Gender Diversity and Bank Misconduct

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Abstract

This paper investigates whether gender-diverse bank boards can play a role in preventing costly misconduct episodes. We exploit the fines received by European banks from US regulators to reduce endogeneity issues related to supervisory and governance mechanisms. We show that greater female representation significantly reduces the frequency of misconduct fines, equivalent to savings of $7.48 million per year. Female directors are more influential when they reach a critical mass and are supported by women in leadership roles. The mechanism through which gender diversity affects board effectiveness in preventing misconduct stems from the ethicality and risk aversion of the female directors, rather than their contribution to diversity. The findings are robust to alternative model specifications, proxies for gender diversity, reverse causality, country and bank controls, and sub-sample analyses.

Keywords: Misconduct; Gender diversity; Board of directors; Banks

JEL classification: M14, G21, G34

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1. Introduction

In recent years, larger numbers of scandals and fraud episodes have led to the world's largest banks being hit with an unprecedented number of misconduct fines, amounting to over £370 billion between 2008 and 2018.[2] The incidents reflect the harm suffered by those who deal with the banks and represent a financial and reputational threat to individual financial institutions as well as the broader financial sector. Preventing bank misconduct is a top priority for international regulators and policymakers, and several rules aiming to offer solutions through better regulation or enforcement were recently enacted. Nonetheless, there are several challenges that lawmakers and regulators face in this context, as regulatory reforms might not be effective without changes in bank corporate governance. The underlying idea is that the *tone at the top* shapes a firm's conduct and that more diverse boards, with an increased presence of women, can positively affect company governance (Fields and Keys, 2003; Hermalin and Weisbach, 2003; Campbell and Minguez-Vera, 2008; Algan et al., 2016). In recent years there have been several high-profile campaigns aiming to increase female representation on company boards. Examples include the 2020 Women on Boards (2020WOB) in the US and the Hampton-Alexander Review in the UK; both reports document an increase in the proportion of women on listed companies' boards.[3] However, the number of women in leadership positions (CEO or chairperson) has scarcely changed, and many companies have only one woman on the board. Countries such as France, Italy, and Sweden have gone a step further, introducing mandatory gender quotas. While some progress has been achieved, there is still a long way to attaining gender balance in corporate governance.

In this paper, we investigate the impact of board gender diversity on bank misconduct. We consider the fines issued by US regulatory bodies on European listed banks in the post-crisis period (2009-2018), which relate to misconduct events such as tax evasion, money laundering, market manipulation, and fraud.

[2] This information is contained in the Conduct Cost Project (CCP) Research Foundation (2017) and updated by the authors. Data are available here: https://www.cass.city.ac.uk/faculties-and-research/centres/cbr/research/conduct-costs-project.

[3] The report for the 2020WOB shows that the average number of board seats held by women in companies listed in the Russell 3000 Index has risen to 17.7 per cent in 2018, up from 16 per cent in 2016; however, half the companies in the index have one or no women on their boards. The Hampton-Alexander Review also reports an increase in the proportion of women on boards of FTSE100 companies: it reached 30.2 per cent in 2018, up from 27.7 per cent in 2017.

We examine the post-crisis period as regulators' attention increasingly focused on curbing risk-taking and potentially illegal practices. During this period, the activism of US regulators on European banks was exceptional both in reach and severity of fines.[4] Because of political connections, lobbying activities, or concerns about the financial stability of the domestic banking system, regulatory agencies might be susceptible to regulatory capture (Stigler, 1971), making them less impartial and objective in imposing sanctions on domestic banks. We exploit the fact that US regulators can impose fines not only on banks operating in the US but also on all transactions that pass through its financial system, to US and non-US persons, entities, and institutions.[5] To the extent that board members in our sample of European listed banks have no or weak influence on the outcome of US regulatory investigations, our empirical set-up allows us to mitigate regulatory capture bias.[6]

There is a growing body of literature analysing whether corporate outcomes can be positively influenced by increased gender diversity in the boardroom. More gender-diverse boards are associated with lower tax avoidance (Richardson et al., 2016); fewer incidences of account misreporting (Garcia-Lara et al., 2017); less frequent and less severe security fraud (Cumming et al., 2015); and fewer environmental sanctions (Liu, 2018). We build upon this stream of the literature to provide evidence on whether gender diversity increases board monitoring effectiveness and thus its ability to reduce bank conduct risk, proxied by the number of fines issued by US regulators to EU listed banks.[7] We also investigate the mechanism through which gender diversity can affect board effectiveness in preventing misconduct. The relationship between board gender diversity and corporate performance is usually explained by: (*i*)

[4] US regulators have hit foreign financial institutions particularly hard over the last 10 years: European banks have been fined four times more than their US counterparts, representing 77 per cent of the total of all fines levied by US regulators since 2008 (Fenergo, 2018).

[5] Recently, the Office of Foreign Assets Control (OFAC) has targeted transactions conducted in US dollars even if they involve only non-US entities. For example, CSE, a telecom company from Singapore, was fined $12 million for providing goods and services to Iranian energy projects. The dollar clearing process allows OFAC to claim US jurisdiction. See for the fine https://www.treasury.gov/resource-center/sanctions/CivPen/Documents/20170727_transtel.pdf and for the settlement https://www.treasury.gov/resource-center/sanctions/CivPen/Documents/transtel_settlement.pdf.

[6] An interesting stream of literature focuses on political connections (Gounopoulos et al., 2017) and social connections (Kuang and Lee, 2017). While we acknowledge the importance of such connections, our empirical design allows us to mitigate the role of political connections as we argue that the average EU banks' board member has weak or no influence on the decisions of US regulatory agencies.

[7] Conduct risk is broadly defined as any action of a financial institution or individual that leads to customer detriment or has an adverse effect on market stability or effective competition (Financial Conduct Authority). Regulatory fines for misconduct episodes can be considered the realisation of conduct risk, in the same way trading losses are the realisation of market risk.

the agency theory (gender diversity improves the board monitoring function); (*ii*) the human capital theory (gender diversity improves the board skills and expertise); and (*iii*) behavioural-based theories, such as the gender socialisation theory (gender diversity improves the board monitoring role, as women are more stakeholder-oriented).

Establishing a causal relationship between board diversity and bank misconduct is challenging. Endogeneity issues may arise as board characteristics are not exogenous random variables but are endogenously chosen by firms (Hermalin and Weisbach, 2003; Adams and Ferreira, 2007; Sila et al., 2016). Two sources of endogeneity are potentially likely to bias our estimates: omitted variable bias and reverse causality. To address potential endogeneity issues caused by omitted variable bias, we use bank-level controls, country-level controls, and regulatory agency fixed effects to account for unobserved country-specific and business model-specific characteristics that may or not remain constant over time and might be correlated with misconduct. To account for the possibility of reverse causality caused by female directors self-selecting into a particular type of bank, we use lagged values of the regressors and control for both the number and the dollar amount of previous misconduct fines. In addition, we deal with the problem of endogeneity by adopting an instrumental variable approach. Finally, using a difference-in-difference approach we test the role of gender diversity in mitigating misconduct following the reforms aimed at increasing gender representation on listed companies' board of directors.

We start by documenting differences in bank board composition for our sample of listed European banks. We find significant heterogeneity in board size, tenure, age, and CEO characteristics. While we show an increase in female representation in bank boardrooms during our sample period, the industry remains heavily male-dominated, and there are still bank boards with no female directors. Women in leadership positions, including the CEO and chairperson roles, are even less common.

In our empirical analysis, we employ the negative binomial model to relate the frequency of misconduct fines to board gender diversity. Our dependent variable is the number of misconduct fines imposed on a bank in a given year, and the key explanatory variable is the fraction of female directors. We find that a greater presence of women on the board of directors is associated with fewer misconduct fines, and the effect is economically significant. The estimated coefficient implies that for the average change in

the fraction of women across banks and years in our sample (which is 0.016), the number of fines would decrease by a fraction of 0.27, *ceteris paribus*. The estimated decrease in the frequency of banks' misconduct fines attributed to greater gender diversity is equivalent to saving approximately $7.48 million per year. Our results support the agency theory, as we provide evidence that increased gender diversity in the boardroom can positively influence corporate outcomes. We empirically endorse the critical mass theory on board gender diversity. Our findings reveal that female directors tend to be more influential if they reach a critical mass of three or more, are supported by women in leadership roles (CEO and/or chairperson) and hold seats on boards of relatively smaller banks.

To test the predictions of the gender socialisation theory, that is, whether ethicality/risk aversion is the channel through which a more significant female presence on banks' boards reduces incidences of misconduct, we distinguish among different types of fines according to the severity of the underlying offence. We consider two main proxies for the severity of fines. First, we distinguish between civil and criminal fines.[8] We argue that criminal fines are more severe as they carry a higher societal and professional stigma and are, on average, larger in amount and thus more harmful to the stakeholders of the bank. Moreover, as the conduct at issue frequently involves intent, criminal fines are the result of more unethical behaviour. We find that a change in the proportion of female directors on the board is negatively (albeit weakly) associated with the incidence of criminal fines, thus providing some support to the gender socialisation theory. Second, we distinguish among different types of fines based on the underlying misconduct and proxy their severity by stock price reactions to the fine announcement. We define the following four categories of fines: (*i*) banking violations; (*ii*) economic sanction violations; (*iii*) market violations, and (*iv*) administrative violations. Following a standard event study methodology, we find that share price reactions are more severe for economic sanctions compared to the other types of fines. This is consistent with the fact that economic sanctions tend to be related to exceptional events, attract more media attention, and carry a higher reputational risk. We find that an increase in the proportion of women on the board is associated with a lower frequency of economic

[8] Most US states recognise two types of offences - crimes and civil infractions. Crimes are a matter of criminal law and usually punishable by either time in jail or a fine, or both; civil infractions are generally punishable only by fines or administrative actions. A civil fine is a penalty for an offence not as serious as to be stipulated as a crime. Non-payment of a criminal fine can result in incarceration, whereas non-payment of a civil penalty cannot.

sanction violations, thereby providing further support to the existence of an ethicality/risk aversion channel as a mechanism through which board gender diversity helps reducing misconduct.

Finally, we investigate whether it is board diversity in general, and not gender diversity per se, that reduces misconduct. The human capital theory posits that by widening the range of directors' skills, abilities, managerial approaches and preferences, board diversity is expected to yield benefits in terms of monitoring effectiveness. However, these potential benefits are not without costs, as conflicts may arise in more diverse boards, leading to more unpredictable decision-making (Giannetti and Zhao, 2019). In line with the human capital theory, other aspects of diversity, including age diversity, internationalisation, and employee representation, could be expected to have a misconduct-reducing impact.[9] Our results show that, while the preventive effect of female directors holds even in the presence of other dimensions of diversity, the impact of other types of board diversity on misconduct is not significant.

Our analysis is robust to using a Poisson model for the frequency of misconduct, a probit specification for the binary dependent variable of the incidence of fines, alternative proxies for gender diversity such as the change in the fraction of women, and country fixed effects instead of country controls. We also analyse the impact of female directors across different bank-size groups, and the findings suggest that they are most relevant for relatively smaller banks. Taken together, our findings provide support to the recent policy initiatives to enhance gender balance in traditionally male-dominated industries such as the banking sector.

Our paper contributes to the current literature and policy debate in several respects. First, our work is related to the literature that analyses the relationship between governance and risk in the banking industry (Beltratti and Stulz, 2012; Ellul and Yerramilli, 2013; Nguyen et al., 2016). We contribute to the understanding of the determinants of bank conduct risk. Misconduct represents a cost to society, as banks subsequently incur severe financial and reputational penalties that, in turn, may hinder their ability to provide financial services. We also derive insights into the channels through which the preventive benefits of female board participation materialise. In this respect, our results support the role

[9] Our chosen diversity indicators include all aspects suggested by recent regulatory guidelines (EBA, 2017).

of women in strengthening the board's ability to manage reputational and conduct risks. Our work also relates to the literature on board diversity and firm performance (Ahern and Dittmar, 2012; Liu et al., 2014; Giannetti and Zhao, 2019). The quality of a board's decision-making is likely to depend on the talents and attributes of the directors, but also on the interaction between director characteristics (Cumming et al., 2015; Giannetti and Zhao, 2019). We contribute to this literature by disentangling the ethicality/risk aversion and the diversity hypotheses. More in general, we contribute to the debate on the role of women in leadership positions in the banking industry. Progress towards gender equality has been notoriously slow, despite the recent regulatory drive to increase diversity and to improve the participation of women and minorities in high profile roles. Recent evidence highlights that, globally, women hold less than 20 per cent of bank board seats (Sahay and Cihak, 2018).

Finally, our paper is related to the literature on the effect of sanctions and regulatory behaviour on bank risk (Ioannidou, 2005; Agarawal et al., 2014; Nguyen et al., 2016; Delis, 2017), the cost and availability of credit (Danisewicz et al., 2018; Deli et al., 2019).

The rest of the paper is organised as follows. Section 2 presents a review of the literature and hypotheses development. Section 3 discusses the data and univariate analysis. Section 4 presents the results of our main analysis and a set of robustness checks. Section 5 concludes.

2. Literature and hypotheses development

2.1 Women on boards

Gender diversity is important not only from a societal point of view but also in terms of corporate performance. Boards of directors make decisions that impact all stakeholders, from employees to shareholders and customers. According to the agency theory, gender diversity in the boardroom can positively influence corporate outcomes in relation to fundamental board functions, such as attendance, quality of discussions, and monitoring effectiveness including better oversight of firm's disclosures and reports (Carter et al., 2003; Field and Keys, 2003; Adams and Ferreira, 2009; Terjesen et al., 2009; Gul et al., 2011). More recently, Ye et al. (2019) document a positive and significant relationship between gender-diverse boards and the likelihood and the level of dividend pay-outs, which is consistent with

the view that board gender diversity encourages effective corporate governance, thereby alleviating agency problems.

However, the critical mass theory argues that the minority gender members (women) are not as effective as they could be, unless they comprise an adequate mass. The theory builds upon the token-status and sex-role stereotype theories, suggesting that sole women directors are perceived as images of the stereotype female qualities and treated as symbolic representatives of their social category, coined as tokens (Kramer et al., 2007). An emerging empirical strand of the literature shows that the relationship between women directors and financial performance can be nonlinear, with women able to add value when they reach a critical mass of three or more (Liu et al., 2014). Schwartz-Ziv (2017) documents that the presence of at least three female directors catalyses boards' and directors' activeness in monitoring and managing the firm. In addition, the author finds that gender-balanced boards are more influential in critical times of CEO turnover. The presence of one or two token women on a board, on the other hand, has been linked with poorer firm performance (Joecks et al., 2013). This non-linearity can contribute to explaining why studies on the effects of board gender diversity on firm performance have produced mixed results (Adams and Ferreira, 2009; Adams and Funk, 2012; Ahern and Dittmar, 2012; Mateos de Cabo et al., 2012; Post and Byron, 2015; Bennouri et al., 2018).

