BOARD COMPOSITION AND PERFORMANCE OF STATE-OWNED ENTERPRISES: QUASI-EXPERIMENTAL EVIDENCE[*]

Audinga Baltrunaite, Mario Cannella, Sauro Mocetti, and Giacomo Roma

March 2021

Abstract

The quality of governance crucially affects corporate outcomes, and may be particularly important for state-owned enterprises (SOEs) not disciplined by market competition forces. We examine the impact of board composition on the performance of companies controlled by public entities in Italy. For this purpose, we exploit a reform-induced exogenous change in board composition, aimed at increasing female representation and at reducing the revolving-door phenomenon. The law's provisions were binding for SOEs, but not for companies with a minority share of public ownership, allowing us to adopt a difference-in-differences estimation. The results show that female presence on the boards of directors of SOEs has increased, while that of former politicians has decreased. The new directors have mostly replaced older and less talented men, thereby rejuvenating the boards and improving their quality. To assess the effects of the board shake-up on firm performance, we analyse companies' balance sheets and survey information on citizens' satisfaction with the provision of local public services and on objective measures of their quality. While we detect no significant effects on firm productivity, we find that profitability increases and leverage decreases, thereby reducing corporate credit risk. Finally, there is evidence consistent with an improvement in the quality of SOEs' output.

JEL Codes: G34, L32, H42.

1 Introduction

A central question in corporate governance concerns the relationship between board composition and firm value (Baysinger and Butler, 1985; Hermalin and Weisbach, 1991). Determining whether and how boards of directors influence corporate performance is challenging because of the endogeneous nature of board appointments (Hermalin and Weisbach, 2003; Adams et al., 2010; Roberts and Whited, 2013). To establish causality, a growing literature exploits quotas (mainly related to gender) as a source of exogenous variation in board composition. However, the analysis of such policy interventions fails to deliver conclusive evidence (Ahern and Dittmar, 2012; Matsa and Miller, 2013; Smith, 2018).[1] Plausibly, the findings vary depending on whether or not the observed board choices are sub-optimal, on the presence of frictions in firm-director matching, or on the potential supply of candidate directors.

This paper examines the causal impact of board composition in a novel setting, focusing on state-owned enterprises (SOEs) – i.e., firms with a majority share of stock held by the central or local public entities. State ownership in many economies is extensive and may further increase during the ongoing COVID-19 pandemic (OECD, 2020b). Yet, corporate governance of SOEs faces a number of critical challenges. First, while private shareholders have direct economic incentives to keep management under control and company's performance high (Gupta, 2005), taxpayers – the ultimate "owners" of SOEs – may possess insufficient incentives to monitor the managers (Alchian and Demsetz, 1972). Second, the disciplining power of the market is less effective for SOEs: they often operate in sectors insulated from competition, a factor that appears to mitigate managerial slack (Giroud and Mueller, 2010; Bloom et al., 2019).[2] Moreover, the government often tends to bail out SOEs in trouble, thus generating the so-called "soft budget constraint" problem: while such safety net guarantees the survival of the company, it may as well reduce managerial incentives to maximize the SOE's performance (Lin and Tan, 1999; Kornai et al., 2003). Third, poor

---

[1]Although gender quotas on corporate boards are among the key policies to promote female empowerment (Hughes et al., 2017), their impact on firm performance is ex-ante ambiguous. On the one hand, diversity may be *per se* beneficial when different groups bring about different core values and risk attitudes (Adams and Funk, 2012; Bernile et al., 2018). Moreover, the removal of the glass ceiling may help qualified women to enter corporate boards, thereby reducing the inefficiency loss associated with discrimination (Cuberes and Teignier, 2016; Bertrand et al., 2018; Hsieh et al., 2019). On the other hand, constraints imposed on board selection may lead to sub-optimal choices (Coate and Loury, 1993), with adverse consequences on firm performance (Demsetz and Lehn, 1985).

[2]The market for corporate ownership is also less fluid in SOEs and there is evidence that takeovers may have a disciplinary role on corporate managers (Jensen, 1988; Scharfstein, 1988).

governance may also originate from bureaucrats' and politicians' pursuit of private interests rather than the maximization of social welfare (the so-called "malevolent nature of the government"). Examples include rent-seeking, obtaining personal political or economic benefits, engaging in excess spending, over-staffing, or generating corporate projects to transfer benefits to the interested parties (Shleifer and Vishny, 1994; Mauro, 1995; Shleifer, 1998). Finally, the management of SOEs is arguably more challenging relative to that of private sector companies, because it involves a broader set of goals, comprising public policy issues. All in all, corporate governance and, more specifically, board appointments are more likely sub-optimal in SOEs and constitute a key concern among determinants of their performance.

Our empirical strategy exploits a bundle of reforms that came into force starting from 2012. First, the gender quota for boards of directors (*"Law No. 120/2011"*, referred to as "Golfo-Mosca Law") was mandated for SOEs, imposing a gradually increasing female quota up to 33% for three consecutive board renewals. Second, *"Law No. 190/2012"* (referred to as "Severino Law") banned executive appointments to be granted in SOEs to individuals with former local-level political offices.[3] These policy changes targeted SOEs with an aim of re-balancing female presence on corporate boards and of alleviating the revolving-door phenomenon, whereby political background, rather than meritocratic criteria, determine director appointments.

Our analysis builds on a unique and rich dataset constructed by combining information from several original data sources. We start by identifying the universe of companies with stock held by public entities, such as the central government, regions, municipalities and other types of public administrations. Among them, we distinguish between SOEs and enterprises with public minority share of ownership (PMSEs). For each of these companies we obtain information on the identities and characteristics of their directors, such as gender, age, talent and political background. In particular, talent is measured by the director fixed effects from an AKM-style model identifying the contribution of each director to firm efficiency (Baltrunaite et al., 2020). We then identify directors with previous experience in politics using the registry of local politicians, obtained from the Ministry of Interior. We also collect firm-level indicators of performance from their balance sheets and local-level indicators of the quality of public services from survey data on citizens' satisfaction

---

[3]This restriction also applied to public officers with criminal charges for corruption. However, these are very few in numbers and, unfortunately, unobserved in our data.

and/or observable outputs.

We consider the SOEs as the treated group and the PMSEs – to which the laws did not apply – as the control group, and perform a dynamic difference-in-differences estimation. Figure 1 provides descriptive evidence that the reform was successful (i) in increasing female presence on boards of directors and (ii) in reducing the presence of directors with former experience in politics. The graph plots the share of women (left-hand-side panel) and politicians (righ-hand-side panel) in SOEs and PMSEs over the period 2008-2018. The two groups of enterprises show similar patterns before the implementation of the reforms, and start diverging after them. Specifically, the variables in the control group - PMSEs - continue on virtually the same time trend, whereas in the treatment group - SOEs - it jumps on a steeper path. Using stringent regression specifications, we estimate that the reforms raised the share of women by 4 percentage points on average (7 percentage points at the end of the period)[4] and reduced the share of politicians by 2 percentage points on average (nearly 3 percentage points at the end of the period).[5]

Figure 1: Board composition: directors' gender and past political experience
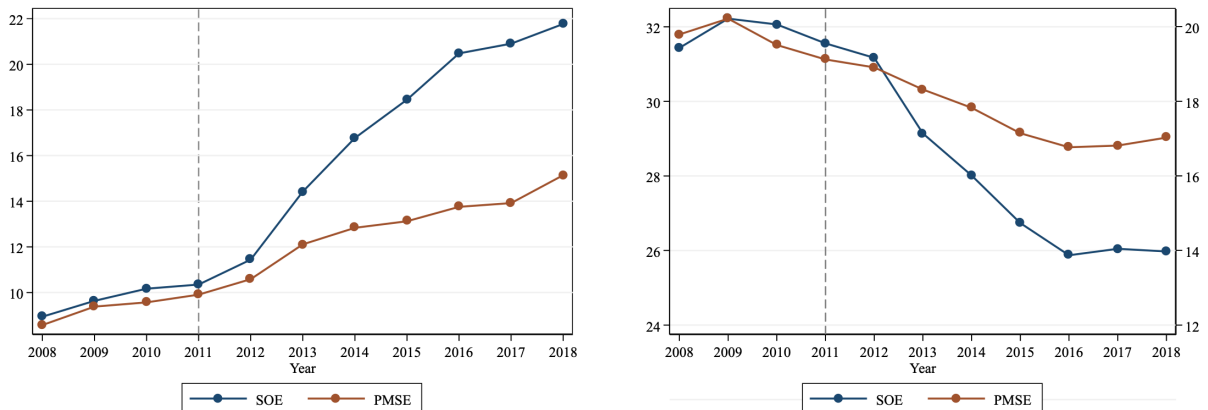
Notes: Figure plots unconditional averages of the percentage of female directors (left-hand-side panel) and of directors with former political experience (right-hand-side panel) on boards of state-owned enterprises (SOE) and of enterprises with a stock held by the public sector below 50% (PMSE). The share of former politicians in SOEs (PMSEs) is depicted on the left (right) axis.

---

[4]The female director presence in SOEs doubled, reaching 22% in 2018 from a mere 10% in 2011. The end-period share of women appears lower than a 33% quota imposed. This is largely explained by a significant presence of companies governed by a sole director (*amministratore unico*) to which the law does not apply. Among firms with a board, the share of women increased from 10% in 2011 to 27% in 2018, while the residual "gap" is due to some non-complying firms. See Section 5 for more details.

