking more generally. We focus on banking firms in particular, as avoiding excessive risk-taking by banks is of particular importance for regulators/policymakers given the significant spillover effects involved in individual bank failures. Our paper also contributes to the corporate governance literature for banks, highlighting the potentially important role of bondholder representatives in addressing the complex interplay of agency problems faced by the many stakeholders relevant to banks. Our study has, as a consequence, significant implications for regulators and corporate governance reform proponents evaluating the effectiveness of both market discipline and boards in controlling bank risk-taking.

The remainder of the paper is organized as follows. Section 2 presents the related literature and key research questions. Section 3 describes our sample, explains how we identify

bondholder representatives, and provides some descriptive statistics. Section 4 presents the methodology used to conduct our empirical investigation. Section 5 discusses our main results and further investigations and contains robustness checks, and Section 6 concludes the paper.

3.2. Related literature and research questions

We argue in this study that the influence of bondholder representatives on the board of directors of banks can be an effective market discipline device to limit excessive bank risk-taking. The specific influence of bondholders on managerial decisions has led to many studies on the use of bond covenants but not on the effect of bondholder representatives. Ashcraft (2008) finds that covenants provide subordinated debtholders with a means to limit bank risk-taking ex-ante.[17] This result is in line with the theoretical literature showing that debt covenants can reduce default risk ex-ante by better aligning the interests of shareholders and managers with those of bondholders and by prohibiting actions that might increase the likelihood of distress (Smith and Warner, 1979; Holmström and Myerson, 1983). However, contractual features that are efficient ex-ante may imply inefficient outcomes in some states of the world and may increase default risk ex-post (Holmström and Myerson, 1983). The presence of covenants ex-ante could therefore impose potential costs on both lenders and borrowers ex-post. Consequently, borrowers are often willing to accept higher interest rates in return for less restrictive covenants. Since the implementation of the first Basel Accord, the use of debt covenants is even more limited for banks as a subordinated bond cannot have restrictive covenants to be counted as Tier 2 capital (Ashcraft, 2008).[18]

An interesting question at the empirical level, which to our knowledge has not been investigated to date, is then the following: can the influence of bondholder representatives on bank boards be an alternative market discipline mechanism for bondholders to reduce excessive risk-taking that might lead to bank insolvency, ideally without a reduction in bank profitability? Bondholders could fail to sufficiently monitor banks' risk-taking behavior if they only receive incomplete information. Transparency regulation combined with effective banking supervision could reduce bank risk-taking (Delis and Staikouras, 2011). However, achieving transparency

[17] There is also empirical evidence that the use of bond covenants affects the risk-taking behavior of managers in non-financial firms (e.g. King and Wen, 2011; Cremers et al., 2007).

[18] Banks have to meet regulatory requirements in terms of capital. Regulatory capital is the sum of two elements: Tier 1 and Tier 2 capital. Tier 1 is going-concern capital. It absorbs losses immediately when they occur. It includes common stock, retained earnings, disclosed reserves, and non-redeemable non-cumulative preferred stock. Tier 2 capital is gone-concern capital. It absorbs losses, when a bank fails, before depositors and general creditors do. It includes undisclosed reserves, asset revaluation reserves and subordinated debt under certain conditions (Basel Committee on Banking Supervision, 2020).

is costly for banks and can reduce their charter value (Hyytinen and Takalo, 2002).[19] Bondholder representatives on the board of banks could provide improved access to information not disclosed to other market participants and improve bondholders' monitoring function. In line with this argument, Erkens et al. (2014) find that the presence of bank representatives on the board of directors of non-financial firms, i.e., directors affiliated to loan-providing commercial banks, is associated with less conservative accounting. However, Güner et al. (2008) and Dittmann et al. (2010) further provide evidence that having bank representatives on boards is also associated with lower profitability, as these affiliated directors defend the interests of their bank when shareholders' and debtholders' objectives diverge.

Bondholder discipline through board representation can only be effective if bank shareholders accept to appoint such directors affiliated with bondholders. Shareholders would include bondholder representatives if the benefits of such inclusion are likely to exceed associated costs. One of the principal costs would be that bondholders' risk aversion, which might help to reduce bank risk-taking, might also decrease profitability. Nevertheless, bondholders frequently do not hold their bonds until maturity and therefore evaluate their investments more from a market-pricing perspective. Bondholders' incentives thus often parallel those of equity investors, as the valuation of both types of securities is linked to bank performance. Banks may furthermore benefit from bondholder representatives on their board through other avenues. Bondholders would have better access to proprietary information about banks, leading to more effective monitoring and a reduced cost of information collection by bondholders. As a consequence of more effective monitoring, banks might be able to issue more bonds with more favorable price terms and fewer covenants. The literature on bank representatives on the board of directors of non-financial firms supports these arguments; it provides evidence that directors affiliated with lending banks decrease the cost of borrowing (Sisli-Ciamarra, 2012), increase the amount of bank debt (Güner et al., 2008; Dittmann et al., 2010; Sisli-Ciamarra, 2012), and reduce the pledge of financial covenants in debt contracts (Sisli-Ciamarra, 2012; Erkens et al., 2014).

Another question we examine in this paper is whether the efficacy of bondholder representatives to discipline banks is conditional on the incentives and ability of both bondholders and their representatives to monitor bank managers. Regarding incentives of bondholder representatives, Fama and Jensen (1983) argue that a failure to monitor insiders

[19] Achieving transparency involves direct costs as it implies providing market participants with accurate and credible information. Indirect costs may also arise if transparency regulation intensifies the appropriability problem faced by banks when they need to publicly disclose information on lending decisions.

implies a loss in human capital for ineffective directors. Having a solid reputation facilitates obtaining additional board seats or keeping those currently held, with the opposite effect for a weak reputation (Gilson, 1990; Kaplan and Reishus, 1990). Therefore, bondholder representatives might have an incentive to monitor when there is a market for directors in which poor performance reduces the value of their human capital. Nevertheless, directors who are not independent by being related to managers or being affiliated to bondholders and shareholders will face a conflict of interest in monitoring actions to undertake. In particular, bondholder representatives who are also a shareholder can benefit from the outcome of a successful risky project, so they are more likely to encourage excessive risk-taking. Similarly, bondholder representatives who are affiliated to shareholders by being one of their employees or on their board of directors are in conflict between two competing duties, balancing the interests of bondholders and shareholders.

The incentives of bondholders to prevent excessive risk-taking behavior might furthermore be influenced by the capital structure of banks. The need to monitor banks with low levels of capitalization could be more significant to avoid excessive risk-taking decisions resulting in losses that these banks might not be able to absorb. However, when banks have low capital levels, some bondholders might prefer riskier strategies to increase the probability of recovering their funds. Troubled banks may then 'gamble for resurrection' under the pressure of both bondholders and shareholders (Gorton and Santomero, 1990; Rochet, 1992; Calem and Rob, 1999). The influence of bondholder representatives might, in this scenario, not deter excessive risk-taking behavior by banks.

Next, the ability of directors to monitor insiders depends on the quality of information they can access (Hermalin and Weisbach, 2007; De Andres and Valledo, 2008). Both the complexity and opacity of the banking business increase the asymmetry of information and might diminish the capacity of a bondholder to monitor the decisions of bank managers (Furfine, 2001; Laeven, 2013; Levine, 2004; Morgan, 2002). The presence of directors affiliated with bondholders on the board of more opaque and complex banks, particularly global systemically important banks, could provide information about their activities and risk that could help bondholders better monitor them. The ability of bondholder representatives to reduce excessive risk-taking that might lead to bank insolvency could also depend on their expertise. We could expect that among bondholder representatives, those with regulatory experience could recognize risks that will not pay off or are unsound for the bank's financial stability and can advise managers to avoid such risks.

3.3. Sample and data description

3.3.1. Our sample

Our sample includes commercial banks and bank holding companies from 15 European countries[20] listed on the stock market. We only consider listed banks as most non-listed banks do not issue bonds; we also were unable to collect data on the board structure of non-listed banks (even examining annual reports). We initially identified all active bank holding companies and commercial banks listed on the stock market in 2017, resulting in 155 banks. Amongst these banks, we were able to assemble data on boards of directors from BoardEx for 105 banks (79 commercial banks and 26 bank holding companies); see Table A.1 in the Appendix for a breakdown by country. On average, our sample covers around 97% of banks' total assets of all listed banks covered by Bloomberg in 2017. We collect, bank by bank, all information available in Bloomberg on their bondholders for the year 2017.[21]

With board terms normally ranging from 3 to 4 years, the literature provides evidence that the board structure is relatively stable for a short period of analysis (Yermack, 2004; Crutchley et al., 2002). Similarly, we can assume that the list of bondholders is relatively stable over a short period. We, therefore, conduct our empirical analysis over the period of analysis 2016-2018. We also test our results' robustness by conducting our empirical analysis on the two alternative periods 2017-2019 and 2015-2017 (see Section 5.7). We, therefore, collect financial statement data and market data from Bloomberg and macroeconomic data from the World Bank over the period 2015-2019. Financial data was winsorized at the 1% and 99% levels (our results are generally similar using non-winsorized data). The variables used in the empirical analysis are defined in Table 1.

[20] Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.
[21] Note that Bloomberg provides only information on current bondholders, with no historical detail.

Table 1. Definitions, data sources, and summary statistics for variables

Variables	Definition	Data sources	Mean	Median	Std Dev.	Min.	Max.
Dependent variables							
DD	Distance to default computed using the Merton (1977) model.	Bloomberg	4.48	4.20	2.33	-0.02	15.74
LnZscore	Measure of bank's solvency, defined as the logarithm of $(\mu_{ROA,t} + car_t)/\sigma_{ROA,t}$, where $\mu_{ROA,t}$ and $\sigma_{ROA,t}$ are the 3-year rolling windows average and standard deviation of return on assets, respectively, and *car* is the equity to total assets ratio at the date t. A higher Z-score indicates that a bank has a lower risk of insolvency.	Bloomberg	4.31	4.39	1.33	0.42	8.36
SDROA	Standard deviation of the return on assets	Bloomberg	0.30	0.10	0.71	0.004	4.97
Volatility	Standard deviation of monthly stock returns over the previous twelve months.	Bloomberg	0.29	0.24	0.17	0.06	1.26
ROA	Return on assets, net income divided by total assets (%).	Bloomberg	0.62	0.46	1.10	-2.51	9.97
Bondholder representatives							
BondRepIndex	Index of the relatedness of the board of directors to bondholders (see Section 3.2.).	BoardEx, Bloomberg	0.21	0.18	0.23	0	1
DCompeting1	Dummy variable taking the value of one if for a given bank all bondholder representatives are considered as non-independent directors using the list of independent directors provided by banks (based on the Corporate Governance Codes).	BoardEx, Bloomberg	0.10	0	0.31	0	1
DCompeting2	Dummy variable taking the value of one if for a given bank all bondholder representatives have a competing interest by being related to shareholders using the three following criteria: (1) they are one of the shareholders of the bank (2) they are affiliated to a bondholder who is also a shareholder of the bank; (3) they are affiliated to a shareholder by being one of their employees or being on their board of directors.	BoardEx, Bloomberg	0.26	0	0.43	0	1
DReputation	Dummy variable taking the value of one if at least one of the bondholder representatives have at least one new board position in other firms during the two years after we identified them as bondholder representatives.	BoardEx	0.58	1	0.49	0	1

DRegulatoryExp	Dummy variable taking the value of one if at least one bondholder representative has a position (past or present) in a supervisory/regulatory authority or in a financial authority (such as ministry of finance, stock exchange commission, money market authority, etc.)	BoardEx	0.35	0	0.47	0	1
Board level control variables							
BoardSize	Natural logarithm of the number of directors on the board.	BoardEx	2.44	2.48	0.37	1.38	3.13
OneTierBoard	Dummy variable taking the value of one if the bank has a one-tier board and the value of 0 if the bank has a dual board (tier-two).	BoardEx	0.62	1	0.48	0	1
Bank level control variables							
Size	Natural logarithm of Total Assets.	Bloomberg	10.73	10.44	1.99	5.11	14.62
GrowthTA	Annual growth rate of total assets (%).	Bloomberg	2.53	2.52	9.50	-18.74	36.53
Loan	Gross loans divided by total assets (%).	Bloomberg	58.19	63.98	20.71	1.94	87.48
Equity	Total equity divided by total assets (%).	Bloomberg	8.16	7.184	3.61	2.14	20.45
Deposit	Deposits divided by total assets (%).	Bloomberg	54.47	57.50	17.83	7.25	89.78
Operating	Total operating expenses divided by total operating income (%).	Bloomberg	3.09	2.12	5.73	-18.77	26.26
Opacity	Index of opacity following Lepetit et al. (2017); the index is based on four opacity components (earnings prediction errors, earnings management, market funding, and lending activity) and ranges from 1 to 10, with higher levels of opacity for higher values of the index.	Bloomberg	5.59	5.5	1.47	1	9.75
Country-level control variables							
GDP	GDP growth rate (%).	World Bank	1.91	1.82	0.62	-0.19	3.17
Supervision	Index measuring the strength of supervisory regime. The yes/no responses to the given questions covered all aspects of the power of the supervisory agency. The value for each answer is either 1 or 0. A higher total value indicates wider and stronger authority for bank supervisors.	World Bank	10.09	11	2.34	4	13
CreditorRights	The creditor rights index measures four powers of secured lenders in bankruptcy: (1) whether there are restrictions, such as	World Bank	1.90	2	1.11	0	4

	creditor consent, when a debtor files for reorganization; (2) whether secured creditors are able to seize their collateral after the petition for reorganization is approved, that is, whether there is no automatic stay or asset freeze imposed by the court; (3) whether secured creditors are paid first out of the proceeds of liquidating a bankrupt firm; and (4) whether an administrator, and not management, is responsible for running the business during the reorganization.						
Instrument variable							
DirectFlightsHeadQ	Number of direct scheduled airline flights from the bank headquarter to the headquarter of firms in the S&P 350 European Index.	Website of the airports	24.49	29	11.21	0	39
Further variables							
DLowEquity	Dummy variable taking the value of one for banks with the ratio of total equity to total assets lower than 5%.	Bloomberg	0.25	0	0.43	0	1
DGSIB	Dummy variable taking the value of one for banks in the list of global systemically important banks in 2017.	Financial Stability Board (FSB)	0.11	0	0.31	0	1
DHighOpacity	Dummy variable taking the value of one if the index of opacity of a bank is higher than the median sample.		0.60	1	0.48	0	1
MES	Marginal Expected Shortfall (MES), introduced by Acharya et al. (2017) and Brownlees & Engle (2017), is defined as the marginal contribution of a bank to systemic risk as measured by the Expected Shortfall of the financial system.	Bloomberg	0.01644	0.01699	0.01076	0.00003	0.05383
DCoVar	Delta-CoVaR (DCoVar), introduced by Adrian & Brunnermeier (2016), corresponds to the Value at Risk of the financial system obtained conditionally on a specific event affecting a given bank.	Bloomberg	0.00401	0.00363	0.00284	-0.00005	0.01218
PropBondRep	Number of bondholder representatives over the total number of directors on bank boards (%).		17.65	15	18.35	0	84.61
DBondRep	Dummy variable taking the value of one if at least one bondholder representative is present on the board of a bank.		0.63	1	0.48	0	1