Based on the predictions on this strand of the literature, we derive our first testable hypothesis as follows:

Hypothesis 1 (Agency theory): Higher gender diversity of bank boards is associated with a lower number of misconduct fines.

2.2 Gender, risk aversion, and ethicality

There are many potential benefits to having a larger presence of female directors. The earlier literature suggests that women are, on average, more risk-averse and less overconfident (Jianakoplos and Bernasek, 1998; Schubert et al., 1999; Croson and Gneezy, 2009, Price, 2012), although Sapienza et al. (2009) find that women who work in the financial industry tend to be less risk-averse compared to women in other sectors. Gender might help explain differences in preferences and attitudes; for example, differences in sensitivity to social cues in determining appropriate behaviour (Croson and

Gneezy, 2009; Alesina et al., 2013; DellaVigna et al., 2013). One explanation for these behavioural differences is unequal discipline: female employees responsible for missteps are subject to stricter penalties than their male counterparts. Egan et al. (2018) examine gender differences in misconduct punishment in the financial advisory industry and find evidence of a *gender punishment gap*. Against the background of a male-dominated industry, where male advisors engage in more severe misconduct both in terms of allegations and subsequent fines, the authors document that following an incident of misconduct female advisers are 20 per cent more likely to lose their jobs and 30 per cent less likely to find new ones relative to male advisers. We can argue that gender roles and cultural norms may also mean that misconduct is more highly penalised for women and therefore less likely (*Risk aversion channel*).

The gender socialisation theory posits that males and females are taught different appropriate behaviours, and women are generally socialised to be caring, compassionate, and attentive to others' needs. In our context, this would translate in greater attention to stakeholders' needs, including depositors, investors, and employees. Female directors are found to be more stakeholder-oriented (Adams et al., 2011; Matsa and Miller, 2013) and less likely to pursue personal goals such as empire building through acquisitions (Levi et al., 2014). Women also bring enhanced corporate social responsibility and a more ethical perspective (Byron and Post, 2016; McGuinnes et al., 2017). Richardson et al. (2016) find that more gender-diverse boards are associated with lower tax avoidance; Garcia-Lara et al. (2017) document fewer incidences of account misreporting in firms with a higher percentage of female directors. Cumming et al. (2015) investigate the effect of board gender diversity on security fraud and find that it reduces both the frequency and the severity of fraud. Similarly, Wahid (2019) documents that listed firms with more gender-diverse boards commit fewer financial reporting mistakes and engage in less fraud. Liu (2018) investigates the relationship between board gender diversity and corporate environmental violations and finds that firms with more gender-diverse boards receive fewer sanctions. Based on this stream of literature, we expect female directors to be less inclined to commit misconduct (*Ethicality channel*).

However, untangling the mechanism through which the presence of women on boards of directors affects misconduct is challenging as differences in ethical sensitivity and risk aversion may overlap. To

investigate the link between gender, ethical behaviour, and risk aversion, we consider the gravity of misconduct as measured by the severity of the underlying offence. First, we distinguish between civil and criminal fines.[10] Criminal fines represent more severe offences, particularly because they refer to a case of conduct with the intention to commit a crime. Second, we distinguish four broad categories of fines according to the type of the underlying misconduct: (*i*) banking business violations (including anti-money laundering sanctions); (*ii*) economic sanctions; (*iii*) market violations; and (*iv*) administrative violations (including tax violations and accounting deficiencies). We then proxy the severity of the different types of misconduct by stock price reactions to the fine announcement.

We argue that the impact of board gender diversity should be stronger for more severe fines, as female directors might exert greater monitoring and closer oversight of board decisions to avoid offences that are less ethical, carry a higher societal and professional stigma, and are more harmful to the bank's stakeholders.

We formulate our second hypothesis as follows:

Hypothesis 2 (Ethicality/risk aversion channel): Higher gender diversity of bank boards is associated with a lower number of more severe misconduct fines.

2.3 Gender and diversity

The potential benefits of having more female directors could be attributed to the broad spectrum of views and skills that they bring to the board. The key argument to support diversity, in line with the human capital theory, is that a more diverse management team tends to be more innovative and creative, more open to different ideas, and willing to consider a broader range of alternatives. The literature provides some support for the human capital theory: female directors are likely to have different views and therefore innovative ideas (Robinson and Dechant, 1997), and a broader set of skills in terms of

[10] In our dataset, the distinction between criminal and civil fines relates to whether the case was brought as a civil or criminal matter. In the US legal system, civil cases usually involve private disputes between persons or organizations. Criminal cases involve an action that is considered to be harmful to society as a whole. The specific conduct at issue also differs between criminal and civil cases. In criminal cases, the conduct at issue is generally more serious and involves intent. On the other hand, civil cases involve negligent conduct. Intent to commit a crime rather than negligence has important implications in terms of ethicality. In terms of punishment, in case of criminal law a person found guilty is punished by incarceration in a prison, in addition to a fine. In case of civil law, the punishment is only pecuniary. Because of these differences, and particularly the case of conduct (i.e. the intent to commit a crime) we have classified criminal fines as less ethical.

educational and professional backgrounds, leading to better decision-making (Anderson et al., 2011). In addition, more diverse boards should be harder to manipulate. Arnaboldi et al. (2020b) investigate whether board heterogeneity impacts on bank performance and find that diversity in board composition relates to different aspects in addition to gender, including age diversity (Carter et al., 2010; Li and Wahid, 2017), internationalisation (Adams and Ferreira, 2012; Oxelheim et al., 2013; Fahlenbrach et al., 2017), and employee representation (Adams and Ferreira, 2007). The literature on the impact of board diversity on firm performance yields mixed results. Giannetti and Zhao (2019) argue that board effectiveness is likely to depend not only on the characteristics of the directors but also on the interaction between them. While diverse groups might be better at problem-solving, there might also be more disagreements. Consistently, the authors find that diverse boards have more numerous and cited patents. However, they also have more frequent board meetings and make less predictable decisions, which in turn increases firm performance volatility.

If it is board diversity in general that matters, we would expect other features, as well as gender diversity, to be associated with a lower number of fines. This would be in line with the view that women are not inherently different from men in leadership positions, and that more diverse boards perform better simply because of the benefits of a multiplicity of views and skills (Nelson, 2014).

We test the diversity channel and formulate the following hypothesis:

Hypothesis 3 (Diversity/human capital channel): Higher overall diversity of bank boards is associated with a lower number of misconduct fines.

3. Data and methodology

3.1. Data and sample selection

Our data set is compiled from several sources. We start by collecting data on corporate governance features of all publicly listed banks in the 28 EU countries for the period 2007-18 from BoardEx. Where the BoardEx data are not complete, we collect information on board members from Bloomberg and individual banks' annual reports. Next, we augment the corporate governance data with the banks' balance sheet and income statement data from Orbis Bank Focus and stock market data from Thomson Eikon. At this stage, we remove bank-years with missing board size or total assets data and exclude

banks with less than three observations over the sample period. This yields a final sample of 83 publicly listed banks headquartered in 21 EU countries, which covers 72 per cent of the total assets of these countries' banking systems at the end of the sample period.[11]

We then collect data on fines imposed on our sample banks by US regulatory agencies during the period 2008-2018 from Violation Tracker.[12] The sanctions retrieved are cross-checked against the information available on the websites and press releases of the corresponding regulatory agencies, which results in a number of additional sanction cases. Our sample includes fines issued by all active regulatory agencies during the period under study. The full list of the sanctions and the relevant sanctioning regulatory agencies is reported in Appendix A. The sanction data include: the type of sanction, the fine amount, the fine date, a short description of the offense, an indication of whether the sanction is civil or criminal, and the sanctioning regulatory body. The sanctions relate to, among others, charges for banking violations, money laundering practices, economic sanction violations, market manipulations, investor and consumer protection violations, tax violations, accounting and data submission deficiencies, and employment discrimination. Overall, we compile a list of 146 sanctions, resulting in either civil or criminal fines, against 13 out of 83 sample banks (around 16% of the sample) during the period 2008-18.

Finally, we augment the sample with country-level data collected from the World Economic Forum (2018) Global Gender Gap Report and the International Monetary Fund.

3.2. Variables

To test Hypotheses 1 and 3, we calculate the dependent variable, *N.Fine*, as the number of misconduct fines imposed on a bank in a given year. To test Hypothesis 2, we employ a binary dependent variable, *D.Fine_Criminal*, which takes a value of one if a bank receives a criminal fine in a given year. We also use as dependent variable the number of misconduct fines imposed on a bank in a given year distinguishing between four types of fines, that is, those related to: (*i*) banking business violations,

[11] The countries included in our sample are Austria, Belgium, Cyprus, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Malta, the Netherlands, Poland, Portugal, Romania, Spain, Sweden, the United Kingdom.

[12] Violation Tracker is a publicly available search engine on corporate misconduct. It covers cases initiated by more than 40 federal regulatory agencies and all divisions of the Justice Department since 2000.

N.Fine_Banking; (*ii*) economic sanction violations, *N.Fine_Economic*; (*iii*) market violations, *N.Fine_Market*; and (*iv*) administrative violations, *N.Fine_Admin*.

To test all our three hypotheses, we use *Female Director %*, the proportion of female directors on the board in a given year, as our main board gender diversity variable (Cumming et al., 2015, Liu, 2018). In additional tests, we use a second board gender diversity variable, Δ *Female Director %*, calculated as the change in the proportion of female directors on the board in a given year. This variable captures the change in female representation in the boardroom regardless of the initial level, thereby reducing potential concerns that larger banks may have a higher proportion of female directors. We also consider the absolute number of women directors as an alternative to the proportion of women on the board to assess the validity of the critical mass theory concerning board gender diversity. Additionally, in order to investigate whether the effectiveness of female directors can be reinforced by the presence of women in other leadership positions, we use a dummy variable, *Female Leader*, which indicates a female chief executive officer (CEO) and/or chairperson or president.

In additional analyses, we include other dimensions of board diversity, besides female representation. We add director age diversity, *Director Age Diversity*, measured as the coefficient of variation for board directors' age, which shows the dispersion of age within the board. We also include board internationalisation, *Foreign Director %,* measured as the proportion of foreign directors on the board. We add employee representation, *Employee Representative %*, measured as the proportion of employee representatives on the board.

We employ a series of control variables, including board, bank, and country characteristics. Board size, *Ln(Board Size)*, is measured as the natural logarithm of the number of directors on the board. Director tenure, *Ln(Director Tenure)*, is the natural logarithm of the average tenure length of directors on the board. Director age, *Ln(Director Age)*, is the mean age of board directors in logarithm form. We also include CEO characteristics: CEO tenure, *Ln(CEO Tenure),* is the natural logarithm of the CEO's tenure length; CEO age, *Ln(CEO Age),* is the natural logarithm of the CEO's age; CEO turnover*, CEO Turnover*, is a dummy variable equal to one in the year a new CEO is appointed.

Turning to bank-specific controls, we include bank size, *Size*, measured as the natural logarithm of total assets. Larger banks tend to be more frequently fined. Moreover, large banks tend to be complex

organisation, which can potentially impact the effectiveness of the board in preventing misconduct. Return on equity, *ROE,* is included to account for the profitability of a bank, whereas risk is captured using the volatility of stock returns, *Stock Return Volatility*¸ measured as the annualised volatility of daily stock market returns. We use the two latter variables as proxies for the financial health of a bank, to account for the existing evidence that firms in financial distress are more likely to commit fraud (Beasley, 1996; Cumming et al., 2015). We also include Tobin's Q, *Ln(Tobin's Q)*, to control for bank charter value (Liu, 2018). All bank-specific controls are winsorised at the 5 percent level.

In our set of country-specific controls, we include the country's gender index rank, *Gender Index Rank*, which is based on the gender gap index score published by the World Economic Forum (2018). The index captures the relative gaps between women and men in a country across four areas: health, education, economy, and politics. We also control for the macroeconomic conditions by including the GDP growth rate, *GDP Growth*. Finally, we include a dummy variable, *G10*, which takes the value of one for the G10 countries, that is, most developed economies. The definition and construction of all the variables used in the study are reported in Appendix B.

3.3. Model specification

To determine whether the gender diversity of the board is associated with bank misconduct, we employ the following model in a panel setup for bank-year *it* in country *j*:

$$\begin{aligned} Misconduct_{it,j} = {} & \beta_0 + \beta_1 Gender\ diversity_{i,t-1} + \beta_2 Gender\ Index\ Rank_j \\ & + \beta_3 Female\ Leader_{i,t-1} + \beta_4 N.Fine_{i,\,t-1} + \beta_5 Ln(Fine)_{i,t-1} + \beta_6 Ln(Board\ Size)_{i,t-1} \\ & + \beta_7 Ln(Director\ Tenure)_{i,t-1} + \beta_8 Ln(Director\ Age)_{i,\,t-1} + \beta_9 Ln(CEO\ Tenure)_{i,t-1} \\ & + \beta_{10} Ln(CEO\ Age)_{i,t-1} + \beta_{11} CEO\ Turnover_{i,t-1} + \beta_{12} Size_{i,t-1} + \beta_{13} ROE_{i,t-1} \\ & + \beta_{14} Stock\ Return\ Volatility_{i,t-1} + \beta_{15} Ln(Tobin's\ Q)_{i,t-1} + \beta_{16} GDPGrowth_{j,t-1} \\ & + \beta_{17} G10_j + \sum Year_t^i + \sum Agency_t^i + \varepsilon_{it,j} \end{aligned} \quad (1)$$

Our dependent variable measures the number of fines received by bank *i* in year *t*. We include the number and dollar amount of fines received by bank *i* in year *t-1* in the specification, to control for the

impact of previous sanctions on the bank's misconduct and the expected additional effort of regulatory authorities with recently (*t-1*) sanctioned banks. Year fixed effects are included to control for changes in the macroeconomic environment over time. We also include agency fixed effects to control for the different bank activities the sanctioning agencies supervise. The correlation matrix for the variables used in the regression analysis is reported in Appendix C.