[5]As expected, there are level differences in the presence of politicians on corporate boards of SOEs and PMSEs. However, this does not question the validity of our identification strategy based on difference-in-differences estimation with firm fixed effects.

The board shakeup due to policy interventions results in other significant changes in board composition. First, the share of older directors decreases by around 2 percentage points with respect to the control group. Second, the measure of board talent increases by 4.5%, on average. To unpack the drivers of the rise in board talent, we adapt the Foster et al. (2001) approach to decompose the variation in aggregate board talent. We identify the variation stemming from changes in the share of stayers, from the entry of new directors and from the exit of incumbent ones, distinguishing by gender and by their political background. We find that the increase in SOEs' board talent is mainly driven by the entry of more talented men (accounting for about 40% of the variation), the entry of more talented women (accounting for a similar amount) and the exit of less talented men (accounting for about one fifth). The positive contribution of new directors is mostly concentrated among non-politicians, although we detect a significant improvement in the selection process also in the former politicians' category. Therefore, we argue that both the removal of the glass ceiling for women (Bertrand, 2018) and the decline of the "mediocre men" (Besley et al., 2017) contribute to the improvement of the governance quality of the SOEs.

In terms of firm performance, while we detect no significant effects in either direction on firm productivity, we find that corporate credit riskiness lowers. The latter effect is likely driven by the positive impact on firm profitability (gross profits to assets increase by around 1%) and by the reduction of leverage. Interestingly, for a subset of the SOEs that are involved in the provision of local public services (public transport, waste collection, energy, gas and water distribution), we observe citizens' satisfaction with these services through targeted surveys or objective measures of their quality based on hard data (e.g., the leakage rate in water distribution). Using this additional information, we find that the quality of these services increases in areas and sectors affected to a larger extent by the governance-improving reforms.[6]

Our study contributes to several different strands of the literature. First, we focus on companies

---

[6]Byron and Post (2016) and Kirsch (2018) review numerous studies uncovering a positive association between female directors and corporate social responsibility, likely attributable to gender differences in ethical orientation, communal characteristics, empathy, and care. More broadly, there is abundant evidence on political empowerment showing that women leaders are more concerned about social and welfare issues than men (Chattopadhyay and Duflo, 2004; Clots-Figueras, 2011; Brollo and Troiano, 2016). With respect to the previous political experience of directors, according to Klausen and Winsvold (2021), the ban of politicians from the management of the SOEs improves the accountability of the affected companies.

with the majority of stock held by public entities, while existing evidence on the effect of gender quotas concern large companies primarily owned by the private sector (Smith, 2018).[7] Moreover, while there is wide consensus that poor governance is the main critical issue concerning SOEs' performance, the empirical research on the topic is in its infancy (Grossi et al., 2015): nearly all studies have a descriptive and correlation-based nature (Daiser et al., 2017). Second, to shed light on the anatomy of the director selection mechanisms, we describe the adjustment process within the board induced by the policy reforms. In particular, we quantify the contribution of the inflows and outflows of directors with different characteristics (i.e., gender and political background) to the overall change in the board quality. Finally, our novel approach measures corporate performance with the quality of the services provided by SOEs, on top of their economic and financial performance. This illustrates the importance of embracing a broader perspective when evaluating the impact of governance quality on firm outcomes. Differently from private-sector-held companies, SOEs may indeed pursue multiple objectives and their social goals may prevail over economic performance under certain circumstances (Aharoni, 1981). Overall, our insights may feed the policy debate on corporate governance, for example, suggesting that policy interventions are likely more effective for companies operating in environments where the disciplining power of the market is weak.

The rest of the paper is organized as follows. Section 2 presents the Italian institutional setting. Sections 3 and 4 describe the data and the empirical strategy, respectively. Section 5 presents the main findings, as well as a sensitivity analysis, and a wide set of additional results. Section 6 concludes the paper.

2 Institutional Setting

2.1 Corporate Governance in SOEs

Most governments in advanced and developing countries have minority or majority stock-holdings in enterprises that operate in the private sector and are primarily subject to private law. The rationale for state intervention in a market economy is to produce goods and services in contexts character-

---

[7]As far as Italy is concerned, the existing evidence concerns stock-listed firms (Ferrari et al., 2018; Comi et al., 2020; Del Prete et al., 2020; Madia and Weber, 2020).

ized by market failures. In fact, public ownership is particularly dense in sectors based on network infrastructure or natural monopoly, such as transportation, water and gas utilities, electricity, and exploration of natural resources (e.g., oil and mining). Although measurement is complicated, recent estimates suggest that undertakings with some stock held by the public sector account for 10% of the world's GDP (Bernier et al., 2020).[8]

In Italy, there are around 10,000 enterprises with a public entity among their shareholders, almost equally distributed between SOEs and PMSEs. Although SOEs represent only 0.1% of the universe of Italian firms, their employment share corresponds to nearly 3% of the total. Among limited liability companies – which are the focus of our study and represent around three quarters of all enterprises with stock held by some public entity – the average number of employees is over one hundred, roughly 10 times higher than the average firm.[9]

The diversity and the selection of board members are the outmost important principles of good corporate governance in SOEs. Indeed, several countries impose prerequisites for board nominations and establish quotas to guarantee a more balanced demographic composition, e.g., in terms of directors experience in public entities, their "independence" or gender (OECD, 2018).

Meritocratic appointments of professionals and the independence of executive decisions are key to boosting firm performance.[10] In theory, the presence of former politicians on SOEs' boards may reflect the lack of meritocracy in directors' choice, whereby partisan affiliation matter more than director expertise (Laurenz, 2014), with negative effects on firm performance (Menozzi et al., 2012). On the other hand, directors with political connections may help voicing companies' needs to policymakers, with favorable effects on the firm value. Some political or government representation on the board may also be justified when SOEs are charged with important public policy objectives.

---

[8]It is also likely that direct participation of the state in business activity will increase in the response to the COVID-19. First, governments might take equity stakes in distressed companies, whose failure could pose a strain on the economy. Second, the demand of the state might increase: Giuliano and Spilimbergo (2014), for example, show that individuals who experienced a severe economic recession during their impressionable years (i.e. early adulthood) have a more positive view on government ownership of business and support more government redistribution.

[9]See Mocetti and Roma (2020) for further evidence on Italian SOEs.

[10]Independent directors can be defined as individuals who are not directly representing any particular stakeholder interested in the company, but who are sought to bring certain skills and competence to the board. To avoid undue interference with the board activity, some jurisdictions (e.g., Germany, some Scandinavian countries, the United Kingdom) limit the number of public servants sitting on SOEs' boards and/or require a majority of independent directors on boards. In some countries, the candidates are pre-selected according to a formal evaluation (e.g., in France) or subject to the approval of a committee (e.g., in Israel). The criteria commonly relate to candidates' education and professional backgrounds. See OECD (2020a) for the implementation of the guidelines on how to improve transparency, management selection and board composition in the SOEs.

Gender quotas aim at narrowing the pronounced gender gaps that persist in the labour force, particularly at the top of the occupational ladder (Bertrand, 2020).[11] As women represent half of the population, equal access to the decision-making process may be desirable on equity grounds (Fagan et al., 2012). As far as efficiency is concerned, a gender-diverse board of directors may improve the quality of the decision-making process compared with a homogeneous board due to a lower risk of group-think (Anderson et al., 2011; Adams et al., 2015). Moreover, there is the "talent pool" argument: if there are no gender differences in directors' talent or qualifications, but only men are viewed as potential candidates, boards will be of lower quality than if the best men and women were considered. However, there may also be negative effects in terms of efficiency. For example, more diversity within the board may lead to more disagreement and conflict, due to diverging preferences and reluctance to share information. Moreover, external constraints on board composition may lead to sub-optimal choices, especially when the pool of female candidates is limited.

2.2 The Natural Experiment

This paper exploits two reforms occurred in Italy since 2011. First, gender quota for boards of directors was mandated by the Law 120/2011 (also called "Golfo-Mosca Law", after the names of the two legislators that proposed it in Parliament). The law was passed in August 2011 and applied to listed companies and SOEs, initially for three consecutive board renewals since its entry into force. It stipulated the quota on the presence of the "less represented gender" of 20% for the first renewal and of 33% for the second and third renewals.[12] The law came into force for companies listed in the Italian stock exchange starting from August 2012 and for SOEs from February 2013.[13]

---

[11]Several countries mandate gender quotas for the boards of directors of SOEs with the aim of accelerating female empowerment and improving firm governance. In France, since 2014 the Law stipulates that the difference between the number of men and women appointed by public administrations in the boards of the SOEs cannot be greater than one. In Germany, since 2016 each gender shall represent at least 30% on the supervisory boards of largest companies (listed and fully co-determined). In Spain, since 2020 the law mandates the gender quota in the boards of SOEs of 40%. See OECD (2020a) for more detailed information about all OECD countries.

[12]According to the Italian Civil Code (Article 2383), the directors of the joint stock companies (*societá per azioni*) are appointed for a maximum term of three years. Companies of other legal forms are free to fix the office duration in their by-laws.

[13]Companies with sole directors (*amministratore unico*) are exempt from the provisions of the Golfo-Mosca Law. In order to foster female presence in top positions of these companies as well, the Legislative Decree 175/2016 stipulates that each public administration shall respect a gender quota of 33% of all its governance appointments on a yearly basis.

