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# Do Gender Board Quotas Matter for Working Mothers? Evidence from State-Owned Firms in Italy

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*In copertina: uno storico "Punto cliente" a Tuscania*
*INPS, Direzione generale, Archivio storico*

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**Tommaso Nannicini**

# Do Gender Board Quotas Matter for Working Mothers? Evidence from State-Owned Firms in Italy

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## *Le quote di genere nei Cda fanno la differenza per le madri lavoratrici? Evidenze dalle imprese a partecipazione statale in Italia*[*]

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September 22, 2025

**Abstract**

In developed countries, the absence of family friendly workplace policies is seen as an important driver of low fertility rates. In this paper we examine whether the introduction of gender quota on boards of directors indirectly led to an increase in fertility and improvements of careers of young mothers working in companies subject to the quota. We exploit the introduction of an Italian law mandating a strict gender quota on the boards of state-owned enterprises (SOEs) in 2013 and leverage matched administrative data on firms and employees from 2008 to 2019. Using a triple-difference-in-differences design, we show that the law substantially increased female board representation. But we find no significant effects on fertility proxied by mandatory maternity leaves, post-childbirth retention, parental leave uptake, or wage penalties following maternity. Overall, the results suggest that while gender quotas successfully diversify leadership, they do not, in isolation, transform workplace practices or mitigate structural disadvantages faced by working mothers.

*Nei paesi sviluppati, la carenza di politiche aziendali a sostegno della famiglia è spesso indicata come una delle cause dei bassi tassi di fertilità. Questo studio indaga se l'introduzione delle quote di genere*

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*nei consigli di amministrazione abbia avuto effetti indiretti sulla natalità e sulle carriere delle giovani madri impiegate in imprese soggette a tale normativa. L'analisi si concentra sulla legge italiana del 2013 che ha imposto quote di genere nei consigli delle imprese a partecipazione statale (SOE), utilizzando dati amministrativi su imprese e lavoratori relativi al periodo 2008-2019. Applicando un approccio di tripla differenza nelle differenze, emerge un aumento significativo della presenza femminile nei consigli di amministrazione. Tuttavia, non si riscontrano effetti rilevanti sulla fertilità (misurata tramite i congedi obbligatori di maternità), sulla permanenza delle neo madri nella stessa impresa, sull'utilizzo dei congedi parentali o sulle penalizzazioni salariali legate alla maternità. Nel complesso, i risultati mostrano che le quote di genere hanno ampliato la diversità ai vertici aziendali, ma da sole non sono sufficienti a trasformare le pratiche lavorative né ad alleviare gli svantaggi strutturali delle madri lavoratrici.*

# 1 Introduction

Declining fertility rates contribute to demographic challenges in most high income countries. In the European Union, as well as in the OECD, the total fertility rate (TFR) is on average 1.5 which is far below the replacement rate. A major reason for low fertility rates are the difficulties women face in balancing family and working lives along with substantial career costs of having children (Kleven et al. 2024). Family f childcare, flexible work-hour arrangements, or fair wage-setting have been recognized as potential remedy for working mothers. But which firms have an incentive to implement these policies? Female executives are generally thought to be more sensitive to the problems of female employees and thus more open to implementing family friendly workplace policies. Consequently, quota regulations that increase the share of women in leadership positions might also lead to higher fertility rates, more female employees taking maternity leaves, and higher retention rates of mothers in affected companies.

In this paper, we test the hypothesis that an increase in the female share on the board of directors of large state-owned companies makes them more attractive for mothers and increases fertility at the firm level. To address this research question, we exploit an Italian law that introduced a strict gender quota in companies with government ownership in 2013. The mandatory quota led to a substantial increase of the female share on company boards of targeted firms in the years following it's introduction along with a change in the board composition toward younger and more talented directors (Baltrunaite et al. 2023). Our analysis investigates whether this exogenous shift in company leadership was substantial enough to lead to changes in workplace cultures and firm policies that affected career and fertility outcomes of female employees.

Apart from the availability of a credible identification strategy, Italy is an interesting country to study the effect of female leadership on fertility outcomes within firms. The Italian society is characterized by conservative gender norms and the female employment rate is low in comparison to other European countries. Even though working women now surpass men in the average level of education, pronounced gender pay gaps persist. In addition, women were disproportionally adversely affected by reforms aimed at increasing labor market flexibility through the expansion of temporary and often low paid jobs (Checchi et al. 2024). These disadvantageous labor market conditions along with high career costs of maternity are reflected in a total fertility rate of 1.2

which is significantly below EU average (Kleven et al. 2024). Italy is thus a country with a lot of room for improvement via gender policies.

For the empirical analysis we compile data from several sources. We start by merging the list of companies with stock held by public entities in 2012 with executive information in the Cerved database which includes detailed information on board members and their gender. Subsequently, we merge firm identifiers with the universe of social security records in the INPS[1] database which provides information on the full company workforce, their characteristics such as gender and age, job types and maternity leave spells, as well as their earnings. We use this data to construct a firm level panel of workforce characteristics by gender covering the period 2008 - 2019. In addition we identify women employees in childbearing age of 18-45 for whom we can recover fertility information from spells with mandatory maternity leave.

Our empirical strategy relies on a difference in differences design which compares state-owned companies with majority public ownership (SOEs), which are subject to the gender quota since 2013, with companies with a public minority share of ownership (PMSEs) which were not obligated to change the gender composition of their boards. As SOEs with a single-administrator and companies that already had a 20% share of female directors before the implementation of the law were not subject to the quota policy, we ultimately implement a triple difference specification with only SOEs with a multi-person board and less than 20% female board members in 2012 as the treatment group.

We start the empirical analysis by replicating the results by Maida and Weber (2022) (MW2022), who evaluate the effects of increased gender diversity in boards of listed companies on the workforce gender composition. Listed companies were also subject to the Italian law. They are privately owned and typically larger than companies with public ownership, but the number of affected SOEs is in our sample is about 4 times as large as the number of listed firms. For both, SOEs and listed companies the reform resulted in a 10 percentage point increase in the share of females on the boards. MW2022 find that the effect of this change in board composition on female representation at the top executive level and among top earners was limited. Our results for SOEs confirm these finding. For both types of firms we estimate small positive effects which are, however, not statistically significant. In addition, there is no consistent evidence of a trickle-down of the board

[1]The data have been accessed through the VisitINPS Scholars program.

changes to lower ranks within the company, neither in listed firms as shown by MW2022 nor in SOEs shown in our analysis. While MW2022 only focus on short-run effects in the first 2-3 post implementation years, the longer sample period allows us to examine effects over a 6 year horizon for SOEs. But there is no evidence that impacts of changes in board composition set in with a delay.

