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DO SUPERVISORY ENFORCEMENT ACTIONS AFFECT BOARD COMPOSITION?

ABSTRACT

Manuscript Type: Empirical

Research Question/Issue: Do enforcement actions impact banks' board composition? Based on a unique sample of sanctions dispensed by the Supervisory Banking Authority during the period 2009-2015 on Italian banks, we investigate whether the supervisory enforcement actions affect changes at bank board level. Moreover, we examine if changes at bank board level subsequent a sanction are effective to reduce probability of further sanctions in the future.

Research Findings/Insights: Findings revealed that a sanctioned bank changes the board composition following a supervisory sanction. We further test whether these changes improve bank governance and may reduce the probability of being sanctioned again, under certain conditions. Robustness tests confirm the results.

Theoretical/Academic Implications: This study provides empirical evidence in support of the role of supervisory enforcement actions in inducing banks to adopt changes at board level. Given that the relationship between supervisory sanctions and change in board characteristics is still neglected, we contend that our results may improve our understanding of the effectiveness of enforcement actions in improving board characteristics.

Practitioner/Policy Implications: We believe that our results can have policy implications by making a clear and concrete contribution to the ongoing debate on the revision of the principles for enhancing corporate governance and banking supervision.

1. INTRODUCTION

The recent financial crisis has highlighted several gaps in bank governance and risk management (Ladipo & Nestor, 2009; Levrau & Van den Berghe, 2009). Since then, regulators and supervisor authorities have strengthened the protection of bank shareholders and stakeholders' interest through a stricter corporate governance regulation with particular reference to the board of directors (Basel Committee on Banking Supervision, 2015; European Banking Authority-EBA, 2011; European Securities and Markets Authority-ESMA andEBA, 2016).

For banking supervisory purposes, governance regulation was revised to stress the importance of the board of directors in the sound and prudent management of banks (ESMA-EBA, 2016; EBA, 2018). The board of directors has a key role in bank governance as it not only monitors management but also provide guidance and advice to managers (Andres & Vallelado, 2008; Grove, Patelli, Victoravich, & Xu, 2011). Specifically, the EBA and the Basel Committee on Banking Supervision have placed the board of directors at the top of the internal governance system. The board is responsible for setting objectives for the bank and the level of risk appetite, for bank organization and direction, and for the organization of the internal control system (EBA, 2018). Because of the special role played by banks in the economy and their fundamental differences from non-financial corporations (see de Haan and Vlahu, 2016), failures of banks and of their governance models are a relevant concern. Thus, stricter supervision is put place by Banking Authorities to ensure that the board effectively performs

its duties and pursues bank safety. Recently, following the banking crises, the attention of the Banking Authorities is also placed on the level of education of the directors and on the need for the bank to provide induction and training processes for the newly appointed board, in line with the fit and proper assessments introduced by Capital Requirement Directive IV - CRD IV (EU Directive 2013/36/EU and the EU Regulation 575/2013; ECB, 2018b).

In their role, Supervisors conduct on-site examinations to ensure that bank operations are consistent with sound banking practices. When on-site examinations identify unsafe, unsound, or illegal banking practices, regulators use a variety of supervisory enforcement actions to require institutions to take corrective measures. These enforcement actions are intended to accomplish several things, including bringing about alterations in the practices and behaviours that caused the misconduct, disciplining the boards' members of the institution, and avoiding potential losses to the deposit insurance fund. Whether these actions are effective in promoting the adoption of sounder and more prudent directors' behaviour is an open question.

On the effectiveness of supervisory activity, current literature has focused on the relationship between enforcement actions and various bank indicators (post-sanctions) such as capital, deposits, risk and performance. This literature has mostly focused on US banks and investigated if enforcement actions are able to reduce bank risk or increase performance (Delis & Staikouras, 2011; Delis, Staikouras, & Tsoumas, 2019, 2017; Lambert, 2018). Surprisingly, despite the supervisory efforts aiming to discipline directors and board-level mechanisms rather than targeting bank risk or performance, studies on the relationship between enforcement actions and changes in bank governance characteristics are still limited. Therefore, this paper aims to fill the gap in the literature by investigating the effects of supervisory enforcement actions on the composition of banks' board. Several dimensions of the board are examined, such as board turnover, directors' education level, board size and gender diversity. A vast literature has supported the crucial role of each of these dimensions on the proper functioning

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of bank governance models (see de Haan & Vlahu, (2016) for a survey of the literature). While supervisory actions are imposed on the board and its members, they do not specifically target any of these dimensions. It is an empirical question to assess what are the changes that banks put in place as a result of the discipling actions.

Moreover, differently from previous studies, we extend this analysis to investigate whether the changes induced by the supervisory actions have an impact on the likelihood of incurring in more supervisory actions in the future. This extension is relevant to assess the effectiveness of the supervision from a regulatory perspective and better captures whether these changes are relevant to the organizations rather than merely a formal signal to the Supervisory Authority that actions are taken to improve the governance of the bank.

Based on a unique dataset of the supervisory sanctions imposed on the directors for a large sample of Italian banks over the period 2009-2015, our results show that sanctioned banks increase the board turnover, reduce the board size and tend to improve the educational level of the board. All these effects seem consistent with banks reacting to the supervisory actions by removing the directors responsible of the sanction and appointing better educated directors. By analysing different type of violations, we find this evidence to hold, in particular, for credit and risk management-related sanctions. However, when testing whether these changes reduce the probability of new sanctions in the future, we find that only the changes in board size have a significant impact.

Overall, our results contribute to the literature on corporate governance and the role of enforcement actions on board functioning in several respects. First, we investigate if sanctions imposed by Supervisors are effective in altering board characteristics and behaviours and focus on multiple relevant dimensions of board functioning. Second, we provide evidence on their effectiveness in terms of disciplining mechanism, i.e. in reducing the likelihood of future

misconduct events. This latter point is relevant in light of the financial and reputational costs imposed by the supervisory actions on the sanctioned banks and that, in some cases when the financial penalties are extremely severe, have the potential to harm the sounds of the bank and the financial stability. To the best of our knowledge, both contributions are novel in the literature. We focus on the Italian banking system, one of the largest in Europe in terms of deposits, total assets and number of employees compared to other European banks. This banking industry has experienced recently various cases of bank crisis, partly due to board weaknesses. Therefore, we contend that our results may improve our understanding of the effectiveness of enforcement actions in enhancing board mechanisms. Finally, we believe that our results can have policy implications by making a clear and concrete contribution to the ongoing debate on the revision of the principles for enhancing corporate governance and banking supervision.

The remainder of the paper proceeds as follows: Section 2 describes the literature review and points out the research questions, Section 3 reports institutional setting, sample, methodology and variables used in empirical analysis, Section 4 analyzes the empirical findings, Section 5 reports on robustness check results, while Section 6 reports conclusions, limits and implications.

2. LITERATURE REVIEW AND RESEARCH QUESTIONS

According to banking regulation, supervisory activity takes place on a regular basis so that bank boards' behaviours are continuously monitored through on-site and off-site examinations. The monitoring role of the Supervisors is motivated by the need to impose discipline on banks

on behalf of small dispositors who may lack the ability or find it too costly to monitor the bank. Therefore, it is the role of regulation and supervisor to design rules and supervisory activities in order to create adequate incentives for good governance and adequate board functioning and ensure sound and prudent management of the bank. When Supervisors detect bank (board) misconduct (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, that does not meet the standards of sound and prudent management as required by the regulation), they are entitled to punish the directors (Basel Committee on Banking Supervision, 2015a). Therefore, sanctions are essential tools for ensuring the stability of the banking system (Quintyn & Taylor, 2003).

Existing literature suggests that supervisory sanctions have a disciplinary effect on bank behaviours. Specifically, scholars mainly investigated the relationship between supervisory enforcement actions and risk exposure of banks, stability and efficiency of the system, in order to appreciate the degree of effectiveness of supervisory actions. Most of the literature, focusing on U.S. market, suggests that enforcement actions enhance banking discipline given the remedial measures that Supervisory Authority can take on imprudent banks (Berger & Davies, 1998; Deyoung, Flannery, Lang, & Sorescu, 2001; Kick, Koetter, & Poghosyan, 2010) and reduce banks' risk appetite (Brous & Leggett, 1996; Jordan, Peek, & Rosengren, 2000; Slovin, Sushka, & Polonchek, 1999). Other studies point out that the enforcement actions increase some direct costs on the bank's management (for example, the limitation of management decision-making powers, increase of supervisory scrutiny, diversion of scarce management time, and loss of reputation) that also constrain excessive risk-taking (Brous & Leggett, 1996; Milne, 2002; Slovin et al., 1999). By using data at the cross-country level, Delis & Staikouras (2011) provide international evidence of a negative association between enforcement outputs (on-site audits and sanctions) and bank risk. Shive & Forster (2017) and Lambert (2018)

showed that riskier banks are more likely to receive an enforcement action in the US, but the effect is different for those who lobby politicians and Supervisors. Delis et al. (2017) also showed a negative association in the U.S. between enforcement actions and various bank indicators (post-sanctions) such as capital, risk and performance. Moreover, Delis et al. (2019) show that total deposits at punished banks decrease in the post-enforcement year and that the deposit decline is predominantly caused by demand-side forces, that is, by punished banks' decision to curtail the asset side of their balance sheet.

While there is empirical evidence on the impact of enforcement on various bank indicators, surprisingly, few studies investigate the key relationship between banking supervision sanctions and bank boards. This is a key relationship because supervisory sanctions are typically "assigned" to the board of a bank, having the ultimate responsibility of the bank, or to individual directors. Therefore, to impact board compositions is the first target of enforcement actions. Since the financial crisis, banking supervision has strengthened the role of a bank's board in order to fulfill its responsibilities and the attention of the policy-makers is now on the board composition and organization as it should contribute to making a board more effective and capable of deciding in a balanced and aware manner. For example, the Capital Requirement Directive IV-CRD IV (EU Directive 2013/36/EU and the EU Regulation 575/2013) set out the principles in order to stimulate the board to commit sufficient time (including multiple directorship) to allow it to perform effectively its duty. Moreover, it is required that the board should have collectively sufficient knowledge, skills and experience to be able to understand the business, including its main risks. These aspects impact not only on the stability and soundness of a bank, but also on the banking sector, as they protect and strengthen stakeholders' confidence. Ultimately, the bank deficiencies reported by the Supervisors, in terms of excessive risks, poor performance, etc., also depend on board

decisions. Therefore, this relationship is even more relevant in light of these reforms and especially critical in the banking industry.

In our study, we focus on the effects of enforcement actions on board dynamics with the aim to investigate whether enforcement actions can induce banks to change and improve board structure (for example, by replacing directors, by modifying the board size, etc.) as a consequence to the deficiencies detected by the Supervisory Authorities. As supervisory actions highlight the agency problems of the bank, this is expected to lead the bank to make appropriate changes in its corporate governance even if these changes are not mandated by the Supervisory Authorities.

In an agency perspective, when Authorities dispense a sanction to bank's board this may reveal a failure by the board to perform its tasks effectively. Therefore, the replacement of the board members acts as a mechanism to strengthen corporate governance structure that can increase the net returns to the internal supervision of a bank, increasing the value of new directors' services (Agrawal, Jaffe, & Karpoff, 1999). Moreover, given that board members frequently offer lobbying services (Borch & Huse, 1993; Pfeffer, 1972), this allows their firms to gain regulatory favours. Therefore, these lobbying services from new board members can become extremely valuable for banks given the subsequent scrutiny that accompanies many supervisory sanctions.

