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Does board diversity mitigate risk? The effect of homophily and social ties on risk-taking in financial institutions

Noora Alzayed [a], Bernardo Batiz-Lazo [c,d,*], Rasol Eskandari [b]

[a] University of Bahrain, Accounting Department, Kingdom of Bahrain
[b] Salford Business School, University of Salford, Salford, United Kingdom
[c] Newcastle Business School, Northumbria University, United Kingdom
[d] Facultad de Economía y Negocios, Universidad Anáhuac, Mexico

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ABSTRACT

Research Question/Issue: This study investigates whether greater board diversity and looser social network ties have an impact on board independence and risk-taking in US financial institutions from 2010 to 2022.The econometric strategy involved structural equation models, where risk as a dependent variable was measured by two latent variables and a total of five measures of risk. Several aspects of board diversity were utilized including gender, social, experience and educational backgrounds.

Research Findings/Insights: The findings suggested that diversity in nationality had a significant positive effect, while age and gender diversity had a minor effect on mitigating risk. Two measures of educational diversity had mixed results while suggesting that financial education is associated with greater risk. Also, social networks had a significant effect on risk-taking, especially on market risk.

Theoretical/Academic Implications: The study highlights the importance of maintaining a sensible level of board diversity across all aspects to avoid issues of cohesion and poor communication. This implication arises from the conclusion that too diverse a board might suffer from the lack of cohesion and communication, while a board with very low diversity will not be able to benefit from diverse backgrounds and expertise.

Practitioner/Policy Implications: Results from this study recommend incorporating social networking requirements in defining the independence of directors.

1. Introduction

Research in this text suggests that corporate governance arrangements for financial institutions differ from those of non-financial firms. This as financial institution boards of directors are typically larger, more independent, and subject to greater scrutiny (de Andres et al., 2012; García-Meca et al., 2015). Indeed, the Basel Committee on Banking Supervision (2006), (2015) emphasizes the importance of corporate governance in financial institutions and calls for better understanding of its relationship with risk-taking (Berger et al., 2014; Laeven and Levine, 2009). But despite many corporate governance codes of conduct across the world assigning the responsibility of monitoring and ensuring the effectiveness of risk management to the board of directors in financial institutions (Basel Committee on Banking Supervision, 2015; Financial Reporting Council, 2018; OECD, 2015), most systematic empirical studies of corporate

* Corresponding author at: Newcastle Business School, Northumbria University, United Kingdom.
E-mail address: bernardo.batiz-lazo@northumbria.ac.uk (B. Batiz-Lazo).

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governance examine performance within the non-financial sector (Bernile et al., 2018; Harjoto et al., 2018; Poletti-Hughes and Briano-Turrent, 2019), while only a handful of systematic studies address the impact of board diversity on risk-taking in financial institutions (Akbar Kharabsheh et al., 2017; Minton et al., 2014; Wang and Hsu, 2013).

Research on governance issues resulting from the diversity of boards of directors' dates to the influential contributions of Carter et al. (2003) and Fields and Keys (2003). This research marked a departure from the prevailing agency theory perspective focused on shareholder value (e.g. Daily et al., 2003 and Hillman and Thomas 2003). The study of board diversity has since become an important area of investigation in understanding the dynamics and effectiveness of corporate governance practices.

Exploring the heterogeneity of boards can include factors such as directors' age, gender, ethnicity, experience, and education (Anderson et al., 2011). The existing literature on corporate leadership diversity primarily focuses on gender diversity (Teodósio, 2021), but recent research suggests that other dimensions such as age, nationality, ethnicity, professional background, and cognition should also be considered.

For instance, a review conducted by Kent Baker et al. (2020) show that studies on board diversity focus mainly on gender diversity, while less attention is given to age, nationality, ethnicity, professional background, and cognition. Studies by Bernile et al. (2018) and Harjoto et al. (2018) are example of some of the few to investigate the multi-faceted impact of board diversity, including age, gender, ethnicity, education, and experience, on risk-taking. They suggest that gender diversity might not be the most important dimension to explore the link between board diversity and risk-taking. These studies highlight the importance of broadening the study of board diversity and its impact on risk-taking. Indeed, recent research by Bernile et al. (2018) was, to the best of our knowledge, the only study to investigate the multi-sided effect of board diversity. However, this research was limited to non-financial firms, highlighting the need for further exploration within the financial sector.

This paper contributes to the extant literature on corporate governance by examining the impact of board diversity on risk-taking attitudes within the financial sector. Additionally and following Abdelbadie and Salama (2019), the study explores the effect of board diversity and social ties on risk-taking. Case studies in the aluminum industry documented in Perchard and MacKenzie (2020) suggested that the social homogeneity within boards of directors, known as homophily, is detrimental to the long-term performance of firms. Social capital theory suggests that directors with similar educational backgrounds, past experiences, gender and ethnicity are more likely to form ties and appoint individuals with similar background, which can influence individual behavior and the flow and quality of information, ultimately impacting on economic outcomes (Cohen et al., 2010; Granovetter, 2005; Hwang and Kim, 2009; Westphal et al., 2006). In this regard, Berger et al. (2013) study the impact of board diversity and social networks on executive appointments in banks, but to the best of our knowledge and with the exception of Abdelbadie and Salama (2019), there has been no attempt to explore the impact of board diversity and social ties on risk-taking by financial institutions.

In short, the research discussed in this paper makes a valuable contribution to the ongoing discussions in the field of corporate governance by examining the influence of board diversity and social ties on different measures of risk attitudes within financial institutions. The paper is structured to provide a contextual background in the following section, followed by a detailed description of the data and variables used in the empirical analysis. The fourth section presents the econometric strategy employed, and the final section offers preliminary conclusions.

2. Literature review

2.1. Social diversity and homophily

Walt and Ingley (2003) state that the concept of diversity in corporate governance relates to board composition and the varied combination of attributes, characteristics and expertise contributed by individual board members in relation to board process and decision-making. Theories behind board diversity include the social categorization framework developed by Turner (1987), which describes the circumstances under which people will classify themselves and others as a group using salient characteristics such as age and gender. This approach also states that people form a social identity by identifying themselves as members of a group (Tajfel and Turner, 1986). The theory predicts that categorizing people into groups could create biases, where people are likely to favor members of the group and perceive non-members as less trustworthy, dishonest, and less cooperative than group members (Tajfel, 1974). In addition, the similarity/attraction theory and the homophily principle (i.e. affinity for similar others) suggest that people are attracted to others who hold similar attributes to themselves such as attitudes and values (Berger et al., 2013; Byrne et al., 1966). These theories put forward the idea that diversity affects groups processes and performances by altering communications among members and by creating negative attitudes toward dissimilar individuals (Riordan and Shore, 1997). The homophily principles further suggest that homogeneity among directors has powerful implications for the information they receive, the attitudes they form, and the interactions they experience (Miller et al., 2001).

Homophily is also believed to be the basis of constructing network ties, where social capital theory suggests that people form social ties based on homophily and similarity of attributes such as age, gender or educational background (Berger et al., 2013; Miller et al., 2001). Consequently, social networks along with other aspects of diversity have the potential to have an impact on economic outcomes, individual behaviors and decision-making because they affect the flow and quality of information (Cohen et al., 2010; Granovetter, 2005; Hwang and Kim, 2009; Westphal et al., 2006).

Group diversity in boards of directors has advantages and disadvantages (Berger et al., 2013; Erhardt et al., 2003; Wang and Hsu, 2013; Webber and Donahue, 2001). Diversity is believed to enhance group performance because diverse groups with members from different perspectives have a greater pool of knowledge, skills, experiences and abilities (Anderson et al., 2011; Berger et al., 2013; Webber and Donahue, 2001), have more ability to solve complex issues and are able to come up with creative solutions to tasks (Harjoto et al., 2018). These advantages of diversity affect board performance by contributing to a more thorough decision-making process (Berger et al., 2013) and providing greater access to information which results in better oversight and monitoring

Table 1
Selected Research into Board Diversity and Risk-Taking in Financial Institutions.

Aspect of Board Diversity	Positive Impact (Decrease risk or superior performance)	Negative Impact on (Increased risk or poor performance)	No Impact on Risk (Undetermined)
Age	Berger et al. (2014)	Wang and Hsu (2013)	Wang and Hsu (2013)
Gender	García-Meca et al. (2015); Jizi and Nehme (2017)	Berger et al. (2014)	
Education	Berger et al. (2014); Anderson et al. (2011); Dionne et al. (2019)	Kirkpatrick (2009)	N/A
Nationality and Ethnicity	Bernile et al. (2018); Anderson et al. (2011)	García-Meca et al. (2015)	Harjoto et al. (2018)
Social Ties	Yoshikawa et al., (2020); Larcker et al. (2013); Khatami et al. (2016)	Kim (2005); Fan et al. (2019); Qiu et al. (2019)	N/A

Notes: Source: authors own estimates.

(Anderson et al., 2011; Erhardt et al., 2003). In addition, board diversity leads to social heterogeneity among directors which is helpful in bringing diverse social viewpoints and developing new strategies (Anderson et al., 2011).

On the other hand, group diversity might have an adverse impact on board functioning resulting from less cohesion that hinders the decision-making process (Harjoto et al., 2018; Wang and Hsu, 2013), complicated communications, coordination difficulties and increased internal conflict due to different backgrounds of directors (Anderson et al., 2011; Berger et al., 2013; Wang and Hsu, 2013). This suggests that too much diversity on a board of directors might lead to inability to reach consensus on risk policies and unbalanced decision-making processes which affects corporate outcomes such as risk-taking (Berger et al., 2013; Bernile et al., 2018).

But as mentioned above, board diversity can be reflected in a number of dimensions. Empirical studies that have examined board diversity include Harjoto et al. (2018) who found that diverse boards are more effective in monitoring corporate investment activities than homogeneous boards. In addition, Anderson et al. (2011) and Erhardt et al. (2003) show that board diversity is positively associated with firms' performance, while García-Meca et al. (2015) show that board diversity has less influence on bank performance in contexts of weaker regulatory and lower investor protection. García-Meca et al. (2015) also find that the type of diversity is important in banks. Berger et al. (2013), Bernile et al. (2018) and Abdelbadie and Salama (2019) are the only studies that combine board diversity and board networks to examine their effect on outsider appointment. They found that similarity of age and gender increase the chances of the outsider appointments and that greater social networks also increase the probability of an outside appointment. They also found that diverse boards adopt more persistent and less risky financial policies and have more efficient innovation processes.

These studies include several aspects of board diversity including age, gender, ethnicity, education and experience which are studied in the context of a single index. However, the validity of using a single index to capture a complex concept such as corporate governance has been questioned by researchers (Black, de Carvalho, Khanna, Kim, and Yurtoglu, 2017; Sheikh, 2019). Also, their measurements of the education and experience diversity only account for some aspects of these variables. For education diversity, they measure the diversity of institutions that granted Bachelor's degrees to directors, but ignore the level and number of qualifications and the financial education aspect. For experience diversity, they include two measurements which are the financial experience and the mean number of other boards on which current directors serve. The latter variable only measures current experience and does not take into account the past experiences of directors, it also does not take into account other professional experiences including legal, executive and consultation.

Table 2
List of Variables.

