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Gender Quotas, Board Diversity and Spillover Effects. Evidence from Italian Banks*

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Abstract

We study the impact of a law, which required the increase of the proportion of women on boards of listed companies to at least one third. We look at its impact on listed banks, but also test whether it led to spillovers into non-listed banks belonging to listed groups or along other board diversity dimensions. Using administrative data, we compare diversity measures of boards of listed and non-listed banks in listed groups with those in non-listed groups, before and after the introduction of the law, in a difference-in-differences specification. We find that the imposition of the gender quota only changed the composition of the boards of listed banks, with no effect on their economic performance, nor spillovers on other non-listed banks in listed groups. The law enhanced diversity of boards of listed banks, also along individual characteristics other than gender.

JEL Classification: G21, G38, J48, J78

Keywords: bank boards, diversity, gender, corporate governance

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1 Introduction

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 2023). Given that women are also often under-represented on corporate boards, especially in top positions in banking and finance (Mateos De Cabo, Gimeno, and Nieto 2012), since the 2000s many European countries have implemented specific policies to boost female representation. 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 recommendations (e.g. in the United Kingdom and in the United States).

Despite their wide adoption in European countries, gender quotas are still a controversial policy, and the existing literature on their effects on both business and politics, carries mixed results (Comi, Grasseni, Origo, and Pagani 2020; Czibor and Dominguez Martinez 2019; Ferrari, Ferraro, Profeta, and Pronzato 2021; Profeta, Amidani Aliberti, Casarico, D’Amico, and Puccio 2014). The main argument in favor of gender quotas is their effectiveness as a tool to equalize opportunity in specific sectors where women face systematic obstacles in accessing top positions due to discrimination or persistent stereotypes. Such policies may lead to a redistribution of jobs or board positions in favor of women and boost female empowerment, with a beneficial impact on women’s human capital, firm productivity and efficiency (Conde-Ruiz and Profeta 2015). However, critics maintain 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 performance when applied to business.

In this open debate, our contribution to the topic exploits the implementation in 2011 of a gender quota law in Italy,¹ setting a minimum proportion of gender representation in both executive and supervisory boards of all companies listed on the Italian stock market (including banks) to study both the direct and indirect effects in terms of diversity generated in the banking sector.² Indeed, we focus both on the group of banks directly targeted by

¹Law No. 120/2011, see section 2 for details. For the sake of simplicity, unless differently specified, in the reminder of the paper we will refer to the *quota law* or simply the *law*. In Italy, the setting of our study, gender gaps are particularly severe and pervasive (Bianco, Ciavarella, and Signoretti 2014; Carta, De Philippis, Rizzica, and Viviano 2023). According to the last Gender Gap Indicator (GGI, 2023), provided by the World Economic Forum, Italy scored 79th over the 146 countries surveyed, whereas close European countries, such as Spain and France, scored, respectively, 18th and 40th.

²The law also applied to State-owned companies, on which we do not focus; see on the issue Baltrunaite,

the quotas, and on their subsidiaries, for which the quota requirement was not binding but could be subject to *spillover* effects induced by the law in terms of diversity of the board composition and economic performance.³

From a conceptual view point, board diversity might entail both benefits and costs. 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 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, and a lack of cooperation and communication (Ferreira 2011).

The policies introducing board gender quotas have provided opportunities in the last decade for research in studying the causal link between women’s empowerment and economic outcomes, especially for non-financial sectors. However, the implementation of mandatory gender quotas in the banking sector has been less explored, due to its special *status* as a highly regulated sector, and the availability of data. Moreover, the few existing studies provide mixed results. 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 Difference-In-Differences (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. Mazzotta and Ferraro (2021) examine the impact of an increasing board gender diversity on the performance of Italian listed banks over the period 2008-2014, finding a positive relationship between performance accounting measures and gender diversity, and a negative effect on market values. In a paper closely related to our, Bongiovanni, De Vincentiis, Cannella, Mocetti, and Roma (2023).

³For *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 behaviors deriving from different social constraints and power relations (see Ferreira (2011)).

Guariglia, Isaia, and Rossi (2023) focus on horizontal spillover effects and document an increasing trend in female presence over the years following the quota law in a sample of about a hundred of Italian non-cooperative unlisted banks.

In this paper we use a DID identification strategy to compare board composition, diversity measures, and performance indicators 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), before and after the introduction of the Italian quota law. 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 limit the control group of banks to those belonging to a group. We believe this allows us to maintain a more comparable group of banks, especially regarding their organizational structure, and the possibility of sharing company knowledge and culture, which is at the basis of the idea of spreading good practices, such as increasing female board representation.⁴

To the best of our knowledge, our paper innovates the literature along three main dimensions. While existing literature has predominantly focused on the effects of gender quota laws on the targeted institutions, we are among the few who also look at possible spillover effects of such laws, enriching the empirical literature on the field (see Section 3).⁵ Indeed, the quota law under study was intended to be a temporary intervention to be applied for a short period of time, in order to establish good practices connected with gender equality in board representation.⁶ In this light it became of paramount importance to understand whether the increased female representation only featured in the targeted institutions, or whether it spread to their subsidiaries, *via* shared firm culture, administrative practices and soft norms. By exploiting rich administrative data sources, we are able to reconstruct connections among banks within the same banking group, in order to investigate spillover effects in board diversity measures from listed banks to those belonging to listed groups.

Moreover, spillovers of gender quotas on corporate board diversity may involve other

⁴We also check the robustness of our findings against an alternative control group but find no relevant differences with respect to the baseline estimates.

⁵Only Bongiovanni et al. (2023) focus on horizontal spillovers in the banking sector in a period comparable to ours. We will discuss in detail the differences with respect to their approach in Section 3.

⁶The quota law was intended to last for three consecutive renewals of board members, corresponding to about 10 years. In 2019 the Italian Parliament extended the validity of the law for three additional renewals.

bank board features different from gender. Then, 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. In our data we observe four main dimensions of diversity of each board member (i.e., gender, geographical provenance, age, tenure), which we consider separately or combined in order to obtain a single index expressing the degree of diversity in each single bank board. This feature allows us to look at whether the members in the boards, following the introduction of the quota law, were different from the previous ones only because females were included, or whether the introduction of female members also increased diversity along other demographic dimensions.

Finally, our work is among the few which specifically focuses on the banking sector. Given that diversity on corporate boards could enhance performance, *via* an effective decision-making process,⁷ improving best practices through 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. In this regard, Italian banks represent a very interesting case study for gender quotas, because during the 2000s they were characterized by a very low proportion of women on boards (Del Prete and Stefani 2013) with mixed effects on performance and bank portfolio riskiness (Del Prete and Stefani 2021). Despite the prescription of mandatory quotas for Italian listed companies, the proportion of female directors on Italian bank boards is still on average lower than in other European countries. Among the 29-EU banking systems, Italian banks are lower performers in gender balances, especially in terms of representation of female executive directors (EBA 2016). 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), while the most recent report released in 2020 shows just a slight improvement (EBA 2020). This means that, in contrast to other sectors where female board representation was generally higher (Comi et al. 2020), the introduction of the law induced a sharp and sudden increase in the presence of female members, which might have impacted both company's culture and business decisions in a starker way.

Our main findings, robust to different specification checks, suggest that the Italian quota law increased the proportion of women on the boards of Italian listed banks, both as directors and as supervisors. Using our synthetic indicator we also find that only in the board of

⁷Principles for Enhancing Corporate Governance, BCBS, 2010.

directors, the quota law generated a higher diversity which is not entirely explained by the gender component. Moreover, we find no evidence of spillover effects on banks belonging to listed groups, as the share of women on boards remains unchanged for these financial institutions. Finally, we report 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 company efficiency.

The rest of the paper is organized as follows. Sections 2 and 3 describe, respectively, the institutional background and the literature related to gender quota spillovers, while section 4 presents the data used and the main descriptive evidence. In section 5 is reported the empirical strategy, while section 6 discusses the main results, and section 7 presents the set of robustness checks. Finally, section 8 reports concluding remarks and derives some policy implications.

2 Institutional setting

The quota law (Law No. 120/2011) came into force on August 12th 2011, requiring that the boards of listed companies be renewed reserving at least 1/5 of their 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.

We refer to the one-year period between the approval of the law by the Italian Parliament and the beginning of its binding requirements (i.e. from August 12th 2011 to August 12th 2012) as the *phase-in* period (Ferrari et al. 2021). 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.⁸ In the intention 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 law. Typically, listed companies had to amend their statutes in order to introduce the rules necessary to guarantee female representation on the company board. However, this could have allowed companies to strategically modify the statutes in order to side-step some formal obligations of the law or to limit their impact on their governance structure. We will come back to this issue when analyzing the unintended consequences of the quota law and the chance for opportunistic

⁸Art. 144 undecies (*Gender balance*) in the listed companies regulatory framework (so-called *Regolamento degli emittenti*), updated by the CONSOB in February 2012. Specifically, it was made clear that, in the case that 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. E.g., in the case the board counts 10 seats, compliance with the 1/5 rule is achieved with 2 women in the board; in case the board counts 11 seats, compliance is achieved with 3 women.

behavior on the part 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 the case that 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).

The law was meant as a temporary intervention, its requirements expiring in 2021.⁹ The intention of the Legislator 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 cease to be mandatory, adequate female representation on boards will no longer be ensured. The law applies to both management and supervisory boards in a target company, as the quota requirements must be met on each board independently. For this reason we will analyze them separately in our empirical specifications.¹⁰ From August 2012, depending on the expiry date of each board member's mandate (which could not be manipulated), when a board seat became vacant the renewal was subject to the gender quota prescription, thus determining a sort of staggered adoption of the norm.¹¹ In the robustness section, we will take into account this staggered implementation of gender quotas for Italian bank boards, distinguishing the different appointments along time.

The law directly applied to Italian listed banks. In order to understand whether a cultural change was initiated by the law in the banking sector, we 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 for them. That is, we focus our attention on banks belonging to a group whose parent holding bank is listed. Both groups of banks are 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 into the non-listed institutions belonging to a listed group.¹² Other banks belonging to a group whose parent bank is not listed constitute our control group.

⁹At the end of 2019, the Parliament extended the obligations of the law for other 3 renewals, and increased the gender quota requirement to 2/5.

¹⁰For 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.

¹¹Notice that in our context, the appointment regards each single board member, and not the entire board.