Previous empirical literature suggests the existence of a negative relationship between firm performance and the replacement of board members (Hermalin & Weisbach, 2003; Kaplan, 1994). With particular reference to derivatives lawsuits, Ferris, Jandik, Lawless, & Makhija (2007) find that firms affected by such lawsuits improved their governance because it leads to beneficial adjustments, such as increased board turnover. They interpret the higher board turnover as a sign of a director departure. Baum, Bohn, & Chakraborty (2016) find that the board turnover rates are higher for more serious wrongdoing and argue that this relationship is

also affected by reputational concerns. Overall, the literature seems conclusive that supervisory actions should induce higher board turnover rates. Similarly, we expect bank shareholders to encourage the departure of the sanctioned directors and of the other members involved in the wrongdoing, leading to an increase in board turnover. Therefore, higher board turnover is likely to be a helpful development in the bank governance if it is a result of agency conflict.

However, the rate of turnover may not sufficiently address the dynamics of governance structure in sanctioned banks. It may be the form of changes in board composition, that may be pivotal. Instead of being a favorable development, higher director's turnover could be the result of voluntary departures by better board members who leave to protect their reputations. Therefore, we also analyze specific changes at the board level that receive a relatively unambiguous interpretation in the literature. We examine three indicators of movement towards improved governance: board size, gender diversity and director's education level. The literature and regulators highlight that these are key factors for a "good" governance, that plays an important role for the sound and prudent management of the bank (see Directive 2013/36/EU - Capital Requirements Directive - CRD IV).

As to board size, literature emphasizes the existence of an inverse relation between board size and effectiveness of the board (Eisenberg, Sundgren, & Wells, 1998; Hermalin & Weisbach, 2003; Jensen, 1993; Yermack, 1996). While, larger boards increase the problems of internal coordination and free-riding, resulting in a loss of board efficiency, both in decision-making processes and in monitoring managers, smaller board size is associated with stronger oversight and improved decision making (Yermack,1996). Therefore, literature as well as self-regulation on corporate governance suggest that the board should have an "adequate" size. Therefore, given that the sanctions to the board represent a failure of board mechanisms that could be exacerbated by larger board size, we should expect supervisory sanctions to induce a reduction in board size to alleviate the problem.

Despite the large number of corporate governance reforms in most developed countries (as requested by Directive 2014/95/UE relating to disclosure of non-financial and diversity information by certain large undertakings and groups), aiming to increase the number of female directors in the financial industry, there is no conclusive evidence on the impact of gender diversity on board performance (Adams, de Haan, Terjesen, & van Ees, 2015). Some studies suggest that increasing the proportion of women in the board improves the monitoring function on management, pointing to different explanations such as ethical reasons, especially in the case of credit cooperatives (Schwizer and Stefanelli, 2011). In addition, women take their role more seriously and take greater care in preparing the board's work and discussion (Carter, Simkins, & Simpson, 2003; Terjesen, Sealy, & Singh, 2009). Finally, female board members tend to highlight critical issues and raise questions that increase the degree of awareness of board decisions. Other studies, on the other hand, suggest a negative link between the presence of women in board and firm performance, pointing to more risk-taking (Adams & Funk, 2012). As to the supervisory actions, more recent literature suggests that higher proportion of female directors is associated with less environmental violations (Liu, 2018) or financial manipulations (Wahid, 2019). Based on this evidence, we should expect that after a supervisory sanction, the board is disciplined to increase the number of female directors in order to reduce future misconduct. Additional evidence to this argument is provided by the gender punishment gap, as suggested by Egan, Matvos, & Seru (2017). According to this evidence, following an event of misconduct females are substantially more likely to be punished more than male colleagues. Therefore, they have stronger incentive to avoid misconduct events.

Lastly, with reference to the board education, some authors show how it indirectly influence the overall performance of the board (Hambrick & Mason, 1984). In particular, the level of

education is considered as a proxy of the quality of human capital in the board, with a positive impact on the director, who can better understand his role and responsibilities, as well as the complexity of the business (Harris & Raviv, 2008; Herrmann & Datta, 2005; Wiersema & Bantel, 1992). This is especially important for banks whose business is considered highly complex and opaque (Mehran, Morrison, & Shapiro, 2012). However, other studies also suggest that directors with higher education levels may be more likely to undertake aggressive and therefore risky business strategies (Beber & Fabbri, 2012; Bertrand & Schoar, 2003; Frank & Goyal, 2007; Minton, Taillard, & Williamson, 2014). Therefore, the literature is not conclusive on board education. On one hand, riskier behaviours are more likely to lead to more wrongdoings and thus more supervisory sanctions, that is not the favourite outcome of the sanctioning process. On the other hand, supervisory sanctions are expected to promote the hiring or substitution of sanctioned directors with better educated directors as this would bring new competencies to the boardroom as well as improve bank reputation.

Based on this literature and arguments, we formulate our first research question as below:

R.Q. 1: Do enforcement actions increase the change of board composition?

Furthermore, our study also aims to test if board changes (as a consequence of a supervisory sanction) reduce the probability of further sanctions for the same bank. This additional test is aimed to prove the effectiveness of the supervisory actions and their disciplining mechanisms. In other words, to test whether the changes induce by supervisory actions are beneficial on terms of reduce likelihood of future misconduct. From the bank perspective, changes in the composition of the board, as a consequence of a sanction, should aim improving the board functioning in order to prevent further deficiencies, thus improve board performance. On the question of what conditions improve board performance, the literature investigated various

aspects referring to the structure and the composition of the board. Among the first characteristics there are the board size and the presence of board committees; with reference to the second, there are the presence of independent directors, the gender diversity on board and the board education. However, the results in the literature are not always consistent (de Haan & Vlahu, 2016). In this study, we aim to test if the changes induced in board composition (as detailed above, i.e. the board turnover and the change in board size, gender diversity and board education) by supervisory sanctions have an impact in reducing future misconducts.

To the extent that the changes in board compositions are effective and aimed to improve bank governance, rather than simply signal in the short term a reaction to the supervisor, we should expect a lower probability of further sanctions. In particular, coherently with our previous predictions we should expect a lower probability of further sanctions if already sanctioned banks consequently reduce board size, increase gender diversity and increase board education. Therefore, we test the following research question:

R.Q. 2: *Do changes in board composition, as a result of a supervisory sanction, reduce the probability of further sanctions for the same bank?*

3. RESEARCH DESIGN: SAMPLE, VARIABLES AND METHOD

3.1 An overview of the Italian banking system

In this paper we focus on the Italian banking system and the supervisory activities over the bank governance. The Italian banking system is one of the most important in Europe. At the end of 2018, Italy was the third largest banking market for deposit (14.5% of Eurozone deposit), total assets (EUR 3.6 trillion, 11.8% of total Eurozone banking assets) and number of employees (254.076 employees). The Italian banking market concentration, measured by the

share of total assets of five largest credit institutions, is equal to 45.6%, higher than Germany (29.1%), lower than France and Spain (respectively, 47.8% and 68.5%) (ECB, Statistical Data Warehouse). From an institutional/ownership perspective, the cooperative- and the joint stock form are the two main institutional settings according to which Italian banks are established. Cooperative banks are the most numerous (268 at the end of 2018 with a market share in terms of loans of 7.1%, Bank of Italy, 2019) characterized by the small size, the localism, the principle of mutuality, the restrictions on ownership and voting rights according to one member-one vote principle (Boscia, Carretta, & Schwizer, 2009). Mutuality is both internal, as the activity is mainly aimed at members, and external, as part of the net income is aimed at the socio-cultural support of the local community. Localism is a constraint for cooperative banks, which can only operate in a restricted area called the area of territorial competence. Cooperative banks cannot be listed in a stock market.

Italian banks established as joint stock companies are 136 with a market share of 84.3% and 78 branches of foreign bank. (Bank of Italy, 2019). They pursue the goal of maximizing shareholder value and can be listed on stock exchanges. Shareholders are the bank's owners and residual claimants.

Finally, the popular banks (22 in 2018 with market share in terms of loans of 3.2%, Bank of Italy, 2019), are larger cooperative banks in which the there are restrictions on ownership and voting rights according to one member-one vote principle, however there is no constraint of localism and the principle of mutuality. The significant size achieved by some popular banks (some of them even listed) and the related governance problems deriving from the voting right and ownership restriction pushed towards the 2015 reform which imposed the mandatory transformation into joint stock company on the popular banks with a total assets greater than 8 billion euros (Jassaud, 2014). In addition, 78 branches of foreign bank operate in Italian financial market with a market share of 5.4% (Bank of Italy, 2019). The latter, according to

89/646/CEE Directive, are subject to the prudential supervision of the country of origin, according to the "Home country control" principle. Moreover, there are 11 banking groups classified as Significant Institutions (SIs) under the Single Supervisory Mechanism (SSM) with a 74% of the total assets of Italian intermediaries (Bank of Italy, 2019). After the law n. 218/1990 the Italian banking system is privately owned[1].

As regards the governance structure of Italian banks, Italian commercial law stipulates three alternative governance models (Melis, 2004). The so-called traditional (or Latin) model is based on the presence of a board of directors and a board of statutory auditors: the former guides and monitors management, while the latter is entrusted with monitoring the board of directors by law (Melis, 2004). In addition, two additional governance models are provided: a one-level (or English) board and a two-level (or German) board. However, the most widespread corporate governance model in Italian banking industry is the traditional one, used by over 99 percent of Italian banks.

Unlike non-financial firms, banks are subject to specific rules and to supervision by the Supervisory Authority, due to the public interests and characteristics of the banking business (Caprio & Levine, 2002; de Haan & Vlahu, 2016; Marinc & Vlahu, 2011). Over time, the need to encourage the evolution of financial markets and intermediaries in a European context has placed the bank's sound and prudent management as the fundamental principle which banking supervision must inspire to ensure the stability, efficiency and competitiveness of the system as a whole. For this reason, Supervisors are very careful to control the internal organizational aspects of a bank, such as governance, organization and internal control, capital adequacy, risk management, ownership restriction. In terms of governance, banking supervision provisions (Bank of Italy, 2013; European Banking Authority, 2011, 2018) recognize the key role of the board of directors as it has to deal with the "strategic supervision", the "management" and "control" of the bank.

In line with European regulation, the banking supervision control tools are based on: a) remote controls, such as off-site surveillance systems, b) spot checks, such as on-site inspections and c) follow-up, for an adequacy check of the action performed (Directive 2013/36/EU, so-called CRD IV). On the domestic market, the Bank of Italy carries out supervisory controls based on the three instruments, with the aim of ensuring the compliance of financial intermediaries, monitors sound corporate management, verifies the prudent measurement of risks by management (Bank of Italy, 2008, 2012). Remote controls are based on the request for published official data and private information that is periodically provided by banks to the supervisory authorities (e.g. financial data, ICAAP reports, mandatory regulatory reporting, mandatory information relating to the holding of significant equity investments, etc.). At the same time, the Bank of Italy carries out a control action on financial intermediaries through on-site inspections, carried out in different ways. First of all, these are general investigations that verify the correct overall management of a bank, with specific reference to the significant risks for the Supervisory Authority. Subsequently, the authority can carry out inspections on specific issues, therefore aimed at individual business processes or risk areas or referring to specific operational or technical aspects. Finally, the authority can carry out a follow-up inspection to verify the effectiveness of corrective actions or actions taken by banks or requested by Supervisors. Following the global crisis of 2008 and sovereign debt crisis of 2011, the European banking supervision discipline has undergone profound changes aimed at strengthening the control over intermediaries. In fact, at the end of 2014, within the framework of the Banking Union, the *Single Supervisory Mechanism (SSM)* started with the aim of helping to restore confidence in the European banking sector and strengthen the resilience of banks. Following the *SSM*, the supervisory functions are attributed to the Bank of Italy and the European Central Bank, based on the division of tasks established by Regulation (EU) no. 1024/2013 and detailed by Regulation (EU) no. 468/2014, applied directly in Italy[2]. Ultimately,

in the context of the banking union, the Bank of Italy contributes to defining the decisions of the *SSM*, deepens the information and knowledge of European banking systems and takes care of the development of homogeneous practices, in the interest of the stability of the European banking system.