Variable	Definition	Database
Risk Measurement		
Z-score	Return on assets plus equity to asset ratio divided by the standard deviation of the return on assets over the period 2010–2022 (High value=low risk)	Bloomberg
ROAV	The standard deviation of the returns on Asset constructed over the period 2010–2022	Bloomberg
Leverage	The ratio of total debt to total assets	Bloomberg
Stock Return Volatility	Annualized standard Deviation of Daily stock returns	Bloomberg
Idiosyncratic Risk	The Standard deviation of the residuals derived from regressing daily stock return on market return in each year	Bloomberg
LV Stand-Alone Risk	A latent variable that represents the stand-alone risk generated from the measurement model based on three risk measurements; *ROAV, Leverage* and *Z-score*.	Structed Equational Model
LV Market Risk	A latent variable that represents market risk generated from the measurement model based on wo risk measurements; *Stock Return Volatility* and *Idiosyncratic Risk*.	Structed Equational Model
Board Diversity and Network		
Age Diversity	The standard deviation of the ages of all directors in the board	BoardEx
Gender Diversity	Percentage of female directors to the total number of directors	BoardEx
Nationality Diversity	Proportion of Directors from different countries	BoardEx
Financial Education Diversity	The percentage of directors on board that hold a financial or accounting degree or certificate	BoardEx
Qualification Diversity	The measure of dispersion of the number of qualifications held by Directors from the mean. This is a count of all qualifications of degree level including all professional qualifications.	BoardEx
Financial Experience Diversity	The percentage of directors with financial experience that are Former bank executives, Executives of nonbank financials, Finance executives of nonfinancial firms, academic position in a related field, or Professional investors	BoardEx
Professional Experience Diversity	The Herfindahl index based on the number of directors' expertise within five categories: consulting, legal, management (executives), and other expertise (i.e. research, technology, medical, etc.). For example, 2directors with legal experience and 3 directors with consulting experience would be defined as (2/5)^2 + (3/5)^2.	BoardEx
Inside Network	The log of the total network size of directors that share professional and/or educational background with another director within the board	BoardEx
Outside Network	The log of the total outside network which is the numbers of overlaps through employment and education as provided by BoardEx.	BoardEx
Firm Control Variables		
Firm size	the log of total assets in billion US dollars	Bloomberg
Market to Book	Market capitalisation to the book value of equity	Bloomberg
Board Size	Number of Directors on the company's board	Bloomberg
Board Independence	Independent directors as a percentage of total board membership.	Bloomberg
CEO Duality	Indicates whether the company's Chief Executive Officer is currently also chairperson of the Board. Takes the value of 0 when the CEO and chairperson positions are separated and 1 otherwise	Bloomberg

Table 1 further shows that diversity in the composition of the board of directors has been measured in a number of ways. Table 1 also suggests mixed results from fieldwork. Each of these dimensions is discussed in greater detail below where it will be evident that some of them have received little attention.

2.2. Age and Gender

As noted in Table 1, age as a component of board diversity has received widespread attention. Berger et al. (2014) found that greater board age decreases risk-taking. In addition, Wang and Hsu (2013) show that age heterogeneity results in good operational risk management but has an adverse impact on the monitoring function of the boards. However, Harjoto et al. (2018) found no association between several aspects of board diversity including age and board performance.

Gender diversity of boards is another aspect that has been widely researched. Altunbaş et al. (2022) show that gender diversity has mitigating effects on climate change. They believe that the negative effect is due to the pro-environmental traits of female personalities, such as social sensitivity and risk-aversion, which help female managers better contain the environmental impact of their decisions about how to implement the board's strategy.

In addition, García-Meca et al. (2015) provide empirical evidence that gender diversity increases performance in banks and qualified women have unique characteristics that create additional value. Their results also suggest that women on boards of banks enhance governance. Also, Jizi and Nehme (2017) found that the presence of women boards favourably impact the risk of firms by reducing stock return volatility. However, Berger et al. (2014) justify the negative impact of female presence on portfolio risk by the lower experience of female directors in comparison to their male counterparts. On the other hand, Farag and Mallin (2017) found that female directors are not risk averse in European banks.

2.3. Education

Table 1 also suggest there has been an interest in exploring the effects of formal education background on risk and performance. The Basel Committee recommends banks to have adequate collective knowledge of each of the types of material financial activities the bank intends to pursue. They also recommend the board to have sufficient knowledge and expertise to enable effective governance and oversight (Basel Committee on Banking Supervision, 2006). In addition, the Organisation for Economic Co-operation and Development (OECD) provide a report of the financial crisis. They state that one of the causes of the crisis was boards' limited knowledge and poor understanding of risk managements (Kirkpatrick, 2009).

Education diversity has been measured differently in different studies. Berger et al. (2014) measured education diversity by the presence of executives with doctoral degrees and found that it is associated with a decrease in portfolio risk. They believe that this result implies that educated directors apply better risk management techniques. In addition, Anderson et al. (2011) measure education diversity based on the educational levels and types of degrees the directors have achieved. For education levels, they use education categories; no college degree, a Bachelor's degree only, or a Master's degree or beyond. For the types of degrees, they calculate the percentage of directors with an MBA degree, a technical degree, a law degree, or a liberal arts degree. They found that board diversity including education diversity has a positive relationship with firms' performance. Dionne et al. (2019) study the effect of financial knowledge on risk management. In their study, financial knowledge is measured by financial experience, financial education, or accounting background. Their findings show that directors' financial knowledge increases a firm's value and that financially educated directors are more effective in hedging activities. They believe that their findings have regulatory implications suggesting that experience and education dimensions should be added to corporate governance regulation for better governance.

Table 3
Descriptive Statistics.

	N	Min	Max	Mean	Std. Deviation
IdiosyncraticRisk	4521	0.09	48.54	2.76	5.51
Zscore	4521	-2.18	1020.335	34.48	107.59
ROAVolatility	4521	0.00	30.35	1.43	3.63
Leverage	4521	0.00	94.31	12.10	15.91
StockReturnVolatility	4521	0.04	204.06	12.46	23.74
AgeDiversity	4521	3.00	14.80	7.72	2.38
GenderDiversity	4521	0.00	40.00	11.84	9.80
NationalityDiversity	4521	0.00	0.60	0.04	0.11
QualificationDiversity	4521	0.40	2.20	1.08	0.35
FinancialEducationDiversity	4521	0.00	0.50	0.11	0.10
FinancialExperienceDiversity	4521	0.00	0.28	0.03	0.06
ProfessionalExperienceDiversity	4521	0.21	1.00	0.44	0.14
OutsideNetwork	4521	52	70592	11030.47	12020.09
InsideNetwork	425	10	74	31.01	20.89
BoardIndependence	4521	37.50	94.11	79.32	11.85
BoardSize	4521	5	20	10.55	2.89
CEODuality	4521	0	1	0.40	0.48
FirmSize	4521	7.86	12.32	9.59	0.81
MarkettoBook	4521	0.10	15.01	1.55	1.51

2.4. Financial Experience

The diversity of board experience is a very important board characteristic that has been found to have a significant effect on various aspects of the firm. Harjoto et al. (2018) found that task-oriented diversity including expertise diversity has a negative impact on suboptimal investment, which suggests that boards with diverse experiences are more effective in overseeing corporate investment activities. They categorize board experience as financial, consulting, legal, management, and other expertise. Similarly, Anderson et al. (2011) used four measures of experience which are the percentage of directors that are CEOs of other firms, the functional background of directors, the heterogeneity of director career development, and the number of senior positions that each director has held during their career. They found that board diversity including experience have a positive effect on firm performance. In addition, Cao et al. (2019) found that foreign experience of directors reduces stock prices crash risk and this effect is more pronounced for firms with more agency problems and weaker corporate governance.

For financial institutions, financial experience is more important than the other sectors. The OECD report on the causes of the 2007–2009 financial crisis argued that the lack of financial expertise of directors played a major role in the difficulties endured by financial instututions during the crisis (Kirkpatrick, 2009). The report also explains that financial expertise among directors is low in financial institutions in the US (Kirkpatrick, 2009). Minton et al. (2014) found that the presence of financial experts is positively related to risk-taking using several measures of risk. They explain that this result is due to the fact that financially experienced directors have a better understanding of complex investments and encourage bank management to increase risk-taking. In their study, a director is considered a financial expert if the director has held an executive position at a banking institution, holds an executive position at a non-bank financial institution, holds a finance-related position, accountant, treasurer of a non-financial firm, holds an academic position in a related field, or works as a hedge fund or private equity fund manager.

2.5. Nationality and ethnicity

Most studies that investigate board diversity do not include the race, ethnicity or nationality of directors, the empirical studies on the impact of ethnicity and nationality on risk-taking are even more limited. Bernile et al. (2018) is one of the limited studies that incorporates a diversity index to study board diversity's effect on risk-taking in non-financial firms. Their diversity index includes the ethnicity of directors and found that greater board diversity leads to lower risk-taking. In addition, Harjoto et al. (2018) investigate the effect of relation-oriented diversity including race on board performance in corporate investment oversight. Their findings show no association between relation-oriented diversity and board performance. They include five categories of race which are Asian, Black, Caucasian, Hispanic, and Native American.

Studies that investigate the effect of board race and nationality on a firm's performance include Anderson et al. (2011) who measure board diversity along several dimensions including board race, they found that board diversity has a positive effect on a firm's performance. They explain that these results are due to the fact that directors from different cultural backgrounds provide new perspectives and problem-solving skills to board discussions. Similarly, Erhardt et al. (2003) found that ethnic diversity has a positive effect on firms' financial performance. On the other hand, García-Meca et al. (2015) show that diversity in nationality decreases bank performance and explain that this due to the fact that demographic differences lower cohesion between groups which leads to slowing

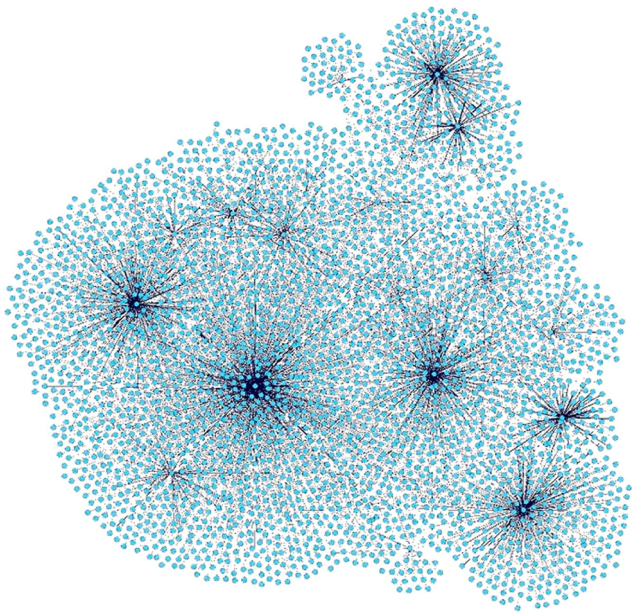

Fig. 1. Director network.

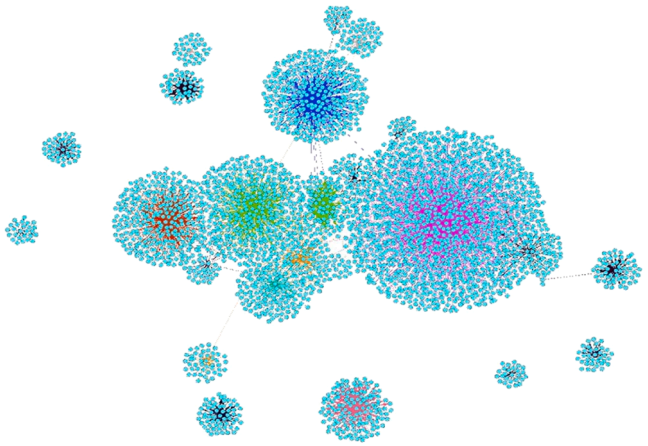

Fig. 2. Financial institutions network.

the decision-making process and eventually reduces bank performance.