¹²For the sake of simplicity, we will hereafter call *listed group* a group whose parent holding bank is listed.

To conclude, it is also important to notice that in 2012 Italian banks were not only affected by the gender quota law, but also by the prohibition of interlocking directorates, i.e. a business practice for which directors sit on more than one corporate board of different companies or financial institutions. The law on interlocking directorates (ID, henceforth) was passed by the Italian Parliament in December 2011, as a part of the so-called *Save Italy* decree (Law Decree 201/2011 of December 6, 2011), and its obligation came into force by the end of April 2012. In order to stimulate competition and foster long-run economic growth, the measure on ID forbids any individual to hold simultaneous appointments in the governing bodies (boards and other top management positions) of two competing banking groups (i.e., those operating in the same local market). Therefore, an individual who had multiple board appointments in competing banks had to opt for only one of them by the end of April 2012 ([Barone, Schivardi, and Sette 2022](#)). This rule applied, and still applies, to all financial institutions, both listed and unlisted, and could have overlapped its effects to those of gender quotas. In our econometric exercise, we carefully take this into account, and discuss the extent to which some of our results could be driven by ID in addition to the gender quota law.

3 Gender quota spillover effects and related literature

In Italy, as in other countries, the gender quotas law stimulated the debate on how some best practices in corporate governance, as a higher gender diversity on boards, can positively contaminate other companies, not directly targeted by the law, or other dimensions of corporate board composition or firm performance. The point is crucial, since to be pervasively effective such laws should have determined a cultural change in corporate governance, spreading from listed companies to the others, so to remove *glass ceiling* effects in all sectors and for all sizes of firms.

Some studies, referred also to other countries and industries, elaborated on this issue, investigating vertical and horizontal spillover effects. Ahern and Dittmar (2012), exploiting the mandatory requirement of gender quotas, introduced for listed Norwegian companies in 2003, use the pre-quota cross-sectional variation in female board representation to instrument for exogenous changes to corporate boards following the prescription. They find that gender quotas caused a significant drop in the stock price at the announcement of the law, presumably due to younger and less experienced boards, consistent with the idea that shareholders choose boards to maximize their value. [Ahern and Dittmar \(2012\)](#) focus only incidentally on how board quotas in Norway might have propagated to other Scandinavian

countries, using firms located in these countries as a control group in a robustness check.

[Schoonjans \(2023\)](#), exploiting the staggered implementation of board gender quotas in Europe, examine their effects on firms' environmental, social and governance (ESG) performance. The author finds a rise of women's representation on boards, driven by more ESG committees, improved innovation and human rights consideration, especially for less publicly exposed and better-governed companies, suggesting spillover effects between different sustainability dimensions. In the same vein, [Pistoresi, Poma, and Rinaldi \(2022\)](#), analyzing the impact of mandatory gender quotas in Italy for listed companies and state-owned firms, support the evidence of positive spillover effects, such as a higher proportion of women in top executive positions for targeted companies and a higher share of women on boards of non-listed and non-state-owned firms; they also point out a positive impact on firm performance under specific conditions, especially when boards are set of small size. On the contrary, [Garcia-Blandon, Ravenda, and Castillo-Merino \(2023\)](#), studying the long-term implications and spillovers of board gender diversity quotas on the advancement of gender diversity in managerial leadership, suggest that Norwegian companies have increased the representation of women on their boards, while simultaneously they experienced a reduction in the presence of female executive directors. More in general, the quota law has not influenced the promotion of gender diversity at other managerial levels, leading also to a decrease in the average tenure and level of independence of the boards of directors.

As far as the Italian banking sector, to the best of our knowledge, only [Bongiovanni et al. \(2023\)](#) examine spillover effects of the mandatory gender quotas enacted in 2012 by using a panel of 103 unlisted Italian banks over the period 2006-2018. They show that both the probability of having at least one woman on the administrative board and the share of women on board increased significantly for unlisted banks after the implementation of the quota law. Differently to [Bongiovanni et al. \(2023\)](#), whose analysis focuses only on unlisted banks, we aim to provide a causal estimate of the direct (i.e., on listed banks) and indirect (i.e., on banks in listed groups) effects of the introduction of gender quotas in the banking sector, in a difference-in-differences identification approach, by comparing Italian listed and unlisted banks before and after the quota law implementation with a proper control group. Our estimates are thus net of the secular increase in female presence in the banking sector over the period under analysis. Moreover, we exploit a more comprehensive sample of banks, and very granular administrative data on their board members (by distinguishing also the board of directors from board of supervisors), and we also provide evidence on the changes induced by quotas on several board characteristics, other than gender (e.g. age, tenure,

geographical provenance), as well as to the economic consequences on banks' balance sheets.

4 Data and descriptive statistics

4.1 The administrative data on board members and bank 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 characteristics relating to board members collected 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 on all financial intermediaries active in the country; *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 from 2008 to 2019, in order to have a sufficiently large time window before and after the year of the implementation of the quota law.¹³

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).¹⁴ From the OR.SO database we construct the 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.¹⁵ 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, we use: measures of bank profitability such as the return

¹³We are forced to set the end of the observational period to 2019 as in the following years additional institutional changes occurred, preventing from conducting the analysis on a longer time-span. See also Section 8 for further details and discussion on the policy changes occurred.

¹⁴The 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.

¹⁵The local profile of each director or supervisor 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.

on assets (ROA) and return on equity (ROE); measures of bank riskiness (the share of bad loans over total loans) and of bank (in)efficiency (operating costs over assets); (log of) the bank's assets and the capital index (equity ratio) as measures capturing bank size and capitalization.¹⁶ All performance variables obtained from the banks' balance sheet data have yearly frequency, and are available until 2019.

4.2 Sample construction

From the universe of banks operating in Italy (645 banks in 2011, the year just before the quota law came into force), in the main analysis we exclude those not belonging to a group (463). The baseline sample is composed by: (i) all banks listed on the Italian Stock Market as of the month of August 2011, and thus obliged to comply with the quota law (referred to as *Listed Banks*, LB; 22 banks); (ii) all banks belonging to a group whose holding company is listed (henceforth referred to as *Banks in Listed Groups*, BLG; 77 banks); (iii) all other banks belonging to a group whose parent-bank is not listed (henceforth simply labeled to as *Banks in Non-Listed Groups*, BNLG; 83 banks). From this sample we are forced to exclude 11 banks because of missing in some of the variables, leading to a final baseline sample of 171 banks, which accounts for about 40 per cent of the total number of banks operating in Italy during our window of analysis, representing about 70 per cent of the total amount of the loans intermediated in the credit market.

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 (*Other Banks*, OB), which are typically small and local banks. Nevertheless, in Section 7 we will show that our results are robust to alterations of this baseline sample: first, using a balanced version of our panel dataset; second, by including also all banks not belonging to a group among the controls.¹⁷

4.3 Variables and descriptive statistics

[Figure 1]

Before the implementation of the quota law, female representation in the Italian banking sector was structurally low (around 6 per cent, Figure 1). It was higher (almost double) in the BS than in the BD: this feature was shared by all types of banks, and it reflected the fact that women tended to be less often employed in crucial or decision-making roles, and more in

¹⁶Depending on the specification (see the following Sections), these will be used as control or as outcome variables. When included as control variables they are lagged by one year.

¹⁷11 of these banks are excluded because of missing values.

monitoring tasks. Following the implementation of the law, the share of female directors and supervisors increased more for listed banks, moving from 3 to 27 percent; female presence on bank boards remained significantly lower for the other intermediaries, especially for directors in banks belonging to listed groups (around 10 percent).

[Table 1]

Table 1 reports descriptive statistics obtained from the OR.SO. archives, which cover salient characteristics of the boards (BD and BS). The figures distinguish the periods before (years 2008-2011) and after (years 2012-2019) the implementation of the quota law. Our dataset includes the proportion of female members on the boards, the size of the board (i.e., the number of members),¹⁸ the average age, the average tenure in the banking industry, the proportion of local members, as those born in the same region (NUTS 2) where the bank is headquartered. In the listed banks the share of female members increases after the implementation of the quota law by 24 percentage points in both the BD and BS; also in the BLG and BNLG groups this figure increases (albeit less sharply).¹⁹

In order to better study the effect of gender quotas in boosting board diversity along other dimensions, we build a synthetic indicator (*Diversity*) based on the computation of an entropy measure, so as to take into account different board members' characteristics (gender, age, tenure, origin) simultaneously.²⁰ In contrast to concentration measures (like the commonly used Herfindahl index), entropy measures are able to express the degree of differentiation of a given entity, also by considering simultaneously more than one single characteristic. The use of entropy measures in economics dates back to the seminal work by Theil (1967), and its applications in the past decades encompass the description of economic diversity in many fields, such as industrial and corporate diversification, regional economic structure, portfolio and financial markets volatility, social fragmentation.

In detail, in our specification, we compute the entropy measure for each of the four characteristics mentioned before, (H_{it}) with the following formula:²¹

$$H_{it} = - \sum_{j=1}^k p_{jt} * \ln p_{jt} \quad (1)$$

¹⁸As 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 become unavailable.

¹⁹The differences in the observed board characteristics before and after the implementation of the law outlined by the t-stats in Table 1 will be fully accounted for in our identification strategy.

²⁰Entropy is a measure of disorder, uncertainty, or diversity; it has been used to analyze different phenomena, such as: the irreversible increase of unavailable energy in the physical sciences; disorganization, diversity and homogeneity in the biological and behavioral sciences; the degree of uncertainty in a system in communication theory (Attaran and Zwick 1987; Jacquemin and Berry 1979).

²¹We follow the classical calculation of the Shannon entropy measure (Theil 1967).

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 variables (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. Diversity generally increased in the period after the implementation of the law (see Table 1). However, from a purely descriptive point of view, the increase seems to be more pronounced in the group of LB.

[Table 2]

Table 2 shows the descriptive statistics of the yearly variables constructed combining the OR.SO. archives with bank balance sheet and encompassing several variables capturing the both bank profitability and bank portfolio characteristics. Listed banks are generally larger intermediaries, more profitable, especially in terms of ROE, while the riskiness of their credit portfolio was lower in both sub-periods relative to that of all the other groups of banks. These measures appear to generally differ between the two sub-periods for all groups of banks. The increase in riskiness and decrease of profitability for all banks is plausibly accounted by the Great Recession. All the empirical specifications will include year fixed effects to account for the general business cycle variations, and region-by-year fixed effects for differential business cycle effects across the Italian territory.

