

Gender quota laws and firm performance: is there a trade-off?

Mariasole Bannò, Emilia Filippi and Chiara Leggerini

Abstract

Purpose – The introduction of gender quota laws in many countries has garnered significant attention in the literature and in the political discourse. Proponents of this solution emphasise its potential to bolster opportunities for women, foster their participation on boards of directors and improve corporate governance, market value and firm performance. Conversely, opponents express concerns regarding the possibility of appointing less-qualified women, thereby diminishing board effectiveness and potentially leading to negative consequences on firm market value and performance. This study aims to address this ongoing debate by examining the impact of gender quota laws on firm performance.

Design/methodology/approach – The impact of gender quota laws on firm performance, measured through ROE, ROA and ROI, is evaluated using a database of 27,977 Italian firms and adopting a two-stage traditional treatment effect model.

Findings – The econometric analysis reveals a negative impact of the gender quota law on firm performance.

Originality/value – This study contributes to the academic debate on the pros and cons of imposing gender quota laws by providing empirical evidence on their impact on firm performance.

Keywords Gender quota laws, Firm performance

Paper type Research paper

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1. Introduction

In recent years, there has been a noticeable increase in the presence of women on board of directors, yet they remain a minority and gender-balanced boards are few in both the private and public sectors of European countries (Comi *et al.*, 2020; Ferrari *et al.*, 2022; Kirsch, 2021). For this reason, promoting women's representation on boards of directors has become increasingly important in many countries, including European ones (Atinc *et al.*, 2022). To achieve a gender-balanced board of directors, European countries have adopted three types of policies:

1. gender quota laws, obliging firms to reach a certain quota of under-represented group members on the board of directors within a certain period of time;
2. recommendations for the inclusion of women on boards; and
3. laws mandating disclosure regarding women's presence on boards (Kirsch, 2021; Leszczyńska, 2018).

Gender quota laws, i.e. laws mandating a higher representation of women on the board of directors, have received much attention in the literature and in the political discourse (Atinc *et al.*, 2022).

Studies analysing the impact of gender quota laws are divided into two categories. The first examines whether gender quota laws effectively enhance the representation of women, aligning with the primary objective of the law (Atinc *et al.*, 2022; Pastore and Tommaso, 2016).

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The second strand of research examines whether the introduction of gender quota laws influences market value, performance and other economic indicators of firms subject to the law, thereby extending the analysis beyond the law's intended scope (Ahern and Dittmar, 2012; Comi *et al.*, 2020; Greene *et al.*, 2020). The present study aligns with this second strand of research. Specifically, it addresses the following research question:

RQ1. What is the impact of women directors on firm performance when gender quota laws are in force?

Studies investigating the economic impact of gender quota laws generally find a negative effect (Bøhren and Staubo, 2016; von Meyerinck *et al.*, 2018; Yang *et al.*, 2019). Nevertheless, the specific impact on firm performance of women directors' involvement subsequent to the introduction of gender quota laws remains ambiguous (Comi *et al.*, 2020). There is no specific reason why women directors should improve firm performance: if women directors are similar to men directors, there should be no effect on firm performance; if they are different, the direction of the effect is not clear (Strøm, 2019). Furthermore, the few existing studies have important limitations. Firstly, there are only a few studies (Comi *et al.*, 2020; Dale-Olsen *et al.*, 2013; Matsa and Miller, 2013) comparing firms subject to gender quota laws with non-subject firms operating in the same country. Existing studies normally adopt a difference-in-difference approach considering only firms subject to the gender quota law before and after its introduction or compare firms subject to the gender quota law with non-subject firms operating in other countries. Secondly, studies analysing the impact of gender quota laws generally evaluate their impact for a few years starting from their introduction. To the best of our knowledge, no study evaluates the effect of gender quota laws years after their introduction without considering the intervening time period. Finally, existing studies examining the impact of gender quota laws generally do not use a theoretical approach to examine the issue and only consider the effects through an empirical analysis. The studies by Comi *et al.* (2020) and Mazzotta and Ferraro (2020) are the only exceptions.

Based on this premise, the study draws upon the "business case" rationale and the resource-based theory (Barney, 1991, 1996) and evaluates the impact of women directors on firm performance (i.e. profitability) when gender quota laws are in force. In particular, it looks at this effect by comparing firms that are subject to a certain gender quota law with firms that are not subject to it and operate in the same country. Moreover, it looks at the effect years after the gender quota law was put in place. In this way, the study overcomes the limitations of the few existing studies. Empirically, this study uses a counterfactual approach, specifically using a two-stage traditional treatment effect model (Lee, 2005). The analysis considers a sample of 27,977 Italian firms in the year 2019.

Italy is a compelling context for this analysis for various reasons. In 2011, the enactment of Law 120/2011, also known as the Golfo-Mosca Law, mandated listed firms and state-owned firms to increase gender diversity on their board of directors. Initially requiring a minimum representation of 20% of each gender by 2012 and escalating to 33% by 2015, the law was subsequently amended in 2019, setting the threshold at 40% women's representation from 2020 onwards. This legislative intervention garnered significant attention across Europe and was considered the first clear intervention by the Italian state regarding gender equality (Profeta *et al.*, 2014). Nowadays, gender equality in Italy is an issue that still needs to be improved and the noteworthy progress in the number of women directors in the largest Italian-listed firms (achieved a decade after adopting a gender quota law in, 2011) deserves attention regarding its consequences. For these reasons, the time period considered in the analysis and the situation in Italy regarding gender equality provide a unique opportunity to assess the impact of gender quota laws.

The econometric analysis reveals a negative impact of the gender quota law on firm performance.

The study makes important contributions. From a theoretical point of view, our study contributes to the existing research aimed at assessing the impact of gender quota laws on firm performance, seeking to clarify the conflicting results by adopting the “business case” rationale and the resource-based theory (Barney, 1991, 1996). According to previous studies, the impact of gender quota laws on firm performance is ambiguous (Comi *et al.*, 2020), despite previous studies generally finding a negative effect (Bøhren and Staubo, 2016; von Meyerinck *et al.*, 2018). Moreover, our study adds to the literature explaining the reasons pro and against such laws and, in particular, to the literature that refers to the impact on firm performance to either support or discourage their introduction. From an empirical point of view, this study builds on previous research by comparing firms that must follow gender quota laws with firms that do not have to follow these laws but still operate in the same country. In this way, all firms are subject to the same conditions and any possible confounding effects that these conditions might have on the analysis are considered. Furthermore, the study evaluates the effect of gender quota laws on firm performance years after their introduction, when organisational adjustments due to the implementation of these laws have already been overcome, so that their effect on firm performance is limited or absent.

In addition, the study has several managerial and policy implications, which will be discussed in Section 6.

2. Theoretical background

2.1 Impact of women directors on firm performance

Gender quota laws aim to promote a greater presence of women directors for reasons of equality (Ferrari *et al.*, 2022) and, in this way, can indirectly foster economic efficiency and profitability (De Vita and Magliocco, 2018). To investigate the issue, this study adopts the theoretical framework given by the “business case” rationale and by the resource-based theory (Barney, 1991, 1996).

The term “business case” encompasses the economic advantages that firms can reap from the inclusion of women directors and gender-balanced boards once these opportunities are capitalised (Kirsch, 2021). A significant inclusion of women on board of directors improves corporate governance processes (Kirsch, 2021), facilitating more extensive discussions that consider a range of alternatives (Atinc *et al.*, 2022; Hamplová *et al.*, 2022). Furthermore, the presence of women directors enables boards to better understand and address the interests and needs of firm stakeholders and clients (Atinc *et al.*, 2022; Pastore and Tommaso, 2016). This is achieved through the establishment of closer links between the firm and its stakeholders (Ntim, 2015), the beneficial relationships with many stakeholders even in the face of conflicting demands (Pastore and Tommaso, 2016) and the higher communication skills (Hazaea *et al.*, 2023). In addition, the inclusion of women directors makes corporate governance practices more transparent (Terjesen *et al.*, 2009). As women directors are usually recruited from outside the firm and are therefore more independent from the management, they allow better monitoring and vigilance over firm activities (Atinc *et al.*, 2022; Mateos de Cabo *et al.*, 2019). This is achieved through, for example, the application of regulations and laws (Ararat and Yurtoglu, 2021) and the mitigation of management’s opportunistic behaviour (Guizani and Abdalkrim, 2022). Consequently, decision-making improves and becomes more comprehensive (Pastore and Tommaso, 2016; Terjesen *et al.*, 2009).

In light of the resource-based theory (Barney, 1991, 1996), women directors are recognised for bringing many valuable resources to the board of directors (Comi *et al.*, 2020): they provide skills, knowledge, ideas and viewpoints that are different (i.e. heterogeneous) from those of men (Ferrari *et al.*, 2022; Pastore and Tommaso, 2016). Moreover, they offer access to unique networks, facilitating, for example, information and inter-organisational

relationships (Atinc *et al.*, 2022; Di Donato *et al.*, 2016). Women directors thus bring a “women leadership style” (Mazzotta and Ferraro, 2020). The changes in the decision-making process (e.g. better work atmosphere, higher politeness, fewer conflicts and more intense and fact-oriented decisions) induced by the presence of women directors coupled with the resources they provide produce better results (Kirsch, 2021): Firms become more closely linked with stakeholders (Bernardi *et al.*, 2002; Pastore and Tommaso, 2016) and can grow and become more competitive (Azmat and Boring, 2020). Firm performance and market value increase, whereas market risk is reduced (Terjesen *et al.*, 2009).

Existing reviews focusing on the effect of women directors on firm performance indicate that the empirical results are conflicting, despite most studies finding a positive effect (Hazaea *et al.*, 2023; Nguyen *et al.*, 2020). On the contrary, a meta-analysis conducted by Pletzer *et al.* (2015) suggests that women directors do not affect firm performance.

More in detail, most empirical studies find a positive effect of women directors on firm performance (Assenga *et al.*, 2018; Erhardt *et al.*, 2003; Isidro and Sobral, 2015; Lee-Kuen *et al.*, 2017; Reguera-Alvarado *et al.*, 2017). This effect persists over an extended period (Campbell and Minguez Vera, 2010) and is maximised when women directors constitute 33% of the board of directors (Arvanitis *et al.*, 2022) or are at least two (Chijoke-Mgbame *et al.*, 2020).

Conversely, few studies indicate that the presence of women directors has a negative effect on firm performance due to issues of tokenism and gender stereotypes (Lim *et al.*, 2019; Ujunwa, 2012). Moreover, the presence of women directors may negatively affect group dynamics (Turner *et al.*, 1987) and potentially foster the creation of social groups between genders, which may lead to increased conflict (Hogg *et al.*, 1990). Finally, few studies demonstrate that the presence of women directors does not affect firm performance (Carter *et al.*, 2010; Gallego-Álvarez *et al.*, 2010; Marinova *et al.*, 2016; Martinez-Jimenez *et al.*, 2020).

Nevertheless, the relationship between women directors and firm performance appears to be more complicated. Women directors negatively affect firm performance when they are few, but they exercise a positive effect when they represent at least 30% of the board of directors (Joecks *et al.*, 2013). Similarly, women directors may have a positive effect on firm performance only if they have a more active role in the board of directors, i.e. they operate in board committees, are independent or are members of controlling families (Ararat and Yurtoglu, 2021). Finally, several mediators influence the relationship between women directors and firm performance, including board and firm characteristics (e.g. board gender independence, CEO duality) (Pandey *et al.*, 2023), firm's orientation towards corporate social responsibility (Jiang *et al.*, 2021; Ouni *et al.*, 2020; Saleh *et al.*, 2021), the country's culture (Naghavi *et al.*, 2021) and national governance quality (Nguyen *et al.*, 2021).

