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# **Better than independent: the role of minority directors on bank boards**

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## **Abstract**

Using a panel of controlled European banks, we examine whether board structures that include directors that are related to minority shareholders can be an effective corporate governance mechanism to limit expropriation by controlling shareholders, without exacerbating risk. We find that the inclusion of such minority directors does indeed increase the effectiveness of bank boards, as it results in higher market valuations whereas the presence of independent directors does not, without increasing risk. Our results depend crucially on whether or not minority directors are related to “active” institutional investors, the extent of holdings of related shareholders, as well as the strength of the supervisory regime. To identify the relationship, we use as instrumental variable for the presence of minority directors the distance of minority shareholders from the headquarters of the bank.

*JEL Classification:* G21, G28, G32

*Keywords:* Bank governance; minority directors; independent directors; market valuation; bank risk.

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## 1. Introduction

Failure of a variety of internal governance mechanisms has been highlighted as a major contributing factor to the 2007–2008 financial crisis (Kirkpatrick, 2009; Basel Committee on Banking Supervision, 2010). Corporate governance, and board oversight in particular, are essential in addressing agency problems and controlling risk within the firm; hence, several international reform initiatives regarding the corporate governance of banks are underway. The Basel Committee on Banking Supervision (2015) indicates in particular that “the primary objective of bank corporate governance should be safeguarding stakeholders’ interest in conformity with public interest on a sustainable basis. Among stakeholders, shareholders’ interest would be secondary to depositors’ interest”. This is in line with the OECD (2010) and European Union (2010) recommendations that corporate governance of banks should have multi-faceted objectives of enhancing welfare, not only of shareholders, but also of depositors, debt holders and regulators. In this paper, we query what forms of corporate governance in banks could help attain the most efficient outcome for stakeholders in terms of both performance and financial stability. We examine in particular whether board directors that are accountable to minority shareholders are more suitable than supposedly independent directors in achieving these objectives in banks with concentrated ownership structures.

Corporate Governance Codes worldwide tend to be similar for nonfinancial and financial firms. However, financial firms, and banks in particular, are different from nonfinancial firms, due to their specific regulation, capital structure (i.e. deposit funding with high leverage), 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. Debtholders such as depositors cannot easily prevent bank shareholders from pursuing more risk, as issuing ‘complete’ debt contracts is generally impossible due to high information asymmetry (Dewatripont and Tirole, 1994). As a consequence, bank shareholders have strong incentives to favor ‘excessively’ risky investments, with potential losses largely shifted to the deposit insurer and/or taxpayers (Galai and Masulis, 1976; Jensen and Meckling, 1976; Merton, 1977). As corporate governance traditionally focuses only on the interests of shareholders, it largely abstracts from these features. This insufficiency 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 welfare of shareholders but also of depositors and regulators. Moreover for banks, tight regulation combined with restrictions on bank entry and activities limit the effectiveness of many

mechanisms intended to address corporate governance problems (Billett et al.1998; Levine, 2004), and external governance mechanisms such as takeovers hardly exist in banking, unlike in other industries (Levine, 2004; De Haan and Vlahu, 2016). All combined, these elements strengthen the important role for more effective monitoring by boards of directors in the banking sector.

In this context, this paper empirically investigates whether banks with concentrated ownership that allow minority shareholders to appoint board directors could achieve increased market value without further risk taking. In firms with concentrated ownership, controlling shareholders might have incentives and ability to monitor managers to make decisions that increase overall shareholder value and thereby benefit all shareholders (Jensen and Meckling, 1976; Shleifer and Vishny, 1986). On the other hand, controlling shareholders may also be tempted to expropriate minority shareholders by reaping private benefits through diversion of assets and profits outside the firm (Johnson et al., 2000). Common internal corporate governance mechanisms are not necessarily well suited to limiting such agency problems in firms with concentrated ownership, as controlling shareholders often participate in management and elect representatives to the board of directors that will represent their interests. In this context, it might be important to find other corporate governance mechanisms to protect minority shareholders (La Porta et al., 1999). One of the current recommendations of Corporate Governance Codes is to introduce a minimum number of independent directors on boards to curtail the agency conflict between insiders (managers or controlling shareholders) and minority shareholders, as independent directors should be able to effectively control and monitor insiders. Whereas independence might perceivably take different forms in firms with dispersed or concentrated ownership structure, relevant recommendations in Corporate Governance Codes are generally not conditional on ownership structure. In most countries, the code only recommends that the majority of directors shall be independent of the company and its management board, without indicating what proportion of these directors should be independent of controlling shareholders in controlled firms. A further problem with the recommendation of having independent directors in controlled firms is that they might not be “strictly” independent, in the sense that they are appointed by controlling shareholders, or alternatively by “independent” nomination committees which may in turn depend on controlling shareholders. Some of these directors, called “non-strictly independent directors” by Crespí-Cladera and Pascual-Fuster (2014), may avoid actions that could encourage controlling shareholders to replace them. These different factors might explain why the existing empirical literature that examines the impact of director

independence on firm performance does not support the high expectations placed by policymakers in the value of board independence.<sup>2</sup>

As an alternative approach to the introduction of “independent” directors, several jurisdictions in Europe with a prevalence of concentrated ownership structures (e.g. Italy and Spain) have introduced a new type of board director in their Corporate Governance Codes, one that is nominated by, or at least linked to, minority shareholders.<sup>3</sup> As these directors are related to minority shareholders, they might be more effective in reducing the occurrence of value expropriation from minority shareholders in firms with concentrated ownership structures, by virtue of not being appointed by controlling shareholders. Whereas the presence of such minority directors may thus lead to an increase in firm value if it effectively curtails agency problems between controlling and minority shareholders, for banking firms it might also intensify the agency conflict arising between shareholders and debtholders/regulators. With minority directors related to minority shareholders, greater risk-taking in banks with concentrated ownership could ensue if minority shareholders’ risk appetite is greater than that of controlling shareholders, due to possibly more extensive diversification of their wider portfolio (Zhang, 1998; Paligorova, 2010; Faccio et al., 2011). John et al. (2008) also argue that even if large shareholders have incentives to increase a firm’s profits by taking on risky projects, they may pursue more conservative projects than minority shareholders to secure the private benefits they can extract from the firm. It is furthermore possible that minority directors could be reluctant to take riskier decisions in order to maintain their reputation in the market for directorships and increase their chance to obtain seats in other boards (Fama and Jensen, 1983), unless their connection with shareholders is very strong (e.g. when being employed by one of them).

Our paper thus aims to complement the literature on corporate governance mechanisms in controlled banks to address agency problems between not only controlling and minority shareholders but also between shareholders and debtholders/regulators, by examining in detail the potential role played by the presence of minority directors in bank boards, i.e. directors related to minority shareholders. Dahya et al. (2008), who analyse the impact of the presence of “independent” directors on market valuation for a worldwide panel of nonfinancial firms with a concentrated ownership structure, classified

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<sup>2</sup> See the survey of De Haan and Vlahu (2016) for banks, and Nguyen and Nielsen (2010) for non-financial firms.

<sup>3</sup> Spain has introduced a proportional voting system in 2000 that allows for a minority of shareholders to appoint directors in proportion to their equity stake in the corporation, for both listed and non-listed corporations. In Italy, a reform of 2005 gives listed companies the right to reserve at least one seat on the board of directors to persons that are not appointed by controlling shareholders. See Gutiérrez and Sáez (2013) for further details.

directors as “independent” if they are not related to the biggest controlling shareholder. We refine this classification by excluding from the category of “independent” directors those that are in fact related to minority shareholders. We therefore classify directors as minority directors if they are related to at least one of the minority shareholders, and as “independent” if they are not related to either minority or controlling shareholders. As corporate governance in most countries is based on the “comply-or-explain” principle, controlling shareholders have the ability to make decisions regarding the quality of the governance practices implemented. In this, they may be influenced by the perceived costs of implementing good corporate governance, i.e. their loss of private benefits. In this wider context, we examine whether banks with controlling shareholders could increase their market valuation by allowing minority shareholders to appoint board directors, who should be more inclined to defend their interests than directors declared as “independent” but that in fact might be “non-strictly independent”. We further investigate whether this presence of minority directors might not, however, also be associated with increased bank risk taking. We overcome the potential endogeneity problem inherent in the analysis by using the distance of minority shareholders from the headquarters of the bank as an instrumental variable for the presence of minority directors. The intuition behind this instrument is that the further minority shareholders are from the headquarters of a bank, the more difficult it might be for them to directly lobby/influence managers and the board of directors; the presence of directors related to them might ensure that their interest will be protected even if they are at a geographical disadvantage in this respect.

We then explore two possible channels through which the presence of minority directors could affect market valuation and risk. The first one captures the risk of expropriation through related party lending (RPTs); we expect the presence of minority directors to reduce RPTs if it is effective in limiting the risk of expropriation. The second channel examines the relevance of minority directors which are related to “active” institutional investors (i.e. pension and mutual funds and investment companies)<sup>4</sup> for actively monitoring insiders and reducing the risk of expropriation. “Active” institutional investors would tend not to have potential business relationships with the companies in which they hold shares, as opposed to “dependent” or “pressure insensitive” institutional investors (banks and insurance companies), and might thus be less willing to challenge insiders’ decisions in order to protect those relationships (Chen et al., 2007). Several studies have found that firms with “active” institutional

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<sup>4</sup> “Active” institutional investors are also called “pressure insensitive investors” (e.g. Chen et al., 2007) or independent investors (Ferreira and Matos, 2008; Ruiz-Mallorqui and Santana-Martín, 2011).

investors as large shareholders are associated with higher performance and higher value (e.g. Chen et al., 2007; Ruiz-Mallorquí and Santana-Martín, 2011), in line with the hypothesis that they monitor insiders more actively. We further aim to examine if “active” institutional investors, when they are not controlling shareholders but instead minority ones, could appoint directors who are related to them, e.g. by being one of their employees, in order to influence insiders and potentially limit any expropriation behavior. We could expect the presence of such directors to have a positive impact on market valuation in this case, with however less clear implications for associated risk-taking.

Our investigation will allow us to evaluate the potential benefits for the different stakeholders of having a board structure of banks that includes minority directors, in the sense that it may be effective in limiting expropriation of minority shareholders by controlling shareholders, and ideally without greater risk taking by banks. We could then consider that the inclusion of minority directors can create a “strong” bank board from the perspective of shareholders, as well as for debtholders and regulators, if it has the potential to increase a bank’s market valuation, without affecting its probability of insolvency. An interesting aspect in this context will be to examine what degree of minority director representation is required to achieve these desired outcomes. We furthermore pay particular attention to the fact that the interplay of agency problems concerned could be greatly influenced by the institutional and regulatory environment in place. Strict banking supervision might provide incentives to directors more generally to effectively monitor insiders, particularly if regulators have the ability to fine or dismiss directors in such an environment. Furthermore, the effectiveness of minority directors’ monitoring might depend crucially on the quality of country-level governance, including both the law protecting minority shareholders and the institutions that enforce it.

Our contributions to the literature are thus as follows: we firstly contribute to the corporate governance literature more generally by examining what constitutes a strong board for banks with controlling shareholders. In this, we highlight the potentially important role played by minority directors in addressing the complex interplay of agency problems faced by the many stakeholders relevant for banks. Our results furthermore emphasize the related role played by “active” institutional investors when they are minority shareholders in assuring improved monitoring of controlling shareholders. We also contribute to the literature on bank regulation through our focus on how potential novel aspects of bank boards currently under discussion interact with the institutional and regulatory environment that banks operate in, and their consequent impact on financial stability in general.

For our investigation, we use a hand collected data set on the ultimate ownership structure and board composition of a sample of listed European banks with controlling shareholders. We find that the presence of minority directors in these European banks' boards is substantial, as they represent on average around 24% of board members when present. Most of these minority directors are related to shareholders through actually being employed by one of them. Overall, our results demonstrate that the presence of minority directors on bank boards affects both market valuation and risk. Firstly, we find that the presence of minority directors on bank boards has a positive and significant impact on market valuation, with evidence that this increase in market value could come from a reduced risk of expropriation as the presence of minority directors decreases the level of related party transactions. Further investigation suggests an important role played by directors related to "active" institutional investors as a channel to explain the positive relationship between the presence of minority directors and market valuation. Secondly, our results show that the presence of minority directors is associated with lower risk. Further investigation reveals that it is in fact the presence of minority directors related to "active" institutional investors that drives this decrease in risk, whereas the presence of minority directors related to other minority shareholders actually results in increased bank risk. Thirdly, the presence of "independent" directors is found not to be associated with higher market valuation and has no impact on risk-taking. Hence, allowing minority shareholders to appoint minority directors, in particular with connections to "active" institutional investors, might represent a more effective way to ensure welfare enhancement of shareholders as well as depositors/debt holders/regulators than can be achieved by the inclusion of "independent" directors. Also important from an overall policymaker's perspective is the fact that this beneficial impact of the presence of minority directors on market valuation and risk is further enhanced the stronger the supervisory regime in place.