In 2019, the Annual Budget Law (Law 160/2019) extended the application of the gender quotas for three more board renewals and raised the percentage of directors of the "less represented gender" to 40%. The enforcement of the gender quotas in the SOEs is entrusted to the Equal Opportunity Department of the Italian Government, which can issue a warning to the company if the quota is not respected. If the company fails to adjust its board composition, the Government has a mandate to remove some directors so that the renewed board is in compliance with the law.

The second reform, mandated by the Law 190/2012 (also called "Severino Law"), interdicted former politicians and individuals with criminal charges for corruption (even in the first instance) from taking executive positions in SOEs. Regarding former politicians, the law's objective was to impede non-reelected politicians from being appointed to the boards of SOEs (in compensation to the lost seat). However, the Law has a narrow scope of application: it only concerns individuals with former political offices in the past two years and in geographically close administrations.

3   Data and Variables

3.1   Data Sources

We build a unique matched firm-director panel dataset for the universe of limited liability companies in Italy with stock held by public entities at all levels, including the central government, regions, municipalities and other public bodies. We cover the 2008-2018 period, so that we can observe SOEs and PMSEs both in the years before and after the policy reforms targeting the presence of women and politicians on boards of directors.

We identify SOEs and PMSEs combining information from several data sources. We use data from the Ministry of Economy and Finance (MEF), which collects data directly from central and local public administration entities on the companies in which they hold minority or majority stock, and combine them with data from CONSOB (the Italian Companies and Exchange Commission) on the ownership structure of all listed companies, and with *Infocamere*, containing registration data of the universe of Italian firms by the provincial Chambers of Commerce, including information on their stockholders.[14] We only consider companies with shares owned by state entities above 1%,

---

[14]MEF data also contains the list of all public administration units and their fiscal identifiers. We use this list to identify the state entities among the stockholders of companies included in the archives of CONSOB and *Infocamere.*

and we label SOEs (PMSEs) those with publicly-owned share – either directly, or through other companies' stock-holdings – above (below) 50%.

We use information from the *Infocamere* dataset to identify director appointments and their personal characteristics, such as names, surnames, age, gender, place of birth, and social security number. We complement this information with a measure of talent drawn from Baltrunaite et al. (2020). Namely, directors' talent is based on the director fixed effect in a two-way fixed effects model – inspired by the work of Abowd et al. (1999) and Bertrand and Schoar (2003) – representing the individual contribution to the variation of the firms' total factor productivity (TFP). Baltrunaite et al. (2020) also shows that this measure of talent correlates with ex-ante and ex-post (observable) indicators of ability, i.e. managers' educational attainment and their forecast precision with respect to the firm's future performance. We provide details on the construction of this variable in the Appendix.

We obtain administrative data from the registry of local politicians from the Ministry of the Interior that collects information on the identities of Italian local politicians. This dataset contains information on all the 642,722 local politicians appointed at the municipal (8,110 municipalities), provincial (103 provinces) and regional (20 regions) levels between 1985 and 2018. We use name, surname, sex, place and date of birth, to recover politicians' social security numbers. We then use their personal identification codes to identify directors with previous political appointments.

To measure firms' performance, we use data provided by *Cerved Group*. This dataset provides balance sheet information of the universe of the Italian limited liability companies in private non-financial sector. Namely, firm performance is measured with labour productivity (as a proxy for technical efficiency), profitability (gross profits over assets), corporate credit riskiness, and financial leverage. Moreover, for a sub-sample of firms involved in delivering local public services, we measure the quality of these services using the *"Aspetti della vita quotidiana"* ("*Aspects of daily life*") survey conducted yearly by the Italian National Institute of Statistics (*Istat*) in a representative sample of the Italian population. The survey contains questions on individual perceptions and behaviors, including self-reported level of satisfaction with different local services. For con-

---

The combination of various data sources allows to cross-check and overcome the limitations of each source taken separately. For example, some public entities do not communicate their shareholdings to MEF; *Infocamere* has a small but non-negligible fraction of missing values due to administrative reasons; CONSOB collects data only on listed companies.

fidentiality reasons, the information is available only at the aggregate level. We also complement perceptions with more objective indicators of the quality of the output (collected by *Istat*), such as the leakage rate in water distribution, the extent of waste recycling and citizens' revealed preferences in the use of public transportation.

3.2 Descriptive Statistics

The sample of limited liability companies with at least 1% share of their stock held by public entities consists of around 6,597 observations, while the information on their balance sheets is available for roughly 6,000 firms. The sample is well-balanced in terms of size of the two groups: there are 3,473 SOEs and 3,124 PMSEs.

Table 1 shows descriptive statistics in terms of the most relevant variables for SOEs and PMSEs, and tests for the presence of statistical differences between the two groups in 2011, the last year before the approval of the reforms.[15] While the geographic distribution is similar, the sectoral composition is slightly different. In particular, the SOEs are more often present in water and waste management, transportation services, and administrative activities. Moreover, SOEs appear to be older, more profitable and less productive than the control group. Most importantly, the two groups are virtually identical when it comes to the female presence on their boards of directors, with merely 10% of female members on their boards in 2011. The share of (former) politicians instead stands at 32% in SOEs, substantially higher – as expected – than the corresponding figure of 19% in PMSEs.

4 Emprical Strategy

Our goal is to estimate the effects of the reform-induced change on board composition and firm performance. Our empirical strategy compares the change in outcomes from pre-reform to post-reform period in SOEs to the change in PMSEs. Formally, we estimate the following OLS difference-in-differences regressions:

$$y_{it} = \beta SOE_i \times Post_t + \alpha_i + \alpha_{r(i)t} + \alpha_{z(i)t} + \varepsilon_{irzt} \tag{1}$$

---

[15]As explained in Section 4, differences in levels between the two groups are not critical for the purpose of causal identification of the reform's effects.

Table 1: Descriptive statistics

	PMSE	SOE	Diff. (1)-(2)	SD	N
Share Women	0.10	0.10	-0.005	0.005	6597
Share Old	0.14	0.15	-0.009	0.006	6597
Share Politicians	0.19	0.32	-0.124***	0.007	6597
Number of Directors	4.90	3.93	0.967***	0.073	6597
Share Sole Director	0.14	0.22	-0.078***	0.010	6597
Southern Italy	0.19	0.19	-0.005	0.010	6597
Electricity & gas	0.13	0.11	0.017**	0.008	6597
Water, waste	0.06	0.14	-0.080***	0.007	6597
Transportation & storage	0.10	0.14	-0.038***	0.008	6597
Professional business service	0.27	0.16	0.107***	0.010	6597
Administrative & support activities	0.04	0.08	-0.048***	0.006	6597
Age Firm	11.54	12.49	-0.950***	0.329	6597
Productivity	5.15	4.99	0.159***	0.043	4189
Profitability	-0.05	-0.03	-0.020***	0.005	5958
Score	5.12	4.80	0.317***	0.044	5775
Financial Leverage	0.70	0.71	-0.011	0.008	6533
Talent 1,000	513.33	504.97	8.358	5.557	3181
Number of firms	3124	3473			

Notes: * denotes significance at 10%, ** significance at 5% and *** significance at 1%. Column 1 and Column 2 report the averages for public minority share enterprises and for state-owned enterprises, respectively in 2012. Column 3 and Column 4 report the mean difference between the two groups and its standard deviation, respectively. Column 5 shows the number of observations for each variable.

where the dependent variable, y_{it}, denotes an outcome variable of firm i located in region r, operating in industry z in year t (e.g., the share of female directors, the share of politicians, indicators of firm performance, or the quality of public services); SOE_i, is an indicator for state-owned enterprises, based on the share of state ownership in the year prior to the reform as discussed in Section 3. $Post_t$ is an indicator that is equal to one for all years after 2011.[16] We note that the regression specification includes both main effects SOE_i and $Post_t$, and their interaction term.

Our baseline empirical model allows us to address a variety of concerns regarding our ability to identify the causal effect of interest. The firm fixed effect, α_i, absorbs time-invariant characteristics

---

[16]Although the reforms came into force for SOEs in 2013, we consider that firms in our sample are affected starting from 2012 onwards, as some of SOEs are stock-listed and were directly subject to the gender quota already in 2012. Moreover, this allows to maintain all the pre-reform years clean from any potential anticipatory or announcement effects of the law and capture them by the dynamically estimated treatment effects.

which are constant within a firm over time. Yet, one might still be concerned about time-varying factors that affect firms situated in different locations or operating in different industries. Therefore, we include year-by-region and year-by-industry fixed effects to control for time-varying shocks that possibly affect different Italian regions and industries, respectively. To account for potential correlation of standard errors within firms, we cluster standard errors at the firm level.

The identifying assumption is that, in absence of the reforms, SOEs and PMSEs would have experienced the same evolution over time in the outcome variable. In order to (indirectly) test our identifying assumption, we fully exploit the granularity of our data using a dynamic difference-in-differences model, as follows:

$$y_{it} = \sum_{t=2008}^{2010} \gamma_t SOE_i + \sum_{t=2012}^{2018} \beta_t SOE_i + \alpha_i + \alpha_{r(i)t} + \alpha_{z(i)t} + \varepsilon_{irzt} \tag{2}$$

where the omitted (reference) category is 2011, the last year prior to the approval of the reforms. The γ_t's measure whether levels of the outcome variable predict the treatment. In other words, they test for the presence of differences in the development of the dependent variable between the two groups prior to the adoption of the reform. Small and statistically insignificant coefficient estimates would provide support to our empirical approach. The β_k coefficients instead estimate the response of outcome y_{it}, k years after the reform is implemented and illustrate not only the average effect of the reform, but also its timing.