2.2 Impact of gender quota laws on firm economic indicators

Research examining the effects of gender quota laws can be classified into two distinct categories. Although the first delves into the effectiveness of gender quota laws in enhancing women's representation on boards of directors, the second category scrutinises the impact of gender quota laws on market value, performance and other economic indicators (e.g. profits, productivity, employment) of firms subject to these laws.

2.2.1 Market value. The introduction of gender quota laws generally leads to a decrease in firm market value (measured as Tobin's *Q* or market-to-book value) (Ahern and Dittmar, 2012; Yang *et al.*, 2019). This negative effect persists over time and stems from the fact that boards of directors become younger and less experienced following the introduction of the law (Ahern and Dittmar, 2012). However, other studies find opposite results: according to Eckbo *et al.* (2022) and Ferrari *et al.* (2022), gender quota laws do not affect firm value (Tobin's *Q*), whereas according to Garcia-Blandon *et al.* (2023), the impact is positive.

Gender quota laws also affect stock prices. The effect on cumulative abnormal returns depends on the firm's information structure: following the introduction of gender quota laws, firms with low information asymmetry experience a positive impact on cumulative abnormal returns, whereas firms with high information asymmetry show no impact (Nyggaard, 2011). In addition, gender quota laws reduce the variability of stock market prices, a common measure of uncertainty at the firm level (Ferrari *et al.*, 2022).

Furthermore, the mere announcement of gender quota laws exerts a negative impact on the cumulative abnormal returns of firms subject to the law (Greene *et al.*, 2020; von Meyerinck *et al.*, 2018). The negative impact is more pronounced for firms compelled to appoint more than one women director to comply with the law and for those facing a limited pool of qualified women candidates (Greene *et al.*, 2020; von Meyerinck *et al.*, 2018). Conversely, the impact is smaller for firms that can more easily adjust their board composition (Greene *et al.*, 2020). Moreover, there is a spillover effect on firms not directly subject to gender quota laws, as they also undergo a significant negative market reaction (von Meyerinck *et al.*, 2018). The announcement of gender quota laws also leads to a decrease in stock market prices, especially for firms without women directors at announcement time (Ahern and Dittmar, 2012).

2.2.2 Firm performance. The introduction of gender quota laws diminishes ROA by fostering increased board independence (Bøhren and Staubo, 2016). Specifically, gender quota laws increase the share of independent directors because women directors tend to be more independent than men as they are usually recruited from outside the firm and tend to have limited experience as managers and stockholders (Atinc *et al.*, 2022; Bøhren and Staubo, 2016). This change reduces ROA because the advice from dependent directors is more important for firm performance compared to the monitoring by independent directors (Bøhren and Staubo, 2016). A negative impact of gender quota laws on ROA has also been found by Yang *et al.* (2019). Conversely, other authors estimate a null effect of gender quota laws on ROA (Dale-Olsen *et al.*, 2013; Ferrari *et al.*, 2022) or a positive effect (Garcia-Blandon *et al.*, 2023). Finally, the impact of gender quota laws on ROA may vary depending on the context (Comi *et al.*, 2020).

Gender quota laws positively affect ROE (Garcia-Blandon *et al.*, 2023) as well as the return on average equity and return on average assets (Mazzotta and Ferraro, 2020). Specifically, the impact is null before the introduction of gender quota laws because women on board of directors are few, perceived as tokens and unable to influence firm performance (Mazzotta and Ferraro, 2020). However, the impact turns positive after the introduction of these laws (Mazzotta and Ferraro, 2020) [1].

2.2.3 Other economic indicators. The impact of gender quota laws has also been analysed concerning profits, risk, productivity, total assets, operating costs, debts and leverage and employment.

Introducing gender quota laws reduces short-term profits because they increase labour costs (but not other costs) and lead to higher relative employment (Matsa and Miller, 2013). Instead, other authors find a null effect on profits (Ferrari *et al.*, 2022) and operating revenues (Dale-Olsen *et al.*, 2013).

Gender quota laws also reduce firm risk (Yang *et al.*, 2019). This happens because women are generally more risk averse, uncertainty averse, less overconfident and particularly responsible and conscientious when making decisions (Faccio *et al.*, 2016; Teodósio *et al.*, 2021). However, in managerial settings and when women are well informed, women and men tend to be equally risk-averse (Dwyer *et al.*, 2002; Faccio *et al.*, 2016).

Regarding productivity, gender quota laws have a null effect (Ferrari *et al.*, 2022). Instead, according to Comi *et al.* (2020), the impact depends on the context: gender quota laws decrease labour productivity and total factor productivity in France; the opposite occurs in Italy; finally, the impact is null in Spain.

Gender quota laws have a null effect on total assets (Ferrari *et al.*, 2022) and operating costs (Dale-Olsen *et al.*, 2013).

Gender quota laws have a null effect on short-term debts (Ferrari *et al.*, 2022), whereas they increase leverage because they increase firm debt (Comi *et al.*, 2020).

Finally, gender quota laws have a null effect on employment (Ferrari *et al.*, 2022). Instead, according to Comi *et al.* (2020), the impact is negative or null depending on the context (Comi *et al.*, 2020).

The impact of gender quota laws on other economic indicators is outlined in Table 1.

To summarise, previous studies generally indicate a negative or no effect of gender quota laws on market value, firm performance and various economic indicators: gender quota laws are thus costly and value decreasing for firms subject to the law (Greene *et al.*, 2020).

2.3 Impact of gender quota laws on firm performance: a critical perspective

Studies investigating the impact of gender quota laws generally find a negative effect on firm performance (Bøhren and Staubo, 2016; von Meyerinck *et al.*, 2018; Yang *et al.*, 2019).

However, existing studies have some important limitations. The first limitation to consider is the sample used for the analysis. Some existing studies focus only on firms subject to the gender quota law (Bøhren and Staubo, 2016; Nygaard, 2011). Other existing studies compare firms subject to the gender quota law with non-subject firms operating in other countries (Ahern and Dittmar, 2012; von Meyerinck *et al.*, 2018; Yang *et al.*, 2019). In this case, it is important to note that foreign firms are not subject to the gender quota law under investigation (Strøm, 2019). Finally, there are only a few studies (Comi *et al.*, 2020; Dale-Olsen *et al.*, 2013; Matsa and Miller, 2013) comparing firms subject to gender quota laws with non-subject firms operating in the same country. This methodological choice has its limitations because control firms may have different characteristics (e.g. size, ownership structure) compared to firms subject to the gender quota law and may be affected differently by changes in the underlying economic reality (macroeconomic exogenous shocks) (Strøm, 2019). However, this methodology ensures that all firms face the same contextual conditions and enables controlling for any potential confounding effects caused by these conditions on firm performance.

The second limitation of previous studies to consider regards the time period. Existing studies generally evaluate the impact of gender quota laws for a few years starting from their introduction. However, during the implementation period, changes in the underlying economic reality may potentially lead to confounding effects and to a difficulty in singling

Table 1 Impact of gender quota laws on economic indicators

<i>Economic indicator</i>	<i>Impact</i>
Short-term profits	Negative (Matsa and Miller, 2013)
Profits	Null (Ferrari <i>et al.</i> , 2022)
Short-term debts	Null (Ferrari <i>et al.</i> , 2022)
Firm risk	Negative (Yang <i>et al.</i> , 2019)
Total assets	Null (Ferrari <i>et al.</i> , 2022)
Leverage	Positive (Comi <i>et al.</i> , 2020)
Productivity	Null (Ferrari <i>et al.</i> , 2022)
Operating revenues and costs	Depends on the context (Comi <i>et al.</i> , 2020)
Employment	Null (Ferrari <i>et al.</i> , 2022)
	Depends on the context (Comi <i>et al.</i> , 2020)

Source: Authors' elaboration

out the impact of the gender quota law (Strøm, 2019). Moreover, during the implementation period, the necessary organisational changes could impact firm performance.

The third limitation is the lack of a critical review that uses a theoretical framework to interpret the results of existing studies, which are often inconclusive. Only in this way could it be possible to clarify the existing conflicting evidence.

3. Research question

The impact of gender quota laws on firm performance is not clear in advance (Comi *et al.*, 2020; Dale-Olsen *et al.*, 2013; von Meyerinck *et al.*, 2018). To address the theoretical limitations of previous studies, this study adopts the “business case” rationale and the resource-based theory (Barney, 1991, 1996).

On the one hand, following the “business case” rationale, gender quota laws are expected to increase firm performance by fostering higher gender equality on the board of directors (Kirsch, 2021). The inclusion of women on board of directors improves corporate governance processes and decision making by facilitating more comprehensive discussions, higher transparency and better monitoring (Atinc *et al.*, 2022; Mateos de Cabo *et al.*, 2019; Terjesen *et al.*, 2009). Furthermore, according to the resource-based theory (Barney, 1991, 1996), women directors provide different and valuable skills, knowledge, qualities, practices and resources (Ferrari *et al.*, 2022; Pastore and Tommaso, 2016). Therefore, gender quota laws are expected to increase firm performance when qualified women are appointed (Comi *et al.*, 2020; Ferreira, 2015; Mazzotta and Ferraro, 2020) or when an inefficient board of directors is changed (Ferrari *et al.*, 2022). However, numerous studies (Torchia *et al.*, 2011) underscore the importance of achieving a critical mass of women to realise the positive effects fostered by women directors, with gender quota laws helping in this direction (Kogut *et al.*, 2014).

On the other hand, by adopting the resource-based theory (Barney, 1991, 1996), gender quota laws may lead to a decrease in firm performance for two reasons. Firstly, they impose a change in the current board of directors (Comi *et al.*, 2020; Ferreira, 2015). If firms were already performing well before the introduction of gender quota laws, then the percentage of women directors was already optimal (Dale-Olsen *et al.*, 2013). In this case, when forced changes occur within an otherwise effective board of directors, three main adverse consequences on its functioning may arise (Ferrari *et al.*, 2022; Hamplová *et al.*, 2022; Leszczyńska, 2018):

1. lower board effectiveness;
2. lower quality of decisions; and
3. increased conflict.

Therefore, the introduction of gender quota laws may represent a “negative shock”, compelling firms to alter an efficient board of directors and leading to lower market value and firm performance (Ahern and Dittmar, 2012; Dale-Olsen *et al.*, 2013; von Meyerinck *et al.*, 2018) [2]. Second, women appointed to comply with gender quota laws may be less qualified in terms of skills, knowledge, qualities, practices and resources or unable to successfully perform the position (Ferrari *et al.*, 2022; Pastore and Tommaso, 2016), particularly when there is a limited pool or absence of qualified women candidates (Comi *et al.*, 2020; Dale-Olsen *et al.*, 2013). The appointment of women directors may give rise to a violation of meritocracy (Ferrari *et al.*, 2022) and exclude qualified men candidates whose characteristics can improve board functioning (Pastore and Tommaso, 2016). As a consequence, when women are not appointed for the “right reasons” (Hamplová *et al.*, 2022), women will always be questioned regarding their skills, viewed merely as “decorative additions”, perceived as “tokens”, questioned and not heard (Fitzsimmons, 2012;

Freidenvall and Hallonsten, 2013; Leszczyńska, 2018). In these cases, gender quota laws will inadvertently reinforce tokenism and gender stereotypes against women rather than promoting gender equality on the board of directors (Leszczyńska, 2018; Piscopo and Clark Muntean, 2018). For these reasons, gender quota laws are expected to diminish firm performance when women are appointed merely to comply with the law regardless of merit and without adding new and beneficial resources to the firm (Mazzotta and Ferraro, 2020).