The remainder of the paper is organized as follows. Section 2 presents the background and the hypotheses tested; Section 3 describes our sample, defines the ultimate ownership variables and the indices of directors' relatedness, and provides some statistics; Section 4 presents the methodology we use to conduct our empirical investigation, and discusses our main results and possible channels of impact; Section 5 presents several policy-relevant refinements of our results; Section 6 contains robustness checks; and Section 7 concludes the paper.

## 2. Governance of banks and codes of corporate governance: key empirical issues

Self-regulatory codes designed to improve corporate governance and share best practices have been adopted by a number of countries. The Corporate Governance Codes are usually implemented without independent monitoring or enforcement mechanisms, and instead based on voluntary compliance. One of the prevailing recommendations of Corporate Governance Codes is that the presence of independent directors can be a signal of a “strong” board, able to curtail the agency conflict between insiders and minority shareholders, as independent directors should be able to effectively control and monitor insiders. While independence might perceivably take different forms in firms with dispersed or concentrated ownership structure in order to obtain a “strong” board, relevant recommendations in Corporate Governance Codes are generally not conditional on ownership structure. The majority of empirical papers regarding whether there is in fact effective monitoring by independent directors focus on listed US firms, which are generally characterized by a dispersed ownership structure. These studies find the contribution of independent directors to firm performance to be either insignificant (e.g. MacAvoy et al., 1983; and more specifically Adams and Mehran, 2012; Aebi et al., 2012 and Minton et al., 2014 for banks) or even negative (e.g. Agrawal and Knoeber, 1996 for nonfinancial firms; and Pathan and Faff, 2013 and De Andres and Vallelado, 2008 for banks).<sup>5</sup> An exception to this is the study by Dahya et al. (2008), who find a positive relationship between the fraction of independent directors and Tobin’s Q for nonfinancial firms with a concentrated ownership structure, particularly in countries with weak legal protection of minority shareholders.

Several theoretical explanations could be advanced to underpin these conflicting findings. Fama and Jensen (1983) argued that independent directors have incentives to monitor insiders, as this may strengthen their reputation of effective and independent decision-making. These independent directors can therefore have incentives to monitor the insiders on behalf of minority shareholders and play an important role in limiting extraction of private benefits, potentially leading to an increase in firm value (Hermalin and Weisbach, 2003; Dyck and Zingales, 2004; Adams and Ferreira, 2007; Adams et al.,

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<sup>5</sup> Another strand of the literature uses data on board attributes (board independence, size, transparency, etc.) produced by Institutional Shareholder Services (ISS) or RiskMetrics through their Corporate Governance Quotient (CGQ) rating system (e.g. Brown and Caylor, 2006; Aggarwal and Williamson, 2006; Aggarwal et al., 2009; Chhaochharia and Laeven, 2009 and Bruno and Claessens, 2010 for nonfinancial firms, and Beltratti and Stulz, 2012 for banks). They all find that a stronger CGQ index has a significant and positive impact on the valuation of firms. Whereas the CGQ rating system seems adequate for widely-held firms, this cannot be said for firms with concentrated ownership structure as it does not explicitly refer to director independence from controlling shareholders. For example, a director employed by another firm that the controlling shareholder owns would be inaccurately classified as independent.

2010). However, several factors may also limit the effectiveness of independent directors. Their independence might e.g. be compromised by the fact that they are appointed by insiders, or alternatively by “independent” nomination committees which may in turn depend on insiders. Independent directors may therefore avoid actions that could encourage insiders to replace them, although reputation and human capital arguments may limit this effect (Fama and Jensen, 1983). A further complication may arise through the fact that insiders may be reluctant to provide relevant inside information to independent directors, limiting their scope for exercising effective governance (Adams and Ferreira, 2007; Harris and Raviv, 2008). These different elements may make it difficult for controlling shareholders to credibly commit to outside investors through the appointment of directors that are classified as “independent”.

The existing literature, mentioned above, which analyses the impact of board independence on bank performance mainly focuses on the agency conflict between insiders and shareholders, ignoring the interests of depositors/regulators. However, after the financial crisis of 2007-2008 a range of empirical studies has turned to the interests of depositors/regulators, by examining the relationship between the presence of independent directors and bank risk-taking behavior. Their findings show either no significant relationship (Erkens et al., 2012; Minton et al., 2014; Battaglia and Gallo, 2017), or that the presence of independent directors is associated with lower risk (Pathan, 2009; Wang and Hsu, 2013; Marques and Opper, 2014). These results are in line with the hypothesis that independent directors have incentives to control insiders to forge their reputation, as suggested by Fama and Jensen (1983). However, none of these studies define board “independence” conditionally on the presence (or not) of controlling shareholders; this holds even for Erkens et al. (2012) and Marques and Opper (2014) who include countries other than the U.S. in their sample where concentrated ownership structures can dominate.

As some European jurisdictions, where firms with controlling shareholders predominate even for large publicly traded firms, recommend in their Corporate Governance Codes to also have minority directors, the aim of this paper is to more finely differentiate between directors who are related to minority shareholders and those unrelated to shareholders. In common with the existing literature, we refer to these unrelated directors as “independent”, while realizing that they may in fact not be “strictly” independent in the sense that they could effectively be nominated or dismissed by the controlling shareholders. The inclusion of minority directors on the board could be a way for controlling shareholders to signal that they will refrain from expropriation. These minority directors, being related

to minority shareholders, might be effective in reducing the ability of controlling shareholders to divert corporate assets to themselves. The presence of such minority directors could therefore potentially offset the value discount associated with the ability of controlling shareholders to expropriate minority shareholders, leading to an increase in firm value if it is indeed an effective way to curtail the agency problem between controlling and minority shareholders. We furthermore investigate whether the potential positive impact on market valuation of having minority directors is greater than the one associated with the presence of “independent” directors, which may in fact be insignificant in the context that outside investors might actually consider them not to be strictly independent. This will allow us to determine what criteria controlling shareholders should use to credibly commit that they will not expropriate minority shareholders, and leads us to examine the following hypothesis:

***H1***: The presence of minority directors increases the market value of banks, and has a greater impact than the presence of “independent” directors.

According to the Basel Committee on Banking Supervision (2015), a “strong” board for banks should safeguard not only the interests of minority shareholders, but also those of depositors/debt holders/regulators. From a theoretical perspective, the presence of directors in banks that are appointed by minority instead of by controlling shareholders might lead to higher risk taking if the risk appetite of the latter is higher; this might occur with possibly more extensive diversification of their overall portfolio (Zhang, 1998; Paligorova, 2010; Faccio et al., 2011). Also, the greater the private benefits controlling shareholders might extract, the greater the incentive to protect these benefits, making engagement in risky investments less attractive (John et al., 2008). It is also possible that minority directors could be less inclined to pursue risk in order to safeguard their reputation in the market for directorships (Fama and Jensen, 1983). These conflicting theoretical predictions regarding the impact of minority directors on bank risk taking lead us to examine the two following alternative hypotheses:

***H2a***: The presence of minority directors increases bank risk taking.

***H2b***: The presence of minority directors decreases bank risk taking.

### **3. Data sources and ownership & board structures**

#### ***3.1. Sample construction and data sources***

We focus our analysis on European countries as a majority of banks there are highly concentrated and thus exposed to conflicts between controlling and minority shareholders (Faccio and Lang, 2002).

Some jurisdictions in Europe furthermore recommend having minority directors in their Corporate Governance Codes (see Footnote 3).<sup>6</sup> We collected the relevant information on ownership and board structure as at the end of December 2013, and conduct our consequent econometric analysis for the period 2011-2013.

Our sample includes bank holding companies, commercial banks and investment banks from 17 European countries<sup>7</sup> that are listed on the stock market and have at least one controlling shareholder. We only consider listed banks as we were unable to collect data on the board structure of non-listed banks (even examining annual reports). We initially identify all active listed banks, resulting in 145 banks. Amongst these banks, we were able to assemble data on ownership structure for 118 banks using Bloomberg, BvD Bankscope, Amadeus, as well as annual reports and websites of banks/firms. Among these 118 banks, we keep the subsample of the 96 banks having at least one controlling shareholder. We follow the existing literature (La Porta et al., 1999, 2002; Lepetit et al., 2015) by using the control threshold of 10%, and also check the robustness of our results by using a control threshold of 20%. As data on ownership are updated only every 18 months in BvD Bankscope and Amadeus, we initially compared the ownership structure of our sample of banks in 2013 and 2011. We found, as in the previous literature (La Porta et al., 1999; Barry et al., 2011), that ownership structure is relatively stable over time: the controlling shareholders remain the same even if the percentage of shares they hold may change slightly. We therefore assume that ownership structure of our sample of banks remains unchanged for the period examined.

We furthermore collect data on biographies of board directors for these 96 banks (1092 board members); this data is in part taken from Bloomberg, but mostly hand-collected from corporate governance reports or annual reports. With board terms ranging normally from 3 to 4 years, we assume that the board structure is stable over our period of analysis.<sup>8</sup>

We finally collect financial statement data from BvD Bankscope, market data from Bloomberg, and macroeconomic data from the World Bank over the larger period 2011-2015, as we additionally consider the two periods 2012-2014 and 2013-2015 for robustness checks. Financial data was winsorized at the 1% and 99% levels (our results are generally similar using non-winsorized data).

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<sup>6</sup> Similar provisions also exist only in Azerbaijan, Bahrain, Bosnia and Herzegovina, and Brazil.

<sup>7</sup> Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

<sup>8</sup> Bloomberg provides some information on board structure of 62 banks among the 96 banks in our sample from 2011 to 2013: board size, number of independent directors, and CEO duality. We observe that these board characteristics do not change significantly over this period.

Table A1 gives a breakdown of banks by country; on average, our sample covers around 71% of banks' total assets of all listed banks provided by BvD Bankscope and Bloomberg.

### ***3.2. Identifying controlling and minority shareholders using their relative voting power***

Our first step is to build control chains for each bank to identify both direct and indirect owners, and their voting rights in the control chain. We follow the existing literature in using the control threshold of 10%. At the first level in the control chain, we consider a shareholder holding more than 10% of shares to be an ultimate owner when they are an individual/family, a government, or a widely held firm that is not a bank's subsidiary. At this level, ultimate owners are direct shareholders of the bank (see e.g. B4 in Figure B1 in Appendix B). For banks with shareholders having a controlling stake for whom we can continue building the control chains, we collect information on ownership structure of shareholders holding more than 10% of shares at each of the following levels in the chain. We continue the control chains until we find all indirect ultimate owners of a bank (see e.g. D1 and D2 in Figure B1 in Appendix B); in our sample, the maximum number of levels in a bank's control chain is eight.<sup>9</sup> We follow La Porta et al. (1999) in defining the direct voting rights of ultimate owners as the percentage of the bank's shares held directly, and their indirect voting rights as the percentage of shares held by an entity at the first level that the ultimate shareholder controls through the intermediate entities in the chain of control. The aggregate voting rights of ultimate owners are then the sum of their direct and indirect voting rights held in the bank (see Figure B1 in Appendix B).

Our second step is to calculate the "relative voting power" of each shareholder, which reflects their potential influence in the decision process, in order to determine whether they have an effective controlling power or not. We use the "Banzhaf Power Index" (BPI) to measure the relative voting power of each shareholder. This index takes into account voting rights, and the possibility to unite with other shareholders to make decisions in a bank (see Section B2 in Appendix B for details). We compute the BPI index using the algorithms for voting power analysis (using the method of generating functions) developed by Dennis Leech at the University of Warwick.<sup>10</sup> This index ranges from 0 to 1; the higher the index, the greater the relative voting power of the shareholder. Using the same threshold as for building the control chain, shareholders with a BPI lower than 10% are classified as minority

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<sup>9</sup> We have 13 banks where several ultimate owners exist for a direct shareholder holding more than 10% of shares at the first level in the control chain. For these we consider as ultimate owner the one holding the largest number of shares.

<sup>10</sup> See <http://homepages.warwick.ac.uk/~ecaae/ipgenf.html>.

shareholders (B5 and B6 in the example given in Section B2 in Appendix B), while those with a BPI greater than 10% are classified as controlling shareholders (B4, D1 and D2 in the example). Analogously to our treatment of the ownership structure, we compute the BPI index for each shareholder for the year 2013, and assume that relative voting power is similarly unchanged for our study period.

### ***3.3. Indices of relatedness of directors***

We categorize directors more finely than in previous literature, and then proceed to assign weights to three factors that characterize the strength of the relatedness between a director and a shareholder/ultimate owner. This approach allows us to compute measures that are more refined than the basic percentage of related/independent directors used in previous studies (e.g. Dahya et al., 2008; Pathan and Faff, 2013).

