Board Gender Quotas and Female Borrowing: Evidence from Loan-Level Data*

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Abstract

We examine how female board representation affects banks' lending to female-led firms, using Italy's mandatory gender quota and loan-level data. As banks increase female board presence, they lend more to female-led firms on both extensive and intensive margins, including smaller firms, without increasing non-performing exposures. The additional credit appears to stem from improved information flows, as female borrowers experience higher post-quota growth. We also uncover organizational adjustments: banks promote more women among rank-and-file employees, which can explain female credit growth. Our findings highlight how board-level gender diversity can improve information processing within banks, shaping credit allocation and broader organizational outcomes.

JEL Classifications: D22, G21, G32, J01, J71
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1 Introduction

Women often encounter systemic barriers in accessing financial resources across various markets such as corporate debt, mortgages, and venture capital.[1] These barriers contribute to economic disparities, including lower home ownership rates and fewer opportunities to start or grow businesses. The under-representation of female entrepreneurs is particularly concerning, as it can result in resource misallocation, with viable women-owned firms struggling to secure financing. This inefficiency curtails individual success and may also dampen economic growth by reducing innovation and job creation (Morazzoni and Sy, 2022).

A potential source of these disadvantages is the under-representation of women on the supply side of capital, particularly in the financial services sector. For example, Huang, Mayer, and Miller (2024) report that only 35% of loan officers are women, while Ceccarelli, Herpfer, and Ongena (2024) find that just 20% of bankers are female. These disparities are even more pronounced in senior positions, reflecting the glass ceiling faced by women (Athey, Avery, and Zemsky, 2000; Matsa and Miller, 2011; Husain, Matsa, and Miller, 2023). Such representation gaps may, in turn, shape how banks operate and interact with their clients. If male lenders, whether front-line loan officers or senior managers setting company-wide lending policies, favor male borrowers or face greater difficulty processing information about female-led firms, female entrepreneurs may be denied credit even when they present profitable investment opportunities. This raises a crucial question: does increasing the share of women on the supply side of capital improve financing outcomes for female borrowers?

In this paper, we investigate whether having more women on banks' boards leads to more lending to female-led firms. To address this question, we leverage the staggered introduction of a mandatory gender quota for the boards of publicly listed firms in Italy in 2012 ("Legge Golfo-Mosca"). This regulation required listed limited liability companies in Italy to increase the share of directors from the underrepresented gender to 20% in the first board renewal after August 2012. The quota then gradually increased to 33% over the next two board renewals, which typically occur every three

[1] Most studies document gender-related disadvantages in debt and equity markets. For example, Alesina, Lotti, and Mistrulli (2013) show that, despite similar levels of risk, female borrowers pay higher interest rates. Similarly, Delis, Hasan, Iosifidi, and Ongena (2022) document that male entrepreneurs seek loans more aggressively, resulting in higher firm performance. Finally, regarding equity financing, Ewens and Townsend (2020) and Hebert (2023) find that early-stage investors favor male over otherwise similar female entrepreneurs. Nevertheless, other papers do not detect such disadvantages (Asiedu, Freeman, and Nti-Addae, 2012; Asiedu, Kalonda-Kanyama, Ndikumana, and Nti-Addae, 2013; Ongena and Popov, 2016).

years. As a result, female board representation in listed banks rose significantly, by 18 percentage points, compared to unaffected non-listed banks.

We combine data from Italy's Credit Registry (CR) on all credit relationships of private firms from 2009 to 2019, along with detailed ownership information, to identify lending relationships between listed banks and female-led firms. We define a firm as female-led if women own more than 50% of its equity. Using a staggered difference-in-difference-in-differences (DDD) design, we compare the evolution of credit relationships between listed and non-listed banks, and both female- and male-led firms, following the introduction of gender quotas. Our analysis reveals a significant expansion in credit access for female-led firms compared to male-led firms: the likelihood of a listed bank forming a credit relationship with a female-led firm increases by 1.4 percentage points after the quota's implementation. Additionally, credit growth in these lending relationships rises by 0.7 percentage points, which corresponds to 5% of its inter-quartile range. This increase is particularly noteworthy given that female-led firms account for only 16% of credit relationships in Italy, despite representing 32% of all firms. This increase in credit also stems from an organic expansion in the amount of capital available to female-led firms, rather than from a reallocation of existing credit.[2]

Our results remain consistent across a wide range of robustness checks. Most importantly, because our identification strategy exploits the staggered implementation of the reform across listed banks, we show that our results are unchanged when we apply the stacked difference-in-differences estimator of Gormley and Matsa (2011) and exclude already treated banks from the control group.[3] Our findings also hold when we define treatment based on the pre-quota share of female directors in listed banks. Moreover, the results are similar when we restrict the definition of female-owned firms to those fully owned by women or when using the actual share of female-owned equity as a measure. Finally, we find no evidence that the results are driven by bank specialization (Paravisini, Rappoport, and Schnabl, 2023).

Next, we investigate whether an increase in the share of women on the supply side of capital led to a change in the riskiness of banks' loan portfolios. On the one hand, a higher share of female lenders could enhance information flows between banks and female borrowers through a homophily

[2]Specifically, the results at the credit-relationship level are not driven by a shift of credit toward more female-friendly banks. Instead, we observe that credit availability at the firm level increases by 0.8 percentage points for female-led firms.

[3]We also provide evidence of robustness using the estimation approach proposed by Callaway and Sant'Anna (2021).

channel (Fisman, Paravisini, and Vig, 2017). For instance, female bankers may better understand the challenges and opportunities faced by female-led firms, fostering improved communication and trust between lender and borrower. This shared perspective could enable female bankers to more accurately assess the creditworthiness of female entrepreneurs, leading to better risk assessments and tailored financial products. By reducing information asymmetries, banks could lower screening and monitoring costs, allowing them to extend more credit to female-led firms without increasing overall portfolio risk. Alternatively, if loans to female-led firms after the quota were associated with higher risk, this would suggest a shift in banks' preferences, indicating that post-quota, banks made a deliberate and potentially costly effort to increase lending to female firms.

We find that most new lending relationships are established with small firms, particularly micro and small-to-medium-sized enterprises (SMEs), where information asymmetries are typically greatest. Moreover, the observed expansion of credit, both on the extensive margin (the probability of initiating a new lending relationship) and the intensive margin (credit growth), does not occur among riskier firms, as measured by their ex-ante credit ratings. Finally, we find no evidence of an ex-post deterioration in credit quality associated with the increase in lending to female-led firms. These firms are not more likely to exhibit a higher probability of default, nor are their exposures more likely to become non-performing loans (NPLs). Overall, the findings suggest that the additional credit extended to female-led firms likely reflects profitable lending opportunities and a reduction in information frictions following the quota.

The observed increase in lending to female-led firms raises important questions about the mechanisms through which female board representation affects credit allocation. To address these questions, we investigate the effects of the gender quota on banks' internal organization to better understand the drivers of the change in lending. Specifically, in the spirit of Bertrand, Black, Jensen, and Lleras-Muney (2018), Maida and Weber (2022), and Ladant and Paul-Delvaux (2025), we examine whether the increased share of female directors following the quota has influenced banks' internal labor markets, potentially leading to greater lending to female borrowers. For instance, a greater representation of women on boards could enhance women's promotion rates through more gender-diverse human resource policies, mentorship opportunities, and leadership recommendations. Female directors may also serve as role models, highlighting the benefits of attaining top leadership positions. Promotions of women to managerial and credit-related positions could, in turn, directly

affect lending behavior by improving information flows and reducing gender-related frictions in credit allocation.

For the empirical analysis, we use administrative micro-data from the Italian Pension Institute (INPS) covering all workers employed in Italian banks from 2009 to 2018. We find that in listed banks affected by the quota, the probability that a woman is promoted to middle management is 0.9 percentage points higher than in untreated banks. This increase is substantial: given a baseline promotion rate of 5.2%, it implies that female employees become nearly 20% more likely to reach middle management. We also find somewhat mixed evidence that female middle managers are more likely to be promoted to top management. Moreover, we show that these changes have important implications for female employees' wages, which increase at all levels in listed banks following the implementation of the quota.

Finally, we examine whether the increase in credit availability for female-led firms affects their behavior. We document significant real effects of improved access to credit: these firms invest more in tangible assets, increase their liquidity, and expand their revenues. Taken together, these findings contradict the hypothesis that increased lending to female borrowers is costly for banks and are inconsistent with the view that the introduction of the gender quota led to suboptimal lending policies. Instead, the evidence suggests that the expansion of lending to female-led firms represents a positive net present value opportunity for listed banks, likely reflecting reduced information frictions between lenders and borrowers.

This paper contributes to several strands of the literature. First, while prior studies have established gender-related financing frictions (e.g., Muravyev, Talavera, and Schäfer, 2009; Bellucci, Borisov, and Zazzaro, 2010; Alesina, Lotti, and Mistrulli, 2013; Ongena and Popov, 2016; Beck, Behr, and Madestam, 2018; Morazzoni and Sy, 2022; Delis, Hasan, Iosifidi, and Ongena, 2022; Hebert, 2023), little is known about how these disparities can be overcome. We add to this literature by examining the role of a mandatory gender quota. Despite considerable evidence on the implications of mandatory gender quotas for firm performance, governance, exit, and director selection,[4] we lack

[4]See, for example, Ahern and Dittmar (2012), Matsa and Miller (2013), Bøhren and Staubo (2014), and Eckbo, Nygaard, and Thorburn (2022) for Norway, Fedorets, Gibert, and Burow (2019) for Germany, Rebérioux and Roudaut (2019) and Ferreira, Ginglinger, Laguna, and Skalli (2021) for France, Greene, Intintoli, and Kahle (2020), Hwang, Shivdasani, and Simintzi (2021), and von Meyerinck, Niessen-Ruenzi, Schmid, and Solomon (2022) for California, De Vita and Magliocco (2018), Baltrunaite, Cannella, Mocetti, and Roma (2023), Mazzotta and Ferraro (2020), and Ferrari, Ferraro, Profeta, and Pronzato (2022) for Italy, and Kuzmina and Melentyeva (2021) for a sample of seven European countries.

evidence on whether these quotas affect lending decisions and, consequently, whether they also have effects on (private) firms unaffected by quotas.[5] Using micro-level loan data from Italy, we show that the Italian gender quota has resulted in more lending from banks more exposed to the quota. This increase in lending is largely concentrated among female-led firms. Importantly, we do not find evidence that these lending relationships result in more non-performing loans.

Second, we expand the prior literature on mandatory quotas in two important ways. While there is considerable evidence on how gender quotas affect the composition and skill set of boards of directors (e.g., Ahern and Dittmar, 2012; Greene et al., 2020; Ferreira et al., 2021; Hwang et al., 2021; Kuzmina and Melentyeva, 2021; von Meyerinck et al., 2022), research on the broader effects of top-level quotas on the female labor market is limited, and the existing evidence is mixed. Bertrand, Black, Jensen, and Lleras-Muney (2018) find no robust evidence that, aside from the directors themselves, other employees benefited from the introduction of the gender quota in Norway, a country with a relatively high degree of gender equality. Similarly, Maida and Weber (2022) examine the Italian gender quota and find small but statistically insignificant increases in the share of women in executive positions or among top earners through 2016.[6] More recently, Ladant and Paul-Delvaux (2025) document an increase in female promotions at the top of the corporate hierarchy following the introduction of the French gender quota. We contribute to this literature by documenting increased female promotions to middle management in a country with a relatively high level of gender inequality. Moreover, previous research on gender quotas has primarily examined direct implications for firms subject to the quota.[7] In contrast, our evidence points to a broader effect of mandatory quotas, as the Italian gender quota does not directly apply to the borrowers themselves, most of which are private firms.