In light of the above and based on the theoretical framework depicted in Figure 1, the study aims to answer this research question: *What is the impact of women directors on firm performance when gender quota laws are in force?*

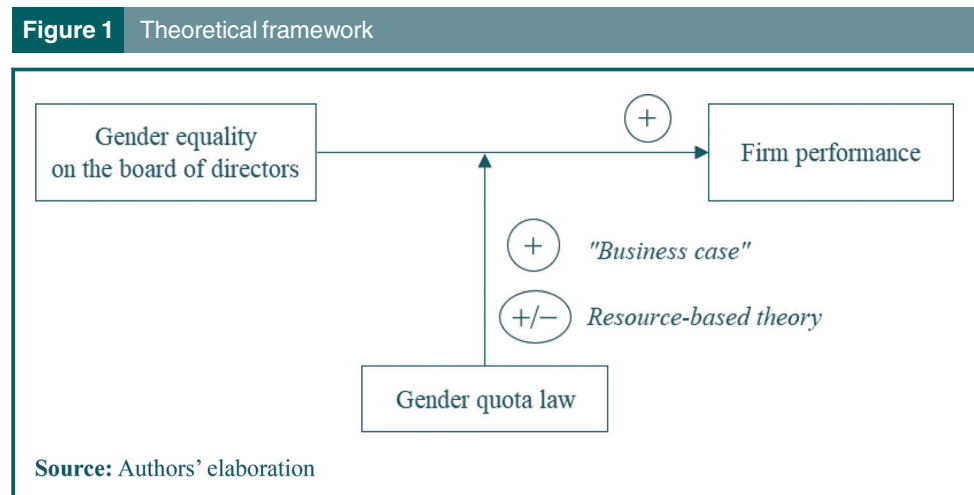
4. Methodology

4.1 Data

Italy is a compelling context for this analysis for various reasons. In 2011, a gender quota law (Law 120 / 2011, also known as the Golfo-Mosca Law) was approved, which garnered significant attention across Europe (Profeta *et al.*, 2014). Moreover, gender equality still needs to be improved. Despite the improvements since 2010, in 2020, Italy ranked 14th in the European Union regarding the Gender Equality Index (European Institute for Gender Equality, 2020). In 2020, only 37% of directors in the largest Italian-listed firms were women, marking a substantial increase from 5% in 2010 (European Institute for Gender Equality, 2020).

To evaluate the effect of gender quota laws on firm performance, we used a database referring to 2019 and consisting of 27,977 Italian firms, among which 371 are firms subject to the Italian gender quota law (i.e. listed and public-owned firms) [3]. Our selection of control sample was randomised, i.e. each firm had the same probability of being selected from the universe of Italian firms active in 2019, excluding listed firms, firms with fewer than five employees, and firms with missing balance sheet and board composition data. χ^2 tests confirmed the representativeness of our sample.

We gathered data regarding the presence of women directors, year of foundation, location, financial situation, innovation and multinational status for each firm. All data was extracted from the Orbis Bureau van Dijk database (with data on innovation sourced from Orbis Intellectual Property), except for data regarding the multinational status of the firm, which was derived from Reprint (Mariotti and Mutinelli, 2017).



4.2 Model

The effect of a public policy (i.e. treatment) is given by the difference between an observable variable among subjects in the treated sample and the counterfactual value (Ferraro, 2009). This counterfactual value can be attributed to the situation the subjects would have been in if they had not been exposed to a specific public policy, so it is a hypothetical value (Ferraro, 2009). A credible strategy for estimating the counterfactual is essential to having a good estimate of public policy effects (Ferraro, 2009). This estimation is critical to understanding whether the effect of the studied phenomenon is actually the result of the public policy, establishing its cause-effect relation (Crano, 1991). The problems in estimating the effect concern: the spontaneous dynamic due to external factors, i.e. the different trend of the result variable in the counterfactual and target population; the omitted variable, i.e. changes outside the public policy that may affect the outcome of the study; and selection bias, which depends on the characteristics of the target sample and the counterfactual without treatment (Bartik and Bingham, 1995; Gramillano, 2012). Selection bias can result from self-selection in the treatment of the subjects studied or by the selection decision made by those controlling public policy (Heckman, 1979).

In our case, the selection bias stems from the presence of women on the board of directors, resulting from public policy (i.e. the introduction of the Golfo-Mosca Law, treatment). Hence, there is no self-selection problem (which is often the most difficult to control empirically) but only the selection effect given by the law. In addition, the absence of values for the dependent variable due to some other process may lead to sample selection bias (Greene, 2011; Heckman, 1979; Sartori, 2003). Another typical concern in evaluating the treatment effect is the possibility that the phenomenon under study exhibits a spontaneous dynamic, that is, the outcome variable is subject to other influences that determine changes between the period before and after a spontaneous dynamic (Bondonio, 2000).

Experts in the field often state that two steps are needed to address these problems (Wooldridge, 2010). The first stage involves checking if a population observation is included in the final representative sample, whereas the second stage involves using that sample to model the hypothesised relationship between the dependent and independent variables (Certo *et al.*, 2016). To avoid the problem of spontaneous dynamics and the omitted variable problems (typical of one group design models [4]) (Bondonio, 2000), we used a model belonging to the comparison group design family [5], specifically a two-stage traditional treatment effect model (Lee, 2005).

The model offers distinct advantages over other methods used in literature for policy evaluation. Firstly, unlike the propensity score matching method, the treatment effects model takes into account both observed and unobserved covariates, eliminating selection bias (Ma and Abdulai, 2017). Secondly, treatment exposure is made random depending on the inverse Mills' ratio (Ma and Abdulai, 2017). Thirdly, the factors that determine outcomes are identified in the second stage (Ma and Abdulai, 2017).

The treatment effects model uses a two-stage consistent estimator and full maximum likelihood (Cong and Drukker, 2000). Based on two sets of independent variables, the treatment effects model takes into account the impact of an endogenously determined binary treatment on another endogenous continuous variable (Cong and Drukker, 2000).

Two types of regressions were run in this study: the first one estimated the probability of a firm being subject to the gender quota law (i.e. the probability of being treated) using a probit regression, and the second one estimated the impact of the presence of women directors on firm performance as a function of the treatment variable (i.e. being subject to the gender quota law), considering other independent variables that could affect firm performance.

Specifically, the first stage is a model where the probability of being treated is denoted by D^*_i , which explains the difference between a treated and a non-treated firm; x_i represent exogenous covariates, which are independent variables used to explain different attitudes between a treated and non-treated firm; u_i is a random component. The selection equation is defined as follows:

$$D^*_i = x_i + u_i \text{ (first stage, selection equation)}$$

The equation for the first stage, common to all proposed models, was defined as follows:

$$\text{Model 0 Treated firm} = f(\text{Firm dimension, Firm age, FDI, North Italy, Centre Italy, Pavitt suppliersdominated, Pavitt scale and information intensive, Pavitt specialized supplier, Pavitt science based})$$

The dependent variable for the first stage was *Treated firm*, describing if the firm is subject to the gender quota law.

In the second stage of the model, D_i (the endogenous binary variable) was defined as the outcome of the first stage's dependent variable D^*_i (the unobserved latent variable):

$$D_i = 1 \text{ if } D^*_i > 0,$$

$$D_i = 0 \text{ otherwise}$$

In the second stage, a linear regression focused on firm performance y_i and included the treatment variable of the first stage D_i (an endogenous dummy variable indicating whether the treatment is assigned or not), other exogenous independent variables w_i and a latent ε_i . The evaluation equation was defined as follows:

$$y_i = w_i + D_i + \varepsilon_i \text{ (second stage, evaluation equation)}$$

The ε_i term, representing the missing variable, ensures that regressing y_i without two steps will yield an unbiased result (Certo *et al.*, 2016).

The equation for the second stage was defined as follows:

$$\text{Model 1 Performance} = f(\text{Treated firm, Presence of woman directors, Board size, Board age, Boardtenure, Firm dimension, Firm age, Innovation, FDI, Risk, North Italy, Centre Italy, Pavitt suppliersdominated, Pavitt scale and information intensive, Pavitt specialized supplier, Pavitt science based})$$

To comprehensively assess the impact of gender quota laws on firm performance, we selected several firm performance indicators as dependent variables. Specifically, Model 1 was tested using ROE (Model 1a), ROA (Model 1b) and ROI (Model 1c).

To analyse the joint impact of being subject to the gender quota law and the presence of women directors on firm performance, we used the following interaction model:

$$\text{Model 2 Performance} = f(\text{Treated firm, Presence of woman directors, Treated firm} \\ \times \text{Presence of woman directors, Board size, Board age, Board tenure, Firm dimension, Firm age, Innovation, FDI, Risk, North Italy, Centre Italy, Pavitt suppliers dominated, Pavitt scale and information intensive, Pavitt specialized supplier, Pavitt science based})$$

Model 2 was tested using the same performance measures as in Model 1: ROE (Model 2a), ROA (Model 2b) and ROI (Model 2c).

The bivariate normal distribution with mean zero is assumed for the treatment effects model's error terms ε_i in the second stage and μ_i in the first stage, along with a correlation such that $\rho_{\varepsilon\mu} = \text{corr}(\mu_i, \varepsilon_i)$ (Cong and Drukker, 2000). Specifically, a significant deviation of $\rho_{\varepsilon\mu}$ from zero may indicate the presence of selection bias arising from factors that are not apparent (Cong and Drukker, 2000). Negative $\rho_{\varepsilon\mu}$ indicates a negative selection bias, implying that firms with lower-than-average dependent variables are more likely to be treated (Cong and Drukker, 2000). Conversely, positive $\rho_{\varepsilon\mu}$ indicates positive selection bias (Cong and Drukker, 2000).

In addition, the presence of either positive or negative selection bias implies that both the propensity score matching method and the ordinary least squares (OLS) regression model may either overestimate or underestimate the impact of gender quota laws on the selected outcomes (Ma and Abdulai, 2017). This is because the propensity score matching technique addresses selection bias without taking into account unobservable factors, whereas the OLS regression model does not account for the endogeneity of being subject to gender quota laws (Ma and Abdulai, 2017).

4.3 Variables

Table 2 reports the definitions and sources of the variables used.

Table 2 Definition and sources of variables used		
Variable	Definition	Source
<i>Dependent variables</i>		
Treated firm	Dummy variable equal to 1 the firm is subject to the gender quota law, and 0 otherwise	Orbis
ROE	Return on equity, given by net income on equity	Orbis
ROA	Return on assets, given by net income on assets	Orbis
ROI	Return on investments, given by net income on investments	Orbis
<i>Independent variable</i>		
Presence of women directors	Percentage of women directors	Orbis
<i>Control variables</i>		
Bord size	Number of directors	Orbis
Board age	Average age of directors	Orbis
Board tenure	Average tenure of directors	
Firm dimension	Logarithm of the number of employees	Orbis
Firm age	Number of years since firm foundation	Orbis
Innovation	Dummy variable equal to 1 if the firm holds a patent, and 0 otherwise	Orbis intellectual property
FDI	Number of foreign direct investments completed by the firm	Reprint
Risk	Standard deviation of the return on assets on the past five years	Orbis
North Italy	Dummy variable equal to 1 if the firm is located in North Italy, and 0 otherwise	Orbis
Centre Italy	Dummy variable equal to 1 if the firm is located in Central Italy, and 0 otherwise	Orbis
South Italy	Dummy variable equal to 1 if the firm is located in South Italy, and 0 otherwise	Orbis
Pavitt suppliers dominated	Dummy variable equal to 1 if the firm is in a supplier dominated industry, 0 otherwise	Orbis
Pavitt scale and information intensive	Dummy variable equal to 1 if the firm is in a scale and information intensive industry, 0 otherwise	Orbis
Pavitt specialized supplier	Dummy variable equal to 1 if the firm is in a specialized supplier industry, 0 otherwise	Orbis
Pavitt science based	Dummy variable equal to 1 if the firm is in a science based industry, 0 otherwise	Orbis
Pavitt other	Dummy variable equal to 1 if the firm is not in a supplier dominated, scale and information intensive, specialized supplier or science based industry, 0 otherwise	Orbis

Source: Authors' elaboration

4.3.1 Dependent variables. In the first stage of the model, the dependent variable is *Treated firm*, which is a dummy variable taking the value 1 if the firm is subject to the gender quota law and 0 otherwise.