Based on the above discussed aspects of board diversity, we distil our main working hypothesis, namely:

H1. : Greater board diversity reduces risk taking in financial institutions.

2.6. Social ties

Board networks have been shown to influence strategic decisions and corporate policies. The effect of social networks has been studied across several aspects including merger and acquisition (El-Khatib et al., 2015), bond yield spreads (Qiu et al., 2019), preferential source of financing (Engelberg et al., 2012), both stock option pay and board reform (Yoshikawa et al., 2020), executive appointments (Berger et al., 2013), credit ratings (Khatami et al., 2016) and firm performance (Fan et al., 2019; Kim, 2005; Larcker et al., 2013; Zona et al., 2015). However, few studies have examined the effect of board social networks on risk-taking of financial institutions. These studies include Abdelbadie and Salama (2019) who found that well connected directors mitigate their credit and insolvency risk. However, this study focuses on banks only.

Figs. 1 and 2 had a preliminary look at the behavior of social ties within the selected sample (details of the sample are provided in the third section below). Fig. 1 shows at least eleven clusters of directors' networks that collect 3327 individual interlocks, which suggests high connectedness and possibly indirect ties. While Fig. 2 visualizes the connections among financial institutions for the period from 2010 to 2022 and suggest that there are at least six clusters of financial institutions' ties.

Social networks are believed to provide firms with strategic resources that help in creating competitive advantages (Yoshikawa et al., 2020). However, existing studies have different results on the benefits of social networks. In studying the effect of social networks on firm performance, Larcker et al. (2013) found that firms with well-connected boards earn higher returns. However, Kim (2005) found that while a moderate level of board network enhances firms' performance, too cohesive a board network destroys it. Similarly, Fan et al. (2019) found that social ties tend to destroy firm value whereas professional ties do not.

Qiu et al. (2019) investigate the effect of social networks on the cost of debt capital. They found that networks of top management teams have a negative correlation with bond yield spreads. They also found that top management team networks increases a firm's access to media coverage, political ties, and financial ties, which in turn can help lower bondholder's risk premiums. They believe that these results imply that networks of firms' top management can help obtain more resources due to improved reputation and image. Similarly, Khatami et al. (2016) found that the social connection between firms and the rating agencies has a positive effect on the credit ratings assigned to the company's issues. Finally, Yoshikawa et al. (2020) show that social networks carry information to directors that affects the director's interests and hierarchical power, which in turn affects the actions of adopting new practices.

H2. : Diffused directors' social networks reduce risk taking in financial institutions.

3. Empirical support

3.1. Sample data

The data covers the period from 2010 to 2022. It includes publicly listed financial institutions in US markets. The financial data was collected from Bloomberg, while the data related to the board diversity variables and board networks was obtained from BoardEx. The selection of financial institutions is based on the Global Industry Classification System (GICS), which includes banks, insurance, and diversified financial companies.

3.2. Dependent variable: risk-taking

Proxies for risk-taking measurements built on prior literature while considering that there were only a handful of studies that explored measures of risk and board characteristics or diversity. Specifically, following Ho et al. (2013) estimates of the impact of board composition on alternative risk measures, we included two types of risk-taking measurements, namely market risk and specific risk. Incorporating two types of risk enabled to explore a firm's level and the firm's sensitivity to market.

Two risk measurements approximated market risk, namely: **Stock Return Volatility** (Bernile et al., 2018; Cain and McKeon, 2016; Cassell, Huang, Manuel Sanchez, & Stuart, 2012; Christy et al., 2013; Deyoung et al., 2013; Erkens, Hung, and Matos, 2012; Ferris, Javakhadze, and Rajkovic, 2017; Guay, 1999; Hutchinson et al., 2015; Jizi and Nehme, 2017; Minton et al., 2014; Nakano and Nguyen, 2012; Pathan, 2009; Saunders et al., 1990; Sheikh, 2019) and **Idiosyncratic Risk** (Akbar et al., 2017; Cassell et al., 2012; Deyoung et al., 2013; Ferreira and Laux, 2007; Pathan, 2009; Sheikh, 2019; Wu, 2016). In our study, Stock Return Volatility was calculated as the annualized standard deviation of the daily stock returns, and the Idiosyncratic Risk was measured as the standard deviation of the residuals derived from regressing daily stock return on market return in each year.

To approximate Specific Risk, we use three risk measurements namely Z-score (Akbar et al., 2017; Berger et al., 2016; Hutchinson et al., 2015; Pathan, 2009), Leverage (Anginer, Demirguc-Kunt, Huizinga, and Ma, 2018; Bernile et al., 2018; Cassell et al., 2012; Ferris et al., 2017; Ho et al., 2013; Minton et al., 2014), and Return on Assets Volatility (Ferris et al., 2017; Ho et al., 2013; John et al., 2008; Laeven and Levine, 2009; Mishra, 2011; Nakano and Nguyen, 2012; Pathan, 2009; Poletti-Hughes and Briano-Turrent, 2019). The Z-score was calculated as the return on assets plus equity to assets ratio divided by the standard deviation of return on assets, and high score of Z-score indicate lower risk. Return on Assets Volatility and Leverage are calculated as the standard deviation of return on assets and the ratio of total debt to total assets respectively.

3.3. Independent variables: board diversity

To cover all aspects of board diversity, we include seven measurements to account for five types of board diversity. The first aspect of diversity is gender diversity calculated as the percentage of female directors to the total number of directors. Second, age diversity is measured as the standard deviation of the ages of all directors in the board following Anderson et al. (2011), Bernile et al. (2018) and Wang and Hsu (2013). Third, nationality diversity is measured as the proportion of directors from different countries.

Fourth, we use two measurements of educational diversity; the diversity of qualifications and financial knowledge. For qualification diversity, we calculate the standard deviation of the number of all qualifications held by directors, including professional qualifications. The financial knowledge diversity is calculated as the percentage of directors on a board that hold a financial or accounting degree or certificate.

For experience diversity, we calculate financial experience and professional experience. Financial experience is calculated as the percentage of directors with previous financial experience. To measure professional experience, we use the Herfindahl index based on percentage of directors' expertise within five categories: financial, consulting, legal, management (executives), and other expertise (research, technology, medical, etc.) following Harjoto et al. (2018).

Figs. 1 and 2 present a preliminary analysis of institutions' and directors' social ties within the sample. Fig. 1 shows 3327 social ties between directors, with at least 11 main clusters. Most clusters in this map are connected to each other, which suggests the presence of indirect networking between directors. Fig. 2 shows social networks of 1912 firms in the sample. There are at least six main clusters with a range between two to six sub-clusters. Unlike the directors' networking map, the institutions' networking map shows that there are isolated clusters that are not connected to other groups. The analysis suggests that social ties is an important aspect and that we can regard our sample as highly connected.

We used two measurements as proxy for board network. The first was inside network size. Following Fan et al. (2019) in studying Board and CEO ties, the first measure was the log of total network size of directors that share professional and/or educational background with another director within the board. The second network measurement is the log of the total outside network size of director measured as the number of overlaps through employment and education as provided by BoardEx.

3.4. Control variables

For the linear regression, we use control variables drawn from the literature on board diversity and board social networks. The most common control variables are the **Firm Size** (Akbar et al., 2017; Altunbaş et al., 2018; Berger et al., 2013, 2014; Bernile et al., 2018; Cao et al., 2019; Dionne et al., 2019; Erhardt et al., 2003; García-Meca et al., 2015; Harjoto et al., 2018; Ho et al., 2013; Jizi and Nehme, 2017; Khatami et al., 2016; Kim, 2005; Larcker et al., 2013; Minton et al., 2014; Poletti-Hughes and Briano-Turrent, 2019; Wang and Hsu, 2013; Wu, 2016; Yoshikawa et al., 2020) and the **Board Size** (Anderson et al., 2011; Berger et al., 2013, 2014; Bernile et al., 2018; Erhardt et al., 2003; Fan et al., 2019; García-Meca et al., 2015; Jizi and Nehme, 2017; Kim, 2005; Minton et al., 2014; Poletti-Hughes and Briano-Turrent, 2019; Yoshikawa et al., 2020). Other control variables used in board diversity studies include **Market to Book ratio** (Akbar et al., 2017; Bernile et al., 2018; Cao et al., 2019; Dionne et al., 2019; Jizi and Nehme, 2017; Larcker et al., 2013; Wu, 2016), **Board Independence** (Anderson et al., 2011; Fan et al., 2019; García-Meca et al., 2015; Harjoto et al., 2018; Jizi and Nehme, 2017; Larcker et al., 2013; Minton et al., 2014; Poletti-Hughes and Briano-Turrent, 2019), and **CEO Duality** (Bernile et al., 2018; Fan et al., 2019; García-Meca et al., 2015; Jizi and Nehme, 2017).

4. Econometric strategy

4.1. Structural equation model

We include two Structural Equation Models (SEM) to examine the effect of board diversity and social ties on risk-taking. Researchers have supported the use of SEM as means of theory testing (Bhaduri and Selarka, 2016; Cliff, 1983; Dolan et al., 1999; Freedman, 1987). The SEM includes two latent variables which are Stand Alone Risk (that loads three measurements of risk), and Market Risk (which loads two measurements of risk). The five observable variables in the measurement model that load the latent variables are the Z-score, ROAV, Leverage, Idiosyncratic Risk, and Stock Return Volatility. The measurement models are specified as follows:

$$ROA \quad V_{i,t} = \alpha_2 + \beta_2 LV \quad StandAlone \quad Risk_{i,t} + \varepsilon 1_{i,t} \tag{1}$$

$$Z - score_{i,t} = \alpha_1 + \beta_1 LV \quad StandAlone \quad Risk_{i,t} + \varepsilon 2_{i,t} \tag{2}$$

$$Leverage_{i,t} = \alpha_3 + \beta_3 LV \quad StandAlone \quad Risk_{i,t} + \varepsilon 3_{i,t} \tag{3}$$

$$Stock \quad Return \quad Volatility_{i,t} = \alpha_4 + \beta_4 LV \quad Market \quad Risk_{i,t} + \varepsilon 4_{i,t} \tag{4}$$

$$Idiosyncratic \quad Risk_{i,t} = \alpha_5 + \beta_5 LV \quad Market \quad Risk_{i,t} + \varepsilon 5_{i,t} \tag{5}$$

Where $LV \quad StandAlone \quad Risk_{i,t}$ and $LV \quad Market \quad Risk_{i,t}$ are the latent variables that represent the stand-alone risk and market risk for the institution i in the year t. Z-score, ROAV, Leverage, Idiosyncratic Risk, and Stock Return Volatility are the observed variables. β_1, β_2 β_3, β_4 and β_5 are the factor loadings that show how the observed indicators determine scores of latent variables. ε represents the residual. This measurement model is the same for both SEMs (board diversity and social ties)

The structural model for the first SEM includes the board diversity variables as the exogenous variables and the predictors of the latent variables defined in the measurement model. The structural model is specified as the following system of equations:

$$\begin{aligned} LV \quad StandAlone \quad Risk_{i,t} = {} & \alpha_6 + \lambda_1 Age \quad Diversity_{i,t-1} + \lambda_2 Gender \quad Diversity_{i,t-1} + \lambda_3 Nationality \quad Diversity_{i,t-1} \\ & + \lambda_4 Financial \quad Education \quad Diversity_{i,t-1} + \lambda_5 Qualification \quad Diversity_{i,t-1} + \lambda_6 Financial \quad Experience_{i,t-1} \\ & + \lambda_7 Professional \quad Experience_{i,t-1} + \varepsilon 6_{i,t} \end{aligned} \tag{6}$$

$$\begin{aligned} LV \quad Market \quad Risk_{i,t} = {} & \alpha_7 + \lambda_8 Age \quad Diversity_{i,t-1} + \lambda_9 Gender \quad Diversity_{i,t-1} + \lambda_{10} Nationality \quad Diversity_{i,t-1} \\ & + \lambda_{11} Financial \quad Education \quad Diversity_{i,t-1} + \lambda_{12} Qualification \quad Diversity_{i,t-1} + \lambda_{13} Financial \quad Experience_{i,t-1} \\ & + \lambda_{14} Professional \quad Experience_{i,t-1} + \varepsilon 7_{i,t} \end{aligned} \tag{7}$$

Where $Age \quad Diversity_{i,t-1}$, $Gender \quad Diversity_{i,t-1}$, $Nationality \quad Diversity_{i,t-1}$, $Financial \quad Education \quad Diversity_{i,t-1}$, $Qualification \quad Diversity_{i,t-1}$, $Financial \quad Experience_{i,t-1}$ and $Professional \quad Experience_{i,t-1}$ are the board diversity and social network variables for the firm i in the year $t-1$. LV StandAlone Risk and LV Market Risk are the latent variables defined in the measurement model. λ_1 to λ_{14} are the regression coefficients.