5   Results

This section presents the results of our empirical analysis. We first estimate the effect of the two nearly contemporaneous reforms on women's and politicians' presence on boards of directors of SOEs. We then investigate the effect of such natural experiment on (i) board selection in terms of other directors' characteristics, (ii) firms' financial performance and productivity, and (iii) the quality of the SOEs output, which we measure with citizens' satisfaction and efficiency indicators of local public services.

5.1 The Direct Effects on Board composition

In Table 2 we report the results of estimating equation 1. The dependent variable in columns 1-4 (5-8) is the share of female directors (the share of politicians). Column 1 (5) presents the most parsimonious regression specification that includes year fixed effects and firm fixed effects, and the interaction between *SOE* and *Post*. In column 2 (6) the specification includes region-by-year and industry-by-year fixed effects, while column 3 (7) includes size-by-year (where firm size is a categorical variable for size quartiles in terms of revenues registered in a firm's first year in the sample). These fixed effects, as discussed in Section 4, control for non-parametric time-varying shocks that correlate with female presence on corporate boards and hit firms in different Italian regions, different industries, and different size quartiles, respectively. Column 4 (8) replicates the specification in column 1 for the sample of enterprises with state stock ownership between 10% and 90%. In other words, we exclude from the analysis firms with small state participation and firms completely owned by the public sector in order to obtain a set of companies with an even more comparable ownership structure.

The coefficient of interest on *SOE* × *Post* interaction term is positive and statistically significant in columns 1-4, indicating that the policy experiment was successful in increasing the female presence on the boards of directors of SOEs. The point estimate is rather stable across different regression specifications and indicates an average increase in the share of women on corporate boards of 4 percentage points in our preferred specification (column 2). This corresponds to a roughly 40% increase from the pre-reform mean. Similarly, the coefficient of interest is statistically significant in columns 5-8 and indicates a negative effect on the presence of politicians, amounting to a reduction of about 2 percentage points in the preferred specification. The effect corresponds to roughly 8% decrease with respect to the pre-reform mean.

In order to shed light on the timing of the effects, Figure 2 plots yearly coefficients and corresponding 90% and 95% confidence intervals from the dynamic differences-in-differences specification (equation 2). For both outcomes of interest, the effect is increasing over time and stabilizes towards the end of the period. The increasing pattern is consistent with the fact that board renewals are staggered. The stabilisation resonates with the fact that towards the end of the period, the majority of the firms should have implemented their second renewal, providing sufficient time to adjust their composition with the legal requirements banning the nomination of former politicians

Table 2: Board composition: gender and political background

	Share Women				Share Politicians			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SOE × Post	0.0376***	0.0388***	0.0348***	0.0412***	-0.0260***	-0.0211***	-0.0212***	-0.0164**
	(0.00414)	(0.00434)	(0.00511)	(0.00518)	(0.00516)	(0.00555)	(0.00638)	(0.00641)
R^2	0.631	0.641	0.639	0.673	0.730	0.736	0.713	0.784
N	61146	61146	48313	30082	61146	61146	48313	30082
Firms	7467	7467	5701	3356	7467	7467	5701	3356
Year FE	✓			✓	✓			✓
Firm FE	✓	✓	✓	✓	✓	✓	✓	✓
Industry-year FE		✓	✓			✓	✓	
Region-year FE		✓	✓			✓	✓	
Size-year FE			✓				✓	
90-10 sample				✓				✓
Mean	0.101				0.257			
SD	0.193				0.307			

Notes: * denotes significance at 10%, ** significance at 5% and *** significance at 1%. Columns 4 and 8 restrict the sample to firms where public entities own between 10% and 90% of the shares. Mean and standard deviation refer to the year 2011. Standard errors are clustered at the firm unit level.

and imposing a 33% gender quota obligation.

Figure 2: Board composition: gender and political background
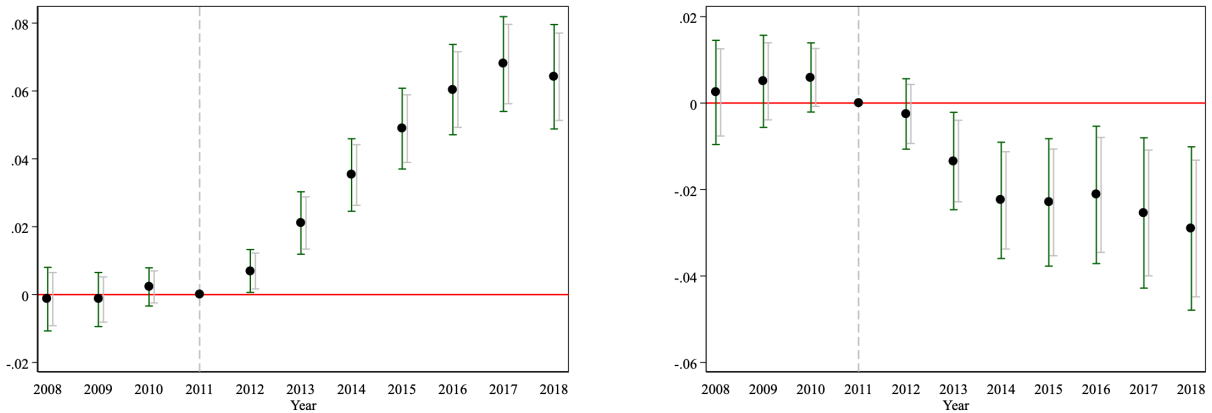
Notes: This Figure plots yearly coefficients and corresponding 90% (in grey) and 95% (in green) confidence intervals from equation 2. The dependent variable is the share of female directors (left-hand-side panel) and the share of politicians (right-hand-side panel).

The pattern shown in Figure 2 also provides support for the identifying assumption underlying our analysis. The evolution of the outcome variables in PMSEs provides a good counterfactual for that in SOEs, had the reforms not happened. Specifically, the zero lead coefficients in the years

prior to the policy changes analysed show that the two groups followed the same time pattern in the four years before the adoption of these reforms. In addition, conditional on covariates, the two groups were also identical in levels: the share of female directors or the share of politicians were similar in the two groups of firms in the period 2008-2011. Overall, the data strongly indicate that the parallel trends assumption is satisfied in our difference-in-differences analysis, lending our findings a causal interpretation.

Our reduced form estimates measure the intention-to-treat effect. Yet, the actual female empowerment falls short of the target of the Golfo-Mosca Law amounting to one third of female board members, possibly because of strategic behavior by public entities. First, as discussed in Section 2, enterprises with a sole director are exempt from the gender quota application directly (for them, the 33% quota applies to all governance positions at the public administration level starting from the year 2016). Interestingly, the data indicate that the share of SOEs with a sole director rose from 23% in 2011 to 38% in 2018, while the change was more attenuated for the control group enterprises (going from 18% to 22%). However, even considering SOEs with multi-member board of directors, even in 2018 one out of four does not have the prescribed share of female directors.[17]

Finally, on top of strategic adjustments to the reform, there is evidence that female directors joining the boards did not gain access to pivotal roles. For example, in 2016 only 2% of female directors appointed by public entities have executive powers, while the corresponding figure for male directors is 8% (Mocetti and Roma, 2020).[18]

The impact of the Severino Law was more limited, in line with the narrower scope of the reform. In fact, the ban concerned individuals with former political offices in the past two years and in geographically close administrations who represent a minority share of the population of politicians observed in our sample. Politicians, however, are more likely to occupy pivotal roles in the SOEs' boards relative to women: in 2016, 5% of politician directors appointed by public entities have executive powers.

---

[17]Non-compliers are more likely to be located in Southern Italy and to operate in administrative activities.

[18]To the best of our knowledge, more comprehensive or panel data on executive positions on boards of directors is not systematically gathered.

5.2 The Effects on Other Directors' Characteristics

A rise in the share of female directors or the decline in the share of politicians due to the reforms analysed may result in changes in other director characteristics. Inclusion of more women may bring about age recomposition on boards of directors (World Economic Forum, 2020). A similar effect may be expected if typically older politicians on corporate boards are replaced by younger directors without past political background. To investigate this, we estimate regression 1 using the share of directors aged over 65 as dependent variable. The results in Table 3, columns 1-3, show that the presence of older (and typically male) board members goes down.[19] In our preferred specification (Column 2) we estimate a decrease of nearly 2 percentage points in the share of elder directors. The left-hand-side panel of Figure 3, plots the coefficients from the dynamic difference-in-difference specification. Similar to the analysis on the presence of women and of politicians on corporate boards, the effect occurs gradually. Moreover, there is no evidence of diverging pre-trends in the presence of the elderly board members.[20]

Besides (likely mechanical) demographic changes, we attempt to understand whether the shakeup of corporate boards leads to changes in the quality of directors. As their ability is unobservable and there are no data on directors' education in Italy, we rely on a measure of directors' talent based on their contribution to boosting firms' total factor productivity (as described in the Appendix in more detail). Table 3, columns 4-6, show regression specifications analogous to the ones on directors' age. The point estimates indicate that the board talent increases, on average, due to the policy changes restricting board appointments to individuals with past political office. The coefficient in column 5 indicates that, on average, the talent of directors in SOEs increases by almost 5% of the sample mean after the reform. The dynamic difference-in-differences plot for the average talent of directors, shown in the right-hand-side panel of Figure 3, depicts a pattern similar to the evidence shown for gender or age composition or the presence of politicians on corporate boards. After 2011, average director talent gradually increases in affected companies.

---

[19]Female board members are, on average, 5 years younger in our sample; board members with political experience are, on average, 2 years older.