We first need to identify directors who are related to minority shareholders and those who are “independent”. As we consider directors to be “independent” when they are not related to either a minority or a controlling shareholder, we also need to identify directors that are related to controlling shareholders. We use four criteria matching both biographical information and bank ownership structure to identify if a director is related to a shareholder (minority or controlling), depending on whether the bank has a pyramidal structure or not. We consider a director to be related to a direct shareholder (minority or controlling) if:<sup>11</sup> (1) they are an employee of the direct shareholder; (2) they are one of the direct shareholders of the bank; (3) they have the same family name<sup>12</sup> as one of the direct shareholders of the bank; or (4) they are an employee of a government agency if the bank is state owned. To determine if directors are related to an indirect ultimate owner of the bank, we further need to consider if they are related to any firms in the control chain. A director is then identified as related to an indirect ultimate owner in one of the following cases: (1) they are an employee either of the ultimate owner or in one of the firms controlled by the ultimate owner in the control chain of the bank; (2) they are one of the ultimate owners of the bank or they are shareholders in at least one of the firms controlled by the ultimate owner in the control chain of the bank; (3) they have the same family name

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<sup>11</sup> We are, however, unable to ascertain who does in fact nominate particular directors.

<sup>12</sup> In our sample, 25 directors have the same family name as owners in the control chain. Taking into account only directors with the same family name as owners when the name is not common in each country, we are left with 19 related directors according to this criterion. As a robustness test, we remove all these cases from the sample.

as the ultimate owner or as one of the indirect shareholders in the control chain of a bank; and (4) they are an employee of a government agency if one of the ultimate owners is state owned.

We then assign weights to three factors that characterize the strength of the relatedness between a director and a shareholder, by giving a weight of one (as compared to zero) for each criterion (see Table B2 in Appendix B). The first factor considers if a director is related to a shareholder (controlling or minority). The second factor is the position of related directors in the board. We distinguish if directors are Chairman/Vice Chairman of the board, or other board members. The Chairman of the board has rights that are of greater significance in the directors meeting. In some countries (such as Italy and Portugal), when votes in the board are tied, the Chairman of the board can have the casting vote to make a decision. A Vice Chairman can act in the Chairman's place such as presiding over board meetings if the Chairman is not present. Therefore, when Chairman or Vice Chairman are related to shareholders, they might have greater opportunities to act in the interests of shareholders. The third factor we consider is whether their relationship with shareholders is in the present or in the past. When directors are, for example, current employees of shareholders/ultimate owners 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 shareholders, thus their impact should be less significant than in the first case.

We use the three factors described above to compute several indices to measure the strength of relatedness of the board of directors for each bank (see Section B3 in Appendix B for details). We consider in our analysis the index *Minority* measuring the presence/influence of directors who are related to minority shareholders, and the index *Independent* measuring the presence of "independent" directors from shareholders. These indices both range from 0 to 10 in principle.

### ***3.4. Some descriptive statistics***

In our sample, 45 banks (47%) have a pyramidal structure with indirect ultimate owners, and 51 banks (53%) have only direct controlling shareholders. Controlling shareholders hold on average 44% of shares in banks with minority directors, versus 70% in banks without minority directors (Table A2), with the remainder held by minority shareholders.

We find that minority directors are present on the board of directors of around 49% of our sample of controlled banks (see Table A2). Minority directors, when present, account for more than 24% of board seats, against 14% of directors related to controlling shareholder; this gives around 62% of

directors that we identified as “independent” in the sense that they are not related to shareholders. The proportion of minority directors is therefore relatively high on average, especially in Spain (65%) where the Corporate Governance Codes cover inclusion of such directors on the board, but also in other countries that do not (France 38%, Switzerland 32%, and UK 47%).

We find that on average around 80% of minority directors are related through employment. Minority directors that are shareholders of the bank or in the control chain represent around 16% of the cases of related directors, while the two other criteria of relatedness account for around 4% of all cases.

We will now empirically examine whether the presence of minority directors might be associated with higher market value, and whether or not it may lead to greater risk taking.

#### 4. Director relatedness and corporate governance effectiveness

##### 4.1. Empirical specification

The econometric specification we use to examine whether the presence of minority directors within bank boards has an impact on banks’ market valuation and risk-taking is as follows:

$$Y_{ijt} = \alpha + \beta Relatedness_{ij} + \sum_m \theta_m BankControl_{ijt} + \sum_n \gamma_n CountryControl_{jt} + \varepsilon_{ijt} \quad (1)$$

where subscript  $i$  denotes bank,  $j$  denotes country,  $t$  the time period ( $t = 2011, 2012, 2013$ ), and  $\varepsilon$  is the idiosyncratic error term.  $Y_{ijt}$  is either Tobin’s Q or the distance to default. We use Tobin’s Q ratio ( $Tobin\_Q_{it}$ ) as a proxy of stock market valuation, following the existing literature (e.g. De Andres and Vallelado, 2008; Dahya et al., 2008; Delis et al. 2017). This ratio is 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. The average of Tobin’s Q ratio in our sample is 1.05 (see Table 1). We compute the distance to default ( $DD_{it}$ ) to proxy for bank insolvency risk using the methodology developed by Merton (1977). A higher distance to default indicates lower default risk. The average distance to default in our sample is 3.52 (see Table 1).  $BankControl_{ijt}$  are bank control variables, and  $CountryControl_{jt}$  are country control variables.

$Relatedness_{ij}$  are indices representing the presence/influence of directors that are related to minority shareholders ( $Minority_{ij}$ ) and directors that are “independent” from shareholders ( $Independent_{ij}$ ). As these two indices are strongly correlated (see Table A3 in Appendix A), we introduce them one by one.

When the dependent variable is the Tobin's Q ratio, we expect a significant and positive coefficient for the index *Minority<sub>ij</sub>* to be in line with the hypothesis H1 that the presence of minority shareholders increases the market value of banks. We furthermore expect the presence of directors that are "independent" from both controlling and minority shareholders (*Independent<sub>ij</sub>*) to increase the market value of banks if minority shareholders have confidence in the independence of these directors, but with a lesser impact than the presence of minority directors.

When the dependent variable is the distance to default, in order to examine hypotheses H2a/H2b, we expect the coefficient associated with *Minority<sub>ij</sub>* to be, respectively, negative/positive and significant if the presence of minority directors decreases/increases the distance to default, i.e. increases/decreases the default risk of a bank. Regarding the expected impact of the presence of "independent" directors on bank risk, the existing literature shows either no significant relationship (Minton et al., 2014; Battaglia and Gallo, 2017), or that the presence of independent directors is associated with lower risk (Pathan, 2009; Pathan and Faff, 2013). We therefore expect the presence of "independent" directors to have either no significant impact or to decrease default risk.

We follow the previous literature (e.g. Dahya et al., 2008; De Andres and Vallelado, 2008; Bhagat et al., 2015; Delis et al. 2017) to select our bank-level control variables. When the dependent variable is the Tobin's Q ratio, we include the following control variables: board size, board tier structure, bank size, growth of assets, capital structure, loan ratio, and risk. In the regressions using the distance to default as dependent variable, we control at the bank-level for board size, board tier structure, bank size, growth of assets, capital structure, loan ratio, deposit ratio, and operating ratio. We furthermore include in all regressions the following country-level variables: the growth rate of GDP, an index measuring the level of minority shareholder protection for each country, and an index measuring the strength of the supervisory regime. We alternatively include country dummies in Equation (1) for robustness checks without changing our main results (see Section 6).

All the control variables are defined in Table 1 with corresponding descriptive statistics. We examined the correlation between our variables of interest (see Table A3 in Appendix A) and detected some potential multicollinearity problems, which we resolved by orthogonalizing the variables in question (see Table 1).

[Insert Table 1]

#### **4.2. Endogeneity and estimation issues**

One of the main concerns of studies on corporate governance in general is the potential problem of endogeneity with firm performance; this has been raised regarding the board of directors in previous studies such as Hermalin and Weibach (1998, 2003). Firm performance could be driven by the actions of previous directors, but at the same time be a potentially influential factor in the choice of subsequent directors. We therefore empirically test for the presence of endogeneity problems for the variables of relatedness of board directors to shareholders. We use for that a two-stage least squares method, finding instrumental variables for the two indices of relatedness of board directors in each of the regressions on Tobin's Q and distance to default. For this we identify instrumental variables (IVs) that satisfy the exclusion restrictions, i.e. they need to be correlated with our indices of relatedness of directors, but without affecting Tobin's Q and distance to default directly.

For the index of relatedness of minority directors  $Minority_{ij}$ , we use the instrumental variable  $DistanceMinoritySH_{ij}$  that measures the average distance of minority shareholders to the headquarters of the bank. The conceptual idea for the relevance of this variable is that the further a minority shareholder is from the headquarters of a bank, the more difficult it might be to directly lobby/influence managers and the board of directors. Presence of directors on the board that are related to them might be a solution for these minority shareholders to ensure that their interests will be protected even if they are at a geographical disadvantage in this respect. We thus expect that a bank with a higher number of minority shareholders located far away from its headquarters has a higher number of minority directors in its board. We compute for each minority shareholder the index  $D$  depending on whether minority shareholders and banks are: (i) in the same city,  $D = 1$ ; (ii) in different cities but same country,  $D = 2$ ; (iii) in different countries but in Europe,  $D = 3$ ; and (iv) in different continents,  $D = 4$ . The variable  $DistanceMinoritySH_{ij}$  is then the average of the index  $D$  per bank.

For the index measuring the presence of "independent" directors, we consider the instrumental variable  $DiffDistanceSH_{ij}$  which is calculated as the average distance of controlling shareholders to the headquarters of the bank minus the average distance of minority shareholders to the headquarters of the bank; construction of the variable  $DiffDistanceSH_{ij}$  is analogous to the one for variable  $DistanceMinoritySH_{ij}$  outlined above. Shareholders in greater proximity to the headquarters of a bank have greater opportunities to directly lobby/influence managers and the board of directors, with obvious consequences for the conflict of interest between controlling and minority shareholders. Hence, if controlling shareholders want to signal they do not want to expropriate minority shareholders,

the lower the difference of average distances of controlling/minority shareholders to the headquarters of the bank, the higher might be the number of “independent” directors needed to help achieve this goal.

In order to determine whether fixed-effects or random-effects estimators are more appropriate, we test whether the individual-specific effect might not be correlated with explanatory variables; this uses the robust Hausman test, which is equivalent to the traditional Hausman test under conditional homoscedasticity (Arellano, 1993; Wooldridge, 2002). The robust Hausman test results reported in the lower part of Tables 2 and 3 indicate that it is appropriate to use the random effects method in our panel. For the IV regressions, we thus apply a generalized two-stage least squares (G2SLS) random-effects estimator, using the Balestra and Varadharajan-Krishnakumar (1987) implementation. As we cannot reject the hypothesis that the data does not have first-order autocorrelation, we use the Generalized Least Square (GLS) random effects technique in the alternative non-IV case.

Being purely distance based measures, our instrumental variables *DistanceMinoritySH<sub>ij</sub>* and *DiffDistanceSH<sub>ij</sub>* should not affect banks’ performance and risk directly. However, as argued above, they are likely to directly affect the indices of relatedness of directors; our instruments should therefore satisfy the exclusion restrictions. We verify the validity of our instruments by examining for each G2SLS regression the Cragg-Donald Wald F statistic for test of weak identification and the LM statistic for test of under-identification. The under-identification and weak identification tests are reported in the lower part of Tables 2 and 3, as well as the coefficients and Z-statistics of our instrumental variables for the first stage, where we include all explanatory variables used in the second stage. We can see from the first-stage results that the instrumental variables have a significant impact on the indices of relatedness at the 1% significance level, with the expected signs. For all regressions we can reject the under-identification restrictions tests and the weak instruments tests at the 1% level, confirming that our instruments are (empirically) relevant.

Then, we carry out endogeneity tests to test whether or not there is in fact an endogeneity problem regarding our variables of interest. For this, we compare the coefficients obtained from models using the G2SLS method with the equivalent ones obtained without instrumental variables, applying the Hausman test to examine the null hypothesis of no significant difference between estimated coefficients in the two models. The endogeneity tests reported in the lower part of Tables 2 and 3 show throughout that we cannot reject the null hypothesis; therefore, we can conclude that the variables of relatedness of board directors to shareholders are strictly exogenous in our sample of European banks. We can see

that the relationship between our indices of relatedness and both Tobin's Q and the distance to default are qualitatively similar between GLS and the second-stage G2SLS estimates. As instrumental variables estimators can be highly inefficient when the explanatory variables are in fact exogenous, we rely on the results from our GLS estimation throughout.

[Insert Tables 2 and 3]

#### **4.3. Impact on market valuation and default risk**

The estimation results for Equation (1) with the Tobin's Q ratio as dependent variable are given in Table 2, whereas Table 3 presents the respective results for the distance to default. In each case, we report the GLS random-effects estimates in columns 1 and 3, and the second stage of the G2SLS random-effects estimations in columns 2 and 4.