The structural model for the second SEM includes the social ties variables as the exogenous variables and the predictors of the latent variables defined in the measurement model. The structural model is specified as the following system of equations:

$$LV \quad StandAlone \quad Risk_{i,t} = \alpha_6 + \lambda_1 OutsideNetwork_{i,t-1} + \lambda_2 InsideNetwork_{i,t-1} + \varepsilon 6_{i,t} \tag{8}$$

$$LV \quad Market \quad Risk_{i,t} = \alpha_7 + \lambda_3 OutsideNetwork_{i,t-1} + \lambda_4 InsideNetwork_{i,t-1} + \varepsilon 7_{i,t} \tag{9}$$

Where $OutsideNetwork_{i,t-1}$ and $InsideNetwork_{i,t-1}$ are the board diversity and social network variables for the firm i in the year $t-1$. LV StandAlone Risk and LV Market Risk are the latent variables defined in the measurement model. λ_1 to λ_4 are the regression coefficients.

The variables and their definitions are listed in the variables' list. The exogenous variables were lagged by one year (t-1). We ran the model with current variables and lagged it by one to three years. The results show that there is not much difference between laggings in terms of significance and model fit. Therefore, we lag the exogenous variables by one year to account for the lagged effect of board diversity and social networking on risk-taking.

4.2. Linear Regression

To test the robustness of the effect of board diversity and social ties on risk-taking with the control variables, we estimate the following model:

$$Risk_{i,t} = \beta_0 + \beta_1 Age\ \ Diversity_{i,t-1} + \beta_2 Gender\ \ Diversity_{i,t-1} + \beta_3 Nationality\ \ Diversity_{i,t-1} + \beta_4 Financial\ \ Education\ \ Diversity_{i,t-1} + \beta_5 Qualification\ \ Diversity_{i,t-1} + \beta_6 Financial\ \ Experience_{i,t-1} + \beta_7 Professional\ \ Experience_{i,t-1} + \beta_8 Control_{i,t-1} + \varepsilon_{i,t} \quad (10)$$

$$Risk_{i,t} = \beta_0 + \beta_1 InsideNetwork_{i,t-1} + \beta_2 OutsideNetwork_{i,t-1} + \beta_3 Control_{i,t-1} + \varepsilon_{i,t} \quad (11)$$

Where $Risk_{i,t}$ is one risk measurement for the company i in the year t out of the five different measurements of risk. In all risk measurements, a higher value indicates a higher risk, except for the Z-score where higher values indicate lower risk. $Age\ \ Diversity_{i,t-1}$, $Gender\ \ Diversity_{i,t-1}$, $Nationality\ \ Diversity_{i,t-1}$, $Financial\ \ Education\ \ Diversity_{i,t-1}$, $Qualification\ \ Diversity_{i,t-1}$, $Financial\ \ Experience_{i,t-1}$, $Professional\ \ Experience_{i,t-1}$, $InsideNetwork_{i,t-1}$, $OutsideNetwork_{i,t-1}$ are the board diversity and social network variables for the firm i in the year $t-1$. $Control_{i,t-1}$ is a set of five variables that control for firm level. Is $\varepsilon_{i,t}$ is the residual. We run a Hausman test which reveals that the null hypothesis is rejected, thus, all models include industry and year fixed effects.

The independent and control variables were lagged by one year (t-1) to account for lagged effects. The descriptions and definitions of all variables are detailed in the variables' list.

5. Empirical results

Table 4 and Fig. 3 show the results of the SEM for the board diversity variables. Panel A reports the measurement model that shows the factor loadings of the risk measurements in the factor analysis. The variables ROA volatility and Leverage are positively loaded on the latent variable Stand-Alone Risk, while Z-score is negatively loaded. This means that the higher value of this latent variable indicates higher risk-taking, because the higher value of the Z-score indicates lower risk-taking. In addition, Idiosyncratic Risk and Stock Return Volatility are positively loaded on the latent variable Market Risk, which means that the higher value of Market Risk indicates more risk-taking.

Panel B of Table 4 shows the results of the structural model. Age Diversity has a significant and positive effect on both the stand-alone and market risk. However, the effect is minor with a coefficient of only 0.152 for stand-alone risk, and 0.227 for market risk. These results are in line with Harjoto et al. (2018) who found no association between age diversity and board performance. In addition,

Table 4
SEM: Board Diversity.

Panel A: Measurement Model		
	LV StandAlone Risk	**LV Market Risk**
ROAV ←	1	
	(Constrained)	
Z-score ←	-1.847***	
	(0.372)	
Leverage ←	3.639***	
	(0.716)	
Idiosyncratic Risk ←		1
		(Constrained)
Stock Return Volatility ←		0.384***
		(0.206)
Panel B: Structural Model		
	LV StandAlone Risk ←	**LV Market Risk ←**
Age Diversity	0.152***	0.227***
	(0.029)	(0.049)
Gender Diversity	-0.094***	0.184***
	(0.009)	(0.009)
Nationality Diversity	1.623**	3.043***
	(0.717)	(0.827)
Qualification Diversity	-0.955**	-0.542
	(0.204)	(0.175)
Financial Education Diversity	1.311**	-3.737*
	(0.696)	(0.770)
Financial Experience Diversity	-7.736	-2.085
	(1.298)	(1.570)
Professional Experience Diversity	0.445	4.594***
	(0.477)	(0.850)
R Squared	0.216	0.118
Observations	5542	5542
Panel C: Model Fit		
Chi-squared	NFI	CFI
1236.621	1.000	1.000

Notes: This table represents the results of the SEM to study the impact of board diversity on stand-alone and market risk. Definitions and sources of all variables are detailed in Table 1. Standard errors are provided in parentheses. Variables with arrows pointing towards them are the endogenous variables *, **, and *** denote significance at 10%, 5%, and 1% respectively.

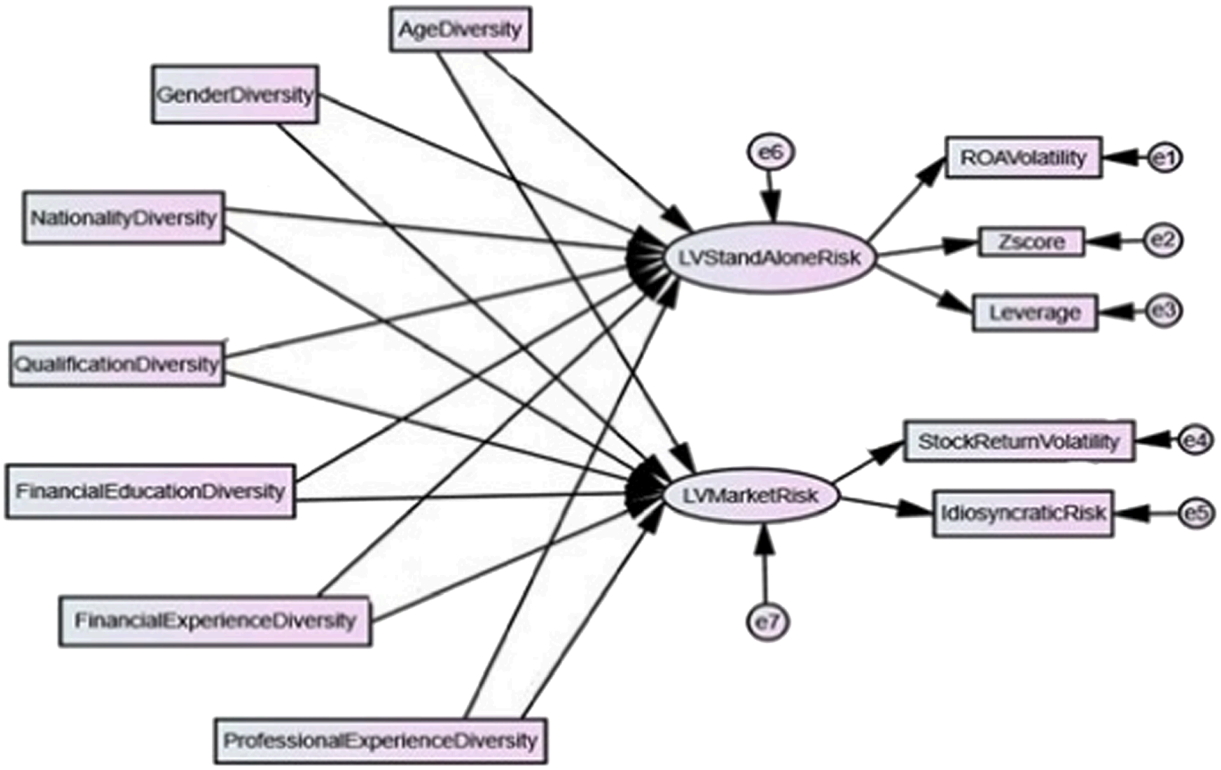

Fig. 3. SEM: Board Diversity.

Gender Diversity has a significant effect on risk-taking, but the effect is negative on stand-alone risk and positive on market risk. Also, similar to the age diversity, gender diversity's effect is low. The negative effect of female presence on stand-alone risk can by justified with the conclusion made by Berger et al. (2014) that female directors have lower experience in comparison to their male counterparts. Since greater age and gender diversity does not seem correlated with lower risk taking in financial institutions, these results thus reject the main hypothesis (H1).

The results show that nationality diversity has a significant and positive effect on risk. The effect also appears to be the strongst compared to the other variables. This result is supported by the increasing importance of nationality diversity in Europe. Borges (2011) reports that the of average non-national directors on European boards is 24%. The degree of diversity of nationality of Board members, reflects the demand for and importance of international competencies. However, Borges (2011) also reports that nationality diversity brings issues such as language difficulties and logistic problems. When comparing this result to other studies, they contradict the findings by García-Meca et al. (2015) who conclude that the demographic differences resulting from diversity of nationality lower cohesion between groups which leads to slowing the decision-making process. Also, the positive effect shown in our results is not in line with Bernile et al. (2018) who found that the diversity index (including ethnicity) leads to lower risk-taking. However, our results are not comparable to theirs, because the effect of ethnic diversity might have been offset by the other five variables in the same index. Finally, since greater nationality diversity does not seem correlated with lower risk taking in financial institutions, this result thus rejects the main hypothesis (H1).