5 Identification strategy

5.1 Baseline 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 difference-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:

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

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

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 years after the implementation of the law (i.e., from year 2012 onwards). Bank (θ_i) and year (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.

5.2 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 year dummies (θ_t) in the period before the implementation of the law, as in a classical event-study approach. The parallel trend assumption is generally met as depicted in the event-study figures (see the following Section). Some minor exceptions should be made on some of the measures of bank economic performance, which we will discuss later in the text.

Second, given that the previous assumption needs to hold conditional on the covariates included, these should be not influenced by the treatment. Our baseline specification is thus parsimonious in the inclusion of time-variant control variables (X_{it}), which are of two main kinds. On the one hand, we always control for bank size and capitalization. Indeed, these are features rather difficult to modify in the medium- and short-term, so that we can be confident that changes in management induced by the law did not influence them. On the other hand, we follow existing literature on gender representation in boards and include economic performance measures so to capture the responses in management nominations induced by changes in performance (Bongiovanni et al. 2023; Mateos De Cabo et al. 2012). This set of control variables (ROA, ROE, riskiness and cost (in)efficiency)) is lagged by one year, so to circumvent potential reverse causality problems. In the empirical analysis we will test the stability of our findings to the exclusion of the control variables (i.e., by showing

the results with or without these controls), and we will tend to consider more robust those results which are not sensible to set of controls included. Extensive robustness and sensitivity checks will be illustrated in Section 7.

Given the almost contemporaneous implementation of the law on the interlocking directorates (see Section 2) all the specifications include a variable aimed at controlling for the potential exposure of each bank to such an additional institutional change. In detail, we include a dummy equal to 1 if a bank presents at least one member (of the BD or BS) shared with any other bank (excluding those in the same group, as defined by the law), following the definition detailed in Barone et al. (2022), in the first quarter of the year 2012 (i.e., just before the prescription of the norm became binding).²²

As the recent developments in the econometric properties of the DID estimators have pointed out (de Chaisemartin and D’Haultfoeuille 2022), a further concern should arise in case of heterogeneous treatment effects. We follow the approach proposed by de Chaisemartin and D’Haultfoeuille (2020) and estimate their diagnostic tests and find that heterogeneity in treatment effect is not an issue in our estimation framework of a sharp DID model.²³ However, to further test the robustness of our approach, in a later section we will also leverage on the staggered adoption of the law (see Section 2) and estimate a staggered DID model.

6 Results

The main aim of the Italian quota law was to increase the share of females both on executive and supervisory boards of Italian listed companies to at least one third. The increase in female participation on boards for Italian banks already emerges in Figure 1, where we depict the share of women for listed banks and the other two groups of intermediaries. In our baseline specifications we first investigate the direct effects of the law on gender diversity on both kinds of bank boards of listed banks (the 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 belonging to a group (as the control group). Since the size of the board is a crucial variable to strategically adjust the proportion of female directors or supervisors on boards, we also investigate the impact of the quota law on the

²²Since the law on ID leaves substantial room to interpretation on its application, to create this variable we prefer to be in line with the operational instructions provided by Barone et al. (2022), so that such definitions are exogenous to our setting. The dummy takes value 1 in the year 2012 for the banks potentially subject to the ID prescriptions. Alternative specifications and a more detailed description of the ID law will be treated in the robustness checks.

²³Results are reported in Del Prete, Papini, and Tonello (2022), Table A.1.

number of seats on bank boards.

All estimates of our paper include a set of fixed effects: bank fixed effects, which absorb all time-invariant unobserved heterogeneity at the bank level; year fixed effects, which control for time trends; region-by-year fixed effects, which absorb time-variant unobserved heterogeneity at the regional level, thus capturing, for example, differential business cycle effects across the Italian territory. Using a stepwise approach, we then add to the model the time-varying bank-level characteristics, as illustrated in the previous Section. Standard errors are robust to heteroskedasticity and clustered at bank level.

6.1 Effects on listed banks

6.1.1 Compliance with the law: share of women and board size

Focusing on listed banks, as shown in Figure 2, the parallel trend test in the pre-reform period is fully satisfied, and the average effect in the post-treatment period is statistically significant, signaling an increase in 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 on the boards increased significantly for listed banks in the period of gender quotas: in columns (2) and (4), with the full set of fixed effects and control variables, the magnitude of the effect was around 14 percentage points for the BD and 19 for the BS, confirming listed banks' compliance with the quota law. The inclusion of the control variables does not alter the DID results. Overall, we do not detect peculiar patterns of statistical significance in the control variables (here and in the following Tables).²⁴

[Figure 2 and Table 3]

The share of women on boards could have increased either because - given the size of the board - banks recruited more female directors or supervisors, or because the size of the board was 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 to sidestep the aim of the quota law. Indeed, a law which imposed gender quotas to Norwegian firms determined a change in their organizational status aimed at avoiding compliance for about a half of the firms (Böhren and Staubo 2014). In order to assess whether such a strategic

²⁴The variables capturing capitalization and the ROA are somehow more consistently positively correlated with the outcome variables, but the size of the coefficients are generally negligible in economic terms.

behavior is in place, we estimate the impact of the quota law on the size of the boards (i.e., number of seats, see Appendix Table A.1), 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.

6.1.2 Diversity along other demographic dimensions

Enhancing gender diversity in a given organization (boards, political bodies, firms, etc.) is generally the main aim of gender quotas prescriptions. However, it is important to notice that favoring the representation of women might improve diversity also along other dimensions, enriching inter-generational, cultural, educational, multi-geographical views and skills. In this vein, we investigate whether the increased appointment of women induced by the Italian quota law also contributed to modifying other demographic characteristics of bank boards; in particular, we focus on board members' age, tenure and geographical origins, using the diversity indicator previously illustrated.

[Figure 3 and Table 4]

As far as the synthetic index of board diversity is concerned, tests for parallel trends and the significance of the average treatment effect are presented in Figure 3, while the DID estimates are reported in Table 4. We observe a different pattern in BD and BS. Concerning BD, the quota law induced an increased diversity: interestingly, the diversity increased not only in the gender of the members, but also along the other observable characteristics (age, origin and tenure). In Appendix Table A.2 we unpack the index components (other than gender) and study the impact of the quota law on each of them. The increase in the share of females induced by the law also determined a decrease of about two years in the average age of the directors, and a decrease of about 9 percentage points in the share of local members. The law also induced some decrease in the average experience, as one should expect given that females were newly introduced in the boards, in line with other evidence (Ahern and Dittmar 2012). Thus, overall the law increased diversity along characteristics other than being female in the BD. 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, as also confirmed by the estimates on the single index components presented in Table A.2, panel B.

6.2 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 spillover effects in terms of increasing female presence on boards, plausibly stemming from the spread of best practices within the same banking group from the *parent bank* to its *affiliates*. Results are reported in Figure 4 and Table 5. For banks in listed groups, the share of female directors or supervisors did not change significantly.

[Figure 4 and Table 5]

Nevertheless, some minor signals of potential spillover effects could be detected. First, if we consider the slight increase in the share of females occurred from year 2016 in Figure 4: this could be consistent with idea that, as cultural changes take time to be absorbed, also such spillover effects might have started with some time lag.²⁵ Second, the coefficient in column (4) of Table 5 is marginally statistically significant. Nevertheless, this is not robust to the specification which only include the set of fixed effects (column 3), nor to the extensive set of robustness check performed (see Section 7). Overall, we thus tend to conclude that we could not detect robust spillover effects in banks belonging to listed groups, signaling that the practices introduced for the leading banks did not spread to their affiliates in the post-reform period, at least in the short-run.

In order to evaluate strategic behavior, induced by listed banks on the boards or their affiliates 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 seats, see Appendix Table A.3). The board of directors of banks belonging to listed groups lost 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 female candidates able to serve on the board of directors of the parent listed bank, directly subject to the law prescription, from affiliated banks. However, using our granular data on director mandates and new appointments, and investigating movements from affiliated banks towards the parent listed one, we find that the drain of directors by listed banks is not frequent, and involves both women and men. The decrease in board size we found seems mainly attributable to strategies of re-organization of few large Italian banking groups during the period under examination, with a subsequent rationalization of seats on the boards of affiliated banks.

²⁵Unfortunately, we cannot extend the time window of our analysis beyond year 2019 to test this hypothesis as other institutional changes on the quota law and in the banking sector occurred, which would prevent the correct identification of such lagged spillover effects.

6.3 Effects on bank performance

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

[Figure 5 and Table 6]

Results are reported in Figure 5 and Table 6.²⁶ Concerning bank profitability, both return on assets (ROA) and return on equity (ROE) are not significantly affected for listed banks by gender quotas, even if two main caveats are on order. First, for the ROE measure the parallel trend assumption does not seem to be sufficiently met (Figure 5). Second, for the ROA measure the specification in column (2) is marginally statistically significant, but not that in column (1) and in the robustness check. Equally, the impact of the quota law is not statistically significant for listed banks on the measure of portfolio riskiness (the share of bad loans on total loans).

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 market value or economic performance in the short-term, mainly due to the lower experience of the newly appointed directors, our estimates suggest that the Italian quota law improved gender diversity on Italian bank boards with substantially neutral effects on bank performance. Regarding the Italian setting under study, the existing literature found non-conclusive results on the effects of quota laws on company economic performance. Comi et al. (2020) detected a positive impact of the quota law on firms' productivity only, while Ferrari et al. (2021) found 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.

7 Robustness checks

In what follows we test the robustness of our results along several dimensions, including: alterations of the baseline sample, sensitivity to alternative specifications, alternative iden-

²⁶As 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. For this reason, we focus our performance analysis only on listed banks.

tification strategy based on staggered DID, restricted time window of the analysis, opportunistic behaviors in de-listing. The results are reported in Appendix Tables from [A.4](#) to [A.9](#) and commented in detail in the following subsections.

7.1 Balanced panel

In our main analysis we make use of an open sample, which means we include the universe of banks operating in Italy in the period under analysis (thus resulting in an unbalanced panel). In the Section 4 we explain in a detailed way the construction of our sample, which also includes banks merged over the period. Here we repeat our main analysis in the balanced panel version of our data, where we include all banks continuously operating in the whole period under investigation. The results (see column 1 of Tables from [A.4](#) to [A.7](#)) do not detach from our baseline. This robustness check allows us to exclude that the (few) enters of newly authorized intermediaries and the (more numerous) exits for bank mergers and acquisitions (M&As) may play some relevant role in our estimates.