Our results show that the presence and influence of minority directors within the board (*Minority*) has a significant and positive impact on Tobin's Q (columns 1 and 2 of Table 2). These results are consistent with the hypothesis H1, suggesting that having directors that are related to minority shareholders might be an effective means to convince outside investors that controlling shareholders may refrain from diverting resources. Our results further show that the presence of directors that are "independent" from shareholders (*Independent*) is not associated with a significant impact on Tobin's Q (columns 3 and 4 of Table 2). Our results are in contrast to those of Dahya et al. (2008) who find a significant and positive relationship between the presence of "independent" directors and Tobin's Q. A plausible explanation for this is the fact that we exclude from "independent" directors those that are in fact related to minority shareholders, for which we find a positive and significant impact on Tobin's Q. The non-significant relationship between "independent" directors and stock market valuation could be due to the difficulty faced by controlling shareholders to commit credibly to non-expropriation through the inclusion of "independent" directors; this is due to the fact that the latter are often appointed by controlling shareholders, or otherwise by "independent" nomination committees which may nevertheless also depend on them. As a consequence, our results indicate that banks with controlling shareholders might be able to offset the market value discount, at least partly, by allowing minority shareholders to appoint related directors rather than including directors that are "independent" from shareholders.

Our results further show that the presence and influence of minority directors on the board significantly increases the distance to default (i.e. decreases default risk), in line with our hypothesis

H2b (columns 1 and 2 of Table 3). The results seem to indicate that minority directors might in fact be reluctant to take riskier decisions supporting the hypothesis that they aim to maintain their reputation in the market for directorships (Fama and Jensen, 1983). Inclusion of directors that are related to minority shareholders appears therefore to be an effective approach to curtail the agency problems observed in banks between minority and controlling shareholders, as well as between shareholders and depositors/debt holders/regulators. We furthermore find that the presence of “independent” directors is not associated with a significant impact on default risk (columns 3 and 4 of Table 3), in line with Minton et al. (2014) and Battaglia and Gallo (2017).

As for the control variables included, almost all are seen to be significant. In particular, we find a negative relationship between board size and Tobin’s Q, in line with Pathan and Faff (2013).

#### **4.4. Channels of impact**

##### *Related party transactions*

We have hypothesized that the positive impact of the presence/influence of minority directors on Tobin’s Q could be driven by a reduction in the risk of expropriation by controlling shareholders, as minority directors could curb diversion of corporate resources by effectively monitoring insiders. We follow Cheung et al. (2006) and Dahya et al. (2008) and use related party transactions (RPTs) as a proxy of the degree of potential resource diversion. There are many types of transactions that can be conducted between related parties, such as sales, asset transfers, leases, lending arrangements, guarantees; however, for banks the dominant RPT is loans to related parties. We collect the amount of loans granted by insiders to related parties from banks’ annual reports for the years 2011-2013 and compute for each bank the ratio of related loans to total assets<sup>13</sup>; we find that these related loans represent around 1.35% of total assets in our sample of European banks.

The existing literature shows that controlling shareholders have the opportunity to transfer wealth from the firm to their own benefit (tunneling resources), in particular through RPTs (e.g. Johnson et al., 2000; Bae et al. 2002; Bertrand et al., 2002). We therefore might expect that banks with minority directors on their boards have lower levels of RPTs, with increased monitoring reducing possible resource diversion. We further analyze whether the presence of “independent” directors could also

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<sup>13</sup> Since the implementation of the IAS 24 Related Party Disclosures norm in 2011, European listed companies are required to disclose in their annual reports all transactions with related parties such as executives, associates and their family members.

reduce related loans, by alternatively including  $Independent_{ij}$  instead of  $Minority_{ij}$ . Results in Table 4 show that the coefficient of  $Minority_{ij}$  is negative and statistically significant, implying that the presence/influence of minority directors reduces the amount of related loans granted by insiders. We also find that the presence of “independent” directors significantly reduces related loans. With RPTs being a key mechanism for controlling shareholders to expropriate minority shareholders, including either minority directors or “independent” directors seems to limit such behavior. However, as our previous results indicated, only the presence of minority directors is associated with a positive impact on banks’ market valuation and appears therefore to be a credible way for controlling shareholders to signal they will not expropriate minority shareholders.

[Insert Table 4]

#### *“Active” Institutional investors*

We now examine whether minority shareholders that are “active” institutional investors (i.e. pension and mutual funds and investment companies) could achieve better monitoring of controlling shareholders and consequent limitation of expropriation behavior through the appointment of directors that are related to them. More than 87% of these directors are related to “active” institutional shareholders through being one of their employees, with presumably significant skills and incentives to further the interests of their employers.

To examine this potential channel of impact, we first augment Equation (1) with interaction terms between the index measuring the presence/influence of minority directors ( $Minority_{ij}$ ) and a dummy variable taking the value of one if at least one of the minority directors is related to an “active” institutional shareholder. Our results are shown in Table 5, Panel A. We observe that the positive impact of minority directors on Tobin’s Q appears to hold only if at least one of the minority directors is related to an “active” institutional shareholder, confirming the role of this potential channel. Furthermore, we note at the same time that the risk reducing impact of minority directors appears to be significantly driven by those related to “active” institutional shareholders, whereas absence of any minority director related to an “active” institutional shareholder seems to in fact lead to increased risk taking (in line with our hypothesis H2a).

We further analyze the impact on market valuation and default risk of having directors related to “active” institutional shareholders as compared to having directors related to the other minority shareholder types. In our sample, around 17% of directors are related to “active” institutional

shareholders as minority shareholders, 40% to “dependent” institutional investors, i.e. banks and insurance companies, 30% to individuals/families, 12.5 % to non-financial companies, 2.5% to foundations/research institutes, and none related to a government or a public authority. We exclude the group of minority directors related to “active” institutional investors; we are thus able to determine if a shift in the number of directors related to “active” institutional investors to another type of related directors results in an increase or a decrease in Tobin’s Q and default risk. The results in Table 5 Panel B show that a shift from directors related to “active” institutional shareholders to any other minority director type is significantly associated with a decrease in Tobin’s Q. These results confirm the role played by directors related to “active” institutional shareholders as a channel to explain the positive relationship we observed between market valuation and the presence of minority directors. Moreover, our results show that a shift in directors related to “active” institutional shareholders to other types of minority directors does not imply a different level of default risk, except for those related to foundations/research institutes and families/individuals (but only at a 10% significance level).

[Insert Table 5]

## 5. When do minority directors matter most?

We now examine in greater detail whether there are particular circumstances or contexts in which the presence/influence of minority directors on boards has the most significant impact on market valuation and/or risk.

### 5.1. Degrees of “minor”

In our analysis so far, we have defined a minority director as being related to shareholders with less than a 10% stake. We now examine whether there are any differences in results when minority directors are related to minority shareholders holding particular levels of stakes within that less than 10% range. In our sample, around 70% of minority directors are related to shareholders holding less than 1% of shares, 19% to shareholders holding between 1 to 5% of shares, and only 11% to shareholders holding between 5 to 10% of shares. We thus disaggregate our index measuring the presence/influence of minority directors over three ranges below the 10% threshold, i.e. below 1% (*MinorityInfl<sub>ij</sub>*), between 1% and 5% (*Minority1to5<sub>ij</sub>*), and between 5% and 10% (*Minority5to10<sub>ij</sub>*). When we rerun Equation (1) with those three sub-indices, we observe that the positive impact on Tobin’s Q is driven by minority directors that are related to shareholders with less than 5% holdings (see Table 6, Panel A), whereas

we find a negative impact on Tobin's Q when minority directors are related to shareholders with more than 5% holdings. The result that minority directors are linked to lower bank risk seems to hold independently of the levels of shares held by the minority shareholder they are related to.

We similarly reexamine the potential channel of impact of minority directors being related to "active" institutional shareholders. In our sample, minority directors are mostly related to "active" institutional shareholders holding either less than 1% of shares or between 1 to 5% of shares, but are absent in the 5 to 10% range of shareholdings. We therefore only interact the two disaggregated indices *MinorityInfl<sub>ij</sub>* and *Minority1to5<sub>ij</sub>* with a dummy variable taking the value of one if at least one of the minority directors is related to an "active" institutional shareholder. Results in Table 6 Panel B show that the presence of minority directors that are related to "active" institutional shareholders has a positive impact on market valuation irrespective of the proportion of shares held by them. The presence of minority directors related to the other shareholder types has a negative impact if they hold more than 1% of shares. Our results also confirm that only the presence of minority directors related to "active" institutional shareholders is associated with an increase in the distance to default (i.e. a decrease in default risk).

[Insert Table 6]

## ***5.2. Institutional and regulatory environment***

We then investigate whether a strong regulatory and institutional environment, more specifically strong supervisory regimes and high levels of shareholder protection, could influence the role played by minority directors in addressing the complex agency conflicts faced by the different bank stakeholders. In strict supervisory systems, supervisors can issue fines against, or even dismiss, bank directors without formal proceedings, and/or mandate new board elections. This might give strong incentives to directors to soundly monitor insiders if they seek to keep their board seat. The effectiveness of directors' monitoring might also depend crucially on the level of minority shareholder protection. If minority shareholders want to nominate directors to board positions, they might need to rely on the existence of formal legal procedures to oversee and safeguard the process, making strong minority shareholder laws an additional complementary corporate governance mechanism. On the other hand, greater minority shareholder protection might limit the opportunistic expropriation behavior of bank insiders. Effective monitoring by directors may therefore be less essential in controlling potential agency conflicts in countries with higher levels of minority shareholder protection

(Dahya et al. 2008). To examine whether country-level governance plays a role in minority directors' impact on the reduction of agency conflicts, we augment Equation (1) with interaction terms between the different indices of relatedness and a variable capturing the regulatory and institutional environment.

To measure the strength of the supervisory regime, we compute the index  $SupPow_j$  using the World Bank's 2013 Bank Regulation and Supervision database (Barth et al., 2013). It measures propensities of regulatory authorities to do on-site examinations, in order to make an overall assessment of a bank's economic condition, and their ability to remove and replace managers and directors or to force a bank to change its internal organizational structure when problems are detected. If stronger supervisory regimes provide incentives to minority directors to soundly monitor insiders, we expect the interaction term to be significant and positive.

To measure the level of minority 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 managers or majority shareholders in the corporate decision making process, including the voting process. The rule of law index reflects 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  $Legal_j$  is defined as the revised anti-director rights index multiplied by the rule of law index, with a higher index indicating a higher level of shareholder protection. If the effectiveness of a minority director's monitoring actions depends on the level of shareholder protection, we expect the interaction term to be significant and positive for both the Tobin's Q ratio and the distance to default. On the other hand, we expect the interaction term to be significant and negative if monitoring of minority directors is less essential to reducing potential agency conflicts in countries with higher levels of minority shareholder protection.

The estimation results for the augmented Equation (1) are given in Tables A4 in Appendix A. To facilitate interpretation, we comment the marginal effects evaluated at quartile levels for the index of strength of supervisory regime and the index of minority shareholder protection, as reported in Table 7; the two regulatory and institutional indices are scaled to have a minimum of zero. We observe that the positive impact of the presence/influence of minority directors on Tobin's Q and on the distance to

default is increasing with the strength of supervisory regimes (see columns 1 to 4, Table 7). These results are in line with the argument that a complementary relationship exists between the strength of supervision and the incentives of minority directors to monitor insiders. The stronger is the mandate that regulators have been given to intervene and discipline, the greater is the “threat of action” (Booth et al., 2002) that regulators pose to minority directors. On the other hand, we find that the positive impact of the presence/influence of minority directors on Tobin’s Q is decreasing for higher levels of minority shareholder protection, while the positive impact on the distance to default is increasing for higher levels of minority shareholder protection (see columns 5 to 8, Table 7).

[Insert Table 7]

## 6. Robustness

We subject our results to a wide range of robustness checks relating to possible empirical misspecification and sample issues, and the criteria used to identify controlling shareholders and related directors.<sup>14</sup>

### *Alternative variable definitions, time periods and specifications*

We verify our results using alternative measures of our dependent variables. For the market valuation, we alternatively use Shareholder Market Return (SMR) based on De Andres and Vallelado (2008), and the cost of equity as in Barnes and Lopez (2005) and King (2009). We still find that the presence of minority directors on the board has a positive impact on market valuation and is associated with a lower cost of equity, whereas the presence of “independent” directors has no significant impact. We also 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, which is relatively simpler to implement than the Merton model. We also consider the widely used Z-score (Lepetit and Strobel, 2013, 2015). Both of these two alternative risk measures confirm our results.

We also include country and year dummies in our regressions, excluding country-level variables, and find similar results. To examine whether our results are sensitive to the particular time period chosen, we also rerun our regressions for the periods 2012-2014 and 2013-2015 instead of 2011-2013; our results remain unchanged.

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<sup>14</sup> While we do not include the estimation results discussed in this section, they are available on request.

### *Criteria to identify controlling shareholders and related directors*

We alternatively use voting rights of shareholders instead of their relative voting power to construct our indices of relatedness *Minority* and *Independent*, and find similar results. We also re-estimate our regressions with the percentages of directors in the given relatedness categories; results are again unchanged. We furthermore use the control threshold of 20% instead of 10% to identify controlling and minority shareholders. This alternative minimum control threshold changes our sample as we end up with 71 controlled banks, of which only 29 have minority directors; however, our conclusions remain unchanged.