We include two aspects of education diversity, a general qualification aspect and another that is focused on financial education. Including more than one measurement will help us get a detailed view of the effect of diversity of education on risk-taking and enable us to compare between the importance of the type of qualification. The results show both general qualification and financial education diversity have more significant effect on stand-alone risk than the market risk. However, general qualification diversity has a negative effect, while financial education diversity has a positive effect. This indicates that financially educated board members influence the boards to take more risk.

For diversity of experience, we also include two measurements which are financial and professsional. The professional diversity is measured using the Herfindahl-Hirschman index (HHI) which means that the higher value of this variable represents lower diversity. The results show that financial experience does not have a signifcant effect on risk-taking, while the diversity of professional experience has a significant and positive effect on market risk. This result is supported by the finding of Anderson et al. (2011) who found that board diversity including experience has a positive effect on firms' performance. This can be explained by Harjoto et al. (2018) conclusion that boards with diverse experiences are more effective in overseeing corporate investment activities.

Including several measurements of the same variable enables us to compare and contrast it with other variables from different angles. We have previously compared financial and non-financial aspects of the same variable. When comparing only the finacial aspect of education and experience diversity, the results show that financial education has a more significant effect on risk than

Table 5
SEM: Board Social Ties.

Panel A: Measurement Model		
	LV StandAlone Risk	**LV Market Risk**
ROAV ←	1	
	(Constrained)	
Z-score ←	-2.366**	
	(2.189)	
Leverage ←	4.892**	
	(1.101)	
Idiosyncratic Risk ←		1
		(Constrained)
Stock Return Volatility ←		2.101***
		(0.205)
Panel B: Structural Model		
	LV StandAlone Risk ←	**LV Market Risk ←**
Outside Network	-0.006	2.002**
	(0.002)	(1.003)
Inside Network	-0.105*	-3.035***
	(0.001)	(1.014)
R Squared	0.117	0.093
Observations	425	425
Panel C: Model Fit		
Chi-squared	NFI	CFI
146.177	1.000	1.000

Notes: This table represents the results of the SEM to study the impact of social network on stand-alone and market risk. Definitions and sources of all variables are detailed in Table 1. Standard errors are provided in parentheses. Variables with arrows pointing towards them are the endogenous variables *, **, and *** denote significance at 10%, 5%, and 1% respectively.

financial experience. This finding is in line with the corporate governance principles of the Basel Committee on Banking Supervision (2015) and the corporate governance guide of NYSE Governance Services (2016); they both include board qualification as a main principle for selecting a board member.

Table 5 and Fig. 4 show the results of the SEM to study the effect on board ties of alternative measyres of risk-taking. The loadings of the latent variables in the measurement model are similar to the previous SEM suggesting that higher values of the latent variables indicate more risk-taking. Panel B reports the structural model of regressing Outside Network and Inside Network on the latent variables. The results show that both inside and outside ties of board memebers have more significant effect on the market risk than on stand-alone risk. However, outside network has a positive effect (in line with H2) while inside network has a negative effect (rejecting H2). This significant effect shows the important role of social ties in the decision process related to risk-taking. This important rule is

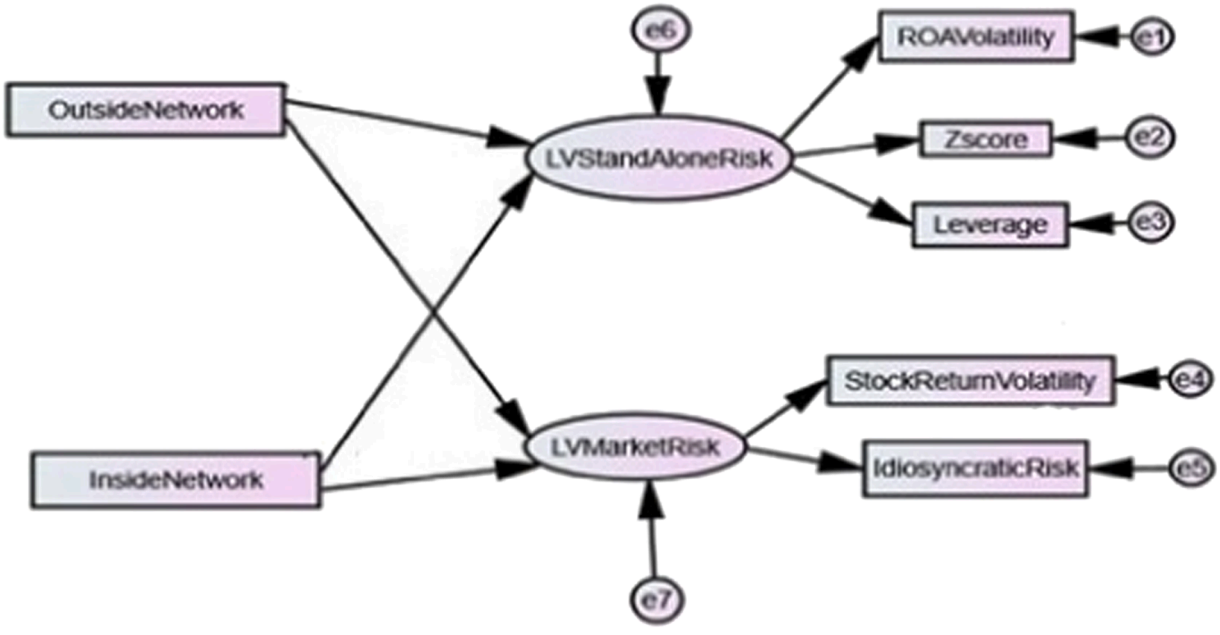

Fig. 4. SEM Board Social Ties.

Table 6
Linear Regression: Board Diversity.

	Dependent Variable: Five measures of risk				
	ROAV	**Z-score**	**Leverage**	**Stock Return Volatility**	**Idiosyncratic Risk**
Age Diversity	-0.009	-0.327	0.538***	0.227***	0.170***
	(0.023)	(0.294)	(0.110)	(0.215)	(0.054)
Gender Diversity	0.018**	0.179***	-0.015	-0.082*	0.001
	(0.008)	(0.012)	(0.027)	(0.024)	(0.008)
Nationality Diversity	1.948	-1.673	-9.877	0.442	-0.107
	(0.454)	(0.608)	(2.444)	(1.911)	(0.857)
Qualification Diversity	-0.925***	0.385*	-2.981*	0.599**	0.498*
	(0.108)	(0.250)	(0.627)	(0.255)	(0.191)
Financial Education Diversity	-0.061*	-1.998	-9.154***	-4.550***	-2.485***
	(0.488)	(0.691)	(2.323)	(1.241)	(0.772)
Financial Experience Diversity	-4.577***	-1.740	7.247	-4.090	-0.762
	(0.878)	(1.669)	(4.524)	(1.089)	(1.524)
Professional Experience Diversity	-1.325***	1.840	-7.752**	4.450***	3.613***
	(0.307)	(0.692)	(1.956)	(2.750)	(1.154)
Board Independence	-0.034***	0.295*	0.090*	-0.037***	-0.034***
	(0.004)	(0.076)	(0.023)	(0.016)	(0.007)
Board Size	-0.1997***	0.172***	-1.185***	0.220	-0.129
	(0.015)	(0.313)	(0.106)	(0.077)	(0.031)
CEO Duality	0.365**	2.147	0.121	0.791***	0.420***
	(0.115)	(0.195)	(0.550)	(0.375)	(0.162)
Firm Size	-0.856***	-1.492	3.081***	2.714***	1.806***
	(0.104)	(0.211)	(0.391)	(0.277)	(0.182)
Market to Book	0.775***	0.524***	-0.675***	0.729***	0.434***
	(0.078)	(0.044)	(0.235)	(0.109)	(0.053)
Observations	4173	4173	4173	4173	4173
R Squared	0.285	0.126	0.236	0.168	0.216

Notes: This table represents the results of regressing five risk measurements (*ROAV, Leverage, Z-score, Stock Return Volatility* and *Idiosyncratic Risk*) on board diversity variables. Definitions and sources of all variables are detailed in Table 1. Model are estimated using industry and year fixed effects. t-statistics based on robust standard errors are provided in parentheses. *, **, and *** denote significance at 10%, 5%, and 1% respectively.

perhaps the result of the strategic resources provided by the board's social works which helps in creating competitive advantages (Yoshikawa et al., 2020). The positive effect of the outside network and the negative effect of the inside network is in line with Fan et al. (2019) who found that social ties tend to destroy a firm's value whereas professional ties do not. Also, it is worth mentioning that Kim (2005) found that while a moderate level of board network enhances firm performance, too cohesive a board network destroys it. Overall, the results on the effects of social networks are significant but the direction of the effect is inconclusive.

*[*Table 5 *near here]*

Table 6 provides the results for estimating Eq. (10) to study the effect of board diversity on five risk measurements. Most of the linear regression results are consistent with the SEM's results except for a few differences. The SEM results show that nationality diversity is very significant while it was not significant in the linear regression. Table 7 provides the results for estimating Eq. (11) to study the effect of

Table 7
Linear Regression: Board Social Ties.

	Dependent Variable: Five measures of risk				
	ROAV	**Z-score**	**Leverage**	**Stock Return Volatility**	**Idiosyncratic Risk**
Outside Network	0.012	-0.921**	2.940*	-1.202**	-1.411***
	(0.001)	(0.205)	(2.118)	(1.116)	(1.001)
Inside Network	0.001	0.984*	-1.685	-1.257***	-2.496**
	(0.002)	(0.798)	(1.874)	(1.074)	(1.714)
Board Independence	-0.036***	0.0742	-0.459***	-0.117***	-0.297***
	(0.005)	(0.478)	(0.078)	(0.024)	(0.059)
Board Size	-0.076**	0.317**	-0.878	0.443**	0.113
	(0.013)	(0.063)	(0.237)	(0.339)	(0.094)
CEO Duality	-0.241	1.177***	-0.241	-1.057	-0.786
	(0.082)	(0.967)	(1.504)	(1.758)	(0.649)
Firm Size	-0.350***	-1.256	2.107*	2.530***	3.392***
	(0.074)	(0.142)	(1.084)	(1.482)	(1.25)
Market to Book	0.325***	0.304***	-2.420***	-0.736	-0.128
	(0.067)	(0.213)	(0.808)	(0.693)	(0.159)
Observations	399	399	399	399	399
R Squared	0.466	0.142	0.358	0.484	0.382

Notes: This table represents the results of regressing five risk measurements (*ROAV, Leverage, Z-score, Stock Return Volatility* and *Idiosyncratic Risk*) on social network variables. Definitions and sources of all variables are detailed in Table 1. Model are estimated using industry and year fixed effects. t-statistics based on robust standard errors are provided in parentheses. *, **, and *** denote significance at 10%, 5%, and 1% respectively.

board ties on five risk measerments. The results show consistency of the inside network effect on risk with the SEM's results reported in Table 5. However, the results of the outside network of boards are different, significant by linear regression and not significant by SEM.

For further analysis, we have divided the sample to two sub-samples; banks and non-banks. The results of the sub-samples were relatively similar to the full sample of financial institutions.

6. Conclusion

The literature review provided by Teodósio (2021), recognizes the presence of women on the board of directors and top management teams has had an impact on the risk taking behavior of financial institutions. Research in this paper has expanded on those and similar findings to provide an improved understanding of the impact of various diversity aspects, such as age, gender, nationality, education, and experience, on risk-taking in US financial institutions. We also included several dimensions of the same variable, level of qualification and financial aspect for diversity of education, and professional and financial aspects for diversity of experience.