PropRegulatoryExp	Number of directors with regulatory experience over the total number of directors on bank boards (%).	BoardEx, Bloomberg	6.01	3.57	8.15	0	45.83
DControllingSH	Dummy variable taking the value of one if at least one shareholder holds more than 20% of shares.		0.73	1	0.44	0	1
DCriticalMass	Dummy variable taking the value of one for banks having at least three bondholder representatives.		0.43	0	0.49	0	1

This table defines the variables and reports summary statistics for the full sample.

3.3.2. Index of relatedness of bondholder representatives

We need to determine if a director is affiliated with at least one bondholder to identify the bondholder representatives on a bank's board. We first identify, for each bank, the list of bondholders for the year 2017 (82,503 bondholders in total). We find that 97.55 % of the bondholders are institutional investors, with investment banks and non-banking financial institutions representing 45% and 41.5% of the bondholders, respectively (see Table A.2 in the Appendix). We next collect data on biographies of board directors for our sample of banks (1381 board members). We use two criteria matching both biographical information of directors and bank bondholders to identify if a director is affiliated to at least one bondholder: (1) they are or were an employee of one of the bondholders; (2) they are or were on the board of directors of one of the bondholders.

We then compute an index to measure the influence of bondholder representatives on the board of banks, which incorporates the proportion of directors affiliated to a bondholder and the strength of the relationship between directors and bondholders. This approach allows us to compute a more refined measure than a dummy variable taking the value of one if at least one director is affiliated to a bondholder or the basic percentage of bondholder representatives.[22]

An important factor to consider in measuring the strength of the relationship between a director and a bondholder is whether their relationship is in the present or the past. When directors are, for example, current employees of a bondholder of the bank, they might have strong incentives to act in the interest of the persons that can fire them. However, when the relatedness is already in the past, the related director is less directly influenced by bondholders; thus, their impact should be less significant than in the first case. Therefore, we consider that a director is weakly related to a bondholder when their relationship was in the past and strongly related with a bondholder if they are currently related. We then compute individual scores to measure the strength of the relatedness between a director and a bondholder, assigning the score of zero, one, and two when a director is not affiliated, weakly affiliated, or strongly affiliated to a bondholder, respectively. An overall index to measure the influence of directors related to bondholders (*BondRepIndex*) on the board is

[22] We test the robustness of the results we obtain when using the index measuring the influence of bondholder representatives by considering alternately a dummy variable for the presence of at least one bondholder representative and the percentage of bondholder representatives, finding similar results (see Section 5.7).

then computed at the bank level by taking the average of the "score of relatedness" of all directors. An index value of zero indicates that the board of directors is independent of bondholders.

3.3.3. Risk and performance measures

We consider several standard measures of bank risk and profitability. We consider two measures of insolvency risk: the logarithm of the traditional time-varying Z-score measure (*LnZscore*)[23] and the distance to default (*DD*) using the methodology developed by Merton (1977)[24]. Note that the higher the Z-score and the distance to default, the lower is default risk. We also consider the standard deviation of the return on assets (*SDROA*) and the bank stock return volatility (*Volatility*) as additional bank risk measures. We lastly use the return on assets (*ROA*) to measure bank profitability.[25]

3.3.4. Descriptive statistics

We find that bondholder representatives are present on the board of directors of 66 banks, i.e., 63% of our sample of banks (see Table 2; Table A.1 presents a distribution of banks by country). We observe from Table A.3 in the Appendix that banks with bondholder representatives are larger, have a higher market funding ratio, a lower equity ratio, and a lower degree of opacity compared to banks without bondholder representatives. Banks with bondholder representatives also have a greater number of directors on their boards, with 14 board members on average against 11 for banks without bondholder representatives. A larger number of banks with bondholder representatives has a two-tier board structure; this is in line with the argument that a two-tier system provides more possibilities to add representatives of additional stakeholders, as the management board and supervisory boards are different (Solomon, 2013).

Bondholder representatives, when present, account on average for four board members, who represent around 28% of board seats; the proportion of bondholder representatives is therefore relatively high on average (see Table 2).

Table 2. Descriptive statistics on bondholder representatives

[23] The Z-score is defined as $(\mu_{ROA,t} + car_t)/\sigma_{ROA,t}$, where $\mu_{ROA,t}$ and $\sigma_{ROA,t}$ are the 3-year rolling windows mean and standard deviation of return on assets, respectively, and *car* is the equity to total assets ratio at date t. As the Z-score risk measure is highly skewed, we use its natural logarithm (Lepetit and Strobel, 2015).

[24] We use 10-year government bond rates of each country for the risk-free rate (as one-year rates are not consistently available); the volatility measure is constructed as the annual volatility of daily stock returns.

[25] We obtain similar results when we measure bank profitability with the return on equity (ROE).

	Mean	Standard deviation	Min.	Max.
Banks with at least one bondholder representative (%)	62.85	-	-	-
Number of directors (among banks with at least one bondholder representative)	14.27	4.73	7	32
Number of bondholder representatives (among banks with at least one bondholder representative)	4	2.50	1	11
Proportion of bondholder representatives (among banks with at least one representative) (%)	28.58	15.65	5.55	84.61

This table displays statistics on the proportion of banks having at least one bondholder representative on their board of directors, the total number of directors on the board, and the number and proportion of bondholder representatives among banks with at least one bondholder representative.

3.4. Methodology

3.4.1. Baseline specification

The econometric specification we use to examine whether the influence of bondholder representatives within bank boards has an impact on their risk and performance is as follows:

$$Y_{i,j,t} = \alpha_0 + \beta BondRepIndex_{i,j} + \sum_p \delta_p BoardControls_{i,j,t} + \sum_m \theta_m BankControls_{i,j,t} + \sum_n \gamma_n CountryControls_{j,t} + \varepsilon_{i,j,t} \quad (1)$$

where subscript *i* denotes bank, *j* denotes the country, *t* the time period, and $\varepsilon_{i,j,t}$ is the idiosyncratic error term. $Y_{i,j,t}$ is the dependent variable that alternatively stands for: bank risk measured by the logarithm of the Z-score (*LnZscore)*, the distance to default (*DD*), the standard deviation of ROA (*SDROA*) or the bank's stock return volatility (*Volatility*), and bank profitability proxied by the return on assets (*ROA*).

BondRepIndex is the independent variable of interest, an index representing the influence of directors related to bondholders. We expect the coefficient associated with *BondRepIndex* to be significant and positive for the two default risk measures (*LnZscore* and *DD*) and negative for the standard deviation of ROA (*SDROA*) and the stock return volatility (*Volatility*) to be in line with

the hypothesis that bondholders can exert effective market discipline through their representatives. Furthermore, we should find a non-significant relationship between BondRepIndex and ROA if the influence of bondholder representatives does not reduce bank profitability.

We control for other board characteristics ($BoardControl_{i,j,t}$) commonly used in the literature, i.e. board size ($BoardSize_{i,j,t}$) and board tier structure[26] ($OneTierBoard_{i,j,t}$). We also control at the bank level ($BankControls_{i,j,t}$) for bank size, growth of assets, loan ratio, capital structure, deposit ratio, operating expenses ratio, and an index measuring bank opacity. We furthermore include the following country-level variables ($CountryControls_{j,t}$): the growth rate of GDP (*GDP*), an index measuring the strength of supervision (*Supervision*), and one measuring the level of creditor rights (*CreditorRights*). All control variables are defined in Table 1 with corresponding descriptive statistics. Table A.4 in Appendix A shows the correlation coefficients and collinearity diagnostics between our variables of interest (see Panel A). We ensure the absence of multicollinearity problems by computing the variance inflation factors (VIF), which have a mean value of 1.09 with a maximum of 2.99 (see Table A.4 Panel B).

We estimate all regressions over the period 2016-2018 using country random-effects to control for possible within-country correlations that could bias our analysis. The country random-effects specification, which is commonly used in the literature (Dahya et al., 2008, Durnev and Kim, 2005, La Porta et al., 2002, Claessens et al., 2002), explicitly allows for correlated errors among the observations within a country and produces consistent standard errors. This specification is supported by the Breusch and Pagan (1980) Lagrange multiplier test, which rejects the null hypothesis that errors are independent within countries for all risk regressions. For the profitability regression, the Breusch and Pagan (1980) Lagrange multiplier test does not reject the null hypothesis that errors are independent within countries; the Hausman test indicates the presence of country fixed effects. Nevertheless, we also estimate this regression using country-random effects, as such a specification has been shown to be preferable to a fixed-effects one when a sample consists only of a subsample of the total population of countries, as in our case (Greene,

[26] While the one-tier board of directors has a single body of directors that includes both executive and non-executive directors and makes strategic decisions, the two-tier board of directors is a system in which a firm has two distinct boards of directors, a management and a supervisory board. The management board is comprised of executive directors only and makes decisions related to operational and tactical direction of the firm. The supervisory board consists exclusively of non-executive directors and makes decisions about long-term strategic decisions. The supervisory board is responsible for the hiring and firing of the management board.

1997, Claessens et al., 2002, Durnev and Kim, 2005), and as two country-level independent variables are time-invariant preventing the use of country-fixed effects. As a robustness check, we re-estimate all regressions with country fixed effects by removing time-invariant country-level variables (see Section 5.7).

3.4.2. Endogeneity issues and estimation methodology

To identify the causal effect of the presence of bondholder representatives on bank risk and profitability, we have to assume that our variable of interest (*BondRepIndex*) is exogenous and uncorrelated with the error term. However, this may not be the case. The potential problem of endogeneity with key firm variables is a major concern of studies on corporate governance. More generally, previous studies such as Hermalin and Weibach (1998, 2003) have raised this issue regarding the composition of the board of directors.

To address potential endogeneity issues caused by omitted variable bias, we use bank-level controls including board of directors characteristics, country-level controls, and country random effects that account for unobserved country-specific characteristics that might be correlated with bank risk and performance. In addition, we deal with the problem of endogeneity by adopting an instrumental variable approach. To address the potential endogeneity issue between bank risk/profitability and the relatedness index of bondholder representatives, we perform an instrumental variable (IV) model using a two-stage least squares instrumental variable regression. While finding valid instruments is challenging, the literature suggests that board composition can be adequately instrumented by the number of direct flights to and from a firm headquarter's city, by influencing the number of available potential directors that the firm can look for (Bernile et al., 2018; Bernstein et al., 2016; Giroud, 2013). In our analysis, we use an alternative director supply-based instrumental variable approach to address potential exogenous variation in board composition. In particular, we instrument the variable measuring the influence of bondholder representatives within bank boards by the number of direct scheduled airline flights from the bank headquarter to the headquarters of firms in the S&P 350 European index. The conceptual premise for the relevance of our IV is that the presence of more abundant travel opportunities increases the ease and thus the likelihood of being able to recruit directors from companies in the S&P 350 European index. With 97.55% of debtholders in our sample being financial institutions, but the latter making up only 15.5% of firms in the S&P 350 European index, a higher degree of flight

connectivity, assuming otherwise equal qualification levels of director candidates, could be expected to decrease the likelihood of recruiting bondholder-related directors to the board.

The first stage analysis of our instrumental approach explicitly tests this conjecture (see column 1 in Table 3). Results show a strong negative relationship between the IV and the index representing the influence of directors related to bondholders.[27] This finding is consistent with our expectation that more flights from the bank headquarter to the headquarters of companies in the S&P 350 European index facilitate the recruitment of directors from these companies, thereby reducing the likelihood of having bondholder-related directors on the board.

In Table 3, we provide, for each regression, the first stage F-statistic on the instrument and the p-value related to the Anderson canonical correlation LM statistic for the relevance of the instrument. We verified that all F-statistics are greater than ten and that we can reject the null of the Anderson canonical correlation LM test.

3.5. Empirical results

We first examine whether the influence of bondholder representatives impacts bank risk and profitability, then investigate several factors related to the incentives and ability of bondholders and their representatives to monitor banks that could affect these relationships, and finally perform a range of further robustness checks.