3.2 Sample and data collection

In order to answer our research questions, we analyze the population of Italian banks during the period 2009-2015. We selected 2009 as the starting year of our observation given the unavailability of financial data prior to 2009 for most part of small banks. Moreover we choose 2015 as the ending year since post to 2015 Italian banking system was subject to a new sanctioning rules in line with the EU directive UE/2013/36 (Capital Requirements Directive - CRD IV).

Based on the statistical information system published by Bank of Italy we identified 730 banks that were operative over the period under investigation. In this group we also included banks that started their business after 2009, as well as banks that ended their business before 2015, with the constraint that the information should be available for at least two consecutive years (Pathan, 2009). Branches of foreign banks are excluded from the analysis, since they are supervised by their home-country supervisor. From this initial group we have eliminated 75 banks due to a lack of publicly available information. We have also eliminated all the observations concerning the banks that were subject to extraordinary measures by the Supervisory Authority (special administration, interim management, etc.) during the period under review. Moreover, we have excluded the banks with a one-tier or two-tier boards, given that these governance models are used by less than 1 percent of Italian banks. The final sample

is composed of 651 banks, including 209 joint stock banks, 37 popular banks and 405 cooperative banks.

We used different sources for the data collection. From the statistical information system of the Bank of Italy, we retrieved the demographic information of each bank (name, location, seniority, etc.). In addition, from the Bank of Italy website we retrieved the Supervisory Bulletins to find information about the sanctions imposed by the Supervisory Authority on the board of directors of Italian banks during the period under analysis. The Supervisory Bulletin is monthly published and it reports the sanctions imposed on banks' board. From the analysis of this source we retrieved the following information i) the governing body that was sanctioned and the members responsible for the violation; ii) a list of alleged infringements, sort by type of violation (e.g. deficiencies in organization and internal controls, deficiencies in credit management, etc.); iii) the amount of the sanction imposed on the board of directors.

As sanctioned directors can file an appeal, we also verify whether the court has dismissed the sanction. This information was obtained from the Banking Supervisory Bulletin and from the website of the Italian administrative justice.

Data on board structure and composition were hand-collected from bank websites, corporate governance reports and financial reports. Such information has been further verified and supplemented through the consultation of the Italian Banking Association Yearbook; this Yearbook, annually published, reports the composition of the Italian bank boards. Finally, financial and balance sheet data were obtained from Bankscope database (by Bureau van Dijk) and were further integrated through the consultation of the annual financial statement of each bank.

From the data collection we obtained an unbalanced panel of 4,256 observations. In particular, only 7% of annual observations refer to banks whose directors have been sanctioned.

3.3 Dependent variables

In order to investigate whether the composition of the board of directors is affected by enforcement actions (RQ1), we have used several dependent variables to capture the change in board composition. In particular, we refer to the directors' turnover as a general measure of change in board composition. Furthermore, we also used more specifically measures of board change. Given that the sampled banks are mainly unlisted banks, some of the board related variables are not publicly available (number of independent directors, number of board meetings, board compensation, directors' detailed professional profile, etc.). Among the variables that the literature and corporate governance principles suggest being important for the effectiveness of the board, we were able to build the following variables: board turnover, change in board size, gender diversity, and directors' education. Therefore, we measured the above-mentioned variables as follows:

Board turnover. The threat of replacement is a mean to encourage board members to run their duties effectively (Franks, Mayer, & Renneboog, 2001; Kang & Shivdasani, 1995; Kaplan, 1994). In this paper, we calculate this indicator as follows (Eldenburg, Hermalin, Weisbach, & Wosinska, 2004):

$$\frac{(\text{N. of new directors at } t) + (\text{N. of directors that left the board between } t \text{ and } t\text{-1})}{2 \times (\text{Board size at } t - 1)}$$

If the board size does not change, this indicator varies from 0 to 1, where 0 indicates no change in board composition, and 1 indicates that all directors have been replaced during the period. However, if board size changes, this indicator may also have values greater than 1.

Change in board size. Board size is a key mechanism that influences the effectiveness of board action. In particular, the literature highlights the negative relationship between the size of the board and its effectiveness in carrying out its duties (Eisenberg et al., 1998; Hermalin & Weisbach, 2003; Jensen, 1993; Yermack, 1996). This indicator is calculated as a change in the number of members of the bank's board in the period $(t - 1)$, t.

Change in gender diversity. This indicator is calculated as a change in the proportion of women on the board in the period $(t - 1)$, t.

Change in board education. Ideally, board education should be analysed by including detailed information on the education level (degree, master, doctorate, etc.), the scope of studies, the institution issuing the title, etc. (T. King, Srivastav, & Williams, 2016; Lester, Certo, Dalton, Dalton, & Cannella, 2006). However, this information is not always available especially for small banks, given their high informative opacity (San-Jose, Retolaza, & Gutierrez-Goiria, 2011). In particular, we were able to find information on the level of education of directors with particular reference to the degree level. Therefore, we measure the change in board education as the change in the proportion of directors holding a degree during the period $(t - 1)$, t.

In order to investigate if changes in board composition reduce the probability of further sanctions for the same bank (RQ2), the dependent variable is the probability that the board of the bank i will be sanctioned in year t. Therefore, we use a dummy variable equal to 1 if the board of bank i was sanctioned in the year t and 0 otherwise.

3.4 Independent and control variables

The independent and control variables used in the analysis are different for the two research questions, as listed in the next Table 4 and Table 5, respectively.

For the first research question, which concern the effects of the publication of a sanction on the board characteristics, the independent variable is a dummy variable (Sanction) equal to 1 if the board of bank i in the year t was sanctioned by the Supervisory Authority and 0 otherwise.

In order to conduct further analysis, we exploit heterogeneity of sanctions by building additional variables. Specifically, we also built a variable with the amount of the penalty, as a proxy for the severity of the violation detected by the Supervisory Authority. Given that the amount of the penalty also depends on the number of directors involved in the sanction procedure, we take the average amount of the penalty per director. In addition, we extract the rationale that justifies the sanction. The sanction report does not mention the specific facts but refers to a generic description of violations and to the rule that has been infringed, allowing us to assign the violations to specific bank processes. In more than 95 percent of the cases we examined, the Authority reported three types of violations:

1. Deficiencies in organizational and internal controls;

2. Deficiencies in credit management;

3. Deficiencies in risk management.

Thus, we built three dummy variables for each of the above-mentioned categories.

To avoid spurious effects between the dependent and independent variables, we include control variables at bank and board levels to account for bank and board characteristics and thus control for other factors that may affect change in board composition. The board composition is influenced by firm characteristics (Markarian & Parbonetti, 2007). Therefore, a first group of

variables controls for the size of a bank measured as the natural logarithm of bank's total assets at the end of year t, the bank age as the natural logarithm of age of bank i in the year t, the bank performance expressed as the natural logarithm of $(1+ \text{ROE})$ at the end of year t, the growth rate of bank's total assets at the end of year t, the bank risk measured as the natural log of the ratio of non-performing loans (NPLs) on gross loans at the end of year t, and the leverage expressed as the natural log of equity to total assets ratio at the end of year t. In addition, we also consider that change in board composition could be impacted by banks' institutional setting (Rasmusen, 1988) and whether banks are subject to market for corporate control mechanisms. Therefore, we add a dummy variable for cooperative banks, and a dummy variable for popular banks; joint-stock banks are the reference category, and a dummy for listed banks (Dyck, Morse, & Zingales, 2010). Moreover, we acknowledge that board composition could be affected by certain bank strategies. Thus, we control whether in year t, a bank acquired another bank, given that these strategies impact bank risk and performance. At the board level, we include the board size in the model with the board turnover as dependent. Scholars argue that the size of the board is inversely related to the quality of monitoring (Jensen, 1993; Yermack, 1996). This argument implies that directors turnover should be negatively related to the size of the board (Agrawal et al., 1999). In the model with dependent variable the change in gender diversity of the board we include as a control variable the change in board size between $(t-1)$ and t given that females appointment to the board member position could depend on the size of the board. Finally, in the model with dependent variable the change in board education, we include as a control variable the change in board size between $(t-1)$ and t and the change in the proportion of women on the board between $(t-1)$ and t in order to control the impact of change in the size of the board on the change in board education and the difference in education level between male and female, respectively.

All models are estimated including GDP growth rate at regional level, year and regional fixed effects to control for any changes in macroeconomic and contextual conditions.

As concerns the second research question, which examines the impact of board changes after the sanction on the probability of further sanctions, the independent variables are:

- the board members' turnover between the year $(t - 1)$ and t;

- the change in board size between the year $(t - 1)$ and t;

- the change in gender diversity between the year $(t - 1)$ and t;

- the change in board education between the year $(t - 1)$ and t,

The operationalization of these variables was already discussed above.

In order to account for bank and board characteristics that may affect the probability that the board is sanctioned by the Supervisory Authority, we include control variables at bank and institutional levels.

In the agency perspective, supervisory enforcement actions help to pinpoint corporate governance problems within the bank, which the bank must subsequently address. Therefore, at the bank level we control for the size, the age and the performance of the bank i at the end of year t. The literature highlights that larger firms, older firms and firms that perform poorly suffer more likely of residual agency problems (Ferris et al., 2007; Strahan, 1998). Moreover, we control for the bank's asset growth rate at the end of year t as a proxy of the bank's growth and the ratio of loans to total assets at the end of year t as a proxy of the bank business model. Agency problems can arise in volatile business given that in such a case it is more challenging to monitor managerial behaviour (Demsetz & Lehn, 1985); so, high risk could positive impact the probability of sanctions. The risk was expressed using a relevant measure for banking supervision such as the NPL/Gross Loans ratio (Non-Performing Loans/Gross Loans).

In addition, controls for the bank institutional settings were included since these variables could impact board effectiveness and hence the probability to be sanctioned by Supervisory Authorities (Borgen, 2004; Hart & Moore, 1998). Therefore, we consider two dummy variables for cooperative and popular banks, joint-stock banks are the reference category. We also recognize that certain bank conditions, could lead to a greater or lesser number of detected infringements. In this group, we considered whether a bank is listed on a stock market; whether in year t, a bank acquired another bank and the bank risk. In general, listed companies are more closely scrutinized by investors and Authorities (Dyck, Morse, & Zingales, 2010). In addition, merger & acquisitions may induce the Authority to exert greater effort in controlling the bank on a regular basis.

Finally, we consider at governance level a dummy variable for the presence within the board of an executive committee. The role of an executive committee is to help the board accomplish its work in the most efficient way. As discussed in the literature, the executive committee acts as screening and review vehicle on major proposals before they come to the full board (Sherman, Kashlak, & Joshi, 1998). Therefore, the presence of an executive committee could impact the board performance and therefore the probability of sanctions.

At last, the Gross Domestic Product (GDP) growth rate for each Italian region was also included.