The findings suggest that board diversity significantly affects risk-taking (H1), with the (financial) qualification of individual board members being the most influential factor. Age and gender also have a significant but minor effect on risk, while experience diversity is the least important, especially when compared to education. Regarding nationality diversity, our results are varied, it is very significant by the structural equations model (SEM) but not significant by linear regression. Additionally, the study highlights the importance of social networks of directors in relation to risk-taking, particularly in terms of market risk, and emphasizes the need for further investigation and regulatory considerations in this area. Thus findings warn corporate governance codes of conduct not include blanket recommendations to increase or decrease aspects of diversity in the boards of financial institutions. As not all aspects of diversity reduce corporate risk taking.

The findings indicate that the social networks of directors (H2) have a significant impact on risk-taking, particularly in relation to market risk. However, due to the inconclusive nature of the results, further investigation is needed to understand how social ties can be regulated as a characteristic of directors. In this regard, the UK's corporate governance code recommends considering various aspects of diversity, including social backgrounds, in appointment and succession plans (Financial Reporting Council, 2018). This finding emphasizes the importance of incorporating the size and characteristics of social networks in defining the independence of directors. Specifically, include requirements related to the size of the network through measures that consider the intensity of relatedness inside and outside the Board for a director to be classified as independent.

Another important implication of our results is the importance of diversity in boards, emphasizing the need for a sensible level of diversity in nationality, social backgrounds, and education. Results suggested that overly diverse boards may face challenges in terms of cohesion and communication, potentially impacting the decision-making process. Conversely, boards with very low diversity may miss out on the benefits of diverse backgrounds and expertise. Financial institutions should consider these implications when appointing new directors.

Declaration of Generative (AI) and AI-assisted technologies in the Writing Process

During the preparation of this work the authors used explainedpaper.com and professional copy-edit services by JA Editorial in order to improve readability and flow of ideas. After using this tool and service, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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Declaration of Competing Interest

The authors report there are no conflict of interests to declare.

Data Availability

The authors do not have permission to share data.

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Appendix A. Pearson Correlation

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Idiosyncratic Risk	1	.003	.062**	.027	.944**	.065**	.070**	.097**	-.035*	-.048**	-.044**	.082**	.164**	-.073	-.083**	.025	.130**	.228**	.116**
Zscore	.003	1	-.284**	-.157**	-.001	-.044**	.088**	-.081**	.106**	-.061**	-.008	-.008	-.081**	.097	.121**	.217**	-.048**	.019	.003
ROA Volatility	.062**	-.284**	1	.137**	.038*	.085**	-.039*	.019	-.167**	.027	-.049**	.050**	-.016	-.032	-.221**	-.295**	.082**	-.288**	.389**
Leverage	.027	-.157**	.137**	1	.019	.088**	.002	.114**	-.150**	-.042**	.012	-.040*	.155**	-.015	-.094**	-.169**	.111**	.084**	.028
Stock Return Volatility	.944**	-.001	.038*	.019	1	.062**	.069**	.111**	-.035*	-.057**	-.050**	.074**	.186**	-.075	-.082**	.044**	.124**	.251**	.114**
Age Diversity	.065**	-.044**	.085**	.088**	.062**	1	-.176**	-.031	.028	-.033*	-.075**	.128**	-.139**	-.328**	-.270**	-.089**	.000	-.204**	.011
Gender Diversity	.070**	.088**	-.039*	.002	.069**	-.176**	1	.099**	-.034*	.007	.086**	-.163**	.307**	.194**	.272**	.188**	.028	.341**	.078**
Nationality Diversity	.097**	-.081**	.019	.114**	.111**	-.031	.099**	1	-.048**	-.029	.024	-.112**	.354**	.401**	.075**	.095**	.041*	.277**	.049**
Qualification Diversity	-.035*	.106**	-.167**	-.150**	-.035*	.028	-.034*	-.048**	1	.007	-.009	.036*	-.166**	-.039	.102**	.122**	-.150**	-.074**	-.118**
Financial Education Diversity	-.048**	-.061**	.027	-.042**	-.057**	-.033*	.007	-.029	.007	1	.130**	-.037*	.012	.132*	-.047**	-.117**	.044**	-.002	.049**
Financial Experience Diversity	-.044**	-.008	-.049**	.012	-.050**	-.075**	.086**	.024	-.009	.130**	1	-.412**	.041*	.006	.030	-.012	.055**	.064**	.036*
Professional ExperienceDiversity	.082**	-.008	.050**	-.040*	.074**	.128**	-.163**	-.112**	.036*	-.037*	-.412**	1	-.220**	-.241**	-.208**	-.151**	-.003	-.209**	-.007
Outside Network	.164**	-.081**	-.016	.155**	.186**	-.139**	.307**	.354**	-.166**	.012	.041*	-.220**	1	.293**	.173**	.340**	.140**	.691**	.060**
Inside Network	-.073	.097	-.032	-.015	-.075	-.328**	.194**	.401**	-.039	.132*	.006	-.241**	.293**	1	.274**	.309**	-.167**	.284**	-.027
Board Independence	-.083**	.121**	-.221**	-.094**	-.082**	-.270**	.272**	.075**	.102**	-.047**	.030	-.208**	.173**	.274**	1	.241**	-.148**	.265**	-.067**
Board Size	.025	.217**	-.295**	-.169**	.044**	-.089**	.188**	.095**	.122**	-.117**	-.012	-.151**	.340**	.309**	.241**	1	-.123**	.427**	-.091**
CEO Duality	.130**	-.048**	.082**	.111**	.124**	.000	.028	.041*	-.150**	.044**	.055**	-.003	.140**	-.167**	-.148**	-.123**	1	.145**	.030
Firm Size	.228**	.019	-.288**	.084**	.251**	-.204**	.341**	.277**	-.074**	-.002	.064**	-.209**	.691**	.284**	.265**	.427**	.145**	1	-.128**
Market To Book	.116**	.003	.389**	.028	.114**	.011	.078**	.049**	-.118**	.049**	.036*	-.007	.060**	-.027	-.067**	-.091**	.030	-.128**	1

Note: ** Correlation is significant at the 0.01 level, * Correlation is significant at the 0.05 level.

Appendix B. Board diversity and social network review

Paper	Board variables	Variables Definition	Risk measurements	Effect of board on risk	sector	country	sample size	Period
(Berger et al., 2014)	age, gender, education of Board executives	Average Board Age increase of 5 years. Increase in female presence. Presence of executives with PhD	Risk-weighted assets to total assets (RWA/TA), and a Herfindahl Hirschman index for loan portfolio concentration (HHI, log))	Board age negatively related to risk. Increase in female presence leads to increase in portfolio risk. The presence of executives with PhD leads to decrease in portfolio risk	Banks	Germany	3525 banks, 19,750 observations	1994–2010
(Wu, 2016)	Gender Diversity	-	firm as being bankrupt if it makes a Chapter 11 filing. variable is set to 1 if the firm files for bankruptcy within one year, and 0 otherwise	Board size and gender diversity are negatively related to bankruptcy risk.	Non-financial	US	217 bankrupts. 9100 non-bankrupts	1996–2006
(Ho et al., 2013)	Board size, CEO duality, Board independence	-	Total risk is measured by the standard deviation of return on assets, Underwriting risk is measured by the standard deviation of the company's loss ratio, Investment risk is measured by the standard deviation of return on investment, Leverage risk is defined as 1 minus the surplus-to assets ratio	More board independence and CEO duality lead to higher risk, impact of board size on different risk-taking measures varies.	Property Causality Insurance Industry	US	252 firms	1996–2007
(Akbar et al., 2017)	Board size, independence and CEO duality	Size is the log of number of directors, percentage of nonexecutive directors, CEO duality is a dummy variable	idiosyncratic risk is the standard deviation of the residuals from the two-index market model, Z-score is the average ROA and Average CAR to the standard deviation of ROS	Board independence and CEO duality have a negative impact on risk, board size has no impact on size	Financial Sector	UK	276 firms, 2760 firm year observation	2003–2012
(Wang and Hsu, 2013)	Board size, independence, age, tenure	Size is number of directors, independence is percentage of independent directors, the standard deviation of age divided by	events by the variable OP, which equals one if a firm has an operational risk event in a certain year in our sample	Board size is negatively associated with operational risk, board independence is associated with less fraud, board age and tenure a	Financial institutions	US	103 firms	1996–2010

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Paper	Board variables	Variables Definition	Risk measurements	Effect of board on risk	sector	country	sample size	Period
		average age, the standard deviation of tenure divided by average tenure	period, 0 otherwise	proxy for diversity show important role in managing operational risk				
(Harjoto et al., 2018)	Board gender, race (Asian, Black, Caucasian, Hispanic, and Native Americans), age, tenure, experience (financial, consulting, legal, management (executives), and other expertise)	relation oriented index (Board gender, race, age) task-oriented index (tenure, experience)	firm-specific deviation from the expected level of investment. They measure corporate investment using capital expenditures (CAPEX), R& D expenses (RDEX), and acquisition spending (ACQEX)	task-oriented board diversity attributes, such as tenure and expertise, are negatively associated with suboptimal investment. No association between board relation-oriented diversity measured by gender, race, and age, and board performance	non-financial firms	US	15,125 firm year observations form 1898 firms	1998–2014
(García-Meca et al., 2015)	Women, Foreigners	the percentage of female and foreign directors on boards	Tobin's Q: the book value of total assets minus the book value of common equity plus the market value of common equity divided by the book value of total assets. ROA is calculated as the income before extraordinary items, interest expense, and taxes divided by the average of the two most recent years of total assets	gender diversity increases bank performance, while national diversity inhibits it	Banks	9 countries (Canada, France, Germany, Italy, the Netherlands, Spain, Sweden, the United Kingdom, and the United States)	159 banks, 877 observations	2004–2010
(Bernile et al., 2018)	Diversity index (gender, age, ethnicity, education, experience)	fraction of women on board, standard deviation of board age, Herfindahl concentration indexes for director ethnicity, institutions where directors received bachelor degree, director financial experience	Volatility of stock return, net book leverage, net market leverage, dividend-to-equity ratio, CAPEX-to-asset ratio, and R&D-to-asset ratio, log number of patents, firm profitability	greater board diversity leads to lower volatility and better performance.	nonfinancial, non-utility firms	US	21,572 firm year observations	1996–2014
(Minton et al., 2014)	Financial expertise in the board	Directors is the percentage of independent	The standard deviation of daily stock	fraction of independent financial experts	commercial banks, S&Ls and	US	1106 firm year observations	2003–208

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Paper	Board variables	Variables Definition	Risk measurements	Effect of board on risk	sector	country	sample size	Period
		directors who are financial exp (Former bank executive, Executive of nonbank financials, Finance executive of nonfinancial, academic position in a related field, Professional investor)	return, section: real-estate-related activity and bank leverage, nominal cumulative stock return	is positively related to several measures of	investment banks			
(Cao et al., 2019)	Board directors with foreign experience	equals 1 if a firm has at least one director with foreign experience and 0 otherwise	negative conditional skewness, down-to-up volatility	Board Directors with Foreign Experience help reduce crash risk	non-financial firms	Chinese	23,758 observations, 2610 firms	1999–2017
(Erhardt et al., 2003)	Ethnic and gender diversity	percentage of women and minorities (African, Hispanic, Asian and Native Americans) to white Anglo-Saxons for executive directors	Return on assets and investments	board diversity is positively associated with return on assets and investments	Public firms	US	127 firms	1993–1998
(Anderson et al., 2011)	age, gender, ethnic, education, experience, tenure	Age: the coefficient of variation of director age, Gender: percentage of women on board, Ethnicity: percentage of Asian, African American, Hispanic, and Native American director. Education: Herfindahl index based on percentage of education level and major. Experience: CEO in other firms, Professional experience (law, accounting, consulting), standard deviation of firm's directors worked in, number of senior managerial positions during the career. Board tenure	Industry adjusted Topin's Q.	both types of director heterogeneity gave a positive relationship to firm performance	Russell 1000 nonfinancial, industrial firms	US	615 firms	2003–2005