### *Sub sample analysis*

We rerun our regressions on different sub-samples to test the robustness of our analysis. We first exclude Spain and Italy from the initial sample to ensure that our results are not driven by their inclusion, as these are the only two countries to prescribe the presence of minority directors (with however no obligation for companies to comply or explain deviations from this). Results show that our main conclusions are unchanged. Next, we exclude from the initial sample banks having dual class shares. The existence of dual class shares can bias voting rights in a bank (Faccio and Lang, 2002), and thereby might weaken the relevance of minority directors in our study. Excluding the four banks having dual class stock, our conclusions from previous sections prevail. We had considered “having the same family name with shareholder” as one of the criteria to identify “related directors”. In our main results, we only considered related directors having the same family name as shareholders when it is not a common family name in each country (8 directors in our sample). We also went further and did not consider these directors at all as their relatedness may be exposed to a potentially more substantial risk of misclassification; our main conclusions remained unchanged.

## **7. Conclusion**

Our investigation examined whether banks with controlling shareholders that allow minority shareholders to appoint board directors can benefit from an increased market valuation as a consequence, and whether or not this presence of minority directors would, however, be accompanied by increased bank risk taking. For this, we analyse the impact of the presence/influence of such minority directors, compared to “independent” directors, on stock market valuation and bank default risk, using a hand-collected data set on banks’ ultimate control and relatedness of board directors to shareholders for a sample of listed European banks.

We find that the presence and influence of minority directors on bank boards has a positive and significant impact on market valuation. We provide evidence that minority directors might generate value by decreasing the risk of expropriation, as we find that their presence on boards has a negative impact on the magnitude of related party transactions. Hence, our results confirm that minority directors can be a way for banks with controlling shareholders to credibly commit that they will not expropriate minority shareholders. One of the potential channels of impact we examined is the role of minority shareholders classified as “active” institutional investors (i.e. pension and mutual funds, and investment companies) in the limitation of expropriation behavior of controlling shareholders. This could be achieved through appointing directors that are related to them (e.g. through being one of their employees) in order to achieve better monitoring of controlling shareholders. Our results confirm the role played by directors related to “active” institutional investors as a channel to explain the positive relationship we observe between Tobin’s Q and the presence of minority directors.

Our overall results further suggest that the presence of minority directors on boards is associated with lower risk. However, further investigation interestingly reveals that risk is seen to be lower only in banks where at least one minority director is related to “active” institutional investors, but is in fact higher otherwise. This result points to the importance of including minority directors with connections to “active” institutional investors when aiming to credibly commit to non-expropriation of minority shareholders while at the same time reducing risk taking incentives.

Regarding the impact of the presence of “independent” directors, we find that it is associated with a non-significant impact on both market valuation and risk-taking. It appears therefore that the presence of “independent” directors on boards does not credibly signal a strong board likely to restrain controlling shareholders from diversion of firm resources. An approach of allowing minority shareholders to appoint directors seems therefore a more effective way to achieve the twin objectives of not only enhancing welfare of shareholders but also of depositors, debtholders and regulators.

We further observe that stronger supervisory regimes might increase the incentives of minority directors to monitor insiders more effectively and soundly. This result suggests that the inclusion of such directors is more likely to be successful if bank-level governance is accompanied by a strict supervisory regime. Our results also show that effective monitoring of minority directors is less essential in controlling potential agency conflicts in countries with higher levels of minority shareholder protection.

Overall, 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 in terms of both market valuation and financial stability. Some regulators have suggested amending Codes of Corporate Governance with the recommendation that at least one director should be nominated by banking regulators to reduce the agency conflict between shareholders and depositors/debt holders/regulators (Acharya et al., 2009). However, such a recommendation might be considered unacceptable for many bank insiders and may thus not be widely applied. Our work suggests instead that recommending a sufficient presence of minority directors could increase bank board effectiveness for controlled banks, in particular if they are related to “active” institutional investors as they might be more willing to challenge controlling shareholders’ decisions and limit any expropriation behavior. Firstly, this could ensure that the risk-taking incentives of insiders are better aligned with the interests of other stakeholders such as depositors, debt holders and banking supervisors. Secondly, it could also allow controlling shareholders to credibly commit that they will not divert corporate resources, leading to higher market valuations. As a consequence, it seems advisable that Corporate Governance Codes should recommend allowing minority directors to be present in bank boards. Of course, to a controlling shareholder, the cost of including minority directors is the potential reduction in perquisites linked to being in a controlling position, which might thus plausibly result in resistance to the introduction of any such changes. A final important implication of our work is that regulation and governance cannot and should not be viewed in isolation. Attempts to raise directors’ ability to soundly and effectively monitor controlling shareholders are more likely to be successful if bank-level governance is accompanied by a strict supervisory regime.

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

| Variables   | Definition  | Data sources  | Mean  | Median | Standard Deviation | Min.   | Max.  |
|---|---|---|-------|--------|--------------------|--------|-------|
| <i>Dependent variables</i>                          |   |   |       |        |                    |        |       |
| Tobin_Q   | Book value of assets minus the book value of equity plus the market value of equity, divided by the book value of assets  | Bloomberg, Bankscope  | 1.05  | 0.99   | 0.26               | 0.69   | 2.67  |
| DD  | Distance to default computed using the Merton (1977) model.   | ibid  | 3.52  | 3.17   | 2.61               | -2.35  | 11.61 |
| <i>Indices of relatedness of board of directors</i> |   |   |       |        |                    |        |       |
| Minority  | Index of the relatedness of board directors to minority shareholders having less than 10% of relative voting power (see Section B3 in Appendix B for details)   | Bloomberg, Bankscope,   | 3.08  | 1.5    | 3.52               | 0      | 10    |
| Independent   | Index of the independence of board directors from both controlling and minority shareholders using threshold of 10% of relative voting power (see Section B3 in Appendix B for details)   | Amadeus, annual reports   | 7.33  | 7.5    | 2.21               | 2      | 10    |
| <i>Bank level control variables</i>                 |   |   |       |        |                    |        |       |
| BoardSize   | Natural logarithm of the number of directors on the board   | Bloomberg   | 2.33  | 2.39   | 0.47               | 1.09   | 3.25  |
| Size  | Natural logarithm of Total Assets (orthogonalized on BoardSize)   | Bankscope   | 16.79 | 16.67  | 2.61               | 9.88   | 21.65 |
| Risk  | Standard deviation of monthly stock returns over the previous twelve months   | Bloomberg   | 3.07  | 0.33   | 31.79              | 0.20   | 522.7 |
| Growth  | Annual growth rate of total assets (%)  | Bankscope   | 5.70  | 2.47   | 18.13              | -25.01 | 64.04 |
| Loan  | Gross loans divided by total assets (%)   | ibid  | 47.14 | 51.61  | 25.60              | 0.59   | 89.67 |
| Capital   | Total equity divided by total assets (%)  | ibid  | 13.67 | 6.99   | 17.40              | 0.83   | 55.28 |
| Deposit   | Deposits divided by total assets (%)  | ibid  | 55.46 | 58.20  | 22.70              | 1.72   | 91.72 |
| Operating   | Total operating expenses divided by total operating income (%)  | ibid  | 1.80  | 1.43   | 1.49               | -0.83  | 9.06  |
| OneTierBoard  | Dummy variable taking the value of one if the bank has a one-tier board   | Annual reports  | 0.67  | 1      | 0.47               | 0      | 1     |
| <i>Country-level control variables</i>              |   |   |       |        |                    |        |       |
| GDP   | GDP growth rate (%)   | World Bank  | 0.36  | 0.58   | 1.61               | -4.02  | 3.59  |
| Legal   | 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. This index is rescaled to make its range 0 to 5 | Djankov et al. (2008)<br>Worldwide Governance Indicators (World Bank) | 13.11 | 13.75  | 4.63               | 5.71   | 21.33 |

|                               |  |   |      |      |       |       |       |
|-------------------------------|--|---|------|------|-------|-------|-------|
| SupPow                        | Index measuring the strength of supervisory regime, with range 0 to 13. A higher value indicates wider and stronger authority for bank supervisors   | Bank regulation and supervision database (World Bank) | 10   | 11   | 2.33  | 4     | 13    |
| <i>Further variables</i>      |  |   |      |      |       |       |       |
| LoanRPT                       | Loans to related parties divided by total assets (%)   | Annual reports  | 1.35 | 0.12 | 3.67  | 0     | 23.73 |
| DInstActive                   | Dummy variable taking the value of one if at least one of the minority directors is related to an “active” institutional investor (mutual funds, pension funds, and investment companies)  | Bloomberg, Bankscope, Amadeus, annual reports         | 0.63 | 1    | 0.48  | 0     | 1     |
| PctMinorityInstActive         | Percentage of minority directors related to “active” institutional investors (mutual funds, pension funds, and investment companies)   | ibid  | 16.6 | 0    | 32.79 | 0     | 100   |
| PctMinorityInstDep            | Percentage of minority directors related to “pressure-sensitive” institutional investors (banks and insurance companies)   | ibid  | 38.8 | 12.5 | 43.1  | 0     | 100   |
| PctMinorityFamily             | Percentage of minority directors related to individuals/families   | ibid  | 29.7 | 0    | 40.1  | 0     | 100   |
| PctMinorityIndust             | Percentage of minority directors related to non-financial companies  | ibid  | 12.5 | 0    | 27.6  | 0     | 100   |
| PctMinorityFund               | Percentage of minority directors related to foundation/research institute  | ibid  | 2.24 | 0    | 13.9  | 0     | 100   |
| MinorityInfl                  | Index of the relatedness of board directors to minority shareholders having less than 1% of relative voting power  | ibid  | 2.33 | 0    | 3.29  | 0     | 10    |
| Minority1to5                  | Index of the relatedness of board directors to minority shareholders having between 1% and 5% of relative voting power   | ibid  | 0.96 | 0    | 2.51  | 0     | 10    |
| Minority5to10                 | Index of the relatedness of board directors to minority shareholders having between 5% and 10% of relative voting power  | ibid  | 0.53 | 0    | 1.87  | 0     | 10    |
| <i>Instrumental variables</i> |  |   |      |      |       |       |       |
| DistanceMinoritySH            | Average index per bank of distance of minority shareholders from the bank’s headquarters. We compute for each minority shareholder an index $D$ depending on whether minority shareholders and banks are: (i) in the same city, $D = 1$ ; (ii) in different cities but same country, $D = 2$ ; (iii) in different countries but in Europe, $D = 3$ ; and (iv) in different continents, $D = 4$ ; $DistanceMinoritySH$ is the average of $D$ per bank | Bankscope, annual reports                             | 2.17 | 2.34 | 0.81  | 1     | 3.63  |
| DiffDistanceSH                | Average index per bank of distance of controlling shareholders to the headquarters of the bank minus the average index per bank of distance of minority shareholders to the headquarters of the bank   | ibid  | 0.05 | -0.1 | 1.42  | -2.34 | 3.42  |

**Table 2** Impact of relatedness of directors to shareholders on market valuation

| Dependent variable: Tobin's Q          |                        |   |                        |   |
|--|------------------------|---|------------------------|---|
|  | GLS<br>(1)             | G2SLS 2 <sup>nd</sup> Stage<br>(2)                                      | GLS<br>(3)             | G2SLS 2 <sup>nd</sup> Stage<br>(4)                                    |
| Minority                               | 0.0146***<br>(6.27)    | 0.114**<br>(2.37)   |                        |   |
| Independent                            |                        |   | -0.00531<br>(-1.56)    | -0.0515<br>(-0.63)  |
| BoardSize                              | -0.0600***<br>(-7.50)  | -0.134***<br>(-3.23)  | -0.0596***<br>(-7.24)  | -0.120***<br>(-2.83)  |
| Size                                   | -0.104***<br>(-12.14)  | -0.123***<br>(-2.84)  | -0.110***<br>(-11.65)  | -0.134***<br>(-3.97)  |
| Growth                                 | 0.000564***<br>(3.30)  | -0.000340<br>(-0.44)  | 0.000529***<br>(2.97)  | -0.000500<br>(-0.64)  |
| Capital                                | 0.000547<br>(1.33)     | -0.0599<br>(-1.48)  | 0.00103**<br>(2.44)    | -0.0215<br>(-0.64)  |
| Loan                                   | 0.00000307<br>(0.01)   | 0.00753<br>(0.19)   | -0.000175<br>(-0.64)   | -0.0221<br>(-0.65)  |
| Risk                                   | 0.000181<br>(1.57)     | 0.0000177<br>(0.05)   | 0.000117<br>(1.04)     | -0.00000143<br>(-0.00)  |
| Tier1                                  | 0.00461<br>(0.31)      | -0.0643<br>(-0.78)  | 0.0227<br>(1.40)       | 0.0293<br>(0.45)  |
| SupPow                                 | -0.0106***<br>(-3.47)  | 0.0133<br>(0.52)  | -0.0167***<br>(-4.07)  | -0.0143<br>(-0.74)  |
| Legal                                  | -0.00604***<br>(-4.04) | -0.0226*<br>(-1.66)   | -0.00612***<br>(-3.15) | -0.00918<br>(-0.85)   |
| GDP                                    | 0.00395**<br>(2.05)    | -0.00453<br>(-0.57)   | 0.00596***<br>(2.83)   | -0.00383<br>(-0.44)   |
| Constant                               | 1.175***<br>(23.12)    | 0.940**<br>(2.50)   | 1.300***<br>(15.81)    | 1.669**<br>(2.07)   |
| Observations                           | 282                    | 282   | 282                    | 282   |
| <i>FE vs RE test</i>                   |                        |   |                        |   |
| Chi-squared                            | 10.942                 | 5.25  | 11.437                 | 2.09  |
| p-value                                | [0.28]                 | [0.81]  | [0.25]                 | [0.99]  |
| <i>IV First stage estimation</i>       |                        |   |                        |   |
| Instrument used                        |                        | G2SLS 1 <sup>st</sup> Stage<br>DistanceMinoritySH<br>1.458***<br>(5.16) |                        | G2SLS 1 <sup>st</sup> Stage<br>DiffDistanceSH<br>-0.286***<br>(-3.20) |
| <i>Instrument validity tests</i>       |                        |   |                        |   |
| Weak identification test (F-stat)      |                        | 26.62   |                        | 10.21   |
| p-value                                |                        | [0.00]  |                        | [0.00]  |
| Underidentification test (LM-stat)     |                        | 25.31   |                        | 10.28   |
| p-value                                |                        | [0.00]  |                        | [0.00]  |
| <i>Endogeneity test (IV vs non-IV)</i> |                        |   |                        |   |
| Chi-squared                            |                        | 3.34  |                        | 0.16  |
| p-value                                |                        | [0.99]  |                        | [1.00]  |