3.5.1. Core results

The second stage regression results of our instrumental variables approach are reported in Table 3, columns (2) to (6). The relatedness index is significant for all our insolvency and bank risk measures at 1 or 5% levels of significance (see columns (2)-(5)). Our results, therefore, show that the influence of bondholder representatives significantly decreases bank risk. Another interesting result is that this risk-reduction is not accompanied by a decrease in profitability as reflected by the non-significant impact of the influence of bondholder representatives on ROA (see column (6)).

Overall, our results show that the influence of bondholder representatives on banks' boards is an effective market discipline mechanism to limit excessive risk-taking without deterring profitability. The influence of directors related to bondholders gives these an instrument to

[27] For brevity, these are only reported for LnZscore as dependent variable; similar results are obtained for the other dependent variables considered in the second stage.

influence managers and ensure that the bank is managed in their interest. The fact that this market discipline leads to a decrease in insolvency risk and general bank risk reinforces its value in complementing bank supervision and ensuring banking stability. Moreover, the neutral effect on profitability makes the influence of bondholder representatives on banks' boards a particularly promising mechanism for reducing agency conflicts between shareholders and debtholders/regulators.

However, this general result might potentially conceal some disparities in the effectiveness of such a mechanism across banks. To investigate this further, we consider several factors related to the incentives and ability of bondholders and their representatives to monitor banks to capture better the impact of the influence of bondholder representatives on banks' risk.

Table 3. Influence of bondholder representatives and bank risk & performance (Equation (1))

		LnZscore	**DD**	**SDROA**	**Volatility**	**ROA**
	(1)	(2)	(3)	(4)	(5)	(6)
	IV	IV	IV	IV	IV	IV
	1st Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage
BondRepIndex		3.276***	3.585**	-1.510**	-21.28**	-1.376
		(3.05)	(1.98)	(-2.49)	(-1.96)	(-1.45)
DirectFlightsHeadQ	-0.00705***					
	(-4.50)					
Size	0.130***	-0.443***	-0.654***	0.179**	3.838***	0.181
	(11.03)	(-3.19)	(-3.00)	(2.28)	(2.94)	(1.57)
GrowthTA	-0.000917	0.00814	0.00334	0.000935	-0.131	0.00732
	(-0.50)	(0.88)	(0.27)	(0.18)	(-1.58)	(1.07)
Equity	-0.00670	0.00301	0.0386	0.0364**	0.00222	0.128***
	(-1.25)	(0.11)	(1.00)	(2.35)	(0.01)	(5.86)
Loan	-0.00287***	0.0203***	0.0165***	-0.00231	-0.0435	-0.00593*
	(-3.46)	(4.30)	(2.80)	(-0.87)	(-1.13)	(-1.94)
Deposit	-0.00378***	0.0144*	0.0109	-0.00299	-0.0101	0.00232
	(-3.22)	(1.88)	(1.23)	(-0.70)	(-0.18)	(0.64)
Operating	-0.00457*	0.0197	0.00592	-0.00783	-0.316**	-0.0326***
	(-1.71)	(1.35)	(0.32)	(-0.95)	(-2.41)	(-3.17)
Opacity	-0.00203	-0.264***	-0.843***	0.0602	6.153***	-0.325***
	(-0.13)	(-3.17)	(-8.18)	(1.28)	(9.04)	(-2.80)
BoardSize	-0.0351	0.555*	1.512***	-0.719***	-5.639**	-0.658***
	(-0.60)	(1.86)	(4.15)	(-4.29)	(-2.31)	(-3.66)
OneTierBoard	-0.242***	0.877***	0.587	-0.430**	-2.534	-0.472**
	(-5.57)	(2.74)	(1.32)	(-2.38)	(-0.88)	(-2.06)
GDP	0.0169	0.503***	0.293	-0.0793	-3.321**	0.0399
	(0.49)	(2.75)	(1.37)	(-0.77)	(-2.18)	(0.41)
Supervision	-0.0154	0.0367	0.00644	-0.0305	0.0968	-0.0795***
	(-0.77)	(0.05)	(0.08)	(-0.16)	(0.18)	(-2.77)
CreditorRights	0.00229	-0.153	-0.0742	0.0867	0.514	0.110**
	(0.05)	(-0.09)	(-0.41)	(0.19)	(0.45)	(1.99)

Country-Random Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	309	309	302	309	305	315
IV F-stat	-	22.43	12.92	22.27	16.55	13.34
Anderson LM statistic p-val	-	<0.01	<0.01	<0.01	<0.01	<0.01

This table reports 2SLS estimations of risk measures and performance (logarithm of the Z-score *LnZscore*, distance to default *DD*, standard deviation of the ROA *SDROA*, bank stock return volatility *Volatility*, and return on assets *ROA*) on the bondholder relatedness index (*BondRepIndex*) and control variables. All variables are as defined in Table 1. Column (1) reports 1st stage IV regression for LnZscore as dependent variable in the second stage. Columns (2) to (6) report 2nd stage IV regression estimates obtained when the bondholder relatedness index (*BondRepIndex*) is instrumented with the number of direct flights from the bank headquarter to the headquarters of firms in the S&P 350 European index. The T-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

3.5.2. Competing interests

The effectiveness of the market discipline applied by bondholders through their representatives depends on their incentives to deter banks from taking excessive risks. Bondholder representatives who are not independent of the company and its management board or of shareholders are potentially in a conflict between competing duties, balancing the interests of different stakeholders.

To examine if the results we found previously depend on the potentially competing interests of bondholder representatives, we first use the information provided by BoardEx to identify which directors are classified as independent for each bank. We then identify amongst the directors we classified as affiliated to a bondholder those who are considered as non-independent; we find that, on average, around 45% of bondholder representatives fall into this category. Finally, we compute the dummy variable *DCompeting1* that takes the value of one if, for a given bank, all bondholder representatives are considered as non-independent directors.

In most countries, the Corporate Governance Codes only recommend that independent directors be independent of the company and its management board, without indicating that these directors should also be independent of shareholders. The existing literature shows that shareholders have stronger incentives to favor 'excessively' risky investments than managers, especially for banks where potential losses can be shifted to debtholders, deposit insurers, and taxpayers. We therefore next identify bondholder representatives who might have a competing interest by being non-independent from shareholders, using the following criteria: (i) they are one

of the shareholders of the bank (ii); they are affiliated to a bondholder who is also a shareholder of the bank; (iii) they are or were affiliated to a shareholder by being one of their employees or being on their board of directors. For this, we collect from BankFocus and Bloomberg the list of direct shareholders for our sample of banks in 2017. We find that, on average, around 51% of bondholder representatives have such a competing interest. We then create the dummy variable *DCompeting2* taking the value of one if, for a given bank, all bondholder representatives have a conflict of interest in their incentives to lobby for less risk-taking by being a shareholder or affiliated to a shareholder.

We then augment Equation (1) with an interaction term between the relatedness index of the board of directors to bondholders (*BondRepIndex*) and alternatively the dummy variable *DCompeting1* and *DCompeting2*, as follows:

$$Y_{i,j,t} = \alpha_0 + \beta_1 BondRepIndex_{i,j} + \beta_2 BondRepIndex_{i,j} \times DCompeting_{i,j} + \sum_p \delta_p BoardControls_{i,j,t} + \sum_m \theta_m BankControls_{i,j,t} + \sum_n \gamma_n CountryControls_{j,t} + \varepsilon_{i,j,t} \quad (2)$$

where the variable *DCompeting* stands for either *DCompeting1* or *DCompeting2*.

The estimation results for Equation (2) use the same 2SLS estimation methodology as for Equation (1). In the second stage, the model estimated values from stage one are used in place of the actual value of the relatedness index of the board of directors to bondholders for both the non-interacted and interacted term.

Results in Table 4 Panel A show that the influence of directors affiliated with bondholders contributes to significantly reduce bank risk irrespective of whether those bondholder representatives are considered as independent or not. Results in Table 4 Panel B further show that the influence of bondholder representatives contributes to reduce bank risk significantly overall with, however, a lower impact (at the 10% level of confidence) when all bondholder representatives have a conflict of interest in their incentives to lobby for less risk-taking by being a shareholder or affiliated to a shareholder. Our results further show that the neutral effect on performance holds independently of the potentially competing interests of bondholder representatives.

Overall, our results show that the discipline exerted by bondholders through their representatives is effective in reducing bank risk and seems to be not conditional on the potential competing interests they might have. The independence of bondholder representatives from the management board or shareholders does not seem to be a key factor in the reducing impact we

found previously. Therefore, our results suggest that it is not independence of directors that is better for financial stability, but instead that directors are affiliated with bondholders. To ascertain our results, we first regress bank risk measures on the proportion of independent directors, as defined by the Corporate Governance Codes, who are also not affiliated to a bondholder. We find that the presence of such independent directors (who can be affiliated to shareholders) significantly increases bank risk (see Table A.5 in the Appendix). We next regress bank risk measures on the proportion of directors who are not affiliated to a bondholder or a shareholder. We find that the presence of such directors has a neutral impact on bank risk (see Table A.6).

Table 4. Bondholder representatives with competing interest (Equation (2))

	LnZscore	**DD**	**SDROA**	**Volatility**	**ROA**
	(1)	(2)	(3)	(4)	(5)
Panel A: Non-independent bondholder representatives					
BondRepIndex (β_1)	3.124***	2.909*	-2.149***	-33.31**	-0.715
	(2.99)	(1.80)	(-3.56)	(-2.28)	(-0.90)
BondRepIndex *DCompeting1 (β_2)	0.835	0.542	-0.221	-2.726	-0.132
	(0.45)	(0.68)	(-0.75)	(-0.38)	(-0.09)
Control variables	Yes	Yes	Yes	Yes	Yes
Country random effects	Yes	Yes	Yes	Yes	Yes
Observations	309	302	309	305	315
Wald test:					
$\beta_1 + \beta_2 = 0$	3.958**	3.451**	-2.369***	-36.033**	-0.846
	(3.933)	(4.300)	(14.60)	(5.785)	(0.281)
Panel B: Bondholder representatives affiliated to shareholders					
BondRepIndex (β_1)	3.571***	5.391***	-2.342***	-34.65***	-0.727
	(3.35)	(3.55)	(-3.88)	(-3.41)	(-0.91)
BondRepIndex *DCompeting2 (β_2)	-1.227*	-1.815*	0.152	11.26*	0.810
	(-1.72)	(-1.84)	(0.93)	(1.71)	(1.41)
Control variables	Yes	Yes	Yes	Yes	Yes
Country random effects	Yes	Yes	Yes	Yes	Yes
Observations	309	302	309	305	315
Wald test:					
$\beta_1 + \beta_2 = 0$	2.344*	3.576*	-2.190***	-23.39*	0.082
	(3.088)	(3.569)	(13.61)	(3.394)	(0.006)

Panel A of this table reports second stage 2SLS estimations of risk measures and performance (logarithm of Z-score *LnZscore*, distance to default *DD*, standard deviation of the ROA *SDROA*, bank stock return volatility *Volatility*, and return on assets *ROA*) on the bondholder relatedness index (*BondRepIndex*), its interaction with a dummy variable taking the value of one if, for a given bank, all bondholder representatives are considered as non-independent directors using the list of independent directors provided by banks (based on the Corporate Governance Codes) (*DCompeting1*), and control variables. Panel B of this table reports second stage 2SLS estimations of risk measures and performance (logarithm of Z-score *LnZscore*, distance to default *DD*, standard deviation of the ROA *SDROA*, bank stock return volatility *Volatility*, and return on assets *ROA*) on the bondholder relatedness index

(*BondRepIndex*), its interaction with a dummy variable taking the value of one when bondholder representatives are related with shareholders (*DCompeting2*), and control variables. All variables are as defined in Table 1. Columns (1) to (5) report 2nd stage IV regression estimates where the model estimated values from the first stage are used in place of the actual value of the bondholder relatedness index (*BondRepIndex*) for both the non-interacted and the interacted term. The T-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

3.5.3. Reputation in the market for directorships

Another important factor that may influence the incentives of bondholder representatives to monitor banks is their reputation in the market for directorships. Fama and Jensen (1983) argued that directors have incentives to monitor managers if they want to strengthen their reputation for effective decision-making. In addition, a strong reputation could help obtain other board seats (Gilson, 1990; Kaplan and Reishus, 1990). Therefore, bondholder representatives might have more substantial incentives to monitor banks when they aim to get new board positions.

We identify for each bondholder representative if they obtain new board positions in other firms during the two years after we identified them as a bondholder representative. We then compute the dummy variable *DReputation* taking the value of one if at least one of the bondholder representatives has at least one new position in other firms. Statistics in Table 1 show that, on average, around 58% of banks have at least one of their bondholder representatives associated with new board positions.

We augment Equation (1) with an interaction term between the relatedness index of the board of directors to bondholders (*BondRepIndex*) and the dummy variable *DReputation*. Results in Table 5 show that our previous results of bondholder representatives being linked to lower bank risk hold independently of whether or not bondholder representatives have the motivation to monitor banks to get new board positions. Also, our results again show that the neutral impact of the influence of bondholder representatives on ROA holds in all cases.