7.2 Staggered DID specification

In the baseline estimations of the paper we use a non-staggered DID approach, as the dummy $Post_t$ is simply interacted with the treatment status. In what follows we shortly explain how the staggered implementation of the quota law (see Section 2) can be used for identification purposes in our context.

Leveraging on the staggered renewal of the board members, we define a new dummy variable ($DID_{staggeredLB_{itb}}$), which takes value 1 from the year when this first change took place under the quota law, onwards. This variable is created for each of the two boards (b) in each Listed Bank (i), and it is mechanically zero before year 2012 (i.e., for $t < 2012$) and for all banks belonging to the control group. In order to apply this staggered treatment structure to Banks in Listed Groups (and create the variable $DID_{staggeredBLG_{it}}$), we define each of these banks to be treated from the year when the first change (either in the board of directors or in the board of supervisors) took place in the Listed parent-bank. The first newly appointed females appeared in year 2012 (between August and December).

The use of such different specification might help identification, as the comparison of not-yet-treated units with those already treated would provide additional variation which can be leveraged for identification. By implementing this staggered specification in our DID framework (i.e., also maintaining the group of never treated banks as a control), we do obtain estimates - included in columns (2) of the Appendix Tables from [A.4](#) to [A.7](#) - very similar to

the baseline specification (not staggered). This further proves that our DID strategy (either in the sharp or in the staggered design) is well specified.²⁷

7.3 Diversity control variables

In columns (3) of the Appendix Tables [A.4](#), [A.6](#), [A.7](#) we test an alternative specification in which we add to the control variables the components of the diversity index (other than gender). The rationale behind this test is to show that the effect estimated is mainly due to the increase in the gender quota and not to other correlated characteristics of the board members.

7.4 The law on ID and alternative interlocking measure

Our baseline strategy encompasses bank and year FE, and region-by-year FE. Threats to our identification strategy would arise if some bank-by-year unobserved factor would influence the board features and the economic outcomes studied, other than through the quota law. The ID law previously discussed could potentially influence both set of measures in a contemporaneous way with respect to the application of the quota law.

In general, the prescription of the ID law was quite subject to interpretation, and, it does not forbid ID in all cases. Specifically, the measure on ID forbids any individual to hold simultaneous appointments in the governing bodies (boards and other top management positions) of two competing banking groups. Two banking groups are defined as competitor if they operate in the same local market. An individual holding multiple board appointments in competing banks had to opt for only one of them by the end of April 2012 ([Barone et al. 2022](#)). ID are still acceptable in some explicit cases, e.g.: (i) for positions in boards or top management within the same banking group; (ii) if banks do not operate in the same geographical market; (iii) for small banks, which are exempted from the application of the norm. In many other instances its application depended to a case-by-case interpretation, on which the Banking Supervisory Authority could intervene with fines only ex post. As a consequence, it may well happen that at any given point in time, after April 2012, in the administrative database of the banking boards and top management used in our empirical work we still observe individuals holding positions in more than one board.²⁸

²⁷We also applied this staggered DID structure in an IV setting, which could be seen as an alternative way to estimate spillover effects. Precisely, for the groups of BLG banks we instrumented the share of female board members with the newly created *DIDstaggeredBLG_{it}* variable. As in the reduced form setting, albeit the quite precisely identified in the first stage, the IV estimates deliver no spillover effects.

²⁸This might arise for two main reasons: (i) the inclusion in one of the explicit exemption of the ID law; (ii) the individual has been appointed in one new board or top managerial position and has 6 months to evaluate whether the new appointment constitutes an ID forbidden by the law or not. In case of positive

Following the rules indicated in the ID normative and its operationalization as suggested by [Barone et al. \(2022\)](#), we construct two main indicators of whether a bank happened to be subject to the ID law. The first is a dummy variable which indicates if a bank in the year 2012 (Q1) appeared to be potentially subject to the ID law. The second is a dummy which indicates for every year from 2012 onwards if a bank is potentially subject to the ID law (as it appears in the Bank Board Archive in Q1 of every year). To clean out our measures, we exclude cases of individuals sitting in different boards within the same group (as stated by the ID law).

The Appendix Figure [B.1](#) shows the decreasing shares of banks potentially subject to the ID law (according to our reconstructed measures), distinguishing by listed banks, banks in listed groups, and banks in non-listed group. The figure clearly documents a drop following the introduction of the ID law, which is, reassuringly, quite comparable across the three sub-groups of banks used in our analysis.

To take into account this potential threat, all the regressions performed include the first control variable previously defined, which identifies all banks potentially subject to the ID prescription as resulting in Q1 2012. In the Appendix Tables from [A.4](#) to [A.7](#) test an alternative control variable (the second variable described above), so to show that the results are not sensitive to the specific way in which we control for ID potential exposure. Notice that, in this case, due to data availability, we can only construct such a measure until year 2015. Overall, we can conclude that our results appear not to be driven by the ID in all cases.²⁹

7.5 Alternative definition of the control group

In all our specifications we restricted attention to banks belonging to a specific cluster, so that the pool of our controls is made of 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 as far as their organizational structure is concerned, and the possibility of sharing company 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

evaluation, he/she would decide to withdraw from either the new position or the old one. In case of negative evaluation, he/she could decide to hold both positions because she/he believes that they do not constitute a violation of the ID law. In the former case, in the administrative archive we could still observe an individual holding more than one position for the time span occurring from the appointment to the withdrawal decision; in the latter case, the individual is still subject to the controls of the Banking Authority, which is in charge of supervising the concrete implementation of the ID law.

²⁹For comparison reasons, estimates until year 2015 are included in Tables [A.8](#) and [A.9](#), and for the diversity index in column 5 of Table [A.5](#). See also a following robustness check on alternative time window.

to all non-listed banks, both belonging or not, to a banking group. The results are included in Appendix Tables from A.4 to A.7 and do not show remarkable differences with respect to our baseline results.

7.6 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 in their boards, in terms of gender as well as all other potential dimensions.³⁰ These recommendations did not bear any formal requirement to fulfill, but were intended to work as a 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 matter of fact, we observed a slight increase in the share of females in BLG banks from year 2016. As a final test, we repeat our analysis on a smaller time window until year 2015. Results reported in Appendix Tables A.8 and A.9 confirm that the effects of the quota law do not change substantially if we focus on this smaller time window.

7.7 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 (Böhren and Staubo 2014). In our case, 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. A total of two de-listings occur (in 2015 and 2017), but they are due to reasons not related to the quota law. Our main results are largely unchanged if we exclude these intermediaries from the sample.

8 Concluding remarks

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

³⁰See: *Benchmark di diversity per il sistema bancario italiano*, Bank of Italy, July 2015.

To this end, we exploit the introduction of a law (Law No. 120/2011), mandating Italian listed companies, including listed banks, to temporarily increase female representation in their executive and supervisory boards. We use administrative census data from the Bank of Italy’s bank boards archive on the composition of corporate boards in all banks operating in Italy between 2008 and 2019. These data make it possible to describe on a yearly basis the board characteristics in terms of four main diversity dimensions (gender, age, tenure, geographical origins). We link board features with several bank characteristics, which are collected or derived from the Bank of Italy’s Census of banks, with data on bank performance and riskiness, drawn from the Bank of Italy’s Supervisory Reports. We implement a difference-in-differences 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 groups) and all other banks belonging to a non-listed group (our controls).

Our main findings show that the quota law increased the share of women in charge in Italian listed banks, both as directors and as supervisors, 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 to the other banks belonging to listed groups, suggesting that changes in corporate culture need time to be improved significantly. Our results are robust to different specifications, particularly accounting for the staggered implementation of the quota law, as well as for other regulatory changes (e.g. interlocking directorates) that were enacted in the same time window of the introduction of mandatory gender quotas.

The very limited spillover effects to non-targeted institutions may also depend on the hysteresis that characterized some corporate governance improvements, with spillover effects that might have propagated with some lags in the banking sector. Unfortunately, we cannot further extend the time window of the analysis to better investigate lags of the policy, because in 2020 and 2022 two policy changes occurred involving gender quotas. Notably, in 2020 the duration of the Italian quota law - which, by the way, was intended as a temporary prescription that would have ended in 2021 - was extended for approximately 10 additional years. Then, in 2022, the Bank of Italy - acting in the vest of the Italian Banking Authority - extended the prescription of the quota law to all Italian banks. In the end, it would be impossible to disentangle the lags due to the spillover effects in the application of the 2011 quota law relative to these additional, and more recent, institutional changes.

Anyway, our results raise some policy implications regarding the effects of the law, both for regulators and shareholders. First, since in the period under investigation gender quotas were only applied by those institutions 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. As mentioned previously, this plausible concern have induced the Italian Legislator to further extend the measure for an additional decade and to increase the share of the less represented gender on boards to 40 percent. Moreover, the limited spillover effects on non-targeted institutions, even if belonging to listed groups, may also suggest the need to extend mandatory gender quotas to more comprehensive pools of targets for the effectiveness of the policy.³¹ In addition, although many equality improvements have been reached by means of board gender quotas, there could be other tools to be introduced to achieve greater gender diversity at lower hierarchical levels, able to spread gender friendly culture at senior management positions, such as, for instance, quotas on C-suites.³² Finally, differently to previous evidence suggesting worst economic performance after the introduction of mandatory gender quotas ([Ahern and Dittmar 2012](#); [Berger et al. 2014](#)), we document that the introduction of the Italian quota law was basically neutral in terms of performance of listed banks, so as not to entail for shareholders an equity *versus* efficiency trade-off, at least in the banking sector.

³¹This would also probably explain why, after a period of recommendation (soft law), the Bank of Italy extended in 2022 mandatory gender quotas to all Italian banks.

³²C-quotas were recently introduced in Germany and France.

