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GENDER QUOTAS, BOARD DIVERSITY AND SPILLOVER EFFECTS. EVIDENCE FROM ITALIAN BANKS

by Silvia del Prete*, Giulio Papini* e Marco Tonello†

Abstract

We study the impact of a 2011 law on the diversity of bank boards. The law required all listed companies in Italy (including banks) to increase the share of female representatives on their boards up to one third of total seats. We look at listed banks (the ones directly targeted by the law), but also test whether the law led to spillover effects on non-listed banks belonging to listed groups. Using administrative data on board composition between 2007 and 2019, we compare some measures of diversity of boards of listed and unlisted banks belonging to listed groups with those of institutions included in non-listed groups, before and after the introduction of the law. We find that female representation increased only for listed banks, with no spillover effects of the law on those belonging to listed groups, while the economic performance of listed banks remained broadly unchanged.

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* Bank of Italy, Florence Branch, Regional Economic Research Unit.

† Bank of Italy, Florence Branch, Regional Economic Research Unit, GLO and CRILDA (Catholic University Milan).

1 Introduction[1]

In the last two decades gender diversity on corporate boards has gained increasing attention from policymakers, institutional investors, and academics, as international comparisons document the pervasiveness of gender gaps in many economic, financial and political contexts worldwide, with negative effects on economic growth and employment (WEF 2020). Women are often underrepresented on corporate boards, especially in top positions in banking and finance (Mateos De Cabo, Gimeno, and Nieto 2012). In Italy, the setting of our study, gender gaps are particularly severe and pervasive: the last Gender Gap Indicator (GGI), provided by the World Economic Forum, shows a fall from the 41st place in 2015 to the 76th in 2020.

Since the 2000s many European countries have implemented specific measures to boost female representation on corporate boards. Some of these measures have been introduced in the form of mandatory quotas (e.g. in Norway, France, Spain, and Italy), while others in the form of soft recommendations (e.g. in the United Kingdom and in the United States).

In the face of their wide adoption in European countries, gender quotas are still a controversial policy. The main argument in favor of gender quotas is their effectiveness as a tool to equalize opportunity in specific sectors where women face systematic barriers to top positions due to discrimination or persistent stereotypes (glass ceiling). Such policies may lead to a redistribution of jobs or board positions in favor of women and boost female empowerment, with beneficial impact on women's human capital, firm productivity and efficiency (Conde-Ruiz and Profeta 2015). However, critics share the view that the under-representation of women is not due to discrimination or other negative externalities, but it is merely the result of women's choices. Thus, by equalizing outcomes rather than opportunities, affirmative action policies risk promoting less-qualified individuals, decreasing business performance. Similarly the literature on their effects on gender diversity, business and politics, though vast, carries mixed results (Comi, Grasseni, Origo, and Pagani 2020; Ferrari, Ferraro, Profeta, and Pronzato 2021; Profeta, Amidani Aliberti, Casarico, D'Amico, and Puccio 2014).

In this open debate, our contribution to the topic exploits the implementation in 2011

[1]We wish to thank Francesco D'Amuri, Roberta Occhilupo, Lucia Rizzica, Annalisa Scognamiglio, Eliana Viviano and the participants to the European Public Choice Society conference (Lille, 2021), European Society for Population Economics conference (Barcelona, 2021), European Association of Labour Economists conference (Padua, 2021), Associazione Italiana degli Economisti del Lavoro conference (Salerno, 2021), Università di Firenze DISEI seminar (Florence, 2021), and the Bank of Italy's Gender Workshop (Rome, December 2021) for useful comments. We are indebted to Roberta Borghi for generous support with the data. The views expressed in this paper are those of the authors and do not necessarily reflect those of the Bank of Italy. The usual disclaimers apply.

of a Gender Quota Law in Italy[2], setting a minimum share of gender representation in both executive and supervisory boards of all companies listed on the Italian stock market, including banks, as well as of State-owned companies. We focus both on the group of banks directly targeted by the quotas and on their subsidiaries, for which the quota requirement is not binding but could be subject to *spillover* of the Quota Law.

In the empirical analysis we investigate the effect of the law both on board composition and on economic performance of Italian banks. To the best of our knowledge, our paper innovates the empirical literature along different dimensions.

First, differently from previous analyses, which study the consequences of quota laws across different countries (Comi et al. 2020) or within a country but across different sectors (see for Italy Bruno, Ciavarella, and Linciano (2018)), we focus on the Italian banking industry, which is not easily comparable with other economic sectors. Indeed, despite the large number of studies conducted for other non-financial sectors, either in a context of gender diversity or in a framework of gender quotas, interest on the banking system remains high, given that its special status as a regulated activity means that the conclusions drawn for other firms do not necessarily apply to banks.

In this respect, Italian banks represent a very interesting *case study* for gender quotas, because during the 2000s they were characterized by a very slow increase in the share of women on boards (Del Prete and Stefani 2013), and more this day, despite the prescription of mandatory quotas for Italian listed companies, the share of female directors on Italian bank boards is still on average lower than in other European countries. In fact, a European comparison (EBA 2016), based on financial institutions belonging to 29-EU banking systems, shows that Italian banks are lower performers in Europe in gender balances, especially in terms of representation of female executive directors. According to the European Banking Authority (EBA)'s report on gender benchmarking, in 2016 Italian banks exhibited a share of women in governing bodies that was around a half of the average share for banks belonging to the 29-EU banking systems (7.35 *versus* 13.63 percent). The most recent report released in 2020 shows a slight improvement for Italy (EBA 2020).

Second, differently from previous studies, investigating the links between board gender diversity and Italian banks' economic performance (see Del Prete and Stefani (2021)), in this paper we exploit the exogenous variation in gender composition of corporate bodies, induced by the Italian Quota Law, to evaluate direct effects and changes for listed banks, not only on the share of women in charge, but also on board diversity along other board characteristics

[2]Law No. 120/2011, see section 2.2 for details.

(age, experience, origin, etc.), as well as on bank economic outcomes. Moreover, we introduce a single index of diversity (based on measures of entropy) to describe in a synthetic and effective way the main changes in terms of diversity possibly induced by the Quota Law, both considering gender but also net of its contribution.

Finally, and more relevant, using connections among banks *within* the same banking group, we are able to investigate spillover effects from listed banks to banks belonging to listed groups, on board diversity measures, in order to analyze the possible spreading of best practices in corporate governance induced by the gender quota prescription. Indeed, given that diversity on corporate boards could enhance performance *via* an effective decision-making process (see section 2.1 and Appendix B), improving best practices trough gender diversity in corporate boards is a crucial issue, especially for banks. Good corporate governance increases monitoring efficiency and this is pivotal in the banking sector to guarantee a sound financial system and, consequently, a country's economic development, according to international regulatory principles.[3]

We use a difference-in-differences (DID) identification strategy by comparing board composition, diversity measures, as well as performance indicators, before and after the introduction of the Italian Quota Law. We compare outcomes of two treated groups (listed banks and banks belonging to a listed group) with those of a control group (all other banks belonging to non-listed groups). While listed banks are the target of the Law, we also focus on banks belonging to a listed group, in order to measure the potential spillover effects of the Law. Female representation in these banks could have either increased, if a change in the corporate culture of the whole group induced the adoption of the prescription of the law by those units that are both functionally and organizationally linked to those directly targeted, or decreased, if listed banks used their non-listed affiliates as a pool to promote (rare) female boards' members to positions on their own boards. In our empirical exercise, we choose to limit the control group of banks to those at least belonging to a group. We believe this allows us to maintain a more comparable group of banks, especially in what concerns their organizational structure, and the possibility of sharing firm knowledge and culture, which is at the basis of the idea of spreading good practices, such as increasing female board representation.[4]

Our empirical analysis could benefit from the high quality of the data, available for a very long-lasting period. First, we have the advantage to use very granular data at board-director-level, allowing us to study intended and unintended consequences of gender quotas.

[3]Principles for Enhancing Corporate Governance, BCBS, 2010.

[4]We will also check the robustness of our findings to an alternative control group.

Second, we have the chance to analyze exogenous variations induced by gender quotas, both on bank board composition and on bank performance, during a very long-lasting period with a large pre- and post-treatment time window, thus reinforcing the robustness and the external validity of our empirical results.

Our main findings suggest that the Italian Quota Law increased the share of women on the boards of Italian listed banks, both as directors and as auditors. Using our synthetic indicator, which combines four main sources of board diversity (gender, age, tenure and geographical origin), we also find that only in the Board of Directors, the Quota Law generated a higher diversity which is not entirely explained by the gender component. Moreover, we support the evidence that spillover effects on banks belonging to listed groups, potentially stemming from the spread of good practices, were null, since the share of women on boards remains unchanged for these intermediaries, and only affected the banks directly targeted by the law. Finally, our estimates support the view that the Italian Quota Law *per se* was neutral to business performance of listed banks, thus not posing a trade-off between gender equality and firm efficiency for its implementation.

The rest of the paper is organized as follows. Section 2 presents a short review of the most recent studies related to our work and describes the institutional background; section 3 describes the data used in the analysis; section 4 presents the empirical strategy, while section 5 discusses the main results. Section 6 presents the robustness checks, finally section 7 concludes and derives some policy implications.

2 Related literature and institutional setting

2.1 Board diversity and gender quotas: evidence for banks

A vast literature as proved that board gender diversity is often positively correlated with good corporate and economic outcomes, enhancing business performance (see the literature review in Appendix B).

From a conceptual point of view board diversity might entail both benefits and costs.[5] On the benefit-side, diverse management bodies are seen as a way of improving decision-making regarding strategies and risk-taking, by facilitating a broader range of views, opinions, experience, perception, values and background. A more diverse management is intended to reduce phenomena of *group think* and *herd behavior*, which might hamper a correct assessment of

[5]For *board diversity* it is intended the heterogeneity in the composition of the boards according to salient demographic characteristics of its members, such as gender, age, experience, geographical provenance. This diversity in demographic characteristics, firstly in gender, should mirror different individuals' biases or prejudices, and different behavior rooting on different social constraints and power relations (Ferreira 2011).

values, risks and economic opportunities (EBA 2016). By selecting directors with different characteristics, firms may widen their access to different resources and connections, or even signal to lower-levels employees that the company is committed to the promotion of minority workers. On the cost-side, increasing diversity might determine increasing conflicts, lack of cooperation and of communication (Ferreira 2011).

Since gender diversity may favor equality in corporate governance and improve economic outcomes, many EU countries have introduced gender quotas for some sectors or groups of firms.[6] The implementation of such policies has stimulated the empirical research on their effects. However, the evidence on the impact of gender mandatory quotas remains still mixed in many EU countries.

In Italy, board gender quotas have provided rooms for further research in studying the causal link between women's empowerment and economic outcomes, especially for non-financial sectors. The implementation of mandatory gender quotas in the banking sector has been less explored, due to its special *status* and the availability of data. Using a sample of 462 banks from 39 countries worldwide, over the period 2008-2017, Liao, Laureiro, and Taboada (2021) show that board gender quota laws resulted in an increase in risk taking and worse operating performance for banks most impacted by the reforms, mostly for those located in countries with a small pool of qualified women executives. Arnaboldi, Casu, Kalotychou, and Sarkisyan (2020) examine the impact of governance reforms related to board diversity on the performance of European Union banks. Using a DID approach, they document that gender reforms increase bank stock returns and their volatility within the first 3 years after their enactment. The effectiveness of reforms is found to depend on a country's institutional environment. The impact on return volatility is found to be beneficial in countries more open to diversity, with common law system and with greater economic freedom, as well as reforms play a bigger role in banks that have *ex-ante* less heterogeneous boards. More recently, Mazzotta and Ferraro (2021) examine the impact of an increasing board diversity on the performance of 22 Italian listed banks over the period 2008-2014, taking into account the effect of the implementation of gender Quota Law in Italy. Their results on accounting measures support managerial and legislative efforts toward more gender-balanced boards and the appointment of female directors in executive or independent roles.

Even though the main aim of gender quotas is promoting the culture of gender equality in corporate governance, reducing gender gaps may have beneficial effects on firm performance and economic growth, as proved by the empirical literature. Therefore, studying the impact

[6]That is listed companies or state-owned companies in Norway and Italy or medium-sized firms in terms of total assets or employees in Spain and France.

of mandatory gender quotas on board composition and performance of Italian banks is pivotal to understand all intended and unintended consequences stemming from the Italian Quota Law on the financial sector.

2.2 The Quota Law and its implementation in the banking sector

The Quota Law (Law No. 120/2011) came into force on August 12 2011, requiring that the boards of listed companies be renewed reserving a quota equal to at least 1/5 of its members to the less represented gender (women), starting from their next appointments and for three consecutive mandates. From the second and third renewal of the boards, the quota would rise to 1/3.

The one-year period between approval of the Law by the Italian Parliament and the beginning of its binding requirements (i.e. from August 12 2011 to August 12 2012) is referred to as a *phase-in* period. During this period the *Italian Regulatory Authority for Listed Companies* (CONSOB) defined the precise rules for the correct implementation of the Quota Law by listed companies.[7] In the intentions of the Legislator, the phase-in period was meant to give sufficient time to the companies to implement the changes in their governance structure necessary to comply with the Quota Law, following the new regulatory framework. Typically, listed companies had to amend their statutes in order to comply with the Law and in order to introduce the rules necessary to guarantee female representation in the company board. However, this could have also represented an occasion for the companies to strategically modify the statutes in order to side-step some formal obligation of the Law or to limit their impact on the company governance structure. We will come back to this issue when analyzing the unintended consequences of the Quota Law and the opportunistic behavior on the parts of the listed banks.

The Quota Law also defined a set of sanctions for non-complying companies. Non-complying companies are first officially warned by the Authority. After 4 months from the warning, in case the company does not comply, the Authority applies a fine (from 100.000 to 1.000.000 euros). Finally, if the company persists in defying the law, the unlawful appointments are invalidated (leading to insufficient numbers of board members to take effective decisions). Finally, the Law was meant as a temporary intervention, its requirements expir-

[7] Art. 144 undecies (*Gender balance*) in the listed companies regulatory framework (so-called *Regolamento degli emittenti*), updated by the CONSOB in February 2012. For example, it was made clear that, in case the 1/5 and 1/3 rule of representation of women in the board would determine a non-integer number, compliance with the Law would be achieved if (and only if) the number of women reached the larger integer. In the case the board has 10 seats, compliance with the 1/5 rule is achieved with 2 women in the board; in case the board has size 11, compliance is achieved with 3 women.

ing in 2023.[8] In the intention of the Legislator the aim was to promote the culture of gender equality, allowing the system to internalize it and then continue without further impositions. Being a temporary measure, it is important to understand whether the Law has resulted in the mere compliance with its letter or it promoted a change in culture as intended by its spirit. In the former case, one would expect that once gender quotas ceases to be mandatory, adequate female representation on boards will no longer be ensured.

The Law directly applied to Italian listed banks (23 at the time the Quota Law was issued), while not to all other banks. In order to understand whether a cultural change was also initiated by the Law in the banking sector, we will also focus our attention on a specific group of banks which might have received a stronger influence of the Law, though compliance was not compulsory. That is, we focus our attention on banks belonging to a group whose main bank is listed (73 in 2011). Both groups of banks are both the focus of our work which aims to study not only the direct effects of the Law on the targeted banks (i.e. the listed ones), but also its potential spillover on the non-listed banks belonging to a listed group.[9] Other banks belonging to a group whose main bank is not listed (91 in 2011) constitute our control group.

The Quota Law applies to both management and supervisory boards in a company, as the quota requirements must be met in each board independently. For this reason we will analyze them separately in our empirical specifications. For the sake of simplicity, in the rest of the paper we will refer to *Board of Directors (BD)* to identify several forms of management board (as defined in the Italian corporate governance law), while we will refer to the *Board of Supervisors (BS)* to identify the different types of boards with duties of supervision and control (as defined in the Italian corporate governance law) on the management decisions taken by the BD.

3 Data and descriptive statistics

3.1 The administrative data on boards' members and banks' characteristics

In this study we use a panel dataset which combines information on bank board members with data on the characteristics and performance of Italian banks. It is built from four different data sources: *i)* individual features relating to board members that are collected

[8] At the end of 2019 Italian gender quotas have been increased up to 2/5, progressively; moreover, the measure became effective for other 3 renewals. The prescription was not extended to non-listed companies.

[9] For the sake of simplicity, we will refer hereafter to a *listed group* as to a group whose main bank is listed.

from the Bank of Italy's administrative archives on Bank Boards (so-called OR.SO., from the Italian acronym *ORgani SOciali*, i.e., Bank boards); *ii)* bank characteristics (i.e. legal form, size, location, etc.), collected from the Bank of Italy's Census; *iii)* data on bank performance and riskiness from the Bank of Italy's Supervisory Register and balance sheet data; *iv)* information on companies listed on the Italian Stock Exchange market, obtained from the *Italian Regulatory Authority for Listed Companies* (CONSOB) website. We consider a time span ranging between 2007 and 2019, in order to have large time windows before and after the year of the implementation of the Quota Law.