Table 5. Reputation of bondholder representatives in the market for directorships

	LnZscore	**DD**	**SDROA**	**Volatility**	**ROA**
	(1)	(2)	(3)	(4)	(5)
BondRepIndex (β_1)	3.618***	3.213**	-2.270***	-24.55*	-1.261
	(3.48)	(2.01)	(-3.80)	(-1.91)	(-1.53)
BondRepIndex *DReputation (β_2)	0.351	0.437	0.428	-16.49*	0.877
	(0.49)	(0.41)	(1.04)	(-1.91)	(1.60)
Control variables	Yes	Yes	Yes	Yes	Yes
Country random effects	Yes	Yes	Yes	Yes	Yes
Observations	309	302	309	305	315
Wald test:					

$\beta_1 + \beta_2 = 0$	3.969***	3.649*	-1.842**	-41.04***	-0.383
	(10.08)	(3.667)	(6.588)	(7.213)	(0.156)

This table reports second stage 2SLS estimations of risk measures and performance (logarithm of the Z-score *LnZscore*, distance to default *DD*, standard deviation of the ROA *SDROA*, bank stock return volatility *Volatility*, and return on assets *ROA*) on the bondholder relatedness index (*BondRepIndex*), its interaction with a dummy variable taking the value of one when at least one of bondholder representatives having new positions in other firms during the two years after we identified them as bondholder representatives (*DReputation*), and control variables. All variables are as defined in Table 1. Columns (1) to (5) report 2nd stage IV regression estimates where the model estimated values from the first stage are used in place of the actual value of the bondholder relatedness index (*BondRepIndex*) for both the non-interacted and the interacted term. The T-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

3.5.4. Regulatory experience

We investigate whether, among bondholder representatives, those with work experience in supervisory or regulatory authorities have the expertise to identify risks that are excessive or damaging for the bank's financial stability and steer managers to avoid such risks. We consider that a director has regulatory experience if they have a position (past or present) in a supervisory/regulatory authority or a financial authority (such as finance ministry, stock exchange commission, money market authority, etc.). We then compute the dummy variable *DRegulatoryExp* that takes the value of one if at least one bondholder representative has such a position. We observe that around 35% of banks have at least one bondholder representative with regulatory experience (see Table 1).

Results when we augment Equation (1) with an interaction term between the relatedness index of the board of directors to bondholders (*BondRepIndex*) and the dummy variable *DRegulatoryExp* are presented in Table 6. We find that the influence of bondholder representatives decreases insolvency risk and overall bank risk, with however a more substantial effect for those having at least one bondholder representative with regulatory experience. These results are in line with the argument that regulatory experience helps bondholder representatives better recognize unsound risks with regards to financial stability.

Table 6. Role of bondholder representatives with regulatory experience

	LnZscore	**DD**	**SDROA**	**Volatility**	**ROA**
	(1)	(2)	(3)	(4)	(5)
BondRepIndex (β_1)	3.369***	4.123**	-0.432**	-28.23**	-0.846
	(3.26)	(2.30)	(-2.17)	(-1.98)	(-1.09)
BondRepIndex *DRegulatoryExp (β_2)	1.263*	2.573**	-0.261**	-23.36***	0.643
	(1.90)	(2.34)	(-2.08)	(-2.67)	(1.26)
Control variables	Yes	Yes	Yes	Yes	Yes
Country random effects	Yes	Yes	Yes	Yes	Yes

Observations	309	302	309	305	315
Wald test: $\beta_1 + \beta_2 = 0$	4.632*** (15.81)	6.695*** (11.41)	- 0.692*** (9.726)	-51.58*** (10.63)	-0.202 (0.052)

This table reports second stage 2SLS estimations of risk measures and performance (logarithm of the Z-score *LnZscore*, distance to default *DD*, standard deviation of the ROA *SDROA*, bank stock return volatility *Volatility*, and return on assets *ROA*) on the bondholder relatedness index (*BondRepIndex*), its interaction with a dummy variable taking the value of one when at least one bondholder representative has regulatory experience (*DRegulatoryExp*), and control variables. All variables are as defined in Table 1. Columns (1) to (5) report 2nd stage IV regression estimates where the model estimated values from the first stage are used in place of the actual value of the bondholder relatedness index (*BondRepIndex*) for both the non-interacted and the interacted term. The T-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels

3.5.5. Low levels of capitalization

We next explore the potential role played by the level of banks' capitalization in the reduction of risk we found previously. Banks that are weakly capitalized might not be able to absorb losses if some risks materialize. Thus, on the one hand, incentives of bondholders, and indirectly those of their representatives, could be stronger to closely monitor such weakly capitalized banks to avoid excessive risk-taking decisions. On the other hand, the desire to monitor weakly capitalized banks could be reduced if bondholders prefer these banks to "gamble" for resurrection by adopting riskier strategies to increase the probability of recovering their funds (Gorton and Santomero, 1990; Calem and Rob, 1999; Rochet, 1992).

To examine this potential channel of impact, we augment Equation (1) with an interaction term between the relatedness index of the board of directors to bondholders (*BondRepIndex*) and the dummy variable *DLowEquity*, taking the value of one if a bank has a ratio of total equity to total assets lower than 5%.[28]

The results, displayed in Table 7, show that bondholder representatives' influence contributes to significantly reducing bank risk with, however, a lower impact for banks with lower levels of capitalization. We continue to find that the influence of bondholder representatives does not significantly impact the profitability of banks. These findings support the argument that bondholders, through their representatives, exert a significant discipline on banks to reduce their risk; however, weaker discipline is applied for banks with lower levels of capitalization.

Table 7. Bondholder representatives in weakly capitalized banks

[28] We follow the definition of the FDIC (the Federal Deposit Insurance Corporation of the US) that a bank is well capitalized if it has a leverage ratio of 5% or greater.

	LnZscore	**DD**	**SDROA**	**Volatility**	**ROA**
	(1)	(2)	(3)	(4)	(5)
BondRepIndex (β_1)	3.746***	4.033***	-2.722***	-31.32***	-0.529
	(3.97)	(2.98)	(-4.72)	(-3.19)	(-1.41)
BondRepIndex *DLowEquity (β_2)	-0.561*	-0.811*	0.872*	6.256*	0.0399
	(-1.76)	(-1.81)	(1.89)	(1.89)	(0.13)
Control variables	Yes	Yes	Yes	Yes	Yes
Country random effects	Yes	Yes	Yes	Yes	Yes
Observations	309	302	309	305	315
Wald test:					
$\beta_1 + \beta_2 = 0$	3.184***	3.221**	-1.849**	-25.06**	-0.488
	(11.42)	(5.721)	(5.672)	(6.496)	(0.898)

This table reports second stage 2SLS estimations of risk measures and performance (logarithm of the Z-score *LnZscore*, distance to default *DD*, standard deviation of the ROA *SDROA*, bank stock return volatility *Volatility*, and return on assets *ROA*) on the bondholder relatedness index (*BondRepIndex*), its interaction with a dummy variable taking the value of one when banks have a ratio of total equity over total assets lower than 5% (*DLowEquity*), and control variables. All variables are as defined in Table 1. Columns (1) to (5) report 2nd stage IV regression estimates where the model estimated values from the first stage are used in place of the actual value of the bondholder relatedness index (*BondRepIndex*) for both the non-interacted and the interacted term. The T-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

3.5.6. Bank complexity

The complex and opaque nature of banking activities exacerbates information asymmetry problems and diminishes stakeholders' capacity to monitor banks' decisions (Furfine, 2001; Levine, 2004; Morgan, 2002; Becht et al., 2012; Laeven, 2013). Financial regulators are acutely aware that ever more complex large banking organizations are increasingly difficult to monitor and control (Bliss and Flannery, 2002, 2019). The influence of bondholder representatives on boards may thus be particularly beneficial in a context of high degrees of complexity; they have more specific information about the complexity of banks' activities and can better monitor bank risk efficiently.

We investigate if the relationship we found previously between the influence of bondholder representatives and bank risk could be explained by the degree of banks' complexity. First, we consider that global systemically important banks (G-SIBs) have higher levels of complexity. We use the list of G-SIBs identified by the Financial Stability Board (FSB, 2017) to explore whether the impact of bondholder representatives on bank risk varies between banks depending on whether or not they figure in the list. We compute the dummy variable *DGSIB* that takes the value of one for the 12 banks of our sample in the list of global systemically important banks in 2017. Second, we consider that banks with a higher degree of opacity are also more complex to monitor. We

follow Lepetit et al. (2017) and compute a composite index based on proxies that capture four components of opacity, i.e., earnings prediction errors, earning management, market funding, and lending activity. Incentives of bondholders, and indirectly those of their representatives, could be stronger to closely monitor such highly opaque and complex banks to avoid excessive risk-taking decisions. The variable *DHighOpacity* takes the value of one if the index of opacity of a bank is higher than the sample median.

We augment Equation (1) with an interaction term between the relatedness index of the board of directors to bondholders (*BondRepIndex*) and alternatively the dummy variable *DGSIB* and *DHighOpacity*. As the issue of large, complex financial institutions has led to a re-examination of risk-assessment practices of the banking system, with a focus not only on individual bank risk but also on individual contributions to the risk of the banking system as a whole (Basel Committee on Banking Supervision, 2010; IMF, 2014), we also examine whether the influence of bondholder representatives on the board of banks affects systemic risk. For this, we consider two commonly used measures of systemic risk. The first, Marginal Expected Shortfall (*MES*), introduced by Acharya et al. (2017) and Brownlees & Engle (2017), is defined as the marginal contribution of a bank to systemic risk as measured by the Expected Shortfall of the financial system. The second measure, Delta-CoVaR (*DCoVar*), introduced by Adrian & Brunnermeier (2016), corresponds to the Value at Risk of the financial system obtained conditionally on a specific event affecting a given bank.[29]

Table 8 Panel A shows that the influence of bondholder representatives is associated with lower individual risk and lower systemic risk. We furthermore find that bondholders apply, through their representatives, a stronger discipline on banks in the list of global systemically important banks (G-SIBs). Table 8 Panel B further provides evidence that the influence of bondholder representatives contributes to significantly reducing both individual and systemic risk, with a stronger impact on risk for banks with higher degrees of opacity. These results indicate that bondholders, through their representatives, apply a stronger discipline on banks with higher

[29] To compute the *MES*, we follow Brownlees & Engle (2017) and implement a GARCH-DCC model, using a coefficient α of 5% and setting the threshold C equal to a fixed 2% market drop. Rather than estimating the *DCoVaR* with a quantile regression, as proposed by Adrian & Brunnermeier (2016), we follow Benoit et al. (2014, Appendix F) and similarly implement a GARCH-DCC model for consistency. Our regressions use the respective Q4-averages of the daily measures computed.

degrees of complexity. We furthermore find that the neutral impact of the influence of bondholder representatives on ROA continues to hold in all cases.

Table 8. Role of bank complexity

	LnZscore	DD	SDROA	Volatility	ROA	MES	DCoVar
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A. Global systemically important banks							
BondRepIndex (β_1)	3.585***	2.908**	-0.430**	-23.32*	-0.752	-0.0216***	-0.0039**
	(3.50)	(2.22)	(-2.15)	(-1.82)	(-0.97)	(-3.04)	(-2.12)
BondRepIndex *DGSIB (β_2)	3.777**	0.681*	-1.277***	-6.649*	0.386	-0.00376*	-0.00596*
	(2.10)	(1.77)	(-3.71)	(-1.71)	(0.26)	(-1.77)	(-1.75)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country random effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	309	302	309	305	315	315	315
Wald test:	7.362***	3.588***	-	-29.96**	-0.366	-0.02532***	-0.0099**
$\beta_1 + \beta_2 = 0$	(12.76)	(6.907)	1.707***	(5.068)	(0.050)	(11.69)	(6.575)
			(18.53)				
Panel B. High degrees of opacity							
BondRepIndex (β_1)	2.833***	2.938*	-0.424**	-25.79**	-0.602	-0.0186**	-0.00328*
	(3.09)	(1.68)	(-1.98)	(-2.53)	(-0.76)	(-2.46)	(-1.72)
BondRepIndex *DHighOpacity (β_2)	1.186***	1.880**	-0.247**	-8.767*	-0.205	-0.00738**	-0.00152*
	(2.92)	(2.47)	(-2.55)	(-1.91)	(-0.94)	(-2.21)	(-1.78)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country random effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	309	302	309	305	315	315	315
Wald test:	4.018***	4.818***	-	-34.55***	-0.807	-0.02593***	-0.0047**
$\beta_1 + \beta_2 = 0$	(20.13)	(7.651)	0.671***	(11.41)	(1.040)	(11.96)	(6.421)
			(10.61)				

Panel A of this table reports second stage 2SLS estimations of risk measures and performance (logarithm of the Z-score *LnZscore*, distance to default *DD*, standard deviation of the ROA *SDROA*, bank stock return volatility *Volatility*, return on assets *ROA*, systemic risk measures *MES* and *DCoVar*) on the bondholder relatedness index (*BondRepIndex*), its interaction with a dummy variable taking the value of one when banks are classified as Global Systemically Important (*DGSIB*), and control variables. Panel B of this table reports second stage 2SLS estimations of risk measures and performance (Z-score *LnZscore*, distance to default *DD*, standard deviation of the ROA *SDROA*, bank stock return volatility *Volatility*, return on assets *ROA*, systemic risk measures *MES* and *DCoVar*) on the bondholder relatedness index (*BondRepIndex*), its interaction with a dummy variable taking the value of one when banks have an index of opacity higher than the sample median (*DHighOpacity*), and control variables. All variables are as defined in Table 1. Columns (1) to (7) report 2nd stage IV regression estimates where the model estimated values from the first stage are used in place of the actual value of the bondholder relatedness index (*BondRepIndex*) for both the non-interacted and the interacted term. The T-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

3.5.7. Robustness tests

We further conduct a series of tests to assess the robustness of our main results related to the criteria used to identify bondholder representatives and alternative empirical specifications.[30]

Alternative measures for the presence of bondholder representatives

In our main analysis, we use the bondholder representative index (*BondRepIndex*) to conduct our investigation. This approach has the advantage of considering the strength of the relatedness between a director and a bondholder through the criterion of whether the relationship is present or in the past. For robustness, we consider two alternative variables that are simpler than the index we used to measure the presence of bondholder representatives on the board of banks. First, we consider the proportion of bondholder representatives (*PropBondRep*), defined as the number of affiliated directors divided by the total number of directors on bank boards. Second, we use a dummy variable taking the value of one if at least one bondholder representative is present on the board of a bank (*DBondRep*).