All models are estimated with year and regional fixed effects to control any changes in macroeconomic and contextual conditions.

3.5 Summary statistics

In this section we report the main descriptive and univariate statistics for the variables used in the analysis. Table 1 shows the descriptive statistics of the independent and control variables.

Table 2 reports the differences in mean between the main characteristics of sanctioned and non-sanctioned banks. Finally, in Table 3 we show Pearson's correlation coefficients.

Insert Table 1 about here

As regards bank characteristics, there are significant differences between sanctioned and non-sanctioned banks (Table 2). Specifically, in Table 2 we compare the mean of our main variables by grouping the sampled banks into three sub-samples: non-sanctioned banks, banks sanctioned once, and banks sanctioned twice or more in the timeframe of our analysis. The most significant differences between these three groups concern the level of bank performance and risk. In particular, compared to non-sanctioned banks, sanctioned banks show lower profitability ($F = 45.29$, $p < 0.1\%$), lower asset growth rate ($F = 6.75$, $p < 1\%$), higher risk ($F = 125.57$, $p < 0.1\%$) and lower level of equity ($F = 14.37$, $p < 0.1\%$). However, we highlight that while for profitability, risk and leverage the three groups differ from one another, in the case of the assets growth rate, significant differences exist between the first two groups and the third, while no appreciable difference exists between the first two.

Insert Table 2 about here

At board level, we report that sanctioned banks have a significantly higher board turnover ($F = 8.89$, $p < 0.1\%$) than non-sanctioned banks and, at the same time, sanctioned banks are also characterized by a significant difference in board size change ($F = 4.90$, $p < 1\%$). Specifically, the banks sanctioned two or more times show a board size reduction significantly higher than the first two groups. Although not used in this study and in order to provide a clear picture of the relationship between board characteristics and probability of sanctions, in Table 2 we also

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report the differences in board size, gender diversity and board education levels. In this regard, we note that sanctioned banks have on average a board size significantly higher than non-sanctioned banks ($F = 15.88$, $p < 0.1\%$). Finally, in banks sanctioned two or more times, the severity of sanctions is significantly higher ($F = 199.12$, $p < 0.1\%$) than in banks sanctioned once. In addition, we highlight that the most frequently detected violations by the Supervisory Authority are those for i) deficiencies in credit management (167 events) with an average severity of € 10,017; ii) deficiencies in organization and internal control (154 events) with an average severity of € 12,039; iii) deficiencies in risk management (32 events) with an average severity of € 15,732.

In Table 3, we show that the severity of sanctions is significantly and negatively associated with bank profitability ($\rho = -0.080$, $p < 1\%$) and the asset growth rate ($\rho = -0.068$, $p < 1\%$) and negatively associated with bank risk ($\rho = 0.150$, $p < 1\%$). Therefore, more severe sanctions are imposed on board of banks with i) low profitability, ii) low asset growth rate, and iii) high risk. Finally, the severity of the penalty is also significantly and positively associated with the board turnover ($\rho = 0.098$, $p < 1\%$) and negatively associated with the change in board size ($\rho = -0.113$, $p < 1\%$).

Insert Table 3 about here

3.6 Methodology

In order to investigate whether and to what extent the publication of a sanction impacts the board composition, we analyse a panel data set for a sample of Italian banks, including those whose board was punished (treated banks) and those whose board was not (non-treated banks). Thus, we estimate the following panel model:

$$\Delta \ Board \ composition \ _{i,t} = a_j + \lambda_t + \beta \ Sanction_{i,t} + \gamma Z_{i,t} + \varepsilon_{i,t} \qquad [1]$$

The dependent variable is $\Delta \ Board \ composition_{i,t}$ i.e. the year-on-year change in board characteristics that we alternatively measure in terms of i) board turnover in the period $(t-1)$, t; ii) change in board size in the period $(t-1)$, t; iii) change in gender diversity in the period $(t-1)$, t; and iv) change in the proportion of directors holding a degree in the period $(t-1)$, t. On the right-hand side of the equation, a_j and λ_t represent the regional and the year fixed effects, respectively; $Z_{i,t}$ is a vector of control variables at bank and board levels. Moreover, we also control for the GDP growth rate at regional level. To answer the first research question, $Sanction_{i,t}$ is the variable of our interest and is defined as a dummy variable equal to 1 if in the year t is published a sanction for the board of the bank i and 0 otherwise.

The model [1] examines the response of the board composition in the year of the publication of a sanction. The coefficient of variable Sanction captures the difference in the one-year change in the response variable for boards that are punished relative to non-punished boards. To avoid simultaneity bias, the control variables related to bank growth, bank performance and merger and acquisition were included in the model lagged one period.

Given the low variability of the dependent variable over time, we estimate the model [1] as a pooled Ordinary Least Square (OLS) model. This choice was confirmed by the Breusch-Pagan Lagrange Multiplier (LM) test, which excluded the need to use a random effects panel model. Likewise, we have ruled out the need to use a fixed-effect panel model as the F test of fixed effects does not rejected the hypothesis that the constant terms are equal across banks. Thus, the pooled approach does not produce biased estimates. However, we highlight that the estimation with a fixed effects panel model lead to the same results obtained with the pooled OLS (results not reported).

In order to address endogeneity related to the relationship between sanctions to the board and change in board composition we estimate model [1] via an instrumental variables (IV) approach. The IV estimates can address this problem if the following assumptions hold: (i) the IV are correlated with the endogenous regressors (relevance criterion); (ii) the IV are not correlated with the error term (exogeneity condition); and (iii) the IV do not directly affect the dependent variable (exclusion criterion). If (ii) and (iii) hold, the instruments are valid. If (i) holds, but the correlations between the instruments and the endogenous regressors are small, the IVs are valid but weak. Therefore, the choice of adequate instruments is crucial. Specifically, we select two instruments: the sanction imposed to the board of statutory auditors and the sanctions imposed to the general manager. These two variables are satisfactory from both a theoretical and empirical standpoint. Specifically, given that in a legal and supervisory perspectives the statutory auditors and the general manager are responsible for the tasks assigned to them by law and supervisory provisions there is no reason to expect that sanctions imposed to them are directly related to the changes at board level. On the other hand, the board of directors is sanctioned if it does not fulfil the tasks that the law or supervisory provisions assign to it. This theoretical expectation is also supported by empirical data: the correlation of our instruments with the endogenous variable is high (the Supervisory Authority often simultaneously punish the board of directors, the board of statutory auditors and the general manager), while the correlation with our dependent variables is low, as they are directly related to board effectiveness in performing its duties. In Table 4 are detailed the variables used in the estimation of model [1].

Insert Table 4 about here

As concerns the second research question, we estimate the following model:

$$Sanction_{i,t} = a_j + \lambda_t + \beta(\Delta\ Board\ composition_{i,t-1}) + \gamma Z_{i,t-1} + \varepsilon_{i,t} \qquad [2]$$

Model [2] predicts the probability that the board of the bank i in the period t is sanctioned. Therefore, we use a dummy variable equal to 1 if the board of the bank i in the period t is sanctioned and 0 otherwise. On the right-hand side of the equation, a_j and λ_t represent regional and year fixed effects, respectively; $\Delta\ Board\ composition_{i,t-1}$ is the independent variable of our interest, lagged one year, that we measured in terms of board turnover, change in board size, change in gender diversity and change in board education; $Z_{i,t-1}$ is a vector of control variables lagged one year. In order to better capture the quality of the changes in board composition and how it could impact the probability that the board of bank i is sanctioned in a given year, we also include in the model the two-way and the three-way interaction terms between the different types of changes in board composition (i.e. Δ Board size×Δ Gender diversity; Δ Board size×Δ Board education; Δ Gender diversity×Δ Board education and Δ Board size×Δ Gender diversity×Δ Board education). This is important because the changes in board composition could affect the probability of sanctions when combined each other. Table 5 presents the variables used in the estimation of the model [2].

Insert Table 5 about here

In the model [2], we add the independent and control variables lagged one year in order to account the lag time between when the Supervisory Authority detects a violation and when the sanction is published, as the former precedes the latter. Therefore, the changes in board characteristics that depend on a sanction are those that occurred when the violation was committed and not when the sanction is published.

To investigate whether, after the first sanction event (within the time span of our research), a change in the board composition affects the probability of further sanctions, we add in the model [2] i) a dummy variable "Already sanctioned" equal to 1 for every years after the year t of the first enforcement action and 0 otherwise, ii) the two way interaction terms between the dummy variable "Already sanctioned" and the independent variables (i.e. Board turnover, Δ Board size, Δ Gender diversity, Δ Board education). Finally, we also test the three way interactions between the dummy "Already sanctioned" and the changes at board level combined each other (e.g. Already sanctioned $\times$ Δ Board size$\times$$\Delta$ Gender diversity, etc.).

To estimate the model [2] we use a simple pooled logit model and we control for regional and time fixed effects. Standard errors are clustered at bank level in all the estimated models. As a robustness check, we also follow a different estimation strategy by applying a conditional logit/fixed effects. Although the estimated coefficients are different and the standard errors are quite large, they lead to the same conclusions as the pooled model (this table is not presented but is available upon request).

4. RESULTS

In this section we present the results of our analysis. Table 6 shows the results of the models related to our first research question. The models are estimated with a two-stage least square

regression by using clustered robust standard errors at bank level. The models are significant. Specifically, we highlight that the under-identifying restrictions test is rejected at the 1% level. Therefore, we reject the null hypothesis that the instruments are uncorrelated with the endogenous regressor. We also reject the null hypothesis of weak instruments at the 1% level, excluding instruments that are weakly correlated with the endogenous regressor. Moreover, the Sargan test (overidentification test of all instruments) is not significant, thus we cannot reject the hypothesis of over-identifying restrictions. Consequently, we conclude that our instruments are valid. Finally, we highlight that instrumental variables (at the bottom of Table 6) are always statistically significant, with positive signs in the first stage. This shows that the sanctions to the board are positively associated with sanctions to the statutory auditors and general manager.

Insert Table 6 about here

The results in column (1) (Table 6) show that the sanctions imposed by the Supervisory Authority on the board of directors of Italian banks impact on the change in board composition. More specifically, in line with literature on fraud, we observe from column (1) that after the publication of a sanction, board members' turnover increases ($\beta = 0.267$, $p < 0.1\%$). Therefore, we conclude that board members' replacement is affected by enforcement actions (Baum et al., 2016). Moreover, in column 2 we find a negative association between sanctions and change in board size ($\beta = -0.889$, $p < 0.1\%$). The sign of the coefficient suggests that sanctions are associated with a reduction in board size (Ferris et al., 2007). In addition, the sanctions are positively associated with an increase in the proportion of directors holding a degree ($\beta = 0.063$,

$p < 1\%$) (column 4). Finally, we do not observe any significant effect of sanctions on the change in the gender diversity of the board (column 3).

We further extend our analysis to test the effect of the sanctions for specific type of violations on board change (Table 7). In particular, we estimate the model [1] by using sanctions classified by type of violation as independent variables, i.e. penalties for deficiencies in i) organization and internal controls; ii) credit management; and iii) risk management. Furthermore, we also estimate the model [1] by using the average amount of the penalties imposed on each directors as independent variable to proxy for the severity of the sanction and thus the disciplining signal (Table 7, columns 13-16).