To test our hypotheses, we deploy a negative binomial count model as the appropriate approach for modelling the number of fines per year in the presence of overdispersion in the dependent variable.[13] We model the frequency rather than the amount or incidence of fines for a number of reasons. First, the disaggregate level of fine information is a unique aspect of our hand-collected dataset. A bank might incur multiple fines of different type in the same year - this information would have been masked had we opted to model the aggregate fine amount or the binary outcome of fine occurrence. [14] Second, the fine amount may not be a good measure of the severity of misconduct as the size of the penalty imposed may be susceptible to regulatory bias stemming from political reasons and the systemic nature of the financial institutions. In addition, the fine amount is the subject of negotiation between regulatory agencies and banks and might depend on banks' willingness to settle the claims. Furthermore, the long-term cost of committing fraud (lost reputation shown by lower share price) outweighs the direct costs of sanctions in the form of fine amount.

The frequency or incidence of fines has been used as the variable of interest in a similar setup in Liu (2018) in the context of environmental lawsuits and in Cumming et al. (2015) in the context of securities fraud. To allow for comparison with previous studies, however, in the robustness analysis, we employ an alternative binary dependent variable, which captures the occurrence of one or more fines for bank *i* in year *t* and estimate a probit model. We also use a probit model for the incidence of criminal fines as

[13] The two candidate exponential models to describe our fine frequency random variable are Poisson and negative binomial. The main difference between the two lies in the characterisation of the dispersion in the data, the negative binomial distribution being more appropriate in cases where data exhibit overdispersion. In our sample the dispersion statistic is equal to 20.2 suggesting that a negative binomial model fits the data better. In this case, the Poisson model underestimates the standard errors albeit still generating unbiased coefficients. The use of the negative binomial model is also supported by the comparison between the observed fine frequencies and the fitted probabilities derived from the two candidate models.

[14] For instance, Société Générale has been issued with 8 fines in 2018, Deutsche Bank with 7 fines in 2015, Crédit Agricole with 6 fines in 2015, and RBS with 5 fines in 2013.

part of the analysis related to Hypothesis 2. Additionally, in the robustness analyses, we re-run the regressions using a Poisson model. The results of the alternative specifications are consistent with those produced by our negative binomial regression model.

3.4. Endogeneity

As in many corporate governance analyses, endogeneity could pose an issue when modelling the relationship between female representation on the board and bank misconduct. Endogeneity of board gender diversity could be attributed to the potentially non-random selection of women on the board, giving rise to the problem of reverse causality. There is consensus that gender diversity might be a choice that firms endogenously make to suit their own strategic goals and functioning environments (Adams and Ferreira, 2007; Coles et al., 2008; Sila et al., 2016). Existing evidence suggests that female directors are more likely to be appointed by already troubled firms in a bid to reverse past problems, a phenomenon known as *glass cliff* (Ryan and Haslam, 2005). On the other hand, banks that are more inclined to transgress might decide to avoid having diverse boards. Equally, women directors might self-select into banks that are less inclined to misconduct or decide to resign as they acquire information about misconduct becoming more likely.

Omitted variable bias could be another source of endogeneity due to the challenges of determining all the factors driving bank misconduct. It could be argued that omitted observable or unobserved bank characteristics could drive both the extent of board gender diversity and the propensity of bank misconduct, thus leading to correlation between the error term and the gender diversity proxy. Prior evidence suggests that the complexity of the firm is a determinant of board characteristics (Hermalin and Weisbach, 1988) and, thus, firms with a more complex structure may opt for more gender-diverse boards (Coles et al., 2008). However, more complex firms can also be opaque and have a more diffuse management structure, which can lead to more opportunities to commit misconduct. Therefore, bank complexity can drive both bank gender-diversity and misconduct and can result in endogeneity.

Other examples of omitted unobserved factors in the misconduct generating process could be managerial stability. CEOs that are longer with the firm may be more effective in terms of managing conduct risk and also be more influential over the selection of board candidates (Hermalin and

Weisbach, 1988; Cai et al., 2009; Coles at al., 2014). CEOs with a track record in the firm might prefer to appoint directors who are less likely to play an effective supervising role. Adams and Ferreira (2009) suggest that female directors devote more effort in monitoring CEOs than male directors. Adams and Funk (2012) show that women are more independent, more open-minded, and less power-oriented than their male counterparts, as well as less concerned about job security. It is therefore possible that managerial preferences for a less effective board would be correlated with gender diversity (Sila et al., 2016).

We use the following three approaches to address endogeneity concerns. First, to mitigate potential reverse causality that may bias our estimates, we run all the regressions using lagged independent variables for both board characteristics and bank-level controls (Dittmann et al., 2010; Liu, 2018). Controlling for previous fines also helps to alleviate the concern that results are driven by women joining boards of banks that have a recent history of good conduct. One additional challenge is related to the lack of specific information regarding the actual timing of misconduct. We consider realised misconduct, that is, the cost that the bank incurs as a result of the breach of rules and regulations. Although there is a possibility that the board changes between the actual misconduct and its realisation, the fines received are relevant to the current board, for several reasons. First, the fines are harmful both financially and from a reputational point of view. Second, the current board of directors is liable for past misconduct and is in charge of liaising with regulators, which ultimately defines the outcome of the legal process.

Secondly, we deal with the problem of endogeneity by adopting an instrumental variable approach. Albeit finding valid instruments is challenging, the literature (Becker et al., 2011; Wahid, 2019) suggests that board characteristics can be adequately instrumented by characteristics of the firm's geographical location.[15] Our selected instrument for the gender diversity proxy is the level of female education (relative to male) in the country where the bank is headquartered. The educational attainment gender gap is published by the World Economic Forum (2018) and is a component of the gender index

[15] To proxy for board gender diversity, Wahid (2019) uses as instrument the female population at the firm's headquarter location. Instead, we use a country-level instrument as in our context the director appointment is conducted at least nationwide.

that we use as a control variable. It captures the gender gap in access to education using four ratios: female enrolment rate over male value in primary, secondary, and tertiary education, respectively, and the relative gap in the literacy rate. The country-level educational attainment sub-index is time-varying and ranges from 0 to 1 (gender parity).

The educational gender gap can be conceptually regarded as an appropriate instrument for the presence of female directors in a given bank, as the probability of female board membership can be assumed to be higher where the educational gender gap in the main pool of candidate directors is smaller. Thus, the selected instrument is bound to induce changes in the presence of women on the board and, additionally, does not have any independent effect on misconduct incidence (our dependent variable) beyond its effect through the correlation with female board representation. As it is expected to be strongly correlated with the endogenous regressor and uncorrelated with the error term, it fulfils the required properties for a valid instrument. Proxies for economic and political gender gaps were also considered but did not qualify as valid instruments.

Third, we address endogeneity caused by omitted variable bias by using bank-specific controls to capture unobserved bank characteristics that may drive the diversity-misconduct relationship. We use bank size as a proxy for bank complexity and incorporate it as a control variable in the misconduct-diversity regression. It has also been shown that women prefer to join larger boards (Liu et al., 2014), which adds to the relevance of bank size as a determinant of board gender diversity and the likelihood of misconduct. In addition, we use measures of changes in corporate governance, such as CEO turnover and CEO tenure, as a proxy for managerial preferences over a less effective board. Equally, such changes in bank corporate governance might discourage women from joining the board. Finally, industry or country effects might drive the relationship between gender diversity and bank misconduct. We employ country-level controls to account for unobserved country-specific characteristics (time-invariant and not) that may be correlated with the level of gender diversity (that is, a country's corporate culture). We also employ regulatory-agency effects to proxy for a bank's business model. As a robustness check, we re-estimate our baseline model using country fixed effects.

More in general, in our set-up, the issue of the women reacting to future misconduct is mitigated by our exogenous identification of bank misconduct based on fines issued by US regulators. During the post-

crisis period, the activism of the US regulators on European banks was exceptional, both in reach and severity of fines. To some extent, only in more recent years, the role of the US regulators as a global regulator has been established. This increased intensity in their supervisory effort on European banks also mitigates the concerns of undetected misconduct.

Finally, we consider regulatory reforms aimed at increasing gender representation on listed companies' boards of directors to represent an exogenous shock to board composition by introducing either discretionary or mandatory gender quotas and test the role of gender diversity in mitigating misconduct following the reforms. Building upon Arnaboldi et al. (2020a), we consider all diversity-related reforms during our sample period. The heterogeneity in regards to the timing and the type of these reforms across European countries facilitates the design of a treatment-based empirical approach that overcomes the endogeneity issues arising in attempting to explain the link between board diversity and misconduct.

4. Empirical results

4.1. Descriptive statistics

Table 1, Panel A, reports the descriptive statistics for the sample used in the regression analysis. Female directors are present in 86.8% of the bank-year observations. The sample banks average 16 directors on their boards, of which 16.4% are women, with a maximum of 60% and a minimum of 0%. Only 4.7% of the bank-year observations have a female CEO, whereas 23.2% have a female chairperson, and 25.5% have women in leadership positions.

[Insert Table 1 about here]

Panel B of Table 1 reports the summary statistics for the fines issued against the sample banks. Around 8% of the bank-year observations have received misconduct fines. Of those, over one third relate to criminal sanctions (2.6% of the bank-year observations). On average, sample banks are levied 0.183 misconduct fines per year, with a maximum of 8 and a minimum of 0. The most frequent type of fine is related to market violations; on average, sample banks experience 0.061 market lawsuits per year.

The statistics pertaining to the bank-specific variables are presented in Panel C. The average bank in our sample has about $306bn in total assets. There is a significant variation in bank size, with total assets ranging from $3.3bn to $1.6tn.

Table 2 reports the evolution of female participation in the governance of the sample banks. Gender diversity increased over the sample period (and consistently so from 2010), with female directors being present in more banks and in a higher proportion. In particular, the number of banks with female directors increased from 80% to 96.1% of the sample between 2007 and 2017. Female representation on the board gradually increased from an average of 10.4% in 2007 to 26.1% in 2017. The presence of female leaders also shows an upward trend during the sample period. Female CEOs witnessed the highest increase, from only 1.5% of boards with female CEOs in 2007 to 7.9% in 2017. The proportion of banks appointing female chairpersons increased from an average of 16.9% to 36.8%, while the presence of female leaders in general increased from an average of 18.5% of boards with female leaders to 38.2%. Nevertheless, despite the tendency of banks to improve gender diversity, their boardrooms remained male-dominated over the sample period.

[Insert Table 2 about here]

Table 3 reports detailed summary statistics for misconduct fines of the sample banks by year. The total number of fines issued over the sample period is 146, with an average (unreported) dollar amount per fine of $364.6m and a maximum of $9bn.[16] Panels B and C of Table 3 report for each year in the sample the average aggregate fine amount received by each bank and the total amount fined across banks, respectively. The mean dollar amount fined in a bank-year is $872.7m, and the total dollar amount fined across the sample is $53.2bn. The incidence of fines increased over the sample period, especially post-2012, peaking at 36 fines in 2015. The major share of fines, both in incidence and dollar amount, is related to market violations, with 49 fines over the sample period averaging $1.1bn per bank-year and amounting close to $30.6bn in total. Fines related to economic sanctions, albeit not as frequent (25 fines), hold the second largest share, accounting for over $14.2bn in total, with an average fine value per bank-year of $791.1m. Fines related to banking business violations are relatively frequent (41 fines), but with a substantially smaller average amount per bank-year of $248.9m and a total amount of $6.5bn. Fines related to administrative violations are the lowest, both in average amount per bank-year ($76m),

[16] The maximum amount ($9bn) was levied against BNP Paribas in 2015, followed by $7.9bn against Deutsche Bank in 2017, and $5.6bn against the Royal Bank of Scotland in 2017.

and numbers (31 fines), amounting to $1.9bn. Overall, market and economic sanction violations are the most heavily penalised types of misconduct.

[Insert Table 3 about here]

4.2. Univariate analysis

Table 4 reports the results of the univariate analysis, where the sample banks are grouped on the basis of board gender diversity in two distinct ways. In Panel A, we distinguish banks with at least one female director (in year *t*-1) and banks without female directors. In Panel B, we differentiate between banks with high and low board gender diversity, according to whether the proportion of female directors in year *t*-1 is above or below the sample median, respectively. The data shows that banks with greater board gender diversity - defined either using a binary or median threshold-based classification of female board representation - experience a higher number of misconduct fines. However, this does not take into account other board and bank-level characteristics that could potentially drive the difference. Banks with more gender-diverse boards tend to be larger; they are more likely to also have women in leadership positions, including both the CEO and chairperson roles, and greater employee representation on the board.

[Insert Table 4 about here]

4.3 Regression analysis

4.3.1 Do female directors reduce misconduct?

Table 5 reports the results of our negative binomial regression model for Hypothesis 1. Drawing on the agency theory, we hypothesise a negative relationship between board gender diversity and bank misconduct. The negative binomial regression models estimate the relationship between our proxy of board gender diversity and the number of fines received by bank *i* in year *t*, employing a set of governance or board-level controls, bank- and country-level controls, and year and regulatory agency fixed effects. Standard errors are clustered at the country level to accommodate country-wise contemporaneous correlation caused by economic conditions and regulatory standards.

Models (1)-(3) focus on the effect of female directors on bank misconduct, and employ as the key test variable the fraction of women on the board (*Female Director %*). To capture bank-level autocorrelation

caused by the regulators' imposing greater scrutiny towards banks that have a recent misconduct record, all models include the misconduct fines (number and dollar amount) received by a bank in the previous year as additional regressors. In Model (2), we add a time-invariant country-level control to capture the progress towards gender equality in the country where the bank is headquartered (*Gender Index Rank*). In Model (3) we control for the effect of the presence of women in leadership positions, including the CEO, chairperson, or president roles (*Female Leader*). These models constitute our baseline specifications.

[Insert Table 5 about here]

The coefficient of our board gender diversity variable is negative and significant in all models: this indicates that female representation on the board is negatively associated with the frequency of misconduct fines. The coefficients in a negative binomial model can be directly interpreted as the change in the log differential of expected counts per unit change in the regressor or converted into the incidence rate ratio (IRR), which represents the change in the rate of incidence of fines. We transform the reported coefficients into the IRR using the exponential of the estimated coefficient multiplied by the change in the independent variable ($e^{\beta \Delta x}$) to obtain the ratio of the rate of fines per year, $N.Fines_1$ / $N.Fines_0$, generated by the given change in our measure of gender diversity $\Delta x = x_1 - x_0$. Thus, our parameter estimates suggest that a one-unit increase in the proportion of women on the board decreases the frequency of fines by a fraction of 0.27, *ceteris paribus*. For the average change in the fraction of women in our sample (0.016), the number of fines will decrease by a fraction equal to $(0.27)^{0.016} = 0.98$. Given that the average fine amount in our sample is $364.6 million, about 0.12% of banks' average total assets, the estimated decrease in the frequency of banks' misconduct incidences as a result of greater gender diversity on the board is equivalent to saving approximately $7.48 million per year. The merit of female directors remains even after controlling for the level of gender equality in the country where the bank is headquartered and the presence of women in leadership positions within the bank's governance.