Tables A.7 and A.8 in the Appendix report the results when we reexamine our Equation (1) with these two alternative measures. We find that our main conclusions are unchanged; bondholder representatives within the board significantly reduce bank risk and have no significant impact on profitability.

Alternative time period and econometric specifications

We next re-run our regressions for the periods 2015-2017 and 2017-2019 instead of 2016-2018. Results, reported in Tables A.9 and A.10, show that our conclusions remain unchanged.

We also re-estimate all regressions with country fixed effects instead of country random effects. For this, we remove time-invariant country-level independent variables, including supervision and creditor rights. Table A.11 reports the results of Equation (1); the first stage F-statistic on the instrument and the p-value related to the Anderson canonical correlation LM statistic show that our instrument is relevant. Although the magnitudes and confidence levels of estimated effects of the bondholder relatedness index (*BondRepIndex*) on bank risk are slightly changed, our main results continue to hold.

[30] We only include in the Appendix the estimation results for the core regressions (Section 5.1.). Estimation results conducted to check the robustness of the results presented in the further analysis are not included in this Appendix but are available upon request; they generally lead to similar results.

Other controlling variables for board characteristics and ownership

We explore whether our results are sensitive to controlling for another board characteristic and ownership structure features of banks that could potentially affect the oversight of risk by the board of directors. In particular, we re-run our regressions including (i) the proportion of directors having regulatory experience (*PropRegulatoryExp*); (ii) a dummy variable taking the value of one if at least one shareholder holds more than 20% of shares (*DControllingSH*), to allow for shareholders with decision power.

Table A.12 reports the results when we reexamine our Equation (1) with these two additional control variables; we find that our main conclusions are unchanged. We do not find evidence that a shareholder with controlling power has an impact on bank risk-taking. Our results also do not show that directors with regulatory experience impact bank risk-taking behavior. This result, combined with the previous findings in Section 5.4. (see Table 6) provides evidence that regulatory experience of directors is not sufficient to reduce bank risk. Such directors also have to be affiliated with bondholders with incentives to exert, through their representatives, significant discipline on banks to reduce bank risk.

Critical mass effect

Finally, we examine if there is a critical mass effect for bondholder representatives to make a difference. The critical mass theory demonstrates that if the number of directors with the same orientations on a board is too small, problems of tokenism arise (hypervisibility, stereotyping, exclusion) (Kanter, 1977). More specifically, it shows that there must be at least three directors having the same orientation on a board before they make a difference; otherwise, they can be considered as tokens. We test the critical mass argument by estimating an expanded version of our Equation (1), where we include an interaction term between the relatedness index of the board of directors to bondholders (*BondRepIndex*) and the dummy variable *DCriticalMass* taking the value of one for banks having at least three bondholder representatives. Results are reported in Table A.13 and show that the influence of bondholder representatives is associated with lower bank risk with, however, a more substantial impact on risk for banks with at least three bondholder representatives on their board.

3.6. Conclusion

The purpose of this paper is to examine whether the influence of bondholder representatives on the board of directors of banks is an effective market discipline mechanism to reduce bank risk. For this, we use a unique dataset that brings together information on bondholders and boards of directors of European listed banks. We exploit flight connectivity between bank headquarters to the headquarters of S&P 350 European firms to allow for endogeneity issues related to banking risk and board composition.

Our results show that bondholders can exert direct market discipline through affiliated directors by reducing bank risk without damaging profitability. Therefore, these results provide strong evidence that the influence of affiliated directors on a bank board provides bondholders an opportunity to influence managers and ensure that the bank acts in their interest.

Further investigations show that the impact of bondholder representatives on bank risk is not conditional on their independence from the management board or their reputation in the market for directorships. On the other hand, our results show that the discipline exerted by bondholders through their representatives is stronger when these representatives have regulatory experience. We also find evidence that the influence of bondholder representatives has a more substantial impact on risk for banks with higher degrees of opacity and G-SIBs. Our results show that bondholder representatives' influence also contributes to reducing systemic risk, with a stronger impact for G-SIBs and banks with higher degrees of opacity. We also find that having bondholder representatives with regulatory experience has a greater reducing impact on individual bank risk. On the opposite, we find that the influence of bondholder representatives has a lower impact on bank risk when they are also affiliated to a shareholder or for banks with lower capitalization levels.

Our findings generate several important policy implications. First, our results support the view that the market discipline exerted by bondholders can strengthen financial stability and be a valuable complement to safety-and-soundness supervision by bank regulators. In particular, our results reinforce the importance of Pillar 3 of the Basel 2 and 3 accords, which promotes market discipline to complement supervisory discipline. Our results also indicate that the beneficial effect of this market discipline mechanism is likely to be stronger for banks with higher degrees of complexity and when bondholder representatives have not only the incentives but also the ability to monitor bank managers.

Second, our findings contribute to the current policy debate on what forms of corporate governance in banks could lead to the most efficient outcome for stakeholders regarding financial stability. Corporate Governance Codes worldwide tend to be similar for nonfinancial and financial firms. However, banks are different from nonfinancial firms due to their specific regulation, capital structure, their inherent complexity and opacity, and the fact that the interests of shareholders of financial firms and those of their debtholders and regulators often diverge. As corporate governance traditionally focuses only on the interests of shareholders, it largely abstracts from these features. This state of affairs can explain why the proposals drawn up by the Basel Committee (2010, 2015), OECD (2010), and the European Union (2010) recommend that corporate governance of banks should be different from that of nonfinancial firms, with the twin objectives of not only enhancing the welfare of shareholders but also of debtholders and regulators. IMF (2014) suggests that board representation for creditors could improve their monitoring but that the consequences of such a recommendation would have to be thoroughly analyzed before being implemented. We provide evidence that recommending the inclusion of bondholder representatives on bank boards could be one way to reduce excessive bank risk-taking. Therefore, the presence of bondholder representatives could allow for bank board structures that more adequately represent bondholders' interests, leading to better alignment with regulators' interests as a consequence.

Appendix

Table A.1. Distribution of banks by country in 2017

Country	Number of listed commercial banks & bank holdings in Bloomberg	Number of listed commercial banks & bank holdings in the sample	Number of banks with at least one bondholder representative on their board	Total assets of sample banks divided by total assets of banks in Bloomberg (%)
Austria	8	5	4	89.7%
Belgium	3	2	2	95.9%
Denmark	23	5	3	96.2%
Finland	3	2	2	95.8%
France	16	9	4	98.5%
Germany	9	9	7	100%
Greece	5	3	2	97.3%
Italy	25	15	6	85.1%
Netherlands	5	5	3	100%
Norway	4	4	1	100%
Portugal	3	2	2	99.9%
Spain	8	8	6	100%
Sweden	6	6	4	100%
Switzerland	21	21	14	100%
United Kingdom	16	9	6	99.1%
Total	**155**	**105**	**66**	**97.16%**

This table reports, for the year 2017, the number of listed banks reported by Bloomberg, the number of banks in our sample, the number of banks with at least one bondholder representative on their board of directors, and the total assets of our sample of banks divided by the total assets of all listed banks in Bloomberg.

Table A.2. Proportion of bondholder type

Bondholder type	Average	Std. Dev	Min	Max
Investment banks	45.35	30.42	0	100
Non-banking financial institutions (including insurance & fund management companies)	41.49	29.26	0	100
Commercial banks	10.71	19.87	0	100
Non-financial firms	2.45	7.04	0	33.33

This table reports the proportion of banks' bondholders who are either investment banks, non-banking financial institutions, commercial banks, or non-financial firms.

Table A.3. Characteristics of banks with and without bondholder representatives

	Banks with bondholder representatives				**Banks without bondholder representatives**				**(Without – with)**
Variables	**Mean**	**StdDev**	**Min.**	**Max.**	**Mean**	**StdDev**	**Min.**	**Max.**	**Means test**
Number of directors	14.27	4.73	7	32	11.23	4.25	4	24	-3.04***
OneTierBoard	0.57	0.49	0	1	0.71	0.45	0	1	0.14***
Size	11.53	1.75	7.85	14.62	9.37	1.58	5.11	13.50	-2.16***
Loan	56.43	19.64	1.94	87.48	61.15	22.16	4.42	87.48	4.71*
Equity	6.97	2.39	2.14	14.15	10.17	4.37	3.06	20.45	3.20***
Market Funding	13.94	11.89	0	63.78	10.88	12.15	0	54.08	-3.06**
Opacity	5.14	1.29	1	9	6.42	1.45	2.75	9.75	1.27***

This table reports mean tests which examine if the variable has the same mean in the sample of banks with bondholder representatives compared to banks without bondholder representatives (bilateral test): *Number of directors* = the total number of directors on the board; *OneTierBoard* = dummy variable taking the value of one for banks with a one-tier board and zero for banks with a two-tier board; *Size* = natural logarithm of banks total assets; *Loan* = gross loans divided by total assets (%); Equity = total equity divided by total assets; *Market funding* = short term and long term market funding divided by total assets (%); *Opacity* = index of opacity, with higher levels of opacity for higher values of the index (see Table1).

Table A.4. Correlation and multicollinearity

Panel A. Correlation matrix

	(1)	(2)	(3)	(4)	(5)	61)	(7)	(8)	(9)	(10)	(111)	(12)	(13)
1. BondRepIndex	1												
2. Size	0.621***	1											
3. GrowthTA	-0.293***	-0.345***	1										
4. Equity	-0.434***	-0.477***	0.197***	1									
5. Loan	-0.184**	-0.223***	0.0350	0.318***	1								
6. Deposit	-0.240***	-0.423***	0.221***	0.106	0.000936	1							
7. Operating	-0.0180	0.00238	0.0608	-0.0482	-0.224***	0.0885	1						
8. Opacity	0.0190	0.0405	-0.201***	-0.0684	-0.168**	0.00426	0.0453	1					
9. BoardSize	0.198***	0.461***	-0.112*	-0.0434	-0.152**	-0.282***	0.0452	0.0848	1				
10. OneTierBoard	-0.0905	0.241***	-0.0547	-0.0131	-0.0857	-0.175**	-0.110	0.0376	0.131*	1			
11. GDP	0.135*	0.0191	0.0129	-0.0957	-0.0359	0.148**	0.0464	-0.108	-0.0497	-0.179**	1		
12. Supervision	-0.113*	-0.120*	0.0153	0.00699	0.0235	0.179**	0.0381	0.0301	0.0995	-0.243***	-0.258***	1	
13. CreditorRights	0.104	0.0228	0.0562	-0.0370	-0.173**	0.241***	0.118*	0.117*	-0.0238	-0.309***	0.0534	0.0108	1

Panel B. Variance inflation factors

Variable	VIF	SQRT-VIF	Tolerance	R-Squared
BondRepIndex	1.95	1.39	0.5140	0.4860
Size	2.99	1.73	0.3341	0.6659
GrowthTA	1.24	1.11	0.8093	0.1907
Equity	1.56	1.25	0.6409	0.3591
Loan	1.28	1.13	0.7827	0.2173
Deposit	1.48	1.21	0.6779	0.3221
Operating	1.09	1.04	0.9176	0.0824
Opacity	1.12	1.06	0.8943	0.1057
BoardSize	1.46	1.21	0.6839	0.3161
OneTierBoard	1.53	1.24	0.6520	0.3480
GDP	1.24	1.11	0.8057	0.1943
Supervision	1.32	1.15	0.7562	0.2438
CreditorRights	1.29	1.14	0.7725	0.2275

This table shows the correlation matrix and the variance inflation factors (VIF). All variables are as defined in Table 1. *, **, and *** denote significance at 10%, 5% and 1% levels, respectively.