Insert Table 7 about here

Table 7 shows the association between sanctions and board changes for the three type of violations mentioned above. This analysis confirms that board members' turnover increases. Consequently, consistent with the results in Table 6, deficiencies i) in organization and internal controls ($\beta = 0.317$, $p < 0.1\%$), ii) in credit management ($\beta = 0.337$, $p < 0.1\%$) and iii) in risk management ($\beta = 0.49$, $p < 5\%$) are positively and significantly associated with directors' replacement. Moreover, also the amount of the sanctions, i.e. our proxy of the severity of violations, positively impacts on board turnover ($\beta = 0.008$, $p < 0.1\%$), as more severe violations are positively associated with board members' turnover (column 13). In addition, we note that together with the increase in board turnover, the sanctions for the above-mentioned deficiencies are also associated with change in board size and in board demographic characteristics. In particular, the sanctions for deficiencies in organization and internal controls

are associated with a board size reduction (β = - 0.981, $p < 0.1\%$) and an increase in board education level (β = 0.083, $p < 5\%$). Moreover, also the sanctions for deficiencies in credit management present the same effect on board size (-1.111, $p < 5\%$) and education level (0.079, $p < 5\%$). With a marginal significant effect, sanctions for deficiencies in credit management positively affect also gender diversity (0.027, $p < 10\%$). Although with low levels of significance, the same effects occur even when the Supervisory Authority imposes sanctions for deficiencies in risk management. We observe a reduction in the board size (β = - 0.953, $p < 1\%$) and an increase in the proportion of directors holding a degree (β = 0.047, $p < 5\%$).

Specifically, we show that sanctions for deficiencies in credit management and risk management impact more than those for deficiencies in organization and internal control on board members' replacement. The differences between the estimated coefficients of the variable Sanction (*t*) (presented in Table 7, columns 1, 5 and 9) across the three type of violations are highly significant ($p < 1\%$). These findings seem to suggest that credit management and risk management are fundamental factors to properly manage the complexity of the banking business, its performance and the control of its risks. Therefore, violations in these two areas are followed by a substantial replacement of board members.

Finally, we note that the changes in board size and in board education are also confirmed when we use the severity of penalties as independent variable (columns 14 and 16). Specifically, more severe sanctions are associated with a significant reduction in board size (β = - 0.046, $p < 0.1\%$) and an increase in board education (β = 0.001, $p < 5\%$).

Lastly, the enforcement actions imposed by the Supervisory Authority do not significantly impact on the change in gender diversity of the board. Therefore, sanctioned and non-sanctioned banks do not differ in the change of gender diversity. This result, coupled with the reduced proportion of women sitting on the board of directors, seems to point out a persistent disadvantageous situation for female directors and a failure to acknowledge the possibility that

increasing women's presence in the board could enhance board functioning by diversity, especially at the time that weaknesses are detected by the Supervisory Authority.

Table 8 shows the estimation results of model [2] relative to our second research question. We use this model to test the effectiveness of the changes at the board level in reducing the probability of receiving further sanctions (recidivism).

Insert Table 8 about here

We have estimated this model by using the probability that the board of bank i will be sanctioned during the period t as the dependent variable. Specifically, in column (1) we show the results of the model [2] using the independent and control variables detailed in Table 5 lagged one period. In next columns 2-5 we present the results obtained including the interaction terms mentioned above. For brevity, in Table 8 we report only the results of the model with significant interactions (the full table is available upon request).

The results in columns 1 and 2 show the determinants of the probability that the board of the bank i is sanctioned in the year t. First, we notice that, although it is not significant, the variable "Already sanctioned" has a negative coefficient in all models. This sign is coherent with the "disciplining mechanism" view that once-sanctioned banks are less exposed to the possibility of further enforcement actions in next periods. Next, we highlight that the probability of sanctions is higher for large banks and for those with high risk level and low profitability. This evidence is significant in all the models in Table 8 and is consistent with an agency view of

enforcement actions (Ferris et al., 2007; Strahan, 1998). Moreover, the board of directors of cooperative and popular banks face greater probability to be sanctioned, in line with the literature that highlight the relevant agency problems in these types of banks (Borgen, 2004; Hart & Moore, 1998).

At board level, it emerges in column 1 that an increase in board education positively affects the probability of sanctions ($\beta = 0.033$, $p < 1\%$). This result could be coherent with the view that more educated directors are more likely to undertake risky strategies (Minton et al., 2014) and hence to incur in sanctions by the Authority. Furthermore, this result justifies the importance of an assessment of the degree of education, of the experience and of the time that the each director dedicates to carrying out his/her task on the board, which was captured by the fit and proper assessment starting from since 2015, within the framework of the *SSM*. And again, the supervisory regulations recalled the importance of induction and training tools to the new directors on the board, to allow them to acquire the right knowledge of the bank business (ECB, 2018b).

In contrast, the main effect of the other independent variables at board level do not show any significant impact. In column 2, we present the results obtained interacting the changes at board level. In particular, in column 2 we show that the two way interaction term between the change in board size and in gender diversity is negative and significant ($\beta = -0.039$, $p < 1\%$). This result suggests that the probability of sanctions to the board is reduced when the size of the board and the proportion of female directors increases. However, by exploring in more details this result, it emerges that an increase in gender diversity significantly reduces the probability of sanction only when the increase in board size is no more than 2 new members. In terms of the relationship between the change in board size and the probability of sanction, the former reduces the latter of 1.3% ($p < 5\%$) only when an increase of one member in board size is matched with an increase in gender diversity and precisely of one new female member.

Therefore, these results seem to highlight that gender diversity can reduce the probability of sanctions only when females are able to exert a significant role on the board. However, when board size increases beyond 2 new members, it seems that the positive effects of an increase in gender diversity are overridden by the problems associated with the excessive increases in board size.

In columns 3-5 we test our second research question. In particular, in order to find the impact that the change at board level, occurred in the periods following the first sanction, has on the probability of further sanctioning measures, we interact the change at board level with the dummy "Already sanctioned". Specifically, in column (3) we show that the main effect of the variable *Δ Board size* is negative and not significant ($\beta = -0.11$, $p > 10\%$), while the interaction term *Already sanc.* $\times$ *Δ Board size* is positive and significant ($\beta = 0.33$, $p < 5\%$). This indicates that a reduction in board size following the first sanction contributes to significantly reducing the likelihood of further sanctions. In column 4, the main effect of the variable *Δ Gender diversity* is negative and marginally significant ($\beta = -0.055$, $p < 10\%$), while the interaction term *Already sanc.* $\times$ *Δ Gender diversity* is positive and significant ($\beta = 0.094$, $p < 5\%$). Therefore, an increase in the proportion of women who sit on the board during the period following the first sanction does not lead to low probability of further sanctions, but it seems that an increase in gender diversity on the board contribute to increase the probability of further sanctions. While we previously noticed that gender diversity is overall beneficial to reduce misconducts, this result is due to the lack of a differential effect between banks that received a sanction from the other banks, since in our time-period sanctioned and non-sanctioned banks do not differ in the proportion of female on board and in the change of gender diversity (see Table 2). Therefore, the overall interpretation is that changes in gender diversity are important for reducing misconduct but not necessarily when they happen after a disciplining action.

Finally, as we noted above, the *Δ Board education* variable is positive and significant in all models in Table 8, while the interaction term *Already sanc. × Δ Board education* is positive and not significant (not reported). This result indicates that an increase in the proportion of graduate directors after a sanction does not contribute significantly to lowering or increasing the probability of further sanctions. Thus, there is no difference in the impact of *Δ Board education* prior and post the first sanction.

5. ROBUSTNESS CHECKS

Table 7 shows that results reported in Table 6 are robust to changes in the dependent variable. Using either the sanctions for different types of violations and the severity of the penalty, the results are consistent with previous specifications. Moreover, we conducted the following robustness tests. First, we re-estimated the model [1] via a non-instrumented approach of the suspected endogenous variables. The results (not reported in the paper) are in line with those presented in Table 6. Therefore, this confirms the robustness of our conclusions. Second, we considered that change in board composition as a consequence of a sanction could occur in the years subsequent the event. Therefore, we used a different specification of model [1] as follows:

$$Board\ characteristics_{i,t} = a_j + \lambda_t + \beta\ PEBC_{i,t} + \gamma Z_{i,t} + \varepsilon_{i,t} \quad [3]$$

We test this model only on the sub-sample of sanctioned banks. The dependent variable is defined in terms of different board characteristics, i.e. board turnover, board size, gender diversity and board education. Unlike model [1], in model [3] we do not use the year-to-year

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change in board characteristics, but we use the corresponding year levels. The variable of main interest is *PEBC* (*Post-enforcement board characteristics*), which is a dummy equal to 1 for board characteristics originated in the year *t* of the sanction imposed on the board of the bank *i* and in the two years after the year *t*, 0 for board characteristics originated in the two years before the enforcement action, and has missing observations for the rest of the sample. Therefore, the model is estimated only for sanctioned banks and for five-year time window around the sanction event. A positive value of β indicates that once a board is sanctioned, board characteristics in the years after the enforcement action positively change so that board turnover, board size, gender diversity and board education increase relative to years before the sanction event.

Insert Table 9 about here

In order to estimate model [3] we use a panel regression and we choose between random, fixed effects and pooled approaches by looking at the Breush-Pagan Lagrange Multiplier (LM) test and at the Hausman test. The results in Table 9 lead to the same conclusions as those reported in Table 6. In the first column the variable *PEBC* is positive and significant ($\beta = 0.034$, $p < 1\%$). This indicates that in the years after a sanction event the board turnover increases respect to the two years before the event. In the column (2) the variable *PEBC* is negative and significant ($\beta = -0.356$, $p < 5\%$). Therefore, in the years after a sanction event the board size decreases relative to the two years before. In the column (3) the variable *PEBC* is not significant as in the column (3) in Table 6. Finally, in column (4) we note that the variable *PEBC* is positive

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and significant ($\beta = 0.028$, $p < 5\%$). Thus, the board education increases in the years after the sanction event relative to the years before.

In order to test the probability that the board of bank i is punished again after the year t of the first sanction, we re-estimate the model [2] only on the sub-sample of at least once-sanctioned banks (Table 10). Therefore, we build a new dependent variable as a dummy equal to 1 if in the years after the first sanction (in our time-period) the board of bank i is punished and 0 otherwise (column 1). Moreover, we estimate the same model to test the probability to be punished again for specific deficiencies in: i) organization and internal controls; ii) credit management; iii) risk management (columns 2-4).

Insert Table 10 about here

The application of these selection criteria leads us to a final sub-sample of 505 bank-year observations pertaining to 168 banks with 40 sanctions events. Given that the sanction events after the first sanction are rare in our sample, logistic models could suffer for rarity of events, since the small size of the selected sub-sample could lead to an underestimation problem of the probability of the events occurring in the sample (Firth, 1993; Gao & Shen, 2007; King & Zeng, 2001). Indeed, the results (not reported) obtained by using a simple logistic approach have shown that several coefficients and standard errors were exacerbated in their magnitude. Therefore, to reduce the bias in maximum likelihood estimates of the coefficients, we used the approach proposed by Firth (1993). Moreover, given the low number of positive events (sanctions) we reduced the regressors to reach a parsimonious model and increase the precision of the estimated coefficients. Table 10 shows the results of this estimation. In column (1), we highlight that after the first sanction, an increase in board size ($\beta = 0.199$, $p < 5\%$) and in board education ($\beta = 0.039$, $p < 5\%$) have a positive impact on the probability that the board of a

given bank will be sanctioned two or more times, i.e. the board is more likely to incur in another sanction. As to change in gender diversity, there is no evidence of an impact on such probability. However, we show that board changes have a different impact on the probability to be punished again depending on the specific type of violations. While, the probability to be punished in the future for deficiencies in credit management is not impacted by changes in board characteristics, we find that board changes affect such probabilities for deficiencies in organization and internal controls (column 2) and in risk management (3). Specifically, we show that an increase in board size and education impact on the probability to be punished again for deficiencies in organization and internal controls. Moreover, positive changes in board characteristics, in terms of board size, gender diversity and board education are significantly associated to the probability to be (re)punished for deficiencies in risk management processes. We obtain similar results when using a logistic approach without the Firth's correction (unreported table). Overall, the results in Table 10 are consistent with previous reported in Table 8.