The main part of this paper investigates the effects of the board composition in SOEs on fertility at the firm level and on careers outcomes of new mothers. We proxy childbirths by spells of mandatory maternity leave which typically lasts 5 months and estimate the effect of the quota law on the probability that women employees age 18-45 give birth. To find out about potential changes in workplace culture, we focus on the set of new mothers, and investigate if they spend more time in voluntary parental leave after giving birth, enjoy higher job stability, or suffer lower earnings costs after returning from parental leave if they are employed in a SOE subject to the quota. We find small and statistically insignificant effects throughout all specifications and outcomes. Overall we conclude that there is no evidence that the addition of female directors to boards led to a change in workplace culture or policies that encourage motherhood among female employees or improve labor market outcomes of working mothers.

Our findings contribute to the lively literature evaluating the introduction of gender quota for large companies in a growing list of countries. This literature has focused on a wide range of different outcomes that can potentially be affected by the gender diversity in leadership to which we add fertility and career outcomes of new mothers. De Acutis et al. (2024) synthesize findings from this literature in a meta-analysis covering estimates from 51 studies analyzing policies in 11 countries. The authors conclude that evaluations of quota policies tend to find significantly positive quota effects on measures of board quality such as experience and education of board members and on several measures of firm performance. However, clear evidence that more gender diversity in the boardroom spills over to gender diversity at lower levels of the company hierarchy or reduces gender gaps is very limited. Starting with the seminal paper by Bertrand et al. (2019) most studies report small and insignificant effects on labor market outcomes and career chances of other women employed in affected companies. The findings from our analysis are in line with the previous literature. In addition, we document the absence of effects on fertility and career development of new mothers.

The Italian law that introduced a binding gender quota for listed and publicly owned companies in 2012 and 2013, respectively, has also been widely studied (Comi et al. 2020; Ferrari et al. 2022). Related to our work, Baltrunaite et al. (2023) study the implications of the quota for SOEs focusing on the effects on firm performance. Their results indicate that an increase in board diversity improved profitability and increased output quality as measured by citizens' satisfaction with the provision of public goods.

Our work also relates to the literature studying how non-wage job amenities shape labor market outcomes (Mas 2025). Several studies provides evidence that workers with higher willingness to pay for family-friendly work arrangements sort into firms offering these amenities. Especially women value firms offering parental leave policies (Goldin et al. 2020) or firms in which unions promote the provision of female friendly amenities (Corradini et al. 2025). Unfortunately, our data do not allow us to measure the direct impact of the quota policy on family friendly policies. But our approach tests whether an increase of females on company boards leads to changes in outcomes that should be affected by the introduction of amenities supporting mothers.

## 2 Institutions

State-owned businesses, also known as public enterprises or state-controlled enterprises, have a significant presence in Italy. These entities are owned or controlled by the Italian government, either at the central or local level. Italian SOEs are companies with private legal corporate structures. This allows the public sector to carry out specific missions more flexibly, avoiding bureaucratic constraints and associated limitations such as public procurement regulations, recruitment practices, and budget restrictions on the use of public funds. Activities of public enterprises include tasks of public interest, managing state assets, providing local public services, or even offering services on the open market, much like standard private businesses ISTAT (2014). According to the Italian Ministry of Economics and Finance (MEF) open data the total count of active SOEs and PMSEs (Partially-Marketed State Enterprises) was approximately 8000 in 2012.[2] About half of the businesses were partially owned by public entities with a shareholding below 50%, while the other half has a higher share. They can be administered by a single administrator or by a board of

[2] https://www.dt.mef.gov.it/it/attivita_istituzionali/partecipazioni_pubbliche/censimento_partecipazioni_pubbliche/open_data_partecipazioni/index.html

directors.

Along with publicly listed companies, SOEs administered by a collegiate body are subject to mandatory gender quotas for boards of directors, as introduced by the Legge Golfo-Mosca law. This law passed in parliament in June 2011 and went into effect in August 2012 for listed firms and in February 2013 for SOEs. The Golfo-Mosca law required a minimum of 20% of board seats for each gender with the first board appointment following August 2012 for listed firms and February 2013 for SOEs, and a minimum of 30% starting from the second appointment. The law provided for the expiry of its application with the third term of board appointments. In 2019, the Annual Budget Law (Law 160/2019) extended the application of the gender quotas for three more board appointments and raised the minimum for each gender to 40%. Since publicly controlled firms can take the form of single administrator entities, approximately 20% of these controlled companies are not affected by the reform.

The responsibility for ensuring compliance with gender quotas in State-Owned Enterprises falls under the jurisdiction of the Equal Opportunity Department within the Italian Government. This department is authorized to issue warnings to companies that do not meet the quota requirements. If a company fails to take corrective action to align its board composition with the mandated quota, the Government is empowered to replace certain directors, thereby ensuring the reconstituted board aligns with legal regulations.[3]

## 3 Data

The dataset for our empirical analysis is constructed by linking data from three different sources. We start with the list of companies that are owned or controlled by the Italian government, at the central or the local level, either directly or through other companies' stock holdings. We refer to companies with more than 50% publicly-owned shares as SOEs (State-Owned Enterprises) and those with less than 50% publicly-owned shares as PMSEs (Partially-Marketed State Enterprises). We then match each company in this set via its fiscal code to data from Cerved, which provides information on the gender composition of the board of directors. This match results in a starting sample of 7,029 companies. The companies' tax identification number allows us to link

[3]The regulatory board of the Italian stock exchange, CONSOB, is in charge of monitoring and supervising compliance with the law in listed firms, see Maida and Weber (2022)

the dataset to social security data from INPS archives which cover the entire population of dependent workers' employment spells in the private non-agricultural sector of the Italian economy. INPS records include detailed information on approximately 18 million workers and 1.5 million firms per year.

Performing the firm level match with INPS records requires respecting privacy rules that specify that the information in the imported variables does not allow the identification of a cell with fewer than four companies. To comply with these rules we imported a sample with 85% of SOE and PMSE companies with cells of four or more companies regarding information on the type of government control, the type of collegiate administration, and the characteristics of the board of directors.[4] The match rate between the two data sources was approximately 65%, resulting in a final sample of 3,883 merged companies.

### 3.1 Firm level panel data

Using INPS records with information on the universe of workers employed in each company, we construct an annual panel with workforce characteristics over the period 2008-2020, focusing on the distribution of workers by gender and occupation and within the firm-specific wage distribution. To fully exploit within-firm distribution of workforce characteristics, we further restrict the sample to firms with more than ten employees, resulting in a final estimation sample of 1864 firms (1175 SOEs and 689 of PMSEs). The set of variables measures the representation of females by occupation and at different quantiles of the firm-specific wage distribution. We measure the gender of the "CEO worker" defined as the employee with the highest wage within a given firm-year.[5] Furthermore, by we track the inflow and outflow of workers into a company each year and calculate the female share among hires and layoffs.