Finally, we contribute to the literature on the glass ceilings women face throughout their career progression. This line of research has examined gender-related differences in pay as well as hiring, promotion, and demotion practices (e.g., Neumark, Bank, and Van Nort, 1996; Blau and Kahn, 1997;

[5]Evidence on the effects of quotas on banks can be found in Del Prete and Stefani (2021) and Del Prete, Papini, and Tonello (2024), while Guiso, Schivardi, and Zaccaria (2024) provide evidence of horizontal spillovers on boards of connected private firms.

[6]Our results may differ because our study focuses on the banking sector, which may be more conservative than the average Italian firm, leaving greater room for improvement for female employees. For example, we find an 18% increase in female directors after the quota, whereas Maida and Weber (2022) document an effect of 10%. Furthermore, in contrast to Maida and Weber (2022) who look at a post-quota implementation period of 2–3 years, our study extends to 2019, giving banks more time to adopt the policy.

[7]One notable exception is Guiso, Schivardi, and Zaccaria (2024), who document spillovers to other boards.

Altonji and Blank, 1999; Goldin and Rouse, 2000; Ginther and Kahn, 2004; Blackaby, Booth, and Frank, 2005; Booth and Leigh, 2010; Moss-Racusin, Dovidio, Brescoll, Graham, and Handelsman, 2012; Azmat and Ferrer, 2017; Cullen and Perez-Truglia, 2023; Bircan, Friebel, and Stahl, 2024) with similar gender gaps in the financial services industry (Egan, Matvos, and Seru, 2022; Huang, Mayer, and Miller, 2024; Benson, Li, and Shue, 2022; Ceccarelli, Herpfer, and Ongena, 2024). This literature has also investigated the effects women in leadership positions have on other female employees (e.g., Broder, 1993; Bertrand, Goldin, and Katz, 2010; Beaman, Duflo, Pande, and Topalova, 2012; De Paola and Scoppa, 2015; Bagues, Sylos-Labini, and Zinovyeva, 2017; Matsa and Miller, 2011; Kunze and Miller, 2017; Flabbi, Macis, Moro, and Schivardi, 2019; Périlleux and Szafarz, 2022; Fortin, Markevych, and Rehavi, 2024). We add to this literature by showing that an increase in the share of female directors results in more promotions of women in the male-dominated financial industry.

The rest of the paper is organized as follows. Section 2 presents the institutional details of the quota. Section 3 describes the data. Section 4 outlines the impact of the quota on female board representation in Italian banks. Sections 5 and 6 present the effects on lending and shed light on the mechanisms underlying our findings. Section 7 examines the real effects of the quota. Finally, Section 8 concludes.

2 The Golfo-Mosca Law (Law 120/2011)

In response to a relatively low share of female directors, Italy enacted a mandatory gender quota on August 12, 2011, referred to as the Golfo-Mosca Law (Law 120/2011). The quota was first discussed in parliament on November 10, 2009, and became binding on August 12, 2012.[8] In contrast to the widely studied Norwegian gender quota, which gave firms five years for compliance, the Italian setting provides a tighter timeline, allowing for a relatively precise estimation of the effects of the quota.

In publicly-listed companies in Italy, board renewals generally occur every three years, with the majority of these renewals happening between March and June. The quota requires listed limited liability companies in Italy to increase the share of directors of the underrepresented gender to 20% in the first board renewal after August 2012. This share gradually increased to 33% in the

[8] A timeline of the law can be found in A1.

subsequent two board renewals, and remained in place until 2022, when the law was originally set to expire. However, as of December 2019, the law has been amended to include three more renewals of the board (including the last one with a quota of one third), with a quota of 40% for the underrepresented gender.

The regulatory board of the Italian stock exchange, CONSOB, monitors compliance with the quota. In case a firm fails to meet its target, CONSOB issues a warning. If a firm remains non-compliant after four months, CONSOB issues a fine ranging from a minimum of EUR 100,000 to a maximum of EUR 1,000,000. After another three months of non-compliance the board is dissolved.

To identify the effect of the gender quota on bank lending to female-led firms, we exploit two characteristics of the reform, resulting in a staggered difference-in-differences (DID) design. First, the reform targeted listed banks, allowing us to partition Italian banks into two groups: treated (publicly-listed banks) and control (non-listed) banks. Second, the timing of the treatment varies because the reform's requirements became mandatory only after the listed banks' first board renewal, i.e., banks renewing their boards later experience a later treatment.[9]

Importantly, we add another dimension to our analysis by focusing on whether the borrowing firm is female-led. We define a firm as female-led if at least 50% of its equity is owned by women and focus on firms that never switch status to avoid confounding effects. Thus, our design becomes a staggered difference-in-difference-in-differences (DDD) approach, comparing the evolution of credit relationships between listed and non-listed banks and between female and male firms after the first board renewal following the introduction of the quota.

3 Data

We obtain the universe of Italian business loans from the Bank of Italy's credit registry, which records all exposures exceeding EUR 30,000.[10] For each loan, we observe the date, amount, and loan type, distinguishing between term loans, self-revolving loans (e.g., credit lines), and auto-liquidating loans (e.g., factoring). The sample is restricted to loans granted to limited liability companies between 2009 and 2019, the latter chosen to exclude the COVID-19 period. Because lending policies are

[9]The timing of the renewals is exogenous to the reform since it depends on the schedule of the bank.

[10]The reporting threshold was lowered from EUR 75,000 to EUR 30,000 in 2009, which marks the start of our sample period.

determined at the ultimate parent level, we consolidate lenders at the banking-group level using the group structure as of end-2019, resulting in 146 bank groups.

From the Orbis database (Bureau van Dijk), we obtain information on the equity ownership of Italian limited liability companies. Using the Italian fiscal code, Orbis identifies owners and records demographic attributes such as gender and age, which we extract following the procedure in Core (2024).[11] We classify a firm as female-led if women own at least 50% of its equity, and we exclude firms that switch status throughout our sample period.[12] Our sample includes 1,524,175 Italian limited liability companies observed in Orbis between 2009 and 2019, yielding more than 6.5 million firm-year observations, of which 32% are female-led.

Data on board members of listed and non-listed banks between 2009 and 2019 come from the OR.SO. database of the Bank of Italy. We extract information for 21 banking groups whose holding companies are listed and for 388 unlisted banks included in the credit registry. The dataset covers more than 23,000 directors over the period. Following the same consolidation approach as above, we aggregate the data at the bank-group-year level, based on the 2019 group structure, obtaining a balanced panel of female board representation for all Italian banks between 2009 and 2019.

Our two main dependent variables are (i) the probability that a credit relationship is established and (ii) credit growth, measured as the mid-point growth rate and capped between –2 and +2 to mitigate the influence of outliers:

$$\frac{\text{credit}_t - \text{credit}_{t-1}}{0.5 \times (\text{credit}_t + \text{credit}_{t-1})}. \tag{1}$$

We merge these data with balance sheet and income statement information from the CERVED database, which covers the entire population of Italian limited liability companies. The final set of variables comes from employee-level records provided by the Italian Pension Institute (INPS), allowing us to study both the probability that an employee is female and the likelihood that a female employee is promoted to middle manager (*Quadri*) or top-level manager (*Dirigenti*).[13] Our final sample includes all full-time employees in Italian banking groups between 2009 and 2018 (i.e., the

[11] This procedure exploits the demographic information embedded in an individual's Italian fiscal code to identify gender and age.

[12] Later in the paper we provide evidence that this choice bears no material effect on the main results.

[13] Under the Italian Civil Code, middle managers (*Quadri*) retain operative responsibilities while also supervising groups of employees, whereas top-level managers (*Dirigenti*) have broad managerial autonomy over the entire firm or one of its business units.

maximum span available in the database), yielding over 3 million observations.

In our analysis, we compare listed and unlisted banks, making it essential to ensure that institutional differences do not spuriously drive our results. This is particularly relevant given that our sample period encompasses the sovereign debt crisis and the introduction of the Targeted Longer-Term Refinancing Operations (TLTRO), which affected banks of different sizes unevenly (Carpinelli and Crosignani, 2021). To mitigate this risk, we focus on the top quartile of banks by credit volume at the beginning of our sample period, yielding a total of 34 banks, whereof 13 are listed and 21 non-listed. This filter excludes six smaller listed banks, most of which specialize in private and investment banking. Importantly, our results remain robust when all Italian banks are included.

Table 1 reports bank-level summary statistics for listed and non-listed banks in 2010, the year prior to the approval of the quota. While the two groups differ substantially in size, they are broadly comparable in terms of risk-weighted assets, leverage, liquidity, capital ratios, and the share of credit extended to female-led firms. Similarly, the share of female employees is comparable across listed and non-listed banks, both for regular employees, middle managers, and top managers. Thus, despite size differences, the two groups are largely similar.

Table 2 presents univariate statistics for the main variables in our sample. The first set of variables describes bank types and the ownership structure of borrowers. Our sample comprises 34 banks over eleven years, with female-led firms accounting for an average of 14% of the banks' loan portfolios.

The second set of variables pertains to loan-level information. As larger institutions, listed banks provide the majority of loans, with female-led firms receiving roughly 16% of these. The average loan amount is approximately €1m, although the median is much smaller (€220k). Average credit growth in the sample is negative (-3%), likely reflecting the aftermath of the global financial crisis and the onset of the sovereign debt crisis in Italy.

Finally, 40% of bank employees are middle managers, while only 2% occupy top-level management positions. Female representation declines at higher levels of the corporate hierarchy: women account for 43% of all employees, about 33% of middle managers, and less than 1% of top-level managers.

4 Female board representation in Italian banks

We first examine the impact of the gender quota on the composition of the board of directors of Italian listed banks. Panel A in Figure 1 plots the share of female directors in listed and non-listed banks around the introduction of the mandatory gender quota in Italy. We observe a strong increase in female board representation over the sample period. Before the enactment of the gender quota, the share of female directors in listed Italian banks was lower than 10%. In 2019, the end of our sample period, this share has increased to 35%, slightly above the mandatory quota of 33% and in line with the later increase in the quota to 40% in 2019.

Even though the quota does not apply to non-listed banks, these banks also experienced a small increase in the share of female directors after 2010, presumably due to a general time trend towards greater gender equality, consistent with the results of Guiso, Schivardi, and Zaccaria (2024). Importantly, the relatively stable share of female directors in both listed and non-listed banks before the introduction of the quota suggests that the parallel trends assumption is not violated. Panel B shows that Italian banks did not increase their board size to accommodate more female directors after the quota was enacted. This implies that listed banks replaced some of their male directors, consistent with larger boards being detrimental to firm performance (Yermack, 1996; Jenter, Schmid, and Urban, 2023).

Next, we examine the effect of the quota more formally and run the following difference-in-differences (DID) regression:

$$\text{Female directors}_{b,t} = \beta \text{Listed}_b \times \text{Post}_{b,t} + \eta_b + \phi_t + \varepsilon_{b,t}, \tag{2}$$

where $\text{Female directors}_{b,t}$ is the share of female directors in bank b in year t. $\text{Post}_{b,t}$ is a dummy equal to 1 from bank's b first renewal of the board after August 2012, and 0 otherwise. As banks renew their boards at different points of time, the post period varies from bank to bank. Listed_b is a dummy equal to 1 if bank b is listed at the time of the quota, and 0 otherwise. The coefficient of interest is β, the differential effect of the quota on listed and unlisted Italian banks. η_b and ϕ_t denote bank and year fixed effects, respectively. As the number of banks in the sample is relatively low, we report Driscoll-Kraay standard errors in parentheses to avoid issues with the small number of clusters (Driscoll and Kraay, 1998; Abadie, Athey, Imbens, and Wooldridge, 2023).

Table 3 provides the estimates of Equation (2). In Model 2, which includes bank and year fixed effects, we find that the share of female directors in listed banks increases by 18 percentage points (p.p.) relative to unlisted banks. Model 3 extends the analysis to all Italian banks in Italy (as opposed to only the 34 largest banks) and the results barely change.