*Notes.* The regressions in this table investigate the impact of the presence/influence of related directors on Tobin's Q. The variables "Minority" and "Independent" are the indices measuring the presence/influence of minority directors and "independent" directors, respectively. All other variables are as defined in Table 1. Columns (1) and (3) report results using the GLS random-effects estimator. Columns (2) and (4) report 2<sup>nd</sup> stage of G2SLS random-effects estimations. The result of robust Hausman test (*fixed effects vs random effects*), first stage regression, tests of validity of instruments and endogeneity test are reported in the lower part of the table. The Z-statistics are in parentheses, with \*, \*\*, and \*\*\* denoting significance at 10%, 5% and 1% levels.

**Table 3 Impact of relatedness of directors to shareholders on the distance to default**

| Dependent variable: Distance to default |                       |   |                       |   |
|---|-----------------------|---|-----------------------|---|
|   | GLS<br>(1)            | G2SLS 2 <sup>nd</sup> Stage<br>(2)                                      | GLS<br>(3)            | G2SLS 2 <sup>nd</sup> Stage<br>(4)                                    |
| Minority                                | 0.0600***<br>(5.42)   | 0.442**<br>(2.02)   |                       |   |
| Independent                             |                       |   | -0.0197<br>(-0.95)    | 0.126<br>(0.45)   |
| BoardSize                               | -0.116***<br>(-2.83)  | -0.593***<br>(-3.18)  | -0.0730<br>(-1.36)    | -0.280*<br>(-1.70)  |
| Size                                    | -0.562***<br>(-10.67) | -1.085***<br>(-6.93)  | -0.509***<br>(-9.10)  | -1.035***<br>(-9.65)  |
| Growth                                  | 0.0166***<br>(11.73)  | 0.00343<br>(0.74)   | 0.0174***<br>(11.01)  | 0.0100**<br>(2.10)  |
| Capital                                 | 0.0687***<br>(15.51)  | 0.753***<br>(3.89)  | 0.0749***<br>(17.10)  | 1.020***<br>(7.01)  |
| Loan                                    | 0.00878***<br>(5.05)  | 0.130<br>(0.88)   | 0.00939***<br>(4.33)  | 0.0820<br>(0.76)  |
| Deposit                                 | -0.0195***<br>(-8.86) | -0.00819<br>(-1.12)   | -0.0179***<br>(-7.49) | -0.0140**<br>(-2.33)  |
| Operating                               | 0.00611<br>(0.55)     | -0.00489<br>(-0.26)   | 0.00485<br>(0.42)     | -0.00404<br>(-0.22)   |
| Tier1                                   | 0.0308<br>(0.39)      | -0.531<br>(-1.26)   | 0.0256<br>(0.26)      | 0.102<br>(0.44)   |
| SupPow                                  | -0.0618***<br>(-2.77) | 0.0146<br>(0.17)  | -0.0865***<br>(-2.98) | -0.0318<br>(-0.51)  |
| Legal                                   | -0.00429<br>(-0.41)   | -0.0558<br>(-0.98)  | -0.00988<br>(-0.69)   | 0.0309<br>(0.92)  |
| GDP                                     | 0.0427***<br>(2.80)   | -0.0513<br>(-1.09)  | 0.0581***<br>(2.97)   | 0.0145<br>(0.27)  |
| Constant                                | 1.504***<br>(3.77)    | 1.415<br>(1.10)   | 1.932***<br>(3.43)    | 0.943<br>(0.37)   |
| Observations                            | 271                   | 271   | 271                   | 271   |
| <i>FE vs RE test</i>                    |                       |   |                       |   |
| Chi-squared                             | 11.202                | 5.10  | 10.912                | 2.37  |
| p-value                                 | [0.19]                | [0.83]  | [0.21]                | [0.98]  |
| <i>IV First stage estimation</i>        |                       |   |                       |   |
| Instrument used                         |                       | G2SLS 1 <sup>st</sup> Stage<br>DistanceMinoritySH<br>1.084***<br>(3.75) |                       | G2SLS 1 <sup>st</sup> Stage<br>DiffDistanceSH<br>-0.252***<br>(-2.83) |
| <i>Instrument validity tests</i>        |                       |   |                       |   |
| Weak identification test (F-stat)       |                       | 14.04   |                       | 7.99  |
| p-value                                 |                       | [0.00]  |                       | [0.00]  |
| Underidentification test (LM-stat)      |                       | 13.99   |                       | 8.14  |
| p-value                                 |                       | [0.00]  |                       | [0.00]  |
| <i>Endogeneity test (IV vs non-IV)</i>  |                       |   |                       |   |
| Chi-squared                             |                       | 7.90  |                       | 0.37  |
| p-value                                 |                       | [0.72]  |                       | [1.00]  |

*Notes.* The regressions in this table investigate the impact of the presence/influence of related directors on the distance to default. The variables “Minority” and “Independent” are the indices measuring the presence/influence of minority directors and “independent” directors, respectively. All other variables are as defined in Table 1. Columns (1) and (3) report results using the GLS random-effects estimator. Columns (2) and (4) report 2<sup>nd</sup> stage of G2SLS random-effects estimations. The result of robust Hausman test (*fixed effects vs random effects*), first stage regression, tests of validity of instruments and endogeneity test are reported in the lower part of the table. The Z-statistics are in parentheses, with \*, \*\*, and \*\*\* denoting significance at 10%, 5% and 1% levels.

**Table 4 Channels of impact (1): related party transactions**

| Dependent variable: Ratio of related loans to total assets |                      |                       |
|--|----------------------|-----------------------|
|  | (1)                  | (2)                   |
| Minority   | -0.199***<br>(-2.75) |                       |
| Independent  |                      | -0.392***<br>(-2.93)  |
| BoardSize  | -1.047***<br>(-3.51) | -1.547***<br>(-4.52)  |
| Size   | 0.340<br>(1.13)      | 0.247<br>(0.79)       |
| Growth   | -0.0120**<br>(-2.41) | -0.0141***<br>(-2.76) |
| Capital  | -0.00475<br>(-0.24)  | -0.0276<br>(-1.35)    |
| Operating  | -0.0822<br>(-1.25)   | -0.00913<br>(-0.14)   |
| Risk   | 0.00138<br>(0.51)    | 0.00243<br>(0.77)     |
| OneTierBoard   | 0.305<br>(0.77)      | -0.129<br>(-0.29)     |
| Legal  | -0.162**<br>(-2.49)  | -0.274***<br>(-4.62)  |
| GDP  | 0.0602<br>(1.11)     | 0.0189<br>(0.33)      |
| Constant   | 4.684***<br>(4.60)   | 9.222***<br>(5.56)    |
| Observations   | 284                  | 284                   |
| <i>FE vs RE test</i>                                       |                      |                       |
| Chi-square   | 7.776                | 8.257                 |
| p-value  | [0.56]               | [0.51]                |

*Notes.* This table reports the results of the following equation to examine the effect of the presence/influence of minority directors/“independent” directors on related party transactions:

$$LoansRPT_{ijt} = \alpha + \beta Relatedness_{ij} + \sum_m \theta_m BankControl_{ijt} + \sum_n \gamma_n CountryControl_{jt} + \varepsilon_{ijt}$$

The dependent variable is the ratio of related loans to total assets. The variables “*Minority*” and “*Independent*” are the indices measuring the presence/influence of minority directors and “independent” directors, respectively. All other variables are as defined in Table 1. To obtain the results, we estimate the above equation by using the GLS random effects estimator. The last two lines of the table report the results of robust Hausman tests test (*fixed effects vs random effects*). Z-statistics are in parentheses, with \*, \*\*, and \*\*\* denoting significance at 10%, 5% and 1% levels.

**Table 5 Channels of impact (2): minority directors related to “active” institutional investors**

|   | Tobin’s Q            | Distance to default  |
|---|----------------------|----------------------|
|   | (1)                  | (2)                  |
| Panel A : Minority directors related to “active” institutional investors  |                      |                      |
| Minority ( $\beta_1$ )  | -0.00288<br>(-0.80)  | -0.0808**<br>(-2.08) |
| Minority * <i>DInstActive</i> ( $\beta_2$ )   | 0.0288***<br>(6.31)  | 0.363***<br>(5.60)   |
| Control variables   | Yes                  | Yes                  |
| <i>Wald test</i><br>$\beta_1 + \beta_2 = 0$   | 0.0260***<br>[0.00]  | 0.283***<br>[0.00]   |
| Panel B : Minority directors related to various minority shareholder types compared to those related to “active” institutional shareholders |                      |                      |
| PctMinorityFamily   | -0.408***<br>(-7.56) | -0.853*<br>(-1.70)   |
| PctMinorityIndust   | -0.429***<br>(-4.97) | -0.777<br>(-1.37)    |
| PctMinorityInstDep  | -0.356***<br>(-7.10) | -0.248<br>(-0.55)    |
| PctMinorityFund   | -0.468***<br>(-5.72) | -3.398***<br>(-4.53) |
| Control variables   | Yes                  | Yes                  |

*Notes.* The regressions in this table examine the potential channel of impact of minority directors being related to “active” institutional investors (pension and mutual funds, and investment companies). Panel A reports estimation results of Equation (1) when augmented with an interaction term between the index measuring the presence/influence of minority directors (*Minority*) and the dummy variable *DInstActive*, which takes the value of one if at least one of the minority directors is related to an “active” institutional investor. Corresponding Wald tests are reported at the end of Panel A. Other variables are as defined in Table 1. Panel B reports estimation results which investigate the impact of having minority directors related to “active” institutional shareholders as compared to having directors related to the other minority shareholder types. The results are obtained by carrying out the following regression:

$$Y_{ijt} = \alpha + \beta_1 PctMinorityInstDep_{ij} + \beta_2 PctMinorityIFamily_{ij} + \beta_3 PctMinorityIndust_{ij} + \beta_4 PctMinorityFund_{ij} + \sum_m \theta_m BankControl_{ijt} + \sum_n \gamma_n CountryControl_{jt} + \varepsilon_{ijt}$$

where *PctMinorityInstDep*, *PctMinorityFamily*, *PctMinorityIndust* and *PctMinorityFund* are the percentage of minority directors related to banks/insurance companies, individuals/families, industrial companies and foundations/research institutes, respectively; we exclude the percentage of minority directors related to “active” institutional investors. The resulting impact on Tobin’s Q and the distance to default are reported in Columns (1) and (2), respectively. We use the GLS random effects estimator; control variables are included in the regressions, but not reported in this table. Z-statistics are in parentheses (p-values are in parentheses in the Wald tests), with \*, \*\*, and \*\*\* denoting significance at 10%, 5% and 1% levels.