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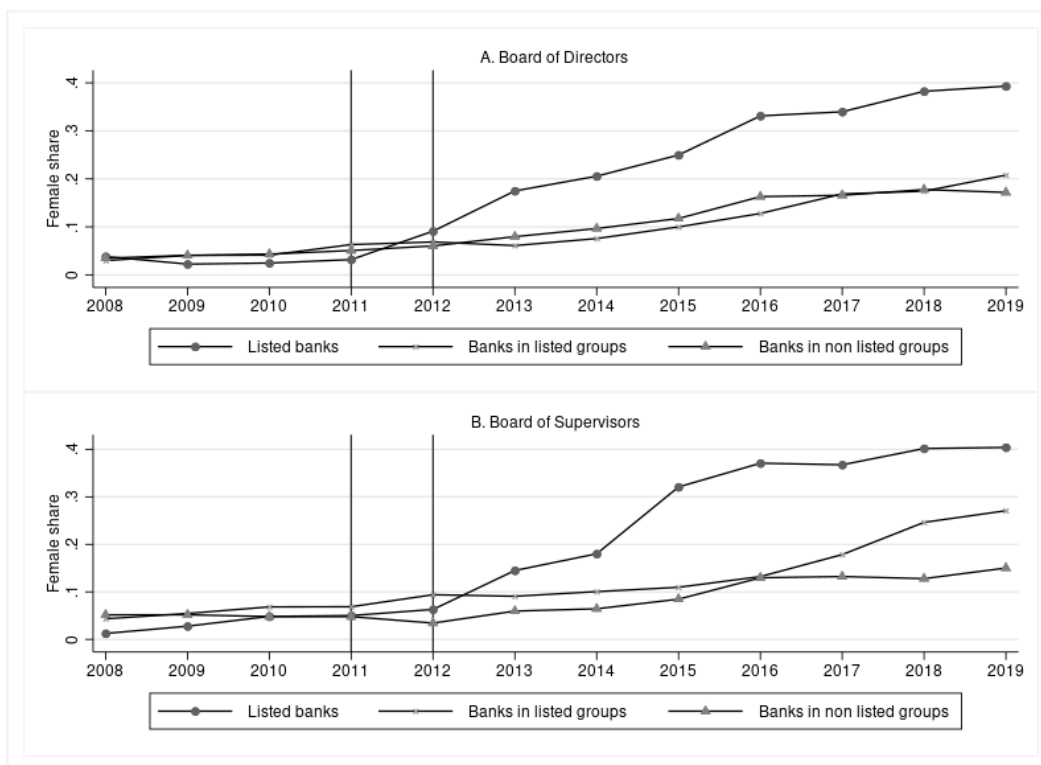
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Figures

Figure 1

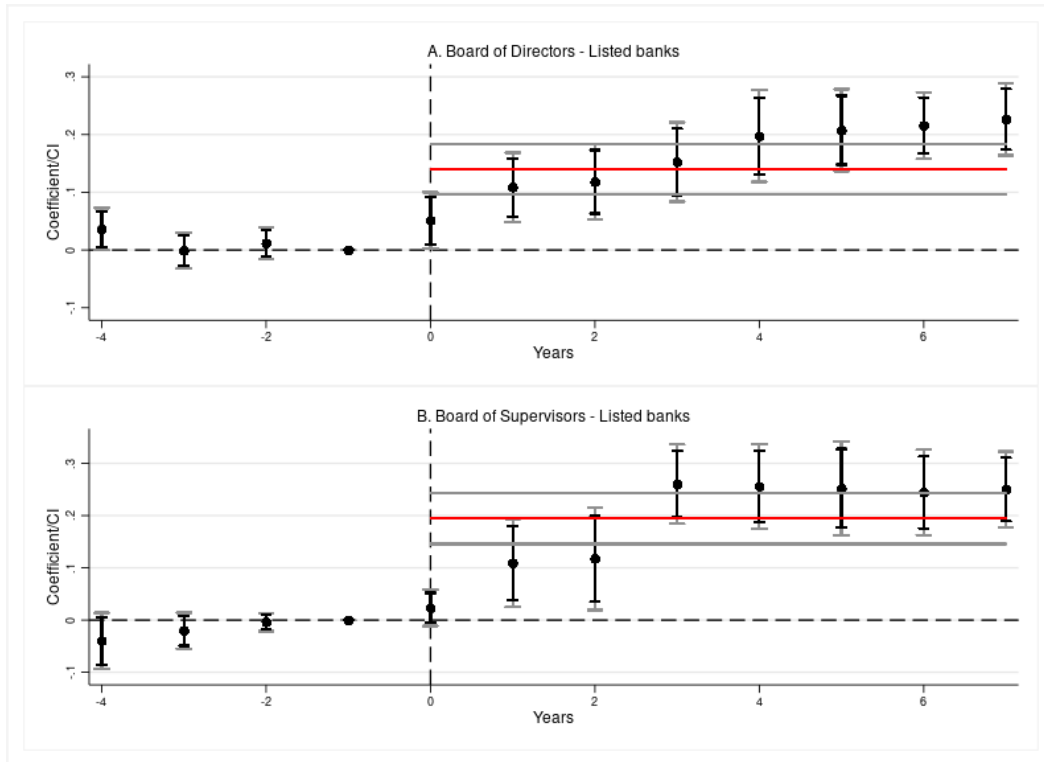
Share of female members in the board of directors and of supervisors from 2008 to 2019.



Notes: the figure depicts the share of female members in the board of directors (Panel A) and supervisors (Panel B) from 2008 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: Bank of Italy (Bank Board Archives).

Figure 2

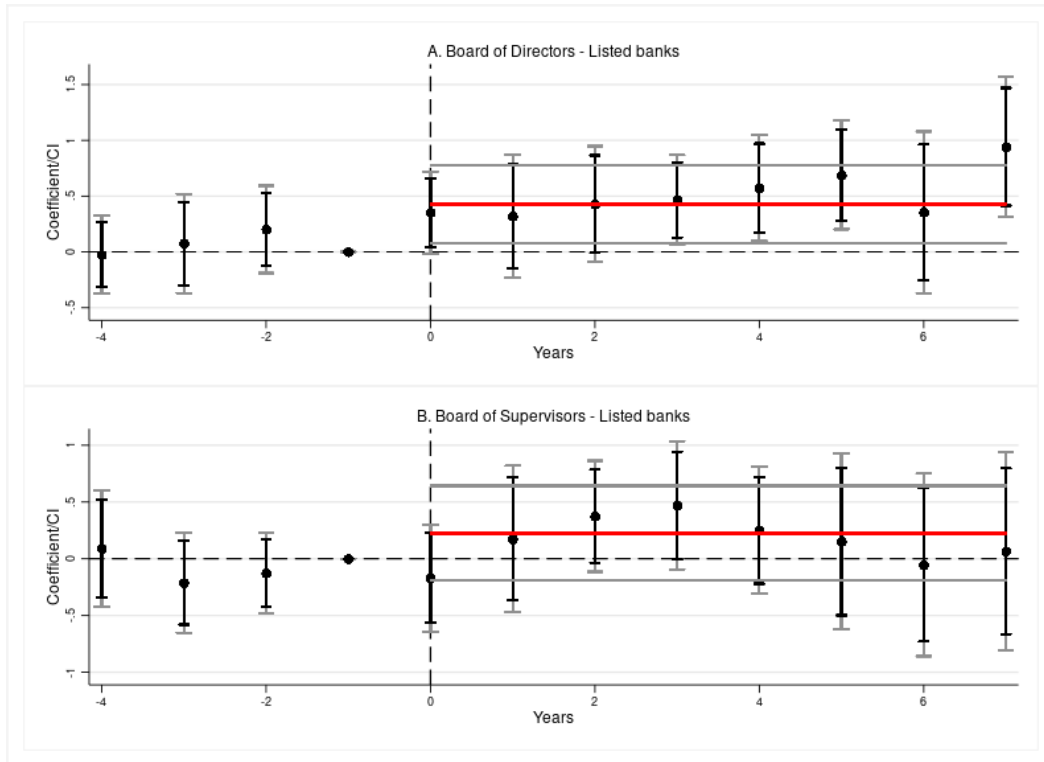
Event study on the share of female members on the boards of listed banks



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). The specifications are analogous to those in columns 2 (Panel A) and 4 (Panel B) of Table 3.

Source: Bank of Italy (Bank Board Archives, Supervisory Register, and Balance Sheet data).

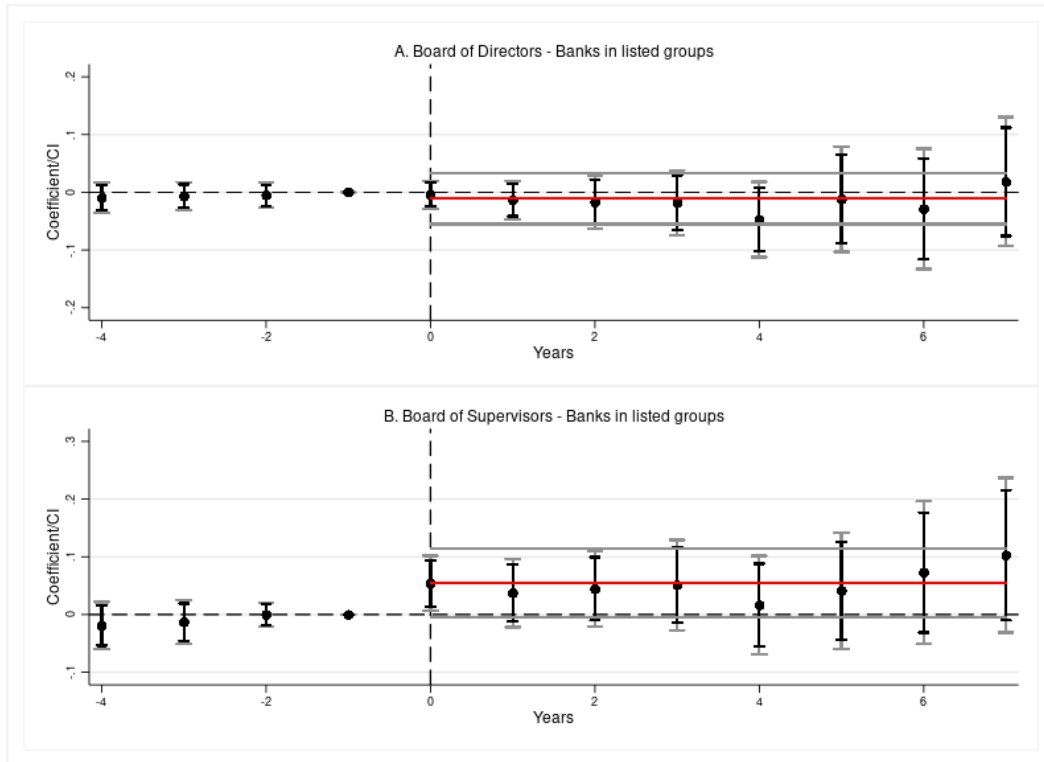
Figure 3
Event study on the diversity index in the boards of listed banks



Notes: the figures depict the effects of the quota law on the diversity index calculated for the 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). The specifications are analogous to those in columns 2 (Panel A) and 4 (Panel B) of Table 4. **Source:** Bank of Italy (Bank Board Archives, Supervisory Register, and Balance Sheet data).