As the timing of board renewals differs across banks, Equation (2) represents a staggered DID model, which may suffer from negative weighting due to dynamic treatment effects. To address this concern, Model 4 in Table 3 re-estimates the analysis from Model 2 using the stacked DID approach of Gormley and Matsa (2011). In this approach, we first construct the control group for each event (i.e., a bank's board renewal under the quota) by excluding already-treated observations and only using never-treated and not-yet-treated firms in the control group, and then creating a new sample of stacked events. Finally, we re-estimate the DID model using this new sample, including bank-event and event-year fixed effects, where an event refers to the corresponding board renewal. The results in Model 4 reinforce this conclusion: the estimated coefficient is nearly identical to that in Model 2, indicating that negative weighting and dynamic effects are not substantial in our setting.

Panel A in Figure 2 plots regression estimates of the share of female directors on interactions of the listed dummy and time dummies along with the corresponding 95% confidence intervals. The time dummies are defined relative to the first renewal of the board after August 2012 ($t = 0$). The interaction for the last year before the first renewal represents the omitted category. The figure confirms the univariate plot in Figure 1. After the introduction of the quota, there is an increase in the share of female directors in listed Italian banks when compared to their unlisted counterparts. In the first board renewal, treated banks increase the share of female directors by roughly 10 p.p. relative to unlisted banks. The increase in the share of female directors in the second renewal ($t = 3$) is a bit smaller in magnitude, likely because unlisted banks also increased their female board representation over time (Figure 1).[14] The coefficients in the pre-reform period show no evidence of pre-trends, suggesting that the parallel trends assumption is unlikely to be violated.

Panel B of Figure 2 corroborates this pattern by applying the Callaway and Sant'Anna (2021) estimator, which explicitly accounts for potential biases arising from negative weighting in staggered treatment settings. As was the case in Table 3 with the stacked DID approach of Gormley and

[14]Note that in contrast to the univariate plot in Figure 1, the share of female directors seems to increase more abruptly. This is because of the staggered nature of the reform. In the regression analyses, we code the time dummies relative to the treatment year, i.e., the treatment for each listed bank takes place in $t = 0$.

Matsa (2011), the results of our staggered design are not sensitive to the choice of estimator. We find a very similar pattern and an average treatment effect on the treated (ATT) of 0.114, significant at the 1% level.

Table A2 and Figure A1 in the Internet Appendix show that the board size in listed banks does not change relative to unlisted banks after the quota. This suggests that listed banks increased the share of female directors by replacing male directors with women rather than by increasing the size of the board.

5 Bank lending around the quota

5.1 Main results

5.1.1 Extensive margin

In this section, we examine the impact of the gender quota on lending to female-led firms, starting with the formation of new lending relationships. In particular, we investigate whether listed banks become more likely to establish relationships with female-led firms after the quota comes into effect.

We consider the repeated cross-section of new lending relationships, formed between a bank b and a firm f in year τ. We follow Khwaja and Mian (2008) and estimate the following extensive margin-level equation:

$$\text{Lending relation}_{b,f,\tau} = \beta \text{Listed}_b \times \text{Female majority}_f + \eta_b + \phi_f + \gamma_\tau + \psi_{g,\tau} + \varepsilon_{b,f,\tau}, \qquad (3)$$

where $\text{Lending relation}_{b,f,\tau}$ is dummy set to 1 if a credit relationship between bank b and borrowing firm f starts after the quota-induced board renewal in year τ, and 0 if the relationship was established before the renewal. Female majority is a dummy equal to 1 if women own more than 50% of the firm's equity at the time of treatment, and 0 otherwise. The main predictor of interest is the interaction between Listed and Female majority.[15]

η_b and ϕ_f denote bank and firm fixed effects, while γ_τ are fixed effects for the year the relationship is formed (cohort fixed effects) and $\psi_{g,\tau}$ are fixed effects for the year of the relationship interacted

[15] We do not estimate a yearly panel of bank–firm loan relationships to avoid creating a sparse matrix dominated by non-existent relationships.

with borrower-female majority fixed effects (g). In essence, we rule out unobserved heterogeneity due to time-invariant firm and bank factors, as well as time-varying heterogeneity in aggregate and gender-specific borrowing conditions. Again, we use Driscoll-Kraay standard errors (Driscoll and Kraay, 1998). This specification, which follows Khwaja and Mian (2008) and De Jonghe, Dewachter, and Ongena (2020), analyzes whether the probability of starting a relationship in the post-reform period is higher for female-led firms in listed banks.

Table 4 presents the estimates for Equation (3). We observe that listed banks affected by the quota had a 1.2 p.p. higher probability of lending to female-led firms following the quota. This result remains robust when the model is augmented with more granular fixed effects. In addition, the coefficient in the fully saturated model (1.4 p.p., Model 3) corresponds to roughly 2.8% of all credit relationships that have been established after the first renewal post 2012 (50.6%).

Figure 3 illustrates the time dynamics of this effect. The first blue line represents the coefficient estimated on the sample of observations up to the first renewal of the board after the quota. Blue lines to the right incorporate additional years in the post-quota period. The graph indicates that the effect becomes significant when including observations one year after the quota and remains constant over time as more years after the reform are added. We conclude that the effect materializes quickly following the reform.

To examine potential pre-trends, we create placebo board renewal years up to three years before the actual quota and assess their impact (represented by the red lines). For example, the rightmost red line assumes a placebo quota in the year immediately preceding the true quota, excluding all years after the actual quota from the sample. If pre-trends were present, the red coefficients would show an upward trend. The graph, however, shows that the coefficients for the fictitious quotas are flat, indicating that the observed effects occur only after the actual quota implementation and are not driven by pre-existing trends in the outcome.

5.1.2 Intensive margin

Next, we investigate the impact of the quota on the intensive margin of credit using the following triple-difference (difference-in-difference-in-differences, DDD) specification:

$$\begin{aligned} \text{CR}_{b,f,t} =& \beta_1 \text{Listed}_b \times \text{Post}_{b,t} \times \text{Female maj}_f + \beta_2 \text{Post}_{b,t} \times \text{Female maj}_f + \\ &+ \eta_{b,f} + \phi_{b,t} + \psi_{f,t} + \varepsilon_{b,f,t}, \end{aligned} \tag{4}$$

where $\text{CR}_{b,f,t}$ represents mid-point credit growth (cf. Equation 1) between bank b and firm f in year t. The main coefficient of interest is β_1, which captures whether credit growth is higher for female-led firms with listed banks post-reform, relative to male-led firms and firms with relationships with non-listed banks, and represents the DDD estimator. The model includes bank-firm, bank-year, and firm-year fixed effects, which allows us to isolate the supply-side component of this effect by controlling for unobserved demand-side variation at the firm-year level, capturing shifts in a firm's aggregate credit demand that might otherwise bias our estimates (Khwaja and Mian, 2008).[16]

Table 5 presents the results. Models 1 to 3 progressively add more fixed effects until we arrive at the full saturation in Model 3, which includes bank–firm, bank–year, and firm–year fixed effects. Consistent with the findings on the extensive margin, the gender quota has a positive and statistically significant effect on the amount of credit extended to female-led firms. Specifically, in Model 3, credit growth for female-led firms with listed banks after the board renewal (treated banks) increases by 0.7 percentage points, corresponding to roughly 5% of its inter-quartile range.

As our DDD approach relies on the staggered timing of the reform for individual banks (unlike the approach for the extensive margin in Equation 3), we again adopt the stacked design of Gormley and Matsa (2011). Specifically, we use not-yet-treated listed banks as the control group and include bank–event and event–year fixed effects, where an event corresponds to the relevant board renewal. The estimates in Model 4 of Table 5 indicate that this approach does not introduce significant bias in our setting, as the coefficients remain largely unchanged when using the stacked DDD specification.[17]

[16] A potential caveat with this approach is that it excludes single-bank relationships from the analysis. This concern is negligible for Italy given the prevalence of multiple lending relationships in the country (Detragiache, Garella, and Guiso, 2000; Gobbi and Sette, 2014). In our sample, around 58% of firms are multi-banked, which corresponds to 78% of observations.

[17] Since we have 4 events (i.e., board renewals of listed banks in 2012, 2013, 2014, and 2015), the number of observations in Model 4 includes control observations (i.e., those of private banks) four times, and those of listed banks that renew their board in 2015, 2014, and 2013, 4, 3, and 2 times, respectively.

It is important to note that the intensive-margin results do not capture the full extent of the credit effect. In particular, if female-owned firms reallocated existing credit relationships from unlisted to listed banks upon treatment, we would observe a positive coefficient at the loan level but no corresponding effect at the firm level. To assess whether the total credit received by female-owned firms actually increases, Model 5 of Table 5 presents a specification aggregated at the firm level.

To aggregate the sample at the firm level, we redefine our main independent variable as follows. In each year t, we measure the share of total lending to firm f that comes from any bank b treated in year t, i.e., the share of lending to firm f from listed banks after their first board renewal, denoted as SharePostListed. We compute the share as:

$$\text{SharePostListed}_{f,t} = \frac{\sum_{b=1}^{n} \text{Credit}_{b,f,t} \times \text{Listed}_b \times \text{Post}_{b,t}}{\text{Total credit}_{f,t}}, \tag{5}$$

i.e., the sum of credit to firm f by treated bank b at time t, divided by the firm's total credit at t. We then interact the lagged value of this variable with a dummy equal to 1 if the firm is female-led. The lag is used because the contemporaneous share of credit is jointly determined with credit growth.

The main limitation of this approach is that it no longer allows us to control for time-varying demand factors through firm–year fixed effects. To account for firm-level demand, we adopt a procedure inspired by Amiti and Weinstein (2018): we first estimate the firm–year fixed effects using Model 3 in Table 5 and then include them as controls in the firm-level specification. In addition, the regression includes firm and year fixed effects, estimated separately for female- and male-owned firms, to further account for systematic differences across firm types.

Model 5 of Table 5 shows that the firm-level estimate is 0.8 percentage points, statistically significant at the 5% level. This value is nearly identical to that in Model 3, suggesting that the observed supply effects are not driven by a reallocation of credit from unlisted to listed banks by female-led firms, but instead reflect new credit that these firms are able to obtain as a result of changes in the board.

Our firm-level estimate is also robust to the procedure of Jiménez, Mian, Peydró, and Saurina (2020), which uses loan-level estimates to de-bias firm-level results, based on the following equation:

$$\hat{\bar{\beta}} = \hat{\bar{\beta}}_{\text{OLS}} - (\hat{\beta}_{\text{OLS}} - \hat{\beta}_{\text{FE}}) \cdot \frac{\text{Var}(X_i)}{\text{Var}(\bar{X}_j)}, \tag{6}$$

where $\hat{\beta}_{\text{OLS}}$ is the OLS estimate from a loan-level (i) regression without firm-year fixed effects (i.e., Model 2 in Table 5), while $\hat{\beta}_{\text{FE}}$ is the estimate from the same regression including firm-year fixed effects. Lastly, $\hat{\tilde{\beta}}_{\text{OLS}}$ is the OLS estimate from a firm-level (j) regression without firm-year fixed effects, and the final term is a scaling factor proportional to the variances of the main independent variables (i.e., Listed×Post×Female majority at the loan level, i, and SharePostListed×Female majority at the firm level, j).

Applying this procedure, we obtain a comparable coefficient of 0.9 p.p. for the DDD term. This suggests that listed banks extended new credit to female-led firms as a result of the quota, rather than simply reallocating existing credit, thereby improving these firms' access to finance.

5.2 Robustness

Thus far, we have demonstrated that all results based on the staggered design (either DID or DDD) remain robust when using the stacked approach of Gormley and Matsa (2011), ruling out treatment heterogeneity as a potential driver of our findings. In this subsection, we present evidence that our results are robust to several alternative specifications.