The coefficient for the number of previously received misconduct fines is positive and significant, suggesting that misconduct episodes tend to be recurrent. However, the coefficient for the dollar amount of misconduct fines in the previous year has a negative and significant sign, suggesting that a more severe regulatory penalty can have a beneficial effect in decreasing the incidence of future misconduct

(disciplining effect). Both the gender equality index and the presence of women in leadership positions show the expected negative signs but are not significant.

As to the other controls, we find a positive and significant sign for bank size. This is not surprising, as larger banks with more cross-border activities are more frequently in the spotlight of regulators and thus more frequently fined. We also find a positive and significant coefficient for our proxy of bank risk (*Stock Return Volatility*), confirming that riskier banks are more likely to have lower conduct standards. Among our governance controls, we find that the length of the CEO tenure is positively associated with the frequency of misconduct fines. This is in line with the CEO entrenchment literature, suggesting that longer tenure might result in the CEO becoming more powerful and more likely to take risks (Bebchuk and Kamar, 2010). In addition, Hermalin and Weisbach (1998) show that monitoring declines as CEO tenure increases, possibly suggesting that the board becomes more entrenched and thus slower in detecting potential misconduct.

Critical mass

To explore the drivers of the effect of board gender diversity on bank misconduct, we consider several tests. Our first test draws upon the critical mass theory, which posits that female directors would have to exceed a certain minority threshold for them to be able to have any material impact on corporate outcomes such as monitoring, performance, and prevention of misconduct. There is consensus in the empirical literature that three or more directors form a critical mass, and, in such instances, female directors would be more effective in voicing their opinion and influencing corporate decision-making (Liu et al., 2014; Liu, 2018). Thus, we run our baseline specifications in Eq. (1) using as a proxy of gender diversity an indicator variable (*Critical Mass* ≥ 3) for a minimum of three female directors on the board. Banks with at least three women on their board constitute about 43% of the bank-year observations in the sample. The results are reported in Table 6, Models (1)-(3). All models bear out a more statistically significant role of gender diversity in curbing misconduct when the number of female directors reaches a critical mass.

[Insert Table 6 about here]

In Models (4)-(5) we test whether the role of female directors, either in the form of critical mass or simply proportional presence, becomes more effective in reducing bank misconduct if they are supported

by a female CEO, president, or chairperson (*Female Leader* interaction terms). The incremental effect of women in leadership positions is statistically significant only when there is no critical mass. This is evident by the fact that the impact of the proportion of female directors is only significant when there is also a woman in a leadership role. This additional effect disappears if there is a female critical mass.

Finally, in Models (6)-(7) we further test the critical mass theory by examining how the absolute number of female directors (rather than their proportional presence on the board) matters for bank misconduct. We employ dummy variables that indicate if a board comprises one, two or more female directors. In particular, Model (6) replaces the dummy variable for three or more women (*Critical Mass* ≥ 3) with a dummy for two or more female directors (*Critical Mass* ≥ 2). Boards with at least two women comprise about 63% of the sample bank-year observations. The dummy variable is insignificant, indicating that two female directors cannot be regarded as a critical mass in the context of board gender diversity. Model (7) includes the female director dummy that captures boards with a single woman member alongside the conventional critical mass dummy (*Critical Mass* ≥ 3). About 24% of the bank-year observations have boards with a sole female director. It emerges that a board with one female director exerts no significant impact on misconduct frequency, whereas a board of three or more female directors is still associated with a reduction in misconduct risk.

Overall the results indicate that the absolute number, as well as the percentage of female directors, does matter for bank misconduct. In support of the critical mass theory, the effect enters the relationship in a nonlinear way, implying that three or more female directors have to be reached for a significant reduction in misconduct frequency.

Bank size effect

The univariate analysis revealed that larger banks are more gender-diverse but also more frequently fined. To control for the fact that larger banks receive more fines, we introduce size effects in the baseline model by categorising the banks into quartiles based on the total value of assets. We then assess the differential impact of gender diversity on misconduct for the largest (top quartile) banks versus other banks by incorporating interaction terms between the fraction of female directors and the size dummy variables (*Size Qi*). The results of this test are presented in Table 7.

[Insert Table 7 about here]

We find that large banks (first and second quartiles), as expected, receive on average a higher number of fines. Still, there is no evidence of an impact of board gender diversity on misconduct for the banks of the top size quartile - the interaction term capturing the fraction of female directors in Q_1 has the expected negative sign but is statistically insignificant. Instead, we find a misconduct-reducing effect for the rest of the sampled banks, as indicated by the negative and strongly significant interaction coefficient in Q_{234}. This result reveals that the aggregate findings in Table 5 exhibit bank size heterogeneity, that, when accounted for, leads to even more robust support for Hypothesis 1.

Change in the proportion of female directors

To complete our evidence in support of Hypothesis 1, we run the baseline specifications using as key variable the change in the fraction of female directors on the board between year *t* and year *t*-1 (Δ *Female Director %*). This proxy has two advantages. While the previous specifications in Table 5 tests for the level of women participation, this proxy captures the change in the degree of women participation regardless of the initial level. It is, therefore, less influenced by board size, which is, in turn, related to bank size. The results of this test are presented in Table 8.

[Insert Table 8 about here]

We find that with a one-unit increase in the change in the representation of women on the board, the number of fines decreases by a factor of 4-5%, *ceteris paribus*. Overall, the beneficial impact of female board directors on bank conduct, as predicted in Hypothesis 1, is confirmed.

4.3.2 Gender diversity and ethicality/risk aversion

In this section, we attempt to shed light on the channels through which women's presence on the board can reduce bank misconduct. One of the challenges is the difficulty to disentangle the ethicality and risk aversion channels. The gender socialisation theory argues that women's influence derives from their ability to foster more ethical decision-making (Cumming et al., 2015; Byron and Post, 2016; McGuinnes et al., 2017; Liu, 2018). A higher female participation should improve the board's attitude towards more ethical issues, such as avoiding involvement in activities that could potentially undermine trust and confidence in the bank, and thus lead to a reduction in misconduct. On the other hand, gender might help explain differences in preferences and behaviour (Croson and Gneezy, 2009; DellaVigna et al., 2013), and the risk attitude might be driven by the existence of a *gender punishment gap* (Egan et al.,

2018). In our context, female directors' role in improving conduct could be driven by their ethical values and/or risk aversion. To this end, we explore whether the mechanism through which gender diversity relates to bank misconduct can be identified in the link between female directors and the occurrence of severe offences.

First, we distinguish between civil and criminal fines. The underlying assumption is that criminal fines reflect more severe and less ethical types of misconduct. Indeed, criminal fines are rare (amounting to less than 3 per cent of the bank-year observations), but also often carry a custodial sentence and a lifetime ban from working in the industry.

The results of this test are reported in Table 9. All models are estimated using a probit specification for the occurrence of criminal fines and use the same set of controls as the baseline regressions presented in Table 5. Our dependent variable is a dummy variable (*D.Fine_Criminal*), which is equal to one if a bank receives a fine imposed by a court for criminal offences and zero otherwise.

[Insert Table 9 about here]

In Model (1) the coefficient on gender diversity suggests that the higher the increase in the proportion of women on the board, the lower the probability of criminal misconduct. However, the coefficient is weakly significant in Model (1) and insignificant in Models (2)-(3), providing only weak support for the ethicality channel.

In Model (4), we augment the specification with an interaction term between the fraction of female directors on the board and the level of gender equality in the country where the bank is headquartered. This additional test aims to investigate whether the association of female directors with bank criminal misconduct depends on the country's institutional culture, that is, more or less supportive of gender equality. The coefficient for the interaction term is negative and significant, while the coefficient for female directors loses significance. We interpret this result as evidence that the role of women in supporting a more ethical behaviour of the board is closely intertwined with the recognition of their role in the society in which they operate. In other words, the ethical impact of female directors is only effective in countries with a higher level of gender equality.

In Model (5), we augment the specification with an interaction term between the fraction of female directors on the board and the presence of women in leadership positions. This test further examines

whether the ethical role of gender diversity is more prominent in banks with women in leadership positions (ethical behaviour encouraged at the top). The result suggests that the ethical role of female directors on the board is not enhanced by women representation in leadership roles within the governance of the bank.

Second, following Cumming et al. (2015), we conjecture that the severity of fines and, in turn, their reputational effect are represented by the extent of the stock market reaction triggered by the fine. In an event study set-up, we measure the effect of fines on share prices based on the abnormal reaction of the bank suffering the fine, computed as the deviation of its stock return from its expected value. The latter is estimated using the constant mean return model computed over the whole sample period.[17] The Cumulative Abnormal Return (CAR) associated with misconduct fines is then regressed on four dummy variables indicating the type of fine. The estimated regression coefficients represent the Cumulative Average Abnormal Return (CAAR) and its significance is assessed using the cross-sectional variation across the events through the t-statistic. The results of the event study are reported in Table 10.

[Insert Table 10 about here]

The findings are supportive of the view that economic sanction violations are more severe and carry higher reputational risk than the other types of fines. Economic sanction violations prompt significantly negative stock market returns in contrast to banking business, market, and administrative violations. The effect becomes apparent for larger event windows with a significant CAAR of –5.1% for the [0, 6] day event window, –7.6% for up to 9 days after the event, and –6.0% for 10 days after the event. The abnormal returns associated with the other three types of fines are insignificant across all event windows. The results are robust to the choice of expected return used as input for deriving the abnormal returns as well as alternative regression specifications. Using the mean return over the 252 and 504 days before the announcement to estimate the expected return as well as including year and country fixed effects in the CAR regressions, we obtain virtually identical results, which are available upon request.

[17] The gains from employing the market model as opposed to the constant return model for the estimation of abnormal return in event studies are linked to reducing the variance of the abnormal return. However, Brown and Warner (1985) find that for random samples and short time periods, the market model is not systematically better at identifying the presence of abnormal returns than models that do not incorporate market-wide factors and firm-specific risk.

We then turn to examine whether the role of board gender diversity in reducing the number of fines varies depending on the severity of fine. Building on our event study finding of a more aggravate market response to economic sanction violations, we run our baseline specification in Eq. (1) linking gender diversity and frequency of fines for each of the four fine sub-samples. The results of this test are reported in Table 11.

[Insert Table 11 about here]

We find a negative and significant coefficient for our proxy of board gender diversity (*Female Director %*) only in relation to economic sanction violations, which, as indicated by our event study, are considered to be the most severe type of fines. This provides further support to the view that gender has a significant effect on the attitudes of managers towards business ethics but also risk-taking. Economic sanctions are the result of complex and sometimes inconsistent global regimes, coupled with the increasing rigor in enforcements by US regulators. In this context, female directors can be influential in helping banks navigate the regulatory landscape and decrease the incidences of economic sanction violations, which are considered by the market as the ones that incur the highest reputational costs.

Overall, the results in this sub-section support the ethicality/risk aversion channel as the mechanism through which gender diversity improves bank conduct.

4.3.3 Gender diversity over other types of diversity

Our Hypothesis 3 postulates that the impact of female directors might be less important in boards that are more diverse overall. We test this hypothesis by augmenting our baseline models with three other measures of board diversity (Arnaboldi et al., 2020b), namely, age diversity captured by the coefficient of variation of the board directors' age (*Director Age Diversity*), internationalisation proxied by the fraction of foreign directors (*Foreign Director %*), and employee representation measured as the fraction of employees on the board (*Employee Representative %*).

Our choice of board diversity indicators is guided by the European regulatory guidelines and encompasses all aspects of diversity proposed by the regulators, with the exception of educational and professional background, due to data limitations.[18] However, we use employee representation as a proxy

[18] The European Banking Authority (2017) Guidelines, Title V, Diversity within the Management Body, state: "The diversity policy should at least refer to the following diversity aspects: educational and professional

of professional background and experience. The European Banking Authority (2017) document argues that employee representation in the boardroom could be seen as a positive way of enhancing diversity, as it adds a different perspective and knowledge of the internal workings of companies.

The results of the regressions including the different components of board diversity are reported in Table 12.

[Insert Table 12 about here]

We find that the coefficient for gender diversity is negative and significant in all models. Interestingly, none of the other board diversity characteristics seems to have an impact on the frequency of misconduct. These findings suggest that female directors exert a strongly significant negative effect on bank misconduct even in the presence of other aspects of board diversity. Overall, the results vindicate rejection of Hypothesis 3 and support the view that the reduction in bank misconduct can be attributed to the role of female directors rather than a general effect of a more diverse board.

4.3.4 Robustness tests

We conduct the following additional tests. First, we run our baseline regressions using a Poisson model for the rate of fine occurrence, as it is a simpler model for count variables but disregards the overdispersion exhibited by our count data with a large number of zeros. The results remain unchanged and are available upon request. The likelihood ratio test for the significance of the overdispersion parameter also shows that the two models are statistically identical.

Second, we run our baseline specifications including country fixed effects on a sub-sample of countries with at least three banks. The results of this test are presented in Table 13. We find negative and significant coefficients for our proxies of board gender diversity and evidence of bank size heterogeneity in the impact of female directors, both consistent with the results obtained using country-level controls. Therefore, we can exclude the possibility that our results are driven by unobserved fundamental differences in the social, economic, and regulatory contexts across countries.

[Insert Table 13 about here]

background, gender, age and, in particular for institutions that are active internationally, geographical provenance, unless the inclusion of the aspect of geographical provenance is unlawful under the laws of the Member State".

In a third test, we address the literature on the glass cliff effect, which posits that women are often appointed into leadership positions that are associated with increased risk of failure (Ryan and Haslam, 2005; Haslam and Ryan, 2008; Liu, 2018). To test whether our results are driven by female directors joining boards of banks that are already experiencing distress, we exclude the cases of women joining the board during "troubled" times. We proceed by dropping observations where the change in stock price volatility in the previous year is equal to or higher than the 75th percentile of the sample. The results of this test are reported in Table 14. The coefficients for our proxies of board gender diversity remain negative and significant across all models after controlling for the potential glass cliff effect, which supports the validity of our Hypothesis 1.

[Insert Table 14 about here]

Next, we test the robustness of our baseline results to the model specification using a pooled probit model for the probability of being sanctioned. The dependent variable is a dummy variable equal to one when a bank is fined and zero otherwise. The results of this test are reported in Table 15. The findings for our main proxy of gender diversity hold; the size differences in the effect of female directors on bank misconduct are also evident in this specification.