The OR.SO. database is a historical archive of information on boards of all Italian banks and financial intermediaries under the supervision of the Bank of Italy. Data include administrative information on all the members, such as: name, gender, date and place of birth, tenure (appointment date, cessation date, causes of cessation).[10] From the OR.SO database we construct main variables that describe the individual dimensions of diversity of all board members. Specifically, we construct a dummy variable for female members, a variable indicating the age (in years), the individuals' tenure (in years) in the banking industry; a dummy variable for *local* members, i.e., indicating whether the individual was born in the same region (NUTS 2) where the bank headquarters are located. This latter variable takes into account the role of the knowledge that the board member has of the local environment and the social norms in which each bank operates, as well as the fact that the member is known in the same environment.[11] From the individual-level archive, we construct a panel at the board (BS or BD), bank and year level, considering the average characteristics of the boards at the end of every calendar year.

As for bank-level variables, the log of total assets and the equity-asset ratio (*capital index*) are used as bank size measures. Data on bank economic performance include standard measures on bank profitability such as the returns on assets (ROA) and on equity (ROE), and the ratio between non-performing bad loans and total loans, which provides information on the riskiness of the bank portfolio. All performance variables are obtained from the banks' balance sheet data, have yearly frequency, and are available until 2019.

[10]The OR.SO. census archives are updated every day, since each bank has the duty to timely communicate any change in its governing bodies to the Bank of Italy; our version of the dataset is updated with information revised up to December 31, 2019.

[11]The local profile of each director might be more relevant for small and local banks characterized by long-lasting and stringent credit relations with local markets and customers. Defining this variable at the macro-area (NUTS 1) or province (NUTS 3) level does not change our results.

3.2 Variables construction and descriptive statistics

Our sample includes four categories of banks. First, all banks listed on the Italian Stock Market as of the month of August 2011, and thus obliged to comply with the Quota Law (labeled to as *Listed Banks*, LB); second, all banks belonging to a group whose head is listed (henceforth labeled to as *Banks in Listed Groups*, BLG); third, all other banks belonging to a group whose head-bank is not listed (henceforth simply labeled to as *Banks in Non-Listed Groups*, BNLG); fourth, all the remaining banks (*Other Banks*, OB), which basically do not belong to any group and are not listed.

In the main analysis we use all banks belonging to a group (BNLG) as the control group. This is because banks belonging to a group share administrative and organizational features, which, on the contrary, cannot be found in banks not belonging to a group (i.e., the OB), and are typically small and local banks. Nevertheless, in Section 6 we will show that our results are robust to alterations of this baseline sample. Our main working sample constituted by LB, BLG and BNLG banks accounts for about 40 per cent of the total number of banks operating in Italy in these years, representing about 70 per cent of the total amount of the loans intermediated in the credit market.

[Table 1]

Table 1 reports descriptive statistics obtained from the OR.SO. archives, which cover salient characteristics of the boards (BD and BS). Figures are yearly averages over the period 2007-2019, distinguishing the periods before and after the implementation of the Quota Law; the latter period indicates the years since 2012 onwards, when the requirements of the gender quotas became compulsory. Our dataset includes the share of female members of the boards, the size of the board (i.e., the number of members)[12], the average age, the average tenure in the banking industry, the share of local members, as those born in the same region where the bank is headquartered. All these variables are measured at the end of each year and are intended to describe the various dimensions of diversity in the boards' composition that can be retrieved from the OR.SO. archives.

[Figure 1]

Before the implementation of the Quota Law, female representation was structurally higher (almost double) in the BS than in the BD and this feature was shared by all types of banks, reflecting the fact that women tend to be more often employed in less crucial or

[12] As prescribed by the Law, we only consider the so-called *active* members. There are other members (so-called *adjunct* members), which are typically called in case the active members became unavailable.

decisional roles and more in monitoring tasks (Figure 1). However, it is important to notice that the share of female directors (and supervisors) increased more for listed banks, moving from 3 percent before the law up to 27 percent subsequently; female presence on bank boards remained significantly lower for the other intermediaries, especially for directors in charge in banks belonging to listed groups (around 10 percent). As far as the size of the boards, we observe that the number of members in the BS remain substantially unchanged after the implementation of the gender quotas in all groups of banks, as well as the number of directors in boards with decisional tasks. Moreover, irrespective of board type or the group of banks considered, the other boards' characteristics do not seem to have changed substantially by comparing the period before and after the Quota Law.

In order to better study the effect of gender quotas in boosting board diversity along other dimensions, we build a synthetic indicator so as to take into account different board members' characteristics (gender, age, tenure, origin) simultaneously. For each of the four characteristics we compute its entropy (H_{it}) with the following formula:

$$H_{it} = \sum_{j=1}^{k} p_{jt} * lnp_{jt} \tag{1}$$

where: i indicates the bank, t the year, p is the share of individuals belonging to category j of the variable of interest (i.e., gender, local, age, tenure) and k is the number of categories. Gender and origin - defined as being born in the region where the bank is headquartered - are naturally categorical, whereas we discretized the two continuous variable (age and tenure in the banking industry) into three categories (low, medium and high) before computing their entropy. The entropy of each characteristic ranges from 0 (maximum concentration) to $\ln k$ (maximum diversity, when the characteristic is uniformly distributed). Finally, we define our measure of diversity as the sum of the four entropies. We also compute an alternative measure which excludes the entropy of the gender variable in order to evaluate the impact on diversity net of the mechanical increase in the number of women induced by the law.

[Table 2]

Table 2 shows the descriptive statistics of the yearly data obtained combining the OR.SO. archives with banks' balance sheet data. Listed banks are generally larger intermediaries, more profitable, especially in terms of ROE. The riskiness of their credit portfolio was lower in both sub-periods relative to that of all the other groups of banks; it doubled for all banks after the introduction of the law, due to the adverse impact of the economic crisis.

4 Identification strategy

4.1 Baseline difference-in-differences specification

The aim of our analysis is to evaluate both the intended and unintended consequences of the Quota Law. To this purpose we define two groups of treated banks (Listed Banks and Banks in Listed Groups) and one control group (Other banks belonging to a group, whose leading bank is not listed), and compare them along several dimensions, before and after the Quota Law was implemented. This strategy corresponds to a differences-in-differences (DID) reduced-form specification, in which the effects on the LB might be interpreted as the direct effects of the Law on those banks that had to comply with it, while the effects on the BLG (if any) could be interpreted as spillover effects of the Law.

The baseline estimation framework takes the following form:

$$Y_{it} = \alpha_0 + \beta_{LB} LB_i \times Post_t + \gamma X_{it} + \theta_i + \theta_t + \epsilon_{it} \tag{2}$$

$$Y_{it} = \alpha_0 + \beta_{BLG} BLG_i \times Post_t + \gamma X_{it} + \theta_i + \theta_t + \epsilon_{it} \tag{3}$$

where: i indicates the bank and t the year; Y_{it} are the outcome variables to be tested; β_{LB} and β_{BLG} are our coefficients of interest capturing the effects of the interactions between the dummies indicating, respectively, the LB and BLG banks (LB_i and BLG_i), and a dummy $Post_t$ indicating the period after the implementation of the Law (i.e., from year 2012 onwards). Bank (θ_i) and time (θ_t) fixed effects are aimed at capturing unobserved characteristics of the banks (fixed over time) and time dynamics. The vector X_{it} includes bank-level time-variant controls.

4.2 Main assumptions and threats to identification

Two main identification assumptions need to be discussed. First, the outcome variables should satisfy the parallel trend assumption in the years before the implementation of the Law. We test this assumption by running regressions of all the outcome variables in which we interact the treatment group dummies (LB_i and BLG_i) with the time dummies (θ_i) in the period before the implementation of the Law, as in classical event-study approach. The parallel trend assumption is generally met as depicted in the baseline results figures (see the following section). Some exceptions should be made on some of the measures of banks' economic performance, which we will discuss later in the text.

Second, given that the previous assumptions need to hold conditional on the covariates included, these should be not influenced by the treatment. Our parsimonious baseline specification includes only two main bank-level time-variant control variables (X_{it}), typically used in the literature (namely, the log of total assets and the capital index). These capture bank size characteristics that are rather difficult to modify in the medium- and short-run; so, we can be confident that changes in management induced by the Law did not influence them. Moreover, we will test the stability of our findings to the exclusion of such variables by showing the results with or without these controls. Additional robustness and sensitivity checks will be also performed in section 6.

A final concern should arise in case of heterogeneous treatment effects, as the recent developments in the econometric properties of the DID estimators have pointed out (de Chaisemartin and D'Haultfoeuille 2022).[13] We thus follow the approach proposed by de Chaisemartin and D'Haultfuille (2020) and estimate their diagnostic tests in order to understand whether heterogeneity in treatment effect is a main problem in our estimation framework of a sharp DID model (i.e., we do not exploit a staggered design in which such concerns might be even more serious). Appendix A Table A.1 shows the main tests. Reassuringly, the share of negative weights (the main diagnostic proposed) is null to negligible for all our outcome variables, so that heterogeneity in treatment effect does not seem to be a concern in our estimation framework. We thus perform our analysis using an OLS estimation framework (so-called Two-Way Fixed Effects (TWFE) model).

5 Results

In the following we will discuss our main empirical findings on the impact of gender quotas on the board composition of Italian banks, first, in terms of direct and indirect (or unintended) effects on the group of listed banks targeted by the Law; then, by looking for potential spillover effects on the group of banks belonging to a listed group.

5.1 Effects on listed banks

5.1.1 Compliance with the Law: share of women and board size

The main aim of the Italian Quota Law was to increase the share of female representation up to one third, both on executive and supervisory boards of Italian listed companies. The

[13] In the context under study, treatment effects could be heterogeneous by single bank or by clusters of banks, for example, because the sovereign debt crisis in 2011, which could have hit differently the banks involved in the analysis. Its effects on banks economic performance confounded in that of the Quota Law might originate heterogeneity in the treatment effect.

increasing pattern in female participation to boards for Italian banks already emerges in Figure 1, where we depict the share of women for listed banks relative to the other two groups of intermediaries.

Therefore, in our baseline specifications we first investigate on gender diversity of both kinds of bank boards of listed banks (the direct target of the Law), and then we focus on banks belonging to a listed group (the indirect target of the Law) to account for spillover effects, relative to all the other intermediaries (as the control group). Since the size of the board is a crucial variable to strategically adjust the share of female directors or supervisors on boards, we also investigate the impact of the Quota Law on all memberships of bank boards. In every specification we control for bank fixed effects, in order to take into account time-invariant unobservables linked to the history of the bank, such as the culture and quality of the management. Using a stepwise approach, we then add to the model year fixed effects, in order to control for common cycle effects, as well as time-varying bank-level features uncorrelated with the prescription of the Quota Law (bank size and bank capitalization). In all estimates standard errors are clustered at bank level.

[Figure 2 and Table 3]

Focusing on listed banks, as shown in Figure 2, the parallel trend test in the pre-reform period is fully satisfied, as well as the average effect in the post-treatment period is statistically significant, signaling an increase in the female presence on corporate boards. The DID results for the share of women are also presented in Table 3, panel A for the BD and panel B for the BS, respectively. The share of female members in the Board of Directors increased significantly for listed banks in the period of gender quotas: in column (3), with the full set of control variables, the magnitude of the effect was around 15 percentage points, confirming listed banks' compliance with the Quota Law. Similar evidence is valid for the supervisory boards, too. In this case, we estimate a statistically significant increase, up to 18 percentage points for the share of female supervisors.

The share of women on boards could increase either because - given the size of the board - banks recruit more female directors or supervisors, or because the size of the board is strategically adjusted to dilute gender diversification. In the former case, in line with the spirit of the Quota Law, corporate governance practices improve and the prescription of the law is fulfilled. On the contrary, in the latter case, firms undertake measures so as to sidestep the aim of the Quota Law.

[Figure 3 and Table 4]

In order to evaluate such strategic behavior, we estimate the impact of the Quota Law on the size of the boards (i.e., number of effective seats, see Figure 3 and Table 4), for both BD and BS. Our results suggest that listed banks did not respond strategically to the requirements of gender quotas by altering their board size.

5.1.2 Diversity along other demographic dimensions

Enhancing gender diversity on boards was the main aim of the Italian Quota Law. However, it is important to notice that favoring the representation of women on corporate boards might improve diversity along other dimensions, enriching inter-generational, cultural, education and multi-geographical views and skills. In this vein we investigate how the Italian Quota Law, by the appointment of new women, also contributed to modify other demographic characteristics of bank boards; in particular, we focus on board members' age, tenure and geographical origins, using a synthetic entropy indicator as presented previously.

One could expect that the appointment of newly female directors or advisors on boards -generally younger and less experienced- should lower the average age of members, should decrease their tenure, both in the banking system as a whole and within the same bank. Moreover, new recruitments should favor the entrance of different geographical origins and cultures. Indeed, the geographical origins of boards' members and their potential connections with the main operational areas where banks are headquartered are important dimensions to be evaluated in finance: the diversification of local members, those born (and resident) in the same region where their bank is headquartered, could enhance the screening capability of the top management and create information spillovers to finance other economic areas relative to those where banks are headquartered.

Another relevant skill that could be important to measure is the level of education of people in charge on bank boards. Unfortunately, we are not able to observe the education background for new entrants, as well as for board members already in charge, because this piece of information is not available on the OR.SO. database. However, it is important to notice that in banking and finance -which is a more relationship-based business than other sectors- the experience gained in the field is as relevant as the education background. So, policies of retention in banking could be highly stringent and the permanence in higher hierarchical levels could be longer lasting, reducing turnover within corporate boards. While the information on the level of education of each board members is not available, by using the appointment date and the cessation date of each mandate from OR.SO., we are able to quantify the tenure (and the experience gained in the field) for a given member serving in

top positions in each bank of our sample.

[Figures 4 and 5 and Tables 5 and 6]

As far as the synthetic index of board diversity, tests for parallel trends and the significance of the average treatment effect are presented in Figures 4 and 5, including and excluding gender, respectively. Main results of estimates are reported in Tables 5 and 6, respectively including or excluding gender from the entropy index. We observe a different pattern in BD and BS. Concerning BD, the Quota Law induced an increased diversity: interestingly, the diversity increased not only because of the gender of the members, but also along the other observable characteristics (age, origin and tenure). Conversely, the Quota Law did not increase the diversity of the BS, so that the new members (albeit females) were similar in their age, local origin and tenure of those present before the Law.

5.2 Spillover effects on banks in listed groups

In this section we focus on banks in listed groups, not directly targeted by the Quota Law, to investigate if there are some spillovers effects in terms of increasing female presence on boards, stemming by the spread of best practices within the same banking group from the *head* to its *branches*. Results are reported in Figure 6 and Table 7. For banks in listed groups, the share of female directors or supervisors did not change significantly, when we control for all the bank-level variables (columns (3) and (6)). Therefore, we do not detect spillover effects on banks belonging to listed groups, signaling that the soft law impact in terms of spread of best practices from the leading bank to those affiliated, and sharing a common governance, was not in place in the post-reform period.

[Figures 6 and 7 and Tables 7 and 8]

In order to evaluate strategic behavior, induced by listed banks on the boards or their affiliated to comply with the Quota Law, we also estimate the effect of the reform on the size of the boards of banks in listed groups (i.e., number of effective seats, see Figure 7 and Table 8), analyzing both BD and BS. The results suggest that, while listed banks did not respond strategically altering their board size, the board of directors of banks belonging to listed groups decreases by about one member when the Quota Law came into force.

We could suppose that this adjustment in board size for banks in listed groups might have been implemented to recruit from affiliated banks female candidates able to serve on board of directors of the parent listed bank, directly subject to the law prescription. However, using

our granular data on directors' mandates and new appointments, and investigating movements from affiliated banks towards the parent listed one, we find that drain of directors by listed banks is less frequent, and involve marginally both women and men. The decreasing effect in board size we found seems mainly attributable to strategies of re-organization of larger Italian banking groups during the period under examination, with a subsequent rationalization of seats in the boards of affiliated banks.

5.3 Effects on bank performance

One might wonder if the Quota Law, by increasing gender diversity on boards, could also have produced direct effects on economic outcomes. We have thus run the econometric specification of equation 2, using as dependent variables economic performance indicators (such as: measures of profitability and riskiness) instead of measures of board composition as in the previous exercises.

[Figure 8 and Table 9]

Results are reported in Figure 8 and Table 9, in the full model (columns [3] and [6]) we control for bank and time fixed effects, and for other bank time-varying variables (size and capitalization); standard errors are clustered at bank-level. As shown in the previous sections, the Italian Quota Law has produced an effective gender diversification on bank boards only for listed banks, generating no significant spillover effects on board composition of banks belonging to listed groups. This is why, we focus our performance analysis only on listed banks.

Concerning bank profitability, both return on assets (ROA) and return on equity (ROE) are not significantly affected for listed banks by gender quotas, albeit for the ROE measure the parallel trend assumption does not seem to be sufficiently met. Equally, the impact of the Quota Law is not statistically significant for listed banks on our measure of portfolio riskiness (the share of bad loans on total loans), when we control for bank size and equity.