In our main analysis, a firm is classified as female-led if women hold at least 50% of the borrowing firm's equity, and we exclude firms that would switch female-led status throughout the sample (i.e., switchers). To assess the robustness of our results, we consider alternative criteria for identifying female-led firms and also include the switchers. Tables A3 and A4 in the Internet Appendix report the results for both the extensive and intensive margins of female borrowing, using four alternative proxies for female ownership: Female majority (switchers), a time-variant dummy equal to 1 if women own more than 50% of the firm's equity and 0 otherwise; Mean equity, the average share of the firm's equity held by women throughout the entire sample period; Equity, the time-variant share of the firm's equity held by women; Full owner, a time-variant dummy equal to 1 if women own 100% of the firm's equity and 0 otherwise.

Our findings indicate that the results for both the extensive and intensive margins are robust across all alternative definitions of female-led firms. Model 4 in Table A3 displays slightly larger standard errors, likely due to the relatively small number of fully female-owned firms in the sample.[18]

In our main analysis, treatment is defined based on a bank's listing status. We next test

[18] Approximately 5.5% of the firms in the sample are fully owned by females.

the robustness of our results using an alternative treatment definition. Specifically, we examine heterogeneity in the effects across listed banks with higher or lower shares of women on the board prior to the quota. We define a continuous variable, Distance, equal to 0.2 (the quota) minus the share of women on the bank's board in 2010, the year before the law was passed. *Distance* is set to zero for private banks (i.e., not subject to the quota) or for listed banks whose board share of women in 2010 exceeded 20%. Models 1 to 3 in Table A5 in the Internet Appendix report the estimates for the three main outcomes of interest, i.e., the share of female directors, the probability of forming a new credit relationship, and credit growth. The respective regression equations follow the corresponding tables (Tables 3, 4, and 5), but we replace the Listed dummy by the Distance dummy.

The coefficient in Model 1 of Table A5 is consistent with the results in Table 3: listed banks without any women on the board (i.e., Distance = 0.2) increase the share of women by 0.2×1.050, or exactly 21%, fully complying with the law. Model 2 shows that these banks also become significantly more likely to initiate lending relationships with female-owned firms following the quota, relative to private banks and already-compliant listed banks. Similarly, Model 3 indicates that the intensive-margin effects are concentrated among listed banks, and they are higher for listed banks that were farther from the quota. In all these cases, the magnitudes of the effects mirror those in the main analysis while standard errors are slightly larger. The latter is explained by the relatively limited variation within the group of listed banks: 8 out of the 13 listed intermediaries (among the 34 largest banks in our sample) had no women on the board prior to the quota.

We also test whether our findings could reflect bank specialization (Paravisini, Rappoport, and Schnabl, 2023). For example, if female-led firms are concentrated in specific industries (e.g., due to stereotypes as in Hebert, 2023), the observed increase in lending growth could simply reflect shifts in lending to these industries over time. To rule out this possibility, we follow the methodology of Benetton and Fantino (2021) and interact a control for bank–industry specialization with Listed, Post, and Female majority.

The results are reported in Table A6 in the Internet Appendix. In Models 1 to 3, we define a dummy variable equal to 1 if the share of bank b's number of loans in the industry of firm f exceeds the bank's overall loan share at the national level. In Models 4 to 6, the dummy equals 1 if the share of bank b's credit amount in the industry of firm f exceeds the bank's overall credit share

nationally. The intuition is that these specialization measures capture differential adjustments in quantities within industries where bank b specializes. We find that our results on credit growth remain unaffected by potential changes in bank specialization over time.

6 Understanding the effects of the gender quota on bank lending

This section examines the mechanisms underlying the observed increase in lending. We conjecture that the quota may have reduced informational frictions in credit allocation, which may be particularly relevant for smaller firms. If improved screening or monitoring played a role, we would expect to see an expansion in credit toward smaller borrowers without a corresponding increase in borrower risk. Furthermore, greater female representation on boards may have altered internal career dynamics, leading to higher promotion rates and wages among female employees and, in turn, expanding their influence over credit-related decisions. By improving the information processing within banks, these organizational changes could help explain the observed shift in lending toward female-led firms.

6.1 Information asymmetries between lenders and borrowers

We first investigate heterogeneity in lending decisions along two key dimensions: firm size and credit risk. Analyzing these dimensions allows us to identify which firms benefited from the increased credit supply and to assess whether information asymmetries played a role in driving the observed patterns. Moreover, this analysis provides insight into why banks had not extended more credit to female-led firms prior to the quota. If the pre-quota lending equilibrium was efficient, a post-quota increase in lending to these firms would likely reflect a shift in preferences rather than improved efficiency, potentially leading to riskier or less profitable loans. Conversely, if we observe an expansion of credit without a corresponding increase in risk, this would suggest that greater female representation on boards helped reduce informational frictions and improve the allocation of credit.

We start by examining differences in borrower size as a proxy for information asymmetries. While firm size is only an indirect measure of informational frictions, we use it because data limitations prevent us from capturing other dimensions of soft information, such as private networks or relational lending aspects. Table 6 presents relationship-level regressions of the probability of forming a new lending relationship (Models 1 to 3, consistent with Table 4) and mid-point credit growth (Models 4

to 6, consistent with Table 5). We split the sample by firm size according to Eurostat criteria, as reporting requirements are stricter for larger firms in Italy, resulting in a more transparent information environment. Specifically, micro-sized enterprises have up to 10 employees, small and medium-sized enterprises (SMEs) have between 10 and 250 employees, and large enterprises have at least 250 employees.

The extensive margin estimates in Models 1 to 3 show that new lending relationships are predominantly formed with smaller female-led firms. In contrast, we find fewer new credit relationships with large female borrowers, although this effect is estimated imprecisely due to the small number of large firms in the sample. On the intensive margin, the results suggest that the increase in credit is concentrated among SMEs, with no significant changes in credit growth for micro-sized or large firms. Taken together, these findings indicate that the post-quota expansion in lending primarily benefited female-led firms where information asymmetries are likely more pronounced, consistent with the interpretation that improved screening or monitoring reduced informational frictions.

We next examine the performance of loans granted to female-led firms. The finding that more credit was directed toward smaller female-led firms suggests that a reduction in information asymmetries between lenders and borrowers may have played a role in driving the lending increase. For instance, female bankers may have a better understanding of the challenges and opportunities faced by female-led firms, fostering improved communication and trust between lender and borrower. This shared perspective could enable female bankers to more accurately assess the creditworthiness of female entrepreneurs, leading to better risk assessments and more tailored financial products. By mitigating information asymmetries, banks could lower screening and monitoring costs, allowing them to extend additional credit to female-led firms without increasing overall portfolio risk.

Alternatively, if information flows between lenders and borrowers were not improving, the expansion in lending could instead be associated with higher credit risk. Finally, if the pre-quota equilibrium was efficient, the post-quota increase in lending to female-led firms would reflect a shift in bankers' preferences, potentially resulting in investments with negative net present value (NPV). This scenario would manifest in marginal loans that are more costly for banks (e.g., requiring higher regulatory capital) and consequently more risky.

Therefore, we examine the riskiness, cost, and ex-post performance of individual exposures to female-led firms resulting from the quota. Since a firm may appear safe at the time of borrowing

but later over-borrow and increase its risk of financial distress, we consider three different measures. First, to assess the ex-ante riskiness of individual exposures, we estimate a probability of default (PD) for each exposure in our sample. We consider the universe of loans in the period 2007–2009 (i.e., before the start of our main sample) and perform a logit regression of a non-performing loan (NPL) indicator for each bank–firm relationship on a set of firm, bank–firm, and loan characteristics.[19] We then use the estimated coefficients from this regression to back out a potential PD for each exposure in our sample. Second, we follow the methodology of Acharya, Bergant, Crosignani, Eisert, and McCann (2022) to estimate the cost for bank b to sustain a given exposure to firm f. As inputs, we use the exposure size and the previously computed PD. We then take the natural logarithm of the resulting capital requirement as a measure of the cost to bank b. Third, we analyze whether the riskiness of exposures increases ex-post by examining the incidence of NPLs up to two years after origination.

The results are presented in Panel A of Table 7. The regression specification follows the extensive-margin Equation (4). Model 1 examines predicted PDs, while Model 2 analyzes the cost of capital for loans, measured as the logarithm of the exposure amount multiplied by its PD. Models 3 and 4 employ a dummy variable indicating the presence of an NPL in a bank-firm relationship. Model 3 considers the status of the lending relationship in year t, while Model 4 investigates the cumulative probability of an NPL occurring within two years after t.

We do not find that exposures to female-led firms by listed banks after the quota exhibit higher PDs or higher capital requirement costs. Furthermore, there is no evidence that these exposures are more likely to become NPLs. If anything, when re-estimating this analysis using the stacked-DDD approach of Gormley and Matsa (2011) in Panel B, we find that both the predicted probability of default and the cost of loans to female-led firms decrease, although the magnitude of these effects is small.

Overall, our results suggest that the additional credit extended to female-led firms as a result of the quota likely represents positive investment opportunities for listed banks. This provides evidence that the quota may help alleviate information frictions affecting female-led firms.

[19] We use the following characteristics: firm Z-score (from CERVED), logarithm of the loan amount, loan amount over the firm's total credit outstanding, and bank-firm exposure by type of loan (credit lines and term loans) as a share of total firm-bank exposure.

6.2 Bank's internal labor markets

The previous section shows that lending effects are strongest where information asymmetries are greater, suggesting that the quota altered how listed banks interact with female borrowers, likely by influencing internal decision-making and information processing. Given that lending decisions are ultimately made by loan officers rather than by board members themselves, it is plausible that increased female board representation affects the broader organizational structure and gender dynamics within banks. Top-level directors, who are directly affected by the quota, typically do not engage in lending decisions themselves.[20] However, they shape the institution's culture, governance priorities, and promotion practices. We therefore hypothesize that the introduction of female directors leads to changes in internal career dynamics, resulting in a greater likelihood of female employees being promoted to decision-making roles within the bank, as well as receiving higher wages.

Promoting more women to managerial or credit-related positions could, in turn, have direct implications for lending behavior. Female managers (and loan officers) may possess insights or experiences that enhance their ability to evaluate female entrepreneurs, improving the accuracy of credit assessments and communication with borrowers. Greater gender diversity at the decision-making level can also reduce homophily in lending networks, ensuring that female-led firms are not disadvantaged by informational or relational barriers. As women gain influence over credit allocation, banks may be better able to identify profitable opportunities among previously underserved female borrowers, thereby contributing to the expansion in lending documented above without increasing risk.

An increase in female board representation could improve female representation within the organization through several channels. First, female directors may be more likely to advocate for human resource policies that promote gender diversity and support the career advancement of women. Second, they may serve as mentors or sponsors, leveraging their networks to recommend capable female employees for managerial positions. Finally, the visible presence of women on the board can act as a powerful signal, demonstrating that leadership roles are attainable for women within the

[20] Dittmann, Maug, and Schneider (2009), however, argue that this is not entirely implausible. Examining bank employees who sit on the boards of non-financial firms in Germany, they find evidence that such directors advance their banks' business interests by facilitating lending.

institution, which may increase motivation and retention among female employees.

There is substantial evidence that women face barriers to career advancement, particularly in the financial sector (e.g., Hospido, Laeven, and Lamo, 2022; Lagaras, Marchica, Simintzi, and Tsoutsoura, 2023). Evidence from Kunze and Miller (2017) and Flabbi, Macis, Moro, and Schivardi (2019) suggests that female executives can help reduce gender gaps within their organizations. However, little is known about whether gender quotas for board directors affect the careers of other executives and employees (Bertrand, Black, Jensen, and Lleras-Muney, 2018; Maida and Weber, 2022; Ladant and Paul-Delvaux, 2025). We therefore examine the effect of the gender quota on the promotion rates of female bank employees by estimating the following equation:

$$\begin{aligned} \text{Manager}_{b,e,t} =& \beta_1 \text{Female}_e \times \text{Listed}_b \times \text{Post}_{b,t} + \beta_2 \text{Female}_e \times \text{Listed}_b + \\ &+ \beta_2 \text{Female}_e \times \text{Post}_{b,t} + \eta_{b,t} + \phi_e + \psi_{g,t} + \varepsilon_{b,e,t}, \end{aligned} \tag{7}$$

where $\text{Manager}_{b,e,t}$ is a dummy variable indicating whether employee e in bank b had a middle-management position in year t. $\eta_{b,t}$, ϕ_e, and $\psi_{g,t}$ denote bank-year, employee, and gender-year fixed effects, respectively. The main explanatory variable is the triple interaction between Post, Listed, and Female (a dummy variable equal to one if employee e is a woman). We again use Driscoll-Kraay standard errors and restrict the sample to employees who are either rank-and-file or middle managers. This specification, thanks to the inclusion of employee fixed effects (ϕ_e), tests whether the quota had a differential impact on the probability that a female employee is promoted to a middle-management position, in listed versus unlisted banks.