**Table 6** Impact of differences in degrees of “minority” and the role of “active” institutional shareholders

|   | Tobin’s Q             | Distance to default |
|---|-----------------------|---------------------|
|   | (1)                   | (2)                 |
| <i>Panel A:</i> Minority directors related to minority shareholders holding various levels of shares            |                       |                     |
| MinorityInf1  | 0.0137***<br>(5.58)   | 0.131***<br>(2.88)  |
| Minority1to5  | 0.0202***<br>(9.91)   | 0.135**<br>(2.21)   |
| Minority5to10   | -0.0270***<br>(-2.77) | 0.112**<br>(2.21)   |
| Control variables   | Yes                   | Yes                 |
| <i>Panel B:</i> Minority directors related to “active” institutional investors holding various levels of shares |                       |                     |
| MinorityInf1 (v1)   | -0.00374<br>(-0.72)   | 0.0296<br>(0.49)    |
| MinorityInf1*DInstActive (v2)   | 0.0160**<br>(2.44)    | 0.183**<br>(2.18)   |
| MinorityInf5 (v3)   | -0.0244*<br>(-1.90)   | -0.0846<br>(-1.38)  |
| MinorityInf5*DInstActive (v4)   | 0.0583***<br>(4.23)   | 0.338***<br>(3.71)  |
| MinoritySup5  | -0.0373**<br>(-2.28)  | 0.127<br>(0.86)     |
| Control variables   | Yes                   | Yes                 |
| <i>Wald test</i>  |                       |                     |
| v1+ v2=0  | 0.0123***<br>[0.00]   | 0.212***<br>[0.00]  |
| v3+ v4=0  | 0.0339***<br>[0.00]   | 0.254***<br>[0.00]  |

*Notes.* The regressions in this table investigate the impact of minority directors for different degrees of “minor” on market valuation (Column (1)) and on the distance to default (Column (2)). Variables are defined as in Table 1. Panel A reports results where minority directors are related to minority shareholders holding varying levels of shareholdings. We use the indices “*MinorityInf1*”, “*Minority1to5*” and “*Minority5to10*” to measure the presence/influence of minority directors related to shareholders holding less than 1%, between 1% and 5%, and between 5% and 10% of shareholdings, respectively. Panel B reports results of the potential channel of impact of minority directors related to “active” institutional shareholders, with different degrees of “minor”. The results in panel B are obtained by including in our regressions the interaction terms between the two indices of minority directors “*MinorityInf1*” and “*Minority1to5*” with the dummy variable *DInstActive*, which takes the value of one if at least one of the minority directors is related to an “active” institutional shareholder. The variable *DInstActive* is not interacted with “*Minority5to10*” as “active” institutional shareholder are absent in the 5 to 10% range of shareholdings. The corresponding Wald tests are reported at the end of Panel B. We use the GLS random effects estimator; control variables are included in the regressions, but not reported in this table. Z-statistics are in parentheses (p-values are in parentheses in the Wald tests), with \*, \*\*, and \*\*\* denoting significance at 10%, 5% and 1% level.

Table 7

## The role of the institutional and regulatory environment

| Marginal effects at        | Supervisory Power    |                     |                     |                     | Shareholder protection |                     |                     |                     |
|----------------------------|----------------------|---------------------|---------------------|---------------------|------------------------|---------------------|---------------------|---------------------|
|                            | SupPow<br>(Q0)       | SupPow<br>(Q25)     | SupPow<br>(Q50)     | SupPow<br>(Q75)     | Legal<br>(Q0)          | Legal<br>(Q25)      | Legal<br>(Q50)      | Legal<br>(Q75)      |
|                            | (1)                  | (2)                 | (3)                 | (4)                 | (5)                    | (6)                 | (7)                 | (8)                 |
| <i>Tobin's Q</i>           |                      |                     |                     |                     |                        |                     |                     |                     |
| Minority                   | -0.0187***<br>(0.00) | 0.0071***<br>(0.00) | 0.0175***<br>(0.00) | 0.0278***<br>(0.00) | 0.0303***<br>(0.00)    | 0.0198***<br>(0.00) | 0.0136***<br>(0.00) | 0.0097***<br>(0.00) |
| <i>Distance to default</i> |                      |                     |                     |                     |                        |                     |                     |                     |
| Minority                   | 0.009<br>(0.27)      | 0.068***<br>(0.00)  | 0.092***<br>(0.00)  | 0.116***<br>(0.00)  | 0.019*<br>(0.17)       | 0.045***<br>(0.00)  | 0.061***<br>(0.00)  | 0.07***<br>(0.00)   |

*Notes.* This table reports marginal effects for different levels of the institutional and regulatory environment. The results in this table are computed from Table A4 in Appendix A. Variables are defined as in Table 1. Columns (1) to (4) report the marginal effects evaluated at quantile levels for the index of strength of supervisory regime, which is measured by the index *SupPow* from the World Bank's 2013 Bank Regulation and Supervision database. Columns (5) to (8) show the marginal effects for different levels of minority shareholder protection, which is measured by the index *Legal*. The index *Legal* combines two 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)). P-values are in parentheses, with \*, \*\*, and \*\*\* denoting significance at 10%, 5% and 1% levels.

## Appendix A

**Table A1      Distribution of banks by country**

| Country        | Number of listed banks | Number of controlled banks in the sample | Total assets of sample banks divided by total assets of all listed banks in Bankscope (%) |
|----------------|------------------------|--|---|
| Austria        | 6                      | 5  | 99.91   |
| Belgium        | 4                      | 3  | 98.98   |
| Denmark        | 28                     | 10                                       | 97.95   |
| Finland        | 4                      | 3  | 81.36   |
| France         | 9                      | 9  | 100   |
| Germany        | 13                     | 10                                       | 32.01   |
| Greece         | 7                      | 6  | 99.15   |
| Ireland        | 2                      | 1  | 45.27   |
| Italy          | 19                     | 12                                       | 11.57   |
| Luxembourg     | 2                      | 0  | 0.00  |
| Netherlands    | 5                      | 2  | 93.16   |
| Norway         | 2                      | 2  | 100   |
| Portugal       | 4                      | 3  | 93.97   |
| Spain          | 7                      | 5  | 48.11   |
| Sweden         | 5                      | 4  | 99.99   |
| Switzerland    | 16                     | 12                                       | 54.93   |
| United Kingdom | 12                     | 9  | 45.75   |
| <b>Total</b>   | <b>145</b>             | <b>96</b>                                | <b>70.71</b>  |

*Notes.* For each country, the table reports the number of listed banks, the number of banks with at least one controlling shareholder, and its sample's representativeness, which is given as the ratio of aggregate total assets of controlled banks contained in the sample to aggregate total assets of all listed banks provided by BvD Bankscope in 2013.

**Table A2**      **Relatedness of board directors to shareholders**

|                       | Number of directors |                  | Banks with minority directors |   |                         |                            |  | Banks without minority directors |   |                            |  |
|-----------------------|---------------------|------------------|-------------------------------|---|-------------------------|----------------------------|--|----------------------------------|---|----------------------------|--|
|                       | Total               | Average per bank | % of banks                    | % shares held by controlling shareholders | % of minority directors | % of independent directors | % of directors related to controlling shareholders | % of banks                       | % shares held by controlling shareholders | % of independent directors | % of directors related to controlling shareholders |
|                       | (1)                 | (2)              | (3)                           | (4)                                       | (5)                     | (6)                        | (7)  | (8)                              | (9)                                       | (10)                       | (11)   |
| Austria               | 91                  | 18.20            | 40                            | 36.95                                     | 14.35                   | 69.28                      | 16.38  | 60                               | 73.96                                     | 54.18                      | 45.82  |
| Belgium               | 44                  | 14.67            | 33.33                         | 51  | 17.65                   | 35.29                      | 47.06  | 66.67                            | 71.31                                     | 66.67                      | 33.33  |
| Denmark               | 105                 | 10.50            | 10                            | 45.84                                     | 10.53                   | 84.21                      | 5.26   | 90                               | 43.77                                     | 86.86                      | 13.14  |
| Finland               | 24                  | 8                | 66.67                         | 21.79                                     | 14.29                   | 71.43                      | 14.29  | 33.33                            | 100                                       | 90                         | 10   |
| France                | 102                 | 11.33            | 66.67                         | 45.10                                     | 38.09                   | 45.89                      | 17.06  | 33.33                            | 71.27                                     | 62.04                      | 37.96  |
| Germany               | 101                 | 10.10            | 20                            | 40.64                                     | 11.01                   | 79.61                      | 9.38   | 80                               | 65.50                                     | 78.42                      | 21.58  |
| Greece                | 87                  | 14.50            | 0                             | -   | -                       | -                          | -  | 100                              | 63.95                                     | 96.43                      | 3.57   |
| Ireland               | 11                  | 11               | 0                             | -   | -                       | -                          | -  | 100                              | 99.42                                     | 100                        | 0  |
| Italy                 | 130                 | 10.83            | 50                            | 58.20                                     | 20.29                   | 60.44                      | 19.28  | 50                               | 67.04                                     | 79.44                      | 20.56  |
| Netherlands           | 16                  | 8                | 50                            | 98  | 11.11                   | 88.89                      | 0  | 50                               | 97.61                                     | 85.71                      | 14.29  |
| Norway                | 13                  | 6.50             | 50                            | 34  | 25                      | 75                         | 0  | 50                               | 31  | 100                        | 0  |
| Portugal              | 64                  | 21.33            | 100                           | 39.30                                     | 7.73                    | 72.58                      | 19.70  | 0                                | -   | -                          | -  |
| Spain                 | 65                  | 13               | 100                           | 43.01                                     | 64.72                   | 25.72                      | 9.56   | 0                                | -   | -                          | -  |
| Sweden                | 49                  | 12.25            | 100                           | 19.22                                     | 24.20                   | 70.59                      | 5.21   | 0                                | -   | -                          | -  |
| Switzerland           | 87                  | 7.25             | 41.67                         | 46.57                                     | 32.29                   | 45.05                      | 22.67  | 58.33                            | 59.73                                     | 66.41                      | 33.59  |
| United Kingdom        | 103                 | 11.44            | 88.89                         | 35.77                                     | 47.02                   | 47.85                      | 5.13   | 11.11                            | 70.70                                     | 57.14                      | 42.86  |
| <b>Sample average</b> | <b>1092</b>         | <b>11.81</b>     | <b>48.96</b>                  | <b>43.96</b>                              | <b>24.16</b>            | <b>62.27</b>               | <b>13.64</b>                                       | <b>51.04</b>                     | <b>70.40</b>                              | <b>78.72</b>               | <b>21.28</b>                                       |

*Notes.* This table reports statistics on relatedness of board directors to shareholders for our sample of 96 European banks. The first two columns show the total and average number of directors per bank in each country. Columns (3) to (11) report statistics on the percentage of banks with and without minority directors, the percentage of shares held by controlling shareholders, the percentage of minority directors, the percentage of “independent” directors, and the percentage of directors related to controlling shareholders. The percentage of shares held by controlling shareholders is computed as the average of the percentage of shares held by controlling shareholders in banks with/without minority directors in each country. We calculate the percentage of minority directors, “independent” directors and directors related to controlling shareholders as the number of each category of directors divided by board size for each bank. We then calculate the average of these ratios for banks with/without minority directors in each country.

**Table A3 Correlation matrix**

|                   | (1)       | (2)       | (3)       | (4)       | (5)       | (6)     | (7)     | (8)       | (9)      | (10)   | (11)      | (12)   | (13) |
|-------------------|-----------|-----------|-----------|-----------|-----------|---------|---------|-----------|----------|--------|-----------|--------|------|
| (1) Tobin_Q       | 1         |           |           |           |           |         |         |           |          |        |           |        |      |
| (2) DD            | 0.673***  | 1         |           |           |           |         |         |           |          |        |           |        |      |
| (3) Minority      | 0.0560    | 0.171**   | 1         |           |           |         |         |           |          |        |           |        |      |
| (4) Independent   | 0.0423    | -0.150*   | -0.595*** | 1         |           |         |         |           |          |        |           |        |      |
| (5) BoardSize     | -0.165**  | -0.123*   | 0.125*    | -0.165**  | 1         |         |         |           |          |        |           |        |      |
| (6) Size          | -0.356*** | -0.513*** | 0.112     | 0.0110    | -0.000    | 1       |         |           |          |        |           |        |      |
| (7) Growth        | 0.163**   | 0.140*    | 0.0242    | -0.0461   | -0.217*** | -0.121* | 1       |           |          |        |           |        |      |
| (8) Capital       | 0.161**   | 0.611***  | 0.201***  | -0.201*** | 0.00777   | -0.0394 | -0.120* | 1         |          |        |           |        |      |
| (9) Loan          | 0.0298    | -0.00739  | -0.0958   | 0.118     | -0.00587  | -0.0250 | -0.154* | -0.0236   | 1        |        |           |        |      |
| (10) Risk         | -0.0124   | -0.0381   | -0.0665   | 0.103     | 0.00578   | 0.0208  | -0.0373 | -0.0102   | 0.0134   | 1      |           |        |      |
| (11) Deposit      | -0.183**  | -0.404*** | -0.259*** | 0.206***  | -0.223*** | -0.0233 | 0.146*  | -0.106*** | 0.264*** | 0.0253 | 1         |        |      |
| (12) Operating    | 0.00243   | -0.0323   | -0.0552   | 0.0997    | 0.0191    | 0.0264  | -0.0190 | -0.0327   | 0.0699   | 0.0080 | 0.0378    | 1      |      |
| (13) OneTierBoard | 0.107     | 0.177**   | 0.270***  | -0.0369   | 0.0656    | -0.0587 | 0.0899  | 0.167**   | -0.0915  | 0.0500 | -0.273*** | 0.0491 | 1    |

*Notes.* This table shows the correlation matrix for bank-level variables. The variables “*Minority*” and “*Independent*” are the indices of relatedness. All variables are as defined in Table 1. \*, \*\*, and \*\*\* denote significance at 10%, 5% and 1% levels, respectively.