Contrary to previous evidence in the literature for non-financial firms (Ahern and Dittmar 2012) and for German banks (Berger, Kick, and Schaeck 2014), which found that mandatory gender quotas determined negative effects on firm value or economic performance in the short-run, mainly due to the lower experience of the new appointed directors, keeping the previous caveats in mind, our estimates seem to suggest that the Italian Quota Law improved gender diversity on Italian bank boards with substantially neutral effects on bank performance. Concerning the Italian setting under study, the existing literature found non-conclusive results on the effects of quota laws on firms' economic performance. Comi et al.

(2020) find a positive impact of the Quota Law on firms' productivity only, while Ferrari et al. (2021) find that the increase in the share of female directors is associated with a lower variability of stock market prices of Italian listed companies, signaling that gender quotas give rise to a beneficial restructuring of the board, which is positively received by the market.

6 Robustness checks

In what follows we test the robustness of our results along two main dimensions. First, we check whether the Law might have induced some forms of opportunistic behaviors on the part of the banks just before the implementation of the Law, and, more precisely, whether some banks operated a de-listing in order to side-step the obligation imposed by the Law. Then, we verify that our results do not vary when we alter the choice of the control group and the time window chosen for the analysis.

Exiting the stock exchange market. In the Phase-in of the implementation of the Law (i.e., in the time spanning from the Law approval in August 2011 to its implementation one year later) banks could have exited the Italian Stock Exchange Market in order to sidestep the requirements of the Law. Indeed, Bøhren and Staubo (2014) observed that as a result of a mandatory gender balance reform in Norway about half the firms change their legal and organizational form. In our case study, however, this threat is not a concern as we do not observe any de-listing from the Italian stock exchange market of the banks subject to the Law in the Phase-in period.[14]

Alternative definition of the control group. In all our specifications we have restricted the attention to banks belonging to a specific cluster, so that the pool of our controls is constituted by banks belonging to groups in which no bank is listed. We restrict the analysis to banks belonging to a group because this allows us to have a more comparable group of banks, especially in what concerns their organizational structure, and the possibility of sharing firm knowledge and culture, which is at the basis of the idea of spreading good practices, such as increasing female board representation. To test that our analysis is not sensitive to this empirical choice, we enlarge the set of the controls to all non-listed banks, both belonging or not, to a banking group. The results are depicted in Appendix A figures from A.1 to A.7 and do not show remarkable differences with respect to our baseline results.

Region-specific trends. Local dynamics, especially in the crisis years, might have differentially affected the behaviour of banks and their performance. We add region-specific

[14] A total of two de-listings occur (in 2015 and 2017), but they are due to reasons not related to the Quota Law.

trends to our specifications and find that our baseline results are unchanged (see Figures from A.8 to A.14 in Appendix A).

Alternative time window. In July 2015 the Italian Banking Authority, following the EU recommendations, addressed to all supervised entities a general invitation to increase diversity, along gender as well as all potential other dimensions, in the boards.[15] These recommendations did not bear any formal requirement to fulfill, but were intended to work as sort of soft-law invitation to all banking and financial institutions. This might have altered the estimation of the effects of the Quota Law under study for banks in listed groups, by adding the effects of this additional soft-law regulation. As a test, in the event-study setting depicting the results for banks in listed groups (Figures 6 and 7), we check whether the dynamic effects show some changes from $t = 4$ (corresponding to year 2015) onwards. Nevertheless, we do not find sizable increases, which could be related to the soft-law regulation.

7 Concluding remarks

This paper contributes to the literature on gender diversity in top management positions and on effects stemming from gender quotas on economic performance, too. The issue is particularly relevant for banking, since finance is typically a male-dominated sector; moreover, despite a growing interest on this topic, results are often mixed and the evidence on banks and on gender quotas effects is still limited.

We exploit the introduction of a law (Law No. 120/2011) mandating Italian listed companies, including listed banks, to temporarily increase female representation in the executive and supervisory boards (Boards of Directors and Supervisory Boards). We use administrative census data from the Bank of Italy's Supervisory Register on the composition of boards in all banks operating in Italy between 2007 and 2019. These data make it possible to describe the board characteristics in terms of four main diversity dimensions (gender, geographical origins, age, tenure) and on a yearly basis. We link board features with several bank characteristics, which are collected or derived from the Bank of Italy's Census, and with data on bank performance and riskiness from the Bank of Italy's Supervisory Register. We implement a difference-in-differences (DID) identification strategy by comparing board diversity measures before and after the introduction of the Quota Law, between listed banks and non-listed banks belonging to a listed group (our treated group) and all other banks belonging to a non-listed group (our control group).

Our main findings show that the Quota Law increased the share of women in charge

[15] See: *Benchmark di diversity per il sistema bancario italiano*, Bank of Italy, July 2015.

on Italian listed banks, both as directors and as auditors, generating, however, indirect diversification effects, net of the mechanic effect of the gender component, only in the board of directors. Albeit the targeted banks did not sidestep the prescription of the Law by altering the board size or de-listing, the Law was not able to spread its effects on the other banks of listed groups.

Our results raise some policy implications regarding the effects of the law, both for shareholders and regulators. Since we find that the Quota Law was only applied by the banks directly targeted by the measure, one might wonder whether they will stick to a gender balanced composition of their boards once the requirement ceases to be effective.[16] We also find that the introduction of the Quota Law was basically neutral in terms of the performance of listed banks, so as not to entail an equity *versus* efficiency trade-off, at least in the banking sector.

[16] In this regard, notice that the effectiveness of the Law was extended by the Italian parliament in 2019 (law 169/2019) from three to six consecutive mandates.

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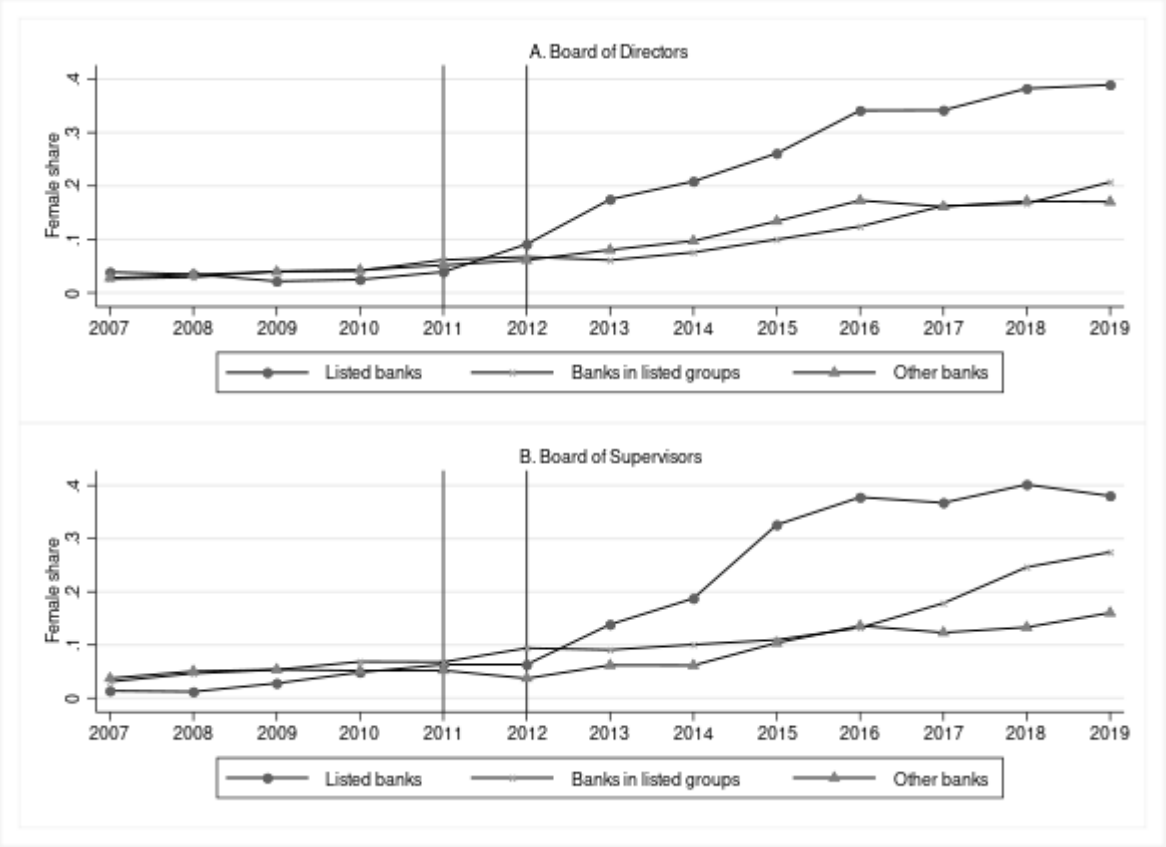
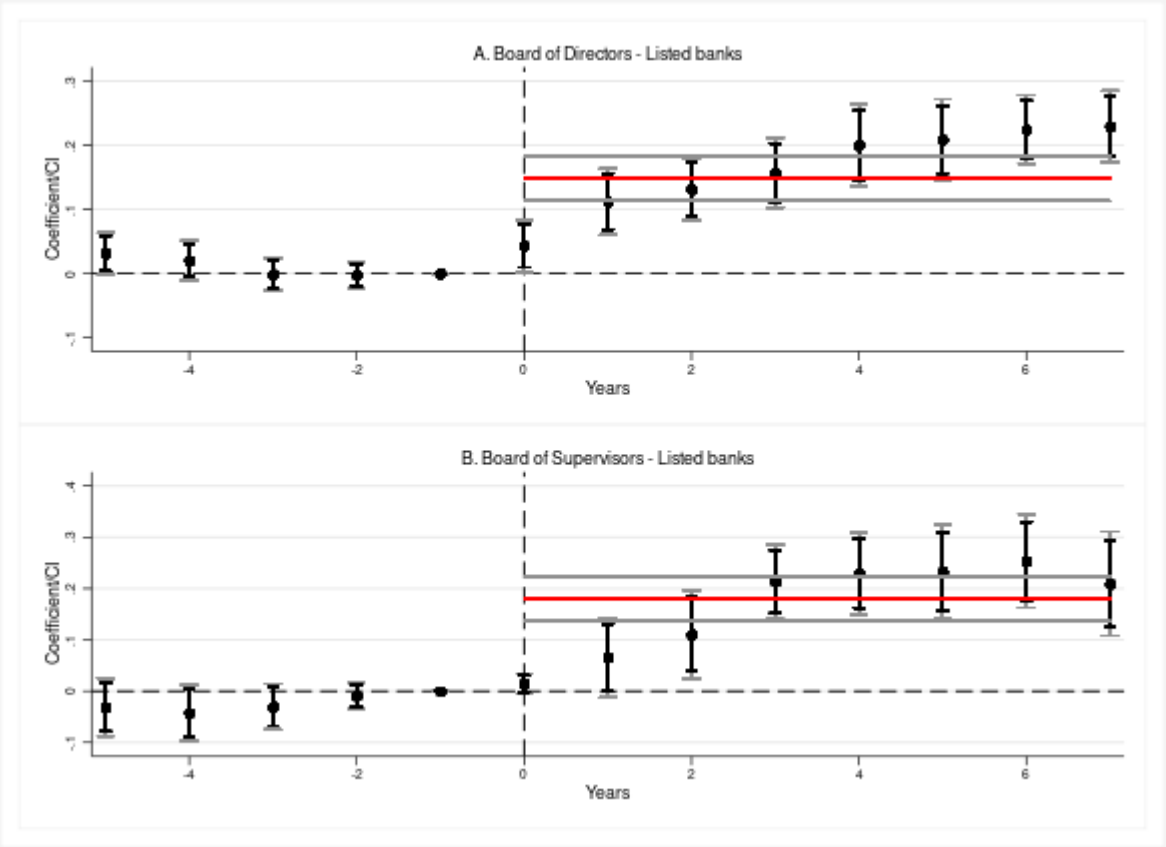
Figures

Figure 1
Share of female members in the Board of Directors and in the Supervisory Board from 2007 to 2019.



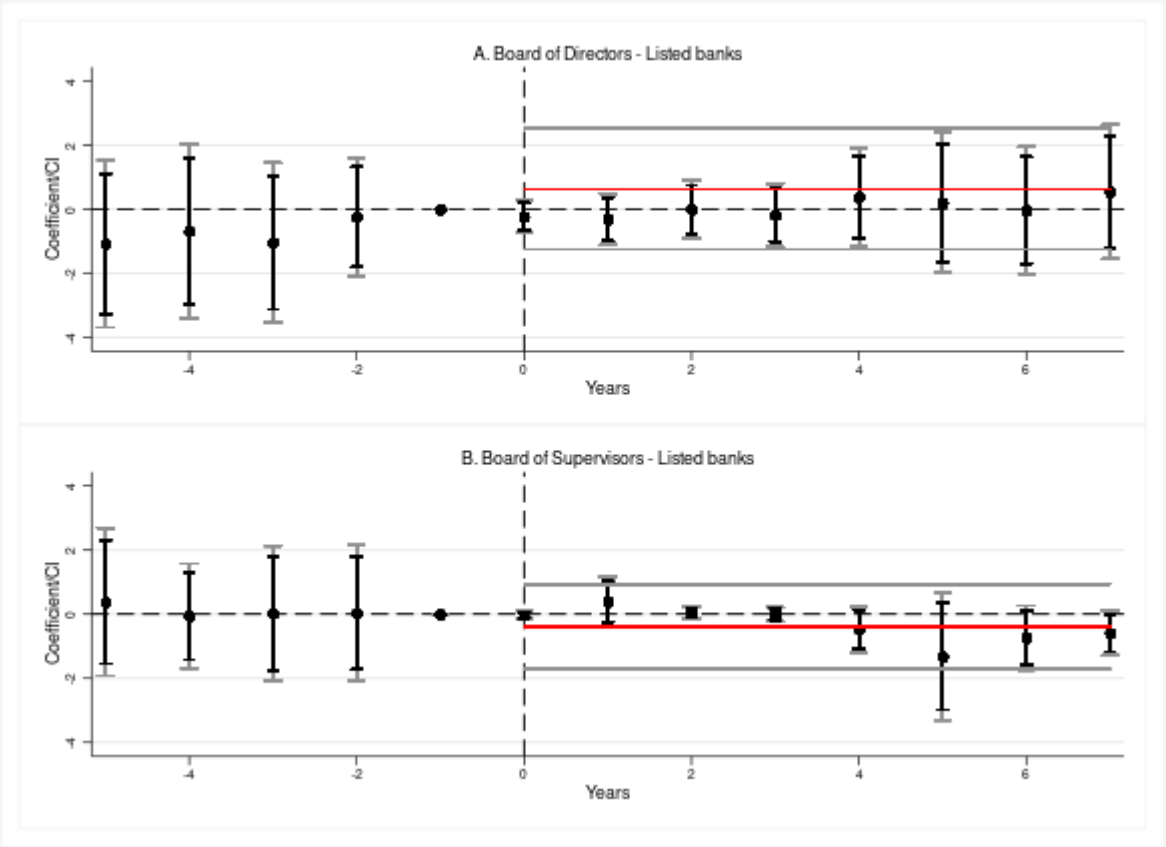
Notes: the figure depicts the share of female members in the board of directors (Panel A) and supervisors (Panel B) from 2007 to 2019; the first vertical line, in each panel, indicates the approval of the Quota Law (2011), while the second vertical line indicates the moment when the requirements of the Law became compulsory, one year later (2012).
Source: OR.SO. archives, Bank of Italy.