Table A.5. Proportion of independent directors not affiliated with bondholders

		LnZscore	DD	SDROA	Volatility	ROA
	(1)	(2)	(3)	(4)	(5)	(6)
	IV	IV	IV	IV	IV	IV
	1st Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage
PropIndepDirector		-0.0501***	-0.0393*	0.0244**	0.269**	0.00672
		(-2.81)	(-1.66)	(2.32)	(2.08)	(0.85)
DirectFlightsHeadQ	0.486***					
	(4.06)					
Size	2.165**	0.0774	-0.194*	-0.0637	0.421	0.0155
	(2.40)	(0.98)	(-1.86)	(-1.37)	(0.66)	(0.43)
GrowthTA	-0.0199	0.000342	-0.0103	0.00513	-0.0527	0.0154***
	(-0.15)	(0.03)	(-0.82)	(0.86)	(-0.69)	(4.53)
Equity	1.111***	0.0268	0.0306	0.0259	0.287	0.111***
	(2.73)	(0.83)	(0.74)	(1.38)	(1.15)	(9.30)
Loan	-0.0489	0.00400	0.00626	0.00523*	0.0103	-0.00456**
	(-0.76)	(0.73)	(0.90)	(1.65)	(0.20)	(-2.21)
Deposit	0.124	0.00670	0.00576	-0.000105	-0.0862	-0.0000420
	(1.39)	(0.95)	(0.63)	(-0.03)	(-1.48)	(-0.01)
Operating	-0.205	-0.00868	-0.00666	0.00536	2.887	-0.0889
	(-1.01)	(-0.57)	(-0.34)	(0.61)	(1.34)	(-0.84)
Opacity	0.875	-0.226**	-0.873***	0.0437	6.284***	-0.110***
	(0.73)	(-2.47)	(-7.36)	(0.83)	(8.41)	(-3.92)
BoardSize	-12.66***	-0.0459	1.323***	-0.388*	-8.294***	-0.309*
	(-2.94)	(-0.12)	(2.60)	(-1.73)	(-2.89)	(-1.73)
OneTierBoard	-2.310	0.0141	-0.219	-0.00564	3.176	-0.239***
	(-0.73)	(0.06)	(-0.70)	(-0.04)	(1.64)	(-3.15)
GDP	-0.0267	0.493**	0.423*	-0.103	-4.094**	0.0549
	(-0.01)	(2.53)	(1.70)	(-0.93)	(-2.46)	(0.96)
Supervision	-1.141	-0.0659	-0.0742	0.0148	1.137	-0.0277
	(-1.11)	(-0.40)	(-0.48)	(0.19)	(0.52)	(-1.41)
CreditorRights	1.154	-0.105	0.105	0.0709	-0.893	-0.0355
	(0.49)	(-0.27)	(0.30)	(0.38)	(-0.17)	(-0.87)
Country-Random Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	309	309	302	309	305	315
IV F-stat	-	15.40	14.82	14.75	19.77	8.89
Anderson LM statistic p-val	-	<0.01	<0.01	<0.01	<0.01	<0.01

This table reports 2SLS estimations of risk measures and performance (logarithm of the Z-score *LnZscore*, distance to default *DD*, standard deviation of the ROA *SDROA*, bank stock return volatility *Volatility*, and return on assets *ROA*) on the proportion of independent directors who are not affiliated to a bondholder (*PropIndepDirector*) and control variables. All variables are as defined in Table 1. Column (1) reports 1st stage IV regression for LnZscore as dependent variable in the second stage. Columns (2) to (6) report 2nd stage IV regression estimates obtained when the proportion of independent directors is instrumented with the number of direct flights from the bank headquarter to the headquarters of firms in the S&P 350 European index. The T-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Table A.6. Proportion of directors not affiliated with either bondholders or shareholders

		LnZscore	DD	SDROA	Volatility	ROA
	(1)	(2)	(3)	(4)	(5)	(6)
	IV	IV	IV	IV	IV	IV
	1st Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage
PropNotAffiliatedDirector		0.0509*	0.0477	-0.0132*	-0.345	-0.0192
		(1.96)	(1.42)	(-1.94)	(-1.29)	(-1.30)
DirectFlightsHeadQ	-0.437**					
	(-2.30)					
Size	-1.723	0.0797	-0.184	-0.0237	-0.310	-0.0230
	(-1.18)	(0.71)	(-1.36)	(-0.83)	(-0.30)	(-0.40)
GrowthTA	-0.0403	0.00620	-0.0174	-0.00183	-0.192	0.0132*
	(-0.18)	(0.45)	(-1.07)	(-0.52)	(-1.61)	(1.92)
Equity	0.00716	-0.0180	-0.0123	0.0286***	0.0783	0.147***
	(0.01)	(-0.47)	(-0.26)	(2.91)	(0.20)	(7.25)
Loan	0.170*	-0.00215	0.00158	0.00290	0.0740	-0.000384
	(1.65)	(-0.24)	(0.15)	(1.32)	(0.69)	(-0.08)
Deposit	-0.283**	0.00822	0.0148	-0.00146	-0.0271	-0.00329
	(-2.27)	(0.84)	(1.07)	(-0.52)	(-0.34)	(-0.54)
Operating	0.999***	-0.0343	-0.0241	0.00928	0.446	-0.0113
	(2.95)	(-1.07)	(-0.64)	(1.12)	(1.52)	(-0.69)
Opacity	-0.433	-0.244**	-1.078***	0.0567**	6.976***	-0.266**
	(-0.26)	(-2.32)	(-8.64)	(2.15)	(6.54)	(-2.06)
BoardSize	13.67**	-0.684	0.630	0.154	-2.363	-0.298
	(2.30)	(-1.31)	(0.94)	(1.11)	(-0.46)	(-1.03)
OneTierBoard	-9.648**	0.353	-0.0228	-0.0661	2.621	-0.399*
	(-2.12)	(1.02)	(-0.05)	(-0.71)	(0.91)	(-1.89)
GDP	-1.148	0.583***	0.675***	-0.176***	-5.570**	-0.0299
	(-0.35)	(2.81)	(2.69)	(-3.41)	(-2.48)	(-0.28)
Supervision	0.743	-0.0441	-0.0610	0.0120	0.983	-0.0490
	(0.82)	(-0.70)	(-0.86)	(0.80)	(1.01)	(-1.60)
CreditorRights	-0.0626	-0.282**	-0.175	0.0616**	0.239	0.102*
	(-0.03)	(-2.22)	(-1.25)	(2.03)	(0.11)	(1.67)
Country-Random Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	309	309	302	309	305	315
IV F-stat	-	5.54	4.94	5.27	4.75	4.87
Anderson LM statistic p-val	-	<0.05	<0.05	<0.05	<0.05	<0.05

This table reports 2SLS estimations of risk measures and performance (logarithm of the Z-score *LnZscore*, distance to default *DD*, standard deviation of the ROA *SDROA*, bank stock return volatility *Volatility*, and return on assets *ROA*) on the proportion of directors who are not affiliated to either a bondholder or a shareholder (*PropNotAffiliatDirector*) and control variables. All variables are as defined in Table 1. Column (1) reports 1st stage IV regression for LnZscore as dependent variable in the second stage. Columns (2) to (6) report 2nd stage IV regression estimates obtained when the proportion of independent directors is instrumented with the number of direct flights from the bank headquarter to the headquarters of firms in the S&P 350 European index. The T-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Table A.7. Robustness check (1): The proportion of bondholder representatives

		LnZscore	**DD**	**SDROA**	**Volatility**	**ROA**
	(1)	(2)	(3)	(4)	(5)	(6)
	IV	IV	IV	IV	IV	IV
	1st Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage
PropBondRep		0.0900***	0.0779**	-0.0438**	-0.577**	-0.0282
		(2.71)	(2.02)	(-2.44)	(-1.99)	(-1.26)
DirectFlightsHeadQ	-0.266***					
	(-3.61)					
Size	5.631***	-0.523***	-0.667***	0.229**	4.197***	0.173
	(10.20)	(-2.85)	(-3.10)	(2.31)	(2.77)	(1.45)
GrowthTA	-0.130	0.0177	0.0124	-0.00378	-0.227**	0.00303
	(-1.51)	(1.57)	(0.87)	(-0.62)	(-2.12)	(0.36)
Equity	0.0922	-0.0270	0.0309	0.0508***	0.0803	0.141***
	(0.36)	(-0.86)	(0.92)	(3.05)	(0.32)	(7.30)
Loan	-0.175***	0.0264***	0.0185***	-0.00532	-0.0729	-0.00564*
	(-4.51)	(3.91)	(2.77)	(-1.49)	(-1.57)	(-1.72)
Deposit	-0.225***	0.0214**	0.0128	-0.00617	-0.0534	0.00122
	(-4.05)	(2.05)	(1.36)	(-1.15)	(-0.75)	(0.27)
Operating	-0.230*	0.0259	0.00104	-0.0113	-0.211	-0.0384
	(-1.85)	(1.48)	(0.06)	(-1.22)	(-1.60)	(-0.24)
Opacity	0.00190	-0.279***	-0.900***	0.0722	6.060***	-0.318***
	(0.00)	(-2.99)	(-9.18)	(1.47)	(8.47)	(-2.67)
BoardSize	-0.243	0.428	1.626***	-0.625***	-5.837**	-0.714***
	(-0.09)	(1.26)	(4.57)	(-3.51)	(-2.29)	(-3.53)
OneTierBoard	-7.559***	-0.764**	0.370	-0.372**	-2.217	-0.335*
	(-3.68)	(-2.30)	(1.11)	(-2.08)	(-0.85)	(-1.88)
GDP	0.773	0.152	0.284	-0.0785	-3.211**	-0.0986**
	(0.47)	(0.49)	(1.39)	(-0.73)	(-2.02)	(-2.50)
Supervision	-1.778	-0.397	0.0748	-0.0895	-0.509	0.150*
	(-1.55)	(-0.55)	(0.73)	(-1.10)	(-0.66)	(1.92)
CreditorRights	2.684	-0.523***	-0.223	0.217	1.391	0.173
	(1.00)	(-2.85)	(-1.08)	(1.20)	(0.88)	(1.45)
Country-Random Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	309	309	302	309	305	315
IV F-stat	-	13.57	11.33	13.03	10.88	11.33
Anderson LM statistic p-val	-	<0.01	<0.01	<0.01	<0.01	<0.01

This table reports 2SLS estimations of risk measures and performance (logarithm of the Z-score *LnZscore*, distance to default *DD*, standard deviation of the ROA *SDROA*, bank stock return volatility *Volatility*, and return on assets *ROA*) on the proportion of bondholder representatives (*PropBondRep*) and control variables. All variables are as defined in Table 1. Column (1) reports 1st stage IV regression for LnZscore as dependent variable in the second stage. Columns (2) to (6) report 2nd stage IV regression estimates obtained when the proportion of bondholder representatives is instrumented with the number of direct flights from the bank headquarter to the headquarters of firms in the S&P 350 European index. The T-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Table A.8. Robustness check (2): The presence of at least one bondholder representative

		LnZscore	**DD**	**SDROA**	**Volatility**	**ROA**
	(1)	(2)	(3)	(4)	(5)	(6)
	IV	IV	IV	IV	IV	IV
	1st Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage
DBondRep		2.334***	2.335**	-1.070**	-16.86**	-0.956
		(3.11)	(1.99)	(-2.50)	(-2.03)	(-1.47)
DirectFlightsHeadQ	-0.00951***					
	(-4.41)					
Size	0.147***	-0.362***	-0.533***	0.141**	3.499***	0.142
	(9.00)	(-3.20)	(-3.25)	(2.18)	(3.15)	(1.59)
GrowthTA	-0.000474	0.00513	-0.00492	0.00233	-0.122	0.00943
	(-0.19)	(0.57)	(-0.44)	(0.45)	(-1.49)	(1.51)
Equity	-0.0224***	0.0345	0.0679	0.0220	-0.187	0.121***
	(-3.05)	(1.15)	(1.54)	(1.29)	(-0.52)	(4.88)
Loan	-0.00204*	0.0162***	0.0113**	-0.000429	-0.00788	-0.00426
	(-1.77)	(3.93)	(2.16)	(-0.18)	(-0.20)	(-1.47)
Deposit	-0.00195	0.00790	0.0100	-0.0000394	0.0333	0.00418
	(-1.23)	(1.23)	(1.25)	(-0.01)	(0.66)	(1.12)
Operating	-0.00344	0.0118	-0.00528	-0.00413	-0.227*	-0.0316***
	(-0.93)	(0.88)	(-0.31)	(-0.54)	(-1.67)	(-3.18)
Opacity	0.0155	-0.309***	-0.846***	0.0799*	6.557***	-0.339***
	(0.72)	(-3.76)	(-7.92)	(1.71)	(9.67)	(-2.91)
BoardSize	-0.0422	0.621**	1.687***	-0.752***	-4.481*	-0.572***
	(-0.54)	(2.12)	(4.52)	(-4.51)	(-1.83)	(-3.37)
OneTierBoard	-0.358***	0.941***	0.528	-0.459**	-2.467	-0.482**
	(-6.12)	(2.86)	(1.24)	(-2.45)	(-0.81)	(-2.09)
GDP	0.0228	0.517***	0.266	-0.0844	-2.838*	0.0410
	(0.51)	(2.88)	(1.19)	(-0.83)	(-1.86)	(0.42)
Supervision	-0.0176	0.0218	-0.0204	-0.0232	0.0819	-0.0799***
	(-0.90)	(0.02)	(-0.16)	(-0.08)	(0.18)	(-2.81)
CreditorRights	-0.0365	-0.0420	0.0862	0.0350	0.329	0.0826
	(-0.81)	(-0.02)	(0.29)	(0.05)	(0.35)	(1.48)
Country-Random Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	309	309	302	309	305	315
IV F-stat	-	23.29	16.07	23.23	16.01	14.95
Anderson LM statistic p-val	-	<0.01	<0.01	<0.01	<0.01	<0.01

This table reports 2SLS estimations of risk measures and performance (logarithm of the Z-score *LnZscore*, distance to default *DD*, standard deviation of the ROA *SDROA*, bank stock return volatility *Volatility*, and return on assets *ROA*) on the dummy variable taking the value of one if at least one bondholder representative is present on the board of a bank (*DBondRep*) and control variables. All variables are as defined in Table 1. Column (1) reports 1st stage IV regression for LnZscore as dependent variable in the second stage. Columns (2) to (6) report 2nd stage IV regression estimates obtained when *DBondRep* is instrumented with the number of direct flights from the bank headquarter to the headquarters of firms in the S&P 350 European index. The T-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Table A.9. Robustness check (3): Using the period from 2015 - 2017