In the second stage of the model, the dependent variables encompass various firm performance indicators. Firm performance can be measured with market-based indicators (e.g. Tobin's *Q*) as well as financial statement ratios (i.e. ROE, ROA and ROI) (Dale-Olsen *et al.*, 2013; Marinova *et al.*, 2016). Neither measure is perfect when evaluating the effect of board changes (Dale-Olsen *et al.*, 2013) and there is little agreement on the most optimal one (Marinova *et al.*, 2016). Specifically, as highlighted by Dale-Olsen *et al.* (2013), market-based indicators are influenced by an anticipation issue: due to the impending changes to the board of directors, market participants predict future performance and impact market value regardless of the actual outcomes of the board change. Similarly, market participants might cause a reduction of Tobin's *Q* if they perceive women as less qualified than men irrespective of their real skills and capabilities (Dale-Olsen *et al.*, 2013). At the same time, financial statement ratios are sensitive to management manipulation and changing accounting practices (Dale-Olsen *et al.*, 2013; Marinova *et al.*, 2016). For these reasons, when assessing the impact of women directors on firm performance, "measuring performance by the return on assets is at least as adequate as measuring it by Tobin's *Q*" (Dale-Olsen *et al.*, 2013, p. 116). Thus, in line with previous studies (Comi *et al.*, 2020; Dale-Olsen *et al.*, 2013; Mazzotta and Ferraro, 2020) examining the impact of gender quota laws on firm performance, we used ROE and ROA. These measures are commonly used in literature for measuring firm financial performance (Arvanitis *et al.*, 2022; Carter *et al.*, 2010; Nguyen *et al.*, 2021; Saleh *et al.*, 2021). We also considered the indicator of performance ROI as a dependent variable. Having three dependent variables enables us to examine whether the results are affected by different firm performance measures.

4.3.2 Independent variable. The independent variable used in the analysis is *Presence of women directors*, which measures the percentage of women directors on the board of directors, in line with previous studies (De Masi *et al.*, 2018; Ferrari *et al.*, 2022; Latura and Weeks, 2022; von Meyerinck *et al.*, 2018).

4.3.3 Control variables. To account for other factors that may affect firm performance, we considered several control variables. In line with Mazzotta and Ferraro (2020), *Firm dimension* and *Firm age* are included. *Firm dimension*, measured with logarithm of the number of employees (Carrasco *et al.*, 2015; Coffey and Wang, 1998; Smith, 2007), is considered as larger firms are more likely to have higher firm performance, which may originate from market power (Lee, 2009). *Firm age* is measured with the number of years since the firm's foundation (Marinova *et al.*, 2016; Pandey *et al.*, 2023; Ujunwa, 2012). Younger firms are expected to register lower performance as they have less market experience and generally have a higher cost structure (Ujunwa, 2012). At the same time, younger firms are more likely to grow faster (Ararat and Yurtoglu, 2021).

Control variables describing board characteristics are also included. We included *Board size*, measured as the number of directors on a firm's board of directors (Chijoke-Mgbame *et al.*, 2020; Marinova *et al.*, 2016; Saleh *et al.*, 2021). Larger boards of directors signify higher expenses, lower efficiency and more disputes in the board (Nguyen *et al.*, 2021; Ujunwa, 2012). *Board tenure* is measured as the average number of years a director is serving the board. Longer board tenure tends to be positively associated with firm performance as directors accumulate firm-specific knowledge, become more diligent in their duties and perform better in monitoring management (Livnat *et al.*, 2021; Huang and Hilary, 2018). Finally, we included *Board age*, measured as the average age of directors. Younger directors might be more risk-inclined and thus promote innovative strategies that improve firm performance, whereas older directors may be more risk-averse and conservative in selecting strategies (Shehata *et al.*, 2017).

We also accounted for the degree of innovation through the variable *Innovation*, which is a dummy variable equal to 1 if the firm holds a patent, and 0 otherwise (Andries and Faems, 2013). Innovation is recognised to positively affect firm performance (Al Naqbi et al., 2020). We also included the degree of internationalisation through the variable *Foreign Direct Investment (FDI)*, measured as the number of FDI completed by the firm (Zona et al., 2022). Internationalisation is associated with firm performance, despite previous studies finding conflicting results regarding the sign of this association (Luu et al., 2023). We also considered a measure of risk: *Risk* is measured by the standard deviation of ROA over the past five years (Miller and Chen, 2004). Risk can positively affect firm performance (Nartea et al., 2011). Moreover, as firm strategy and performance could be affected by the context (Wright et al., 2007), we considered the firm's geographical location with *North Italy* and *Centre Italy*, which are dummy variables equal to 1 if the firm is located in North Italy or Centre Italy, respectively, and 0 otherwise. Finally, as industry's characteristics (e.g. industry concentration, capital intensity, R&D intensity, industry growth rate) are expected to affect firm performance (Adetunji and Owolabi, 2016), we included dummy variables following the Pavitt Taxonomy (Bogliacino and Pianta, 2016; Pavitt, 1984): *Pavitt suppliers dominated*, *Pavitt scale and information intensive*, *Pavitt specialized supplier* and *Pavitt science based* are dummy variables equal to 1 if the firm is in a particular industry, and 0 otherwise.

5. Results

5.1 Descriptive statistics

Table 3 reports the means, standard deviations and minimum and maximum values of the variables in the full sample of firms (Panel A) and in the subsets of treated firms and non-treated firms (Panel B).

Performance indicators (i.e. ROE, ROA and ROI) exhibit different values across the three groups of firms. In the full sample of firms, *ROE* is 2.76%, *ROA* is 2.70% and *ROI* is 5.39%. Notably, non-treated firms display higher values of *ROE*, *ROA* and *ROI* compared to treated firms. *Percentage of women directors* is 17.71% in the full sample of firms, with treated firms showing a higher proportion of women directors compared to non-treated ones.

Treated firms are larger and older and are much more innovative than non-treated ones. The most substantial difference between treated and non-treated firms regards the level of internationalisation. In addition, although minor, differences exist in the industry and geographical distribution of the two samples.

5.2 Econometric results

Table 4 shows the regression results for the models, whereas Figure 2 reports the interaction graphs.

Considering the first stage, which estimates the probability of a firm being subject to the gender quota law (i.e. the probability of being treated) (Model 0) and is common to all the models, it emerges that *Firm dimension*, *Firm age* and *FDI* exhibit a positive and significant coefficient. For the geographical location, *North Italy* has a positive but not significant coefficient, whereas *Centre Italy* has a positive and significant coefficient. All dummy variables representing the Pavitt Taxonomy have a positive coefficient, but with varying levels of significance.

Focusing on the second stage of the models estimating the impact of the presence of women directors on firm performance as a function of the treatment variable (i.e. being subject to the gender quota law), in Model 1a (impact on ROE), Model 2a (impact on ROA) and Model 3a (impact on ROI), *Treated firm* shows a positive but not always significant coefficient, whereas *Presence of women directors* exhibits a positive but not always significant coefficient. Upon introducing interaction terms in Model 1b (impact on ROE), Model 2b (impact on ROA) and

Table 3 Descriptive statistics

Variables	Panel A Full sample (27,977 firms)				Panel B Treated firm (371 firms)				Panel B Non-treated firm (27,606 firms)				Wilcoxon rank test (1) vs (2)	
	Mean/%	SD	Min	Max	Mean/% (1)	SD	Min	Max	Mean/% (2)	SD	Min	Max		
Treated firm	1.33%	0.11	0	1	—	—	—	—	—	—	—	—	—	—
ROE	2.76%	13.30	-99.88%	98.19%	1.27%	12	-72.14%	98.19%	2.78%	13.31	-99.88%	98.19%	98.19%	**
ROA	2.71%	13.30	-99.88%	98.19%	1.27%	12	-72.14%	98.19%	2.73%	13.32	-99.88%	98.19%	98.19%	**
ROI	5.39%	8.06	-29.97%	30%	3.20%	8.31	-28.61%	30%	5.42%	8.06	-29.97%	30%	30%	***
Presence of women directors	17.71%	0.24	0%	100%	25.71%	0.16	0%	100%	17.60%	0.24	0%	100%	100%	***
Board size	4.27	2.67	1	39	8.32	3.75	1	39	4.22	2.61	1	39	39	***
Board age	54.27	8.01	20.00	85.00	55.24	5.25	39.25	85.00	54.25	8.04	20.00	85.00	85.00	***
Board tenure	3.64	2.27	1.00	39.00	3.03	1.34	1.00	39.00	3.64	2.28	1.00	39.00	39.00	***
Firm dimension	4.05	1.29	1.61	11.68	4.93	1.82	1.61	11.68	4.04	1.27	1.61	10.79	10.79	***
Firm age	22.53	18.86	0	188	28.94	29.62	0	188	22.45	18.66	0	165	165	***
Innovation	20.29%	0.40	0	1	47.44%	0.50	0	1	19.93%	0.4	0	1	1	***
FDI	0.32	2.74	0	155	4.27	15.51	0	155	0.27	2.04	0	111	111	***
Risk	6.38	14.71	0	569.94	5.77	17.68	0	569.94	6.39	14.67	0	569.94	569.94	***
North Italy	72.99%	0.44	0	1	75.74%	0.43	0	1	72.95%	0.44	0	1	1	***
Centre Italy	18.65%	0.39	0	1	20.22%	0.40	0	1	18.63%	0.39	0	1	1	***
South Italy	8.36%	0.28	0	1	4.04%	0.18	0	1	8.42%	0.28	0	1	1	***
Pavitt suppliers dominated	32.54%	0.47	0	1	19.68%	0.40	0	1	32.72%	0.47	0	1	1	***
Pavitt scale and information intensive	13.34%	0.34	0	1	23.72%	0.43	0	1	13.20%	0.34	0	1	1	***
Pavitt specialized supplier	26.80%	0.44	0	1	31.54%	0.47	0	1	26.74%	0.44	0	1	1	***
Pavitt science based	9.45%	0.29	0	1	18.87%	0.39	0	1	9.32%	0.29	0	1	1	***
Pavitt other	17.86%	0.38	0	1	6.20%	0.24	0	1	18.02	0.38	0	1	1	***

Notes: Wilcoxon rank test: significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Source: Authors' elaboration