Figure 2
Event study on the share of female members on the boards of listed banks



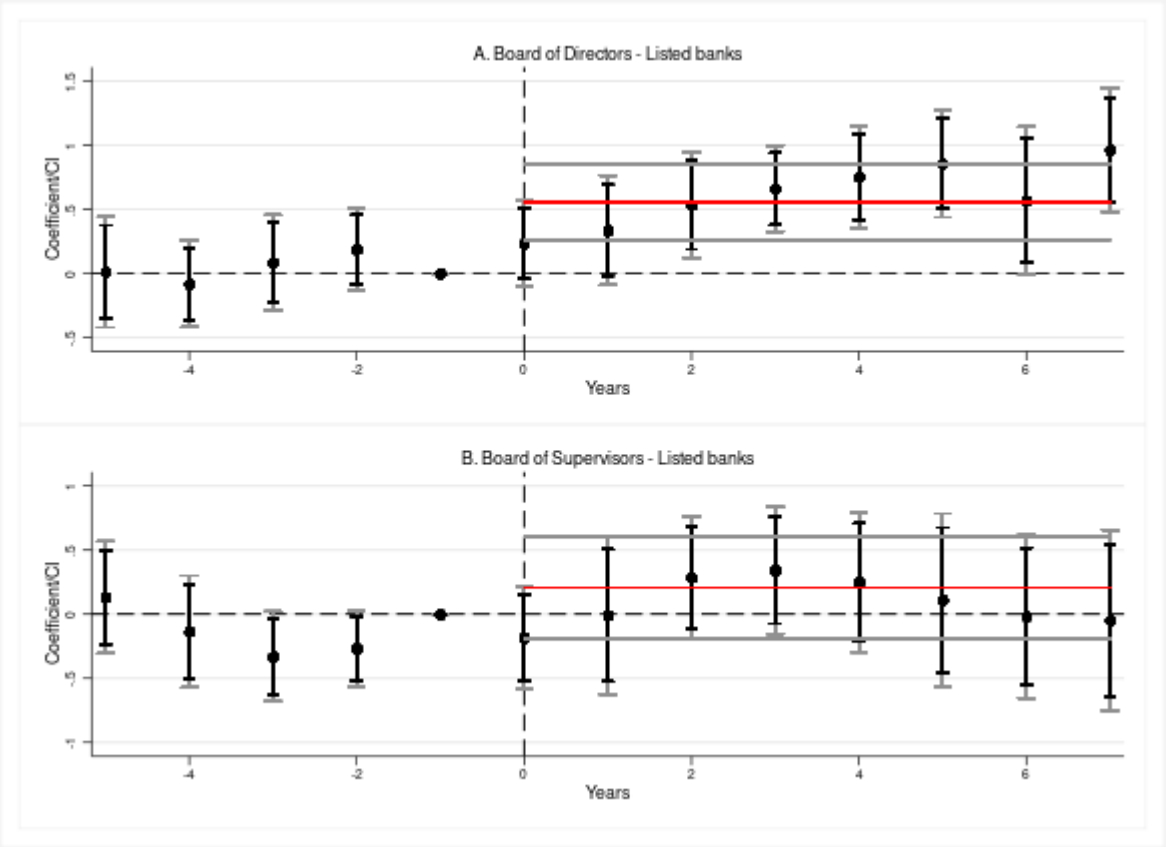
Notes: the figures depict the effects of the Quota Law on the share of female members in Boards of directors (Panel A) and supervisors (Panel B); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012). **Source**: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure 3
Event study on the size of the boards of listed banks



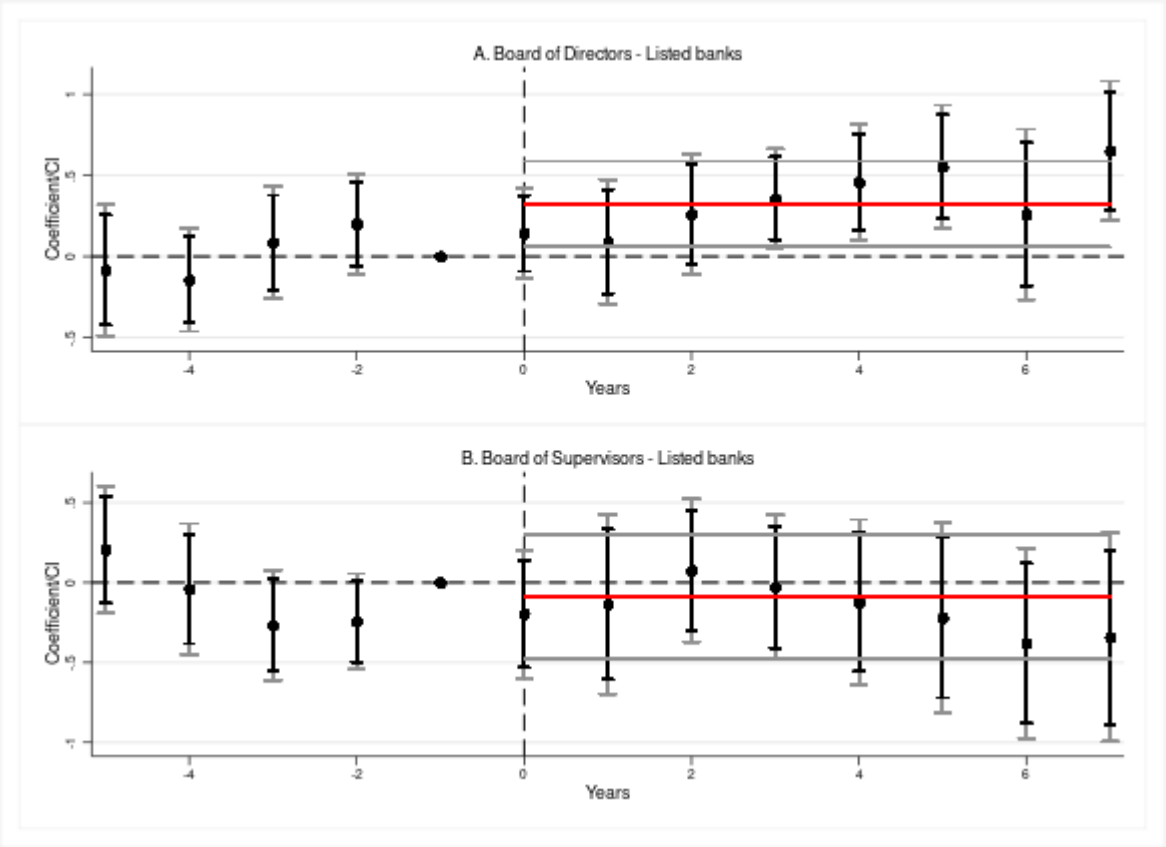
Notes: the figures depict the effects of the Quota Law on the size of Boards of directors (Panel A) and supervisors (Panel B); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012). **Source**: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure 4
Event study on the diversity index (including gender) in the boards of listed banks



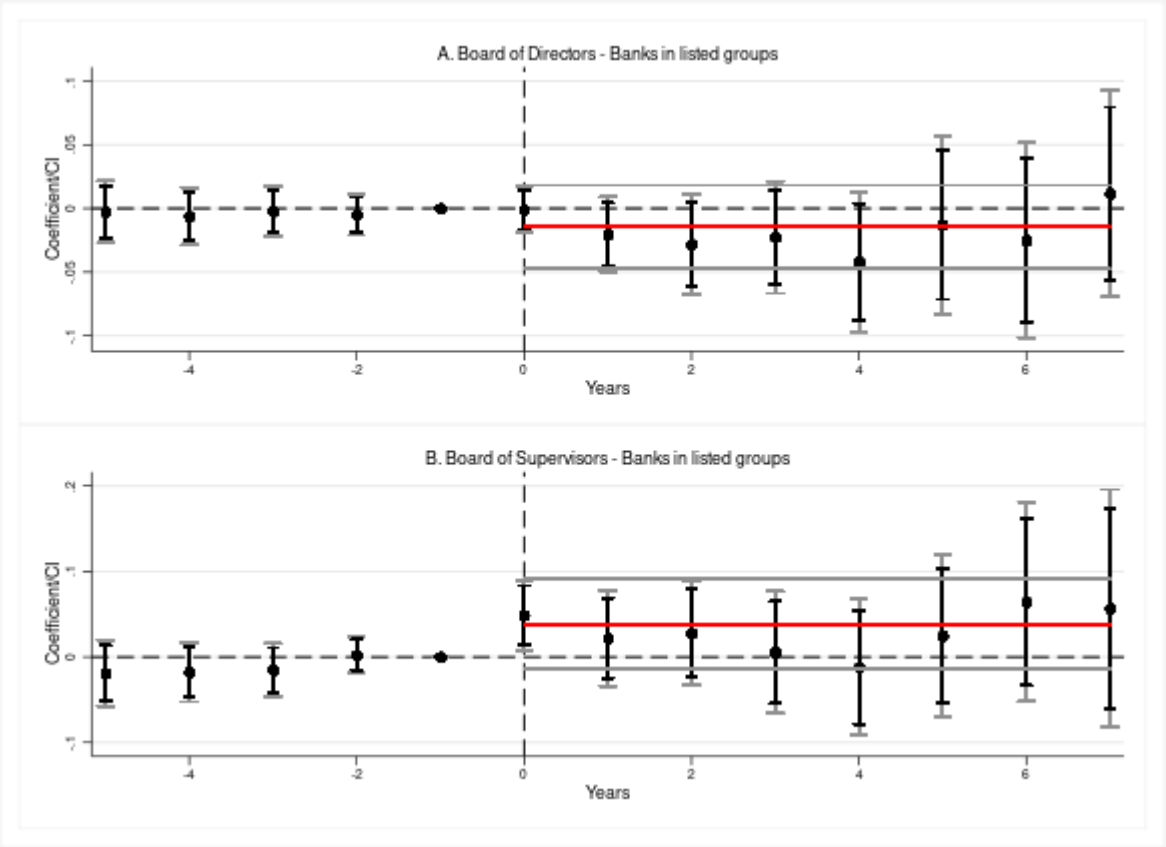
Notes: the figures depict the effects of the Quota Law on our measure of diversity (including gender) in Boards of directors (Panel A) and supervisors (Panel B); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012). **Source**: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure 5
Event study on the diversity index (excluding gender) in the boards of listed banks



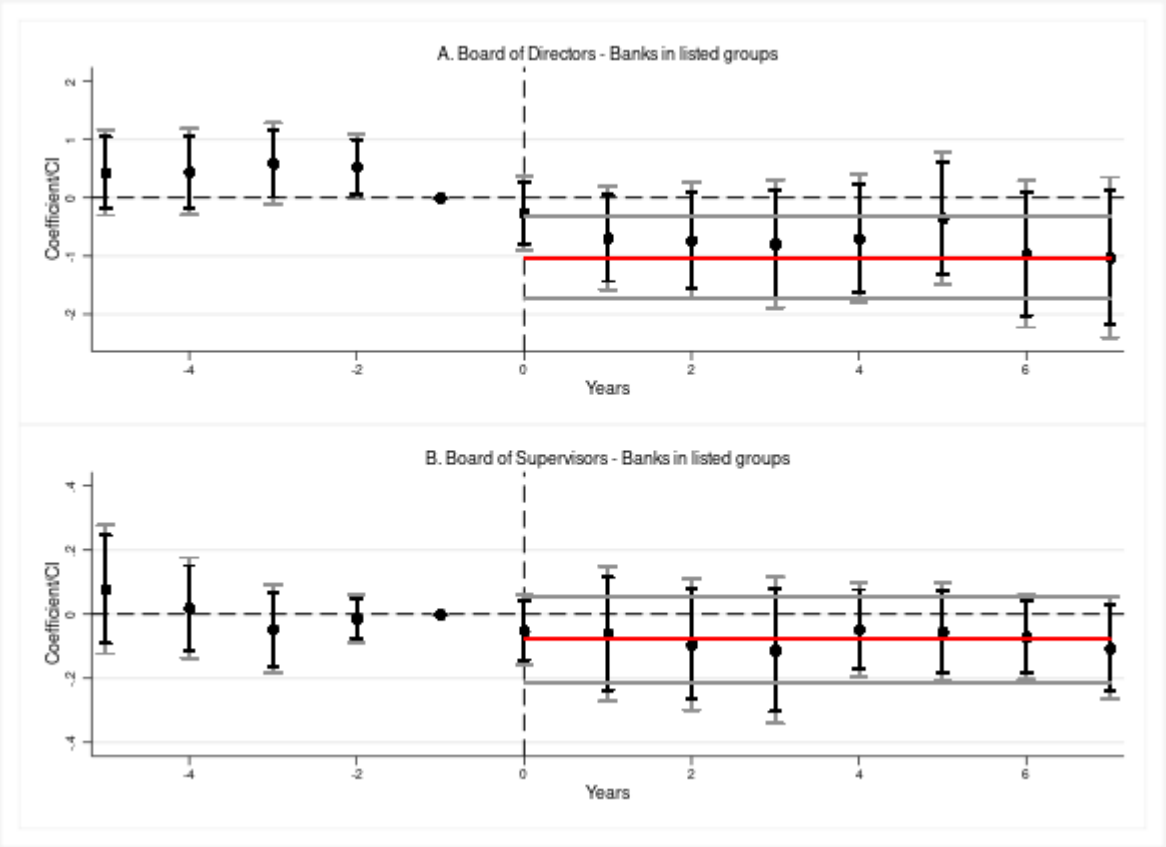
Notes: the figures depict the effects of the Quota Law on our measure of diversity (excluding gender) in Boards of directors (Panel A) and supervisors (Panel B); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012). **Source**: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure 6
Event study on the share of female members on the boards of banks in listed groups



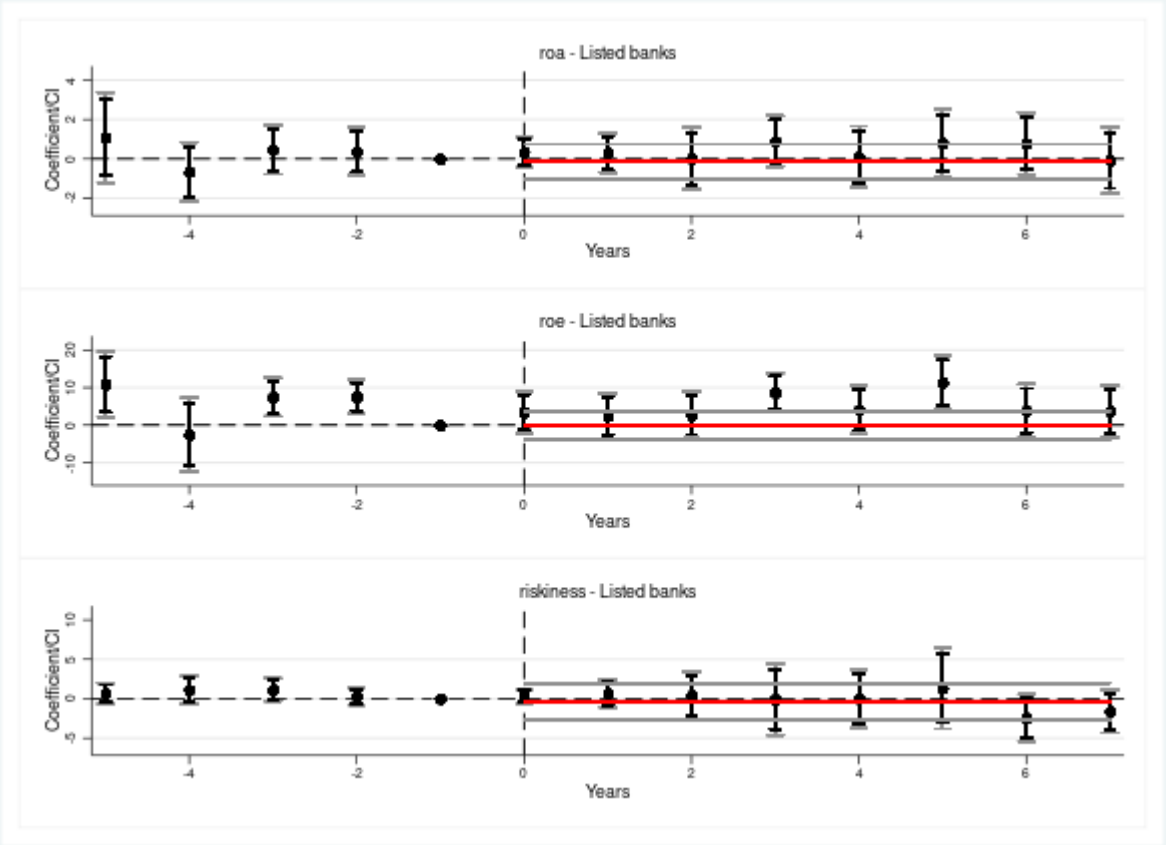
Notes: the figures depict the effects of the Quota Law on the share of female members in Boards of directors (Panel A) and supervisors (Panel B); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012). **Source**: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure 7
Event study on the size of the boards of banks in listed groups



Notes: the figures depict the effects of the Quota Law on the size of Boards of directors (Panel A) and supervisors (Panel B); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012). **Source**: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure 8
Event study on the economic performance of listed banks



Notes: the figures depict the effects of the Quota Law on four measures of performance of listed banks: return on assets (ROA, top Panel), return on equity (ROE, middle Panel), and a measure of riskiness (the share of bad loans on total loans; bottom Panel); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012). **Source**: OR.SO. archives, Bank of Italy and balance sheet data.

Tables

Table 1

Descriptive statistics: boards' characteristics before and after the Quota Law.