Our "treated group" includes firms that are required to comply with the gender quota law based on firm characteristics measured in 2012. Those are SOEs managed by a collegiate body,

[4]Since INPS rules allow the submission of a request for merging external data at the beginning of the project to maintain some flexibility, the cells we have created include information on a board of directors with a gender quota below 20% and whether or not they have a collegiate administration for the period 2012-2016. They also pertain to companies that have been continuously state-owned enterprises (SOEs) for the period 2012-2016. Additionally, they contain information on five classes of female share in the board in 2011. A cell with a minimum of four companies that include all of this information is required to reduce the initial sample size by 15%.

[5]As our the average firm in our sample is smaller than the typical listed firm, we modify the definitions of CEO relative to MW2022 and do not require that the CEO is a manager.

where the proportion of the underrepresented gender among administrators was below 20%. The "control group" includes all PMSEs and the SOEs managed either by a single administrator or by a board of directors where the proportion of the underrepresented gender was greater than or equal to 20% among administrators in 2012. Table 1, Panel A presents descriptive statistics of firm level variables in 2012 for SOEs and PMSEs in columns 1 to 4, as well as for the Treated and Control Group companies in columns 5 to 8. On average, SOEs in our sample are larger than PMSEs. But when we focus on the Treated Group, which excludes firms with more than 20% female board members and firms with a sole administrator, the average firm size is similar than in the Control Group. The share of female employees is also similar across the four groups of firms varying between 34% and 38% and average gender wage gaps are between 88% and 90%. The share of firms with a female CEO's is lower in the Treated Group (14%) than in the Control Group (19%).

Table A.1 compares measures of female representation the Treated and Control Groups with the Treated Group of Listed companies and the matched Control Group of Limited Firms in Maida and Weber (2022). This comparison highlights that SOEs and PMSEs are significantly smaller and wages are about 30% lower in public firms than in the average Listed firm. Although the shares of female employees do not differ between both types of companies, female workers have better positions in the within firm wage distribution in public firms than in listed firms.

### 3.2 Individual level data with maternity information

In Italy, maternity leave consists of five months of mandatory leave from work (hereafter, ML), during which women are prohibited from working. By default, maternity leave begins two months before delivery and ends three months after, although some flexibility in timing and duration due to health reasons is allowed. In addition to mandatory maternity leave, households are entitled to ten months (no more than six months per parent) of voluntary parental leave (PL), which can be used until the child is twelve years old. If taken before the child's seventh birthday. up to six months of PL are paid by social security at 30% of the pre-birth wage.

To analyze the effect of the law on women's fertility decisions, we merge female workers employed in the Treated and Control Group firms over the period 2008–2019 with the INPS archive "Differenze di Accredito" ("credit differences") using the worker identifier. This archive provides

detailed monthly information on mandatory maternity leaves during which mothers are not working and receive INPS allowances. It also records the monthly occurrence of voluntary parental leave episodes. We cannot observe the exact duration of these episodes in days. But observe a monthly indicator equal to one if a woman had an episode of leave during the month.[6]

We select a sample of women aged 18 to 45 and construct an indicator equal to one whenever an episode of mandatory maternity leave is recorded in a given year. If a maternity episode spans two calendar years, the indicator is assigned to the first year, allowing us to capture maternity events over the period 2009–2019. We then track each woman for twelve months following the end of her mandatory maternity leave and record the number of months in which she takes parental leave, experiences a layoff or voluntary resignation, or remains employed at the same firm. To analyze the effect of the reform on motherhood-related wage penalties, we compute the percentage change in weekly earnings in the years before and after a maternity episode. We restrict the sample to the first maternity leave episode of each woman and to spells for which wage data are available in the years before and after the leave.

Table 1, Panel B presents descriptive statistics of our main fertility related outcome variables. In the Treated Group, shown in column 7, we have 20,613 yearly observations of women in the 18-45 age group 6.4% of which have a mandatory maternity spell in this year. These 1255 women with maternity leave, spend on average 3 additional periods on voluntary parental leave. Job changes in the year after maternity leave are rare, more than 94% of women are still in the same job and less than 1% are fired or quit voluntarily. The 484 women for whom we observe a wage in the year before and after their first mandatory maternity leave, experience a wage cut of around 10% on average.

## 4 Empirical strategy

We first assess the impact of reform-induced changes on board composition and firm-level measures of gender diversity. The Golfo-Mosca law gradually introduced a mandatory gender quota for the boards of directors of SOEs. As outlined in Section 2, the reform targeted SOEs managed by a collegiate body where the proportion of the under-represented gender among ad-

[6] Another INPS archive, called "Maternità," exists and provides information on the actual length of parental leave; however, it is not reliable before 2013, so we decide not to use it in our analysis.

ministrators was below 20% in 2012. To evaluate the impact of this reform, we specify a triple difference-in-difference model, estimating the following equation:

$$\begin{aligned} Y_{it} &= \beta_1 \cdot \text{SOE}_i + \beta_2 \cdot \text{Below20}_i + \beta_3 \cdot \text{Post}_t + \beta_4 \cdot (\text{SOE}_i \times \text{Below20}_i) + \beta_5 \cdot (\text{SOE}_{it} \times \text{Post}_t) \\ &+ \beta_6 \cdot (\text{Below20}_i \times \text{Post}_t) + \beta_7 \cdot (\text{SOE}_i \times \text{Below20}_i \times \text{Post}_t) + \alpha_i + \delta_t + \delta_{t,j} + \delta_{t,r} + \epsilon_{it} \quad (1) \end{aligned}$$

where indices *i*, *j*, *r*, and *t* refer firms, industries, region and years, respectively. The outcome $Y_{it}$ represents one of our gender diversity measures for firm $i$ in year $t$. $SOE_i$ is a dummy variable indicating whether the a company $i$ was a SOE in 2012, $Below20_i$ is a dummy variable equal to one if company $i$ is administrated by a collegiate body and if the share of women on the board is below 20% in 2012. $Post_t$ is a dummy variable that is equal to zero in the years priors to 2013 and one in all subsequent years. $\delta_t$ represents a set of year dummies, $\delta_{t,j}$ and $\delta_{t,r}$ are year-industry and year-region fixed effects respectively. $\beta_7$ is the main parameter of interest capturing the average change in the outcome $Y$ associated with the reform. Note that we define 2012 as the "reference year" as the mandatory gender quota became effective in 2013.

Our identification strategy is based on the assumption that, in the absence of the reform, the outcomes in firms subject to the gender quota would have evolved in a manner similar than those in the Control Group. We provide support for this hypothesis by estimating an event study version of the equation (1) given by :

$$\begin{aligned} Y_{it} &= \alpha_i + \sum_{\tau} \beta_{1\tau} \cdot (\text{SOE}_i \times \mathbb{1}(t = \tau)) + \sum_{\tau} \beta_{2\tau} \cdot (\text{Below20}_i \times \mathbb{1}(t = \tau)) \quad (2) \\ &+ \sum_{\tau} \beta_{3\tau} \cdot (\text{SOE}_i \times \text{Below20}_i \times \mathbb{1}(t = \tau)) + \delta_t + \delta_{t,j} + \delta_{t,r} + \epsilon_{it} \end{aligned}$$

where $\alpha_i$ is a firm fixed effect that captures any time invariant unobserved firm characteristics. Again, the reference year is 2012. This model allow ua to test for differential effects in all years before and after the reform. Small and statistically insignificant $\beta_{3\tau}$ in the years before 2012 support the common trend assumption. $\beta_{3\tau}$ for $\tau > 2012$ illustrate dynamic effects and the timing of the reform.