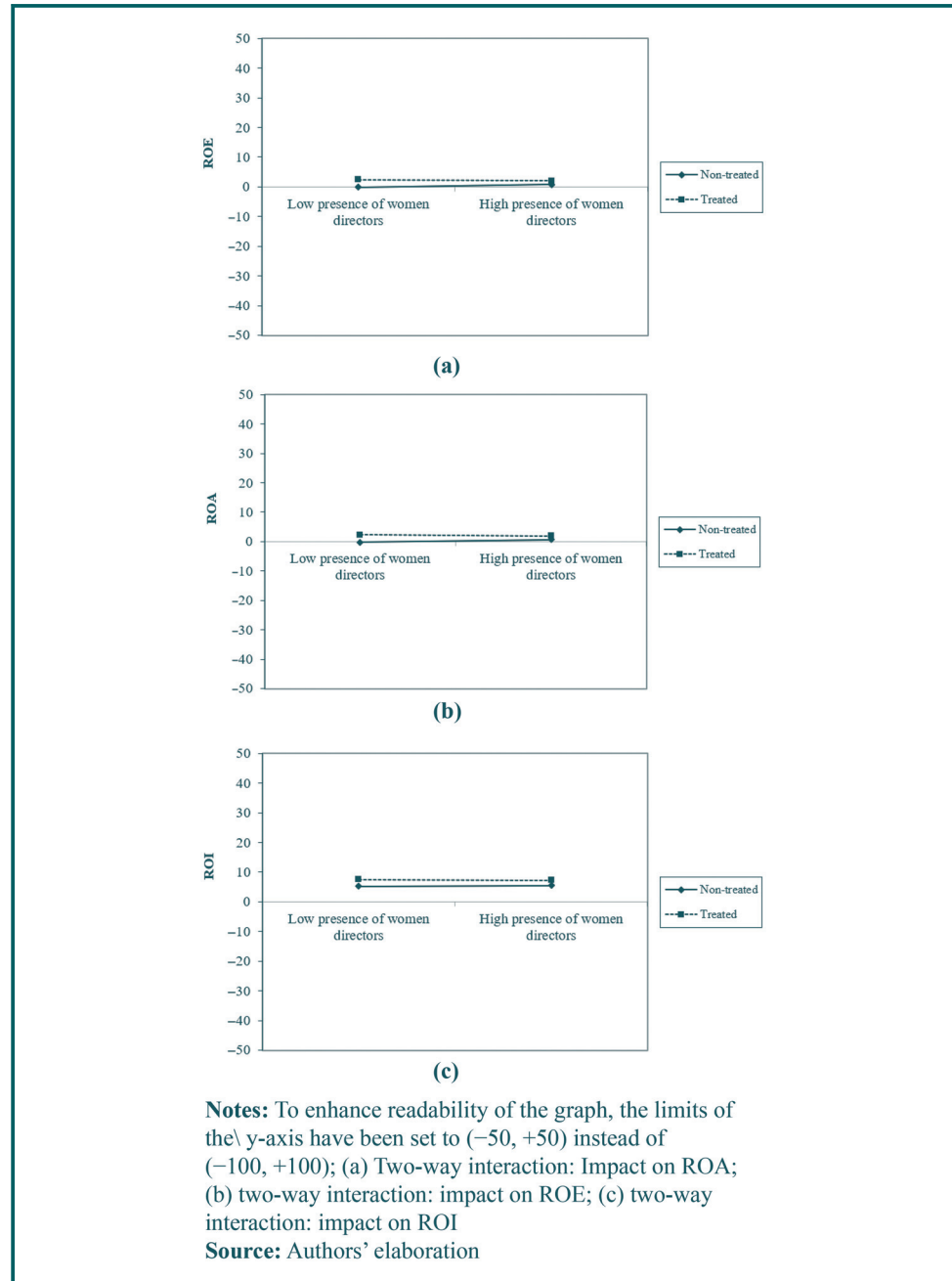
Table 4 Regression results

Variables	Model 0		Model 1a		Model 1b		Model 2a		Model 2b		Model 3a		Model 3b	
	First stage	Treated firm	Second stage	ROE	Second stage	ROE	Second stage	ROA	Second stage	ROA	Second stage	ROI	Second stage	ROI
Treated firm			4.3610 (5.0280)		10.7300* (5.5500)		4.2170 (5.033)		10.6200* (5.5580)		7.6780*** (2.905)		10.3200*** (3.1600)	
Presence of women directors			0.5380 (0.3390)		0.6000* (0.3400)		0.6000* (0.339)		0.6620* (0.3400)		0.0099 (0.2060)		0.0357 (0.2070)	
Treated firm × presence of women directors					-11.0200** (4.2920)				-11.0600** (4.3000)				-4.5690* (2.3580)	
Board size			-0.0667** (0.0321)		-0.0627* (0.0321)		-0.0716** (0.0321)		-0.0676** (0.0322)		-0.1600*** (0.0195)		-0.1590*** (0.0195)	
Board age			-0.0009 (0.0103)		-0.0007 (0.0103)		-0.00198 (0.0103)		-0.0018 (0.0103)		-0.0244*** (0.0063)		-0.0243*** (0.0063)	
Board tenure			0.2080*** (0.0363)		0.2090*** (0.0363)		0.2070*** (0.0363)		0.2080*** (0.0363)		0.0508** (0.0221)		0.0512** (0.0221)	
Firm dimension			-0.0679 (0.0689)		-0.0807 (0.0691)		-0.0696 (0.0690)		-0.0825 (0.0692)		0.0763* (0.0419)		0.0710* (0.0420)	
Firm age			0.0420*** (0.0047)		0.0419*** (0.0047)		0.0432*** (0.0047)		0.0430*** (0.0047)		0.0070** (0.0029)		0.0070** (0.0029)	
Innovation			0.3060 (0.2110)		0.3090 (0.2110)		0.3420 (0.2120)		0.3450 (0.2110)		1.002*** (0.1280)		1.004*** (0.1280)	
FDI			-0.0516 (0.0440)		-0.0684 (0.0442)		-0.0497 (0.0440)		-0.0665 (0.0443)		-0.0871*** (0.0261)		-0.0940*** (0.0261)	
Risk			-0.0830*** (0.0054)		-0.0828*** (0.0055)		-0.0816*** (0.0055)		-0.0815*** (0.0055)		-0.0106*** (0.0033)		-0.0105*** (0.0033)	
North Italy			0.1640 (0.0999)		0.2040 (0.2920)		0.2650 (0.2920)		0.2510 (0.2920)		0.0221 (0.1790)		0.0161 (0.1790)	
Centre Italy			0.1970 (0.3310)		0.1710 (0.3310)		0.2310 (0.3310)		0.2050 (0.3320)		-0.1170 (0.2020)		-0.1280 (0.2030)	
Pavitt suppliers dominated			0.6920*** (0.2360)		0.6870*** (0.2360)		0.7950*** (0.2360)		0.7900*** (0.2360)		0.9500*** (0.1440)		0.9480*** (0.1450)	
Pavitt scale and information intensive			1.0240*** (0.3000)		0.9760*** (0.3010)		1.1520*** (0.3000)		1.1030*** (0.3010)		-0.5060*** (0.1830)		-0.5260*** (0.1840)	
Pavitt specialized supplier			0.4430*** (0.0841)		0.7520*** (0.2500)		0.8290*** (0.2500)		0.7990*** (0.2510)		-0.1240 (0.1530)		-0.1370 (0.1530)	
Pavitt science based			1.6180*** (0.3400)		1.5380*** (0.3420)		1.7330*** (0.3400)		1.653*** (0.3420)		0.8400*** (0.2070)		0.8070*** (0.2080)	
Constant			-3.4730*** (0.1370)		1.0960 (0.6970)		0.9510 (0.6970)		0.9590 (0.6970)		6.253*** (0.4240)		6.2560*** (0.4250)	
Observations			27,977		27,977		27,977		27,977		27,977		27,977	
Lambda			-2.4630 (2.0140)		-3.9170* (2.0660)		-2.3900 (2.0160)		-3.8500* (2.0690)		-3.8270*** (1.1620)		-4.4300*** (1.1800)	
rho			-0.1866		-0.2962		-0.1811		-0.2911		-0.4737		-0.5467	

Notes: Standard errors in parentheses * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Source: Authors' elaboration

Figure 2 Interaction graphs



Model 3b (impact on ROI), *Treated firm* always shows a positive and significant coefficient, whereas *Presence of women directors* exhibits a positive but not always significant coefficient. The interaction term *Treated firm* × *Presence of women directors* always has a negative and significant coefficient. These interaction effects are illustrated in Figure 2. In summary, the presence of women directors in firms subject to the gender quota law has a negative impact on firm performance (measured with ROE, ROA and ROI).

Other control variables yielded interesting results (Table 4).

6. Discussion and conclusion

The present study aimed to clarify the impact of gender quota laws on firm performance by adopting the theoretical lens of the “business case” rationale and the resource-based theory (Barney, 1991, 1996) and by using a counterfactual approach on a sample of 27,977 Italian firms.

We found that gender quota laws have a negative effect on firm performance. This result is in line with Böhren and Staubo (2016) and Yang *et al.* (2019), who find that the introduction of gender quota laws diminishes firm performance. This result is also in line with the literature according to which gender quota laws may have negative effects at the firm level. This literature suggests that, following the introduction of these laws, less-qualified women may be appointed, especially when there are no or few women who qualify for the position (Comi *et al.*, 2020; Ferrari *et al.*, 2022), so that appointed women may be considered “decorative additions” and not heard (Fitzsimmons, 2012; Leszczyńska, 2018) and an efficient board of directors may be changed with negative consequences on its functioning (Ferrari *et al.*, 2022; Hamplová *et al.*, 2022; Leszczyńska, 2018). However, the scarcity of women qualified to serve as directors does not seem to be an issue in Italy, which is instead characterised by an excess supply of qualified women (Comi *et al.*, 2020) considering that the gender quota law applies to a very small portion of Italian firms (about 375 out of nearly 220,000 firms with more than 10 employees active in 2019; Istat, 2021).

A more plausible explanation for the negative impact of gender quota laws on firm performance seems to be related to the influence of external factors. The relationship between gender quota laws and firm performance is complex and not “unambiguously determined” (Comi *et al.*, 2020), so that it is extremely difficult to disentangle the impact of each factor on firm performance when assessing the impact of gender quota laws. Therefore, the negative impact of gender quota laws on firm performance may not be solely due to the mandatory inclusion of women on the board of directors but also to other moderating factors regarding the firm or the country. Such factors include, for example, board gender independence, CEO duality, firm’s orientation towards corporate social responsibility, national culture and national governance quality (Naghavi *et al.*, 2021; Nguyen *et al.*, 2021; Pandey *et al.*, 2023; Saleh *et al.*, 2021). In the case of Italy, the level of gender equality could explain the results of our analysis. Gender equality in Italy needs to be improved and women may face gendered barriers within the firm and in the external context. Specifically, Italian women directors risk not being listened to, being a symbol without power and visibility, not receiving recognition for their contribution and not being considered as their men counterparts (Bannò *et al.*, 2023). This can limit the ability of women directors to realise their full potential and negatively affect their effectiveness, with the consequence that their impact on firm performance becomes null or even negative. The study by Amore *et al.* (2014) supports this view: in their analysis of the effect of gender interactions at the top of the corporate hierarchy on the performance of Italian family firms, they find that the positive impact of women is reduced when the firm is located in geographic areas characterised by gender prejudices.

Important managerial and policy implications can be derived from this analysis. This study advises firms that the imposition of a gender quota law can negatively affect firm performance. According to existing literature (Comi *et al.*, 2020; Ferrari *et al.*, 2022), some reasons may include the appointment of less qualified women or the change of an efficient board of directors. Faced with the imposition of a gender quota law, firms must bear in mind that appointing women directors to comply with the law may need to be accompanied by other organisational adjustments to ensure that women directors can bring, in line with the “business case” rationale, economic benefits to the firm. In particular, firms must ensure that the appointed women directors can bring their different (i.e. heterogeneous) and unique skills, knowledge, ideas, viewpoints and networks to the board of directors (Atinc *et al.*, 2022; Di Donato *et al.*, 2016; Ferrari *et al.*, 2022), thus allowing, for instance, better and more transparent corporate governance processes (Kirsch, 2021; Terjesen *et al.*, 2009), better understanding and satisfaction of the interests and needs of firm stakeholders and clients (Pastore and Tommaso, 2016) and better monitoring and vigilance over firm activities (Mateos de Cabo

et al., 2019). Only in this way can firms fully benefit from the inclusion of women on the board of directors, avoiding potential negative impacts on firm performance. Concurrently, policymakers should assist firms in implementing the advisable organisational changes and empowering women directors. It is desirable that the imposition of gender quota laws does not have negative effects on firms but rather encourages the inclusion of new valuable resources and perspectives that can enhance firm performance. Moreover, policymakers should keep in mind that gender quota laws may not be the best solution to change social structures impeding gender equality in leadership positions and on firms' boards of directors (Strøm, 2019). Therefore, policymakers should supplement these laws with additional incentives to further encourage the presence of women within firms. Some examples could include offering tax incentives or economic advantages in public tenders to firms that exceed a certain threshold of women's participation at all hierarchical levels. Moreover, instead of legislative interventions at the firm level, policymakers should prefer a broader approach aimed at improving gender equality at the societal level. This could indeed be a first step towards promoting the inclusion of women in leadership positions within firms without resorting to mandates and constraints.