Table A4

## Role of the institutional and regulatory environment

| Dependent variable   | Tobin's Q             |                        | Distance to default |                    |
|----------------------|-----------------------|------------------------|---------------------|--------------------|
|                      | Y = SupPow            | Y = Legal              | Y = SupPow          | Y = Legal          |
|                      | (1)                   | (2)                    | (3)                 | (4)                |
| Minority             | -0.0187***<br>(-3.12) | 0.0303***<br>(6.30)    | 0.00959<br>(0.27)   | 0.0194<br>(0.66)   |
| Minority * Y         | 0.00518***<br>(4.71)  | -0.00208***<br>(-4.44) | 0.0118*<br>(1.89)   | 0.00516*<br>(1.72) |
| Control variables    | Yes                   | Yes                    | Yes                 | Yes                |
| Observations         | 282                   | 282                    | 271                 | 271                |
| <i>FE vs RE test</i> |                       |                        |                     |                    |
| Chi 2 - stat         | 10.689                | 12.485                 | 8.761               | 9.539              |
| p-value              | 0.2200                | 0.2539                 | 0.1875              | 0.2989             |

*Notes.* The regressions in this table examine the effects of different levels of institutional and regulatory environment on the impact of minority directors on market valuation (Columns (1) and (2)), and distance to default (Columns (3) and (4)). The variable *Minority* is the index measuring the presence/influence of minority directors on the board. All variables are as defined in Table 1. We augment Equation (1) with interaction terms between the index *Minority* and a variable capturing alternatively the strength of the supervisory regime (*SupPow*), and the level of shareholder protection (*Legal*). The marginal effects of these regressions are reported in Table 7. We use the GLS random effects estimator; control variables are included in the regressions, but not reported in this table. The results of robust Hausman tests (*fixed effects vs random effects*) are reported in the last two lines. Z-statistics are in parentheses, with \*, \*\*, and \*\*\* denoting significance at 10%, 5% and 1% levels.

## Appendix B

### B1. Example of a control chain

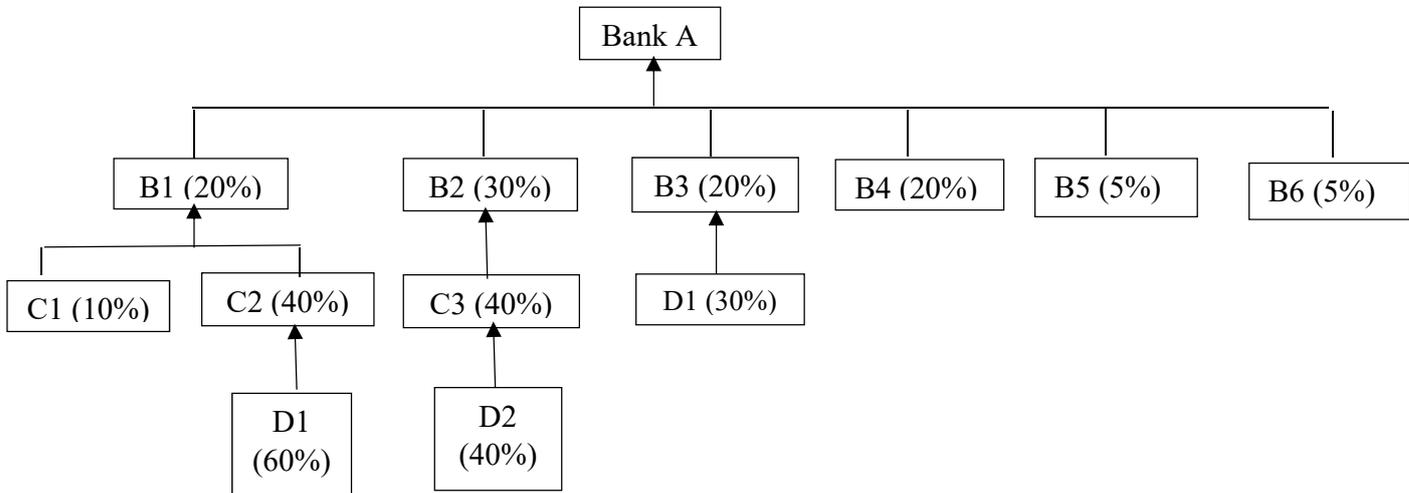


Figure B1 Example of a control chain.

This figure provides an example of a control chain for a bank with a pyramidal structure. We have three owners at the 10% control threshold: (i) one direct owner: B4, with 20% of voting rights; (ii) two indirect ultimate owners: D1 and D2, with respectively 40% (20% + 20%) and 30% of voting rights.

### B2. The Banzhaf Power Index

The construction of the Banzhaf Power Index (BPI) is based on the underlying theory of coalitions. In this, a *coalition* is any group of players that join forces to vote together. The total number of votes controlled by a coalition is called the *weight of the coalition*. A *winning coalition* is one with enough votes to win. A *losing coalition* is one without enough votes to win. A player whose desertion of a winning coalition turns it into a losing one is called a *critical player*. A player's power is proportional to the number of times the player is critical. The *quota* is the minimum number of votes needed to pass a decision; the quota is 51.

We provide an example based on our Figure B1 by calculating the BPI of direct shareholders (B1 to B6) and ultimate owners (B4, D1 and D2). As we need to sum up to 100% of shares to compute the BPI at the first level of the control chain, two BPI will be computed for direct shareholders that are also ultimate owners (for example B4); we then keep the BPI associated with their ultimate owner position.

Step 1: We determine all *winning* coalitions in Tables B1, i.e. coalitions with a total of shares greater than 51%.

**Table B1** *Winning coalitions at the first and last levels of the control chain*

|  | Number of shareholders in a winning coalition          |  |  |  |   |
|--|--|--|--|--|---|
|  | 2 shareholders   | 3 shareholders   | 4 shareholders   | 5 shareholders   | 6 shareholders  |
| <u>Panel A: Winning coalitions at the first level of the control chain (direct shareholders)</u> |  | { <u>B1</u> , <u>B2</u> , <u>B3</u> }<br>{ <u>B1</u> , <u>B2</u> , <u>B4</u> }<br>{ <u>B1</u> , <u>B2</u> , <u>B5</u> }<br>{ <u>B1</u> , <u>B2</u> , <u>B6</u> }<br>{ <u>B1</u> , <u>B3</u> , <u>B4</u> }<br>{ <u>B2</u> , <u>B3</u> , <u>B4</u> }<br>{ <u>B2</u> , <u>B3</u> , <u>B5</u> }<br>{ <u>B2</u> , <u>B3</u> , <u>B6</u> }<br>{ <u>B2</u> , <u>B4</u> , <u>B5</u> }<br>{ <u>B2</u> , <u>B4</u> , <u>B6</u> } | { <u>B1</u> , <u>B2</u> , <u>B3</u> , <u>B4</u> }<br>{ <u>B1</u> , <u>B2</u> , <u>B3</u> , <u>B5</u> }<br>{ <u>B1</u> , <u>B2</u> , <u>B3</u> , <u>B6</u> }<br>{ <u>B1</u> , <u>B2</u> , <u>B4</u> , <u>B5</u> }<br>{ <u>B1</u> , <u>B2</u> , <u>B4</u> , <u>B6</u> }<br>{ <u>B1</u> , <u>B2</u> , <u>B5</u> , <u>B6</u> }<br>{ <u>B1</u> , <u>B3</u> , <u>B4</u> , <u>B5</u> }<br>{ <u>B1</u> , <u>B3</u> , <u>B4</u> , <u>B6</u> }<br>{ <u>B2</u> , <u>B3</u> , <u>B4</u> , <u>B5</u> }<br>{ <u>B2</u> , <u>B3</u> , <u>B4</u> , <u>B6</u> }<br>{ <u>B2</u> , <u>B3</u> , <u>B5</u> , <u>B6</u> }<br>{ <u>B2</u> , <u>B4</u> , <u>B5</u> , <u>B6</u> } | { <u>B1</u> , <u>B2</u> , <u>B3</u> , <u>B4</u> , <u>B5</u> }<br>{ <u>B1</u> , <u>B2</u> , <u>B3</u> , <u>B4</u> , <u>B6</u> }<br>{ <u>B1</u> , <u>B2</u> , <u>B4</u> , <u>B5</u> , <u>B6</u> }<br>{ <u>B1</u> , <u>B2</u> , <u>B3</u> , <u>B5</u> , <u>B6</u> }<br>{ <u>B1</u> , <u>B3</u> , <u>B4</u> , <u>B5</u> , <u>B6</u> }<br>{ <u>B2</u> , <u>B3</u> , <u>B4</u> , <u>B5</u> , <u>B6</u> } | { <u>B1</u> , <u>B2</u> , <u>B3</u> , <u>B4</u> , <u>B5</u> , <u>B6</u> } |
| <u>Panel B: Winning coalitions at the last level of the control chain (ultimate owners)</u>      | { <u>D1</u> , <u>D2</u> }<br>{ <u>B4</u> , <u>D1</u> } | { <u>B4</u> , <u>D1</u> , <u>D2</u> }  |  |  |   |

*Notes.* This Table presents the coalitions at the first and last levels in the control chain that total more than 51% of shares, based on Figure B1 in Appendix B. Voting rights of direct shareholders B1, B2, B3, B4, B5, B6 are 20, 30, 20, 20, 5 and 5, respectively. Voting rights of ultimate owners B4, D2 and D1 are 20, 30, and 40, respectively. Critical players are underlined.

Step 2: Critical players are determined for each winning coalition. We count the number of votes the coalition has without a particular Player, and if the coalition has no longer enough votes to win (i.e. less than 51% of shares), then that Player is critical. In our example, the critical players are underlined in Table B1.

Step 3: We determine the number of times all players are critical: 54 at the first level in the control chain and 5 at the last level (see Table B1).

Step 4: We determine the number of times Player P is critical. At the first level of the control chain, we have B1, B3 and B4 that are critical 9 times, B2 21 times, B5 and B6 3 times. For the ultimate owners, D1 is critical 3 times, D2 and B4 1 time.

Step 5:  $BPI(P)$  is the number of times Player P is critical (from Step 4) divided by the number of times all players are critical (from Step 3). For the first level in the control chain, we have:  $BPI(B1) = BPI(B3) = BPI(B4) = 9/54 = 16.7\%$ ;  $BPI(B2) = 21/54 = 38.9\%$ ; and  $BPI(B5) = BPI(B6) = 3/54 = 5.6\%$ . For the ultimate owners, we have:  $BPI(D1) = 3/5 = 60\%$ ;  $BPI(D2) = 1/5 = 20\%$ ;  $BPI(B4) = 1/5 = 20\%$ . For B4, we retain the BPI of the ultimate owner position, i.e. 20%.

### B3. Construction of the indices of relatedness of directors

We assign weights to the three factors we consider to characterize the strength of the relatedness between a director and an ultimate owner, by giving a weight of one (as compared to zero) for each of the following criteria: (1) the director is considered to be related to a direct or indirect ultimate owner; (2) the related director is a Chairman or a Vice Chairman of the board; and (3) the relatedness between the director and the ultimate owner is current. For each director, we sum up the weights for all the connections they have with ultimate owners to obtain the “score of relatedness” of a director (see Table B2).

**Table B2** Score of relatedness of director

|                      | Not related<br>(0) | Related (1)                |          |                         |          |
|----------------------|--------------------|----------------------------|----------|-------------------------|----------|
|                      |                    | Chairman/Vice Chairman (1) |          | Other board members (0) |          |
|                      |                    | Present (1)                | Past (0) | Present (1)             | Past (0) |
| Score of relatedness | 0                  | 3                          | 2        | 2                       | 1        |

*Notes.* This table explains the way the score of relatedness of a director is calculated. We give a weight of one (as compared to zero) for each following criteria: (1) if directors are related to minority/controlling shareholders; (2) if the related director is Chairman or Vice Chairman of the board; (3) if the relationship is in the present.

A “score of relatedness” is then computed at the bank level by taking the average of the “score of relatedness” of all directors. We then use these scores to compute our indices. If the “score of relatedness” of a bank is zero, it indicates that its board of directors is totally independent from shareholders, and we set the index of relatedness at 0. For banks with a positive “score of relatedness”, we rank them into deciles to obtain an index of relatedness that ranges from 1 to 10. Finally, our index of relatedness of directors to shareholders varies from 0 to 10. The higher the index, the more the board of directors is related to shareholders. We compute the index  $Minority_i$  that measures the presence/influence of minority directors in their board, and the index  $Controlling_i$  that measures the presence/influence of directors that are related to controlling ultimate owners. The presence of independent directors is computed by subtracting the average of the two indices of relatedness of board to controlling and to minority shareholders from the highest value of the index (i.e. from 10):

$$Independent_i = 10 - \frac{(Minority_i + Controlling_i)}{2}$$

Hence, the higher the index of independence, the more independent from shareholders is the bank.