Figure 4

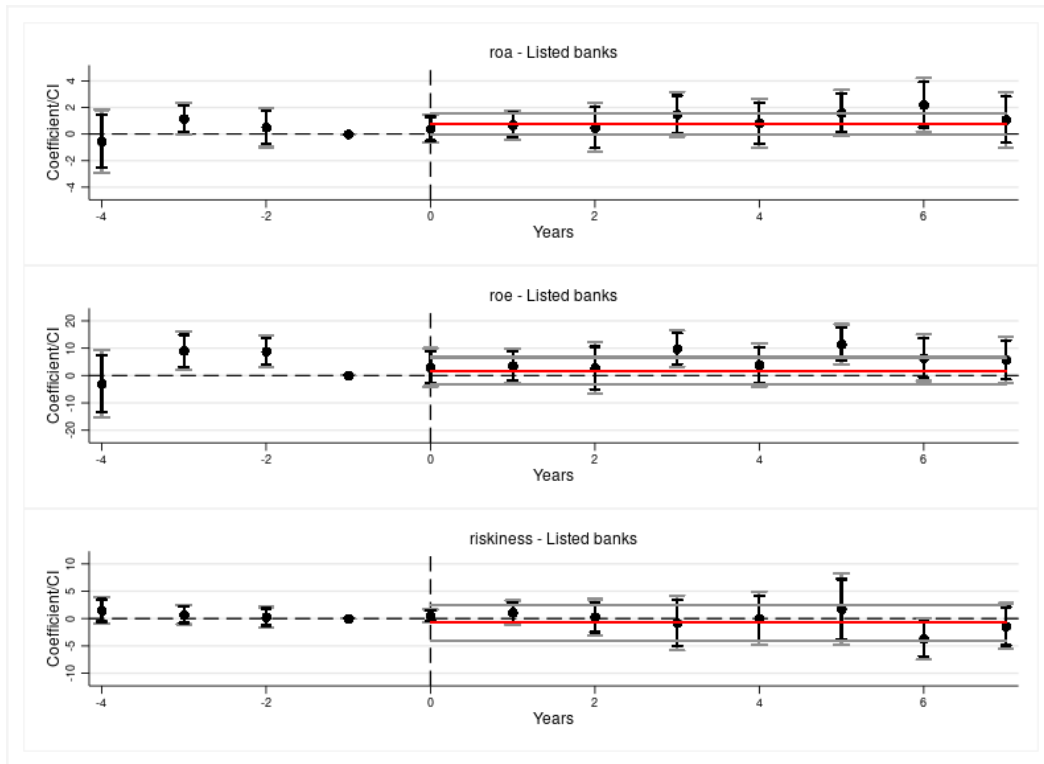
Event study on the share of female members on the boards of banks in listed groups



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). The specifications are analogous to those in columns 2 (Panel A) and 4 (Panel B) of Table 5.

Source: Bank of Italy (Bank Board Archives, Supervisory Register, and Balance Sheet data).

Figure 5
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). The specifications are analogous to those in columns 2 (top Panel), 4 (middle Panel), and 6 (bottom Panel) of Table 6. **Source:** Bank of Italy (Bank Board Archives, Supervisory Register, and Balance Sheet data).

Tables

Table 1
Descriptive statistics: board characteristics before and after the quota law.

	<i>Before the quota law</i>					<i>After the quota law</i>				
	mean	sd	median	min	max	mean	sd	median	min	max
<i>A. Listed banks</i>										
<i>Board of directors (BD)</i>										
Share of females	0.03	0.05	0.00	0.00	0.25	0.27***	0.14	0.27	0.00	0.57
Size of the board	13.35	4.65	12.00	8.00	32.00	12.56	4.02	12.00	2.00	24.00
Diversity	2.25	0.61	2.48	0.35	3.14	2.78***	0.63	3.01	0.64	3.49
Average age	61.68	4.57	62.45	50.94	69.94	59.71***	4.34	59.78	48.03	70.31
Average tenure	10.14	2.75	9.70	4.00	17.32	9.63	3.21	9.51	1.99	17.14
Share of local members	0.52	0.26	0.57	0.08	0.94	0.40***	0.23	0.39	0.00	0.88
Share of foreign members	0.04	0.08	0.00	0.00	0.40	0.07**	0.10	0.00	0.00	0.44
<i>Board of supervisors (BS)</i>										
Share of females	0.04	0.09	0.00	0.00	0.33	0.28***	0.18	0.33	0.00	0.75
Size of the board	5.84	5.74	3.00	3.00	23.00	5.17	5.28	3.00	2.00	30.00
Diversity	1.13	0.97	1.00	0.00	3.47	1.49**	0.92	1.27	0.00	3.47
Average age	59.20	7.19	60.17	44.09	77.10	57.86*	4.97	57.88	45.69	69.03
Average tenure	10.83	3.33	10.32	4.52	18.50	9.77*	4.63	9.49	0.71	24.46
Share of local members	0.61	0.31	0.67	0.00	1.00	0.56	0.34	0.67	0.00	1.00
Share of foreign members	0.00	0.01	0.00	0.00	0.09	0.00	0.03	0.00	0.00	0.33
N			83					160		
<i>B. Banks in listed groups</i>										
<i>Board of directors (BD)</i>										
Share of females	0.04	0.06	0.00	0.00	0.29	0.10***	0.12	0.08	0.00	0.50
Size of the board	10.70	3.03	10.00	4.00	18.00	8.95***	2.70	9.00	3.00	25.00
Diversity	2.25	0.64	2.46	0.00	3.38	2.24	0.70	2.42	0.00	3.39
Average age	60.59	4.48	60.92	46.02	73.61	60.44	4.75	61.39	46.23	70.75
Average tenure	8.59	2.77	8.28	1.69	16.86	9.30*	3.78	9.03	0.38	20.23
Share of local members	0.50	0.24	0.55	0.00	1.00	0.47*	0.27	0.47	0.00	1.00
Share of foreign members	0.01	0.04	0.00	0.00	0.25	0.01	0.05	0.00	0.00	0.33
<i>Board of supervisors (BS)</i>										
Share of females	0.06	0.13	0.00	0.00	0.67	0.13***	0.19	0.00	0.00	0.67
Size of the board	3.20	0.63	3.00	3.00	6.00	3.04***	0.33	3.00	2.00	6.00
Diversity	0.93	0.77	0.64	0.00	3.28	0.99	0.78	0.68	0.00	3.47
Average age	60.33	5.89	59.88	47.58	78.67	59.88	5.43	60.06	46.47	76.17
Average tenure	11.11	3.21	10.98	3.35	20.36	11.38	5.05	11.14	0.66	26.10
Share of local members	0.58	0.30	0.67	0.00	1.00	0.56	0.30	0.67	0.00	1.00
Share of foreign members	0.02	0.07	0.00	0.00	0.33	0.02	0.09	0.00	0.00	0.50
N			327					306		
<i>C. Banks in non listed groups</i>										
<i>Board of directors (BD)</i>										
Share of females	0.04	0.07	0.00	0.00	0.50	0.13***	0.12	0.11	0.00	0.60
Size of the board	10.23	3.41	11.00	1.00	18.00	9.66**	3.33	9.00	1.00	25.00
Diversity	2.03	0.78	2.25	0.00	3.25	2.12	0.84	2.30	0.00	3.38
Average age	59.40	5.03	59.41	45.13	75.04	59.88	5.08	59.95	44.28	74.25
Average tenure	8.30	3.23	8.40	0.61	15.79	9.84***	3.99	9.65	1.11	22.16
Share of local members	0.54	0.31	0.54	0.00	1.00	0.50**	0.32	0.50	0.00	1.00
Share of foreign members	0.08	0.16	0.00	0.00	0.83	0.09	0.18	0.00	0.00	1.00
<i>Board of supervisors (BS)</i>										
Share of females	0.05	0.13	0.00	0.00	0.67	0.09***	0.17	0.00	0.00	0.67
Size of the board	3.16	0.80	3.00	2.00	9.00	3.18	0.89	3.00	1.00	9.00
Diversity	0.82	0.72	0.64	0.00	2.89	0.90*	0.71	0.64	0.00	3.20
Average age	59.36	6.84	58.93	42.63	78.29	58.91	6.83	58.98	40.92	81.10
Average tenure	10.71	4.30	11.06	0.67	19.90	11.58	4.94	11.34	0.70	24.54
Share of local members	0.59	0.35	0.67	0.00	1.00	0.57	0.36	0.67	0.00	1.00
Share of foreign members	0.02	0.10	0.00	0.00	0.71	0.02	0.09	0.00	0.00	0.67
N			332					469		

Notes: figures are averages over the period 2008-2019; *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. The asterisks indicate that the mean value of each characteristic after the implementation of the quota law is statistically different from the mean value before, at levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. **Source:** Bank of Italy (Bank Board Archives).

Table 2
Descriptive statistics: bank characteristics before and after the quota law.