		LnZscore	DD	SDROA	Volatility	ROA
	(1)	(2)	(3)	(4)	(5)	(6)
	IV	IV	IV	IV	IV	IV
	1st Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage
BondRepIndex		2.971**	3.950**	-1.827**	-27.66*	-1.915
		(2.23)	(1.98)	(-2.16)	(-1.76)	(-1.61)
DirectFlightsHeadQ	-0.00472***					
	(-2.78)					
Size	0.102***	-0.431***	-0.630***	0.182*	4.386**	0.0740
	(9.45)	(-2.66)	(-2.65)	(1.90)	(2.39)	(0.56)
GrowthTA	-0.00335*	0.0139*	-0.00182	-0.00494	-0.0216	-0.00267
	(-1.87)	(1.69)	(-0.17)	(-1.06)	(-0.26)	(-0.41)
Equity	-0.0191***	0.0366	0.0484	0.0109	0.217	0.0702***
	(-3.80)	(1.45)	(1.28)	(0.61)	(0.72)	(2.90)
Loan	-0.000964	0.00846**	0.00818	0.000608	-0.0572	0.000343
	(-1.02)	(2.05)	(1.51)	(0.25)	(-1.30)	(0.10)
Deposit	-0.000498	0.00182	0.0155**	0.00223	-0.0183	-0.00316
	(-0.48)	(0.33)	(2.24)	(0.76)	(-0.33)	(-0.71)
Operating	-0.00176	0.133	0.00523	-0.00709	-0.0388	0.173
	(-0.87)	(0.72)	(0.42)	(-1.27)	(-0.39)	(1.04)
Opacity	-0.00900	-0.210***	-0.773***	-0.0185	6.136***	-0.399***
	(-0.60)	(-2.60)	(-7.22)	(-0.42)	(6.97)	(-2.58)
BoardSize	-0.00301	0.0278	0.0743**	0.00966	-0.499*	-0.0124
	(-0.55)	(1.12)	(2.23)	(0.66)	(-1.85)	(-0.61)
OneTierBoard	-0.0727**	0.195	0.423*	-0.0722	-1.007	-0.0842
	(-2.05)	(1.11)	(1.84)	(-0.68)	(-0.50)	(-0.56)
GDP	0.00362	0.301*	0.539**	-0.208**	-5.489***	0.0886
	(0.14)	(1.77)	(2.56)	(-2.50)	(-3.23)	(0.78)
Supervision	-0.0102	-0.00831	0.0497	-0.0582*	-0.255	-0.0596
	(-1.22)	(-0.04)	(0.47)	(-1.79)	(-0.33)	(-1.33)
CreditorRights	0.0306*	-0.101	-0.0628	0.176**	-0.0965	0.256**
	(1.77)	(-0.23)	(-0.26)	(2.34)	(-0.05)	(2.53)
Country-Random Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	305	305	301	305	304	314
IV F-stat	-	12.82	10.57	11.35	10.87	11.36
Anderson LM statistic p-val	-	<0.01	<0.01	<0.01	<0.01	<0.01

This table reports 2SLS estimations of risk measures and performance (logarithm of the Z-score *LnZscore*, distance to default *DD*, standard deviation of the ROA *SDROA*, bank stock return volatility *Volatility*, and return on assets *ROA*) on the bondholder relatedness index (*BondRepIndex*) and control variables. All variables are as defined in Table 1. Column (1) reports 1st stage IV regression for LnZscore as dependent variable in the second stage. Columns (2) to (6) report 2nd stage IV regression estimates obtained when the bondholder relatedness index (*BondRepIndex*) is instrumented with the number of direct flights from the bank headquarter to the headquarters of firms in the S&P 350 European index. The T-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Table A.10. Robustness check (4): Using the period from 2017 – 2019

		LnZscore	DD	SDROA	Volatility	ROA
	(1)	(2)	(3)	(4)	(5)	(6)
	IV	IV	IV	IV	IV	IV
	1st Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage
BondRepIndex		3.632***	5.354***	-1.225**	-36.60***	-0.344
		(3.20)	(2.69)	(-2.22)	(-2.84)	(-0.90)
DirectFlightsHeadQ	-0.00748***					
	(-4.79)					
Size	0.147***	-0.488***	-0.682***	0.0986	3.990**	0.0876
	(12.92)	(-2.91)	(-2.63)	(1.21)	(2.22)	(1.55)
GrowthTA	-0.0000143	0.0313**	0.0403**	0.00239	-0.495***	0.0251***
	(-0.01)	(2.43)	(2.01)	(0.38)	(-3.47)	(5.64)
Equity	-0.0153**	0.00830	0.169***	0.0270	-0.393	0.0924***
	(-2.40)	(0.23)	(2.82)	(1.53)	(-0.98)	(7.31)
Loan	-0.000404	0.0165***	0.0158	-0.00238	-0.177***	-0.000574
	(-0.37)	(2.77)	(1.63)	(-0.81)	(-2.65)	(-0.28)
Deposit	-0.00168	-0.00149	0.00356	-0.00602*	0.0401	0.000552
	(-1.30)	(-0.20)	(0.31)	(-1.65)	(0.49)	(0.22)
Operating	-0.0162***	-0.0270	0.0374	0.00616	-1.381***	-0.00980
	(-3.08)	(-0.76)	(0.75)	(0.36)	(-3.73)	(-0.83)
Opacity	0.0249**	-0.265***	-0.584***	0.0718**	4.326***	-0.0616***
	(2.24)	(-3.91)	(-5.27)	(2.16)	(5.71)	(-2.63)
BoardSize	0.0152***	-0.0994***	-0.261***	0.0385**	1.889***	-0.0140
	(2.89)	(-3.01)	(-4.71)	(2.39)	(5.13)	(-1.23)
OneTierBoard	-0.229***	0.675**	0.935*	-0.203	-4.664	-0.472***
	(-5.41)	(2.08)	(1.72)	(-1.31)	(-1.28)	(-4.29)
GDP	-0.00304	0.318	0.134	-0.150	1.186	-0.0411
	(-0.08)	(1.48)	(0.49)	(-1.42)	(0.55)	(-0.55)
Supervision	-0.0210	0.0914	0.136	-0.0441	-0.742	-0.0674
	(-0.76)	(0.19)	(1.64)	(-0.34)	(-0.87)	(-0.89)
CreditorRights	0.00525	-0.282	-0.307*	0.124	1.606	0.000952
	(0.08)	(-0.24)	(-1.82)	(0.41)	(0.85)	(0.01)
Country-Random Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	311	311	305	311	313	314
IV F-stat	-	23.27	17.75	24.10	22.05	24.18
Anderson LM statistic p-val	-	<0.01	<0.01	<0.01	<0.01	<0.01

This table reports 2SLS estimations of risk measures and performance (logarithm of the Z-score *LnZscore*, distance to default *DD*, standard deviation of the ROA *SDROA*, bank stock return volatility *Volatility*, and return on assets *ROA*) on the bondholder relatedness index (*BondRepIndex*) and control variables. All variables are as defined in Table 1. Column (1) reports 1st stage IV regression for LnZscore as dependent variable in the second stage. Columns (2) to (6) report 2nd stage IV regression estimates obtained when the bondholder relatedness index (*BondRepIndex*) is instrumented with the number of direct flights from the bank headquarter to the headquarters of firms in the S&P 350 European index. The T-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Table A.11. Robustness check (5): Using country fixed effects

		LnZscore	DD	SDROA	Volatility	ROA
	(1)	(2)	(3)	(4)	(5)	(6)
	IV	IV	IV	IV	IV	IV
	1st Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage
BondRepIndex		3.272***	3.156**	-1.493**	-14.51**	-1.153
		(2.99)	(2.09)	(-2.43)	(-2.04)	(-1.13)
DirectFlightsHeadQ	-0.00742***					
	(-4.64)					
Size	0.131***	-0.443***	-0.576***	0.177**	2.054	0.195
	(10.95)	(-3.13)	(-3.04)	(2.22)	(1.42)	(1.54)
GrowthTA	-0.000332	0.00810	0.000729	0.000965	-0.188	0.00301
	(-0.18)	(0.86)	(0.06)	(0.18)	(-0.92)	(0.15)
Equity	-0.00563	0.00295	0.0439	0.0364**	0.0218	0.161***
	(-1.02)	(0.10)	(1.26)	(2.30)	(0.07)	(4.24)
Loan	-0.00308***	0.0203***	0.0168***	-0.00229	-0.0806	-0.00621
	(-3.68)	(4.21)	(2.92)	(-0.85)	(-1.05)	(-1.02)
Deposit	-0.00452***	0.0144*	0.0180*	-0.00301	-0.155**	0.00539
	(-3.70)	(1.85)	(1.83)	(-0.69)	(-2.57)	(1.41)
Operating	-0.00479*	0.0197	0.00103	-0.00768	0.0905	-0.0278
	(-1.79)	(1.32)	(0.06)	(-0.92)	(0.63)	(-1.44)
Opacity	-0.00807	-0.264***	-0.742***	0.0593	6.128***	-0.364*
	(-0.48)	(-3.10)	(-6.64)	(1.24)	(4.59)	(-1.95)
BoardSize	-0.0350	0.557*	1.711***	-0.726***	-9.076*	-0.815***
	(-0.58)	(1.83)	(4.53)	(-4.25)	(-1.79)	(-3.10)
OneTierBoard	-0.241***	0.876***	0.608	-0.429**	0.139	-0.634**
	(-5.33)	(2.68)	(1.55)	(-2.34)	(0.06)	(-2.06)
GDP	0.00662	0.505***	0.288	-0.0776	-4.200	0.0273
	(0.18)	(2.70)	(1.25)	(-0.74)	(-1.41)	(0.34)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	309	309	302	309	305	315
IV F-stat	-	21.56	16.83	21.56	21.19	26.22
Anderson LM statistic p-val	-	<0.01	<0.01	<0.01	<0.01	<0.01

This table reports 2SLS estimations of risk measures and performance (logarithm of the Z-score *LnZscore*, distance to default *DD*, standard deviation of the ROA *SDROA*, bank stock return volatility *Volatility*, and return on assets *ROA*) on the bondholder relatedness index (*BondRepIndex*) and control variables. All variables are as defined in Table 1. Column (1) reports 1st stage IV regression for LnZscore as dependent variable in the second stage. Columns (2) to (6) report 2nd stage IV regression estimates obtained when the bondholder relatedness index (*BondRepIndex*) is instrumented with the number of direct flights from the bank headquarter to the headquarters of firms in the S&P 350 European index. The T-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Table A.12. Robustness check (6): Including other controlling variables for board characteristics and ownership

		LnZscore	DD	SDROA	Volatility	ROA
	(1)	(2)	(3)	(4)	(5)	(6)
	IV	IV	IV	IV	IV	IV
	1st Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage	2nd Stage
BondRepIndex		3.943***	3.623*	-0.542**	-26.19**	-1.402
		(2.68)	(1.69)	(-2.17)	(-2.03)	(-1.40)
DirectFlightsHeadQ	-0.00587***					
	(-4.03)					
Size	0.0931***	-0.413***	-0.567***	0.0592**	3.534***	0.164*
	(7.32)	(-3.19)	(-2.97)	(2.44)	(3.12)	(1.81)
GrowthTA	-0.00206	0.0129	-0.00560	-0.00493***	-0.154*	0.00812
	(-1.18)	(1.18)	(-0.40)	(-2.60)	(-1.76)	(1.27)
Equity	-0.0143***	0.0261	0.0503	0.0131**	-0.121	0.127***
	(-2.94)	(0.73)	(1.00)	(2.33)	(-0.35)	(5.44)
Loan	-0.000779	0.0124***	0.0119*	-0.000784	0.00389	-0.00539*
	(-0.98)	(2.68)	(1.91)	(-1.01)	(0.10)	(-1.81)
Deposit	0.000269	-0.00314	0.00135	0.00275***	0.0539	0.00247
	(0.28)	(-0.55)	(0.18)	(2.91)	(1.15)	(0.67)
Operating	-0.00289	0.0312*	0.0296	-0.00514*	-0.316**	-0.0327***
	(-1.11)	(1.89)	(1.36)	(-1.79)	(-2.31)	(-3.14)
Opacity	0.00879	-0.295***	-1.091***	0.0637***	6.622***	-0.319***
	(0.68)	(-3.89)	(-10.60)	(4.95)	(10.59)	(-2.76)
BoardSize	-0.0783*	0.186	1.477***	0.0213	-3.604	-0.657***
	(-1.71)	(0.66)	(3.88)	(0.41)	(-1.59)	(-3.63)
OneTierBoard	-0.230***	0.778**	0.269	-0.125*	-2.208	-0.483*
	(-6.61)	(1.99)	(0.51)	(-1.75)	(-0.69)	(-1.96)
DControllingSH	0.0596*	-0.0834	0.124	0.0582	1.677	0.0270
	(1.88)	(-0.40)	(0.43)	(1.62)	(0.95)	(0.20)
PropRegulatoryExp	0.0167***	-0.0432	-0.0515	0.00702	0.318	0.00927
	(8.18)	(-1.57)	(-1.32)	(1.50)	(1.41)	(0.51)
GDP	0.0508**	0.365**	0.422*	-0.0896***	-2.618*	0.0497
	(2.00)	(2.16)	(1.90)	(-3.23)	(-1.76)	(0.47)
Supervision	0.00543	-0.00202	-0.0411	-0.000586	0.392	-0.0702**
	(0.74)	(-0.04)	(-0.70)	(-0.08)	(1.08)	(-2.51)
CreditorRights	-0.0421***	-0.209*	-0.0470	-0.00197	0.542	0.0889
	(-2.60)	(-1.80)	(-0.33)	(-0.10)	(0.66)	(1.30)
Country random effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	309	309	302	309	305	315
IV F-stat	-	16.24	14.19	15.57	14.31	14.77
Anderson LM statistic p-val	-	<0.01	<0.01	<0.01	<0.01	<0.01

This table reports 2SLS estimations of risk measures and performance (logarithm of the Z-score *LnZscore*, distance to default *DD*, standard deviation of the ROA *SDROA*, bank stock return volatility *Volatility*, and return on assets *ROA*) on the bondholder relatedness index (*BondRepIndex*) and control variables. Two additional controlling variables are included: (i) the proportion of directors having regulatory experience (*PropRegulatoryExp*); (ii) a dummy variable taking the value of one if at least one shareholder holds more than 20% of shares (*DControllingSH*), that we can consider as shareholders with a decision power. All variables are as defined in Table 1. Column (1) reports 1st stage IV regression for LnZscore as dependent variable in the second stage. Columns (2) to (6) report 2nd stage IV regression estimates obtained when the bondholder relatedness index (*BondRepIndex*) is instrumented with the number of direct flights from the bank headquarter to the headquarters of firms in the S&P 350 European index. The T-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels. Two identification test statistics are used. The first-stage F-statistic (IV F-statistic) tests if instruments are weak; if the IV F-statistic is smaller than 10, the instrument is weak. The Anderson canonical correlation LM statistic tests for underidentification, under the null hypothesis that excluded instruments are irrelevant.