Results from Equation (7) are presented in Table 8. We find that, in listed banks affected by the quota, the probability of a female employee being promoted to middle management increases by 0.9 percentage points (Model 3). This specification includes bank-year, gender-year, and worker fixed effects, which absorb time-invariant differences across workers. Furthermore, Model 4 in Table 8 shows that our estimates remain robust when using the stacked DDD approach of Gormley and Matsa (2011). Similarly, Model 4 of Table A5 in the Internet Appendix shows that the effect is also robust when defining treatment as the distance from the quota threshold. Finally, it is worth noting that the magnitude of the effect is sizable: since only 5.2% of all employees in our sample are eventually promoted to middle management, an increase of 0.9 percentage points in the likelihood of

promotion corresponds to an almost 20% rise in the probability of promotion for female employees. Importantly, our results are not driven by a reallocation of workers from private to public banks: re-estimating Model 3 of Table 8 excluding all workers moving between banks of different listing statuses yields identical results.[21]

In Model 5 of Table 8, we also examine the probability that a female middle manager is promoted to a top-management position. To this end we restrict the sample to middle and top managers only and use as outcome a dummy variable that takes a value one if the employee holds a top-management position, and zero otherwise. Although the estimated effect is positive, it is not statistically significant, suggesting the presence of a potential glass ceiling in women's career progression. However, when re-estimating this effect using the stacked approach in Model 6, we find the coefficient to be statistically significant. This indicates that the reform may also have influenced promotion rates at the very top of the organizational hierarchy.

Figure 4 illustrates the dynamic impact of the gender quota on managerial promotions by replacing the post indicator with yearly dummy variables. The omitted category is the year before treatment, and 0 denotes the year of the first board renewal following the quota. The graph shows no apparent violation of the parallel-trends assumption. Notably, the quota's effect on promotions becomes statistically significant after one year and then increases steadily over time. This pattern suggests that the influence of the quota on managerial promotions unfolds gradually, likely reflecting the time required for organizations to implement changes in their internal labor market policies. Importantly, the lag in female promotion rates aligns with the delayed increase in new female lending relationships documented in Figure 3.

Next, we examine the effect of the quota on the wages of female bank employees. Table A7 in the Internet Appendix builds on Model 3 of Table 8, but uses the natural logarithm of annual wages as the dependent variable. Model 1 includes all bank employees, while Models 2 to 4 separately analyze rank-and-file employees, middle managers, and top managers. We find that, following the quota, female bank employees in affected institutions earned on average 1.3% more than their male counterparts. This effect holds across all employee categories, with the strongest impact observed among senior managers. These results are consistent with an increase in the demand for female managers after the introduction of the quota, who may have been poached from other banks or

[21] This procedure leads to the exclusion of 75,578 worker-bank-year observations, or 2.4% of the sample.

appointed to directorships at other firms, thereby strengthening their bargaining power.

Lastly, we examine whether the quota led to an increase in the hiring of female employees. Such an increase could result from the poaching of female candidates from other industries, from greater hiring by unlisted firms or banks not affected by the quota, or from the entry of women into the labor force, for instance part-time workers or those previously unemployed.

For this analysis, we mirror our specification in Equation (3) and consider the cross-section of hiring events. We then define a dummy $\text{Hiring}_{i,b,t}$ that takes value of one if worker i is hired by bank b after its first renewal of the board following the quota enactment, and zero if beforehand. The main independent variable is then the product of a dummy Female_i (if worker i is a woman) and Listed_b (if bank b is listed).

In Table A8 of the Internet Appendix, models 1 and 2 suggest that the overall hiring of female employees, particularly among junior female employees, rose slightly, although the effect is not statistically significant at conventional levels. In contrast, the coefficient for middle managers is smaller in magnitude (Model 3), and the coefficient for top managers is negative (Model 4).

Taken together, the evidence indicates that female bank employees benefited from higher promotion rates and also enjoyed higher wages as a result of the gender quota. By contrast, there is no evidence that the quota led to increased hiring at more senior levels. Instead, these women were mainly promoted within their organizations, consistent with firm-specific human capital leading to primarily internal CEO appointments, as suggested by Cziraki and Jenter (2022). The results also point to an increased demand for highly qualified female employees, which in turn contributed to higher wages at the top of the hierarchy.

Overall, the findings indicate that the quota resulted in changes in banks' internal labor markets. The observed improvements in female representation and advancement within the organization are consistent with developments that may have influenced information flows and gender-related frictions in lending decisions. These patterns point to a possible connection between internal labor market dynamics and the documented increase in credit to female-led firms. The results on internal labor markets differ from earlier evidence from Norway and Italy (Bertrand, Black, Jensen, and Lleras-Muney, 2018; Maida and Weber, 2022), which found no improvements in female promotion rates or wages, but are broadly in line with more recent findings from France (Ladant and Paul-Delvaux, 2025).

7 Real effects

As a final step, we examine whether the increased lending to female-led firms was associated with real effects for these borrowers. Given the improved information flows between lenders and borrowers, as well as the unchanged likelihood of non-performing loans, we expect that female borrowers may have benefited from the expansion in credit, enabling them to grow further. To test this, we use firm-year-level financial data from CERVED and estimate the following firm-level regression model on the sample of borrowing firms:

$$\begin{aligned} y_{f,t} =& \alpha + \beta_1 \text{SharePostListed}_{f,t} \times \text{Female}_f + \text{Log(Total credit)}_{f,t} + \phi_f + \\ &+ \tau_t \times \text{Female majority}_f + \iota_j \times \tau_t + \epsilon_{f,t}, \end{aligned} \tag{8}$$

where $y_{f,t}$ denotes the growth rate of a firm-level outcome of interest, including total assets, tangible and intangible assets, liquidity, revenues, and total employment. $\text{SharePostListed}_{f,t}$ is the share of firm f's credit obtained from a listed bank in year t after the bank has been treated, as defined in Equation (5), and $\text{Log(Total credit)}_{f,t}$ is the natural logarithm of the firm's total credit. To mitigate the influence of outliers, all growth rates are computed as mid-point growth rates. All specifications include firm, female-majority-year, and industry-year ($\iota_j \times \tau_t$) fixed effects.

The results are presented in Table 9. We find that borrowing from a listed bank after the quota was introduced is particularly beneficial for female-owned firms. Compared to a female-owned firm that borrows exclusively from private banks, borrowing fully from treated banks is associated with higher growth in several firm-level outcomes: asset growth increases by 0.4 percentage points (around 10% of the mean), tangible asset growth by 0.8 percentage points (133% of the mean), liquidity growth by 1.4 percentage points (32% of the mean), and revenue growth by 0.8 percentage points (42% of the mean). In contrast, we find no significant differential effects on intangible assets or total employment.

Overall, these results suggest that the reform affected credit allocation by expanding access to finance for female-led firms, and that the additional credit was directed toward firms with positive investment opportunities. Consistent with the earlier evidence on improved information flows and unchanged credit risk, female borrowers appear to have used the increased credit to expand their operations, invest more in tangible assets, and strengthen their liquidity positions.

8 Conclusion

This paper examines how increased female representation on bank boards affects lending to female-led firms, exploiting the mandatory gender quota introduced by the "Legge Golfo-Mosca" in Italy as a natural experiment. By linking board-level diversity to loan-level credit data, we show that the introduction of the quota led listed banks to significantly increase the share of female directors on their boards and to alter their lending behavior toward female-led firms.

Following the reform, listed banks became more likely to form new lending relationships and to expand existing relationship. The increase in lending is concentrated among smaller firms and does not result in higher ex-ante or ex-post credit risk. Importantly, the additional credit appears to stem from an expansion of available funding rather than a reallocation of existing credit.

This improved access to finance is associated with real effects for female-led firms, which subsequently invest more in tangible assets, enhance liquidity, and expand revenues. To understand the mechanisms behind these changes, we examine banks' internal organization and find that the quota coincided with higher promotion rates and wages for female employees, particularly at the middle-management level. These organizational adjustments are consistent with improved information flows within banks and a reduction in gender-related frictions in lending decisions.

Taken together, the evidence suggests that greater female representation in bank leadership can enhance information processing and screening efficiency, especially in settings characterized by high informational asymmetries. By fostering a more inclusive decision-making environment, gender-diverse boards may help identify profitable lending opportunities previously overlooked due to information barriers. While our results are specific to Italy's quota reform, they highlight a broader mechanism through which diversity in financial institutions can influence the allocation of credit and, ultimately, firm performance.

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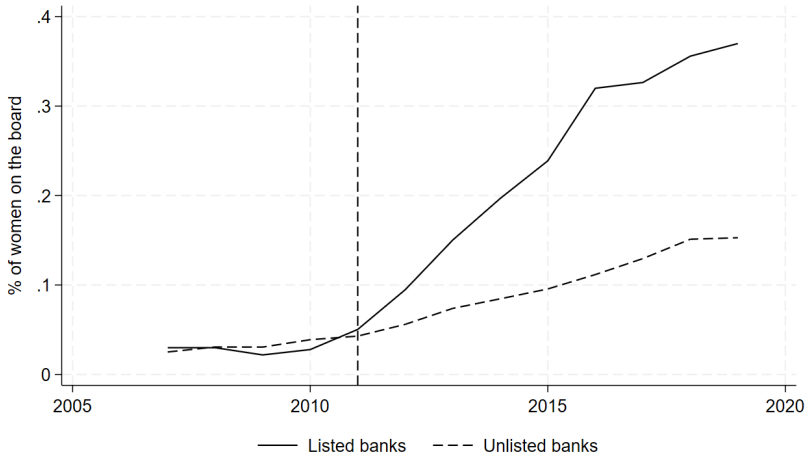
Figures

Figure 1: **Bank boards around the introduction of the gender quota**

Panel A plots the share of female directors in listed and non-listed banks around the introduction of the mandatory gender quota in Italy. Panel B plots the number of directors. The vertical dashed line indicates the year the gender quota was enacted (2011).