# 5 Results

## 5.1 Board Composition

Before examining company-level and individual level outcomes, we utilize equation (3) to estimate how the gender composition of boards in publicly owned SOEs with a female board share below the quota level in 2012 boards changed over time relative to companies in the Control Group. Figure 1 presents the yearly regression coefficients of the interaction term $SOEi \times \text{Below20}i$ along with the corresponding confidence intervals. We normalize coefficients in the pre-implementation year 2012 and the coefficient $\beta_{3,0}$ corresponds to the year of the actual implementation of the policy in 2013. .

Figure 1 shows that in the years prior to the quota implementation the coefficient estimates are close to zero and the time pattern does not indicate diverging pre-trends in female board shares. But with the introduction of the quota we observe a sudden jump by 5 percentage points in the share of female directors in companies subject to the quota. This increase continues over the next two years which is potentially due to variation the years of board renewals across companies. In later years differences in female board quota between treated and control group firms stabilize even though the quota was raised further up to 40% in 2019. The reason might be spillover effects to companies in the control group. Zaccaria et al. (2024) provide evidence that the formal search process for female directors lead to increases in female appointments on boards of non-targeted companies that are connected by board membership.

## 5.2 Gender diversity within firms

Next, we investigate how the increase in the female share on boards of firms subject to the quota affects the gender composition and gender wage gaps in the workforce. Here we follow Maida and Weber (2022) in the definition of outcome variables and compare females in leadership positions, at different positions of the within firm wage distribution, and the overall gender composition of employees, hires, and layoffs. Table A.2 in the appendix presents coefficient estimates of equation (3). For better visibility, Figure 2 shows coefficient estimates of the triple diff coefficients along with confidence intervals next to estimates of the quota reform effects for listed companies in two specifications reported by Maida and Weber (2022).

The main difference between our study and Maida and Weber (2022) (MW2022) is that definition of the treatment group. We examine quota effects on firms with public ownership, while MW2022 focus on private listed firms. In terms of the sample size of the treated group our sample of treated firms is about 4 times larger than the sample in MW2022. In addition, we estimate the average effects over a longer time period of 8 years while MW2022 present short-run effects. The first stage effects are, however, comparable in both studies. The average treated company increased the share of female directors by 10 percentage points, both in publicly owned and in listed relative to untreated comparison companies.

Interestingly, our results confirm the findings in Maida and Weber (2022) of limited spillover effects from the quota law on gender composition and gender gaps in the workforce firms subject to the quota policy. As Figure 2 shows, the point estimates are generally positive, as expected, but across samples and specifications they are small in magnitude and mostly not statistically significant. The confidence intervals are not tighter in the much larger sample of public firms which indicates that variation in outcomes is not only driven by sampling error but also by heterogeneity across firms. The only variable for which we find a significant impact of the quota for public firms is the share of hires who are female. The coefficient indicates a substantial increase of 9 percentage points. But this estimate is imprecise and the confidence interval overlaps with the estimates for limited companies. In addition, the increase in female hires does not seem to be large enough to change the overall share of female employees in treated companies.

In summary, these results support the interpretation that although gender quotas have succeeded in increasing women's representation on boards, substantive changes—particularly regarding pay equity, leadership positions, and retention—have remained limited in both public and private firms. Without deeper organizational and policy reforms, the impact of board gender quotas appears modest and constrained.

### 5.3 Fertility decision

Italy has been facing a profound demographic crisis in recent decades. The yearly number of births has been steadily declined, dropping from 577,000 in 2008 to 400,249 in 2021. Additionally, the average age of childbirth has been consistently rising from 29.8 years in 1995 to 32.4 years in

2023. The total fertility rate is below the EU and OECD average. Unfortunately, this trend often results in a permanent decision to forego having children (Prati (2022)).

Labor market conditions and weak institutional support for working mothers- such as the inadequate provision of early childcare services - are key factors that may help explain low fertility rates in Italy (ISTAT 2023). In addition, policies at the firm level are potentially crucial for fertility decisions. Tate and Yang (2015) show that managers play a pivotal role in shaping workplace practices and fostering female-friendly cultures. Thus policies that promote gender equality in access to top positions, establish family friendly workplaces and improve the work-life balance of working parents are important tools to address the fertility crisis. A female board quota my facilitate the establishment of these polices as female managers may be more aware of problems of female employees and thus more likely to actively install female friendly workplace policies.

Here we test the direct impact of the introduction of the gender quota on Italian firms on fertility decisions and labor market outcomes of young mothers working in affected companies. To conduct the analysis, we estimate the firm level regression model in in equation (1) and adapted specification at the individual level which allows for worker and firm fixed effects, given by the following equation:

$$\begin{aligned} Y_{kit} &= \alpha_i + \alpha_k + \beta_1 \cdot (\text{SOE}_i \times \text{Post}_t) + \beta_2 \cdot (\text{Below20}_i \times \text{Post}_t) \\ &+ \beta_3 \cdot (\text{SOE}_i \times \text{Below20}_i \times \text{Post}_t) + \delta_t + \delta_{t,ij} + \delta_{t,ir} + \epsilon_{ikt} \end{aligned} \tag{3}$$

$Y_{kit}$ is one of several outcome variables related to fertility and maternal labor market outcomes of individual $k$ in company $i$ and year $t$. As explained in Section 3.2 or main proxy for fertility is an indicator of a mandatory maternity leave in year $t$. To evaluate conditions for working mothers we measure months of voluntary parental leave, the probability that a mother is laid off or quits as well as the probability of staying with the pre-maternity employer in the year after maternity leave. To approximate the child penalty we measure the wage change between the pre-maternity and post-maternity year for women who are employed in both years. As in the previous section, $SOE_i$ is a dummy variable indicating whether the company $i$ was a SOE in 2012, $Below20_i$ is a dummy variable indicating whether a company $i$ is administrated by a collegiate body with a

share of the less represented gender below 20%, and $Post_t$ is a dummy variable that is equal to zero in the years priors to 2013 and one in all subsequent years. We also include firm fixed effects, denoted by $\alpha_i$, individual effects $\alpha_k$ and a set of year dummies $\delta_t$. $\delta_{t,j}$ and $\delta_{t,r}$ denote year-industry and year-region fixed effects respectively.