This study has some limitations. Firstly, as already stated, the relationship between gender quota laws and firm performance is complex (Comi *et al.*, 2020) and the effect of women directors on firm performance may be influenced by the specific characteristics of women directors (Rubino *et al.*, 2021) such as their qualifications, skills, knowledge, educational background and nationality. In addition, other factors like board efficiency or the presence of a woman CEO may play a role. The failure to account for these factors represents a primary limitation of this study, which could be addressed in future research. Secondly, we measured firm performance only using financial statement ratios (i.e. ROE, ROA and ROI). Despite these measures being as adequate as market-based indicators such as Tobin's *Q* (Dale-Olsen *et al.*, 2013), it is important to note that the sole reliance on financial statement ratios serves as a limitation. Future research should replicate the analysis, incorporating market-based indicators as well. Thirdly, this study used a quantitative approach. Future studies could adopt a mixed-method approach to unveil the underlying mechanisms and consider diverse factors that moderate the relationship between gender quota laws and firm performance. Finally, the study focused on the Italian context. Future research should extend their analysis to other institutional settings, as the findings of this study may not necessarily be generalisable across different contexts.

We firmly advocate for the implementation of gender quota laws, recognising their significant role in enhancing the representation of women on board of directors (Kirsch, 2021) and fostering gender equality (Hamplová *et al.*, 2022). In this regards, gender quota laws have been successful (Dale-Olsen *et al.*, 2013). We believe that the negative impact of gender quota laws on firm performance should not be the focus when evaluating for or against introducing these laws.

Despite gender quota laws being a success, solely relying on them is insufficient to drive meaningful societal change. Policymakers should focus on enhancing the mechanisms through which women are integrated into the board of directors, ensuring that their appointments are not merely token gestures but reflective of genuine inclusivity. In essence, although gender quota laws represent a significant step forward, they should be complemented with broader strategies aimed at fostering a culture of inclusivity and equality within corporate governance.

Notes

- 1 Ben Slama *et al.* (2019), who investigate the effect of a voluntary approach, find that this approach decreases ROA for poorly performing firms, whereas it has the opposite effect for high-performing firms.
- 2 On the contrary, if an inefficient board of directors is changed, gender quota laws have a positive impact (Ferrari *et al.*, 2022).
- 3 At the end of 2019, there were 375 listed Italian firms (Borsa Italiana, 2019). However, for four out of these 375 firms, information on board composition could not be retrieved from the Orbis Bureau van Dijk database. Consequently, our database includes 371 out of 375 listed Italian firms.

- 4 In these models, the programme impact is estimated by studying the treated sample before and after treatment (Bartik and Bingham, 1995).
- 5 In this family, the programme impact is estimated by studying the treated sample and the non-treated sample (Bartik and Bingham, 1995).

References

- Adetunji, O.M. and Owolabi, A.A. (2016), "Firm performance and its drivers: how important are the industry and firm-level factors?" *International Journal of Economics and Finance*, Vol. 8 No. 11, p. 60, doi: [10.5539/ijef.v8n11p60](https://doi.org/10.5539/ijef.v8n11p60).
- Ahern, K.R. and Dittmar, A.K. (2012), "The changing of the boards: the impact on firm valuation of mandated female board representation", *The Quarterly Journal of Economics*, Vol. 127 No. 1, pp. 137-197, doi: [10.1093/qje/qjr049](https://doi.org/10.1093/qje/qjr049).
- Al Naqbi, E., Alshurideh, M., AlHamad, A. and Al Kurdi, B. (2020), "The impact of innovation on firm performance: a systematic review", *International Journal of Innovation, Creativity and Change*, Vol. 14 No. 5, pp. 31-58.
- Amore, M.D., Garofalo, O. and Minichilli, A. (2014), "Gender interactions within the family firm", *Management Science*, Vol. 60 No. 5, pp. 1083-1097, doi: [10.1287/mnsc.2013.1824](https://doi.org/10.1287/mnsc.2013.1824).
- Andries, P. and Faems, D. (2013), "Patenting activities and firm performance: does firm size matter?" *Journal of Product Innovation Management*, Vol. 30 No. 6, pp. 1089-1098, doi: [10.1111/jpim.12047](https://doi.org/10.1111/jpim.12047).
- Ararat, M. and Yurtoglu, B.B. (2021), "Female directors, board committees, and firm performance: time-series evidence from Turkey", *Emerging Markets Review*, Vol. 48, p. 100768, doi: [10.1016/j.ememar.2020.100768](https://doi.org/10.1016/j.ememar.2020.100768).
- Arvanitis, S.E., Varouchas, E.G. and Agiomirgianakis, G.M. (2022), "Does board gender diversity really improve firm performance? Evidence from Greek listed firms", *Journal of Risk and Financial Management*, Vol. 15 No. 7, p. 306, doi: [10.3390/jrfm15070306](https://doi.org/10.3390/jrfm15070306).
- Assenga, M.P., Aly, D. and Hussainey, K. (2018), "The impact of board characteristics on the financial performance of Tanzanian firms", *Corporate Governance: The International Journal of Business in Society*, Vol. 18 No. 6, pp. 1089-1106, doi: [10.1108/CG-09-2016-0174](https://doi.org/10.1108/CG-09-2016-0174).
- Atinc, G., Srivastava, S. and Taneja, S. (2022), "The impact of gender quotas on corporate boards: a cross-country comparative study", *Journal of Management and Governance*, Vol. 26 No. 3, pp. 685-706, doi: [10.1007/s10997-020-09562-6](https://doi.org/10.1007/s10997-020-09562-6).
- Azmat, G. and Boring, A. (2020), "Gender diversity in firms", *Oxford Review of Economic Policy*, Vol. 36 No. 4, pp. 760-782, doi: [10.1093/oxrep/graa043](https://doi.org/10.1093/oxrep/graa043).
- Bannò, M., D'Allura, G.M. and Filippi, E. (2023), "Women and international strategy: preliminary results", *Sinergie Italian Journal of Management*, Vol. 41 No. 2, pp. 77-100, doi: [10.7433/s121.2023.05](https://doi.org/10.7433/s121.2023.05).
- Barney, J. (1991), "Special theory forum. The resource-based model of the firm: origins, implications, and prospects", *Journal of Management*, Vol. 17 No. 1, pp. 97-98, doi: [10.1177/014920639101700107](https://doi.org/10.1177/014920639101700107).
- Barney, J.B. (1996), "The resource-based theory of the firm", *Organization Science*, Vol. 7 No. 5, pp. 469-469, doi: [10.1287/orsc.7.5.469](https://doi.org/10.1287/orsc.7.5.469).
- Bartik, T.J. and Bingham, R.D. (1995), *Can Economic Development Programs Be Evaluated?*, Upjohn Institute Working Paper No. 95-29, W.E. Upjohn Institute for Employment Research, Kalamazoo, Michigan, doi: [10.17848/wp95-29](https://doi.org/10.17848/wp95-29).
- Ben Slama, R., Ajina, A. and Lakhali, F. (2019), "Board gender diversity and firm financial performance in France: empirical evidence using quantile difference-in-differences and dose-response models", *Cogent Economics & Finance*, Vol. 7 No. 1, p. 1626526, doi: [10.1080/23322039.2019.1626526](https://doi.org/10.1080/23322039.2019.1626526).
- Bernardi, R.A., Bean, D.F. and Weippert, K.M. (2002), "Signaling gender diversity through annual report pictures: a research note on image management", *Accounting, Auditing & Accountability Journal*, Vol. 15 No. 4, pp. 609-616, doi: [10.1108/09513570210441440](https://doi.org/10.1108/09513570210441440).
- Bogliacino, F. and Pianta, M. (2016), "The Pavitt Taxonomy, revisited: patterns of innovation in manufacturing and services", *Economia Politica*, Vol. 33 No. 2, pp. 153-180, doi: [10.1007/s40888-016-0035-1](https://doi.org/10.1007/s40888-016-0035-1).
- Bøhren, Ø. and Staubo, S. (2016), "Mandatory gender balance and board independence: mandatory gender balance and board independence", *European Financial Management*, Vol. 22 No. 1, pp. 3-30, doi: [10.1111/eufm.12060](https://doi.org/10.1111/eufm.12060).

Bondonio, D. (2000), "Metodi per La valutazione degli aiuti alle imprese con specifico target territoriale", Working Paper No. 14, Dipartimento di Politiche Pubbliche e Scelte Collettive, Università del Piemonte Orientale "A. Avogadro".

Borsa Italiana (2019), "Review dei mercati 2019", 30 December.

Campbell, K. and Minguez Vera, A. (2010), "Female board appointments and firm valuation: short and long-term effects", *Journal of Management & Governance*, Vol. 14 No. 1, pp. 37-59, doi: [10.1007/s10997-009-9092-y](https://doi.org/10.1007/s10997-009-9092-y).

Carrasco, A., Francoeur, C., Labelle, R., Laffarga, J. and Ruiz-Barbadillo, E. (2015), "Appointing women to boards: is there a cultural bias?" *Journal of Business Ethics*, Vol. 129 No. 2, pp. 429-444, doi: [10.1007/s10551-014-2166-z](https://doi.org/10.1007/s10551-014-2166-z).

Carter, D.A., D'Souza, F., Simkins, B.J. and Simpson, W.G. (2010), "The gender and ethnic diversity of US boards and board committees and firm financial performance", *Corporate Governance: An International Review*, Vol. 18 No. 5, pp. 396-414, doi: [10.1111/j.1467-8683.2010.00809.x](https://doi.org/10.1111/j.1467-8683.2010.00809.x).

Certo, S.T., Busenbark, J.R., Woo, H. and Semadeni, M. (2016), "Sample selection bias and Heckman models in strategic management research", *Strategic Management Journal*, Vol. 37 No. 13, pp. 2639-2657, doi: [10.1002/smj.2475](https://doi.org/10.1002/smj.2475).

Chijoke-Mgbame, A.M., Boateng, A. and Mgbame, C.O. (2020), "Board gender diversity, audit committee and financial performance: evidence from Nigeria", *Accounting Forum*, Vol. 44 No. 3, pp. 262-286, doi: [10.1080/01559982.2020.1766280](https://doi.org/10.1080/01559982.2020.1766280).

Coffey, B.S. and Wang, J. (1998), "Board diversity and managerial control as predictors of corporate social performance", *Journal of Business Ethics*, Vol. 17 No. 14, pp. 1595-1603, doi: [10.1023/A:1005748230228](https://doi.org/10.1023/A:1005748230228).

Comi, S., Grasseni, M., Origo, F. and Pagani, L. (2020), "Where women make a difference: gender quotas and firms' performance in three European Countries", *ILR Review*, Vol. 73 No. 3, pp. 768-793, doi: [10.1177/0019793919846450](https://doi.org/10.1177/0019793919846450).

Cong, R. and Drukker, D.M. (2000), "Treatment effects model", *Stata Technical Bulletin*, Vol. 55, pp. 1-60.

Crano, W.D. (1991), "Pitfalls associated with the use of financial incentives (and other complex manipulations) in human social research", *Basic and Applied Social Psychology*, Vol. 12 No. 4, pp. 369-390, doi: [10.1207/s15324834bas1204_1](https://doi.org/10.1207/s15324834bas1204_1).