	<i>Before the quota law</i>					<i>After the quota law</i>				
	mean	sd	median	min	max	mean	sd	median	min	max
<i>A. Listed banks</i>										
ROA	0.24	1.32	0.45	-6.29	3.68	-0.20**	1.34	0.05	-6.64	3.28
ROE	2.94	13.69	3.55	-78.96	64.19	1.71	12.39	0.72	-39.65	75.07
Riskiness	3.57	3.07	3.02	0.00	15.63	7.99***	6.72	6.80	0.00	44.93
Log of total assets	23.54	1.64	23.49	20.02	26.80	23.97**	1.61	24.02	20.67	27.08
Capital index	10.32	5.03	9.39	2.04	34.25	11.65**	4.07	11.42	2.55	26.42
Operating costs over assets	1.89	0.87	1.89	0.22	4.33	1.85	0.78	1.88	0.18	6.00
N			91					169		
<i>B. Banks in listed groups</i>										
ROA	0.83	3.17	0.55	-9.33	29.97	0.10***	2.82	0.14	-10.91	23.20
ROE	5.43	12.97	3.93	-56.88	95.94	1.99***	12.22	0.56	-49.50	78.48
Riskiness	5.95	12.13	3.26	0.00	99.88	10.08***	13.95	6.80	0.00	99.91
Log of total assets	21.89	1.41	21.81	17.96	25.68	22.30***	1.43	22.22	17.91	25.99
Capital index	10.59	8.90	8.99	1.54	96.47	14.32***	13.12	12.35	1.82	98.77
Operating costs over assets	2.90	5.12	2.36	0.12	52.73	2.69	4.33	2.29	0.16	53.87
N			336					322		
<i>C. Banks in non listed groups</i>										
ROA	-0.07	3.14	0.34	-50.05	6.43	-0.64***	3.00	0.05	-41.07	5.30
ROE	1.22	11.68	2.56	-69.78	45.53	-0.56**	10.56	0.40	-49.57	70.70
Riskiness	4.19	3.62	3.60	0.00	23.66	8.90***	9.82	7.08	0.00	99.99
Log of total assets	21.28	1.58	21.32	17.39	25.31	21.84***	1.46	21.92	17.40	25.30
Capital index	11.11	7.72	9.32	0.94	88.28	12.91***	9.95	11.28	0.83	99.53
Operating costs over assets	2.87	3.17	2.39	0.09	48.32	2.61	3.02	2.09	0.08	49.92
N			348					502		

Notes: figures are averages over the period 2008-2019; *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. The *Capital index* is the ratio between equity and total assets. The asterisks indicate that the mean value of each characteristic after the implementation of the quota law is statistically different from the mean value before, at levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. **Source:** Bank of Italy (Supervisory Register and Balance Sheet data).

Table 3

The effects of the quota law on the share of females on boards of listed banks.

	(1)	(2)	(3)	(4)
	A. Board of directors		B. Board of supervisors	
LB X Post	0.152*** (0.019)	0.140*** (0.022)	0.185*** (0.023)	0.194*** (0.025)
Log of total assets		0.022 (0.013)		0.015 (0.016)
Capital index		-0.001 (0.001)		0.003** (0.002)
Operating costs over assets		2.776* (1.481)		2.108 (1.548)
ROA		-0.001 (0.002)		0.009*** (0.003)
Riskiness		-0.000 (0.001)		-0.000 (0.001)
ROE		-0.000 (0.000)		-0.000 (0.000)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Region*Year FE	No	Yes	No	Yes
<i>N</i>	1044	1044	1044	1044
<i>R</i> ²	0.744	0.795	0.645	0.757

Notes: OLS regression with robust standard errors in parentheses, 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); each regression includes a dummy which controls for the potential exposure to the interlocking directors law in year 2012; the other bank-level control variables are lagged by one year; FE indicates fixed-effects. Asterisks indicate statistical significance at levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. **Source:** Bank of Italy (Bank Board Archives, Supervisory Register, and Balance Sheet data).

Table 4
The effects of the quota law on diversity of listed banks.

	(1)	(2)	(3)	(4)
	A. Board of directors		B. Board of supervisors	
LB X Post	0.468*** (0.152)	0.428** (0.180)	0.272 (0.211)	0.224 (0.213)
Log of total assets		0.189 (0.157)		-0.025 (0.079)
Capital index		0.010 (0.010)		0.011* (0.006)
Operating costs over assets		-9.401 (11.606)		11.574 (13.289)
ROA		0.011 (0.015)		0.053*** (0.013)
Riskiness		0.004 (0.010)		-0.005 (0.007)
ROE		0.000 (0.005)		-0.005* (0.003)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Region*Year FE	No	Yes	No	Yes
N	1044	1044	1044	1044
R^2	0.521	0.647	0.514	0.618

Notes: OLS regression with robust standard errors in parentheses, clustered at the bank level. See Table 3 for the definitions of the variables and fixed effects (FE). Asterisks indicate statistical significance at levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. **Source:** Bank of Italy (Bank Board Archives, Supervisory Register, and Balance Sheet data).

Table 5

The effects of the quota law on the share of females on boards of banks in listed groups.

	(1)	(2)	(3)	(4)
	A. Board of directors		B. Board of supervisors	
BLG X Post	-0.014 (0.017)	-0.011 (0.023)	0.036 (0.029)	0.055* (0.030)
Log of total assets		0.008 (0.011)		0.033** (0.016)
Capital index		-0.000 (0.001)		0.002 (0.002)
Operating costs over assets		1.460 (1.541)		0.609 (1.515)
ROA		0.001 (0.002)		0.007** (0.003)
Riskiness		-0.001 (0.001)		0.001 (0.001)
ROE		-0.000 (0.000)		-0.000 (0.001)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Region*Year FE	No	Yes	No	Yes
N	1434	1434	1434	1434
R^2	0.640	0.688	0.593	0.706

Notes: OLS regression with robust standard errors in parentheses, clustered at the bank level. See Table 3 for the definitions of the variables and fixed effects (FE). Asterisks indicate statistical significance at levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. **Source:** Bank of Italy (Bank Board Archives, Supervisory Register, and Balance Sheet data).

Table 6

The effects of the quota law on the economic performance of listed banks.

	(1)	(2)	(3)	(4)	(5)	(6)
	A. ROA		B. ROE		C. Riskiness	
LB X Post	0.409 (0.301)	0.740* (0.407)	2.155 (2.013)	1.796 (2.489)	-0.964 (1.200)	-0.745 (1.672)
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Region*Year FE	No	Yes	No	Yes	No	Yes
Bank controls	No	Yes	No	Yes	No	Yes
N	1110	1110	1110	1110	1110	1110
R^2	0.372	0.560	0.400	0.515	0.594	0.689

Notes: OLS regression with robust standard errors in parentheses, clustered at the bank level. LB indicates the dummy for listed banks; each regression includes a dummy which controls for the potential exposure to the ID law in year 2012; *Post* indicates the period since the requirements of the quota law became compulsory (from 2012 onwards); bank controls include the log of total assets and the capital index (lagged by one year); FE indicates fixed-effects. Asterisks indicate statistical significance at levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. **Source:** Bank of Italy (Bank Board Archives, Supervisory Register, and Balance Sheet data).

A Appendix: Additional Tables

Table A.1

The effects of the quota law on the size of the boards of listed banks.

	(1)	(2)	(3)	(4)
	A. Board of directors		B. Board of supervisors	
LB X Post	-0.129 (0.832)	-0.407 (0.972)	-0.211 (0.682)	-0.164 (0.606)
Log of total assets		0.569 (0.382)		-0.233 (0.217)
Capital index		-0.015 (0.030)		0.015 (0.015)
Operating costs over assets		42.916 (76.908)		-98.658 (72.690)
ROA		-0.011 (0.038)		0.031 (0.021)
Riskiness		0.002 (0.019)		0.001 (0.007)
ROE		0.006 (0.012)		-0.014* (0.008)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Region*Year FE	No	Yes	No	Yes
N	1044	1044	1044	1044
R^2	0.778	0.811	0.848	0.870

Notes: OLS regression with robust standard errors in parentheses, clustered at the bank level. LB indicates the dummy for listed banks; each regression includes the control variable for the status of interlocking in 2012. *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 (lagged by one year); FE indicates fixed-effects. Asterisks indicate statistical significance at levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. **Source:** Bank of Italy (Bank Board Archives, Supervisory Register, and Balance Sheet data).

Table A.2

The effects of the quota law on other diversity characteristics of listed banks.

	(1)	(2)	(3)	(4)
	(Age)	(Experience)	(Local)	(Foreign)
A. Board of directors				
LB X Post	-2.386** (0.973)	-1.602** (0.658)	-0.093** (0.044)	-0.006 (0.015)
<i>N</i>	1044	1044	1044	1044
<i>R</i> ²	0.787	0.785	0.881	0.847
B. Board of supervisors				
LB X Post	0.779 (2.031)	-1.211 (1.114)	0.015 (0.066)	-0.001 (0.004)
<i>N</i>	1044	1044	1044	1044
<i>R</i> ²	0.683	0.671	0.822	0.918
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Region*Year FE	Yes	Yes	Yes	Yes
Bank-level controls	Yes	Yes	Yes	Yes

Notes: OLS regression with robust standard errors in parentheses, clustered at the bank level. LB indicates the dummy for listed banks; each regression includes the control variable for the status of interlocking in 2012. *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 (lagged by one year); FE indicates fixed-effects. Asterisks indicate statistical significance at levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. **Source:** Bank of Italy (Bank Board Archives, Supervisory Register, and Balance Sheet data).

Table A.3

The effects of the quota law on the size of the board of banks in listed groups.

	(1)	(2)	(3)	(4)
	A. Board of directors		B. Board of supervisors	
BLG X Post	-1.199*** (0.362)	-1.113*** (0.397)	-0.058 (0.064)	-0.037 (0.063)
Log of total assets		0.779*** (0.256)		0.017 (0.033)
Capital index		0.007 (0.020)		-0.003 (0.002)
Operating costs over total assets		21.500 (26.952)		4.367 (3.212)
ROA		0.033 (0.028)		-0.003 (0.005)
Riskiness		-0.015 (0.017)		-0.001 (0.002)
ROE		-0.006 (0.010)		-0.000 (0.001)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Region*Year FE	No	Yes	No	Yes
<i>N</i>	1434	1434	1434	1434
<i>R</i> ²	0.759	0.805	0.834	0.861

Notes: OLS regression with robust standard errors in parentheses, clustered at the bank level. LB indicates the dummy for listed banks; each regression includes the control variable for the status of interlocking in 2012. *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 (lagged by one year); FE indicates fixed-effects. Asterisks indicate statistical significance at levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. **Source:** Bank of Italy (Bank Board Archives, Supervisory Register, and Balance Sheet data).

Table A.4
Robustness for the share of females on the boards of listed banks.