The empirical results presented in Table 2, Panel A show effects on mandatory maternity leaves for all working women age 18-45, and Panel B shows effects on voluntary parental leave conditional on taking a mandatory leave. Panel A, column 3 estimates a firm-level regression comparable to the specifications in Section 5.2. The coefficient estimate is close to zero and not statistically significant, indicating that the increase in gender diversity on boards does not affect fertility decisions. This result is confirmed by individual level regressions of equation (3) shown in column 1, which includes worker fixed effects, and column 2, which includes worker and firm fixed effects. The latter two specifications exploit variation within women with multiple maternity leave spells. The estimated coefficients are equally close to zero as the effect in the firm level regression.[7]

While we do not find evidence of increased fertility, it might still be that due to the quota law, mothers face better conditions at the workplace and take more time on voluntary parental leave. In 2012 mothers employed in control group firms took on average close to three months of parental leave (see Table 1). Compared to this baseline measure, the coefficient estimates in Panel B indicate that mothers in firms affected by the quota law spend about 10% - 20% more time on voluntary parental leave. But the estimates are imprecise and insignificant.

Table 3 shows the quota effects on mothers' job stability, in columns 1-3, and wage penalties, in column 4. At baseline, in 2012, mothers employed in the control group companies have very stable jobs, 94% of them keep the same job in the year after maternity leave, and 0.4% or 0.9% are laid off or quit their jobs voluntarily. The estimates of the reform effects show that the probability of remaining in the same job increases slightly, mostly due to a reduction in quits. But all coefficients are small and insignificant. In the sample of women with wage earnings in the year before and after maternity leave, the average wage penalty is 10 percentage points in the control group in 2012. The estimate in column 4 shows a positive effect, which means that the penalty declines by about 2 percentage points. However, this coefficient is insignificant as well.

[7]The stability of maternity leave take-up rates in treated versus control firms is visually confirmed in Figure A.1 which underscores that a higher representation of women on boards did not lead to significant changes in reproductive decisions during the period under study.

In sum, our results indicate that neither fertility responds to the quota law which increased the share of females directors on company boards, nor did labor market outcomes of young mothers change significantly. These finding suggests that despite institutional changes at the board level, firm level policies regarding a family friendly work environments or flexible hours arrangements did not change, or did not change sufficiently to affect women's choices. It seems that board gender quotas alone were insufficient to shift deeply entrenched demographic patterns, particularly given Italy's low fertility rates and the structural barriers women face in balancing work and family life.

## 6 Conclusions

This paper offers a thorough evaluation of the effect of Italy's gender quota law on public and state-controlled companies, examining whether the board quota also led to improvements of working conditions, career chances and fertility choices of women working in these firms. Using a rich matched dataset linking administrative firm- and worker-level records, and employing a rigorous triple difference-in-differences methodology, the analysis finds limited evidence that the reform produced meaningful spillovers into women's everyday work-life experiences.

In line with the previous literature, our results show that the quota law successfully improved the gender balance on company boards and thereby achieved its direct goal. We also confirm that the quota law did not improve women's representation at the top of the company hierarchy or in top earnings positions, nor do we find spillovers to the overall representation of women or gender earnings gaps in companies subject to the quota. Even though SOEs are have overall smaller gender gaps and we measure the quota effects over a longer time horizon, our findings are in line with results for Italian listed companies reported by Maida and Weber (2022). They are also in line with the broader literature which shows limited spillover effects of quota policies on other women employed by companies subject to the quota (De Acutis et al. 2024). This cross-study consistency reinforces the conclusion that board-level reforms alone are insufficient to drive systemic changes in gender equity across firms.

At the same time, the novel result of the present paper lies in the extension of the analysis to fertility and maternity-related outcomes – an area that was less explored in previous studies of

quota effects. By directly investigating whether increased female leadership influences fertility decisions and career outcomes around maternity leave of women employed by companies subject to the quota, this study addresses an essential dimension of gender equality often overlooked in corporate governance debates. However, we find that mandatory board gender quota did not significantly affect any of the fertility related outcomes. This underscores the depth of structural and cultural barriers that continue to constrain women's choices, particularly in the context of Italy's persistently low fertility rates and traditional gender norms.

These findings have important policy implications. They highlight that while gender quotas are a necessary step, they are insufficient on their own to drive structural gender equality. Effective reforms must be part of a broader institutional strategy that includes supportive family policies, affordable childcare, cultural changes regarding caregiving roles, and stronger enforcement of anti-discrimination laws. Without these complementary measures, gender quotas risk becoming isolated achievements with little impact on the real challenges women face in balancing career and family life. In Italy's context—marked by low fertility, weak female labor force participation, and deeply ingrained gender norms—this study serves as a cautionary tale: progress at the top does not automatically trickle down, underscoring the need for a comprehensive institutional approach to gender equality.

The literature has shown that women value job amenities that offer female friendly workplace culture and help improve their work life balance a (Goldin et al. 2020; Corradini et al. 2025) and they are willing to earn lower wages in return for these amenities. In Italy, mothers to be sort into firms with low wage growth firms at the beginning of their careers (Card et al. 2025). But our results cast doubt on whether these women are rewarded with a more family friendly workplace environment in return for missed career opportunities.

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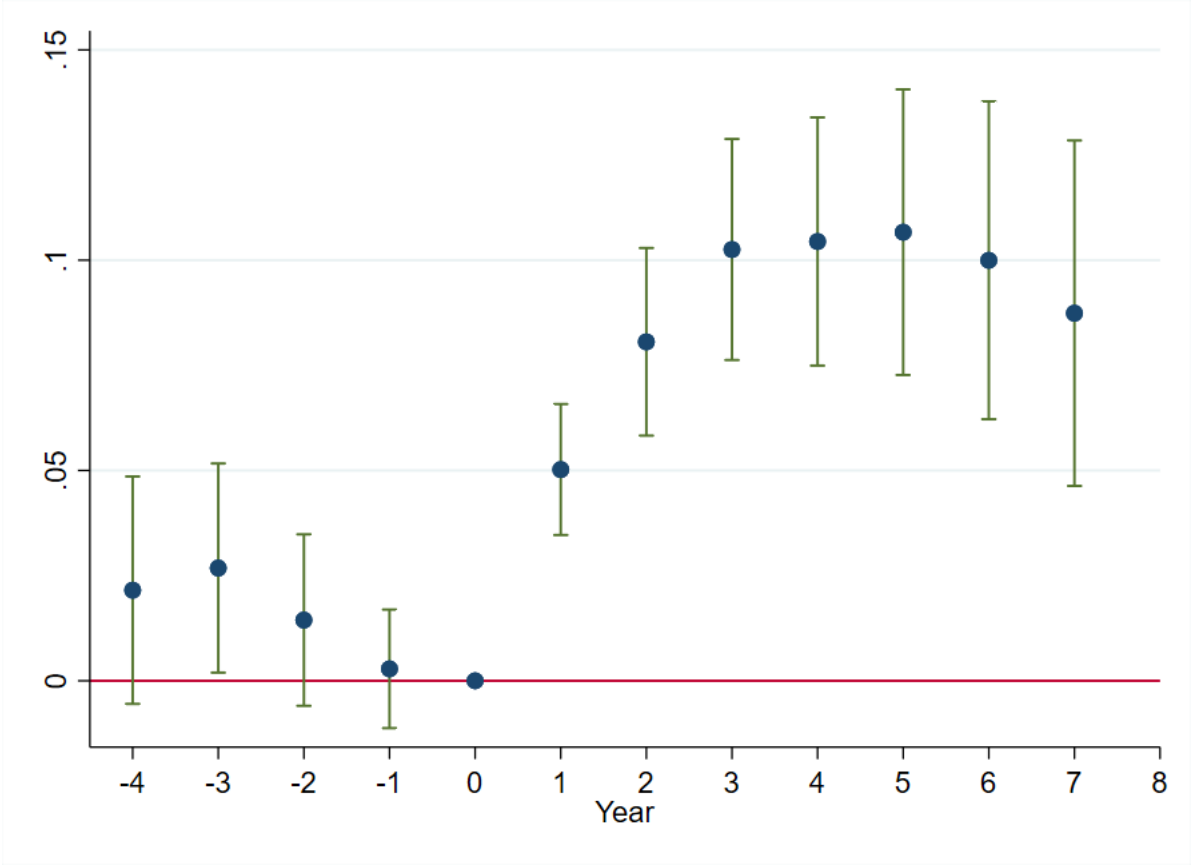
**Table 1**