Dale-Olsen, H., Schøne, P. and Verner, M. (2013), "Diversity among Norwegian boards of directors: does a quota for women improve firm performance?" *Feminist Economics*, Vol. 19 No. 4, pp. 110-135, doi: [10.1080/13545701.2013.830188](https://doi.org/10.1080/13545701.2013.830188).

De Masi, S., Słomka-Golebiowska, A. and Paci, A. (2018), "Women do the job: the reasons to set quota for women on boards", *International Journal of Business and Management*, Vol. 13 No. 12, pp. 167-179, doi: [10.5539/ijbm.v13n12p167](https://doi.org/10.5539/ijbm.v13n12p167).

De Vita, L. and Magliocco, A. (2018), "Effects of gender quotas in Italy: a first impact assessment in the Italian banking sector", *International Journal of Sociology and Social Policy*, Vol. 38 Nos 7/8, pp. 673-694, doi: [10.1108/IJSSP-11-2017-0150](https://doi.org/10.1108/IJSSP-11-2017-0150).

Di Donato, F., Panaro, D. and Trucco, S. (2016), "Board gender diversity, network and firms' performance in the Italian listed companies", *International Journal of Business and Management*, Vol. 11 No. 10, p. 332, doi: [10.5539/ijbm.v11n10p332](https://doi.org/10.5539/ijbm.v11n10p332).

Dwyer, P.D., Gilkeson, J.H. and List, J. (2002), "Gender differences in revealed risk taking: evidence from mutual fund investors", *Economics Letters*, Vol. 76 No. 2, pp. 151-158, doi: [10.1016/S0165-1765\(02\)00045-9](https://doi.org/10.1016/S0165-1765(02)00045-9).

Eckbo, B.E., Nygaard, K. and Thorburn, K.S. (2022), "Valuation effects of Norway's board gender-quota law revisited", *Management Science*, Vol. 68 No. 6, pp. 4112-4134, doi: [10.1287/mnsc.2021.4031](https://doi.org/10.1287/mnsc.2021.4031).

Erhardt, N.L., Werbel, J.D. and Shrader, C.B. (2003), "Board of director diversity and firm financial performance", *Corporate Governance: An International Review*, Vol. 11 No. 2, pp. 102-111, doi: [10.1111/1467-8683.00011](https://doi.org/10.1111/1467-8683.00011).

European Institute for Gender Equality (2020), "Gender equality index 2020 Italy".

Faccio, M., Marchica, M.-T. and Mura, R. (2016), "CEO gender, corporate risk-taking, and the efficiency of capital allocation", *Journal of Corporate Finance*, Vol. 39, pp. 193-209, doi: [10.1016/j.jcorpfin.2016.02.008](https://doi.org/10.1016/j.jcorpfin.2016.02.008).

- Ferrari, G., Ferraro, V., Profeta, P. and Pronzato, C. (2022), "Do board gender quotas matter? Selection, performance, and stock market effects", *Management Science*, Vol. 68 No. 8, pp. 5618-5643, doi: [10.1287/mnsc.2021.4200](https://doi.org/10.1287/mnsc.2021.4200).
- Ferraro, P.J. (2009), "Counterfactual thinking and impact evaluation in environmental policy", *New Directions for Evaluation*, Vol. 2009 No. 122, pp. 75-84, doi: [10.1002/ev.297](https://doi.org/10.1002/ev.297).
- Ferreira, D. (2015), "Board diversity: should we trust research to inform policy?" *Corporate Governance: An International Review*, Vol. 23 No. 2, pp. 108-111, doi: [10.1111/corg.12092](https://doi.org/10.1111/corg.12092).
- Fitzsimmons, S.R. (2012), "Women on boards of directors: why skirts in seats aren't enough", *Business Horizons*, Vol. 55 No. 6, pp. 557-566, doi: [10.1016/j.bushor.2012.07.003](https://doi.org/10.1016/j.bushor.2012.07.003).
- Freidenvall, L. and Hallonsten, H. (2013), "Why not corporate gender quotas in Sweden?" *Representation*, Vol. 49 No. 4, pp. 467-485, doi: [10.1080/00344893.2013.859349](https://doi.org/10.1080/00344893.2013.859349).
- Gallego-Álvarez, I., García-Sánchez, I.M. and Rodríguez-Dominguez, L. (2010), "The influence of gender diversity on corporate performance", *Revista de Contabilidad*, Vol. 13 No. 1, pp. 53-88, doi: [10.1016/S1138-4891\(10\)70012-1](https://doi.org/10.1016/S1138-4891(10)70012-1).
- García-Blandon, J., Argilés-Bosch, J.M., Ravenda, D. and Rodríguez-Pérez, G. (2023), "Female directors, board-gender quotas and firm performance: evidence from Norway", *Economic Research-Ekonomska Istraživanja*, Vol. 36 No. 2, p. 2142822, doi: [10.1080/1331677X.2022.2142822](https://doi.org/10.1080/1331677X.2022.2142822).
- Gramillano, A. (2012), "Combined approach of evaluation tools for regional policy innovation—the case of Marche region", Vol. Regional Study Conference.
- Greene, W.H. (2011), *Econometric Analysis*, Prentice Hall, Englewood Cliffs, NJ.
- Greene, D., Intintoli, V.J. and Kahle, K.M. (2020), "Do board gender quotas affect firm value? Evidence from California Senate Bill No. 826", *Journal of Corporate Finance*, Vol. 60, p. 101526, doi: [10.1016/j.jcorpfin.2019.101526](https://doi.org/10.1016/j.jcorpfin.2019.101526).
- Guizani, M. and Abdalkrim, G. (2022), "Board gender diversity, financial decisions and free cash flow: empirical evidence from Malaysia", *Management Research Review*, Vol. 45 No. 2, pp. 198-216, doi: [10.1108/MRR-03-2021-0246](https://doi.org/10.1108/MRR-03-2021-0246).
- Hamplová, E., Janeček, V. and Lefley, F. (2022), "Board gender diversity and women in leadership positions – are quotas the solution?" *Corporate Communications: An International Journal*, Vol. 27 No. 4, pp. 742-759, doi: [10.1108/CCIJ-02-2022-0022](https://doi.org/10.1108/CCIJ-02-2022-0022).
- Hazaea, S.A., Al-Matari, E.M., Farhan, N.H.S. and Zhu, J. (2023), "The impact of board gender diversity on financial performance: a systematic review and agenda for future research", *Corporate Governance: The International Journal of Business in Society*, Vol. 23 No. 7, pp. 1716-1747, doi: [10.1108/CG-07-2022-0302](https://doi.org/10.1108/CG-07-2022-0302).
- Heckman, J.J. (1979), "Sample selection bias as a specification error", *Econometrica*, Vol. 47 No. 1, pp. 153-161.
- Hogg, M.A., Turner, J.C. and Davidson, B. (1990), "Polarized norms and social frames of reference: a test of the self-categorization theory of group polarization", *Basic and Applied Social Psychology*, Vol. 11 No. 1, pp. 77-100, doi: [10.1207/s15324834basp1101_6](https://doi.org/10.1207/s15324834basp1101_6).
- Huang, S. and Hilary, G. (2018), "Zombie board: board tenure and firm performance", *Journal of Accounting Research*, Vol. 56 No. 4, pp. 1285-1329, doi: [10.1111/1475-679X.12209](https://doi.org/10.1111/1475-679X.12209).
- Isidro, H. and Sobral, M. (2015), "The effects of women on corporate boards on firm value, financial performance, and ethical and social compliance", *Journal of Business Ethics*, Vol. 132 No. 1, pp. 1-19, doi: [10.1007/s10551-014-2302-9](https://doi.org/10.1007/s10551-014-2302-9).
- Istat (2021), "Conti economici delle imprese e dei gruppi di impresa", Anno 2019, available at: www.istat.it/it/files/2021/11/Report-Conti-economici-imprese-e-gruppi_2019.pdf
- Jiang, L., Cherian, J., Sial, M.S., Wan, P., Filipe, J.A., Mata, M.N. and Chen, X. (2021), "The moderating role of CSR in board gender diversity and firm financial performance: empirical evidence from an emerging economy", *Economic Research-Ekonomska Istraživanja*, Vol. 34 No. 1, pp. 2354-2373, doi: [10.1080/1331677X.2020.1863829](https://doi.org/10.1080/1331677X.2020.1863829).
- Joecks, J., Pull, K. and Vetter, K. (2013), "Gender diversity in the boardroom and firm performance: what exactly constitutes a 'critical mass'?" *Journal of Business Ethics*, Vol. 118 No. 1, pp. 61-72, doi: [10.1007/s10551-012-1553-6](https://doi.org/10.1007/s10551-012-1553-6).
- Kirsch, A. (2021), "Women on board. Policies in member states and the effects on corporate governance", European Parliament.