[20]The decrease in elder members and the ensuing rejuvenation of the board is in line with the effect of gender quotas on directors of listed companies (Ferrari et al., 2018) and on politicians of Italian municipalities (Baltrunaite et al., 2014).

Table 3: Board Characteristics

	Share Old			Talent 1,000		
	(1)	(2)	(3)	(4)	(5)	(6)
SOE × Post	-0.0179***	-0.0182***	-0.0142**	27.93***	23.60***	21.05***
	(0.00513)	(0.00546)	(0.00636)	(4.267)	(4.633)	(5.570)
R^2	0.582	0.592	0.621	0.696	0.710	0.706
N	61146	61146	30082	31221	31221	14752
Firms	7467	7467	3356	4053	4053	1861
Year FE	✓		✓	✓		✓
Firm FE	✓	✓	✓	✓	✓	✓
Industry-year FE		✓			✓	
Region-year FE		✓			✓	
90-10 sample			✓			✓
Mean	0.146			508.4		
SD	0.230			154.3		

Notes: * denotes significance at 10%, ** significance at 5% and *** significance at 1%. The dependent variable in Columns 1-3 is the share of directors of age above 65; while in Columns 4-6 it is the permille rank of managerial talent indicator. Mean and standard deviation refer to the year 2011. Standard errors are clustered at the firm unit level.

Figure 3: Board Characteristics
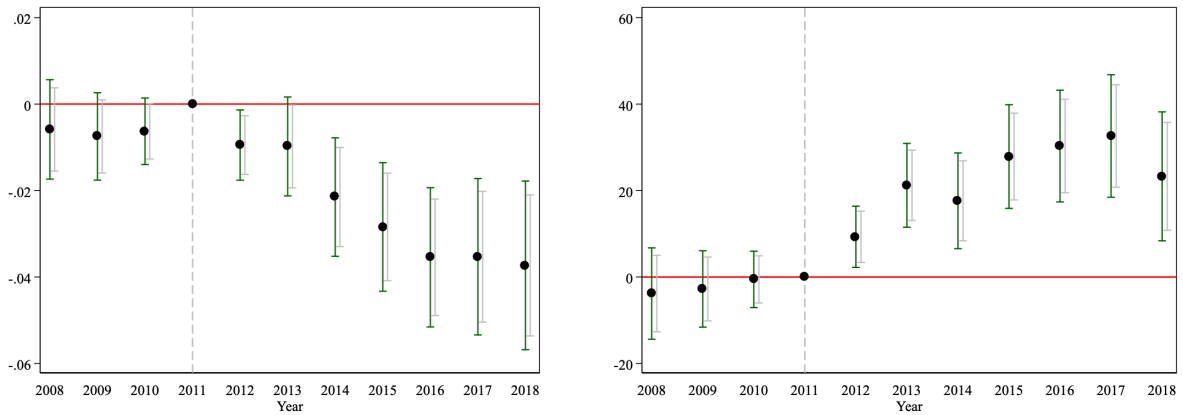
Notes: This Figure plots yearly coefficients and corresponding 90% (in grey) and 95% (in green) confidence intervals from equation 2. The dependent variable on the left-hand-side panel is the share of directors older than 65, and on the right-hand-side panel is the measure of directors' talent in per-miles.

To shed light on the anatomy of board selection, we investigate which movements in board appointments (e.g., due to incoming or outgoing directors) are the main drivers of talent changes within the board. In particular, we adapt Foster et al. (2001) decomposition, used for productivity growth accounting, to talent growth for the two groups of enterprises. Namely, talent growth

between t and $t+1$ can be decomposed as follows:

$$\Delta\Theta = \Theta_{t+1} - \Theta_t =$$

$$\omega_t^{men\_out}(\Theta_t^{men\_out} - \Theta_t) + \omega_{t+1}^{men\_in}(\Theta_{t+1}^{men\_in} - \Theta_t) +$$

$$\omega_t^{women\_out}(\Theta_t^{women\_out} - \Theta_t) + \omega_{t+1}^{women\_in}(\Theta_{t+1}^{women\_in} - \Theta_t) +$$

$$(\omega_{t+1}^{stayers} - \omega_t^{stayers}) \times (\Theta_t^{stayers} - \Theta_t)$$

where Θ_t^s is the average talent of subgroup s – e.g., male or female directors entering, exiting or staying in the board – at time t and ω_t^s is their corresponding weight within the board. The overall talent variation $\Delta\Theta$ can be expressed as a weighted sum of the contribution of male directors exiting or entering the board (first row), female directors exiting or entering the board (second row), and the reallocation term capturing talent variation that is due to a change in the shares of the stayers (third row). The same decomposition can be applied partitioning the population in different subgroups, i.e. politician and non-politicians or the intersection between gender and the politician indicator. Concerning the mechanics of the decomposition, the entry of new directors at time $t+1$ contributes positively (negatively) to the aggregate talent variation if their average talent is greater (lower) than the overall average talent at time t.[21]

Figure 4 provides graphical evidence of the decomposition of talent variation for SOEs and PMSEs, before and after the Golfo-Mosca reform. The height of the bar represent the extent of the variation of board talent and the different colors refer to the contribution of each item considered. In the interest of clarity, we distinguish directors by gender on the left-hand-side panel and by politician status in the right-hand-side one. Consistently with the previous findings, talent variation was comparable in SOEs and PMSEs in the pre-treatment period, while it differs significantly in the post-treatment period: SOEs show a more pronounced improvement of average board talent.

The figure also visually highlights the most important channels leading to positive talent selection on SOEs' boards. As far as the gender dimension is concerned, consistent with the decline

---

[21]See Melitz and Polanec (2015) for a review and an extension of productivity decomposition methods. It is also worth noting that our case is simpler with respect to those applied to firms and aggregate productivity changes. First, our measure of director talent is time invariant while firm productivity might well vary over time. Second, the decomposition *a la* Olley and Pakes, based on moments of the joint distribution of market shares and productivity, are not replicable in our case because each director enters with a weight equal to 1 in the calculation of the overall talent, while the firms affect aggregate productivity to a different extent, depending on their size and market share.

of the "mediocre men" (Besley et al., 2017), gender quota provisions induce a more competitive market for male board members' selection. In fact, more talented male directors enter boards, while low ability men step down. Moreover, a significant contribution due to the entry of more talented women is consistent with the "glass-ceiling" hypothesis (Bertrand, 2018): the quota requirement reduces hurdles for talented female candidates to access board appointments. Moving to the political dimensions, the largest contribution to the talent growth in SOEs is attributable to a positive selection of new directors among non-politicians (whose share and average talent both increase). However, there is evidence of a positive substitution effect in the selection process within the subgroup of politicians.

Figure 4: Contributions to talent growth
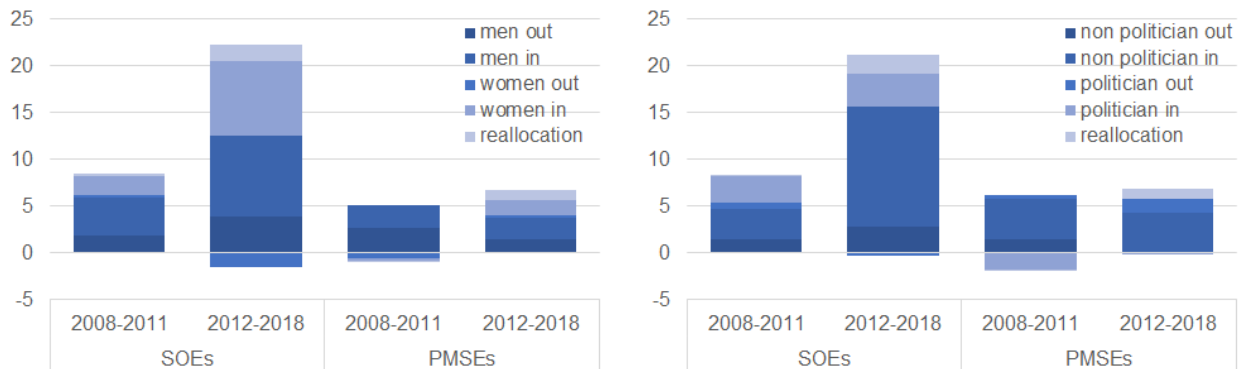
Notes: This Figure represents the contributions to the change in directors' talent in the pre-reform and the post-reform periods, for SOEs and PMSEs. We distinguish directors by gender (left-hand-side panel) and politician status (right-hand-side panel).

5.3 Effects on Firms' Performance

We contribute to the debate on the effects of board composition on firms' performance by studying firm's productivity and financial indicators. We follow the same structure of the presentation of the results as in the previous sub-sections, estimating the regression equation 1 to quantify the impact of the reform and the regression equation 2 to assess its timing and causal validity. As indicated by small and statistically not significant regression coefficients in Table 4, columns 1-2, labour productivity of SOEs did not evolve in a differential manner following the implementation of the reforms compared to PMSEs that were not subject to them. Figure 5 clearly illustrates the null

effect, as the two groups of companies do not exhibit differences in their labour productivity nor before, neither after 2011.[22]

Table 4, columns 3-4 show the results on firm credit risk score – negative and statistically significant coefficients indicate that firms subject to governance-improving reform reduce their riskiness. Although the exact algorithm used to construct this score is not known to us, we inspect the effects on two other variables that likely are considered by the agency attributing credit scores: firm profitability (columns 5 and 6) and its leverage (columns 7 and 8). According to the more demanding specification, profitability increases by 1%, while leverage decreases by around 1 percentage point.