[Insert Table 15 about here]

Next, we re-estimate our baseline negative binomial regression model for the frequency of fines using a control function-based instrumental variable approach, which is suitable in the context of nonlinear models of discrete and count variables with continuous endogenous regressors. Control function estimators first estimate the model of endogenous regressors as a function of the instruments, as the "first stage" of 2SLS, then use the errors from this model as an additional regressor in the main model. This approach is more general than maximum likelihood as it allows flexibility in the specification of the first stage function, and the joint distribution of errors need not be fully parameterised (Lewbel et al., 2012).

The results of this test are reported in Table 16. The instrumental variable approach confirms that the findings of our analysis regarding the effect of women directors hold after controlling for the potentially endogenous nature of board characteristics.

[Insert Table 16 about here]

Finally, building upon Arnaboldi et al. (2020a), we consider all diversity-related reforms during our sample period to test whether the impact of women in curtailing misconduct is significant following post-crisis corporate governance reforms aimed at increasing gender representation on listed companies' boards of directors. To this end, data are collected from the European Corporate Governance Institute (ECGI), the European Commission (EC), the World Bank Report on the Observance of Standards and Codes (ROSC), and publications from each country's relevant regulator. During our sample period, EU countries such as France and Italy introduced mandatory gender quotas (2011 and 2012, respectively). Using a difference-in-difference empirical framework that controls for agency and time fixed effects and allows for country-specific residual serial correlation, we find evidence that following the exogenous shock of board diversity reforms the misconduct-reducing impact of female directors is significant and stronger, although the effect takes up to two years to materialise. The results of this test are reported in Table 17.

[Insert Table 17 about here]

5. Conclusions

This study examines the relationship between board gender diversity and bank misconduct as captured by the fines imposed by US regulators on European banks. Bank misconduct has significant implications not only for individual financial institutions, as large regulatory fines can harm their soundness, but also for the whole banking industry. Therefore, understanding the role of board gender diversity in curbing bank misconduct can contribute to reducing systemic risk and strengthening financial stability.

Post-crisis, US regulators have issued a record number of fines to foreign financial institutions. This offers a unique set-up for our analysis. We hand-collect and analyse misconduct fines issued to European listed banks by all US regulatory agencies, both relating to criminal sanctions and civil infringements. We find that a larger presence of women on the board of directors is associated with fewer misconduct fines. The effect is economically significant: the estimated decrease in the frequency of banks' misconduct fines as a result of greater board gender diversity is equivalent to a saving of $7.48 million per year. Boards with three or more women are found to have a stronger impact in curbing

misconduct compared to those with two or fewer women, corroborating the critical mass theory concerning board gender diversity. These results seem to provide support to the view that increased gender diversity helps reducing conduct risk by helping to foster a better corporate culture.

To understand the mechanisms through which the presence of women on the board affects bank misconduct, we test the ethicality/risk aversion channel and the diversity/human capital channel. We find evidence to support the ethicality channel, as indicated by the negative association of board gender diversity with criminal misconduct, conditional on the bank being based in a country with a higher level of gender equality. We also find support for the risk aversion mechanism, as board gender diversity is associated with a lower frequency of economic sanction violations that trigger a more severe stock market reaction and are currently one of the biggest challenges for US and European banks. To test the diversity channel, we consider other aspects of board diversity, including age diversity, the presence of foreign directors and employee representatives. We find no evidence to support board diversity, rather than the presence of women, playing a role in containing bank misconduct. Our results therefore suggest that women bring a unique set of skills to corporate boards, in line with the gender socialisation theory interpretation.

Overall, our findings support the view that gender diversity has a significant effect on the attitudes of managers towards business ethics but also risk-taking: gender diversity improves bank culture and reduces conduct risk. We also find that women in corporate governance are more influential in countries with higher gender equality. While most European countries have made considerable progress in terms of gender equality in areas such as educational attainment and health, substantial inequality remains in areas such as economic participation and political empowerment. One of the biggest challenges lies in changing stereotypes and bias in society, highlighting the importance of government and regulatory initiatives aimed at fostering gender diversity. Our results provide evidence that policymakers should take a holistic, bottom-up approach to gender issues to ensure the impact of gender diversity in corporate governance. Interestingly, we find that female board representation has no impact on bank misconduct for the largest banks. While current reforms often target the inclusion of more female directors in larger banks, our results point towards a beneficial effect of board gender diversity also for medium-sized and smaller banks. Such banks may not have the same relevance for financial stability as larger banks;

however their role in maintaining trust and confidence in the financial system should be taken into account. Additional evidence points to a recidivism of bank misconduct and the strong deterrent represented by larger monetary penalties.

An interesting avenue of further research is to investigate whether the regulatory fines, as a consequence of misconduct events, trigger changes in the governance of the bank, or prompt the bank senior management to consider including more women on the board in order to increase the perceived ethicality of the board in the eyes of stakeholders and regulators.

Table 1: Summary statistics

Variable	N	Mean	Median	Std. dev.	Minimum	Maximum
Panel A: Corporate governance						
Female Director	789	0.868	1.000	0.339	0.000	1.000
Female Director %	789	0.164	0.148	0.121	0.000	0.600
Δ *Female Director %*	693	0.016	0.000	0.058	-0.250	0.222
Female CEO	789	0.047	0.000	0.212	0.000	1.000
Female Chair	789	0.232	0.000	0.422	0.000	1.000
Female Leader	789	0.255	0.000	0.436	0.000	1.000
Board Size	789	16.129	15.000	5.916	4.000	41.000
Director Tenure	789	6.203	5.900	2.781	0.100	16.671
Director Age	789	58.325	58.588	4.602	35.800	70.385
CEO Tenure	789	5.857	4.000	5.110	1.000	28.000
CEO Age	789	56.103	56.000	7.278	33.000	79.000
CEO Turnover	789	0.147	0.000	0.354	0.000	1.000
Director Age Diversity	789	0.145	0.142	0.047	0.013	0.905
Foreign Director %	789	0.197	0.182	0.204	0.000	1.000
Employee Representative %	789	0.074	0.000	0.127	0.000	0.600
Panel B: Misconduct fines						
D.Fine	798	0.076	0.000	0.266	0.000	1.000
N.Fine	798	0.183	0.000	0.799	0.000	8.000
N.Fine_Banking	798	0.051	0.000	0.311	0.000	3.000
N.Fine_Economic	798	0.031	0.000	0.230	0.000	3.000
N.Fine_Market	798	0.061	0.000	0.354	0.000	4.000
N.Fine_Admin	798	0.039	0.000	0.229	0.000	2.000
Fine (m)	798	66.711	0.000	540.610	0.000	9033.557
D.Fine_Criminal	798	0.026	0.000	0.160	0.000	1.000
Panel C: Bank- and country-level controls						
Total Assets (bn)	789	306.766	76.275	473.087	3.263	1641.308
ROE	789	0.064	0.076	0.106	-0.210	0.248
Stock Return Volatility	787	0.384	0.338	0.183	0.140	0.811
Tobin's Q	785	2.278	1.004	3.333	0.927	13.612
GDP Growth	789	0.992	1.400	2.844	-9.100	25.000
Gender Index Score	789	0.745	0.738	0.039	0.674	0.822

The table reports the summary statistics for the sampled banks on the variables used in the analysis. Panel A and Panel C report the statistics on corporate governance and bank- and country-level controls, respectively, over the 2007-17 period. Panel B reports the statistics on misconduct fine variables over the 2008-18 period. Bank-level control variables are winsorised at the 5 percent level. Definitions of the variables are provided in Appendix B.

Table 2: Female representation in bank governance

	Female Director	*Female Director %*	*Female CEO*	*Female Chair*	*Female Leader*
2007	0.800	0.104	0.015	0.169	0.185
2008	0.806	0.113	0.015	0.209	0.224
2009	0.716	0.103	0.015	0.209	0.224
2010	0.750	0.101	0.044	0.176	0.206
2011	0.824	0.111	0.044	0.235	0.265
2012	0.859	0.132	0.042	0.197	0.225
2013	0.938	0.165	0.037	0.188	0.212
2014	0.944	0.204	0.070	0.211	0.239
2015	0.949	0.226	0.064	0.256	0.282
2016	0.949	0.250	0.077	0.308	0.333
2017	0.961	0.261	0.079	0.368	0.382

The table reports the statistics on gender diversity in bank governance over the sample period. The mean value is reported for: (i) female director dummy variable, (ii) fraction of female directors, (iii) female CEO dummy variable, (iv) female chairperson / president dummy variable, and (v) female leader dummy variable. Definitions of the variables are provided in Appendix B.

Table 3: Misconduct fines - Time trend by sanction type

Panel A: Number of bank fines

	N.Fine	*N.Fine_Banking*	*N.Fine_Economic*	*N.Fine_Market*	*N.Fine_Admin*
2009	6	1	2	0	3
2010	5	0	3	0	2
2011	2	0	0	1	1
2012	12	4	4	4	0
2013	12	1	5	4	2
2014	17	4	1	10	2
2015	36	11	5	9	11
2016	16	8	1	2	5
2017	18	6	1	8	3
2018	22	6	3	11	2
Total	146	41	25	49	31

Panel B: Average bank fine amount ($ m)

	Fine	*Fine_Banking*	*Fine_Economic*	*Fine_Market*	*Fine_Admin*
2009	80.663	8.385	392.000	0.000	0.977
2010	270.454	0.000	266.200	0.000	276.835
2011	72.524	0.000	0.000	145.000	0.048
2012	915.638	1010.500	537.000	189.183	0.000
2013	521.408	50.000	34.010	1202.685	7.815
2014	292.976	107.540	258.661	394.500	41.500
2015	1652.255	333.330	2575.298	912.435	34.043
2016	137.744	201.075	2.486	0.655	4.592
2017	2043.182	98.387	425.000	2677.320	48.562
2018	1347.132	134.312	852.467	1415.925	445.895
Sample	872.710	248.862	791.136	1093.701	76.034

Panel C: Total bank fine amount ($ m)

	Fine	*Fine_Banking*	*Fine_Economic*	*Fine_Market*	*Fine_Admin*
2009	403.315	8.385	392.000	0.000	2.930
2010	1352.269	0.000	798.600	0.000	553.669
2011	145.048	0.000	0.000	145.000	0.048
2012	3662.550	2021.000	1074.000	567.550	0.000
2013	2607.039	50.000	136.038	2405.370	15.630
2014	2636.781	322.620	258.661	1972.500	83.000
2015	16522.545	2333.311	10301.193	3649.740	238.301
2016	826.462	804.300	2.486	1.310	18.367
2017	14302.272	393.548	425.000	13386.600	97.124
2018	10777.057	537.250	852.467	8495.550	891.790
Total	53235.338	6470.414	14240.445	30623.620	1900.858

The table reports the summary statistics on misconduct fines of the sampled banks over the sample period. Panel A reports the number of fines across the sample, by year and in total; Panel B reports the average amount of fines per bank-year, by year and for the full sample; and Panel C reports the total amount of fines across the sample, by year and in total. The statistics are reported for: (i) all misconduct fines and separately for those related to (ii) banking business violations, (iii) economic sanction violations, (iv) market violations, and (v) administrative violations. Definitions of the variables are provided in Appendix B.

Table 4: Univariate analysis by board gender diversity

Panel A: Presence of female directors

	Boards with female directors		Boards without female directors		Difference	
	N	Mean	N	Mean	Mean	*p*-value
D.Fine	664	0.089	103	0.020	0.070**	0.016
N.Fine	664	0.217	103	0.020	0.198**	0.022
Fine (m)	664	78.972	103	7.748	71.225	0.223
Female CEO	664	0.061	103	0.009	0.052**	0.031
Female Chair	664	0.288	103	0.049	0.240***	0.000
Female Leader	664	0.314	103	0.059	0.255***	0.000
Board Size	664	16.471	103	14.389	2.083***	0.001
Director Tenure	664	6.322	103	5.889	0.434	0.141
Director Age	664	58.533	103	58.178	0.354	0.456
CEO Tenure	664	6.016	103	6.204	-0.188	0.739
CEO Age	664	56.371	103	55.622	0.749	0.328
CEO Turnover	664	0.146	103	0.117	0.030	0.424
Director Age Diversity	664	0.144	103	0.148	-0.005	0.378
Foreign Directors %	664	0.208	103	0.159	0.050**	0.022
Employee Representative %	664	0.084	103	0.018	0.065***	0.000
Total Assets (bn)	664	349.080	103	143.358	205.721***	0.000
ROE	664	0.060	103	0.045	0.014	0.206
Stock Return Volatility	664	0.379	103	0.402	-0.022	0.241
Tobin's Q	664	2.188	103	1.899	0.288	0.399

Panel B: Fraction of female directors (median split)

	High board gender diversity		Low board gender diversity		Difference	
	N	Mean	N	Mean	Mean	*p*-value
D.Fine	342	0.135	425	0.035	0.099***	0.000
N.Fine	342	0.354	425	0.059	0.295***	0.000
Fine (m)	342	143.846	425	9.505	134.34***	0.001
Female CEO	342	0.100	425	0.019	0.081***	0.000
Female Chair	341	0.419	425	0.124	0.294***	0.000
Female Leader	342	0.456	425	0.137	0.320***	0.000
Board Size	342	16.304	425	16.101	0.203	0.636
Director Tenure	342	6.343	425	6.201	0.143	0.479
Director Age	342	58.812	425	58.222	0.590*	0.070
CEO Tenure	342	6.12	425	5.979	0.141	0.715
CEO Age	342	55.661	425	56.76	-1.099**	0.036
CEO Turnover	342	0.146	425	0.139	0.007	0.771
Director Age Diversity	342	0.136	425	0.15	-0.015***	0.000
Foreign Directors %	342	0.202	425	0.201	0.001	0.957
Employee Representative %	342	0.099	425	0.057	0.042***	0.000
Total Assets (bn)	296	462.507	415	218.606	243.901***	0.000
ROE	296	0.062	415	0.054	0.007	0.327
Stock Return Volatility	342	0.339	423	0.416	-0.077***	0.000
Tobin's Q	294	1.65	412	2.502	-0.853***	0.001

The table reports the results of the univariate analysis by the board gender diversity based on the presence and fraction of female directors on the board. In Panel A, a bank is assigned to the sub-sample of banks with female directors in year *t* if it has at least one female director on the board in year *t-1*, and to the sub-sample of banks without female directors otherwise. In Panel B, a bank is assigned to the sub-sample of banks with high board gender diversity in year *t* if the fraction of female directors on its board in year *t*-1 is equal or greater than the sample median, and to the sub-sample of banks with low board gender diversity otherwise. The *t*-test for the equality of means is reported in the last two columns, where *, **, and *** indicate significance at the 1%, 5%, and 10% level, respectively. Definitions of the variables are provided in Appendix B.