**Descriptive Statistics**

| **A: Firm Level Variables** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | PMSEs | | SOEs | | Control Group | | Treated Group | |
| Variable | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Firm size | 121.97 | 563.58 | 222.48 | 141.38 | 187.62 | 140.46 | 181.05 | 519.21 |
| Share females | 0.36 | 0.25 | 0.38 | 0.26 | 0.38 | 0.26 | 0.35 | 0.24 |
| Avg wage | 632.68 | 287.19 | 605.35 | 216.26 | 610.92 | 264.52 | 623.93 | 203.97 |
| Gender gap | 0.88 | 0.31 | 0.90 | 0.30 | 0.89 | 0.29 | 0.90 | 0.34 |
| Female CEO | 0.17 | 0.37 | 0.12 | 0.38 | 0.19 | 0.39 | 0.14 | 0.35 |
| Share with single administrator | 0.06 | 0.25 | 0.15 | 0.36 | 0.19 | 0.39 | 0.00 | 0.00 |
| Share with <20% women on board | 0.22 | 0.42 | 0.29 | 0.45 | 0.41 | 0.49 | 0.00 | 0.00 |
| Number of firms | 689 | 689 | 1,175 | 1,175 | 1,215 | 1,215 | 649 | 649 |
| **B: Individual Level Variables** | | | | | | | | |
| *Women aged 18–45* | | | | | | | | |
| Number of obs | 21,255 | | 39,415 | | 40,057 | | 20,613 | |
| Share on mandatory leave | 0.06 | 0.25 | 0.06 | 0.24 | 0.06 | 0.24 | 0.06 | 0.25 |
| *Women on mandatory leave* | | | | | | | | |
| Number of obs | 1,372 | | 2,393 | | 2,510 | | 1,255 | |
| Months on voluntary leave | 2.65 | 2.87 | 2.99 | 2.80 | 2.88 | 2.99 | 3.01 | 2.93 |
| Share fired next year | 0.01 | 0.08 | 0.00 | 0.06 | 0.00 | 0.07 | 0.00 | 0.06 |
| Share quit next year | 0.01 | 0.09 | 0.01 | 0.10 | 0.01 | 0.10 | 0.01 | 0.09 |
| Share staying | 0.94 | 0.24 | 0.94 | 0.23 | 0.94 | 0.24 | 0.94 | 0.23 |
| *Women employed in year before and after leave* | | | | | | | | |
| Number of obs | 458 | | 855 | | 829 | | 484 | |
| Wage change | -0.13 | 0.18 | -0.09 | 0.20 | -0.10 | 0.20 | -0.10 | 0.19 |

*Note:* The sample comprises state-owned firms in 2012 with more than ten employees, matched to the Italian social security (INPS) database. Columns (1)–(2) show firms with minority public ownership; (3)–(4), firms controlled by public entities; (5)–(6), control group firms; (7)–(8), treated firms affected by the reform. The gender wage gap is defined as the difference between average weekly female and male full-time equivalent wages. Mandatory leave refers to registered episodes of maternity leave.

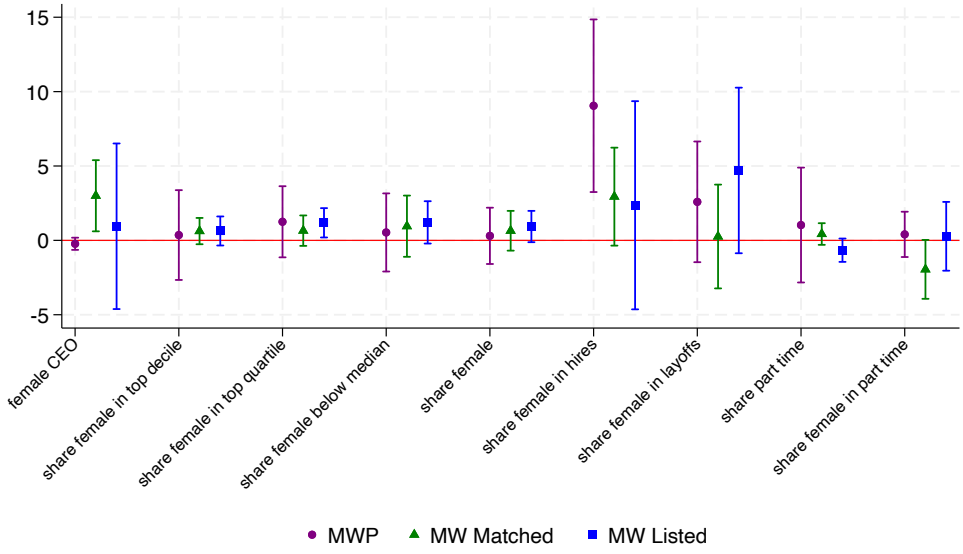
**Figure 1**
**Board Composition – First Stage: Triple Difference-in-Differences Specification**




Note: This Figure plots yearly regression coefficients over the period 2008-2019 and corresponding intervals at 99%, where the dependent variable is the share of female directors from equation (3). The treated group includes companies controlled by public entities managed by a collegiate body, with a share of the less represented gender below 20% among administrators in 2012. The control group consists of all companies with minority state participation, and those under state control if managed by a single administrator or by a board of directors with a share of the less represented gender greater than or equal to 20% among administrators in 2012. $\beta_0$ corresponds to the year of actual implementation of the policy 2013. Coefficient $\beta\_1$ is normalized to zero. The sample comprises all the state owned firms in 2012, delivered for the match with the Italian social security (INPS) database . All the regressions include firm and year fixed effects, sectoral and regional trend fixed effects. Standard errors, are clustered at the firm level.