Panel A: Share of female directors



Panel B: Board size

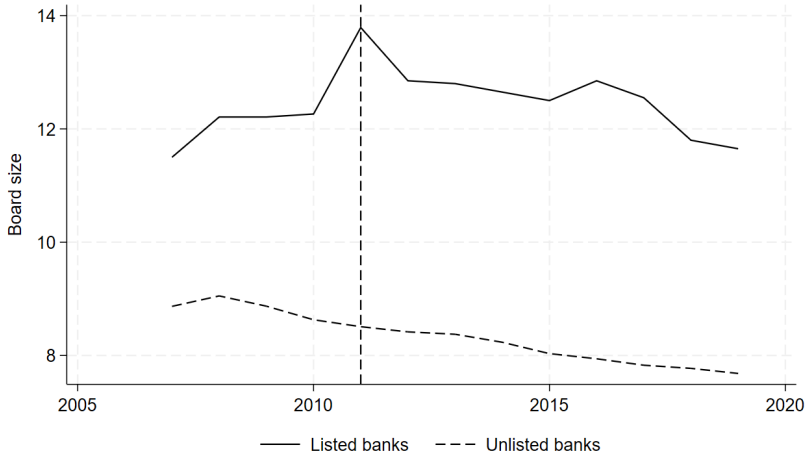
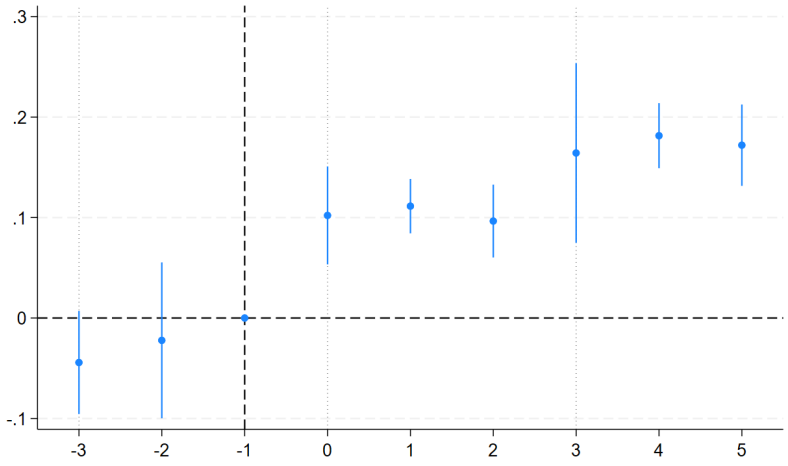


Figure 2: **Share of female directors around the introduction of the gender quota**

Regression estimates of the share of female directors on interactions of the listed dummy and time dummies along with the corresponding 95% confidence intervals. The sample is restricted to the 34 banks with the largest lending portfolio in 2009. The time dummies are defined relative to the first renewal of the board after August 2012 ($t = 0$). The interaction for the last year before the first renewal represents the omitted category. In Panel A, coefficients are estimated using a staggered difference-in-differences model, while in Panel B the estimator as in Callaway and Sant'Anna (2021) is used.

Panel A: Staggered difference-in-differences



Panel B: Callaway and Sant'Anna (2021)

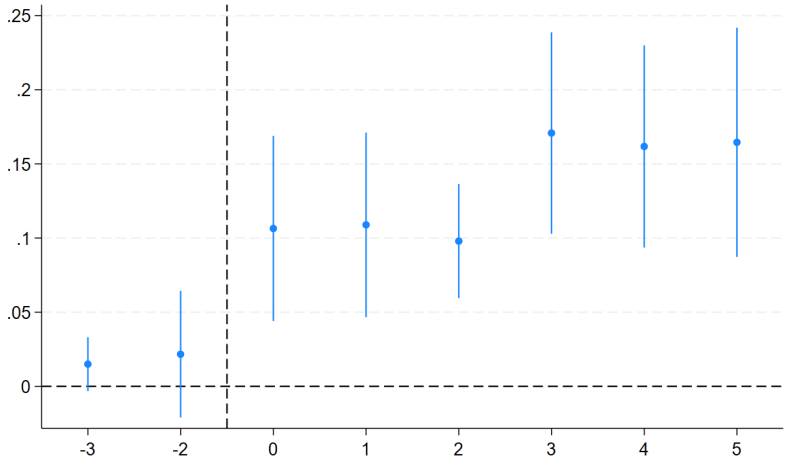


Figure 3: **Lending to female firms: Extensive margin**

This figure plots regression estimates for Equation (3). The first blue line represents the coefficient estimated from the sample of observations up to the first board renewal after the quota. Blue lines to the right incorporate additional years in the post-quota period. The red lines indicate fictitious board renewal years, extending up to three years before the first actual renewal after the quota. For example, the rightmost red line assumes a placebo quota in the final year before the actual quota was enacted, excluding post-quota years from the sample. Red lines further to the left shift the hypothetical treatment year progressively further back in time.

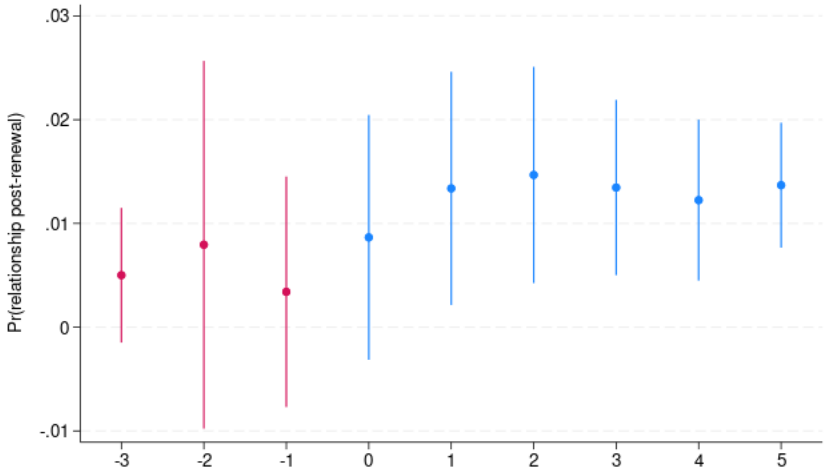
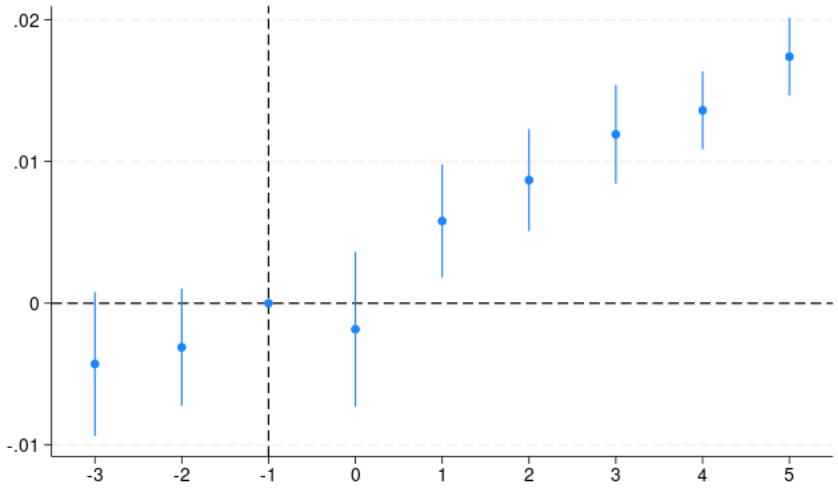


Figure 4: **Promotion rates of female bank employees around the gender quota**

This figure plots the dynamic version of Equation (7) by replacing the post indicator with yearly dummy variables. The dependent variable is a dummy variable indicating whether an employee was promoted to a middle-management position. The omitted category is the year before treatment, and 0 denotes the year of the first board renewal following the quota.



Tables

Table 1: **Balancing of covariates**

This table reports mean bank characteristics for listed (column 1) and non-listed banks (column 2). All variables are measured in 2010. Assets refers to the total assets of the bank group. Credit amount is the total amount of credit issued by the bank group. Share credit female refers to the share of credit to female led firms. RWA are risk weighted assets, scaled by total assets. Bank leverage, CAP ratio and TIER 1 ratio are different indicators for bank capitalization. LIQ ratio indicates the liquidity of the banking group. Finally, Female employees, Female middle manager and Female top manager refer to the share of female employees, female middle managers, and female top managers, respectively. Column 3 reports the difference between non-listed and banks. Standard errors are in parentheses. *, ** and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)
	Non-listed bank	Listed bank	Difference
Ln(Assets)	9.309	11.320	2.012***
	(1.311)	(1.511)	(0.527)
Ln(Credit amount)	21.563	23.706	2.143***
	(1.424)	(1.284)	(0.471)
Share credit female	0.084	0.072	-0.011
	(0.032)	(0.021)	(0.009)
RWA (%)	69.728	72.546	2.819
	(13.559)	(11.174)	(4.472)
Bank leverage (%)	8.969	8.677	-0.292
	(2.022)	(2.317)	(0.810)
CAP ratio (%)	13.274	12.340	-0.934
	(2.706)	(3.671)	(1.221)
TIER 1 ratio (%)	10.653	9.745	-0.908
	(3.267)	(4.125)	(1.399)
LIQ ratio (%)	7.960	6.910	-1.050
	(6.132)	(3.041)	(1.661)
Female employees	0.419	0.386	-0.034
	(0.076)	(0.092)	(0.030)
Female middle manager	0.262	0.269	0.007
	(0.093)	(0.078)	(0.029)
Female top manager	0.064	0.085	0.021
	(0.061)	(0.043)	(0.018)
N	21	13	34

Table 2: **Summary statistics**

This table reports summary statistics for the main variables. The first panel reports summary statistics at the bank-year level: the share of listed banks, the share of loans to female-led firms, the total number of loans and the natural logarithm of credit amount. The second panel refers to loan-level variables, where we also add information about the probability that a relationship starts after the quota. The last panel relates to information at the employee-level: share of female employees, share of middle and top managers, share of employees promoted to middle manager, and share of female middle and top managers.

	Mean	SD	Median	Min	Max
Banks					
Listed banks	0.38	0.49	0.00	0.00	1.00
Share female majority firms	0.14	0.04	0.15	0.00	0.24
Number of loans	18,962	26,785	5,977	12.00	111,432
Ln (Credit amount)	22.37	1.66	22.13	18.04	25.41
Credit relationships					
Listed bank	0.72	0.45	1.00	0.00	1.00
Female majority firm	0.16	0.36	0.00	0.00	1.00
Pr(relationship post-renewal)	0.51	0.50	1.00	0.00	1.00
Ln (Credit amount)	12.51	1.33	12.39	10.31	16.24
Credit growth	-0.03	0.36	0.00	-2.00	2.00
Employees					
Female	0.43	0.50	0.00	0.00	1.00
Middle manager	0.40	0.49	0.00	0.00	1.00
Top manager	0.02	0.15	0.00	0.00	1.00
Promoted middle manager	0.05	0.22	0.00	0.00	1.00
Female middle manager	0.13	0.33	0.00	0.00	1.00
Female top manager	0.00	0.05	0.00	0.00	1.00

Table 3: **The effects of the quota on banks' boards**

Bank-level regressions of the effects of the Italian gender quota on the composition of the board of directors (Equation 2). The outcome variable is the share of female directors. Post is a dummy equal to 1 from the first renewal of the board after 2011, and 0 otherwise. Listed is a dummy equal to 1 if the bank is listed, and 0 otherwise. In Models 1, 2, and 4, the sample is restricted to the 34 largest banks by lending in 2009, while Model 3 includes all banks. In Model 4, we re-estimate the effects using the stacked DID approach as in Gormley and Matsa (2011). Driscoll-Kraay standard errors are applied in all models. *, ** and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
	Share of female directors			
Test	Baseline	Baseline	All banks	Stacked DID
Listed × Post	0.169***	0.182***	0.164***	0.183***
	(0.038)	(0.027)	(0.020)	(0.019)
Post	0.068***	-0.066***	0.006	-0.050***
	(0.017)	(0.016)	(0.013)	(0.008)
Listed	0.050*			
	(0.025)			
Bank FE	No	Yes	Yes	Yes
Year FE	No	Yes	Yes	Yes
Bank-Event FE	No	No	No	Yes
Event-Year FE	No	No	No	Yes
N	374	374	1539	1244
R^2	0.617	0.297	0.669	0.735
Mean Dep. Var.	0.118	0.118	0.104	0.118
S.D. Dep. Var.	0.134	0.134	0.122	0.134

Table 4: **Lending to female firms: Extensive margin**

Relationship-level regressions of the probability of a new lending relationship at the firm-bank level (Equation 3). Listed is a dummy equal to 1 if the bank is listed, and 0 otherwise. Female majority is a dummy equal to 1 if the equity owned by women in the borrowing firm is above 50%, and 0 otherwise. Driscoll-Kraay standard errors are applied. *, ** and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)
	Lending relationship		
Listed × Female majority	0.012***	0.014***	0.014***
	(0.003)	(0.003)	(0.003)
Firm FE	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes
Year Relationship FE	No	Yes	No
Year Relationship-Female Maj. FE	No	No	Yes
N	362074	362074	362074
R^2	0.305	0.777	0.777
Mean Dep. Var.	0.506	0.506	0.506
S.D. Dep. Var.	0.500	0.500	0.500