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Paper	Board variables	Variables Definition	Risk measurements	Effect of board on risk	sector	country	sample size	Period
(Jizi and Nehme, 2017)	Gender Diversity	Percentage of women on board, dummy variables to indicate the existence of women on the board	Stock return volatility	Women on board reduce firm's risk	FTSE 350 non-financial firms	UK	1138 observations	2008–2013
(Dionne et al., 2019)	Board independence and knowledge	A director has a financial knowledge if he or she is (a) financially active or has financial experience, (b) is financially educated, or (c) possesses an accounting background	Delta percentage, ROE, ROA, Tobin's Q	directors' financial knowledge increases firm value through the risk management	Gold mining industry	Canada and US	36 firms	1992–1999
(Poletti-Hughes and Briano-Turrent, 2019)	Gender Diversity	Percentage of female directors on the board	Volatility of ROA, Volatility of Tobin's Q, sales growth	women on board increase venture risk and performance hazard risk in family-owned firms	non-financial firms	Argentina, Brazil, Chile and Mexico	125 firms and 1263 observations	2004–2014
(Altunbaş et al., 2018)	CEO tenure, CEO age, CEO gender, CEO experience, CEO education, Board size, Board independence	CEO number of years	dummy variable indicating the presence of corporate misconduct	banks are more likely to commit misconduct when the CEO tenure is long. Large and independence boards mitigate but do not prevent misconduct	banks	US	960 banks	1998–2015
(Qiu et al., 2019)	Top management team network	interlocking members are defined as the ones who work in two or more firms in a fiscal year. three centrality measures: Degree, Betweenness, and Eigenvector.	The cost of debt. by subtracting the matched Chinese treasury bond yield from the corporate bond yield	results provide strong evidence that bondholders require lower bond yield spreads for firms with higher TMT network centrality	non-financial firms	China	688 firms, 857 bond year observations	2007–2016
(Yoshikawa et al., 2020)	Sent ties and Received ties	Sent ties are the number of the focal firm's executive directors who serve on the board of another firm that has already adopted stock option pay and/or EOS. received ties are the count of the focal firm's directors who also serve as directors on the	dummy variable that takes the value of 1 if firm i adopts the practice in year t, and 0 otherwise.	sent ties established by executives increase the probability of adopting stock option pay whereas received ties are strongly related to the adoption of both stock option pay and board reform	non-financial firms	Japan	3565 firms	1997–2002

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Paper	Board variables	Variables Definition	Risk measurements	Effect of board on risk	sector	country	sample size	Period
		board of firms that are prior adopters.						
(Fan et al., 2019)	CEO-Board ties	classify a director as friendship-tied to the CEO if she has shared educational background or memberships of social organizations. Friendship Tie Breadth is defined as the number of directors with friendship-ties to the CEO divided by the total number of board directors. Friendship Tie Depth is computed as the total number of friendships ties the CEO has with board directors divided by the total number of board directors	Tobin's Q and Total Q	board-CEO friendship ties have a negative and economically meaningful impact on firm value	non-financial firms	US	1696 firms, 2786 unique CEOs and 20,487 directors	2000–2014
(Berger et al., 2013)	Board Age, Board education, Gender diversity, social ties	Age: absolute difference between the age of the individual in question and the average age of the members of the executive board. Education: dummy variable that takes on the value one if both the appointee and any member of the executive board of the appointing bank have an academic degree. Gender diversity: dummy equal to one if both the appointee as well as at least one executive board member is female. Social ties: the intensity of an individual's connectedness is measured by the number of	Outside appointments or inside appointments	Homophily based on age and gender increase the chances of the outsider appointments. Similar educational backgrounds, in contrast, reduce the chance that the appointee is an outsider. Greater social ties also increase the probability of an outside appointment	Banks	Germany	between 1821 and 3364 per year	1993–2008

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Paper	Board variables	Variables Definition	Risk measurements	Effect of board on risk	sector	country	sample size	Period
		common contacts the agent has with any other individual in the staff database prior to appointment.						
(Kim, 2005)	Board network density, board external social capital	Board network density is defined as the extensiveness or the cohesiveness of contact among the members of board of directors, and board external social capital refers to the degree to which board members have outside contacts in the external environment.	ROA	moderate level of board network density enhances firm value, while too cohesive a board network destroys	Large Public firms	Korea	199 firms	1990–1999
(Larcker et al., 2013)	Director's formal or professional ties	Well connectedness by degree, closeness, betweenness, centrality, eigenvector	firm-specific one-year-ahead characteristic-adjusted returns	Firms with the best-connected boards earn higher future excess returns	Public firms	US	115,411 directors	2000–2007
(Khatami et al., 2016)	connections between board members and senior executives of Moody's and those of public debt issuers.	Connection Dummy: takes the value of 1 if there are past connections, current connections, Professional connections, educational connection, Army connections	non-convertible debt issues	the existence of personal connections between directors of the rating agency and those of the issuing company has a significant positive impact on the credit ratings assigned to the company's issues	industrial companies	US	1719 non-convertible public debt issues by 327 companies	1994–2011

References

Abdelbadie, R.A., Salama, A., 2019. Corporate governance and financial stability in US banks: do indirect interlocks matter? J. Bus. Res. *104* (July), 85–105. https://doi.org/10.1016/j.jbusres.2019.06.047.

Akbar, S., Kharabsheh, B., Poletti-Hughes, J., Shah, S.Z.A., 2017. Board structure and corporate risk taking in the UK financial sector. Int. Rev. Financ. Anal. *50*, 101–110. https://doi.org/10.1016/j.irfa.2017.02.001.

Altunbaş, Y., Thornton, J., Uymaz, Y., 2018. CEO tenure and corporate misconduct: Evidence from US banks. Financ. Res. Lett. *26* (July 2017), 1–8. https://doi.org/10.1016/j.frl.2017.11.003.

Altunbaş, Y., Gambacorta, L., Reghezza, A., Velliscig, G., 2022. Does gender diversity in the workplace mitigate climate change? Eur. Cent. Bank. https://doi.org/10.20955/r.85.67.

Anderson, R.C., Reeb, D.M., Upadhyay, A., Zhao, W., 2011. The economics of director heterogeneity. Financ. Manag. *40* (1), 5–38. https://doi.org/10.1111/j.1755-053X.2010.01133.x.

de Andres, P., Romero-Merino, M.E., Santamaria, M., Vallelado, E., 2012. Board determinants in the banking industry. Int. Perspect. *Manag. Decis. Econ. 33* (January), 147–158. https://doi.org/10.1002/mde.

Anginer, D., Demirguc-Kunt, A., Huizinga, H., Ma, K., 2018. Corporate governance of banks and financial stability. J. Financ. Econ. *130* (2), 327–346. https://doi.org/10.1016/j.jfineco.2018.06.011.

Basel Committee on Banking Supervision, 2006. *Enhancing Corp. Gov. Bank. Organ. Bank. Int. Settl.* https://doi.org/10.1016/s1093-3263(98)80024-7.