Table 5: Board gender diversity and bank misconduct - Baseline regressions

	N.Fine	*N.Fine*	*N.Fine*
	(1)	(2)	(3)
Female Director %	-1.293*	-1.259*	-1.731*
	(0.743)	(0.740)	(0.950)
Gender Index Rank		-0.019	
		(0.043)	
Female Leader			-0.366
			(0.253)
N.Fine	0.235***	0.244***	0.275***
	(0.079)	(0.085)	(0.075)
Ln(Fine)	-0.026*	-0.027*	-0.034**
	(0.014)	(0.014)	(0.014)
Ln(Board Size)	0.178	0.132	0.217
	(0.255)	(0.273)	(0.240)
Ln(Director Tenure)	0.580	0.639	0.564
	(0.396)	(0.453)	(0.404)
Ln(Director Age)	-2.653	-3.257	-2.752
	(1.983)	(2.557)	(1.932)
Ln(CEO Tenure)	0.731***	0.731***	0.764***
	(0.252)	(0.247)	(0.218)
Ln(CEO Age)	-0.961	-1.050	-1.662
	(0.937)	(1.036)	(1.249)
CEO Turnover	0.310	0.294	0.312
	(0.537)	(0.512)	(0.489)
Size	1.311***	1.344***	1.438***
	(0.216)	(0.250)	(0.276)
ROE	0.278	0.298	0.058
	(1.575)	(1.579)	(1.142)
Stock Return Volatility	1.938**	1.867**	2.139***
	(0.776)	(0.727)	(0.732)
Ln(Tobin's Q)	0.122	0.096	0.045
	(0.261)	(0.243)	(0.278)
GDP Growth	-0.043	-0.032	-0.043
	(0.106)	(0.097)	(0.104)
G10	0.675	0.717*	0.602
	(0.427)	(0.422)	(0.388)
Intercept	-26.439**	-24.266**	-26.518**
	(10.705)	(11.896)	(10.524)
Year FE	Yes	Yes	Yes
Agency FE	Yes	Yes	Yes
IRR *Female Director %*	0.274	0.284	0.177
Observations	700	700	700
Log-Likelihood	-119.01***	-118.97***	-118.25***
Pseudo R-Squared	0.62	0.62	0.62

The table reports the results from the negative binomial model for the number of misconduct fines in year *t*. All independent variables are lagged by one year. Standard errors clustered at the country level are reported in parentheses. IRR indicates the Incidence Rate Ratio for the main variable in the analysis. Agency FE stands for the type of agency that issues the fine. The Log-Likelihood statistic pertains to the null hypothesis that the model coefficients are jointly zero. ***, **, * denote significance at the 1%, 5%, 10% level, respectively. Definitions of the variables are provided in Appendix B.

Table 6: Critical mass and female leadership

	N.Fine (1)	*N.Fine* (2)	*N.Fine* (3)	*N.Fine* (4)	*N.Fine* (5)	*N.Fine* (6)	*N.Fine* (7)
Critical Mass (≥3)	-0.734**	-0.734**	-0.807***	-0.871**			-0.870**
	(0.324)	(0.327)	(0.310)	(0.347)			(0.343)
Critical Mass (≥2)						0.673	
						(0.497)	
Critical Mass (=1)							-0.820
							(0.788)
Gender Index Rank		-0.021					
		(0.041)					
Female Leader			-0.382	-0.589			
			(0.254)	(0.388)			
Critical Mass x *Female Leader*				0.237			
				(0.407)			
Female Director %					-1.189		
					(0.750)		
Female Director % x *Female Leader*					-1.318**		
					(0.666)		
N.Fine	0.255***	0.264***	0.303***	0.300***	0.286***	0.226**	0.235**
	(0.081)	(0.085)	(0.071)	(0.072)	(0.075)	(0.091)	(0.094)
Ln(Fine)	-0.034**	-0.034**	-0.044***	-0.044***	-0.035**	-0.025	-0.030*
	(0.016)	(0.016)	(0.016)	(0.017)	(0.014)	(0.016)	(0.018)
Ln(Board Size)	0.432	0.379	0.519*	0.505**	0.190	0.194	0.473
	(0.300)	(0.301)	(0.275)	(0.257)	(0.242)	(0.319)	(0.320)
Ln(Director Tenure)	0.496	0.563	0.482	0.469	0.651	0.554	0.424
	(0.334)	(0.397)	(0.362)	(0.387)	(0.436)	(0.472)	(0.394)
Ln(Director Age)	-3.087	-3.759	-3.179*	-3.327*	-2.468	-1.769	-2.261
	(1.955)	(2.331)	(1.889)	(1.857)	(2.023)	(2.421)	(2.198)
Ln(CEO Tenure)	0.737***	0.737***	0.761***	0.771***	0.729***	0.600**	0.714***
	(0.262)	(0.258)	(0.236)	(0.216)	(0.217)	(0.255)	(0.245)
Ln(CEO Age)	-1.189*	-1.296	-1.865*	-1.947**	-1.481	-0.586	-1.100
	(0.689)	(0.814)	(0.960)	(0.955)	(1.058)	(0.850)	(0.746)
CEO Turnover	0.341	0.321	0.355	0.373	0.271	0.205	0.343
	(0.545)	(0.517)	(0.506)	(0.480)	(0.478)	(0.542)	(0.547)
Size	1.348***	1.385***	1.471***	1.495***	1.389***	1.245***	1.313***
	(0.180)	(0.216)	(0.230)	(0.223)	(0.231)	(0.194)	(0.187)
ROE	-0.401	-0.382	-0.651	-0.602	0.081	0.498	-0.603
	(1.965)	(1.986)	(1.505)	(1.487)	(1.215)	(1.643)	(2.176)
Stock Return Volatility	1.132	1.055	1.348	1.440*	2.020***	2.694**	1.044
	(0.920)	(0.856)	(0.840)	(0.797)	(0.775)	(1.048)	(0.957)
Ln(Tobin's Q)	0.112	0.081	0.052	0.063	0.027	0.214	0.083
	(0.211)	(0.184)	(0.206)	(0.191)	(0.275)	(0.245)	(0.226)
GDP Growth	-0.023	-0.011	-0.023	-0.028	-0.037	-0.075	-0.022
	(0.109)	(0.101)	(0.109)	(0.109)	(0.098)	(0.111)	(0.112)
G10	0.590	0.637	0.494	0.481	0.678*	0.590	0.615
	(0.458)	(0.438)	(0.436)	(0.434)	(0.373)	(0.508)	(0.503)

Intercept	-24.827**	-22.371*	-25.096**	-25.451**	-27.253***	-30.744**	-27.383**
	(11.148)	(11.599)	(10.910)	(10.946)	(10.565)	(12.404)	(12.047)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Agency FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	700	700	700	700	700	700	700
Log-Lik Full Model	-117.9***	-117.9***	-117.1***	-117.0***	-118.0***	-118.6***	117.3***
Pseudo R-Squared	0.623	0.623	0.626	0.626	0.623	0.620	0.624

The table reports the results from the negative binomial model for the number of misconduct fines in year *t*. The key variable is *Critical Mass (≥k*), which is a dummy variable indicating that the number of women on the board is ≥*k*. All independent variables are lagged by one year. Standard errors clustered at the country level are reported in parentheses. Agency FE stands for the type of agency that issues the fine. The Log-Likelihood statistic pertains to the null hypothesis that the model coefficients are jointly zero. ***, **, * denote significance at the 1%, 5%, 10% level, respectively. Definitions of the variables are provided in Appendix B.

Table 7: Board gender diversity and bank misconduct – Bank size effect

	N.Fine	*N.Fine*	*N.Fine*
	(1)	(2)	(3)
Female Director % x *Size* Q_1	-0.517	-0.506	-0.936
	(0.643)	(0.655)	(0.904)
Female Director % x *Size* Q_{234}	-9.702***	-9.743***	-9.835***
	(2.348)	(2.402)	(2.395)
Size Q_1	10.910***	10.519***	11.030***
	(0.851)	(0.853)	(0.893)
Size Q_2	12.209***	11.830***	12.387***
	(0.8210)	(0.820)	(0.970)
Size Q_3	-5.298***	-5.295***	-5.641***
	(0.547)	(0.563)	(0.588)
Gender Index Rank		-0.016	
		(0.043)	
Female Leader			-0.253
			(0.253)
N.Fine	0.254***	0.262***	0.279***
	(0.076)	(0.085)	(0.070)
Ln(Fine)	-0.033**	-0.033**	-0.037***
	(0.015)	(0.015)	(0.014)
Ln(Board Size)	0.155	0.116	0.184
	(0.248)	(0.280)	(0.247)
Ln(Director Tenure)	0.610*	0.654	0.578
	(0.365)	(0.440)	(0.395)
Ln(Director Age)	-3.036	-3.590	-3.059
	(1.923)	(2.809)	(1.951)
Ln(CEO Tenure)	0.679***	0.681***	0.713***
	(0.233)	(0.231)	(0.216)
Ln(CEO Age)	-0.742	-0.832	-1.263
	(0.811)	(0.920)	(1.124)
CEO Turnover	0.375	0.363	0.366
	(0.521)	(0.498)	(0.492)
Size	1.052***	1.084***	1.212***
	(0.109)	(0.146)	(0.179)
ROE	1.041	1.065	0.796
	(1.377)	(1.383)	(1.053)
Stock Return Volatility	1.911**	1.841**	2.028***
	(0.759)	(0.721)	(0.757)
Ln(Tobin's Q)	0.143	0.119	0.077
	(0.241)	(0.217)	(0.238)
GDP Growth	-0.067	-0.057	-0.067
	(0.095)	(0.084)	(0.093)
G10	0.652**	0.678**	0.578*
	(0.308)	(0.324)	(0.299)
Intercept	-29.605***	-27.220**	-31.731***
	(9.496)	(12.510)	(9.911)
Year FE	Yes	Yes	Yes
Agency FE	Yes	Yes	Yes
Observations	700	700	700
Log-Likelihood	-116.231	-116.200	-115.902
Pseudo R-Squared	0.628	0.629	0.629

The table reports the results from the negative binomial model for the number of misconduct fines in year *t* accounting for the size of the bank. *Size Qi*, *i* = 1, 2, 3, 4, represents banks in the i^{th} quartile as grouped by asset value, where 1 stands for the top quartile. The interaction term *Female Director %* x *Size Qi* is the key variable defined as the percentage of female directors in the i^{th} size quartile. All independent variables are lagged by one year. Standard errors clustered at the country level are reported in parentheses. Agency FE stands for the type of agency that issues the fine. The Log-Likelihood statistic pertains to the null hypothesis that the model coefficients are jointly zero. ***, **, * denote significance at the 1%, 5%, 10% level, respectively. Definitions of the variables are provided in Appendix B.

Table 8: Change in board gender diversity and bank misconduct

	N.Fine (1)	*N.Fine* (2)	*N.Fine* (3)
Δ*Female Director %*	-2.968*	-3.067*	-3.072*
	(1.769)	(1.765)	(1.855)
Gender Index Rank		-0.028	
		(0.047)	
Female Leader			-0.326
			(0.228)
N.Fine	0.257***	0.270***	0.300***
	(0.081)	(0.088)	(0.078)
Ln(Fine)	-0.036**	-0.037**	-0.045***
	(0.015)	(0.015)	(0.015)
Ln(Board Size)	0.269	0.193	0.334
	(0.311)	(0.332)	(0.301)
Ln(Director Tenure)	0.500	0.591	0.482
	(0.393)	(0.459)	(0.404)
Ln(Director Age)	-2.266	-3.239	-2.245
	(2.430)	(3.010)	(2.406)
Ln(CEO Tenure)	0.662**	0.667**	0.670***
	(0.263)	(0.262)	(0.234)
Ln(CEO Age)	-0.993	-1.153	-1.522
	(0.728)	(0.876)	(0.946)
CEO Turnover	0.287	0.270	0.282
	(0.560)	(0.532)	(0.525)
Size	1.290***	1.342***	1.385***
	(0.199)	(0.244)	(0.237)
ROE	0.672	0.687	0.581
	(1.556)	(1.575)	(1.163)
Stock Return Volatility	2.230***	2.092***	2.500***
	(0.735)	(0.664)	(0.727)
Ln(Tobin's Q)	0.194	0.153	0.146
	(0.236)	(0.208)	(0.243)
GDP Growth	-0.072	-0.057	-0.078
	(0.105)	(0.094)	(0.102)
G10	0.481	0.543	0.392
	(0.491)	(0.483)	(0.476)
Intercept	-27.598**	-23.963*	-28.153**
	(12.154)	(13.229)	(12.095)
Year FE	Yes	Yes	Yes
Agency FE	Yes	Yes	Yes
IRR Δ*Female Director %*	0.0514	0.0466	0.0463
Observations	672	672	672
Log-Likelihood	-118.41***	-118.31***	-117.77***
Pseudo R-Squared	0.611	0.611	0.611

The table reports results from the negative binomial model for the number of misconduct fines in year *t*. The key variable is the change in the fraction of female directors, Δ*Female Director %*. All independent variables are lagged by one year. Standard errors clustered at the country level are reported in parentheses. IRR indicates the Incidence Rate Ratio for the main variable in the analysis. Agency FE stands for the type of agency that issues the fine. The Log-Likelihood statistic pertains to the null hypothesis that the model coefficients are jointly zero. ***, **, * denote significance at the 1%, 5%, 10% level, respectively. Definitions of the variables are provided in Appendix B.

Table 9: Ethicality/risk aversion channel - Criminal vs. civil fines

	D.Fine Criminal (1)	*D.Fine Criminal* (2)	*D.Fine Criminal* (3)	*D.Fine Criminal* (4)	*D.Fine Criminal* (5)
Female Director %	-1.576*	-1.062	-1.138	5.528	-1.559
	(0.884)	(1.091)	(1.515)	(4.103)	(0.952)
Gender Index Rank		-0.068			
		(0.061)			
Female Leader			0.170		
			(0.294)		
Female Director % x *Gender Index Rank*				-0.414*	
				(0.246)	
Female Director % x *Female Leader*					0.811
					(1.195)
N.Fine	-0.084	-0.099	-0.079	-0.141	-0.055
	(0.312)	(0.311)	(0.286)	(0.305)	(0.247)
Ln(Fine)	0.068*	0.074*	0.070**	0.078**	0.066**
	(0.036)	(0.040)	(0.035)	(0.035)	(0.032)
Board Controls	Yes	Yes	Yes	Yes	Yes
Bank Controls	Yes	Yes	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Agency FE	Yes	Yes	Yes	Yes	Yes
Observations	700	700	700	700	700
Log-Likelihood	-23.06***	-22.87***	-23.01***	-22.68***	-22.98***
Pseudo R-Squared	0.76	0.76	0.76	0.76	0.76

The table reports the probit model results for the probability of receiving a criminal fine for misconduct in year *t*. All independent variables are lagged by one year. Standard errors clustered at the country level are reported in parentheses. Agency FE stands for the type of agency that issues the fine. The Log-Likelihood statistic pertains to the null hypothesis that the model coefficients are jointly zero. ***, **, * denote significance at the 1%, 5%, 10% level, respectively. Definitions of the variables are provided in Appendix B.