Table 5: **Lending to female firms: Intensive margin**

Relationship-level regressions of mid-point credit growth at the firm-bank level (Equation 4). In Model 4, we re-estimate the effects using the stacked DDD approach as in Gormley and Matsa (2011). Model 5 collapses the data at the firm level and includes firm-year fixed effects, which are estimated based on Model 3 and then included as control variables. SharePostListed denotes the share of a firm's credit obtained from a listed bank in a given year, after the bank has been treated. Post is a dummy equal to 1 from the first renewal of the board after 2011, and 0 otherwise. Listed is a dummy equal to 1 if the bank is listed, and 0 otherwise. Female majority is a dummy equal to 1 if the equity owned by women in the borrowing firm is above 50%, and 0 otherwise. Driscoll-Kraay standard errors are applied. *, ** and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
	Credit growth				
Test	Baseline	Baseline	Baseline	Stacked DDD	Firm level
Listed × Post × Female majority	0.003**	0.003**	0.007**	0.008**	
	(0.001)	(0.001)	(0.002)	(0.003)	
Post × Female majority	-0.003	-0.002	-0.001	-0.002	
	(0.002)	(0.002)	(0.004)	(0.002)	
Listed × Post	-0.011				
	(0.009)				
Post	0.011*				
	(0.006)				
SharePostListed × Female majority					0.008**
					(0.003)
SharePostListed					-0.001
					(0.006)
Firm-Bank FE	Yes	Yes	Yes	Yes	No
Year FE	Yes	No	No	No	No
Bank-Year FE	No	Yes	Yes	Yes	No
Firm-Year FE	No	No	Yes	Yes	No
Bank-Event FE	No	No	No	Yes	No
Event-Year FE	No	No	No	Yes	No
Firm FE	No	No	No	No	Yes
Female Maj.-Year FE	No	No	No	No	Yes
N	4857943	4857943	3715554	22740623	1187852
R^2	0.165	0.168	0.456	0.580	0.583
Mean Dep. Var.	-0.031	-0.031	-0.029	-0.031	-0.010
S.D. Dep. Var.	0.362	0.362	0.363	0.362	0.287

Table 6: **Firms size and lending to female firms**

Relationship-level regressions of the probability of a new lending relationship (Models 1 to 3) and mid-point credit growth (Models 4 to 6). The sample is split based on firm size following Eurostat criteria. Micro-sized enterprises have up to 10 employees, SMEs have between 10 and 250 employees, whereas large enterprises have at least 250 employees. Listed is a dummy equal to 1 if the bank is listed, and 0 otherwise. Female majority is a dummy equal to 1 if the equity owned by women in the borrowing firm is above 50%, and 0 otherwise. Post is a dummy equal to 1 from the first renewal of the board after 2011, and 0 otherwise. Driscoll-Kraay standard errors are applied. *, ** and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Lending relationship			Credit growth		
Borrower size	Micro	SME	Large	Micro	SME	Large
Listed × Female majority	0.012**	0.012**	-0.035			
	(0.004)	(0.005)	(0.051)			
Listed × Post × Female majority				-0.004	0.015***	0.008
				(0.005)	(0.003)	(0.017)
Post × Female majority				-0.000	-0.006*	-0.001
				(0.006)	(0.003)	(0.026)
Firm FE	Yes	Yes	Yes	No	No	No
Bank FE	Yes	Yes	Yes	No	No	No
Year Relationship-Female Maj. FE	Yes	Yes	Yes	No	No	No
Firm-Bank FE	No	No	No	Yes	Yes	Yes
Bank-Year FE	No	No	No	Yes	Yes	Yes
Firm-Year FE	No	No	No	Yes	Yes	Yes
N	126597	141054	9201	1184564	1981688	132414
R^2	0.784	0.770	0.768	0.525	0.425	0.364

Table 7: **Predicted PD and non-performing loans**

Relationship-level regressions of predicted probability of default (PD), capital cost of loans, measured by the natural logarithm of the amount of the exposure times its PD, and non-performing loans (NPLs), measured by a dummy for the existence of an NPL in the relationship between the firm and the bank in year t. In Model 4, we focus on the cumulative probability of an NPL within 2 years after a lending relation is established. In Panel B we re-estimate the effects using the stacked DDD approach as in Gormley and Matsa (2011). Post is a dummy equal to 1 from the first renewal of the board after 2011, and 0 otherwise. Listed is a dummy equal to 1 if the bank is listed, and 0 otherwise. Female majority is a dummy equal to 1 if the equity owned by women in the borrowing firm is above 50%, and 0 otherwise. Driscoll-Kraay standard errors are applied. *, ** and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
	PPD	Log(Cost)	NPL	NPL (f.2)
		Panel A: Baseline		
Listed × Post × Female majority	-0.0003	-0.00694	0.001	0.001
	(0.0008)	(0.0150)	(0.001)	(0.001)
Post × Female majority	-0.00005	0.0008	-0.001	-0.002**
	(0.00008)	(0.0117)	(0.001)	(0.001)
Firm-Bank FE	Yes	Yes	Yes	Yes
Bank-Year FE	Yes	Yes	Yes	Yes
Firm-Year FE	Yes	Yes	Yes	Yes
N	4014215	4014215	3950503	3966072
R^2	0.885	0.862	0.556	0.699
Mean Dep. Var.	0.015	8.050	0.024	0.045
S.D. Dep. Var.	0.018	1.763	0.152	0.201
		Panel B: Stacked DDD		
Listed × Post × Female majority	-0.0001**	-0.020***	-0.000	-0.000
	(0.0000)	(0.007)	(0.001)	(0.001)
Post × Female majority	-0.0001**	0.007	0.000	-0.000
	(0.0000)	(0.005)	(0.000)	(0.001)
Firm-Bank FE	Yes	Yes	Yes	Yes
Bank-Year FE	Yes	Yes	Yes	Yes
Firm-Year FE	Yes	Yes	Yes	Yes
Bank-Event FE	Yes	Yes	Yes	Yes
Event-Year FE	Yes	Yes	Yes	Yes
N	23916715	23916715	23474894	23581986
R^2	0.958	0.945	0.829	0.878
Mean Dep. Var.	0.016	7.942	0.026	0.047
S.D. Dep. Var.	0.019	1.796	0.159	0.212

Table 8: **The effects of the quota on internal labor markets: Promotions**

Employee-level regressions of the probability of being promoted to a middle manager or top manager (Equation 7). Models 1 to 4 analyze promotions of regular employees to middle managers, while Models 5 and 6 consider promotions of middle managers to top managers. In Model 4 and 6 we estimate the effects using the stacked DDD approach as in Gormley and Matsa (2011). Post is a dummy equal to 1 from the first renewal of the board after 2011, and 0 otherwise. Listed is a dummy equal to 1 if the bank is listed, and 0 otherwise. Female is a dummy equal to 1 if the worker is employee, 0 otherwise. Driscoll-Kraay standard errors are applied. *, ** and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Middle manager				Top manager	
Test	Baseline	Baseline	Baseline	Stacked DDD	Baseline	Stacked DDD
Female × Listed × Post	0.008*	0.009**	0.009**	0.010***	0.001	0.001**
	(0.004)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)
Female × Post	-0.012**	-0.012***	-0.007**	-0.007***	-0.000	-0.000
	(0.004)	(0.004)	(0.003)	(0.001)	(0.001)	(0.000)
Female × Listed	-0.007	-0.005	-0.007	-0.012**	0.029***	0.023***
	(0.005)	(0.006)	(0.006)	(0.004)	(0.006)	(0.002)
Listed × Post	-0.016**					
	(0.006)					
Post	0.065***					
	(0.016)					
Listed	-0.081***					
	(0.011)					
Worker FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Year FE	No	Yes	Yes	Yes	Yes	Yes
Female-Year FE	No	No	Yes	Yes	Yes	Yes
Bank-Event FE	No	No	No	Yes	No	Yes
Event-Year FE	No	No	No	Yes	No	Yes
N	3057896	3057896	3057896	15728727	1300602	6961999
R^2	0.924	0.927	0.927	0.938	0.928	0.940
Mean Dep. Var.	0.405	0.405	0.405	0.419	0.051	0.056
S.D. Dep. Var.	0.491	0.491	0.491	0.493	0.221	0.229

Table 9: **Real effects**

Firm-level regressions of midpoint growth in total assets (Model 1), tangible and intangible assets (Models 2 and 3), liquidity (Model 4), revenues (Model 5), and employment (Model 6), following Equation (8). The sample is restricted to firms that borrow. SharePostListed is the share of the firm's credit obtained from a listed bank in a given year, after the bank has been treated. Female majority is a dummy equal to 1 if the equity owned by women in the borrowing firm is above 50%, and 0 otherwise. Standard errors are clustered at the firm and year level. *, ** and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Growth rate					
	Assets	Tangibles	Intangibles	Liquidity	Revenues	Employment
SharePostListed × Female majority	0.004**	0.008**	-0.008	0.014**	0.008**	0.001
	(0.001)	(0.003)	(0.008)	(0.006)	(0.003)	(0.002)
SharePostListed	-0.000	0.000	0.006	-0.005	-0.003*	0.000
	(0.001)	(0.003)	(0.005)	(0.007)	(0.001)	(0.002)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Female Maj.-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2206533	2206533	1719481	2216188	2270100	1936761
R^2	0.239	0.185	0.165	0.071	0.167	0.200
Mean Dep. Var.	0.040	0.006	-0.094	0.044	0.019	0.023
S.D. Dep. Var.	0.245	0.507	0.855	1.006	0.410	0.276

Internet Appendix

Board Gender Quotas and Female Borrowing: Evidence from Loan-Level Data

— not for publication —

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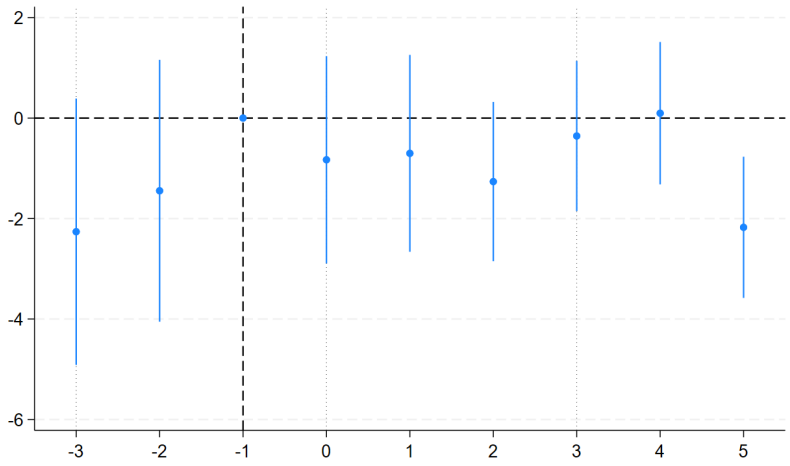
Figure A1: **Number of directors around the introduction of the gender quota**

Regression estimates of the number of directors on interactions of the listed dummy and time dummies along with the corresponding 95% confidence intervals. The sample is restricted to the 34 banks with the largest lending portfolio in 2009. The time dummies are defined relative to the first renewal of the board after August 2012 ($t = 0$). The interaction for the last year before the first renewal represents the omitted category. In Panel A, coefficients are estimated using a staggered difference-in-differences model, while in Panel B the estimator as in Callaway and Sant'Anna (2021) is used.