- Kogut, B., Colomer, J. and Belinky, M. (2014), "Structural equality at the top of the corporation: mandated quotas for women directors: research notes and commentaries", *Strategic Management Journal*, Vol. 35 No. 6, pp. 891-902, doi: [10.1002/smj.2123](https://doi.org/10.1002/smj.2123).
- Latura, A. and Weeks, A.C. (2022), "Corporate board quotas and gender equality policies in the workplace", *American Journal of Political Science*, Vol. 67 No. 3, p. 12709, doi: [10.1111/ajps.12709](https://doi.org/10.1111/ajps.12709).
- Lee, M. (2005), *Micro-Econometrics for Policy, Program and Treatment Effects*, 1st ed. Oxford University Press, Oxford, doi: [10.1093/0199267693.001.0001](https://doi.org/10.1093/0199267693.001.0001).
- Lee, J. (2009), "Does size matter in firm performance? Evidence from US public firms", *International Journal of the Economics of Business*, Vol. 16 No. 2, pp. 189-203, doi: [10.1080/13571510902917400](https://doi.org/10.1080/13571510902917400).
- Lee-Kuen, I.Y., Chan, S.-G. and Zainudin, R. (2017), "Gender diversity and firms' financial performance in Malaysia", *Asian Academy of Management Journal of Accounting and Finance*, Vol. 13 No. 1, pp. 41-62, doi: [10.21315/aamjaf2017.13.1.2](https://doi.org/10.21315/aamjaf2017.13.1.2).
- Leszczyńska, M. (2018), "Mandatory quotas for women on boards of directors in the European Union: harmful to or good for company performance?" *European Business Organization Law Review*, Vol. 19 No. 1, pp. 35-61, doi: [10.1007/s40804-017-0095-x](https://doi.org/10.1007/s40804-017-0095-x).
- Lim, K.P., Lye, C.-T., Yuen, Y.Y. and Teoh, W.M.Y. (2019), "Women directors and performance: evidence from Malaysia", *Equality, Diversity and Inclusion: An International Journal*, Vol. 38 No. 8, pp. 841-856, doi: [10.1108/EDI-02-2019-0084](https://doi.org/10.1108/EDI-02-2019-0084).
- Livnat, J., Smith, G., Suslava, K. and Tarlie, M. (2021), "Board tenure and firm performance", *Global Finance Journal*, Vol. 47, p. 100535, doi: [10.1016/j.gfj.2020.100535](https://doi.org/10.1016/j.gfj.2020.100535).
- Luu, T.D., Trinh, L.A., Nguyen, T.P.B., Ngo, N.L.C., Le, N.P.N. and Vu, N.V. (2023), "Degree of internationalisation and firm performance: the flattening role of organisational slack resources", *Review of International Business and Strategy*, Vol. 33 No. 5, pp. 889-908, doi: [10.1108/RIBS-03-2022-0030](https://doi.org/10.1108/RIBS-03-2022-0030).
- Ma, W. and Abdulai, A. (2017), "The economic impacts of agricultural cooperatives on smallholder farmers in rural China", *Agribusiness*, Vol. 33 No. 4, pp. 537-551, doi: [10.1002/agr.21522](https://doi.org/10.1002/agr.21522).
- Marinova, J., Plantenga, J. and Remery, C. (2016), "Gender diversity and firm performance: evidence from Dutch and Danish boardrooms", *The International Journal of Human Resource Management*, Vol. 27 No. 15, pp. 1777-1790, doi: [10.1080/09585192.2015.1079229](https://doi.org/10.1080/09585192.2015.1079229).
- Mariotti, S. and Mutinelli, M. (2017), "Italia multinazionale 2017: le partecipazioni italiane all'estero Ed estere in Italia", ICE - Agenzia per la promozione all'estero e l'internazionalizzazione delle imprese italiane.
- Martinez-Jimenez, R., Hernández-Ortiz, M.J. and Cabrera Fernández, A.I. (2020), "Gender diversity influence on board effectiveness and business performance", *Corporate Governance: The International Journal of Business in Society*, Vol. 20 No. 2, pp. 307-323, doi: [10.1108/CG-07-2019-0206](https://doi.org/10.1108/CG-07-2019-0206).
- Mateos de Cabo, R., Terjesen, S., Escot, L. and Gimeno, R. (2019), "Do 'soft law' board gender quotas work? Evidence from a natural experiment", *European Management Journal*, Vol. 37 No. 5, pp. 611-624, doi: [10.1016/j.emj.2019.01.004](https://doi.org/10.1016/j.emj.2019.01.004).
- Matsa, D.A. and Miller, A.R. (2013), "A female style in corporate leadership? Evidence from quotas", *American Economic Journal: Applied Economics*, Vol. 5 No. 3, pp. 136-169, doi: [10.1257/app.5.3.136](https://doi.org/10.1257/app.5.3.136).
- Mazzotta, R. and Ferraro, O. (2020), "Does the gender quota law affect bank performances? Evidence from Italy", *Corporate Governance: The International Journal of Business in Society*, Vol. 20 No. 6, pp. 1135-1158, doi: [10.1108/CG-08-2019-0252](https://doi.org/10.1108/CG-08-2019-0252).
- Miller, K.D. and Chen, W.-R. (2004), "Variable organizational risk preferences: tests of the March-Shapira model", *Academy of Management Journal*, Vol. 47 No. 1, pp. 105-115, doi: [10.2307/20159563](https://doi.org/10.2307/20159563).
- Naghavi, N., Pahlevan Sharif, S. and Iqbal Hussain, H.B. (2021), "The role of national culture in the impact of board gender diversity on firm performance: evidence from a multi-country study", *Equality, Diversity and Inclusion: An International Journal*, Vol. 40 No. 5, pp. 631-650, doi: [10.1108/EDI-04-2020-0092](https://doi.org/10.1108/EDI-04-2020-0092).
- Nartea, G.V., Ward, B.D. and Yao, L.J. (2011), "Idiosyncratic volatility and cross-sectional stock returns in Southeast Asian stock markets", *Accounting & Finance*, Vol. 51 No. 4, pp. 1031-1054, doi: [10.1111/j.1467-629X.2010.00384.x](https://doi.org/10.1111/j.1467-629X.2010.00384.x).
- Nguyen, T.H.H., Ntim, C.G. and Malagila, J.K. (2020), "Women on corporate boards and corporate financial and non-financial performance: a systematic literature review and future research agenda", *International Review of Financial Analysis*, Vol. 71, p. 101554, doi: [10.1016/j.irfa.2020.101554](https://doi.org/10.1016/j.irfa.2020.101554).

- Nguyen, T., Nguyen, A., Nguyen, M. and Truong, T. (2021), "Is national governance quality a key moderator of the boardroom gender diversity-firm performance relationship? International evidence from a multi-hierarchical analysis", *International Review of Economics & Finance*, Vol. 73, pp. 370-390, doi: [10.1016/j.iref.2021.01.013](https://doi.org/10.1016/j.iref.2021.01.013).
- Ntim, C.G. (2015), "Board diversity and organizational valuation: unravelling the effects of ethnicity and gender", *Journal of Management & Governance*, Vol. 19 No. 1, pp. 167-195, doi: [10.1007/s10997-013-9283-4](https://doi.org/10.1007/s10997-013-9283-4).
- Nygaard, K. (2011), "Forced board changes: evidence from Norway", *SSRN Electronic Journal*, doi: [10.2139/ssrn.1793227](https://doi.org/10.2139/ssrn.1793227).
- Uni, Z., Ben Mansour, J. and Arfaoui, S. (2020), "Board/executive gender diversity and firm financial performance in Canada: the mediating role of environmental, social, and governance (ESG) orientation", *Sustainability*, Vol. 12 No. 20, p. 8386, doi: [10.3390/su12208386](https://doi.org/10.3390/su12208386).
- Pandey, N., Kumar, S., Post, C., Goodell, J.W. and García-Ramos, R. (2023), "Board gender diversity and firm performance: a complexity theory perspective", *Asia Pacific Journal of Management*, Vol. 40 No. 3, pp. 1289-1320, doi: [10.1007/s10490-022-09817-w](https://doi.org/10.1007/s10490-022-09817-w).
- Pastore, P. and Tommaso, S. (2016), "Women on corporate boards. The case of 'gender quotas' in Italy", *Corporate Ownership and Control*, Vol. 13 No. 4, pp. 132-155, doi: [10.22495/cocv13i4p13](https://doi.org/10.22495/cocv13i4p13).
- Pavitt, K. (1984), "Sectoral patterns of technical change: towards a taxonomy and a theory", *Research Policy*, Vol. 13 No. 6, pp. 343-373, doi: [10.1016/0048-7333\(84\)90018-0](https://doi.org/10.1016/0048-7333(84)90018-0).
- Piscopo, J.M. and Clark Muntean, S. (2018), "Corporate quotas and symbolic politics in advanced democracies", *Journal of Women, Politics & Policy*, Vol. 39 No. 3, pp. 285-309, doi: [10.1080/1554477X.2018.1477396](https://doi.org/10.1080/1554477X.2018.1477396).
- Pletzer, J.L., Nikolova, R., Kedzior, K.K. and Voelpel, S.C. (2015), "Does gender matter? Female representation on corporate boards and firm financial performance - a meta-analysis", *Plos One*, Vol. 10 No. 6, p. e0130005, doi: [10.1371/journal.pone.0130005](https://doi.org/10.1371/journal.pone.0130005).
- Profeta, P., Aliberti, L.A., Casarico, A., D'Amico, M. and Puccio, A. (2014), "Women directors", *The Italian Way and Beyond*, Palgrave Macmillan, London, doi: [10.1057/9781137427489](https://doi.org/10.1057/9781137427489).
- Reguera-Alvarado, N., De Fuentes, P. and Laffarga, J. (2017), "Does board gender diversity influence financial performance? Evidence from Spain", *Journal of Business Ethics*, Vol. 141 No. 2, pp. 337-350, doi: [10.1007/s10551-015-2735-9](https://doi.org/10.1007/s10551-015-2735-9).
- Rubino, F.E., Tenuta, P. and Cambrea, D.R. (2021), "Five shades of women: evidence from Italian listed firms", *Meditari Accountancy Research*, Vol. 29 No. 7, pp. 54-74, doi: [10.1108/MEDAR-10-2020-1057](https://doi.org/10.1108/MEDAR-10-2020-1057).
- Saleh, M.W.A., Zaid, M.A.A., Shurafa, R., Maigoshi, Z.S., Mansour, M. and Zaid, A. (2021), "Does board gender enhance Palestinian firm performance? The moderating role of corporate social responsibility", *Corporate Governance: The International Journal of Business in Society*, Vol. 21 No. 4, pp. 685-701, doi: [10.1108/CG-08-2020-0325](https://doi.org/10.1108/CG-08-2020-0325).
- Sartori, A.E. (2003), "An estimator for some binary-outcome selection models without exclusion restrictions", *Political Analysis*, Vol. 11 No. 2, pp. 111-138, doi: [10.1093/pan/mpg001](https://doi.org/10.1093/pan/mpg001).
- Shehata, N., Salhin, A. and El-Helaly, M. (2017), "Board diversity and firm performance: evidence from the U.K. SMEs", *Applied Economics*, Vol. 49 No. 48, pp. 4817-4832, doi: [10.1080/00036846.2017.1293796](https://doi.org/10.1080/00036846.2017.1293796).
- Smith, E. (2007), "Gender influence on firm-level entrepreneurship through the power structure of boards", *Women in Management Review*, Vol. 22 No. 3, pp. 168-186, doi: [10.1108/09649420710743644](https://doi.org/10.1108/09649420710743644).
- Strøm, R.Ø. (2019), "The Norwegian gender balance law: a reform that failed?" *Annals of Corporate Governance*, Vol. 4 No. 1, pp. 1-86, doi: [10.1561/109.00000014](https://doi.org/10.1561/109.00000014).
- Teodósio, J., Vieira, E. and Madaleno, M. (2021), "Gender diversity and corporate risk-taking: a literature review", *Managerial Finance*, Vol. 47 No. 7, pp. 1038-1073, doi: [10.1108/MF-11-2019-0555](https://doi.org/10.1108/MF-11-2019-0555).
- Terjesen, S., Sealy, R. and Singh, V. (2009), "Women directors on corporate boards: a review and research agenda", *Corporate Governance: An International Review*, Vol. 17 No. 3, pp. 320-337, doi: [10.1111/j.1467-8683.2009.00742.x](https://doi.org/10.1111/j.1467-8683.2009.00742.x).
- Torchia, M., Calabrò, A. and Huse, M. (2011), "Women directors on corporate boards: from tokenism to critical mass", *Journal of Business Ethics*, Vol. 102 No. 2, pp. 299-317, doi: [10.1007/s10551-011-0815-z](https://doi.org/10.1007/s10551-011-0815-z).
- Turner, J.C., Hogg, M.A., Oakes, P.J., Reicher, S.D. and Wetherell, M.S. (1987), *Rediscovering the Social Group: A Self-Categorization Theory*, Basil Blackwell, Oxford.

Ujunwa, A. (2012), "Board characteristics and the financial performance of Nigerian quoted firms", *Corporate Governance: The International Journal of Business in Society*, Vol. 12 No. 5, pp. 656-674, doi: [10.1108/14720701211275587](https://doi.org/10.1108/14720701211275587).

von Meyerinck, F., Niessen-Ruenzi, A., Schmid, M. and Davidoff Solomon, S. (2018), "As California goes, so goes the nation? The impact of board gender quotas on firm performance and the director labor market", *SSRN Electronic Journal*, doi: [10.2139/ssrn.3303798](https://doi.org/10.2139/ssrn.3303798).

Wooldridge, J.M. (2010), *Econometric Analysis of Cross Section and Panel Data*, MIT Press, Cambridge, MA.

Wright, M., Westhead, P. and Ucbasaran, D. (2007), "Internationalization of small and medium-sized enterprises (SMEs) and international entrepreneurship: a critique and policy implications", *Regional Studies*, Vol. 41 No. 7, pp. 1013-1030, doi: [10.1080/00343400601120288](https://doi.org/10.1080/00343400601120288).

Yang, P., Riepe, J., Moser, K., Pull, K. and Terjesen, S. (2019), "Women directors, firm performance, and firm risk: a causal perspective", *The Leadership Quarterly*, Vol. 30 No. 5, p. 101297, doi: [10.1016/j.leaqua.2019.05.004](https://doi.org/10.1016/j.leaqua.2019.05.004).

Zona, F., Bannò, M. and Coller, G. (2022), "International expansion and firm growth in domestic markets: family versus non-family firms", *Family Business Review*, Vol. 35 No. 2, pp. 159-183, doi: [10.1177/08944865221084423](https://doi.org/10.1177/08944865221084423).

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