	Board of Directors (BD)				*Board of Supervisors (BS)*			
	Before the Quota Law		*After the Quota Law*		*Before the Quota Law*		*After the Quota Law*	
	mean	sd	mean	sd	mean	sd	mean	sd
A. All banks								
Share of females	0.049	0.077	0.121	0.122	0.088	0.171	0.140	0.204
Size of the board	9.621	3.054	8.909	2.851	3.153	1.310	3.101	1.203
Average age	57.319	5.585	57.462	5.695	55.561	7.613	55.880	6.813
Average tenure	8.657	3.059	9.829	3.958	10.189	3.647	11.757	4.933
Share of local members	0.771	0.271	0.773	0.285	0.770	0.294	0.785	0.297
Diversity	1.880	0.776	1.966	0.840	0.721	0.708	0.779	0.741
Diversity (excluding gender)	1.744	0.730	1.664	0.762	0.572	0.668	0.553	0.667
N	3415		4093		3439		4085	
B. Listed banks								
Share of females	0.032	0.053	0.270	0.136	0.033	0.086	0.274	0.180
Size of the board	13.092	4.936	12.593	4.120	6.075	6.006	5.103	5.214
Average age	61.245	4.756	59.740	4.290	59.133	7.038	57.776	4.955
Average tenure	9.828	2.865	9.614	3.162	10.610	3.378	9.723	4.620
Share of local members	0.539	0.254	0.400	0.231	0.617	0.301	0.542	0.349
Diversity	2.203	0.662	2.783	0.646	1.192	0.965	1.472	0.917
Diversity (excluding gender)	2.258	0.585	2.248	0.572	1.114	0.905	0.991	0.880
N	109		167		107		164	
C. Banks in listed groups								
Share of females	0.039	0.060	0.102	0.122	0.053	0.124	0.130	0.188
Size of the board	10.646	3.126	8.856	2.777	3.211	0.642	3.032	0.331
Average age	60.498	4.439	60.316	4.914	60.102	5.901	59.897	5.419
Average tenure	8.477	2.668	9.271	3.766	10.815	3.184	11.340	5.037
Share of local members	0.509	0.247	0.464	0.273	0.586	0.304	0.562	0.302
Diversity	2.215	0.659	2.210	0.741	0.915	0.762	0.987	0.774
Diversity (excluding gender)	2.096	0.600	1.963	0.698	0.814	0.715	0.764	0.662
N	427		312		426		308	
D. Banks in non listed groups								
Share of females	0.039	0.070	0.126	0.126	0.049	0.129	0.098	0.173
Size of the board	10.166	3.430	9.445	3.417	3.138	0.747	3.156	0.884
Average age	59.168	5.090	59.850	5.274	59.029	6.885	58.581	6.948
Average tenure	8.071	3.209	9.783	4.041	10.344	4.278	11.285	5.040
Share of local members	0.535	0.313	0.494	0.317	0.589	0.350	0.558	0.363
Diversity	1.993	0.771	2.066	0.870	0.801	0.723	0.904	0.731
Diversity (excluding gender)	1.882	0.746	1.764	0.811	0.714	0.710	0.736	0.693
N	427		501		434		500	
E. Other banks								
Share of females	0.053	0.081	0.114	0.115	0.104	0.184	0.141	0.208
Size of the board	9.193	2.688	8.631	2.507	3.019	0.532	2.994	0.341
Average age	56.269	5.512	56.670	5.669	54.015	7.458	55.949	6.720
Average tenure	8.739	3.085	9.903	3.998	10.036	3.600	10.976	4.892
Share of local members	0.869	0.196	0.868	0.204	0.840	0.248	0.856	0.240
Diversity	1.788	0.779	1.868	0.822	0.653	0.667	0.702	0.703
Diversity (excluding gender)	1.642	0.725	1.586	0.746	0.483	0.612	0.479	0.630
N	2452		3113		2472		3113	

Notes: figures are averages over the period 2007-2019; *After the Quota Law* indicates the period since the requirements of the of the Quota Law became compulsory (from 2012 onwards). The *Size of the board* is measured by the number of active members; a board member is defined *local* if born in the same region (NUTS 2 level) of the bank's headquarters; average tenure and average age are measured in years; Diversity is the index calculated according to eq. 1, both including and excluding gender among the heterogeneity dimensions. *Source*: OR.SO. archives, Bank of Italy.

Table 2

Descriptive statistics: yearly data on banks' characteristics and performances.

	Before the Quota Law		*After the Quota Law*	
	mean	sd	mean	sd
A. All banks				
ROA	0.448	2.184	-0.189	1.862
ROE	3.683	9.435	0.623	7.762
Riskiness	4.492	6.206	8.939	8.094
N	3485		4187	
B. Listed banks				
ROA	0.623	2.430	-0.195	1.329
ROE	5.480	15.082	1.677	12.285
Riskiness	3.245	2.980	8.348	7.298
N	114		172	
C. Banks in listed groups				
ROA	0.973	3.371	0.107	2.807
ROE	6.651	13.495	1.992	12.181
Riskiness	5.606	12.016	10.049	13.912
N	434		324	
D. Banks in non listed groups				
ROA	0.120	2.942	-0.625	2.967
ROE	2.253	11.468	-0.528	10.453
Riskiness	3.945	3.602	9.190	9.966
N	448		516	
E. Other banks				
ROA	0.408	1.675	-0.148	1.485
ROE	3.341	7.538	0.613	6.167
Riskiness	4.454	5.073	8.818	6.896
N	2489		3175	

Notes: figures are averages over the period 2007-2019. *After the Quota Law* indicates the period since the requirements of the of the Quota Law became compulsory (from 2012 onwards). The *Riskiness* of the bank loan portfolio is measured as the ratio between non-performing loans and total loans. *Source*: OR.SO. archives, Bank of Italy, and balance sheet data.

Table 3

The effects of the Quota Law on the share of females in the boards of listed banks.

	A. Board of Directors			B. Board of Supervisors		
	(1)	(2)	(3)	(4)	(5)	(6)
LB X Post	0.234***	0.149***	0.149***	0.231***	0.180***	0.180***
	(0.0155)	(0.0180)	(0.0182)	(0.0182)	(0.0223)	(0.0222)
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	Yes	No	Yes	Yes
Bank controls	No	No	Yes	No	No	Yes
N	1198	1198	1198	1199	1199	1199
R^2	0.586	0.743	0.743	0.537	0.616	0.619

Notes: OLS regression with robust standard errors, clustered at the bank level. LB indicates the dummy for listed banks; Post indicates the period since the requirements of the Quota Law became compulsory (from 2012 onwards); bank-level control variables include the log of total assets and the capital index; FE indicates fixed-effects. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. *Source*: OR.SO. archives, Bank of Italy, and balance sheet data.

Table 4
The effects of the Quota Law on the size of the boards of listed banks.

	A. Board of Directors			B. Board of Supervisors		
	(1)	(2)	(3)	(4)	(5)	(6)
LB X Post	-0.215	0.678	0.631	-0.405	-0.388	-0.375
	(0.921)	(0.959)	(0.957)	(0.671)	(0.680)	(0.674)
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	Yes	No	Yes	Yes
Bank controls	No	No	Yes	No	No	Yes
N	1198	1198	1198	1199	1199	1199
R^2	0.718	0.731	0.737	0.821	0.822	0.822

Notes: OLS regression with robust standard errors, clustered at the bank level. LB indicates the dummy for listed banks; Post indicates the period since the requirements of the Quota Law became compulsory (from 2012 onwards); bank-level control variables include the log of total assets and the capital index; FE indicates fixed-effects. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. *Source*: OR.SO. archives, Bank of Italy, and balance sheet data.

Table 5
The effects of the Quota Law on diversity (including gender) in listed banks.

	A. Board of Directors			B. Board of Supervisors		
	(1)	(2)	(3)	(4)	(5)	(6)
LB X Post	0.622***	0.561***	0.556***	0.321	0.192	0.208
	(0.125)	(0.152)	(0.152)	(0.202)	(0.210)	(0.206)
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	Yes	No	Yes	Yes
Bank controls	No	No	Yes	No	No	Yes
N	1198	1198	1198	1199	1199	1199
R^2	0.504	0.510	0.516	0.475	0.487	0.496

Notes: OLS regression with robust standard errors, clustered at the bank level. LB indicates the dummy for listed banks; Post indicates the period since the requirements of the Quota Law became compulsory (from 2012 onwards); bank-level control variables include the log of total assets and the capital index; FE indicates fixed-effects. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. *Source*: OR.SO. archives, Bank of Italy, and balance sheet data.

Table 6
The effects of the Quota Law on diversity (excluding gender) in listed banks.

	A. Board of Directors			B. Board of Supervisors		
	(1)	(2)	(3)	(4)	(5)	(6)
LB X Post	0.200*	0.326**	0.323**	-0.0676	-0.108	-0.0916
	(0.110)	(0.135)	(0.135)	(0.195)	(0.202)	(0.197)
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	Yes	No	Yes	Yes
Bank controls	No	No	Yes	No	No	Yes
N	1198	1198	1198	1199	1199	1199
R^2	0.479	0.489	0.494	0.465	0.468	0.478

Notes: OLS regression with robust standard errors, clustered at the bank level. LB indicates the dummy for listed banks; Post indicates the period since the requirements of the Quota Law became compulsory (from 2012 onwards); bank-level control variables include the log of total assets and the capital index; FE indicates fixed-effects. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. *Source*: OR.SO. archives, Bank of Italy, and balance sheet data.

Table 7

The effects of the Quota Law on the share of females in the boards of banks in listed groups.

	A. Board of Directors			B. Board of Supervisors		
	(1)	(2)	(3)	(4)	(5)	(6)
BLG X Post	0.0515***	-0.0151	-0.0147	0.0702***	0.0359	0.0381
	(0.0134)	(0.0168)	(0.0168)	(0.0235)	(0.0276)	(0.0270)
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	Yes	No	Yes	Yes
Bank controls	No	No	Yes	No	No	Yes
N	1660	1660	1660	1661	1661	1661
R^2	0.502	0.633	0.633	0.527	0.567	0.573

Notes: OLS regression with robust standard errors, clustered at the bank level. LB indicates the dummy for listed banks; Post indicates the period since the requirements of the Quota Law became compulsory (from 2012 onwards); bank-level control variables include the log of total assets and the capital index; FE indicates fixed-effects. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. *Source*: OR.SO. archives, Bank of Italy, and balance sheet data.

Table 8

The effects of the Quota Law on the size of the boards of banks in listed groups.

	A. Board of Directors			B. Board of Supervisors		
	(1)	(2)	(3)	(4)	(5)	(6)
BLG X Post	-1.808***	-1.097***	-1.028***	-0.0966**	-0.0793	-0.0790
	(0.282)	(0.377)	(0.362)	(0.0490)	(0.0684)	(0.0682)
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	Yes	No	Yes	Yes
Bank controls	No	No	Yes	No	No	Yes
N	1660	1660	1660	1661	1661	1661
R^2	0.733	0.752	0.760	0.777	0.779	0.779

Notes: OLS regression with robust standard errors, clustered at the bank level. LB indicates the dummy for listed banks; Post indicates the period since the requirements of the Quota Law became compulsory (from 2012 onwards); bank-level control variables include the log of total assets and the capital index; FE indicates fixed-effects. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. *Source*: OR.SO. archives, Bank of Italy, and balance sheet data.

Table 9
The effects of the Quota Law on listed banks' performances.

	A. ROA		
	(1)	(2)	(3)
LB X Post	0.133	0.148	-0.129
	(0.310)	(0.315)	(0.444)
Bank FE	Yes	Yes	Yes
Year FE	No	Yes	Yes
Bank controls	No	No	Yes
N	1263	1263	1263
R^2	0.338	0.366	0.509
	B. ROE		
LB X Post	0.202	0.330	-0.038
	(1.911)	(1.938)	(1.938)
Bank FE	Yes	Yes	Yes
Year FE	No	Yes	Yes
Bank controls	No	No	Yes
N	1263	1263	1263
R^2	0.386	0.420	0.435
	C. Riskiness		
LB X Post	-0.648	-0.732	-0.340
	(1.267)	(1.275)	(1.193)
Bank FE	Yes	Yes	Yes
Year FE	No	Yes	Yes
Bank controls	No	No	Yes
N	1250	1250	1250
R^2	0.515	0.568	0.614

Notes: OLS regression with robust standard errors, clustered at the bank level. LB indicates the dummy for listed banks; Post indicates the period since the requirements of the Quota Law became compulsory (from 2012 onwards); bank-level control variables include the log of total assets and the capital index; FE indicates fixed-effects. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. *Source*: OR.SO. archives, Bank of Italy, and balance sheet data.

A Appendix: Additional Figures and Tables

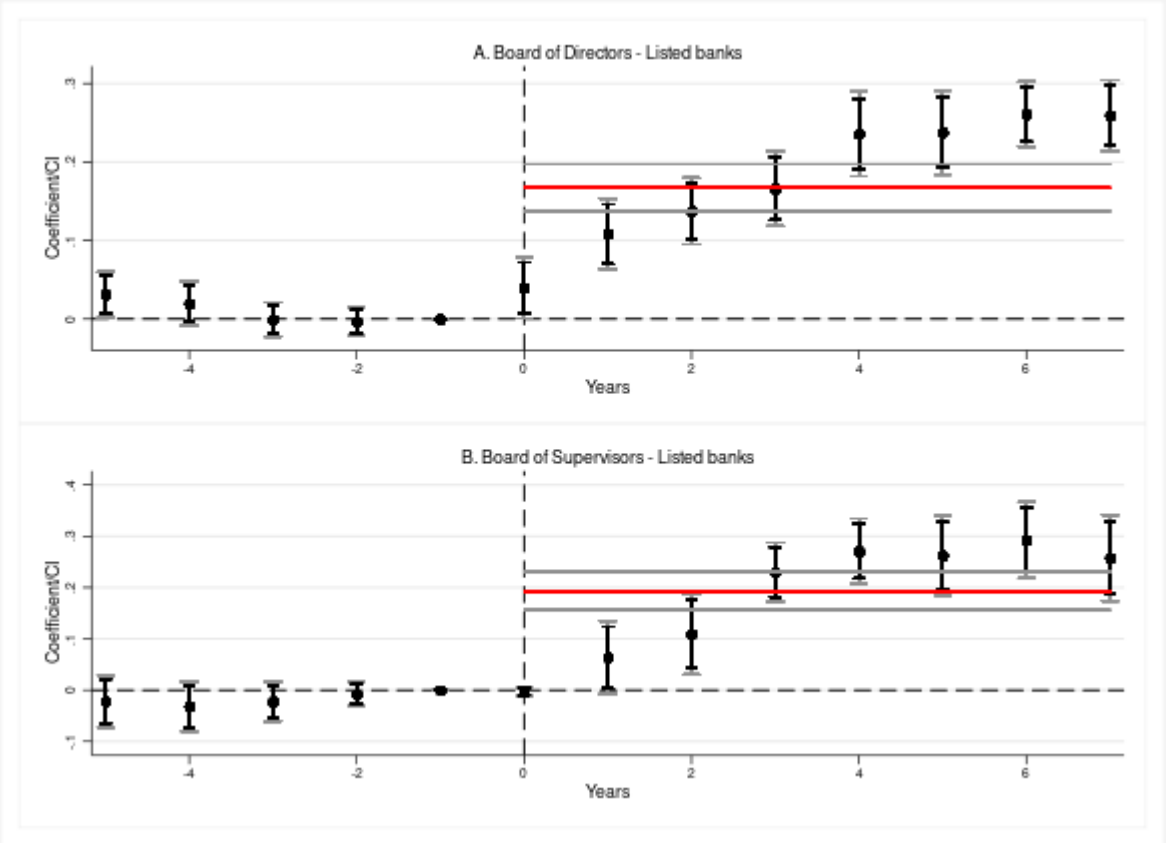
Table A.1
Diagnostic tests for the two-way FE estimator.

	ROA	*ROE*	*Riskiness*
Share of negative weights	0	0	0
σ_0	0.381	4.830	1.106
σ_{fe}	NA	NA	NA

	Share of females		*Board size*		*Diversity*		*Diversity (no gender)*	
	BD	BS	BD	BS	BD	BS	BD	BS
Share of negative weights	0.005	0.006	0.005	0.006	0.005	0.006	0.005	0.006
σ_0	0.917	0.756	6.435	1.748	3.455	0.759	1.970	0.550
σ_{fe}	198.569	435.800	1,393.618	1,007.094	746.620	436.651	425.598	316.667

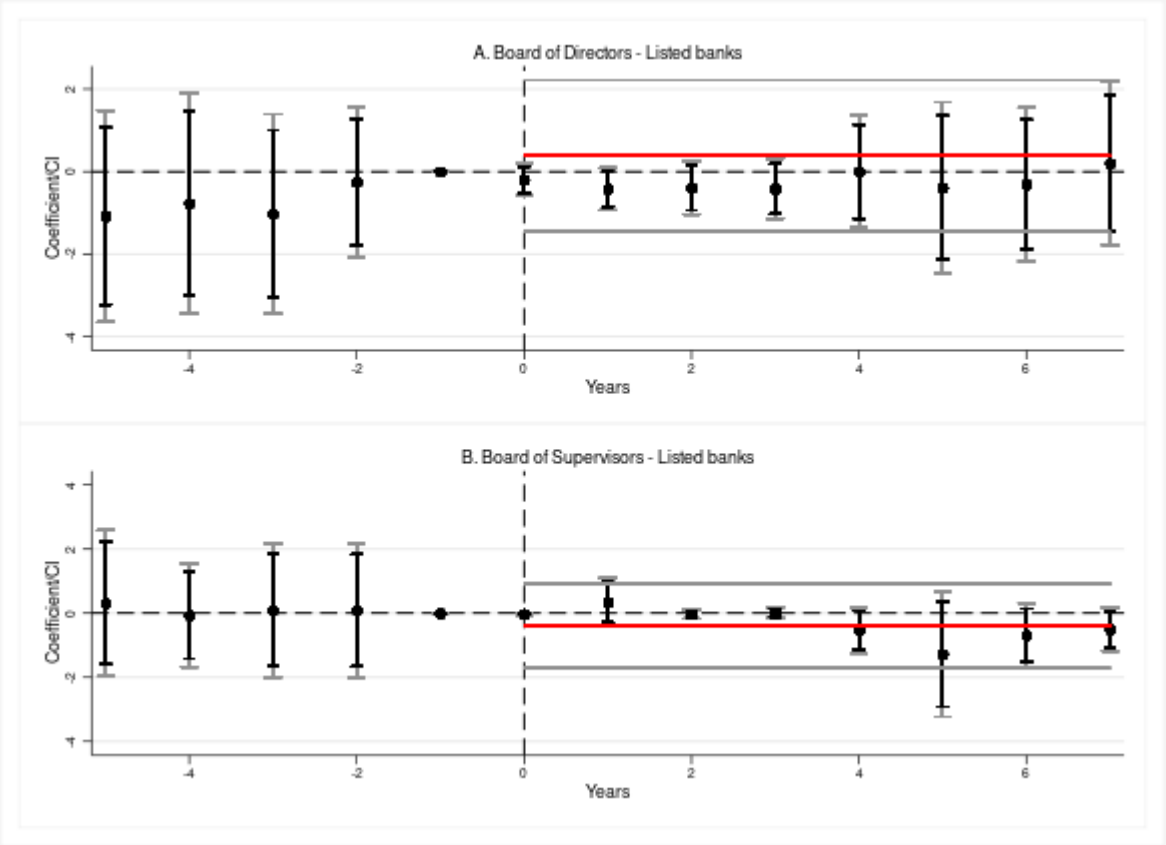
Notes: the table shows the diagnostic tests for heterogeneity in treatment effect in TWFE DID estimation framework proposed by de Chaisemartin and D'Haultfuille (2020). *Source*: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure A.1
Event study on the share of female members on the boards of listed banks with the alternative control group