Table 4: Firm Performance

	Productivity		Score		Profitability		Leverage	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SOE $\times$ Post	-0.0111	-0.0253	-0.139***	-0.0741**	0.0130***	0.0108***	-0.0190***	-0.00944*
	(0.0191)	(0.0209)	(0.0312)	(0.0328)	(0.00344)	(0.00342)	(0.00525)	(0.00557)
R^2	0.872	0.879	0.675	0.690	0.465	0.482	0.742	0.751
N	40866	40866	55330	55330	55268	55268	60496	60496
Firms	5166	5166	6940	6940	7117	7117	7411	7411
Year FE	✓		✓		✓		✓	
Firm FE	✓	✓	✓	✓	✓	✓	✓	✓
Industry-year FE		✓		✓		✓		✓
Region-year FE		✓		✓		✓		✓
Mean	5.062		4.943		-0.0422		0.704	
SD	1.360		1.690		0.194		0.332	

Notes: * denotes significance at 10%, ** significance at 5% and *** significance at 1%. The dependent variable in Columns 1-2 is firm's labour productivity, defined as revenues over number of workers (in log), in Columns 3-4 – credit riskiness score, in Columns 5-6 – firm profitability, which is a dummy equal to one if the firm has positive profits and zero otherwise, and in Columns 7-8 - its leverage, defined as the difference of total revenues and net worth divided by total revenues. Mean and standard deviation refer to the year 2011. Standard errors are clustered at the firm unit level.

5.4   Effects on Quality of Public Services

While productivity and profit maximization are widely regarded as the appropriate goal for privately-held firms, economic performance is only one of several goals for SOEs, and not necessarily the most important one (Aharoni, 1981).[23] For example, a significant fraction of SOEs operate in local

---

[22]Backed with Matsa and Miller (2013) findings for Norway that firms affected by gender quotas undertake fewer workforce reductions, one may explain this finding by the lower willingness to shed labour in companies with a more gender-balanced governance.

[23]See, e.g., Curci et al. (2017) for the assessment of Italian local public enterprises' performance relative to the private sector firms.

Figure 5: Firm Performance
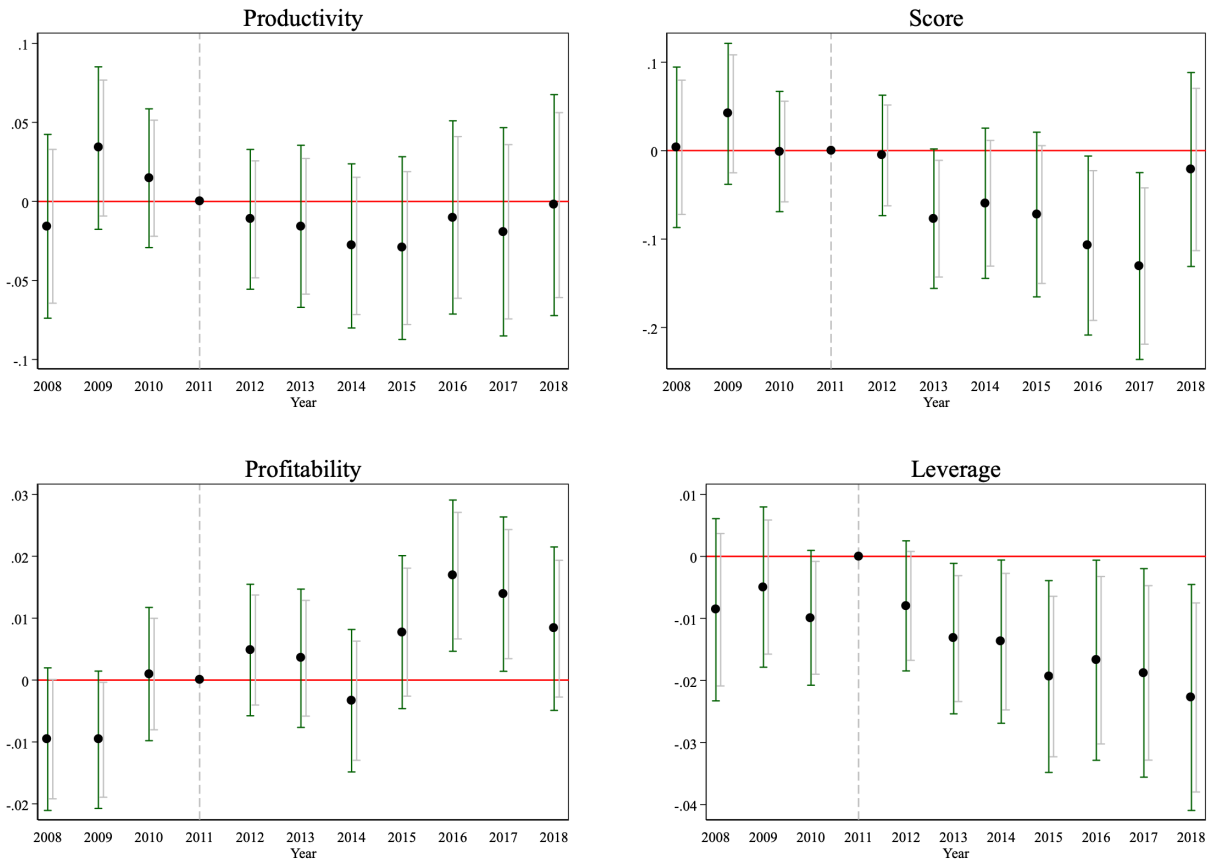
Notes: This Figures plot yearly coefficients and corresponding 90% (in grey) and 95% (in green) confidence intervals from equation 2. The dependent variable on the top-left panel is firm's labour productivity, defined as revenues over number of workers (in log), on the top-right is the credit riskiness score, on the bottom-left is firm profitability, which is a dummy equal to one if the firm has positive profits and zero otherwise, and on the bottom right is leverage, defined as the difference of total revenues and net worth divided by total revenues.

public services where the quality and the efficiency of the services provided are the key parameters to evaluate their performance, as they reflect the firm's capacity to pursue their primary – social – goal.

While profitability and productivity are available from balance sheet data, measuring the quality of the services provided by SOEs is more challenging. In order to measure the effect of board composition on this other dimension of performance, we exploit survey data capturing citizens' satisfaction with the quality of local public services, namely, public transportation, waste management, and energy, gas, and water distribution. Information for each type of services is available at the regional level and therefore we identify 100 different region-type of service cells.[24] For each

---

[24]Specifically, the data report, for each region and type of services, the fraction of households that are sufficiently

cell, we consider two different measures of satisfaction: the average satisfaction over all items and the first principal component explaining most of the variance of the underlying items.[25] We also complement perception indexes with observable (and more objective) indicators of the quality of local public services. Namely, we have information at the same level of aggregation on the leakage rate in water distribution, the extent of recycled waste collection and the use of local public transportation (which we interpret as the quality indicator based on the constituents' revealed preferences). To facilitate comparability and interpretation of the results, we standardize all these satisfaction measures.

Since the quality measures are available only at a more aggregate level, in this part of the analysis we also measure our treatment variable at the aggregate level. Specifically, we use the treatment intensity defined as the pre-reform fraction of SOEs over the total number of firms involved in provision of these services at the regional level. The intensity of the treatment is weighted by the number of employees of the companies to take into account that a larger company influences to a greater extent the measure of the quality of the services provided. Moreover, we exclude SOEs owned by the central administration because they generally provide services at the national level.[26] We then run regressions specifications, as follows:

$$y_{rst} = \sum_{t=2008}^{2010} \gamma_t SOEshare_{rst} + \sum_{t=2012}^{2018} \beta_t SOEshare_{rst} + \alpha_{rs} + \gamma_t + \varepsilon_{rst} \tag{3}$$

Table 5 reports the results from regression as in 2. We use different indicators for the quality of the services provided as the dependent variables and two main specifications, with the second one saturating the model with region-year fixed effects to capture any potential unobserved local shocks affecting our variables of interest. The coefficient of interest is rather stable across different specifications. According to our preferred specifications (column 4 for the perception-based indicators and column 6 for the indicators based on hard data), moving from region-sector cell at the 25th percentile of the distribution of SOEs' share to one at the 75th percentile corresponds to

---

or very much satisfied with specific items (e.g., the frequency and punctuality of bus services, the transparency of the tariffs, the time respondents waited to be served, etc.).

[25]Using averages provides a simple and transparent measure of satisfaction. However, this approach implicitly assumes that each item enters with the same weight and therefore that they bear equal importance. The principal component analysis relaxes this assumption and has the advantage of using a different weight structure that is not imposed *ex-ante* by the researcher, but instead is aimed at extracting the first principal component that explains the majority of the variance of the underlying variables.

[26]The results are qualitatively robust to perturbation of these choices in the computation of the treatment intensity.

an increase of around one fifth of the standard deviation of the quality of services. Therefore, the impact is not only statistically significant, but also substantial from a quantitative point of view.

Table 5: Quality of the Local Public Services

| Dependent variable: | Citizens' satisfaction | | | | Objective measures | |
| | Average | | PCA | | | |
	(1)	(2)	(3)	(4)	(5)	(6)
SOE share × Post	0.128***	0.177***	0.167**	0.276***	0.227**	0.277***
	(0.036)	(0.037)	(0.068)	(0.069)	(0.101)	(0.135)
Region-sector FEs	✓	✓	✓	✓	✓	✓
Year FEs	✓		✓		✓	
Region-Year FEs		✓		✓		✓
Observations	1,316	1,316	1,316	1,316	636	636

Notes: The dependent variable refers to simple average of perceived satisfaction on various items in columns (1) and (2), the first principal component of perceived satisfaction on various items in columns (3) and (4) and objective indicators on quality of the public services in columns (5) and (6). Standards errors clustered at the region-sector level in parentheses. $^{***}p < 0.01$ $^{**}p < 0.05$, $^{*}p < 0.1$.