Panel A: Staggered difference-in-differences



Panel B: Callaway and Sant'Anna (2021)

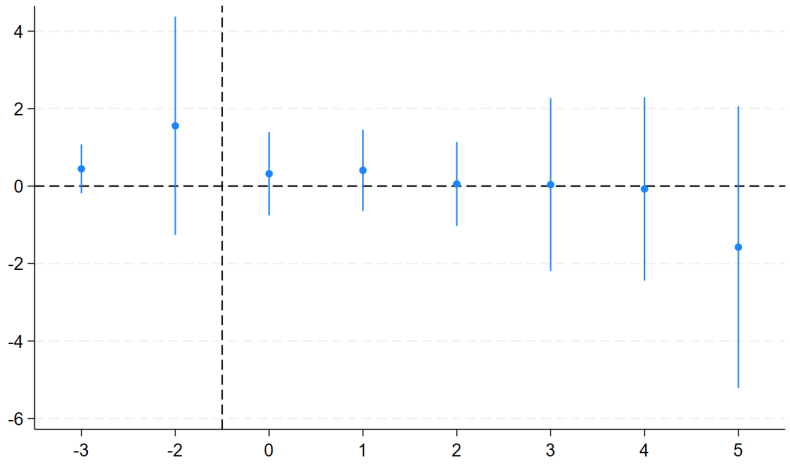


Table A1: **Timeline of the Golfo-Mosca Law (Law 120/2011)**

10/11/2009	First proposal in parliamentary commission. One-third of least represented gender, starting from first renewal after the law comes into effect.
30/06/2010	Proposal is sent to lower chamber. One-third of least represented gender, starting from first renewal after the approval of the law, but not before six months since inception, for three consecutive renewals.
02/12/2010	The lower chamber approves the proposal.
15/03/2011	The upper chamber approves a modified proposal. One-third of least represented gender, for three consecutive renewals. For the first renewal starting after one year since the inception of the law, the quota is one-fifth.
27/06/2011	The lower chamber re-approves the modified proposal by the upper chamber.
12/07/2011	The law is published in its final form. One-third of least represented gender, for three consecutive renewals. For the first renewal starting after one year since the inception of the law, the quota is one-fifth.
12/08/2012	The law is binding. Every renewal of the board from this time on must comply with one-fifth quota (and then one-third for two consecutive renewals)

Table A2: **The effects of the quota on banks' board size**

Bank-level regressions of the effects of the Italian gender quota on the size of the board of directors (Equation 2). The outcome variable is the number of directors. Post is a dummy equal to 1 from the first renewal of the board after 2011, and 0 otherwise. Listed is a dummy equal to 1 if the bank is listed, and 0 otherwise. In Models 1, 2, and 4, the sample is restricted to the 35 largest banks by lending in 2009, while Model 3 includes all banks. In Model 4 we re-estimate the effects using the stacked DID approach as in Gormley and Matsa (2011). Driscoll-Kraay standard errors are applied in all models. *, ** and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
	Number of directors			
Test	Baseline	Baseline	All banks	Stacked DID
Listed × Post	0.470	0.764	0.389	0.880
	(0.832)	(0.740)	(0.679)	(0.730)
Post	-0.689	2.152**	0.900*	2.036***
	(0.624)	(0.688)	(0.499)	(0.399)
Listed	3.497***			
	(0.808)			
Bank FE	No	Yes	Yes	Yes
Year FE	No	Yes	Yes	Yes
Bank-Event FE	No	No	No	Yes
Event-Year FE	No	No	No	Yes
N	374	374	1539	1244
R^2	0.178	0.649	0.736	0.705
Mean Dep. Var.	11.70	11.70	8.811	11.70
S.D. Dep. Var.	4.219	4.219	3.486	4.219

Table A3: **Extensive margin results (alternative definitions of female ownership)**

Relationship-level regressions of the probability of a new lending relationship at the firm-bank level (Equation 3). Listed is a dummy equal to 1 if the bank is listed, and 0 otherwise. Female majority (switchers) is a time-variant dummy equal to 1 if women own more than 50% of the firm's equity and 0 otherwise. Mean equity is the average share of the firm's equity held by women throughout the entire sample period. Equity is the time-variant share of the firm's equity held by women. Full owner is a time-variant dummy equal to 1 if women own 100% of the firm's equity and 0 otherwise. Driscoll-Kraay standard errors are applied. $^{+}$, *, ** and *** represent statistical significance at the 12%, 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
	Lending relationship			
Listed × Female majority (switchers)	0.0125***			
	(0.00303)			
Listed × Mean equity		0.000169***		
		(4.69e-05)		
Listed × Equity			0.000169**	
			(5.59e-05)	
Listed × Full owner				0.026^{+}
				(0.015)
Firm FE	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Year Relationship-Female FE	Yes	Yes	Yes	Yes
N	392942	347088	378616	389173
R^2	0.776	0.777	0.776	0.777
Mean Dep. Var.	0.509	0.512	0.510	0.506
S.D. Dep. Var.	0.500	0.500	0.500	0.500

Table A4: **Intensive margin results (alternative definitions of female ownership)**

Relationship-level regressions of mid-point credit growth at the firm-bank level (Equation 4). Post is a dummy equal to 1 from the first renewal of the board after 2011, and 0 otherwise. Listed is a dummy equal to 1 if the bank is listed, and 0 otherwise. Female majority (switchers) is a time-variant dummy equal to 1 if women own more than 50% of the firm's equity and 0 otherwise. Mean equity is the average share of the firm's equity held by women throughout the entire sample period. Equity is the time-variant share of the firm's equity held by women. Full owner is a time-variant dummy equal to 1 if women own 100% of the firm's equity and 0 otherwise. Driscoll-Kraay standard errors are applied. *, ** and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
	Credit growth			
Listed × Post × Female majority (switchers)	0.00451**			
	(0.00141)			
Listed × Female majority (switchers)	-0.000418			
	(0.00288)			
Post × Female majority (switchers)	-0.000537			
	(0.00323)			
Listed × Post × Mean equity		8.91e-05**		
		(2.80e-05)		
Post × Mean equity		-3.64e-05		
		(3.72e-05)		
Listed × Post × Equity			7.86e-05**	
			(2.74e-05)	
Listed × Equity			-5.84e-05	
			(6.03e-05)	
Post × Equity			-2.44e-05	
			(4.06e-05)	
Listed × Post × Full owner				0.010*
				(0.005)
Post × Full owner				-0.004
				(0.007)
Firm-Bank FE	Yes	Yes	Yes	Yes
Year FE	No	No	No	No
Bank-Year FE	Yes	Yes	Yes	Yes
Firm-Year FE	Yes	Yes	Yes	Yes
N	4023700	4036437	4036437	3944816
R^2	0.457	0.457	0.457	0.456
Mean Dep. Var.	-0.029	-0.029	-0.029	-0.029
S.D. Dep. Var.	0.364	0.364	0.364	0.364

Table A5: **Distance to quota (alternative definition of treatment)**

Estimation of the main analyses using the distance from the quota, as of 2010, as treatment. Distance is defined as the difference between the share of women on the board in 2010 and the minimum share mandated by the law (20%). Distance is set to zero for private banks and for listed banks whose share of women on the board in 2010 exceeds 20%. The dependent variables are: the share of women on the board at the bank level (Model 1); the probability of a new lending relationship at the firm–bank level (Model 2); mid-point credit growth at the firm–bank level (Model 3); and the probability of promotion to middle manager at the employee level (Model 4). The respective regression equations follow the corresponding tables (Tables 3, 4, 5, and 8). Driscoll-Kraay standard errors are applied. *, ** and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
	Share female directors	Lending relationship	Credit growth	Promotion
Distance × Post	1.050***			
	(0.136)			
Distance × Female majority		0.076***		
		(0.021)		
Distance × Post × Female majority			0.028*	
			(0.015)	
Distance × Post × Female				0.064**
				(0.025)
Year FE	Yes	-	-	-
Bank FE	Yes	Yes	-	-
Firm FE	-	Yes	-	-
Year Relationship-Female Maj. FE	-	Yes	-	-
Firm-Bank FE	-	-	Yes	-
Firm-Year FE	-	-	Yes	-
Bank-Year FE	-	-	Yes	Yes
Worker FE	-	-	-	Yes
Female-Year FE	-	-	-	Yes
N	374	362074	3715554	3057896
R^2	0.805	0.852	0.456	0.935

Table A6: **Lending to female firms: Intensive margin and bank specialization**

Relationship-level regressions of mid-point credit growth (Equation 4) with additional controls for bank specialization as in Benetton and Fantino (2021). We define a dummy, Specialized that equals one if the share of bank b's number of loans (credit amount) in the industry of firm f exceeds the bank's overall loan share (credit amount) at the national level, and we then include interactions of this dummy with the dummies Listed, Post, and Female majority in Models 1 to 3 (4 to 6). Post is a dummy equal to 1 from the first renewal of the board after 2011, and 0 otherwise. Listed is a dummy equal to 1 if the bank is listed, and 0 otherwise. Female majority is a dummy equal to 1 if the equity owned by women in the borrowing firm is above 50%, and 0 otherwise. Driscoll-Kraay standard errors are applied. *, ** and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Credit growth					
Bank specialization measure	Number of loans			Credit amount		
Listed × Post × Female majority	0.004**	0.003**	0.007**	0.003*	0.003*	0.007**
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)
Post × Female majority	-0.002	-0.002	-0.001	-0.002	-0.002	-0.003
	(0.002)	(0.002)	(0.005)	(0.002)	(0.003)	(0.005)
Listed × Post	-0.011			-0.010		
	(0.009)			(0.009)		
Post	0.010			0.007		
	(0.006)			(0.007)		
Interactions for Specialization	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	No	No	Yes	No	No
Bank-Year FE	No	Yes	Yes	No	Yes	Yes
Firm-Year FE	No	No	Yes	No	No	Yes
N	4848012	4848012	3712778	4848012	4848012	3712778
R^2	0.165	0.168	0.456	0.164	0.168	0.456

Table A7: **The effects of the quota on internal labor markets: Wages**

Employee-level regressions of the natural logarithm of annual wages (Equation 7). Model 2 excludes managers, while Models 3 and 4 analyze middle and top managers, respectively. Post is a dummy equal to 1 from the first renewal of the board after 2011, and 0 otherwise. Listed is a dummy equal to 1 if the bank is listed, and 0 otherwise. Female is a dummy equal to 1 if the worker is female, 0 otherwise. Driscoll-Kraay standard errors are applied. *, ** and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
	Log(Wage)			
	All	No Manager	Mid. manager	Top manager
Female × Listed × Post	0.013**	0.010*	0.007***	0.032**
	(0.005)	(0.005)	(0.002)	(0.013)
Female × Listed	0.015***	0.028	-0.001	0.001
	(0.004)	(0.017)	(0.005)	(0.064)
Female × Post	-0.014***	-0.011***	-0.011**	-0.015
	(0.004)	(0.003)	(0.004)	(0.014)
Worker FE	Yes	Yes	Yes	Yes
Bank-Year FE	No	Yes	Yes	Yes
Female-Year FE	No	No	Yes	Yes
N	3080129	1789684	1216487	64343
R^2	0.844	0.698	0.731	0.334

Table A8: **The effects of the quota on internal labor markets: Hiring**

Employee-level regressions of the probability of a hire occurring after the board's renewal. Model 1 includes all bank employees, Model 2 excludes managers, while Models 3 and 4 analyze hirings of managers and top managers, respectively. Listed is a dummy equal to 1 if the bank is listed, and 0 otherwise. Female is a dummy equal to 1 if the worker is female, 0 otherwise. Driscoll-Kraay standard errors are applied. *, ** and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
	Hiring			
	All	No Manager	Mid. Manager	Top Manager
Listed × Female	0.006	0.004	0.002	-0.009
	(0.007)	(0.007)	(0.008)	(0.078)
Bank FE	Yes	Yes	Yes	Yes
Female-RelYear FE	Yes	Yes	Yes	Yes
N	67373	51670	13807	1895
R^2	0.780	0.778	0.789	0.776