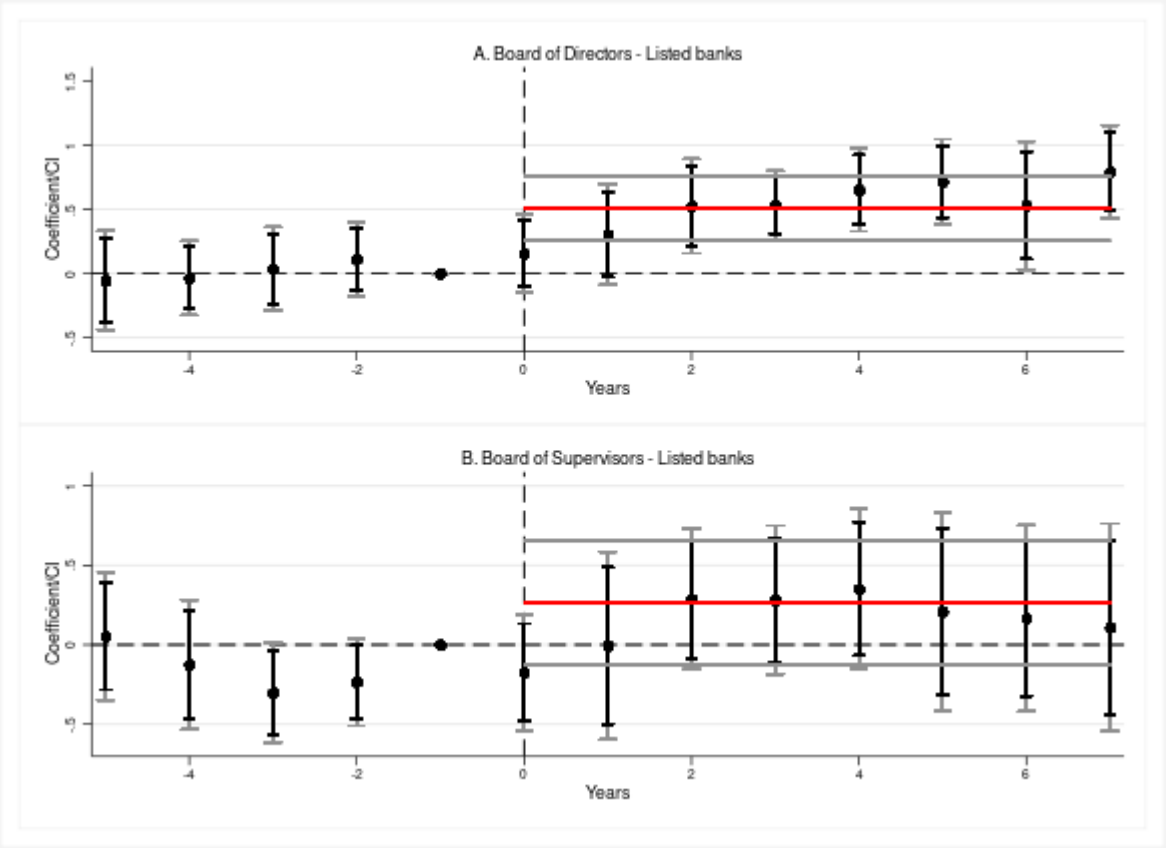
Notes: the figures depict the effects of the Quota Law on the share of female members in Boards of directors (Panel A) and supervisors (Panel B) by using as control group all Italian banks (excluding those in listed groups); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012). **Source**: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure A.2
Event study on the size of the boards of listed banks with the alternative control group



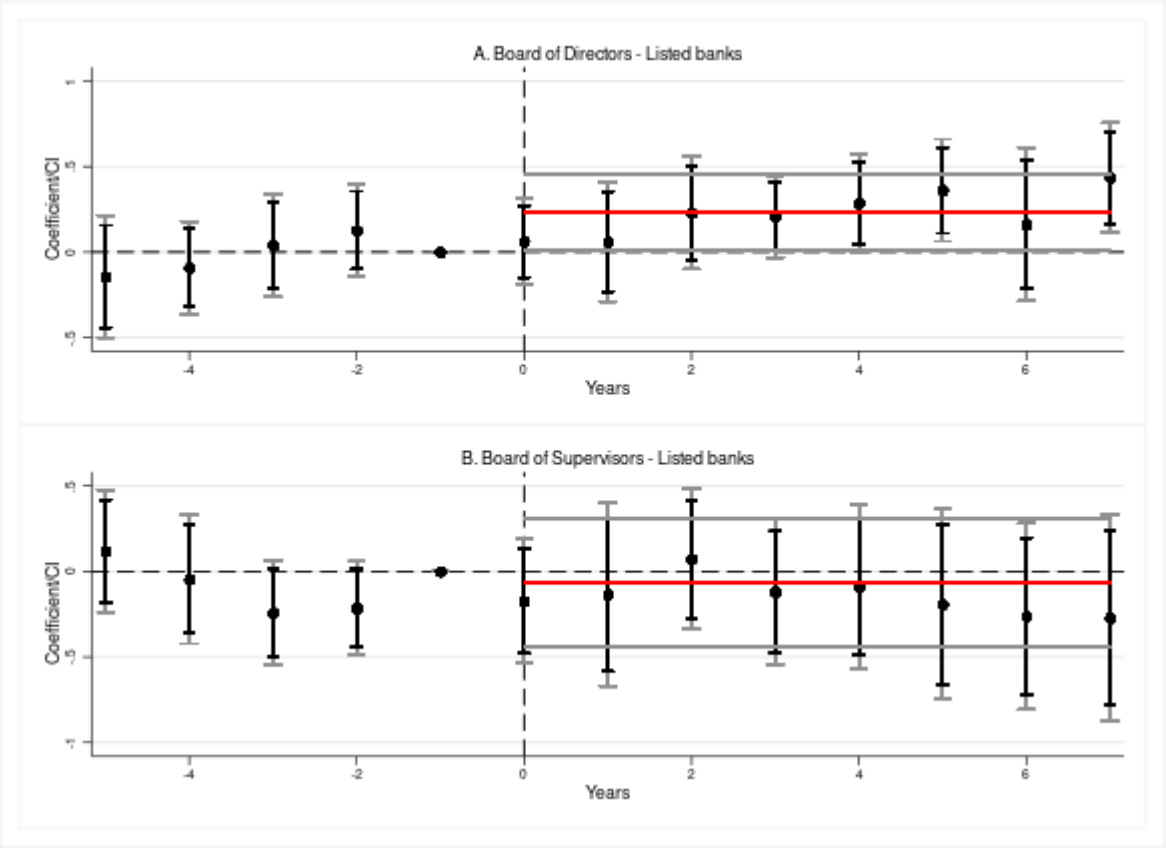
Notes: the figures depict the effects of the Quota Law on the size of Boards of directors (Panel A) and supervisors (Panel B) by using as control group all Italian banks (excluding those in listed groups); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012). **Source**: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure A.3
Event study on the measure of diversity (including gender) in the boards of listed banks with the alternative control group



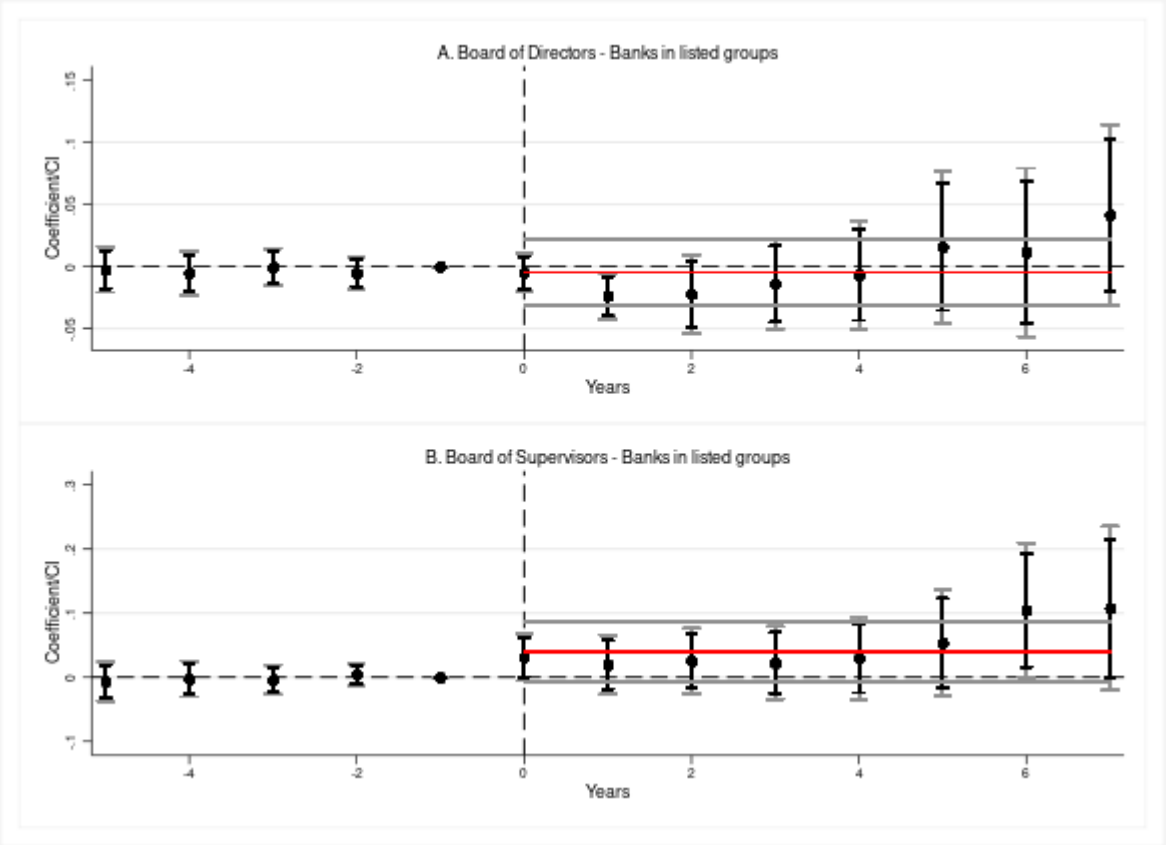
Notes: the figures depict the effects of the Quota Law on our measure of diversity (including gender) in Boards of directors (Panel A) and supervisors (Panel B) by using as control group all Italian banks (excluding those in listed groups); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012).
Source: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure A.4
Event study on the measure of diversity (excluding gender) in the boards of listed banks with the alternative control group



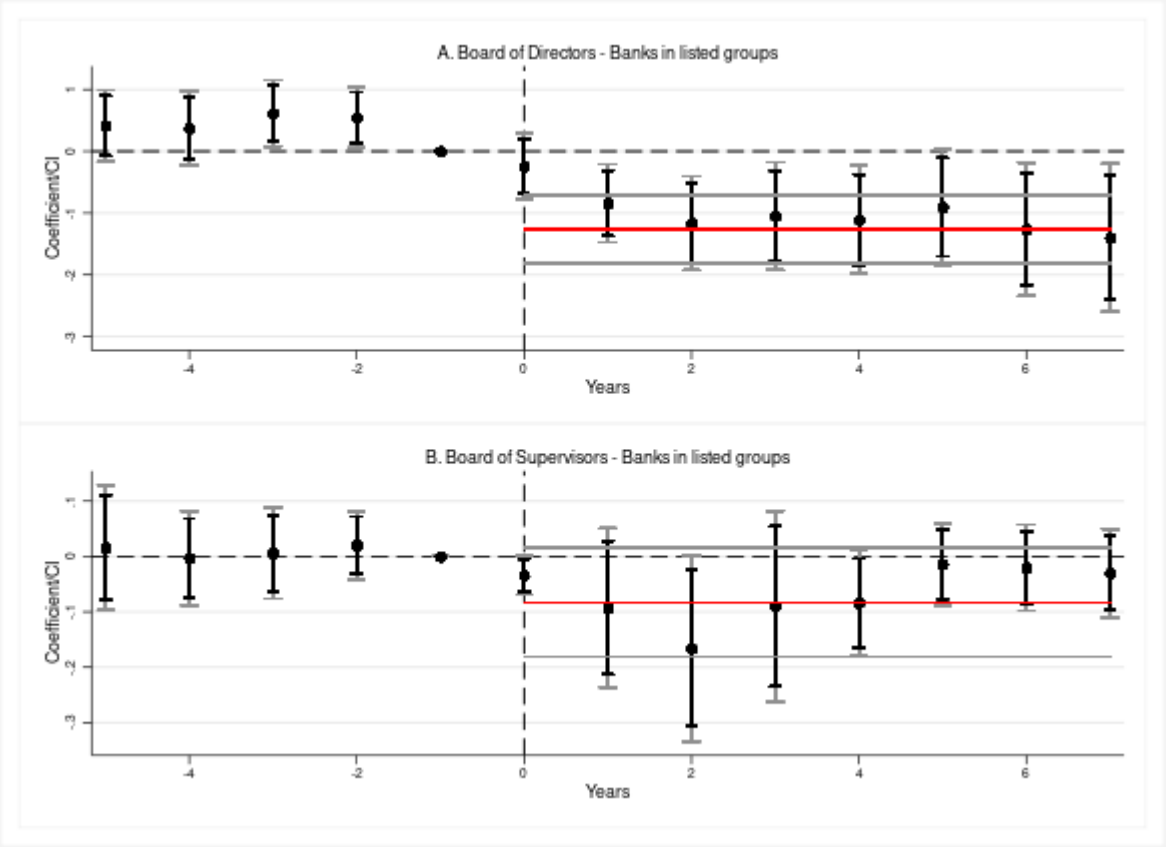
Notes: the figures depict the effects of the Quota Law on our measure of diversity (excluding gender) in Boards of directors (Panel A) and supervisors (Panel B) by using as control group all Italian banks (excluding those in listed groups); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012).
Source: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure A.5
Event study on the share of female members on the boards of banks in listed groups



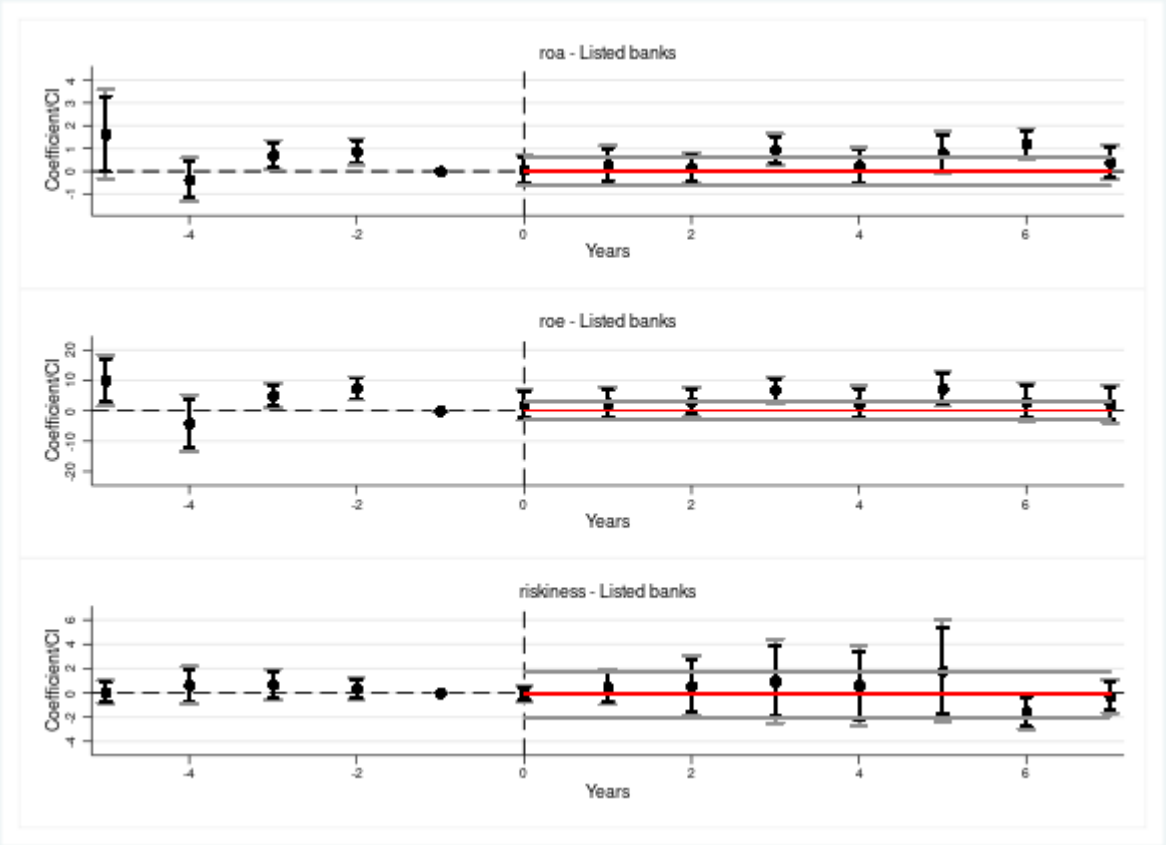
Notes: the figures depict the effects of the Quota Law on the share of female members in Boards of directors (Panel A) and supervisors (Panel B) by using as control group all Italian banks (excluding those in listed groups); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012). **Source**: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure A.6
Event study on the size of the boards of banks in listed groups with the alternative control group