6. DISCUSSION AND CONCLUSIONS

The publication of supervisory actions affects the bank board with respect to: the directors turnover, board size and board education. More specifically, in the year of publication of a sanction event sanctioned banks increase the board turnover, reduce the board size and tend to improve the educational level of the board. These results are also confirmed when the sanction is expressed in terms of severity of violations (the amount of the penalties).

All these effects seem consistent with the necessity or the attempts to improve and enforce the bank governance, at least by removing the directors responsible of the sanction and their replacement with better educated directors.

Exploiting the heterogeneity of the sanctions, the analysis has shown that banks' response to the enforcement actions changes depend on the type of violations. The impact on board turnover is confirmed across all types of violations, i.e. for deficiencies in organization and internal control, in credit management processes and risk management. However, the impact of sanctions on board turnover is larger for violations in the areas of credit management processes and risk management. Given the importance of lending and credit policies and risk management, related to the typical Italian banking business model, this results could be explained considering that it is of crucial importance for banks to be prudent in these key areas to safeguard their assets and protect their stability and hence investors' interests. Therefore, based on this evidence, it seems that violations in the areas of credit management processes and risk management are perceived as more "relevant" in the" eyes" of the banks and of the regulators so that there is much more internal or external pressure for a change in the governance.

Do changes induced by the sanctions have a beneficial impact on the sanctioned banks? The answer to this question is crucial to assess whether the role of the supervisor in punishing the bank indeed produce not only "an effect" but a positive effect. In particular, we are interested in assessing whether this positive effect is in terms of better governance, as it is in the scope of the Supervisor sanctioning process. Our analysis on the probability of being sanctioned again is meant to empirically test it. Generally speaking, the results show that previously sanctioned banks have a lower probability of being sanctioned again. However, our results suggest that board turnover has no effect on such probability, suggesting that the increase in board turnover as an effect of a sanction event could be a "mechanical" result of the sanction but do not reveal an intention of the bank to improve the governance. Looking at specific measures of board changes, it emerges that banks have a lower probability of being sanctioned again if they reduce the board size when sanctioned. This result seems to be in line with the literature which

emphasizes that larger boards increase the problems of internal coordination and free-riding, resulting in a loss of board efficiency, both in decision-making processes and in monitoring managers (Eisenberg et al., 1998; Hermalin & Weisbach, 2003; Jensen, 1993; Yermack, 1996). The role of gender and board education is quite controversial because it seems that an increase in gender diversity and in board education do not lead to low probability of further sanctions. As concerns the gender diversity, this result could be explained considering that the time-trend of the change of female presence on the board of Italian banks does not differ between sanctioned and non-sanctioned banks in the years under investigation. Therefore, even if gender diversity could be beneficial for improving bank governance, it seems that the change in the gender diversity of the boards of Italian banks is not a strictly consequence of a sanction. Moreover, it is to consider the still reduced presence of women on the board of Italian banks and more generally of Italian companies that prevent to create a critical mass such that women can effectively impact the behavior of the board. As regards board education, although the level of education is considered as a proxy of the quality of human capital, with a positive impact on the board capability to better understand and manage the business (Herrmann & Datta, 2005; Wiersema & Bantel, 1992), it is also suggested in the literature that directors with higher education levels may be more likely to undertake aggressive and therefore risky business strategies. About this issue, it is important to emphasize that, recently, the Capital Requirement Directive IV - CRD IV (EU Directive 2013/36/EU and the EU Regulation 575/2013) point out that banks have the primary responsibility of selecting and nominating individuals for the board who comply with the requirements for fitness and propriety ("suitability"). They must carry out their own due diligence and assessment of the members of the board, not only prior to the appointment but also on an ongoing basis (e.g. in the case of a significant change to the responsibilities of a member of the board) (ECB, 2018b). It is therefore an internal control tool which, in the future, can improve the choice of the "best" director and therefore favour the

board effectiveness also in the sense of lesser penalties. It is therefore good practice that Supervisors and banks need to pay close attention to.

Overall our results have interesting policy implications as they point out that the Supervisory enforcement process is able to impact the bank board composition – not only producing an immediate board turnover – reducing the size and improving the education level of the board. This changes, in particular the reduction in the board size, negatively affect the probability of being sanctioned again. These are changes that "guide" the board to improve its compliance to the prudential principles on better governance set by Supervisory Banking Authorities.

Footnotes

[1] The only cases of public-owned banks, i.e. Monte dei Paschi di Siena in July 2017 and Banca Popolare di Bari in December 2019, are referred to situations of banking restructuring managed through precautionary recapitalization scheme (International Monetary Fund, 2020).

[2] According to the *SSM*, the European Central Bank and the national supervisory authorities of the countries (Euro area) jointly perform supervisory powers and duties on banks. The European Central Bank supervises directly the significant institutions (SIs) (European Central Bank (ECB), 2018a, p. 57), while the less significant institutions (LSIs) are controlled by the national authorities, in the context of the guidelines outlined by the European Central Bank and a control action carried out in any case according to a close interaction with the latter. In any case, the European Central Bank may, if necessary, also supervise the LSIs.

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TABLE 1
Descriptive statistics

Variables	N.	Mean	Std. Dev.	Min	Max
Bank size (*ln*)	4,256	20	1.674	14.98	26.79
Bank age (*ln*)	4,256	3.62	1.11	-0.693	5.21
Loans/Total Assets	4,256	0.62	0.161	0	0.99
Bank performance (*ln*)	4,254	0.042	0.096	-1.35	0.648
Leverage	4,256	0.12	0.07	0.004	0.995
Asset growth rate	3,684	0.075	0.07	-0.023	0.205
Bank risk (*ln*)	4,013	-2.565	0.628	-4.605	0.774
Board Turnover (*ln*)	4,252	0.124	0.197	0	1.417
Δ Board size	3,665	-0.052	0.838	-10	6
Δ Gender diversity	3,677	0.007	0.040	-0.278	0.286
Δ Board education	3,652	0.008	0.071	-0.714	0.431

GDP (Regional level)	4,256	-0.003	0.027	-0.083	0.047
Severity of penalty (€/000)	4,256	0.552	3.276	0	95.270

Bank size is the natural log of bank total assets at the end of the fiscal year Bank age is the natural log of bank age. Loans/Total Assets is the ratio between loans and total assets at the end of the fiscal year, as a proxy of the bank business model. Bank performance is the natural log of (1 + ROE). Leverage is the Equity/Total assets ratio. Asset growth rate is the growth rate of bank total asset calculated as (Total assets$_t$ – Total assets$_{t-1}$)/Total assets$_{t-1}$. Bank risk is the natural log of NPL/Gross Loans ratio. Board turnover is the natural log of board members' turnover. Δ Board size is the difference between board size in the year t and in the previous year (t – 1). Δ Gender diversity is the difference between the proportion of female on the board in the year t and in the previous year (t – 1). Δ Board education is the difference between the proportion of directors holding a degree in the year t and in the previous year (t – 1). GDP is the growth rate of gross domestic product in the year t at regional level. Severity of penalty is the average amount of penalty (/000) per sanctioned directors.

TABLE 2
Univariate Tests of Difference in means (ANOVA) between non-sanctioned board, boards sanctioned once and boards sanctioned twice or more

	Sanctioned boards			
Variables	never	only once	twice or more	F-stat.
Bank size (ln)	20.073	19.964	20.235	3.15*
Bank age (ln)	3.639	3.591	3.499	2.34†
Loans/Total Assets	0.660	0.652	0.669	1.13
Bank performance (ln)	0.050	0.021	0.017	45.29***
Leverage	0.118	0.109	0.098	14.37***
Asset growth rate	0.076	0.076	0.058	6.75**
Bank risk (ln)	-2.660	-2.377	-2.189	125.57***
Board Turnover (ln)	0.099	0.119	0.129	8.89***
Δ Board size	-0.032	-0.073	-0.210	4.90**
Δ Gender diversity	0.007	0.007	0.007	0.08
Δ Board education	0.008	0.008	0.004	0.27
Severity of penalty (€/000)		1.598	3.230	199.12***
Board size	9.724	9.981	10.722	15.88***
Gender diversity	0.046	0.046	0.039	1.38
Board education	0.404	0.426	0.413	1.69

The table reports the mean of the independent and control variables for the following groups of banks: i) never sanctioned; ii) sanctioned only once; iii) sanctioned two times or more in the period 2009-2015. Moreover, the table reports the F statistic (ANOVA test) in order to analyze the differences among group means. Bank size is the natural log of bank total assets at the end of the fiscal year Bank age is the natural log of bank age. Loans/Total Assets is the ratio between loans and total assets at the end of the fiscal year, as a proxy of the bank business model. Bank performance is the natural log of (1 + ROE). Leverage is the Equity/Total assets ratio. Asset growth rate is the growth rate of bank total asset calculated as (Total assets$_t$ – Total assets$_{t-1}$)/Total assets$_{t-1}$. Bank risk is the natural log of NPL/Gross Loans ratio. Board turnover is the natural log of board members' turnover. Δ Board size is the difference between board size in the year t and in the previous year (t – 1). Δ Gender diversity is the difference between the proportion of female on the board in the year t and in the previous year (t – 1). Δ Board education is the difference between the proportion of directors holding a degree in the year t and in the previous year (t – 1). Severity of penalty is the average amount of penalty (/000) per sanctioned directors. Board size is the number of board members. Gender diversity is the proportion of female on board. Board education is

the proportion of directors holding a degree. †, *, **, *** denote significance at 10%, 5%, 1% and 0.1%, respectively.

TABLE 3
Correlation matrix – Pearson coefficients

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Bank size	1												
2. Bank age	-0.039*	1											
3. Loans/Total Assets	0.144**	0.166**	1										
4. Bank performance	0.099**	0.063**	-0.087**	1									
5. Asset growth rate	-0.008	-0.144**	-0.166**	0.152**	1								
6. Leverage	-0.480***	0.076***	-0.094***	0.039***	-0.114***	1							
7. Bank risk	-0.211**	0.108**	0.028†	-0.356**	-0.221**	0.082***	1						
8. Board Turnover	0.086**	-0.186**	-0.075**	-0.111**	-0.034*	-0.025***	0.048**	1					
9. Δ Board size	-0.029†	0.069**	-0.016	0.061**	0.054**	-0.006	-0.036*	-0.006	1				
10. Δ Gender diversity	0.015	-0.002	-0.014	-0.020	-0.014	-0.032***	0.038*	0.203**	-0.013	1			
11. Δ Board education	0.018	0.010	-0.006	-0.003	-0.006	0.002	-0.009	0.10**	-0.080**	0.082**	1		
12. GDP (Regional level)	-0.013	0.016	0.055**	0.120**	-0.095**	0.049***	-0.136**	-0.019	0.016	-0.040*	0.001	1	
13. Severity of penalty	0.003	-0.015	-0.001	-0.080**	-0.068**	-0.044***	0.150**	0.098**	-0.113**	0.018	0.031†	0.013	1

The table reports the correlation coefficients. Bank size is the natural log of bank total assets at the end of the fiscal year Bank age is the natural log of bank age. Loans/Total Assets is the ratio between loans and total assets at the end of the fiscal year, as a proxy of the bank business model. Bank performance is the natural log of (1 + ROE). Asset growth rate is the growth rate of bank total asset calculated as (Total assets$_t$ – Total assets$_{t-1}$)/Total assets$_{t-1}$. Leverage is the equity/total asset ratio. Bank risk is the natural log of NPL/Gross Loans ratio. Board turnover is the natural log of board members' turnover. Δ Board size is the difference between board size in the year t and in the previous year ($t-1$). Δ Gender diversity is the difference between the proportion of female on the board in the year t and in the previous year ($t-1$). Δ Board education is the difference between the proportion of directors holding a degree in the year t and in the previous year ($t-1$). GDP is the growth rate of gross domestic product in the year t at regional level. Severity of penalty is the average amount of penalty (/000) per sanctioned directors. †, *, **, *** denote significance at 10%, 5%, 1% and 0.1%, respectively.