Table A.13. Robustness check (7): Critical mass effect

	LnZscore	DD	SDROA	Volatility	ROA
	(1)	(2)	(3)	(4)	(5)
BondRepIndex (β_1)	3.507***	3.281**	-1.002**	-25.86**	-0.763
	(3.90)	(2.56)	(-2.55)	(-2.02)	(-0.99)
BondRepIndex *DCriticalMass (β_2)	1.202*	1.990**	-0.465*	-15.80*	0.714
	(1.89)	(2.21)	(-1.68)	(-1.74)	(1.23)
Control variables	Yes	Yes	Yes	Yes	Yes
Country random effects	Yes	Yes	Yes	Yes	Yes
Observations	309	302	309	305	315
Wald test:	4.709***	5.270***	-1.467***	-41.66**	-0.049
$\beta_1 + \beta_2 = 0$	(17.90)	(10.95)	(9.322)	(6.854)	(0.002)

This table reports the second stage of risk measures and performance (logarithm of the Z-score *LnZscore*, distance to default *DD*, standard deviation of the ROA *SDROA*, bank stock return volatility *Volatility*, and return on assets *ROA*) on the bondholder relatedness index (*BondRepIndex*), its interaction with a dummy variable taking the value of one when there are at least three bondholder representatives on the board (*DCriticalMass*), and control variables. All variables are as defined in Table 1. Columns (1) to (5) report 2nd stage IV regression estimates where the model estimated values from the first stage are used in place of the actual value of the bondholder relatedness index (*BondRepIndex*) for both the non-interacted and the interacted term. The T-statistics are in parentheses, with *, **, and *** denoting significance at 10%, 5% and 1% levels.

GENERAL CONCLUSION

Corporate governance reform, especially in the financial sector, has gained importance since poor corporate governance in the financial sector is to blame for the collapse and struggles of many banks and savings companies in the crisis of 2007-2008. Since then, jurisdictions worldwide have pursued several solutions to promote good corporate governance, including promoting employee ownership and enhancing the role of market participants in overseeing corporate risk management. The objective of this thesis was to evaluate the promotion of employee share ownership (ESO) in the banking sector and the role of direct market discipline through the presence of bondholder representatives on the bank's board of directors.

We first examine in Chapter 1 whether an increase in employee share ownership may lead to a decrease in the risk of European banks. Our findings show that employee ownership is an effective mechanism to limit excessive bank risk-taking. Bank employees (both executives and non-executive employees) have incentives and can reduce bank risk when they own shares. Our results support the “undiversified wealth” hypothesis stating that employees may not hold well-diversified portfolios and thus have incentives to reduce bank risk-taking. Indeed, executives can monitor bank risk by investing in less risky projects, whereas non-executive employees can reduce operational risk by carefully implementing and executing executives’ decisions. Our investigation shows several channels to explain how and why employee ownership can influence bank risk. First, we provide evidence that ownership affects both executive and non-executive employees' incentive to monitor banking risk. We show that the incentive to reduce bank risk of executive employees is weakened if they own share options, but this does not happen with non-executive ownership. Moreover, executive and non-executive ownership is associated with a decrease in risk, but only in banks with fewer employees, consistent with the argument that the free-rider problem occurs as the number of employees increases. Second, we also explore the ability of executive and non-executive employees to influence banks' risk-taking behavior. We show that employee representation on the board does not affect the effect of executive ownership, but it significantly strengthens the impact of non-executive ownership. In addition, we find that shareholder protection provides shareholder-employees rights to protect their interests and influence bank decisions. Thus, the risk-reducing effect of both executive and non-executive ownership is only significant in a strong shareholder protection environment. We also observe that executive and non-executive employee ownership reduce bank risk in normal times but not during crisis times.

Importantly, our results show evidence that although both executive and non-executive employee ownership leads to lower bank risk, they negatively impact bank performance.

Therefore, our findings provide important policy implication that both executive and non-executive employee ownership can be an effective mechanism to monitor bank risk-taking from inside since it helps to align the manager's interests with other stakeholders such as depositors and debtholders and banking supervisors. Policy-makers should promote broad-based employee ownership plans, however, without stock options, in the banking sector. Thus, employee ownership can strengthen financial stability and be a valuable complement to safety-and-soundness supervision by bank regulators.

The second chapter complements the first chapter by examining whether the supportive national policy suggested by the European Commission is effective in promoting employee share ownership programs (ESOP) in European banks. Its objective is to evaluate the effectiveness of the country support measures, including the development of a legal framework and the use of financial incentives to promote ESOP under the influence of bank ownership structure, bank transparency, and the level of shareholder protection of the country where the bank is located.

Examining the ESOP adoption of listed banks in sixteen western European countries, our results show that country supportive measures effectively promote ESOP in the banking sector. Banks in countries with more supporting regulatory frameworks and higher financial incentives offer a greater likelihood of ESOP adoption. However, although supportive measures effectively promote ESOP in widely-held banks independently of bank opacity and country shareholder protection, they are only effective to promote ESOP in closely-held banks when banks are transparent or located in countries with strong levels of shareholder protection. Our findings provide evidence for the role of ESOP in reshaping the agency conflicts among bank stakeholders. As ESOP turns employees into shareholders, it changes the balance of power between insiders (managers in widely-held banks and majority shareholders in closely-held banks) and outsiders (minority shareholders). Therefore, the effectiveness of country supportive measures to promote ESOP will be influenced by the complex interplay of agency problems faced by stakeholders in both widely-held and closely-held banks. Our findings indicate that policymakers can enhance the effectiveness of supportive measures to promote ESOP in the banking industry by improving bank transparency and shareholder protection.

Finally, in the third chapter, we examine whether the influence of bondholder representatives on the board of directors of banks is an effective market discipline mechanism to reduce bank risk. For that, we analyze a unique dataset that brings together information on bondholders, shareholders, and boards of directors of European listed banks. Using the number of direct flights from bank headquarters to the headquarters of firms in the S&P 350 European

index as an instrumental variable in a two-stage least-squares analysis, we show that bondholders can exert direct market discipline through affiliated directors by reducing bank risk without damaging profitability. Therefore, these results provide strong evidence that having representation on a bank's board provides bondholders an opportunity to influence managers and ensure that the bank acts in their interest.

Our further investigations show that bondholder representatives' effect is not conditional on their independence from the management board or their reputation in the market for directorships. However, this effect will be weaker when bondholder representatives have a competing interest related to shareholders and banks with lower capitalization levels, but stronger when these representatives have regulatory experience. Moreover, we show evidence that the effect of bondholder representatives has a more substantial impact on both individual and systemic risk of banks with higher degrees of opacity and banks in the list of global systemically important banks (G-SIBs).

The study in this chapter is the first to consider bondholder representatives as a market discipline device to limit excessive bank risk-taking. Our findings highlight the role of bondholder representatives in addressing the complex interplay of agency problems faced by the many stakeholders relevant to banks. Our results show significant implications for corporate governance reform initiatives to enhance the effectiveness of both market discipline and boards in controlling bank risk-taking

Overall, this dissertation evaluates the effectiveness of promoting employee share ownership (ESO) and proposes an alternative mechanism of market discipline through the presence of bondholder representatives on the board to restrain banks' excessive risk-taking. We show evidence that promoting ESO and enhancing the presence of bondholder representatives on banks' boards are two effective mechanisms to monitor bank risk-taking from the inside. Our work contributes to the current policy debate on whether the corporate governance of banks should be different from that of nonfinancial firms. Even though the conflicts of interests between stakeholders (such as majority shareholders, minority shareholders, managers, debtholders, creditors, the government) are more complex and stronger than that of non-financial firms, Corporate Governance Codes worldwide tend to apply similar recommendations to all firms. Our findings support the proposals of the Basel Committee (2010, 2015), OECD (2010), and the European Union (2010) that corporate governance of banks should be different from that of nonfinancial firms, with the twin objectives of not only enhancing the welfare of shareholders but also of debtholders and regulators. Policy-makers, therefore, need to pay due attention to corporate governance in the banking industry.

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Abstract

The target of this thesis is to examine two mechanisms to promote good corporate governance in banking firms, including employee ownership and the presence of bondholder representatives in a bank's board. In Chapter 1, we examine whether a greater level of employee ownership leads to lower bank risk. Using a sample of European banks, we find that the total employee ownership, as well as each of its components (executive and non-executive ownership), significantly reduce banks' risk. Our study is the first to investigate whether non-executive ownership, in addition to executive ownership, has an impact on bank risk-taking. Moreover, our results shed light on the channels through which employee ownership affects a bank's risk. We demonstrate that not only executive ownership, but also non-executive ownership leads to a lower level of non-performing loans ratio. Chapter 2 complements Chapter 1 by examining whether the national supportive policy suggested by the European Commission is effective to promote employee share ownership programs (ESOP) in European banks. We find that supportive measures are effective to promote ESOP in widely-held banks independently of bank opacity and shareholder protection, but they are only effective to promote ESOP in closely-held banks if banks are transparent or located in countries with stronger shareholder protection. Our finding suggests that authorities should improve shareholder protection and bank transparency to enhance the effectiveness of supportive measures for employee ownership programs. In Chapter 3, we examine whether the influence of bondholder representatives on the board of directors of banks is an effective market discipline mechanism to reduce bank risk-taking. Our empirical results provide evidence that the influence of bondholder representatives significantly reduces all dimensions of bank risk without reducing profitability. Our study is the first to consider bondholder representatives as a market discipline device to limit excessive firm risk-taking. We contribute to the corporate governance literature for banks by highlighting the potentially important role of bondholder representatives in addressing the complex interplay of agency problems faced by the many stakeholders relevant to banks. Our finding has significant implications for regulators and corporate governance reform proponents promoting the role of market discipline and boards in controlling bank risk-taking.

Keywords: Corporate governance; board of directors; bank risk; employee ownership; bondholder representative.

Résumé

L'objectif de cette thèse est d'examiner deux mécanismes pour promouvoir la bonne gouvernance d'entreprise dans les établissements bancaires, notamment l'actionnariat salarié et la présence de représentants des obligataires au conseil d'administration de la banque. Au chapitre 1, nous examinons si un actionnariat salarié plus important conduit à une diminution du risque bancaire. À partir d'un échantillon de banques européennes, nous constatons que l'ensemble de l'actionnariat salarié, ainsi que chacune de ses composantes (l'actionnariat des dirigeants et l'actionnariat des non-dirigeants), réduit significativement le risque d'insolvabilité des banques. Notre étude est la première à examiner si l'actionnariat des non-dirigeants, en plus de l'actionnariat des dirigeants, a un impact sur la prise de risque bancaire. De plus, nos résultats mettent en lumière les canaux par lesquels l'actionnariat salarié affecte le risque d'une banque. Nous démontrons que non seulement l'actionnariat des dirigeants, mais aussi l'actionnariat des non-dirigeants conduit à un niveau inférieur de risque. Le chapitre 2 complète le chapitre 1 en examinant si la politique nationale de soutien suggérée par la Commission européenne est efficace pour promouvoir les programmes d'actionnariat salarié (ESOP) dans les banques européennes. Nous constatons que les mesures de soutien sont efficaces pour promouvoir l'ESOP dans les banques à participation multiple, et ce indépendamment de l'opacité bancaire et de la protection des actionnaires. En revanche, elles ne sont efficaces pour promouvoir l'ESOP dans les banques à participation restreinte que si les banques sont transparentes ou situées dans des pays où la protection des actionnaires est plus forte. Notre conclusion suggère que les autorités devraient améliorer la protection des actionnaires et la transparence bancaire afin d'améliorer l'efficacité des mesures de soutien aux programmes d'actionnariat salarié. Au chapitre 3, nous examinons si l'influence des représentants des obligataires au sein du conseil d'administration des banques est un mécanisme efficace de discipline de marché pour réduire la prise de risque bancaire. Nos résultats empiriques montrent que l'influence des représentants des obligataires réduit significativement toutes les dimensions du risque bancaire sans réduire la rentabilité. Notre étude est la première à considérer les représentants des obligataires comme un dispositif de discipline de marché pour limiter la prise de risque excessive des banques. Nous contribuons à la littérature sur la gouvernance d'entreprise pour les banques en soulignant le rôle potentiellement important des représentants des obligataires dans la résolution de l'interaction complexe des problèmes d'agence auxquels sont confrontées les nombreuses parties prenantes au sein des banques. Notre conclusion a des implications importantes pour les régulateurs et les partisans d'une réforme de la gouvernance bancaire qui promeuvent le rôle de la discipline de marché et des conseils d'administration dans le contrôle de la prise de risque bancaire.

Mots clés : Gouvernance d'entreprise ; Conseil d'administration ; risque bancaire ; actionnariat salarié ; représentant des obligataires.