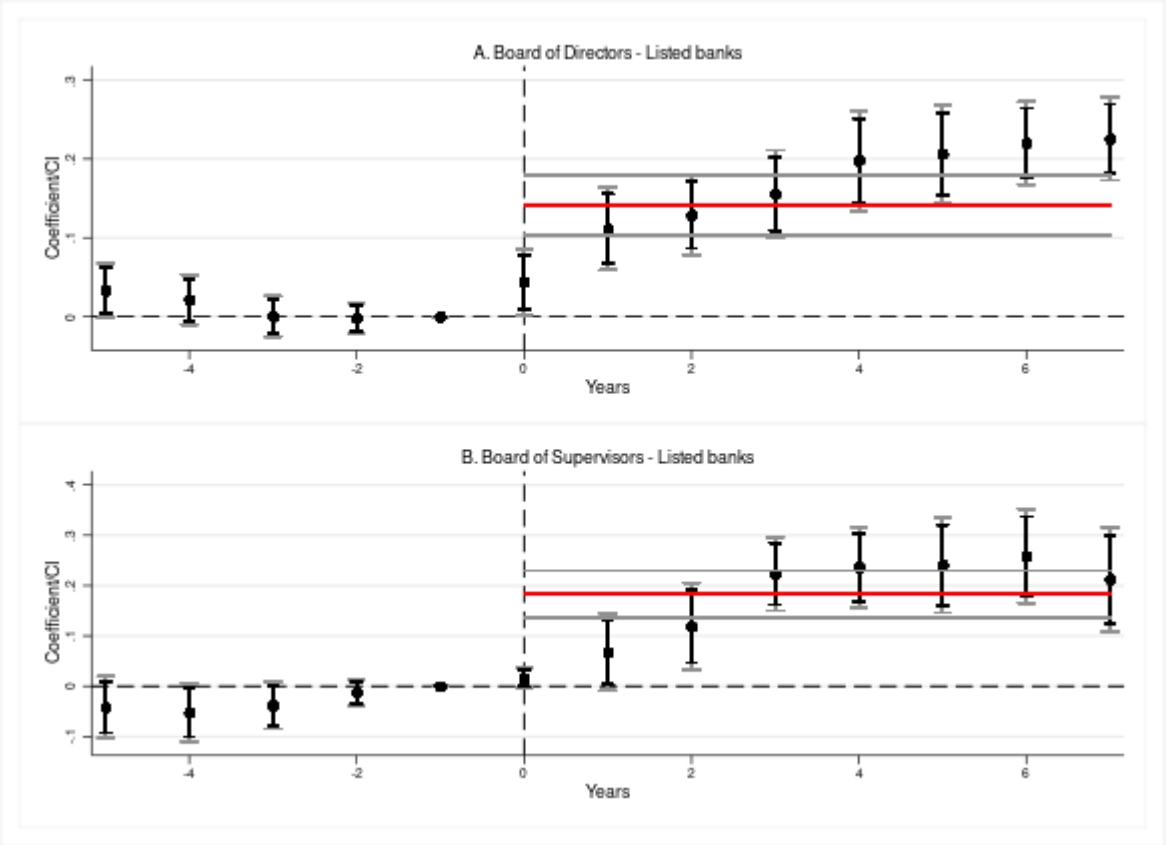
Notes: the figures depict the effects of the Quota Law on the size of Boards of directors (Panel A) and supervisors (Panel B) by using as control group all Italian banks (excluding those in listed groups); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012). **Source**: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure A.7
Event study on the performance of listed banks with the alternative control group



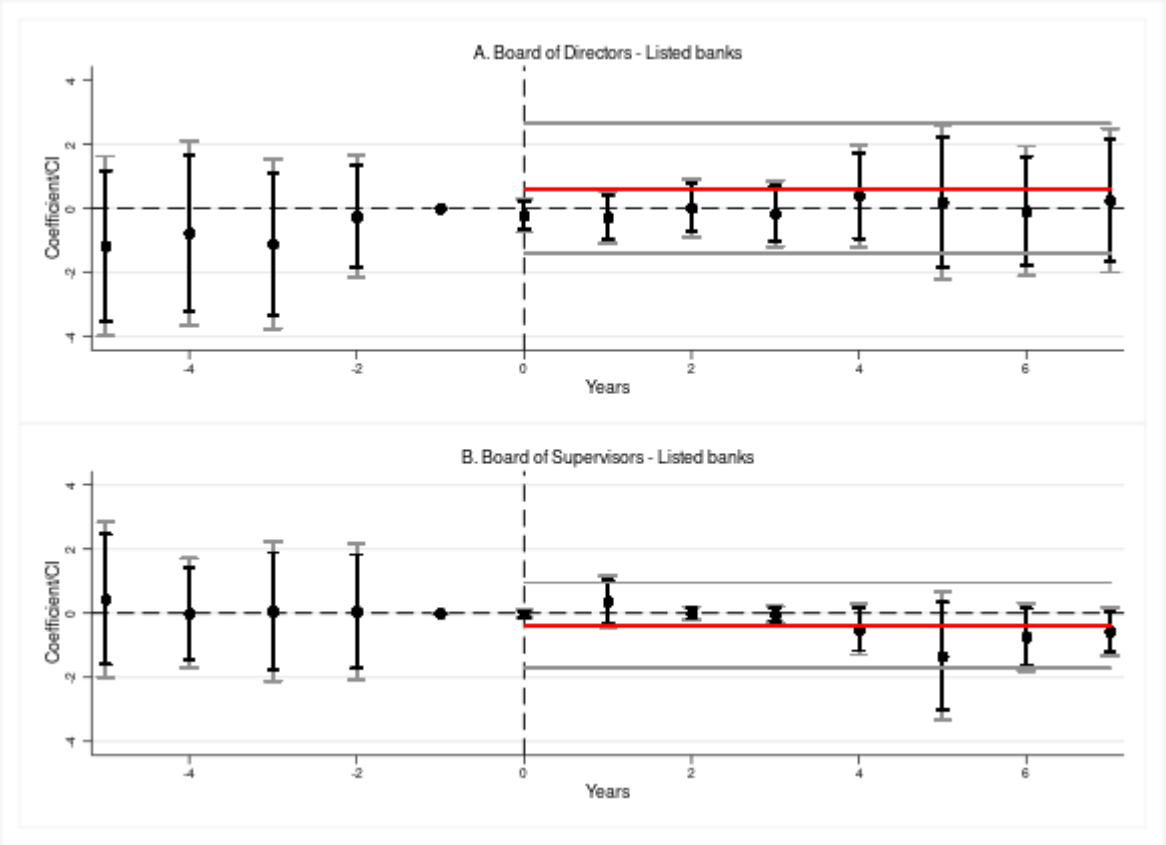
Notes: the figures depict the effects of the Quota Law on four measures of performance of listed banks: return on assets (ROA, top Panel), return on equity (ROE, middle Panel), and a measure of riskiness (the share of bad loans on total loans; bottom Panel); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012). **Source**: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure A.8
Event study on the share of female members on the boards of listed banks with region-specific trends



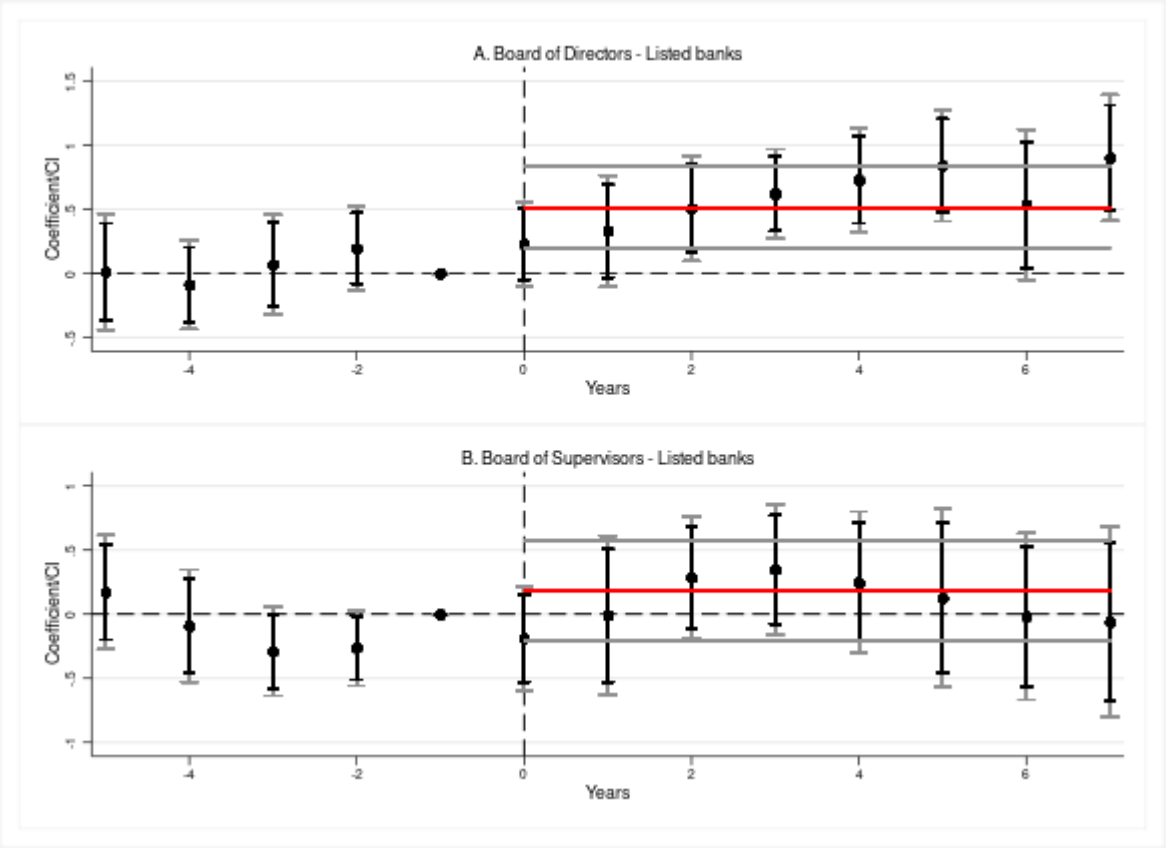
Notes: the figures depict the effects of the Quota Law on the share of female members in Boards of directors (Panel A) and supervisors (Panel B) by using as control group all Italian banks (excluding those in listed groups); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012). **Source**: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure A.9
Event study on the size of the boards of listed banks with region-specific trends



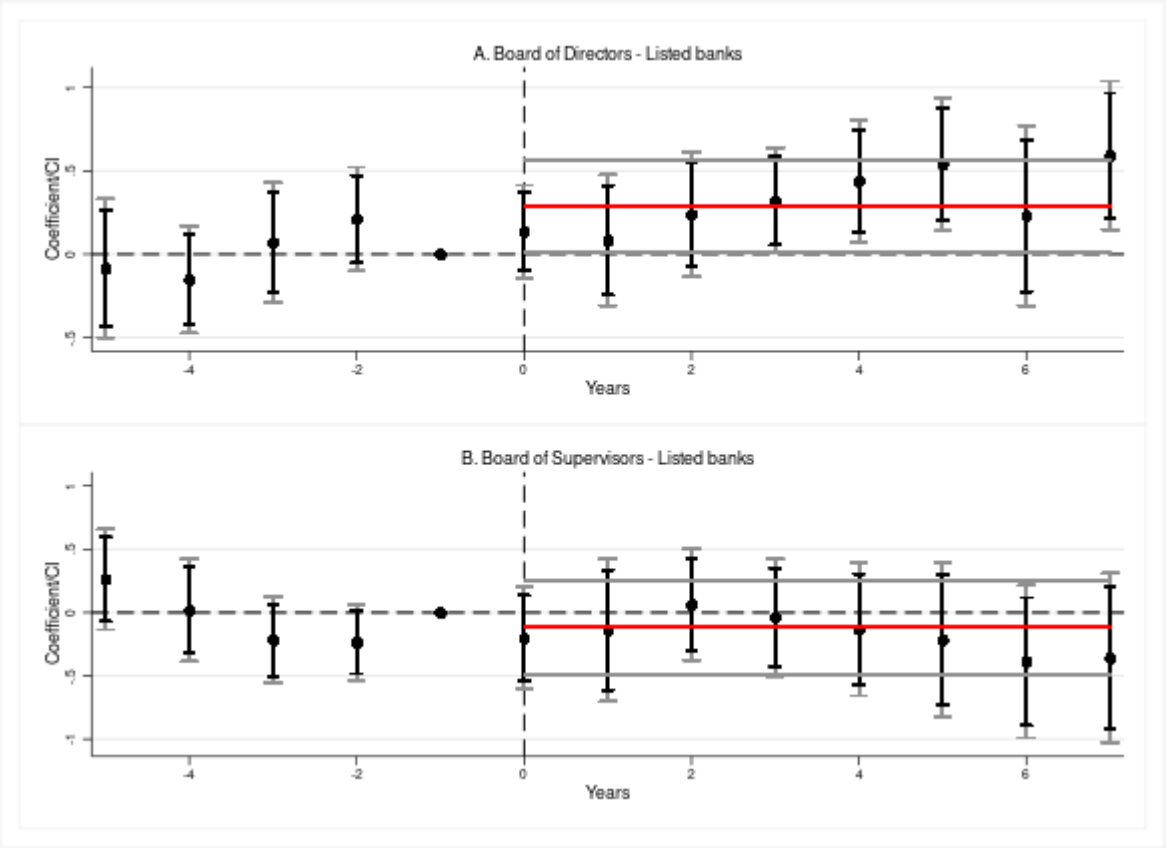
Notes: the figures depict the effects of the Quota Law on the size of Boards of directors (Panel A) and supervisors (Panel B) by using as control group all Italian banks (excluding those in listed groups); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012). **Source**: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure A.10
Event study on the measure of diversity (including gender) in the boards of listed banks with region-specific trends



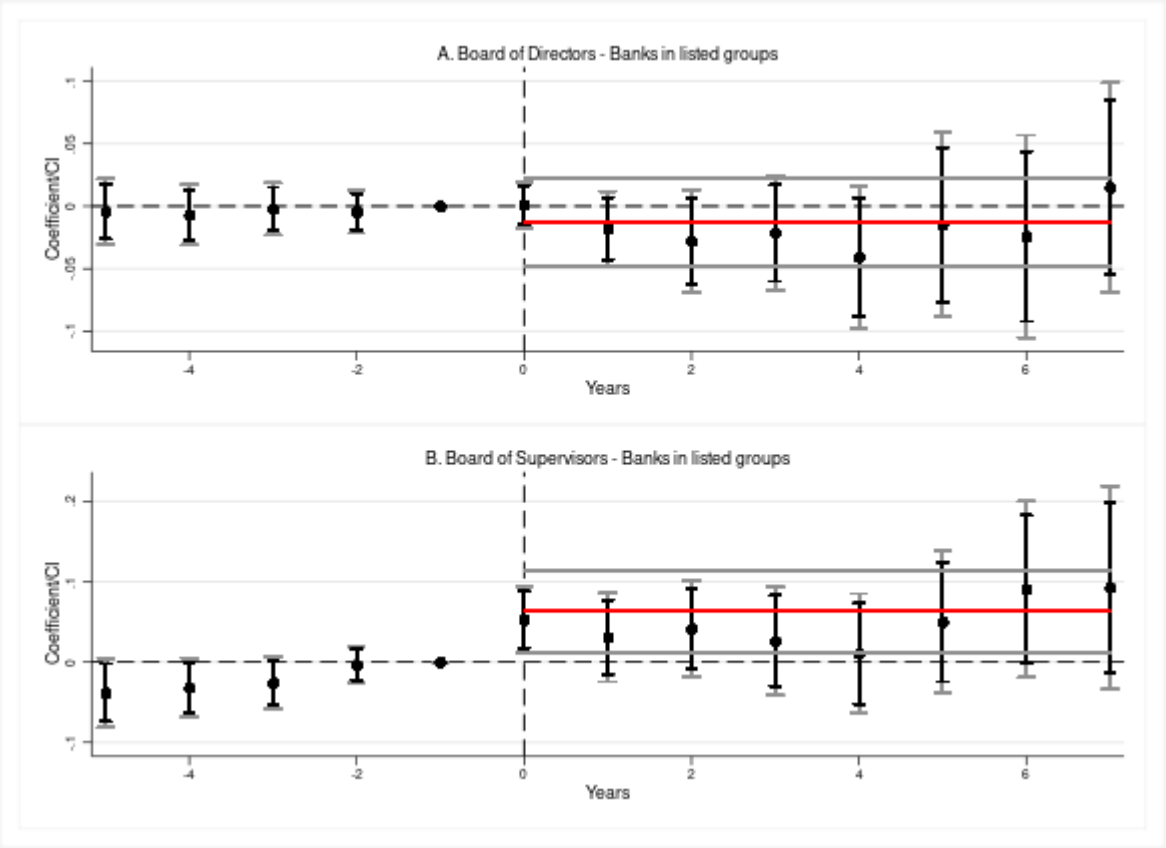
Notes: the figures depict the effects of the Quota Law on our measure of diversity (including gender) in Boards of directors (Panel A) and supervisors (Panel B) by using as control group all Italian banks (excluding those in listed groups); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012).
Source: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure A.11
Event study on the measure of diversity (excluding gender) in the boards of listed banks with region-specific trends