Figure 6 shows the results from the dynamic difference-in-differences estimation. While there are no important differences in citizens' satisfaction over the quality or quantity of local public services in regions and sectors with a higher market presence of SOEs before the adoption of the reforms, it increases with respect to the control group in the following period. Although the year-by-year coefficients for the objective indicators are never statistically significant (right-hand-side panel), the point estimates clearly exhibit a divergent pattern after the implementation of the two reforms (the large confidence interval likely reflects the small number of observations, since objective indicators are available only for a subset of local public services).

6 Conclusions

This paper studies the impact of board composition on corporate performance using two almost contemporaneous reforms as a source of exogenous variation. Differently from existing studies, mostly analyzing large companies owned within the private sector, we focus on state-owned enterprises. Their scope of operations often extends to settings not disciplined by market forces, raising

Figure 6: Quality of local public services
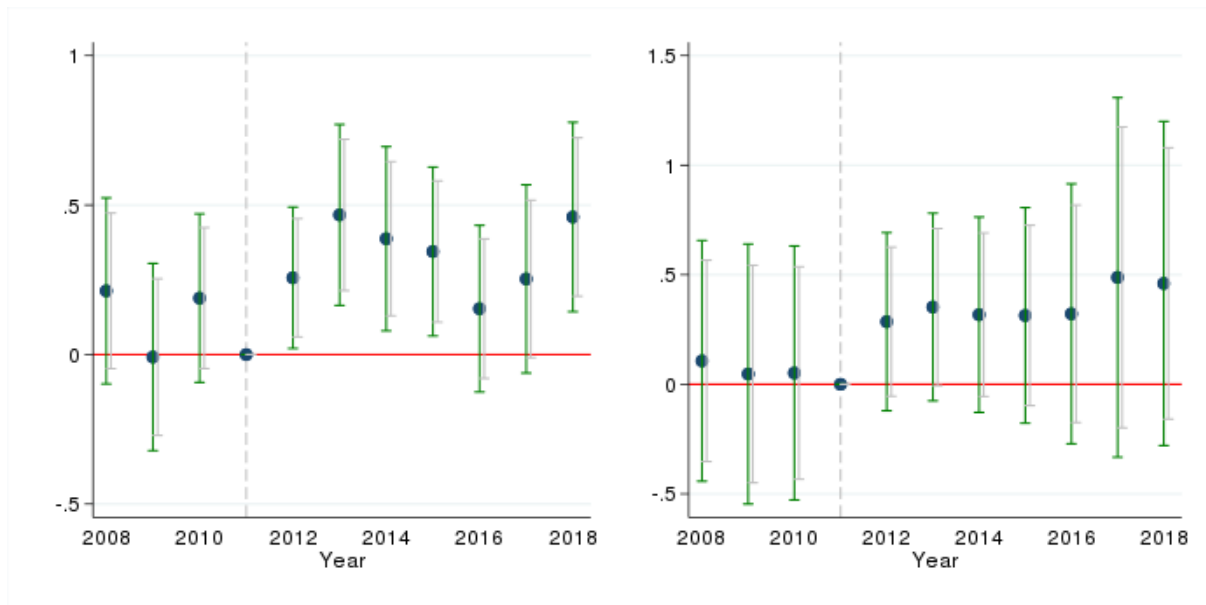
Notes: This Figure plots yearly coefficients and corresponding 90% (in grey) and 95% (in green) confidence intervals from equation 2. The dependent variable on the left-hand-side panel is the share of citizens' satisfied with the provision of local public services, and on the right-hand-side panel is the objective measure on the quality of local public services.

serious concerns on the the quality of their governance and on the mechanisms driving board selection.

To identify the effects of the reforms that aimed at improving gender balance on corporate boards and reducing their reliance on former politicians, we perform a dynamic difference-in-differences estimation. We exploit the fact that the policy changes were binding only for firms with a majority share of stock held by public entities, while firms with minority stock held by public entities were exempt from these provisions.

After quantifying the effects of this natural experiment in raising female representation and diminishing the presence of former politicians on corporate boards of treated firms, we study its effects on board selection and firms' performance. According to our findings, gender quotas and legal limits to the revolving-door phenomenon contributed to rejuvenating corporate boards and improving their quality. While we detect no changes on firm productive efficiency, there is evidence that firm profitability and other financial indicators improve. Importantly, we also find that the output quality of SOEs involved in the provision of local public services increases.

Our findings contribute to debate on the impact of board composition on firm performance, showing favorable effects of reforms aimed at increasing gender diversity and at insulating SOEs

governance from political influence. In particular, we show that these policy measures are able to remove preexisting sub-optimal board appointments. Although the usual caveats regarding the external validity of the study apply, our findings may inform policymakers on the expected effects of this type of regulatory interventions, particularly important given the absence of empirical evidence on the topic in the existing literature.

References

ABOWD, J. M., F. KRAMARZ, AND D. N. MARGOLIS (1999): "High Wage Workers and High Wage Firms," *Econometrica*, 67, 251–333.

ACKERBERG, D. A., K. CAVES, AND G. FRAZER (2015): "Identification Properties of Recent Production Function Estimators," *Econometrica*, 83, 2411–2451.

ADAMS, R. B., J. DE HAAN, S. TERJESEN, AND H. VAN EES (2015): "Board Diversity: Moving the Field Forward," *Corporate Governance: An International Review*, 23, 77–82.

ADAMS, R. B. AND P. FUNK (2012): "Beyond the Glass Ceiling: Does Gender Matter?" *Management Science*, 58, 219–235.

ADAMS, R. B., B. E. HERMALIN, AND M. S. WEISBACH (2010): "The Role of Boards of Directors in Corporate Governance: A Conceptual Framework and Survey," *Journal of economic literature*, 48, 58–107.

AHARONI, Y. (1981): "Performance Evaluation of State-Owned Enterprises: A Process Perspective," *Management Science*, 27, 1340–1347.

AHERN, K. R. AND A. K. DITTMAR (2012): " The Changing of the Boards: The Impact on Firm Valuation of Mandated Female Board Representation," *Quarterly Journal of Economics*, 127, 137–197.

ALCHIAN, A. A. AND H. DEMSETZ (1972): "Production, Information Costs, and Economic Organization," *American Economic Review*, 62, 777–795.

ANDERSON, R. C., D. M. REEB, A. UPADHYAY, AND W. ZHAO (2011): "The Economics of Director Heterogeneity," *Financial Management*, 40, 5–38.

BALTRUNAITE, A., P. BELLO, A. CASARICO, AND P. PROFETA (2014): "Gender Quotas and the Quality of Politicians," *Journal of Public Economics*, 118, 62 – 74.

BALTRUNAITE, A., G. BOVINI, AND S. MOCETTI (2020): "Managerial Talent and Managerial Practices: Are They Complements?" *mimeo*.

BAYSINGER, B. D. AND H. N. BUTLER (1985): "Corporate Governance and the Board of Directors: Performance Effects of Changes in Board Composition," *Journal of Law, Economics and Organization*, 1, 101–124.

BERNIER, L., M. FLORIO, AND P. BANCE (2020): *The Routledge Handbook of State-Owned Enterprises*, Routledge.

BERNILE, G., V. BHAGWAT, AND S. YONKER (2018): "Board Diversity, Firm Risk, and Corporate Policies," *Journal of Financial Economics*, 127, 588 – 612.

BERTRAND, M. (2018): "Coase Lecture – The Glass Ceiling," *Economica*, 85, 205–231.

——— (2020): "Gender in the Twenty-First Century," *AEA Papers and Proceedings*, 110, 1–24.

BERTRAND, M., S. E. BLACK, S. JENSEN, AND A. LLERAS-MUNEY (2018): "Breaking the Glass Ceiling? The Effect of Board Quotas on Female Labour Market Outcomes in Norway," *Review of Economic Studies*, 86, 191–239.

BERTRAND, M. AND A. SCHOAR (2003): "Managing with Style: The Effect of Managers on Firm Policies," *Quarterly Journal of Economics*, 118, 1169–1208.

BESLEY, T., O. FOLKE, T. PERSSON, AND J. RICKNE (2017): "Gender Quotas and the Crisis of the Mediocre Man: Theory and Evidence from Sweden," *American Economic Review*, 107, 2204–2242.

BLOOM, N., E. BRYNJOLFSSON, L. FOSTER, R. JARMIN, M. PATNAIK, I. SAPORTA-EKSTEN, AND J. VAN REENEN (2019): "What Drives Differences in Management Practices?" *American Economic Review*, 109, 1648–83.

BROLLO, F. AND U. TROIANO (2016): "What Happens when a Woman Wins an Election? Evidence from Close Races in Brazil," *Journal of Development Economics*, 122, 28–45.

BYRON, K. AND C. POST (2016): "Women on Boards of Directors and Corporate Social Performance: A Meta-Analysis," *Corporate Governance: An International Review*, 24, 428–442.

CHATTOPADHYAY, R. AND E. DUFLO (2004): "Women as Policy Makers: Evidence from a Randomized Policy Experiment in India," *Econometrica*, 72, 1409–1443.