**Figure 2**

**Comparison of quota effects for firms with public ownership and for listed firms in Maida and Weber (2022)**




*Note* The figure plots coefficient estimates and 95% confidence intervals of diff-in-diff coefficients for the main outcome variables in Table A.2 (denoted as MPW) and Tables 3 and 4 in Maida and Weber (2022) denoted as (MW Listed and MW Matched).

**Table 2**
**Mandatory and voluntary maternity leave regression results**

| | | | |
|---|---|---|---|
| **A: Mandatory Maternity Leave** | | | |
| | Maternity Leave | | Fertility (firm-level) |
| | (1) | (2) | (3) |
| Post × SOE × Below20 | -0.000 | -0.000 | 0.000 |
| | (0.007) | (0.008) | (0.001) |
| Constant | 0.043*** | 0.012 | 0.023*** |
| | (0.010) | (0.022) | (0.001) |
| Observations | 565,586 | 565,564 | 19,045 |
| R-squared | 0.172 | 0.172 | 0.589 |
| Fixed Effects | Worker FE | Worker and Firm FE | Firm FE |
| **B: Voluntary Parental Leave** | | | |
| Post × SOE × Below20 | 0.270 | 0.506 | 0.525 |
| | (0.207) | (0.444) | (0.446) |
| Constant | 2.189*** | 2.188** | 2.144* |
| | (0.426) | (1.050) | (1.152) |
| Observations | 33,840 | 15,761 | 15,691 |
| R-squared | 0.233 | 0.690 | 0.702 |
| Fixed Effects | Firm FE | Firm FE | Firm FE |

*Note:* Columns 1 and 2 in Panel A report coefficients from equation (3) over 2008–2019. The dependent variable is a dummy for maternity leave episodes. The sample includes women aged 18–45 employed in state-owned firms matched to INPS data. Column 3 reports estimates from Equation (3) using firm-level average maternity leave episodes. Panel B uses equation (3) with the dependent variable being the number of voluntary parental leave episodes following mandatory leave. All regressions include year-region and year-industry fixed effects. Standard errors are clustered at the firm level.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

**Table 3**

**Separations, Retentions, and Wage Penalties**

| | Firings | Quits | Stayers | Wage Penalties |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Post × SOE × Below20 | -0.0007 | 0.0101 | 0.0677 | 0.0178 |
| | (0.0062) | (0.0086) | (0.0580) | (0.0260) |
| Constant | 0.0148 | 0.0692* | 1.706** | 0.0317 |
| | (0.0153) | (0.0371) | (0.1060) | (0.0871) |
| R-squared | 0.209 | 0.124 | 0.671 | 0.207 |
| Observations | 33,840 | 33,840 | 33,840 | 10,922 |

*Note:* This table presents regression coefficients from Equation (3) for the period 2008–2019.
Columns (1)–(3): Dependent variables are dummies for whether a woman was fired, quit, or stayed with the same firm.
Column (4): Dependent variable is the wage change from one year before to one year after mandatory maternity leave.
All regressions include firm fixed effects. Standard errors (in parentheses) are clustered at the firm level.
*** $p$ <0.01, ** $p$ <0.05, * $p$ <0.1.

# Online Appendix

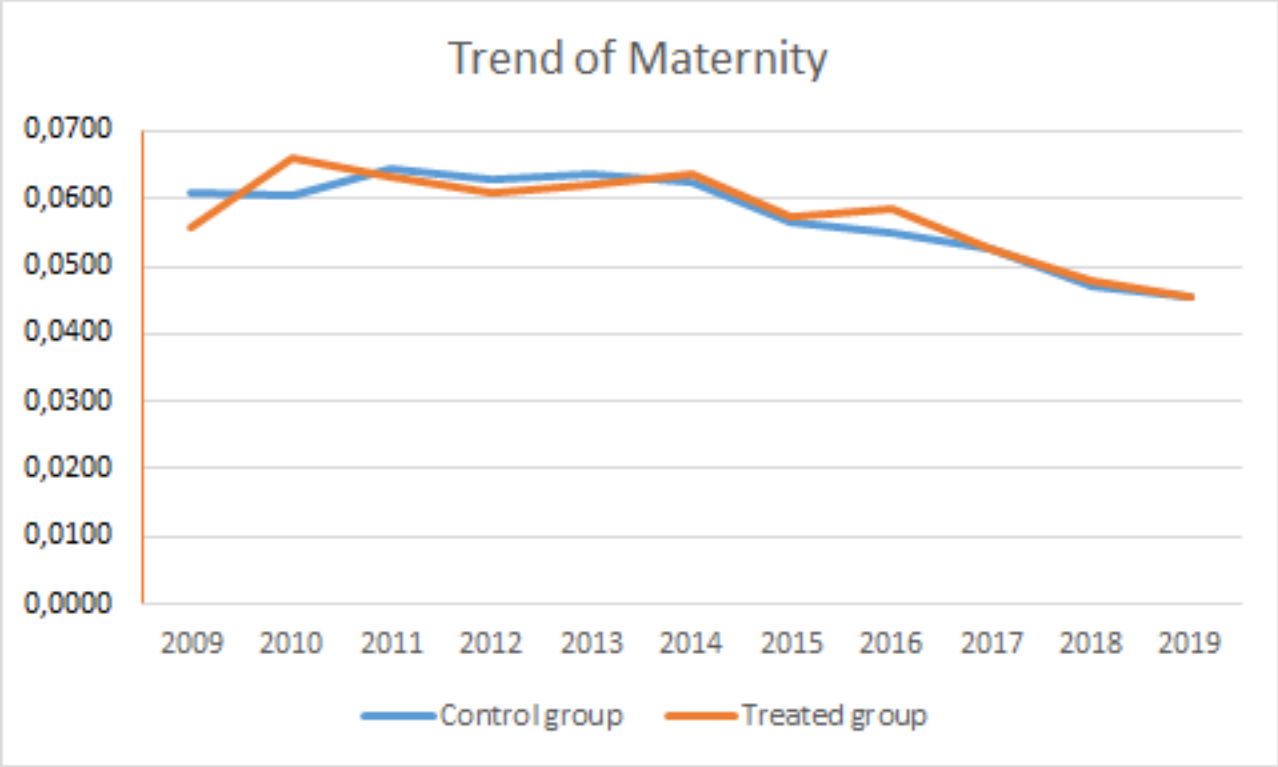
**Table A.1**
**Descriptive Statistics: Female Representation in 2012**