Basel Committee on Banking Supervision, 2015. *Corp. Gov. Princ. banks. Bank Int. Settl.* https://doi.org/10.1002/9781118390443.ch16.
Berger, A.N., Kick, T., Koetter, M., Schaeck, K., 2013. Does it pay to have friends? Social ties and executive appointments in banking. J. Bank. Financ. *37* (6), 2087–2105. https://doi.org/10.1016/j.jbankfin.2013.01.040.
Berger, A.N., Kick, T., Schaeck, K., 2014. Executive board composition and bank risk taking. J. Corp. Financ. *28*, 48–65. https://doi.org/10.1016/j.jcorpfin.2013.11.006.
Berger, A.N., Imbierowicz, B., & Rauch, C. (2016). The roles of corporate governance in bank failures during the recent financial crisis, *48*(4), 729–770. ⟨https://www.jstor.org/stable/43863002⟩.
Bernile, G., Bhagwat, V., Yonker, S., 2018. Board diversity, firm risk, and corporate policies. J. Financ. Econ. *127* (3), 588–612. https://doi.org/10.1016/j.jfineco.2017.12.009.
Bhaduri, S.N., Selarka, E., 2016. Corporate governance and corporate social responsibility of Indian companies. Springer. https://doi.org/10.1007/978-981-10-0925-9.
Black, B., de Carvalho, A.G., Khanna, V., Kim, W., Yurtoglu, B., 2017. Corporate governance indices and construct validity. Corp. Gov.: Int. Rev. *25* (6), 397–410. https://doi.org/10.1111/corg.12215.
Borges, A. (2011). *European corporate governance report.* Retrieved from ⟨http://www.heidrick.com/PublicationsReports/PublicationsReports/HS_EuropeanCorpGovRpt2011.pdf⟩.
Byrne, D., Clore, G.L., Worchel, P., 1966. Effect of economic similarity-dissimilarity on interpersonal attraction. J. Personal. Soc. Psychol. *4* (2), 220–224. https://doi.org/10.1037/h0023559.
Cain, M.D., McKeon, S.B., 2016. CEO personal risk-taking and corporate policies. J. Financ. Quant. Anal. *51* (1), 139–164. https://doi.org/10.1017/S0022109016000041.
Cao, F., Sun, J., Yuan, R., 2019. Board directors with foreign experience and stock price crash risk: Evidence from China. J. Bus. Financ. Account. *46* (9–10), 1144–1170. https://doi.org/10.1111/jbfa.12400.
Carter, D.A., Simkins, B.J., Simpson, W.G., 2003. Corporate governance, board diversity, and firm value. Financ. Rev. *38* (1), 33–53. https://doi.org/10.1111/1540-6288.00034.
Cassell, C.A., Huang, S.X., Sanchez, J.M., Stuart, M.D., 2012. Seeking safety: The relation between CEO inside debt holdings and the riskiness of firm investment and financial policies. J. Financ. Econ. *103* (3), 588–610. https://doi.org/10.1016/j.jfineco.2011.10.008.
Christy, J.A., Matolcsy, Z.P., Wright, A., Wyatt, A., 2013. Do board characteristics influence the shareholders' assessment of risk for small and large firms? J. Account., Financ. Bus. Stud. *49* (2), 161–196. https://doi.org/10.1111/abac.12005.
Cliff, N., 1983. Some cautions concerning the application of causal modeling methods. Multivar. Behav. Res. *18* (1), 115–126. https://doi.org/10.1207/s15327906mbr1801_7.
Cohen, L., Frazzini, A., Malloy, C., 2010. Sell-side school ties. J. Financ. *40* (4), 35–37. https://doi.org/10.2469/dig.v40.n4.25.
Daily, C.M., Dalton, D.R., Cannella, A.A., 2003. Corporate governance: Decades of dialogue and data. Acad. Manag. Rev. *28* (3), 371–382. ⟨http://www.jstor.com/stable/30040727⟩.
Deyoung, R., Peng, E.Y., Yan, M., 2013. Executive compensation and business policy choices at U.S. commercial banks. J. Financ. Quant. Anal. *48* (1), 165–196. https://doi.org/10.1017/S0022109012000646.
Dionne, G., Chun, O.M., Triki, T., 2019. The governance of risk management: The importance of directors' independence and financial knowledge. Risk Manag. Insur. Rev. *22* (3), 247–277. https://doi.org/10.1111/rmir.12129.
Dolan, C., Bechger, T., Molenaar, P., 1999. Using structural equation modeling to fit models incorporating principal components. Struct. Equ. Model. *6* (3), 233–261. https://doi.org/10.1080/10705519909540132.
El-Khatib, R., Fogel, K., Jandik, T., 2015. CEO network centrality and merger performance. J. Financ. Econ. *116* (2), 349–382. https://doi.org/10.1016/j.jfineco.2015.01.001.
Engelberg, J.E., Reed, A.V., Ringgenberg, M.C., 2012. How are shorts informed?. Short sellers, news, and information processing. J. Financ. Econ. *105* (2), 260–278. https://doi.org/10.1016/j.jfineco.2012.03.001.
Erhardt, N.L., Werbel, J.D., Shrader, C.B., 2003. Board of director diversity and firm financial performance. Corp. Gov.: Int. Rev. *11* (2), 102–111. https://doi.org/10.5465/ambpp.2017.14207abstract.
Erkens, D.H., Hung, M., Matos, P., 2012. Corporate governance in the 2007-2008 financial crisis: Evidence from financial institutions worldwide. J. Corp. Financ. *18* (2), 389–411. https://doi.org/10.1016/j.jcorpfin.2012.01.005.
Fan, Y., Boateng, A., King, T., MacRae, C., 2019. Board-CEO friendship ties and firm value: Evidence from US firms. Int. Rev. Financ. Anal. *65* (February), 101373 https://doi.org/10.1016/j.irfa.2019.101373.
Farag, H., Mallin, C., 2017. Board diversity and financial fragility: Evidence from European banks. Int. Rev. Financ. Anal. *49*, 98–112. https://doi.org/10.1016/j.irfa.2016.12.002.
Ferreira, M.A., Laux, P.A., 2007. Corporate governance, idiosyncratic risk, and information flow. J. Financ. *62* (2), 951–989.
Ferris, S.P., Javakhadze, D., Rajkovic, T., 2017. CEO social capital, risk-taking and corporate policies. J. Corp. Financ. *47*, 46–71. https://doi.org/10.1016/j.jcorpfin.2017.09.003.
Fields, M.A., Keys, P.Y., 2003. The emergence of corporate governance from Wall St. to Main St.: Outside directors, board diversity, earnings management, and managerial incentives to bear risk. Financ. Rev. *38* (1), 1–24. https://doi.org/10.1111/1540-6288.00032.
Financial Reporting Council, 2018. UK Corp. Gov. Code.
Freedman, D.A., 1987. As others see us: A case study in path analysis. J. Educ. Stat. *12* (2), 101–128. https://doi.org/10.3102/10769986012002101.
García-Meca, E., García-Sánchez, I.M., Martínez-Ferrero, J., 2015. Board diversity and its effects on bank performance: An international analysis. J. Bank. Financ. *53*, 202–214. https://doi.org/10.1016/j.jbankfin.2014.12.002.
Granovetter, M., 2005. The impact of social structure on economic outcomes. J. Econ. Perspect. *19* (1), 33–50. https://doi.org/10.4324/9780429494338.
Guay, W.R., 1999. The sensitivity of CEO wealth to equity risk: An analysis of the magnitude and determinants. J. Financ. Econ. *53*, 43–71. https://doi.org/10.4324/9780203940136.
Harjoto, M.A., Laksmana, I., Yang, Y., 2018. Board diversity and corporate investment oversight. J. Bus. Res. *90* (April), 40–47. https://doi.org/10.1016/j.jbusres.2018.04.033.
Hillman, A.J., Thomas, D., 2003. Boards of directors and firm performance: integrating agency and resource dependence perspectives. Acad. Manag. Rev. *28* (3), 383–396.
Ho, C.L., Lai, G.C., Lee, J.P., 2013. Organizational structure, board composition, and risk taking in the U.S. property casualty insurance industry. J. Risk Insur. *80* (1), 169–203. https://doi.org/10.1111/j.1539-6975.2012.01464.x.
Hutchinson, M., Seamer, M., Chapple, L.E., 2015. Institutional investors, risk/performance and corporate governance. Int. J. Account. *50* (1), 31–52. https://doi.org/10.1016/j.intacc.2014.12.004.
Hwang, B.H., Kim, S., 2009. It pays to have friends. J. Financ. Econ. *93* (1), 138–158. https://doi.org/10.1016/j.jfineco.2008.07.005.
Jizi, M.I., Nehme, R., 2017. Board gender diversity and firms' equity risk. Equal., Divers. Incl. *36* (7), 590–606. https://doi.org/10.1108/EDI-02-2017-0044.
John, K., Litov, L.P., Yeung, B.Y., 2008. Corporate governance and risk taking. J. Financ. *63* (4) https://doi.org/10.2139/ssrn.979413.
Kent Baker, H., Pandey, N., Kumar, S., Haldar, A., 2020. A bibliometric analysis of board diversity: Current status, development, and future research directions. J. Bus. Res. *108* (August), 232–246. https://doi.org/10.1016/j.jbusres.2019.11.025.
Khatami, S.H., Marchica, M.T., Mura, R., 2016. Rating friends: The effect of personal connections on credit ratings. J. Corp. Financ. *39*, 222–241. https://doi.org/10.1016/j.jcorpfin.2016.04.006.
Kim, Y., 2005. Board network characteristics and firm performance in Korea. Corp. Gov.: Int. Rev. *13* (6), 800–808. https://doi.org/10.1111/j.1467-8683.2005.00471.x.

Kirkpatrick, G., 2009. The corporate governance lessons from the financial crisis. OECD J.: Financ. Mark. Trends *1* (February), 61–87.
Laeven, L., Levine, R., 2009. Bank governance, regulation and risk taking. J. Financ. Econ. *93* (2), 259–275. https://doi.org/10.1016/j.jfineco.2008.09.003.
Larcker, D.F., So, E.C., Wang, C.C.Y., 2013. Boardroom centrality and firm performance. J. Account. Econ. *55* (2–3), 225–250. https://doi.org/10.1016/j.jacceco.2013.01.006.
Miller, M., Lynn, S.-L., James, M.C., 2001. Birds of a feather: Homophily in social networks. Annu. Rev. Sociol. *27*, 415–444.
Minton, B.A., Taillard, J.P., Williamson, R., 2014. Financial expertise of the board, risk taking, and performance: Evidence from bank holding companies. J. Financ. Quant. Anal. *49* (2), 351–380. https://doi.org/10.1017/S0022109014000283.
Mishra, D.R., 2011. Multiple large shareholders and corporate risk taking: Evidence from East Asia. Corp. Gov.: Int. Rev. *19* (6), 507–528. https://doi.org/10.1111/j.1467-8683.2011.00862.x.
Nakano, M., Nguyen, P., 2012. Board size and corporate risk taking: Further evidence from Japan. Corp. Gov.: Int. Rev. *20* (4), 369–387. https://doi.org/10.1111/j.1467-8683.2012.00924.x.
NYSE Governance Services. (2016). *NYSE: Corporate Governance Guide*. Retrieved from ⟨https://www.nyse.com/publicdocs/nyse/listing/NYSE_Corporate_Governance_Guide.pdf⟩.
OECD, 2015. G20/OECD Principles of Corporate Governance. OECD Publishing. https://doi.org/10.1787/9789264236882-en.
Pathan, S., 2009. Strong boards, CEO power and bank risk-taking. J. Bank. Financ. *33* (7), 1340–1350. https://doi.org/10.1016/j.jbankfin.2009.02.001.
Perchard, A., MacKenzie, N.G., 2020. Aligning to disadvantage: How corporate political activity and strategic homophily create path dependence in the firm. Hum. Relat. Vol. 74 https://doi.org/10.1177/0018726720908923.
Poletti-Hughes, J., Briano-Turrent, G.C., 2019. Gender diversity on the board of directors and corporate risk: A behavioural agency theory perspective. Int. Rev. Financ. Anal. *62* (August 2018), 80–90. https://doi.org/10.1016/j.irfa.2019.02.004.
Qiu, X., Su, Z. qin, Xiao, Z., 2019. Do social ties matter for corporate bond yield spreads? Evidence from China. Corp. Gov.: Int. Rev. *27* (6), 427–457. https://doi.org/10.1111/corg.12294.
Riordan, C.M., Shore, L.M.F., 1997. Demographic diversity and employee attitudes: An empirical examination of relational demography within work units. J. Appl. Psychol. *82* (3), 342–358. https://doi.org/10.1037/0021-9010.82.3.342.
Saunders, A., Strock, E., Travlos, N.G., 1990. Ownership structure, deregulation, and bank risk taking. J. Financ. *45* (2), 643–654.
Sheikh, S., 2019. CEO power and corporate risk: The impact of market competition and corporate governance. Corp. Gov.: Int. Rev. *27* (5), 358–377. https://doi.org/10.1111/corg.12285.
Tajfel, H., 1974. Social identity and intergroup behaviour. Soc. Sci. Inf. *13* (2), 65–93. https://doi.org/10.1177/053901847401300204.
Tajfel, H., Turner, J.C., 1986. The social identity theory of intergroup behavior. SAGE Encycl. Theory Psychol. 277–293. https://doi.org/10.4135/9781483346274.n163.
Teodósio, J., 2021. Corporate governance in Portugal: A literature review. In: Vieira, E.S., Madaleno, M., Azevedo, G. (Eds.), Comparartive research on earmings management, corporate governance, and economic value. IGI Global. DOI: 10.4018/978-1-7998-7596-3.ch008.
Turner, J.C., 1987. Rediscovering the Social Group: A Self-Categorization Theory. Blackwell. https://doi.org/10.1111/j.0001-7272.2004.00173.x.
Walt, N., Ingley, C., 2003. Board dynamics and the influence of professional background, gender and ethnic diversity of directors. Corp. Gov. *11* (3), 218–234. https://doi.org/10.1111/1467-8683.00320.
Wang, T., Hsu, C., 2013. Board composition and operational risk events of financial institutions. J. Bank. Financ. *37* (6), 2042–2051. https://doi.org/10.1016/j.jbankfin.2013.01.027.
Webber, S.S., Donahue, L.M., 2001. Impact of highly and less job-related diversity on work group cohesion and performance: a meta-analysis. J. Manag. *27* (2), 141–162. https://doi.org/10.1177/014920630102700202.
Westphal, J.D., Boivie, S., Chng, D.H.M., 2006. The strategic impetus for social network ties. Reconstituting broken CEO friendship ties. Strateg. Manag. J. *27* (5), 425–445. https://doi.org/10.1002/smj.525.
Wu, S., 2016. Corporate governance and bankruptcy risk. J. Account. Audit. Financ. *31* (2), 163–202.
Yoshikawa, T., Shim, J.W., Kim, C.H., Tuschke, A., 2020. How do board ties affect the adoption of new practices? The effects of managerial interest and hierarchical power. Corp. Gov.: Int. Rev. *28* (1), 2–22. https://doi.org/10.1111/corg.12300.
Zona, F., Gomez-Mejia, L.R., Withers, M.C., 2015. Board interlocks and firm performance: Toward a combined agency–resource dependence perspective. J. Manag. *44* (2), 589–618. https://doi.org/10.1177/0149206315579512.