	(1)	(2)	(3)	(4)	(5)
	(Balanced)	(Staggered)	(Diversity controls)	(Alternative interlocking)	(Alternative control group)
A. Board of directors					
LB X Post	0.173*** (0.021)	0.149** (0.022)	0.117*** (0.021)	0.103*** (0.023)	0.156*** (0.018)
<i>N</i>	696	1044	1044	754	5900
<i>R</i> ²	0.800	0.804	0.818	0.764	0.692
B. Board of supervisors					
LB X Post	0.190*** (0.031)	0.260*** (0.029)	0.177*** (0.026)	0.131*** (0.025)	0.196*** (0.022)
<i>N</i>	696	1044	1044	754	5900
<i>R</i> ²	0.792	0.797	0.785	0.750	0.726
Bank FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Region*Year FE	Yes	Yes	Yes	Yes	Yes
Bank controls	Yes	Yes	Yes	Yes	Yes

Notes: OLS regression with robust standard errors in parentheses, 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 (lagged by one year); FE indicates fixed-effects. Specifications in columns refer to: (Balanced) estimates with a balanced panel, (Staggered) to the treatment being assigned on the year of the first nomination of a woman on the board after 2012, (Diversity) includes as controls the other board characteristics, (Alternative interlocking) includes a dummy flagging the existence of an interlocked position on the board from 2012 to 2015, and (Alternative control group) makes use of a control group formed by all banks which are both not listed and not belonging to listed groups. All specifications (unless that in column 4, which uses an alternative ID control) include the control variable for the status of interlocking in 2012. Asterisks indicate statistical significance at levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. **Source:** Bank of Italy (Bank Board Archives, Supervisory Register, and Balance Sheet data).

Table A.5
Robustness for the diversity index on the boards of listed banks.

	(1)	(2)	(3)	(4)	(5)
	(Balanced)	(Staggered)	(Alternative interlocking)	(Until 2015)	(Alternative control group)
A. Board of directors					
LB X Post	0.391* (0.220)	0.468** (0.187)	0.300 (0.198)	0.295 (0.190)	0.408*** (0.126)
<i>N</i>	696	1044	754	754	5900
<i>R</i> ²	0.608	0.650	0.707	0.706	0.580
B. Board of supervisors					
LB X Post	0.365 (0.235)	0.358* (0.187)	0.280 (0.221)	0.271 (0.213) (0.201)	0.251
<i>N</i>	696	1044	754	754	5900
<i>R</i> ²	0.603	0.622	0.706	0.706	0.503
Bank FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Region*Year FE	Yes	Yes	Yes	Yes	Yes
Bank-level controls	Yes	Yes	Yes	Yes	Yes

Notes: OLS regression with robust standard errors in parentheses, 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 (lagged by one year); FE indicates fixed-effects. Specifications in columns refer to: (Balanced) estimates with a balanced panel, (Staggered) to the treatment being assigned on the year of the first nomination of a woman on the board after 2012, (Alternative interlocking) includes a dummy flagging the existence of an interlocked position on the board from 2012 to 2015, (Until 2015) restricts the sample to 2008-2015 in line with the alternative interlocking specification, and (Alternative control group) makes use of a control group formed by all banks which are both not listed and not belonging to listed groups. All specifications (unless that in column 3, which uses an alternative ID control) include the control variable for the status of interlocking in 2012. Asterisks indicate statistical significance at levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. **Source:** Bank of Italy (Bank Board Archives, Supervisory Register, and Balance Sheet data).

Table A.6

Robustness for the share of females on the boards of banks in listed groups.

	(1)	(2)	(3)	(4)	(5)
	(Balanced)	(Staggered)	(Diversity controls)	(Alternative interlocking)	(Alternative control group)
A. Board of directors					
BLG X Post	0.012 (0.047)	-0.023 (0.021)	-0.015 (0.021)	-0.007 (0.017)	-0.006 (0.016)
<i>N</i>	696	1434	1444	1118	6290
<i>R</i> ²	0.702	0.690	0.710	0.703	0.666
B. Board of supervisors					
BLG X Post	0.071 (0.053)	0.037 (0.030)	0.052* (0.030)	0.057* (0.027)	0.040 (0.018)
<i>N</i>	696	1434	1444	1118	6290
<i>R</i> ²	0.755	0.703	0.733	0.737	0.722
Bank FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Region*Year FE	Yes	Yes	Yes	Yes	Yes
Bank controls	Yes	Yes	Yes	Yes	Yes

Notes: OLS regression with robust standard errors in parentheses, 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 (lagged by one year); FE indicates fixed-effects. Specifications in columns refer to: (Balanced) estimates with a balanced panel, (Staggered) to the treatment being assigned on the year of the first nomination of a woman on the board after 2012, (Diversity) includes as controls the other board characteristics, (Alternative interlocking) includes a dummy flagging the existence of an interlocked position on the board from 2012 to 2015, and (Alternative control group) makes use of a control group formed by all banks which are both not listed and not belonging to listed groups. All specifications (unless that in column 4, which uses an alternative ID control) include the control variable for the status of interlocking in 2012. Asterisks indicate statistical significance at levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. **Source:** Bank of Italy (Bank Board Archives, Supervisory Register, and Balance Sheet data).

Table A.7
Robustness for the performance of listed banks.

	(1)	(2)	(3)	(4)	(5)
	(Balanced)	(Staggered)	(Diversity controls)	(Alternative interlocking)	(Alternative control group)
A. ROA					
LB X Post	0.620 (0.542)	0.579 (0.386)	1.007** (0.437)	0.374 (0.411)	0.577* (0.297)
<i>N</i>	804	1110	1069	803	6139
<i>R</i> ²	0.564	0.559	0.586	0.659	0.650
B. ROE					
LB X Post	1.465 (2.612)	0.832 (2.338)	3.345 (2.473)	0.587 (3.140)	2.462 (1.586)
<i>N</i>	804	1110	1069	1118	6139
<i>R</i> ²	0.502	0.514	0.548	0.737	0.543
C. Riskiness					
LB X Post	0.236 (1.887)	-0.897 (1.632)	-1.050 (1.760)	-0.131 (1.557)	-0.893 (1.038)
<i>N</i>	804	1110	1069	1118	6139
<i>R</i> ²	0.700	0.689	0.687	0.762	0.747
Bank FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Region*Year FE	Yes	Yes	Yes	Yes	Yes
Bank-level controls	Yes	Yes	Yes	Yes	Yes

Notes: OLS regression with robust standard errors in parentheses, 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 (lagged by one year); FE indicates fixed-effects. Specifications in columns refer to: (Balanced) estimates with a balanced panel, (Staggered) to the treatment being assigned on the year of the first nomination of a woman on the board after 2012, (Diversity) includes as controls the other board characteristics, (Alternative interlocking) includes a dummy flagging the existence of an interlocked position on the board from 2012 to 2015, and (Alternative control group) makes use of a control group formed by all banks which are both not listed and not belonging to listed groups. All specifications (unless that in column 4, which uses an alternative ID control) include the control variable for the status of interlocking in 2012. Asterisks indicate statistical significance at levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. **Source:** Bank of Italy (Bank Board Archives, Supervisory Register, and Balance Sheet data).

Table A.8
Robustness on the share of females on boards until 2015.

	(1)	(2)	(3)	(4)
	A. Listed banks (BD)	B. Banks in listed groups (BS)	B. Banks in listed groups (BD)	B. Banks in listed groups (BS)
LB X Post	0.100*** (0.023)	0.134*** (0.025)	-0.008 (0.023)	0.058** (0.028)
<i>N</i>	754	754	1118	1118
<i>R</i> ²	0.763	0.751	0.703	0.737
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Region*Year FE	No	Yes	No	Yes
Bank controls	Yes	Yes	Yes	Yes

Notes: OLS regression with robust standard errors in parentheses, clustered at the bank level. BD denotes the Board of Directors, BS the Board of Supervisors. 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 (lagged by one year); FE indicates fixed-effects. Asterisks indicate statistical significance at levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. **Source:** Bank of Italy (Bank Board Archives, Supervisory Register, and Balance Sheet data).

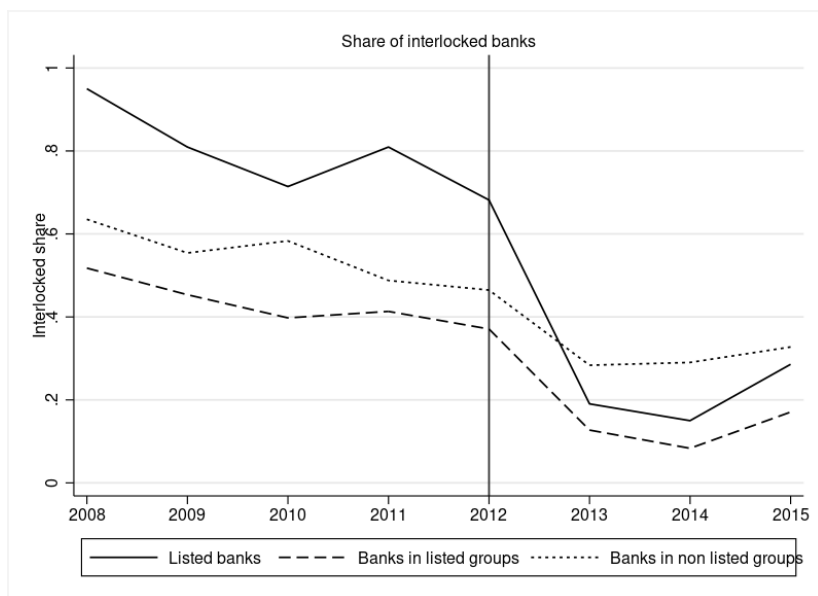
Table A.9
Robustness on bank performances until 2015.

	(1)	(2)	(3)
	A. ROA	B. ROE	C. Riskiness
LB X Post	0.496 (0.418)	1.023 (3.138)	-0.272 (1.563)
<i>N</i>	803	803	803
<i>R</i> ²	0.657	0.591	0.761
Bank FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Region*Year FE	Yes	Yes	Yes
Bank-level controls	Yes	Yes	Yes

Notes: OLS regression with robust standard errors in parentheses, 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 (lagged by one year); FE indicates fixed-effects. Asterisks indicate statistical significance at levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. **Source:** Bank of Italy (Bank Board Archives, Supervisory Register, and Balance Sheet data).

B Appendix: Additional Figures

Figure B.1
Share of interlocked banks 2008 to 2015.



Notes: the figure depicts the share of banks having at least one director sitting on the board of a competitor bank from 2007 to 2019; the vertical line indicates the moment when the requirements of the law on interlocking directories restricting such condition became compulsory. **Source:** Bank of Italy (Bank Board Archives) and [Barone et al. \(2022\)](#).