TABLE 4
Variables used in the estimation of model [1]

Dependent variables	Description
Board turnover	Board turnover in the period $(t-1) - t$
Δ Board size	Change in the board size in the period $(t-1) - t$
Δ Gender diversity	Change in the proportion of female on the board in the bank i in the period $(t-1) - t$
Δ Board education	Change in the proportion of directors holding a degree in the bank i in the period $(t-1) - t$
Independent variables	
Sanction (t)	Dummy equal to 1 if the board of bank i is sanctioned in the year t.
Control variables	
Bank size	Natural log of total assets of the bank i in the year t
Bank age	Natural log of bank age
Leverage	Natural log of Equity/Total Asset ratio of the bank i in the year t
Asset growth rate	Growth rate of bank total asset calculated as (Total assets$_t$ – Total assets$_{t-1}$)/Total assets$_{t-1}$
Bank performance	Natural log of (1 + ROE) for the bank i in the year t
Bank risk	Natural log of NPL/Gross Loans ratio for the bank i in the year t
Listed bank	Dummy equal to 1 if the bank i is listed in a stock exchange market in the year t
Cooperative bank	Dummy equal to 1 if a bank is a cooperative and 0 otherwise
Popular bank	Dummy equal to 1 if a bank is a popular bank and 0 otherwise
Merger & Acquisition	Dummy equal to 1 if the bank i acquires another bank in the year t
GDP (Regional level)	Growth rate of gross domestic product in the year t at regional level
Board size	No. of board members of the bank i in the period t
Δ Board size	Change in the board size of the bank i in the period $(t-1) - t$
Δ Gender diversity	Change in the proportion of female on the board in the bank i in the period $(t-1) - t$
Instrumental variables	
Sanctions to the board of statutory auditors	Dummy equal to 1 if the board of statutory auditors of bank i is sanctioned in the year t.
Sanctions to the general manager	Dummy equal to 1 if the general manager of bank i is sanctioned in the year t.

TABLE 5
Variables used in the estimation of model [2]

Dependent Variable	Description
P(Sanction (t))	Dummy equal to 1 if the board of bank i is sanctioned in the year t.
Independent variables	
Board turnover	Board turnover in the period $(t-1) - t$
Δ Board size	Change in the board size in the period $(t-1) - t$
Δ Gender diversity	Change in the proportion of female on the board in the bank i in the period $(t-1) - t$
Δ Board education	Change in the proportion of directors holding a degree in the bank i in the period $(t-1) - t$
Control variables	
Already sanctioned	Dummy equal to 1 for every years after the year t of the first enforcement action and 0 otherwise
Bank size	Natural log of total assets of the bank i in the year t
Bank age	Natural log of bank age
Loans/Total assets	Ratio between loans and total assets for the bank i in the year t
Bank risk	Natural log of NPL/Gross Loans ratio for the bank i in the year t
Bank performance	Natural log of (1 + ROE) for the bank i in the year t

Merger & Acquisition	Dummy equal to 1 if the bank *i* acquires another bank in the year *t*			
Cooperative bank	Dummy equal to 1 if a bank is a cooperative and 0 otherwise			
Popular bank	Dummy equal to 1 if a bank is a popular bank and 0 otherwise			
Listed bank	Dummy equal to 1 if the bank *i* is listed in a stock exchange market in the year *t*			
GDP (Regional level)	Growth rate of gross domestic product in the year *t* at regional level			
Executive committee	Dummy equal to 1 if an executive committee exists in the bank *i* in the year *t*			

TABLE 6
Regression results of the change of board composition

Dependent variable	Board turnover	Δ Board size	Δ Gender diversity	Δ Board education
Sanction	0.267***	-0.890**	0.02	0.063*
	(4.57)	(-2.90)	(1.29)	(2.06)
Bank size	-0.006*	-0.012	0.0004	-0.002
	(-2.02)	(-0.65)	(0.62)	(-1.38)
Bank age	-0.003	0.066***	-0.0002	0.0013
	(-0.81)	(3.41)	(-0.23)	(0.92)
Leverage$_{(t-1)}$	-0.020*	-0.072	-0.002	0.0002
	(-2.24)	(-1.28)	(-0.76)	(0.05)
Asset growth rate$_{(t-1)}$	-0.120*	0.500	0.014	0.013
	(-2.47)	(1.64)	(1.10)	(0.59)
Bank performance$_{(t-1)}$	-0.042	0.081	0.018	0.009
	(-0.60)	(0.20)	(0.94)	(0.26)
Bank risk$_{(t-1)}$	0.0005	0.042	-0.0003	-0.006*
	(0.08)	(1.16)	(-0.16)	(-1.97)
Listed bank	0.016	0.075	0.003	-0.002
	(0.78)	(0.62)	(0.68)	(-0.28)
Cooperative banks	-0.063***	0.066	0.004†	-0.006
	(-6.39)	(1.32)	(1.82)	(-1.55)
Popular banks	-0.043**	-0.050	0.002	-0.008
	(-2.78)	(-0.63)	(0.74)	(-1.21)
Merger & Acquisition$_{(t-1)}$	0.066**	0.304	0.017*	0.005
	(2.87)	(1.24)	(2.41)	(0.60)
GDP (Regional level)$_{(t-1)}$	-0.004	-0.036*	-0.001	-0.002†
	(-1.58)	(-2.15)	(-1.57)	(-1.74)
Board size$_{(t-1)}$	-0.02†			
	(-1.83)			
Δ Board size			0.0004	-0.006*
			(0.30)	(-2.40)
Δ Gender diversity				0.134**
				(2.59)
Constant	0.221***	-0.053	-0.011	0.023
	(3.50)	(-0.15)	(-0.76)	(0.92)
Year FE	Yes	Yes	Yes	Yes
Regional FE	Yes	Yes	Yes	Yes
N	2779	2779	2779	2773
F	7.78***	2.673***	2.651***	2.661***
Test				

	(1)	(2)	(3)	(4)
Underidentification (*p-value*)	0.0000	0.0000	0.0000	0.0000
Weak identification (F-stat)	129.951	131.260	125.545	125.584
Overidentification (χ^2)	1.539	0.027	2.242	0.572
First stage				
Sanctions to the statutory auditors	0.188**	0.0187**	0.181**	0.0182**
	(3.05)	(3.15)	(3.17)	(3.18)
Sanctions to the general manager	0.086*	0.085*	0.087*	0.084*
	(2.19)	(2.03)	(2.06)	(2.08)

The table shows the estimated results of the IV (two-stage least square) regression with the change in board composition as dependent variable. In column (1) the dependent variable is the board turnover; in column (2) the dependent is Δ Board size; in column (3) the dependent is Δ Gender diversity; and in column (4) the dependent is Δ Board education. Sanction (*t*) is a dummy equal to 1 for board sanctioned in the year *t*. Bank size is the natural log of bank total assets at the end of the fiscal year. Bank age is the natural log of bank age. Leverage is the natural log of equity to total assets ratio. Asset growth rate is the growth rate of bank total asset calculated as (Total assets$_t$ – Total assets$_{t-1}$)/Total assets$_{t-1}$. Bank performance is the natural log of $(1 + ROE)$. Bank risk is the natural log of NPL to Gross Loans ratio. Listed bank is a dummy variable equal to 1 if a bank is listed in a stock exchange market. Cooperative dummy is equal to 1 if a bank is a cooperative and 0 otherwise. Popular bank is a dummy equal to 1 if a bank is a popular bank and 0 otherwise. Merger & Acquisition is a dummy variable equal to 1 if the bank *i* acquires another bank in the year $(t - 1)$. GDP is the growth rate of gross domestic product in the year *t* at regional level. Board size is the number of board members of the bank *i* in the year $(t - 1)$. Δ Board size is the difference between the size of the board in the year *t* and in the previous year $(t - 1)$. Δ Gender diversity is the difference between the proportion of female on the board in the year *t* and in the previous year $(t - 1)$. Year and regional dummies control for year and regional fixed effects. *t* values are reported in parentheses. Standard errors are clustered at bank level. †, *, **, *** denote significance at the 10%, 5%, 1% and 0.1% levels, respectively.

TABLE 7
Regression results of the change in board composition for different type of violation and for severity of sanction.

Deficiencies in	organization and internal control				credit management				risk management				Severity of violations			
Dependent	Turnover	Δ Size	Δ Gender diversity	Δ Education	Turnover	Δ Size	Δ Gender diversity	Δ Education	Turnover	Δ Size	Δ Gender diversity	Δ Education	Turnover	Δ Size	Δ Gender diversity	Δ Education
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Sanction (t)	0.317***	-0.981*	0.012	0.083*	0.377***	-1.111*	0.027†	0.079*	0.490*	-0.953**	-0.004	0.047*	0.008***	-0.046***	0.0004	0.001*
	(4.22)	(-2.44)	(0.86)	(2.37)	(4.58)	(-2.57)	(1.83)	(2.08)	(1.98)	(-3.05)	(-0.47)	(1.97)	(4.70)	(-4.10)	(0.93)	(1.98)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2779	2779	2779	2773	2779	2779	2779	2773	2779	2779	2779	2773	2779	2779	2779	2773
F	11.45***	3.49***	3.74***	4.96***	11.84***	3.44***	10.34***	4.84***	11.97***	2.55***	2.95***	2.25**	12.68***	3.42***	2.83***	2.29**

The table shows the estimated results of the IV regression with the change of board composition as dependent variable. Results are sorted for different type of violation and for severity of sanction. Control variables are included and not reported for brevity. Year and regional dummies control for year and regional fixed effects. Z values are reported in parentheses. Standard errors are clustered at bank level. †, *, **, *** denote significance at the 10%, 5%, 1% and 0.1% levels, respectively.