CLOTS-FIGUERAS, I. (2011): "Women in Politics: Evidence from the Indian States," *Journal of Public Economics*, 95, 664–690.

COATE, S. AND G. LOURY (1993): "Antidiscrimination Enforcement and the Problem of Patronization," *American Economic Review*, 83, 92–98.

COMI, S., M. GRASSENI, F. ORIGO, AND L. PAGANI (2020): "Where Women Make a Difference: Gender Quotas and Firms' Performance in Three European Countries," *ILR Review*, 73, 768–793.

CUBERES, D. AND M. TEIGNIER (2016): "Aggregate Effects of Gender Gaps in the Labor Market: A Quantitative Estimate," *Journal of Human Capital*, 10, 1–32.

CURCI, N., D. DEPALO, AND E. VADALÀ (2017): "Municipal socialism or municipal capitalism? The performance of local public enterprises in Italy," *Bank of Italy Occasional Paper No. 408*.

DAISER, P., T. YSA, AND D. SCHMITT (2017): "Corporate Governance of State-Owned Enterprises: A Systematic Analysis of Empirical Literature," *International Journal of Public Sector Management*, 30, 447–466.

DEL PRETE, S., G. PAPINI, AND M. TONELLO (2020): "Gender Quotas, Board Diversity and Spillover Effects. Evidence from Italian Banks," *mimeo*.

DEMSETZ, H. AND K. LEHN (1985): "The Structure of Corporate Ownership: Causes and Consequences," *Journal of Political Economy*, 93, 1155–1177.

FAGAN, C., M. G. MENÈNDEZ, AND S. G. ANSÓN (2012): *Women on Corporate Boards and in Top Management: European Trends and Policy*, Springer.

FERRARI, G., V. FERRARO, P. PROFETA, AND C. PRONZATO (2018): "Do Board Gender Quotas Matter? Selection, Performance and Stock Market Effect," *IZA Discussion paper No. 11462*.

FOSTER, L., J. HALTIWANGER, AND C. KRIZAN (2001): "Aggregate Productivity Growth: Lessons from Microeconomic Evidence," in *New Developments in Productivity Analysis*, National Bureau of Economic Research, Inc., 303–372.

GIROUD, X. AND H. MUELLER (2010): "Does Corporate Governance Matter in Competitive Industries?" *Journal of Financial Economics*, 95, 312–331.

GIULIANO, P. AND A. SPILIMBERGO (2014): "Growing up in a Recession," *Review of Economic Studies*, 81, 787–817.

GROSSI, G., U. PAPENFUSS, AND M.-S. TREMBLAY (2015): "Corporate Governance and Accountability of State-Owned Enterprises: Relevance for Science and Society and Interdisciplinary Research Perspectives," *International Journal of Public Sector Management*, 28, 274–285.

GUPTA, N. (2005): "Partial Privatization and Firm Performance," *Journal of Finance*, 60, 987–1015.

HERMALIN, B. E. AND M. S. WEISBACH (1991): "The Effects of Board Composition and Direct Incentives on Firm Performance," *Financial management*, 101–112.

——— (2003): "Boards of Directors as an Endogenously Determined Institution: A Survey of the Economic Literature," *Economic Policy Review*, 9, 7–26.

HSIEH, C.-T., E. HURST, C. I. JONES, AND P. J. KLENOW (2019): "The Allocation of Talent and U.S. Economic Growth," *Econometrica*, 87, 1439–1474.

HUGHES, M. M., P. PAXTON, AND M. L. KROOK (2017): "Gender Quotas for Legislatures and Corporate Boards," *Annual Review of Sociology*, 43, 331–352.

JENSEN, M. C. (1988): "Takeovers: Their Causes and Consequences," *Journal of Economic Perspectives*, 2, 21–48.

KIRSCH, A. (2018): "The Gender Composition of Corporate Boards: A Review and Research Agenda," *The Leadership Quarterly*, 29, 346–364.

KLAUSEN, J. E. AND M. WINSVOLD (2021): "Corporate Governance and Democratic Accountability: Local State-Owned Enterprises in Norway," *Journal of Public Policy*, 41, 161–184.

KORNAI, J., E. MASKIN, AND G. ROLAND (2003): "Understanding the Soft Budget Constraint,"

Journal of Economic Literature, 41, 1095–1136.

LAURENZ, E.-J. (2014): "Political Control and Managerial Survival in State-Owned Enterprises," *Governance*, 27, 135–161.

LEVINSOHN, J. AND A. PETRIN (2003): "Estimating Production Functions Using Inputs to Control for Unobservables," *Review of Economic Studies*, 70, 317–341.

LIN, J. Y. AND G. TAN (1999): "Policy Burdens, Accountability, and the Soft Budget Constraint," *American Economic Review*, 89, 426–431.

MADIA, A. AND A. WEBER (2020): "Female Leadership and Gender Gap within Firms: Evidence from an Italian Board Reform," *mimeo*.

MATSA, D. A. AND A. R. MILLER (2013): "A Female Style in Corporate Leadership? Evidence from Quotas," *American Economic Journal: Applied Economics*, 5, 136–169.

MAURO, P. (1995): "Corruption and Growth," *Quarterly Journal of Economics*, 110, 681–712.

MELITZ, M. J. AND S. POLANEC (2015): "Dynamic Olley-Pakes Productivity Decomposition with Entry and Exit," *RAND Journal of Economics*, 46, 362–375.

MENOZZI, A., M. GUTIÉRREZ URTIAGA, AND D. VANNONI (2012): "Board composition, political connections, and performance in state-owned enterprises," *Industrial and Corporate Change*, 21, 671–698.

MOCETTI, S. AND G. ROMA (2020): "Da 8.000 a 1.000? Razionalizzazione e Governance delle Società Pubbliche," *Bank of Italy Occasional Paper No. 570*.

OECD (2018): *Ownership and Governance of State-Owned Enterprises: A Compendium of National Practices*, OECD Publishing, Paris.

——— (2020a): *Implementing the OECD Guidelines on Corporate Governance of State-Owned Enterprises: Review of Recent Developments*, OECD Publishing, Paris.

——— (2020b): *The COVID-19 Crisis and State Ownership in the Economy: Issues and Policy Considerations*, OECD Publishing, Paris.

ROBERTS, M. R. AND T. M. WHITED (2013): "Endogeneity in Empirical Corporate Finance," Elsevier, vol. 2 of *Handbook of the Economics of Finance*, 493–572.

SCHARFSTEIN, D. (1988): "The Disciplinary Role of Takeovers," *Review of Economic Studies*, 55, 185–199.

SHLEIFER, A. (1998): "State versus Private Ownership," *Journal of Economic Perspectives*, 12, 133–150.

SHLEIFER, A. AND R. W. VISHNY (1994): "Politicians and Firms," *Quarterly Journal of Economics*, 109, 995–1025.

SMITH, N. (2018): "Gender quotas on boards of directors," *IZA World of Labor*, 7, 1–10.

WORLD ECONOMIC FORUM (2020): "The Global Gender Gap Report," .

A   Appendix

Construction of the Talent measure

Meausuring managerial talent is challenging. In this paper, we adopt the measure constructed by (Baltrunaite et al., 2020). The methodology employed estimates managerial talent by their ability to boost firm productivity, using an AKM-style model which identifies the contribution of each director to firm efficiency.

More precisely, in a matched firm-director panel dataset over the period 2005-2018, tracking directors across different firms over time, we estimate a high-dimensional two-way fixed effects model. To estimate how much of the unexplained variation in firms' total factor productivity can be attributed to an individual board member, two sources of variation are exploited: cross-sectional variation due to the fact that the same person may sit on several boards and longitudinal variation due to the fact that the same person can switch from one firm to another over time. The estimated director fixed effects, conditional on firm fixed effects, and time-varying firm characteristics can be interpreted as a measure of directors' talent (i.e., the individual contribution to the variation of the firms' TFP).

Formally, the analysis uses the largest connected set of firms, which consists of N firms, linked to each other via director mobility, and each firm i is observed over T_i years. We have therefore an unbalanced panel of $T = \sum_{i=1}^{i=N} T_i$ firm-year observations. In each year t a firm i is run by one or some among J directors, whose identities are known to us. We estimate the following high-dimensional two-way fixed effect model:

$$y = F\alpha + D\psi + X\beta + \varepsilon \tag{4}$$

y is a $T \times 1$ vector whose j-th element is the total factor productivity of firm i in period t;[27] F is

---

[27]We use a measure of TFP computed using balance sheet information with the Levinsohn and Petrin (2003) estimator with the Ackerberg et al. (2015) correction, and that has been purged of sector-year and province-year fixed effects. The TFP measure is computed within 2-digit sectors to account for sectoral differences in the productivity function.

a $T \times N$ matrix that collects firm dummies; D is a $T \times J$ matrix that collects directors dummies; X is a $T \times K$ matrix of year dummies; ε is the $T \times 1$ vector containing the error terms. In our analysis, we use the variable $Talent1,000$, defined as the annual *per-mille* rank of the average director fixed effect (in other words, every year we divide the director quality measure in the per-mille rank from 1 to 1000).

The OLS estimation of equation (4) provides a meaningful estimate of the coefficients ψ of interest as long as directors do not systematically sort into firms based on factors that are not observed by the econometricians and are thus included into the error term. As specification (4) features firm fixed effects, sorting based on companies' time-invariant characteristics would not constitute a threat to the identification. The extensive validity checks are presented in Baltrunaite et al. (2020).