Table 10: CARs around misconduct fines announcement by type of misconduct

	Announcement Window	*Market Reaction*	*t-Stat.*
	(1)	(2)	(3)
D.Fine_Banking	(0, 5)	0.012	1.03
	(0, 6)	0.019	0.97
	(0, 7)	0.016	0.58
	(0, 8)	0.017	0.61
	(0, 9)	0.017	0.63
	(0, 10)	0.015	0.58
	(0, 15)	0.017	1.01
D.Fine_Economic	(0, 5)	-0.026	-1.56
	(0, 6)	-0.051	-1.92*
	(0, 7)	-0.076	-2.03**
	(0, 8)	-0.076	-2.02**
	(0, 9)	-0.076	-1.97**
	(0, 10)	-0.060	-1.64*
	(0, 15)	0.002	0.11
D.Fine_Market	(0, 5)	0.010	1.03
	(0, 6)	0.008	0.53
	(0, 7)	0.011	0.50
	(0, 8)	0.008	0.35
	(0, 9)	0.004	0.20
	(0, 10)	0.014	0.66
	(0, 15)	0.013	0.91
D.Fine_Admin	(0, 5)	0.014	1.10
	(0, 6)	0.010	0.50
	(0, 7)	0.016	0.53
	(0, 8)	0.019	0.63
	(0, 9)	0.022	0.71
	(0, 10)	0.023	0.80
	(0, 15)	0.026	1.42

The table reports cumulative average abnormal returns (CARs) following the announcement of misconduct fines. For each type of fine, we report CARs over different event windows. The event study is based on 112 events. There are 39 cases of multiple sanctions, that is, concurrent fines from different agencies or of different type. On days with multiple misconduct announcements the type of misconduct is determined using the majority rule and, in the few cases of tie, by considering the amount of fine. Cumulative abnormal returns are based on constant expected return model estimated over the whole sample period. The *t*-statistics are derived based on the cross-sectional standard error of the abnormal returns. ***,**,* denote significance at the 1%, 5%, 10% level, respectively. Definitions of the variables are provided in Appendix B.

Table 11: Ethicality/risk aversion channel - Type of fine

	N.Fine_Banking	*N.Fine_Economic*	*N.Fine_Market*	*N.Fine_Admin*
	(1)	(2)	(3)	(4)
Female Director %	-2.486	-4.298***	1.260	1.407
	(2.351)	(1.235)	(1.002)	(2.330)
N.Fine	0.149	-0.556**	-0.206*	-0.187***
	(0.284)	(0.254)	(0.116)	(0.042)
Ln(Fine)	-0.025	0.036	0.050***	0.037
	(0.055)	(0.034)	(0.015)	(0.031)
Board Controls	Yes	Yes	Yes	Yes
Bank Controls	Yes	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Agency FE	Yes	Yes	Yes	Yes
Observations	700	700	700	700
Log-Likelihood	-53.78***	-60.64***	-55.02***	-52.45***
Pseudo R-Squared	0.62	0.40	0.64	0.58

The table reports the results from the negative binomial model for four types of misconduct fines in year *t*. The key variable is the fraction of female directors. All independent variables are lagged by one year. Standard errors clustered at the country level are reported in parentheses. Board controls include board size, directors' tenure and age, and CEO's tenure, age, and turnover. Bank controls include bank size, profitability, stock return volatility, and Tobin's Q. Country controls include gender index rank, GDP growth, and G10 indicator. Agency FE stands for the type of agency that issues the fine. The Log-Likelihood statistic pertains to the null hypothesis that the model coefficients are jointly zero. ***,**,* denote significance at the 1%, 5%, 10% level, respectively. Definitions of the variables are provided in Appendix B.

Table 12: Diversity channel

	N.Fine$_t$	*N.Fine*	*N.Fine*	*N.Fine*
	(1)	(2)	(3)	(4)
Female Director %	-1.724*	-1.561***	-1.766*	-1.659***
	(0.942)	(0.471)	(1.043)	(0.558)
Director Age Diversity	1.609			1.708
	(2.529)			(2.118)
Foreign Director %		-0.206		-0.185
		(1.178)		(1.190)
Employee Representative %			0.351	0.475
			(1.700)	(1.526)
Gender Index Rank	-0.019	-0.028	-0.032	-0.026
	(0.050)	(0.045)	(0.062)	(0.064)
Female Leader	-0.415	-0.377	-0.389	-0.430
	(0.275)	(0.255)	(0.296)	(0.278)
N.Fine	0.295***	0.290***	0.290***	0.300***
	(0.082)	(0.086)	(0.090)	(0.088)
Ln(Fine)	-0.035**	-0.034**	-0.035**	-0.036**
	(0.014)	(0.014)	(0.016)	(0.016)
Board Controls	Yes	Yes	Yes	Yes
Bank Controls	Yes	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Agency FE	Yes	Yes	Yes	Yes
Observations	700	700	700	700
Pseudo R-Squared	0.622	0.622	0.622	0.623
Log-Likelihood	-118.06***	-118.13***	-118.14***	-118.015***

The table reports the results from the negative binomial model for misconduct fines in year *t*. The key variable is the fraction of female directors. Additional proxies for board diversity are added to test for the diversity channel. All independent variables are lagged by one year. Standard errors clustered at the country level are reported in parentheses. Board controls include board size, directors' tenure and age, and CEO's tenure, age, and turnover. Bank controls include bank size, profitability, stock return volatility, and Tobin's Q. Country controls include gender index rank, GDP growth, and G10 indicator. Agency FE stands for the type of agency that issues the fine. The Log-Likelihood statistic pertains to the null hypothesis that the model coefficients are jointly zero. ***,**,* denote significance at the 1%, 5%, 10% level, respectively. Definitions of the variables are provided in Appendix B.

Table 13: Board gender diversity and bank misconduct - Country fixed effects

	N.Fine (1)	*N.Fine* (2)	*N.Fine* (3)	*N.Fine* (4)	*N.Fine* (5)	*N.Fine* (6)
Female Director % x *Size* Q_1	0.988	0.526				
	(1.033)	(1.252)				
Female Director % x *Size* Q_{234}	-7.226**	-7.633***				
	(2.813)	(2.687)				
	(17.567)	(22.035)				
Δ*Female Director %*			-3.245***	-3.140***		
			(1.025)	(1.121)		
Critical Mass					-0.656**	-0.710***
					(0.326)	(0.247)
Female Leader		-0.371		-0.305		-0.368
		(0.307)		(0.270)		(0.293)
N.Fine	0.211**	0.246***	0.232***	0.261***	0.215**	0.254***
	(0.088)	(0.080)	(0.085)	(0.073)	(0.091)	(0.073)
Ln(Fine)	-0.034**	-0.040***	-0.038***	-0.043***	-0.033**	-0.040***
	(0.014)	(0.014)	(0.014)	(0.013)	(0.015)	(0.013)
Board Controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Agency FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Size FE	Yes	Yes				
Observations	674	674	592	592	674	674
Log-Likelihood	109.63***	108.91***	-109.96***	-109.44***	-109.84***	-109.11***
Pseudo R-Squared	0.64	0.64	0.63	0.63	0.64	0.64

The table reports the results from the negative binomial model with country fixed effects for the number of misconduct fines in year *t*. *Size Qi*, *i* = 1, 2, 3, 4, represents banks in the i^{th} quartile as grouped by asset value, where 1 stands for the top quartile. In Models (1) and (2), the interaction term *Female Director %* x *Size Qi* defines the percentage of female directors in the i^{th} size quartile. Size FE denotes the size quartile indicators *Size Qi*. In Models (3) and (4), the key variable is the change in the fraction of female directors, *ΔFemale Director %*. In Models (5) and (6), the key variable is the critical mass dummy variable, *Critical Mass*. All independent variables are lagged by one year. Standard errors clustered at the country level are reported in parentheses. Board controls include board size, directors' tenure and age, and CEO's tenure, age, and turnover. Bank controls include bank size, profitability, stock return volatility, and Tobin's Q. Country controls include gender index rank, GDP growth, and G10 indicator. Agency FE stands for the type of agency that issues the fine. The Log-Likelihood statistic pertains to the null hypothesis that the model coefficients are jointly zero. ***,**,* denote significance at the 1%, 5%, 10% level, respectively. Definitions of the variables are provided in Appendix B.

Table 14: Glass cliff effect - Sub-sample analysis

	N.Fine (1)	*N.Fine* (2)	*N.Fine* (3)
Female Director %	-6.413***		
	(1.913)		
Δ*Female Director %*		-2.848*	
		(1.470)	
Critical Mass			-0.609***
			(1.025)
Gender Index Rank	-0.090	-0.064	-0.063
	(0.075)	(0.063)	(0.067)
Female Leader	-0.944***	-0.437	-0.637*
	(0.352)	(0.356)	(0.330)
N.Fine	0.531***	0.236	0.526***
	(0.156)	(0.255)	(0.184)
Ln(Fine)	-0.040***	-0.035	-0.050***
	(0.015)	(0.077)	(0.018)
Board Controls	Yes	Yes	Yes
Bank Controls	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Agency FE	Yes	Yes	Yes
Observations	490	404	310
Log-Likelihood	-77.87***	-72.41***	-79.46***
Pseudo R-Squared	0.65	0.62	0.64

The table reports the results from the negative binomial model for the number of misconduct fines in year *t* for different proxies for gender diversity. The sub-sample only includes observations for which the change in the stock return volatility in the previous period is lower than the 75th percentile. Standard errors clustered at the country level are reported in parentheses. Board controls include the board size, directors' tenure and age, and CEO's tenure, age, and turnover. Bank controls include the bank size, profitability, stock return volatility, and Tobin's Q. Country controls include the gender index rank, GDP growth, and G10 dummy variable. Agency FE stands for the type of agency that issues the fine. Asterisks next to the Log-Likelihood value represent rejection of the null hypothesis that the model coefficients are jointly zero. ***, **, * denote significance at the 1%, 5%, 10% level, respectively. Definitions of the variables are provided in Appendix B.

Table 15: Board gender diversity and bank misconduct - Probit regressions

	D.Fine (1)	*D.Fine* (2)	*D.Fine* (3)
Female Director % x *Size* Q_1	1.443	1.444	1.756*
	(0.929)	(0.947)	(1.054)
Female Director % x *Size* Q_{234}	-5.470***	-5.473***	-5.396***
	(1.578)	(1.638)	(1.398)
	(9.032)	(12.179)	(9.176)
Gender Index Rank		-0.001	
		(0.062)	
Female Leader			0.407*
			(0.244)
N.Fine	0.004	0.005	-0.014
	(0.109)	(0.119)	(0.094)
Ln(Fine)	0.017	0.017	0.020
	(0.020)	(0.021)	(0.020)
Board Controls	Yes	Yes	Yes
Bank Controls	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Size FE	Yes	Yes	Yes
Observations	700	700	700
Log-Likelihood	-82.65***	-82.65***	-80.78***
Pseudo R-Squared	0.61	0.61	0.62

The table reports the results from the probit model for the incidence of misconduct fine in year *t.* Gender diversity is proxied by the fraction of female directors on the board. *Size Qi*, i = 1, 2, 3, 4, represents banks in the i^{th} quartile as grouped by asset value, where 1 stands for the top quartile. The interaction term *Female Director %* x *Size Qi* is the key variable defined as the percentage of female directors in the i^{th} size quartile. Size FE denotes the size quartile indicators *Size Qi*. All independent variables are lagged by one year. Standard errors clustered at the country level are reported in parentheses. Board controls include board size, directors' tenure and age, and CEO's tenure, age, and turnover. Bank controls include bank size, profitability, stock return volatility, and Tobin's Q. Country controls include gender index rank, GDP growth, and G10 dummy variable. Agency FE stands for the type of agency that issues the fine. The Log-Likelihood statistic pertains to the null hypothesis that the model coefficients are jointly zero. ***, **, * denote significance at the 1%, 5%, 10% level, respectively. Definitions of the variables are provided in Appendix B.

Table 16: Board gender diversity and bank misconduct – Instrumental variable

	N.Fine (1)	*N.Fine* (2)	*N.Fine* (3)
Female Director %	-1.322***	-1.291***	-1.706***
	(3.228)	(5.787)	(3.774)
Gender Index Rank		0.076	
		(0.058)	
Female Leader			0.225
			(0.307)
N.Fine	0.301***	0.326***	0.347***
	(0.072)	(0.083)	(0.073)
Ln(Fine)	-0.008	0.012	-0.018
	(0.017)	(0.021)	(0.015)
Board Controls	Yes	Yes	Yes
Bank Controls	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Agency FE	Yes	Yes	Yes
Observations	689	689	689
Log-Likelihood	-118.35***	-118.32***	-117.76***
Pseudo R-Squared	0.61	0.61	0.62
Wald Test of Exogeneity	8.13***	3.00***	8.28***

The table reports the results from the negative binomial model for the number of misconduct fines in year t estimated using an instrumental variable control function approach. The instrument used is the educational attainment sub-index compiled by the World Economic Forum that captures the gender gap in access to education and is constructed using four ratios: female enrolment rate over male value in primary, secondary and tertiary education, respectively, and the relative gap in the literacy rate. All independent variables are lagged by one year. Standard errors clustered at the country level are reported in parentheses. Agency FE stands for the type of agency that issues the fine. The Log-Likelihood statistic pertains to the null hypothesis that the model coefficients are jointly zero. The Wald test of exogeneity of the instrumented variable tests the hypothesis of no correlation between our board gender diversity proxy (*Female Director %*) and the residuals. ***, **, * denote significance at the 1%, 5%, 10% level, respectively. Definitions of the variables are provided in Appendix B.