| | Maida and Weber (2022) | | | | Maida and Weber (2025) | | | |
|---|---|---|---|---|---|---|---|---|
| | Control Group | | Listed Firms | | Control Group | | Treated Group SOEs | |
| Variable | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Firm size | 684.0 | 1283.0 | 717.0 | 1772.0 | 188.0 | 140.0 | 181.0 | 519.0 |
| Average wage | 886.02 | 364.23 | 974.09 | 499.86 | 610.92 | 264.52 | 623.93 | 203.97 |
| Share Female and Top Decile Earnings | 0.13 | 0.14 | 0.15 | 0.15 | 0.25 | 0.32 | 0.21 | 0.27 |
| Share Female and Top Quartile Earnings | 0.19 | 0.16 | 0.21 | 0.17 | 0.29 | 0.27 | 0.27 | 0.24 |
| Share Female and Below AVG Earnings | 0.48 | 0.22 | 0.51 | 0.23 | 0.44 | 0.29 | 0.40 | 0.27 |
| Share of Female Hired | 0.34 | 0.30 | 0.36 | 0.27 | 0.29 | 0.36 | 0.24 | 0.33 |
| Share of Female Fired | 0.33 | 0.29 | 0.37 | 0.28 | 0.27 | 0.36 | 0.21 | 0.33 |
| Share Females | 0.37 | 0.18 | 0.40 | 0.19 | 0.38 | 0.26 | 0.34 | 0.24 |
| Share Part-Time | 0.07 | 0.08 | 0.07 | 0.08 | 0.15 | 0.21 | 0.13 | 0.19 |
| Share Part-Time and Female | 0.87 | 0.21 | 0.90 | 0.15 | 0.76 | 0.29 | 0.73 | 0.31 |
| Number of Firms | 153 | 153 | 145 | 145 | 1215 | 1215 | 649 | 649 |

*Note:* Columns (1) and (2) include all companies continuously listed between 2012 and 2016 with matched INPS records for 2008–2016. Columns (3) and (4) include limited companies with at least one manager and continuous INPS records from 2008–2016. Columns (5) and (6) refer to state-owned firms in the control group (2012, matched with INPS and over 10 employees). Columns (7) and (8) refer to state-owned firms for which the reform has been binding, identified as explained in the relevant section.

**Figure A.1**

**Maternity trends**




Note: This figure plots the annual average of maternity episodes among women in the age group of 18-45 comparing women who work in state-participated companies with those who work in state-controlled companies managed by a collegiate body and with a share of the less represented gender below 20% among administrators in 2012.

**Table A.2**

**Estimated reform effect on females**

| A: Job Position | | | | | |
|---|---|---|---|---|---|
| VARIABLES | Ceo is a female | Share Females in Top Decile | Share Females in Top Quartile | Fem in Above Med.Earn. | Fem in Below Med.Earn. |
| Post*Below20 | 0.00203 | 0.00123 | -0.00732 | 0.00286 | -0.00931 |
| | (0.00189) | (0.0130) | (0.0102) | (0.00846) | (0.0120) |
| Post*SOE | 0.00230 | -0.0111 | -0.0167 | -0.00765 | -0.0101 |
| | (0.00196) | (0.0136) | (0.0106) | (0.00759) | (0.00936) |
| Post*SOE*Below20 | -0.00229 | 0.00358 | 0.0125 | 0.000114 | 0.00532 |
| | (0.00209) | (0.0154) | (0.0122) | (0.00973) | (0.0134) |
| Constant | -0.0003 | 0.172*** | 0.190*** | 0.207*** | 0.309*** |
| | (0.00106) | (0.00710) | (0.00548) | (0.00401) | (0.00517) |
| B: Workforce Chatacteristics | | | | | |
| VARIABLES | Female Hirings Rate | Female Firing Rate | Share of Females | Share of Part-time | Share of Female Part-time |
| Post*Below20 | -0.062*** | -0.0191 | -0.00348 | 0.0121 | 0.00311 |
| | (0.0240) | (0.0170) | (0.00861) | (0.0118) | (0.00638) |
| Post*SOE | -0.096*** | -0.0244 | -0.00917 | -0.0143 | -0.00633 |
| | (0.0231) | (0.0157) | (0.00643) | (0.0163) | (0.00662) |
| Post*SOE*Below20 | 0.0905*** | 0.0259 | 0.00304 | 0.0103 | 0.00403 |
| | (0.0296) | (0.0207) | (0.00965) | (0.0197) | (0.00777) |
| Constant | 0.297*** | 0.214*** | 0.258*** | 0.0960*** | 0.0642*** |
| | (0.0120) | (0.00845) | (0.00354) | (0.00660) | (0.00335) |
| Observations | 22,335 | 22,309 | 22,335 | 22,335 | 22,335 |
| R-squared | 0.173 | 0.869 | 0.948 | 0.974 | 0.966 |

Note: This table reports regression coefficients on a set of dependent variables from equation (1), over the period 2008-2020. The sample comprises state owned firms in 2012 that could be matched with the Italian social security (INPS) database. The treated group includes companies controlled by public entities managed by a collegiate body, with a share of the less represented gender below 20% among administrators in 2012. The control group consists of all companies with minority state participation, and those under state control if managed by a single administrator or by a board of directors with a share of the less represented gender greater than or equal to 20% among administrators in 2012. Share Female in Top Quartile (Decile) refers to the share of workers with earnings in the top quartile (decile) of the company specific earnings distribution who are female. All the regressions include firm year-region and year-industry fixed effects. Observations are weighted by firm size, measured by the number of workers. Standard errors, in parentheses, are clustered at the firm level.

**Table A.3**

**Female Gross Hiring Rate: Dynamic Model**

| | |
|---|---|
| SOE*Below20_2008 | 0.0453 |
| | (0.0573) |
| SOE*Below20_2009 | 0.1026 |
| | (0.0573) |
| SOE*below20_2010 | 0.1226 |
| | (0.0613) |
| SOE*Below20_2011 | 0.0512 |
| | (0.0576) |
| SOE*Below20_2013 | 0.2645 |
| | (0.06481) |
| SOE*below20_2014 | 0.1452 |
| | (0.05276) |
| SOE*Below20_2015 | 0.1798 |
| | (0.0840) |
| SOE*Below20_2016 | 0.1242 |
| | (0.05193) |
| SOE*Below20_2017 | 0.0782 |
| | (0.0610) |
| SOE*Below20_2018 | 0.1534 |
| | (0.0601) |
| SOE*Below20_2019 | 0.0872 |
| | (0.0610 |
| SOE*Below20_2020 | 0.1526 |
| | (0.0704) |
| Observation | 22,335 |
| R-squared | 0,663 |

Note: This table reports yearly regressions coefficients where the dependent variables is the female gross hiring rate from equation (3), over the period 2008-2020. All the regressions include firm year-region and year-industry fixed effects. Observations are weighted by firm size, measured by the number of workers. Standard errors, in parentheses, are clustered at the firm level.