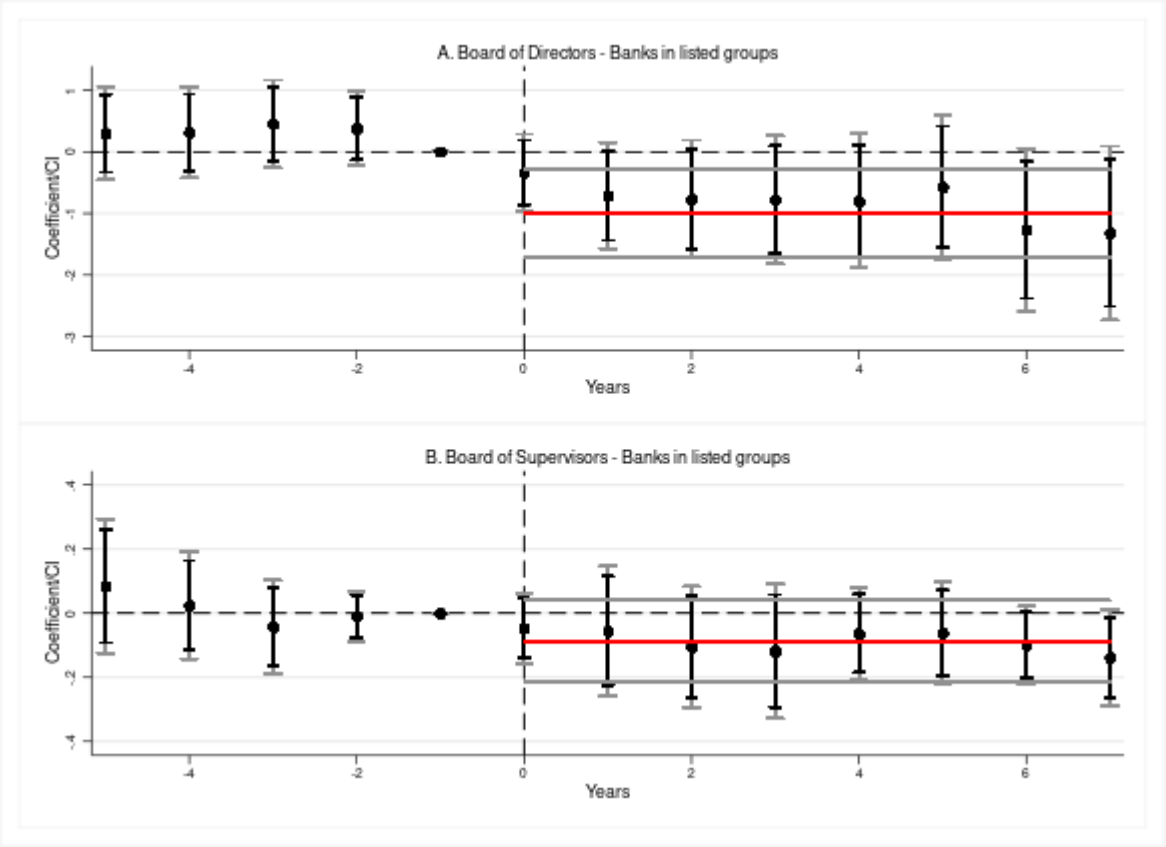
Notes: the figures depict the effects of the Quota Law on our measure of diversity (excluding gender) in Boards of directors (Panel A) and supervisors (Panel B) by using as control group all Italian banks (excluding those in listed groups); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012).
Source: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure A.12
Event study on the share of female members on the boards of banks in listed groups with region-specific trends



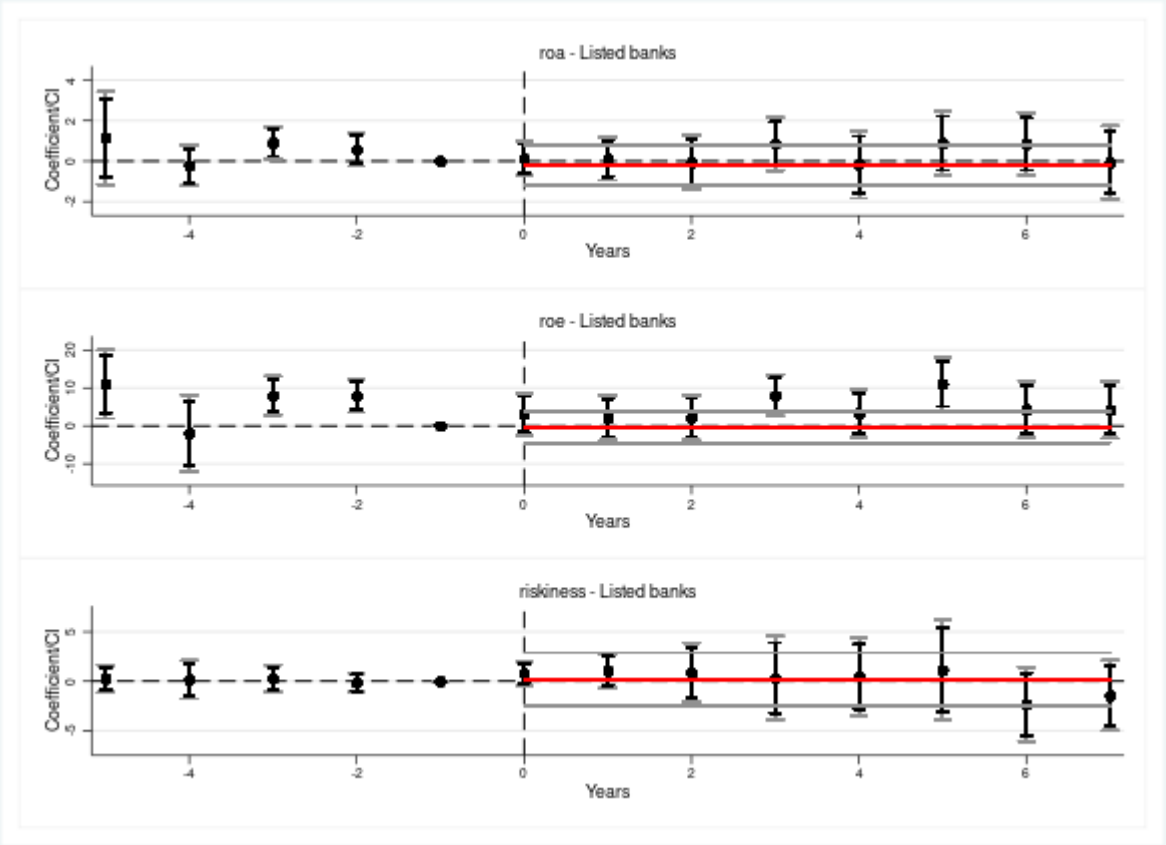
Notes: the figures depict the effects of the Quota Law on the share of female members in Boards of directors (Panel A) and supervisors (Panel B) by using as control group all Italian banks (excluding those in listed groups); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012). **Source**: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure A.13
Event study on the size of the boards of banks in listed groups with region-specific trends



Notes: the figures depict the effects of the Quota Law on the size of Boards of directors (Panel A) and supervisors (Panel B) by using as control group all Italian banks (excluding those in listed groups); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012). **Source**: OR.SO. archives, Bank of Italy, and balance sheet data.

Figure A.14
Event study on the performance of listed banks with region-specific trends



Notes: the figures depict the effects of the Quota Law on four measures of performance of listed banks: return on assets (ROA, top Panel), return on equity (ROE, middle Panel), and a measure of riskiness (the share of bad loans on total loans; bottom Panel); the red line indicates the average effect (in the post-reform period) and the grey lines its 90 per cent confidence interval; the black dots indicate the dynamic effects in the post-reform period and the test for parallel trends in the pre-reform period; the dark and light grey vertical ticks indicate the corresponding 90 and 95 per cent confidence intervals. Year 0, in each panel indicates the year in which the requirements of the Law became compulsory (2012). **Source**: OR.SO. archives, Bank of Italy, and balance sheet data.

B Appendix: A literature review on board diversity and gender quotas: theory and empirical evidence

Within the theory of corporate governance, agency theory has been frequently used to investigate whether female directors help boards and subcommittees in monitoring firm managers' behavior (Adams and Ferreira 2009). A large experimental literature supports the coexistence of the *nature* and *nurture* perspectives and argues that these two perspectives are complementary when it comes to explaining differences and similarities between women and men in economic contexts too (for a recent review, see Eagly and Wood 2013).[17]

Since gender differences are relevant, the appointment of female directors could make board composition more diverse and have a positive impact on economic outcomes, in the banking sector too. Indeed, female directors are more likely than male directors to be more effective monitors (Adams and Ferreira 2009); especially in non-healthy conditions, some studies find that the replacement of executive directors is more likely in case of poor bank performance when the share of women on board is higher (Del Prete and Stefani 2013). Moreover, several papers show that women on boards are more ethical, mainly on remuneration committees (Alkalbani, Cuomo, and Mallin 2019), more independent, as they are not beholden to group think (Adams 2016), more effective in adopting governance best practices and reducing absenteeism (Bianco, Ciavarella, and Signoretti 2014), more risk-averse than men in financial decisions (Bellucci, Borisov, and Zazzaro 2010; Del Prete and Stefani 2021), more prepared and long-term oriented than men (Huse and Solberg 2006), since they spend more time in considering complex decisions and this can help to reduce negative effects on multiple outcomes and stakeholders (Hillman 2015).

The existing literature in economics and management science has prevalently focused on the aspect of gender diversity, and on its effects on economic outcomes (Alesina and La Ferrara 2005). Indeed, a sizable literature has investigated the effects of the appointment of female directors on governance practices, profitability, riskiness, stock market value and other economic and financial performance outcomes, mainly outside the context of gender quotas and with not fully conclusive results. Concerning governance practices, diversity on corporate boards may improve best practices (Bianco, Ciavarella, and Signoretti 2013; Dhir and Dhir 2015) *via* a higher attendance at board meetings, encouraging a better selection of board members, reducing family affiliated directors and enhancing more meritocratic se-

[17] Women and men behave differently as their brain structure and hormones that activate behaviors are different (Guiso and Rustichini 2011); similarly, cultural traits (e.g., unconscious biases, norms, and stereotypes) and socialization (e.g., parental socialization, peer group, children's social context) affect differently gender behavior during life (Eagly and Wood 2013; Zanoni, Janssens, Benschop, and Nkomo 2010).

lection process (Bianco et al. 2014). This topic is even more relevant in the Italian banking sector, where in the pre-quota law period, the female presence on bank boards (mainly on decisional roles) was very rare (Del Prete and Stefani 2013). The female style of leadership, more inclined to monitor outcomes and with a higher risk-aversion (Bertrand 2011), is not always positively correlated with performance. Adams and Ferreira (2009) find a negative impact of gender diversity on profitability of non-financial firms. On the contrary, Garca-Meca, Garca-Snchez, and Martnez-Ferrero (2015) show that gender diversity in European banks increases bank performance, while national diversity inhibits it, especially in contexts of weaker regulatory and lower investor protection environments. At the same time, Del Prete and Stefani (2021) support the evidence that female presence on Italian bank boards positively affects loans portfolio riskiness and enhances bank profitability. However, the view that women are more risk-averse than men, especially in financial sectors, is challenged by Adams and Ragunathan (2017) and Berger et al. (2014). Non-conclusive results also emerge when looking at the relationship between women's empowerment and stock market returns. Dobbin and Jung (2011) argue that women on corporate boards are more likely to adversely affect stock prices, and less likely to positively affect profitability. Adams and Funk (2012) find a positive relationship, and Ryan and Haslam (2005) suggest a significant increase in share prices following the appointment of a female director, even if women are more likely to be appointed in times of general financial downturn and in more precarious positions (the so-called glass cliff). Moreover, other studies highlight the existence of a *critical mass* of women on boards (Schwartz-Ziv 2017), as well as a positive interaction among female CEOs and women on boards (Amore, Garofalo, and Minichilli 2014) or among female CEOs and female workers employed at the firm (Flabbi, Macis, Moro, and Schivardi 2014).

Concerning the influence on human capital, Bertrand, Black, Jensen, and Lleras-Muney (2014) report that gender quotas for listed companies in Norway have improved the representation of female employees at the very top of the earnings distribution within affected firms, while they had no trickle-down effects. Matsa and Amalia (2012) suggest that firms affected by the quota law have fired fewer workers, increasing relative labor costs and employment levels and reducing short-term profits. Recent studies with a focus on politics have shown that gender quotas are not at odds with meritocracy: quotas help to increase the quality of representatives. In the Italian case, gender quotas have been associated with a better quality of politicians (Baltrunaite, Bello, Casarico, and Profeta 2014), measured by their level of education. In the Swedish case, the zipper quota, by requiring to alternate men and women on a party's list of candidates, has increased both female representation and, interestingly,

the competence of male politicians, signaling spillover effects across genders (Besley, Folke, Persson, and Rickne 2017).

As far as firm performance, results are still mixed also in the context of mandatory gender quotas. Nygaard (2011) shows that gender quotas caused negative capital market reactions, because young and less expert members are serving on boards. However, he argues that this effect depends on asymmetric information between independent members on the boards and the companies' managers. Similarly, Ahern and Dittmar (2012), using the prescription of gender quotas in Norway for listed firms, suggest a negative overall effect, due to the small pool of female candidates leading to the selection on boards of younger and less experienced female directors. Comi et al. (2020), comparing the implementation of gender quotas in France, Italy and Spain, suggest that different effects of quotas' prescription on performance could depend also on different design of legislation on corporate gender quotas across countries, in terms of size of the pool of target firms, status of permanent or temporary measures and severity of sanctions for non-compliers. Using firm-level accounting data and a difference-in-differences estimator, the authors find that gender quotas had either a negative or an insignificant effect on firm performance in the countries considered with the exception of Italy, where they find a positive impact only on productivity. The authors argue that this positive effect for Italy could be related to the small pool of Italian targeted firms and to the fact that the *excess of supply* should be more likely in Italy than in other EU countries with less gender imbalance and with a broader application of gender quotas.[18]

In Italy, board gender quotas have provided rooms to further research in studying the causal link between women's empowerment and economic outcomes. In this respect, Ferrari et al. (2021) find that the increase in the share of female directors is associated with a lower variability of stock market prices of Italian listed companies, signaling that gender quotas give rise to a beneficial restructuring of the board, which is positively received by the market. Bruno et al. (2018) suggest that the Italian quota law improved changes in corporate board composition, boosting experience and education of board members; however, the positive effect on firm performance stemming from board composition changes depends on a critical mass of women in charge, varying between 17 and 20 percent. Similarly, studying the implementation of the Italian quota law, Gordini and Rancati (2017) find that gender diversity, as measured by the percentage of women on a board and by the Blau and the

[18]Mandatory gender quotas, like any regulation that forces firms to change their current behavior, are expected to affect firms performance negatively, unless an excess of highly qualified (female) managers are ready to sit on boards (Ferreira 2015). *Excess of supply* is more likely when firms make their choices on the basis of either statistical or taste-based discrimination and/or when gender quotas are targeted on a small sample of firms.

Shannon indices, has a positive and significant effect on Tobin's Q, while the presence of one or more women on the board *per se* has an insignificant effect on firm financial performance. Baltrunaite, Cannella, Mocetti, and Roma (2021), analyzing the impact of gender quotas on Italian State-owned enterprises, show that female presence on the boards of directors increased, replacing older and less talented men. Moreover, they detect no significant effects on firm productivity, while they find that profitability increases and leverage decreases, thereby reducing corporate credit risk.

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