Table 17: Board gender diversity and bank misconduct – Reforms

	N.Fine (1)	*N.Fine* (2)	*N.Fine* (3)	*N.Fine* (4)
Female Director % x *Reform*	-0.462			
	(0.884)			
Female Director % x *Reform*$_{[0,+1]}$		-0.366		
		(2.085)		
Female Director % x *Reform*$_{[-1,+1]}$			0.202	
			(1.838)	
Female Director % x *Reform*$_{[+2,T]}$		-4.054***	-3.919**	-4.099***
		(1.509)	(1.591)	(1.478)
Female Director % x *Reform*$_{[-1]}$				-0.221
				(0.257)
Female Director % x *Reform*$_{[0]}$				-0.848**
				(0.373)
Female Director % x *Reform*$_{[+1]}$				0.960
				(0.568)
N.Fine	0.242***	0.450***	0.444***	0.429***
	(0.083)	(0.123)	(0.119)	(0.139)
Ln(Fine)	-0.028**	-0.039	-0.038	-0.026
	(0.790)	(0.397)	(0.064)	(0.491)
Board Controls	Yes	Yes	Yes	Yes
Bank Controls	Yes	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Agency FE	Yes	Yes	Yes	Yes
Observations	765	539	539	539
Log-Likelihood	-119.21***	-69.35**	-69.35***	-68.58***
Pseudo R-squared	0.62	0.66	0.66	0.66

The table reports the results from the negative binomial model for the number of misconduct fines in year *t* estimated using a difference-in-difference approach. *Reform* is a post-reform dummy equal to 1 when the first board diversity reform is introduced in a country and thereafter, and 0 otherwise. In Model (1), the key variable is the interaction term *Female Director %* x *Reform.* Models (2) and (3) split the post-reform period into two windows [0, +1] and [+2, T] and [-1, +1] and [+2, T], respectively, where T denotes the end of the sample period. Model (4) splits the window surrounding the reform, [-1, +1], into the individual reform dummies for years = -1, 0, 1. All independent variables are lagged by one year. Standard errors clustered at the country level are reported in parentheses. Agency FE stands for the type of agency that issues the fine. The Log-Likelihood statistic pertains to the null hypothesis that the model coefficients are jointly zero. ***, **, * denote significance at the 1%, 5%, 10% level, respectively. Definitions of the variables are provided in Appendix B.

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Appendix A: List of sampled sanctions and sanctioning regulatory agencies

Sanction type	Sanction	Sanctioning regulatory agency
Banking business violations	Banking violation	Office of the Comptroller of the Currency (OCC)
		Federal Reserve
		New York State Department of Financial Services (NYSDFS)
		New York County District Attorney (NYCDA)
	Anti-money laundering deficiency	Federal Reserve
		Justice Department Criminal Division
		New York State Department of Financial Services (NYSDFS)
	Fraud	Justice Department Criminal Division
	Mortgage abuse	US Attorney
		Justice Department multiagency referral
	Financial institution supervision failure	Commodity Futures Trading Commission
	Investor protection violation	Securities and Exchange Commission (SEC)
		Commodity Futures Trading Commission
Economic sanction violations	Economic sanction violation	Justice Department Criminal Division
		Office of Foreign Assets Control
		US Attorney
		New York State Department of Financial Services (NYSDFS)
		Federal Reserve
		Office of Foreign Assets Control
	US sanction violation	Office of Foreign Assets Control
Market violations	Toxic securities abuse	Federal Housing Finance Agency
		National Credit Union Administration
		US Attorney
		Justice Department Civil Division
		Securities and Exchange Commission (SEC)
	Securities issuance or trading violation	Securities and Exchange Commission (SEC)
		Commodity Futures Trading Commission
	Interest rate benchmark manipulation	Justice Department Criminal Division
		Commodity Futures Trading Commission
		Federal Reserve
	Foreign exchange market manipulation	Justice Department Criminal Division
		Federal Reserve
		Justice Department Antitrust Division
	Energy market manipulation	Federal Energy Regulatory Commission
Administrative violations	Tax violation	Justice Department Tax Division
		US Attorney
	Accounting fraud or deficiency	Commodity Futures Trading Commission

Falsification of records of NY financial institutions	New York County District Attorney (NYCDA)
Data submission deficiency	Commodity Futures Trading Commission
False Claims Act	Justice Department Civil Division
	US Attorney
Consumer protection violation	Consumer Financial Protection Bureau
Employment discrimination	Equal Employment Opportunity Commission
Benefit plan administrator violation	Employee Benefits Security Administration
Wage and hour violation	Labour Department Wage and Hour Division
Workplace safety or health violation	Occupational Safety & Health Administration
Servicemembers Civil Relief Act	Justice Department Civil Rights Division
Environmental violation	Environmental Protection Agency

The table presents the list of sampled sanctions by type and relevant sanctioning regulatory agencies.

Appendix B: Variable definitions

Variable	Definition	Source
Misconduct fines		
D.Fine	Dummy variable equal to 1 if a bank has been fined in year *t*, and 0 otherwise	Authors' calculation using Violation Tracker / Regulatory agency data
N.Fine	Number of fines (total) in a bank year	Authors' calculation using Violation Tracker / Regulatory agency data
N.Fine_Banking	Number of fines related to banking business violations	Authors' calculation using Violation Tracker / Regulatory agency data
N.Fine_Economic	Number of fines related to economic sanction violations	Authors' calculation using Violation Tracker / Regulatory agency data
N.Fine_Market	Number of fines related to market violations	Authors' calculation using Violation Tracker / Regulatory agency data
N.Fine_Admin	Number of fines related to administrative violations	Authors' calculation using Violation Tracker / Regulatory agency data
Fine	Fine amount (total) in a bank-year ($)	Violation Tracker / Regulatory agency websites
Ln(Fine)	Ln(1+*Fine*)	Authors' calculation using Violation Tracker / Regulatory agency data
Fine_Banking	Amount of fines related to banking business violations ($)	Authors' calculation using Violation Tracker / Regulatory agency data
Fine_Economic	Amount of fines related to economic sanction violations ($)	Authors' calculation using Violation Tracker / Regulatory agency data
Fine_Market	Amount of fines related to market violations ($)	Authors' calculation using Violation Tracker / Regulatory agency data
Fine_Admin	Amount of fines related to administrative violations ($)	Authors' calculation using Violation Tracker / Regulatory agency data
D.Fine_Criminal	Dummy variable equal to 1 if a fine is addressed in a criminal court, and 0 otherwise	Authors' calculation using Violation Tracker / Regulatory agency data
D.Fine_Banking	Dummy variable equal to 1 if a fine is related to banking business violations, and 0 otherwise	Authors' calculation using Violation Tracker / Regulatory agency data
D.Fine_Economic	Dummy variable equal to 1 if a fine is related to economic sanction violations, and 0 otherwise	Authors' calculation using Violation Tracker / Regulatory agency data
D.Fine_Market	Dummy variable equal to 1 if a fine is related to market violations, and 0 otherwise	Authors' calculation using Violation Tracker / Regulatory agency data
D.Fine_Admin	Dummy variable equal to 1 if a fine is related to administrative violations, and 0 otherwise	Authors' calculation using Violation Tracker / Regulatory agency data
Corporate governance		
Female Director	Dummy variable equal to 1 if the gender of at least one board director is female, and 0 otherwise	Authors' calculation using BoardEx data
Female Director %	Fraction of female directors on the board	Authors' calculation using BoardEx data
Δ *Female Director %*	Change in the fraction of female directors on the board	Authors' calculation using BoardEx data
Critical Mass	Dummy variable equal to 1 if the number of female directors on the board is at least 3, and 0 otherwise	Authors' calculation using BoardEx data
Female CEO	Dummy variable equal to 1 if the gender of the chief executive officer (CEO) is female, and 0 if male	Authors' calculation using BoardEx data

Female Chair	Dummy variable equal to 1 if the gender of the chairperson of the board is female, and 0 if male	Authors' calculation using BoardEx data
Female Leader	Dummy variable equal to 1 if the gender of the CEO and/or the chairperson / president (board leadership) is female, and 0 if male	Authors' calculation using BoardEx data
Board Size	Size of the board (number of board directors)	Authors' calculation using BoardEx data
Ln(Board Size)	Ln(*Board Size)*	
Director Tenure	Average board tenure (years)	Authors' calculation using BoardEx data
Ln(Director Tenure)	Ln(*Director Tenure)*	Authors' calculation using BoardEx data
Director Age	Average age of board directors (years)	Authors' calculation using BoardEx data
Ln(Director Age)	Ln(*Director Age)*	
Director Age Diversity	Coefficient of variation of directors' age = Standard deviation of directors' age / *Director Age*	Authors' calculation using BoardEx data
CEO Tenure	Tenure of the CEO (years)	Authors' calculation using BoardEx data
Ln(CEO Tenure)	Ln(*CEO Tenure)*	Authors' calculation using BoardEx data
CEO Age	Age of the CEO (years)	Authors' calculation using BoardEx data
Ln(CEO Age)	Ln(*CEO Age)*	Authors' calculation using BoardEx data
CEO Turnover	Dummy variable equal to 1 if the CEO in year *t* is different from the CEO in year *t-1*, and 0 otherwise	Authors' calculation using BoardEx data
Foreign Director %	Fraction of foreign directors on the board	Authors' calculation using BoardEx data
Employee Representative %	Fraction of employees on the board	Authors' calculation using BoardEx data
Bank-specific controls		
Total Assets	Total assets (euro)	Orbis Bank Focus
Size	Ln(*Total Assets*)	Authors' calculation using Orbis Bank Focus data
ROE	Return on equity	Authors' calculation using Orbis Bank Focus data
Stock Return Volatility	Annualised standard deviation of daily stock returns (3-year moving average)	Authors' calculation using Thomson Eikon data
Tobin's Q	Tobin's Q = (Total assets – Equity + Market value of equity) / Total assets	Authors' calculation using Orbis Bank Focus and Thomson Eikon data
Ln(Tobin's Q)	Ln(*Tobin's Q)*	Authors' calculation using Orbis Bank Focus and Thomson Eikon data
Size Q_1	Dummy variable equal to 1 if a bank's size (total assets) falls into the 1st (top) quartile of the sample, and 0 otherwise	Authors' calculation using Orbis Bank
Size Q_{234}	Dummy variable equal to 1 if a bank's size (total assets) falls into the 2nd- 4th (bottom) quartiles of the sample, and 0 otherwise	Authors' calculation using Orbis Bank
Low Risk Bank	Dummy variable equal to 1 if a bank's average stock price volatility is below the 75th percentile of the sample, and 0 otherwise	Authors' calculation using Orbis Bank

High Risk Bank	Dummy variable equal to 1 if a bank's average stock price volatility is equal to or above the 75th percentile of the sample, and 0 otherwise	Authors' calculation using Orbis Bank
Country-specific controls		
Gender Index Score	Country gender gap index score	World Economic Forum Global Gender Gap Report 2018
Gender Index Rank	Country ranking based on *Gender Index Score*	Authors' calculations using the World Economic Forum Global Gender Gap Report 2018
GDP Growth	GDP real growth rate	International Monetary Fund (IMF)
G10	Dummy variable equal to 1 if a bank is headquartered in a G10 country, and 0 otherwise	Authors' calculation
Reform Variables		
Reform	Post-reform dummy equal to 1 when the first board diversity reform is introduced and thereafter, and 0 otherwise.	Authors' calculation using: the European Corporate Governance Institute (ECGI); the European Commission (EC); the European Foundation for the Improvement of Living and Working Conditions (Eurofound); the European Trade Union Institute; the United Nations Entity for Gender Equality and the Empowerment of Women (UN Women; the World Bank Report on the Observance of Standards and Codes (ROSC); and publications from each country's relevant regulator
$Reform_{[0,+1]}$	Post-reform window dummy equal to 1 for the year the first board diversity reform is introduced ($t = 0$) and the subsequent year ($t = +1$), and 0 otherwise.	Authors' calculation
$Reform_{[-1,+1]}$	Pre/post-reform window dummy equal to 1 for the year the first board diversity reform is introduced ($t = 0$), the prior year ($t = -1$) and the subsequent year ($t = +1$), and 0 otherwise.	Authors' calculation
$Reform_{[+2,T]}$	Post-reform window dummy equal to 1 for year 2 after the first board diversity reform is introduced ($t = 2$) and subsequent years, and 0 otherwise	Authors' calculation
$Reform_{[-1]}$	Pre-reform dummy equal to 1 for the year before the first board diversity reform is introduced ($t = -1$), and 0 otherwise.	Authors' calculation
$Reform_{[0]}$	Reform dummy equal to 1 for the year the first board diversity reform is introduced ($t = 0$), and 0 otherwise.	Authors' calculation
$Reform_{[+1]}$	Post-reform dummy equal to 1 for year 1 after the first board diversity reform is introduced ($t = 1$), and 0 otherwise.	Authors' calculation

The table provides definitions of the variables used in the analysis and the source of the data.

Appendix C: Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) *Female Director %*	1.00															
(2) Δ *Female Director %*	0.29*	1.00														
(3) *Female Leader*	0.33*	0.01	1.00													
(4) *Ln(Board Size)*	-0.04	-0.03	0.06	1.00												
(5) *Ln(Director Tenure)*	0.07	0.01	0.01	0.03	1.00											
(6) *Ln(Director Age)*	0.02	-0.01	-0.13*	0.14*	0.34*	1.00										
(7) *Ln(CEO Tenure)*	-0.02	-0.04	-0.02	-0.05	0.44*	0.21*	1.00									
(8) *Ln(CEO Age)*	-0.06	-0.04	-0.13*	0.17*	0.24*	0.36*	0.38*	1.00								
(9) *CEO Turnover*	0.01	0.00	0.01	0.03	-0.23*	-0.12*	-0.68*	-0.18*	1.00							
(10) *Size*	0.27*	0.04	0.19*	0.37*	-0.06	0.23*	-0.14*	0.08	0.03	1.00						
(11) *ROE*	0.02	-0.09	-0.02	-0.20*	0.21*	-0.19*	0.12*	-0.18*	-0.12*	-0.21*	1.00					
(12) *Stock Return Volatility*	-0.18*	-0.04	-0.04	0.08	-0.26*	0.03	-0.12*	0.02	0.08	0.22*	-0.43*	1.00				
(13) *Ln(Tobin's Q)*	-0.10*	-0.05	-0.12*	-0.20*	-0.23*	0.07	0.01	-0.03	-0.03	0.09	-0.02	0.12*	1.00			
(14) *Gender Index Rank*	0.44*	0.01	0.21*	-0.13*	0.03	-0.12*	0.01	-0.14*	-0.02	0.34*	0.17*	-0.15*	0.01	1.00		
(15) *GDP Growth*	0.16*	0.04	0.16*	-0.13*	0.02	-0.07	-0.08	-0.18*	0.04	-0.07	0.28*	-0.34*	-0.03	0.12*	1.00	
(16) *G10*	0.24*	0.12*	-0.03	0.03	-0.21*	0.09*	-0.22*	-0.10*	0.06	0.32*	-0.07	0.02	0.17*	0.26*	-0.15*	1.00

The table reports the correlation matrix for the variables used in the baseline regression analysis. * shows significance at the 1 percent level. Definitions of the variables are provided in Appendix B.