TABLE 8
Logit Regression Results of the Probability of sanctions

	1	2	3	4	5
Control variables					
Already sanctioned	-0.11	-0.100	-0.090	-0.15	-0.15
	(-0.49)	(-0.46)	(-0.42)	(-0.70)	(-0.66)
Bank size$_{(t-1)}$	0.27**	0.29***	0.30***	0.29***	0.30***
	(3.10)	(3.36)	(3.34)	(3.34)	(3.34)
Bank age$_{(t-1)}$	-0.17†	-0.17†	-0.17†	-0.17†	-0.17†
	(-1.89)	(-1.93)	(-1.92)	(-1.88)	(-1.86)
Loans/TA$_{(t-1)}$	0.50	0.46	0.44	0.43	0.41
	(0.63)	(0.58)	(0.55)	(0.54)	(0.51)
Bank risk$_{(t-1)}$	1.41***	1.42***	1.42***	1.42***	1.42***
	(6.14)	(6.10)	(6.12)	(6.06)	(6.09)
Bank performance$_{(t-1)}$	-4.86***	-4.89***	-4.90***	-4.84***	-4.86***
	(-4.04)	(-4.04)	(-4.06)	(-4.06)	(-4.09)
Listed bank$_{(t-1)}$	0.20	0.18	0.17	0.18	0.16
	(0.32)	(0.30)	(0.27)	(0.29)	(0.25)
Cooperative banks	1.34***	1.41***	1.43***	1.39***	1.42***
	(4.15)	(4.35)	(4.31)	(4.30)	(4.26)
Popular banks	1.36***	1.41***	1.42***	1.40***	1.42***
	(3.39)	(3.49)	(3.45)	(3.45)	(3.41)
Merger & Acquisition$_{(t-1)}$	-0.64	-0.73	-0.81	-0.75	-0.82
	(-0.80)	(-0.91)	(-0.95)	(-0.92)	(-0.97)
GDP(Regional level) $_{(t-1)}$	-0.14	-0.13	-0.13	-0.14†	-0.14†
	(-1.64)	(-1.58)	(-1.58)	(-1.68)	(-1.68)
Independent variables					
Board turnover$_{(t-1)}$	0.11	0.10	0.10	0.044	0.038
	(0.17)	(0.15)	(0.15)	(0.06)	(0.05)
Δ Board size$_{(t-1)}$	-0.073	0.0040	-0.11	0.0012	-0.12
	(-0.65)	(0.04)	(-0.79)	(0.01)	(-0.88)
Δ Gender diversity$_{(t-1)}$	-0.016	-0.018	-0.018	-0.055†	-0.059†
	(-0.64)	(-0.67)	(-0.69)	(-1.68)	(-1.74)
Δ Board education$_{(t-1)}$	0.033**	0.032**	0.032**	0.031*	0.031*
	(2.79)	(2.67)	(2.68)	(2.54)	(2.51)
Executive committee	0.27	0.26	0.25	0.28	0.27
	(1.42)	(1.39)	(1.33)	(1.46)	(1.39)
Interactions					
Δ Board size$_{(t-1)}$ × Δ Gender diversity$_{(t-1)}$		-0.039**	-0.037**	-0.042**	-0.043**
		(-2.74)	(-2.80)	(-2.89)	(-3.16)
Already sanc.×Δ Board size$_{(t-1)}$			0.33*		0.35*
			(1.99)		(2.00)
Already sanc. ×Δ Gender diversity$_{(t-1)}$				0.094*	0.099*
				(1.98)	(2.06)
Constant	-5.59**	-5.96**	-6.04**	-5.93**	-6.06**
	(-2.73)	(-2.94)	(-2.93)	(-2.93)	(-2.93)
Regional FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

N	2767	2767	2767	2767	2767
Wald χ^2	194.0	201.8	197.5	197.6	193.3
LL	-500.6	-498.8	-497.9	-496.8	-495.7
Pseudo R^2	0.154	0.157	0.158	0.160	0.162

The table shows the estimated results of the logit model with the probability of sanctions as dependent variable. Already sanctioned is a dummy variable equal to 1 for each years after the year t of the first enforcement action and 0 otherwise. Bank size is the natural log of bank total assets at the end of the fiscal year. Bank age is the natural log of bank age. Loans/Total Assets is the ratio between loans and total assets at the end of the fiscal year, as a proxy of the bank business model. Bank risk is the natural log of NPL/Gross Loans ratio. Bank performance is the natural log of $(1 + ROE)$. Listed bank is a dummy variable equal to 1 if a bank is listed in a stock exchange market. Merger & Acquisition is a dummy variable equal to 1 if the bank i acquires another bank in the year t. Cooperative bank is equal to 1 if a bank is a cooperative and 0 otherwise. Popular bank is a dummy equal to 1 if a bank is a popular bank and 0 otherwise. GDP is the growth rate of gross domestic product in the year t at regional level. Board turnover is the natural log of board members' turnover. Δ Board size is the difference between board size in the year t and in the previous year $(t-1)$. Δ Gender diversity is the difference between the proportion of female on the board in the year t and in the previous year $(t-1)$. Δ Board education is the difference between the proportion of directors holding a degree in the year t and in the previous year $(t-1)$. Executive committee is a dummy equal to 1 if an executive committee exists in a given bank. Independent and control variables are lagged one year. Regional and year fixed-effects are included. Z values are reported in parentheses. Standard errors are clustered at bank level. †, *, **, *** denote significance at the 10%, 5%, 1% and 0.1% levels, respectively.

TABLE 9
Regression results of the board characteristics

	Board turnover	Board size	Gender diversity	Board education
	1	2	3	4
PEBC	0.034**	-0.356*	0.004	0.028*
	(2.84)	(-2.13)	(0.72)	(2.50)
Bank size	-0.009†	1.167*	-0.001	0.017
	(-1.84)	(2.60)	(-0.30)	(1.35)
Bank age	0.004	-1.934†	0.001	-0.008
	(0.75)	(-1.74)	(0.19)	(-0.46)
Leverage$_{(t-1)}$	-0.008	-0.740	-0.003	0.018
	(-0.31)	(-1.49)	(-0.20)	(0.60)
Listed bank	0.045	3.484***	-0.002	0.009
	(1.25)	(4.49)	(-0.13)	(0.26)
Cooperative bank	-0.070***		0.001	-0.471***
	(-3.42)		(0.03)	(-9.93)
Popular bank	-0.074***	-1.136*	-0.038**	-0.029
	(-3.89)	(-2.51)	(-3.06)	(-0.71)
Merger & Acquisition$_{(t-1)}$	0.031	0.698		0.014
	(0.68)	(1.59)		(1.13)
Bank performance$_{(t-1)}$	-0.211**	0.814	0.018	-0.059†
	(-2.64)	(1.20)	(0.92)	(-1.79)
Bank risk$_{(t-1)}$	0.003	0.002	0.003	0.000
	(0.23)	(0.01)	(0.58)	(0.00)
Board size$_{(t-1)}$	-0.002			
	(-1.04)			
Gender diversity				0.156
				(1.63)
Constant	0.298**	-7.771	0.059	0.361
	(2.72)	(-0.80)	(0.67)	(1.35)

Bank FE	No	Yes	No	No
Regional FE	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	723	723	723	720
Wald χ^2	66.33***		62.60***	425.04***
F		11.90***		
LM test random vs. pooled	11.16***		453.37***	882.04***
Hausman test fixed vs. random	17.10	27.21**	7.61	16.86
R^2	0.073	0.263	0.053	0.581

The table shows the estimated results of the regression with the board structure and composition variables as dependent. In column (1) the dependent variable is represented by the board turnover; in column (2) the dependent is the board size; in column (3) the dependent is the proportion of female members on the board (Gender diversity); and in column (4) the dependent is the board education. PEBC is a dummy equal to 1 for board characteristics originated in the year t of the sanction imposed on the board of the bank i and in the first two years after the year t, 0 for board characteristics originated in the two years before the enforcement action, and has missing observations for the rest of the sample. Bank size is the natural log of bank total assets at the end of the fiscal year. Bank age is the natural log of bank age. Leverage is the natural log of equity to total assets ratio. Listed bank is a dummy variable equal to 1 if a bank is listed in a stock exchange market. Cooperative bank is equal to 1 if a bank is a cooperative and 0 otherwise. Popular bank is a dummy equal to 1 if a bank is a popular bank and 0 otherwise. Merger & Acquisition is a dummy variable equal to 1 if the bank i acquires another bank in the year $(t-1)$. Bank performance is the natural log of (1 + ROE). Bank risk is the natural log of NPL/Gross Loans ratio. Board size is the number of board members . Gender diversity is the proportion of female directors on the board in the year t. Year and regional dummies control for year and regional fixed effects. Z values are reported in parentheses. Standard errors are clustered at bank level. †, *, **, *** denote significance at the 10%, 5%, 1% and 0.1% levels, respectively.

TABLE 10
Logit regression results of the probability to be punished again

Dependent	P(Further sanctions)	Deficiencies in Organization and internal control	Deficiencies in Credit management	Deficiencies in Risk management
	1	2	3	4
Bank size$_{(t-1)}$	0.510***	0.438**	0.462*	0.0943
	(3.37)	(2.61)	(2.21)	(0.32)
Bank age$_{(t-1)}$	-0.300*	-0.491***	-0.296*	0.461
	(-2.41)	(-3.44)	(-2.26)	(1.54)
Loans/TA$_{(t-1)}$	1.401	-0.102	1.722	
	(0.99)	(-0.07)	(0.83)	
Bank risk$_{(t-1)}$	1.356*	2.160**	1.357*	
	(2.50)	(3.23)	(2.09)	
Bank performance$_{(t-1)}$	-1.560	-0.366	-3.200	-1.727
	(-0.92)	(-0.20)	(-1.62)	(-0.99)
Listed bank$_{(t-1)}$	0.850	0.140	2.551*	
	(0.92)	(0.15)	(2.06)	
Cooperative bank	2.264***	1.381**	4.014***	
	(4.01)	(2.68)	(5.00)	
GDP (Regional level)$_{(t-1)}$	-0.194**	-0.188*	-0.164*	-0.363*
	(-2.63)	(-2.11)	(-2.05)	(-2.17)
Δ Board size$_{(t-1)}$	0.199*	0.291**	0.0870	0.562†

	(2.14)	(2.63)	(0.71)	(1.65)
Δ Gender diversity$_{(t-1)}$	0.0245	-0.0229	0.0367	0.120*
	(0.67)	(-0.55)	(0.93)	(1.97)
Δ Board education$_{(t-1)}$	0.0394*	0.0507*	0.0378	0.0942†
	(2.01)	(2.09)	(1.63)	(1.73)
Constant	-12.10***	-6.924*	-13.31**	-9.341
	(-3.93)	(-2.21)	(-3.11)	(-1.62)
Regional FE	No	No	No	No
Year FE	No	No	No	No
No of observation	460	460	460	474
No of events	40	35	33	14
Wald χ^2	81.99***	50.46***	99.34***	47.05***
LL	-110.9	-85.40	-89.65	-30.73
Pseudo R^2	0.170	0.191	0.210	0.243

The table shows the estimated results of the logit model with the probability to be punished again as dependent variable (column 1). In columns 2-4 we estimate the same model with the probability to be punished a further time for deficiencies in: i) organization and internal controls; ii) credit management; iii) risk management as dependent variables, respectively. Bank size is the natural log of bank total assets at the end of the fiscal year. Bank age is the natural log of bank age. Loans/Total Assets is the ratio between loans and total assets at the end of the fiscal year, as a proxy of the bank business model. Bank risk is the natural log of NPL/Gross Loans ratio. Bank performance is the natural log of (1 + ROE). Listed bank is a dummy variable equal to 1 if a bank is listed in a stock exchange market. Cooperative bank is equal to 1 if a bank is a cooperative and 0 otherwise. GDP is the growth rate of gross domestic product in the year t at regional level. Board size is number of board members in the year t. Gender diversity is the proportion of female on the board in the year t. Board education is the proportion of directors holding a degree in the year t. Independent and control variables are entered lagged one year. Z values are reported in parentheses. Standard errors are clustered at bank level. †, *, **, *** denote significance at the 10%, 5%, 1% and 0.1% levels, respectively.