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Director Fit Matters: Evidence from Board Gender Quota in France

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Abstract

There are three opposing perspectives regarding the contribution of board gender diversity to the firm's financial performance (FP): positive impact, negative impact, and no relationship. Scholars have suggested several factors explaining these contradictory results. However, a significant omission is regarding how the board's social dynamics shape the contribution of female directors to board decision-making, and ultimately to the firm's FP. Our study attends to this issue by employing the theories of similarity-attraction, social identity, and person-group fit. Using the board gender quota law in France as an exogenous policy shock, we find a differential negative cross-country impact of women on corporate boards on FP (measured either by Tobin's Q or return-on-assets) after the introduction of the gender quota. This impact is explained by the fit between new female directors and existing directors, which is defined as the similarity between them in terms of demographics (age and nationality), human capital (top executive, functional and industrial background), and social capital (educational and elite school background). Overall, our results suggest that a decrease in fit of the female directors following the gender quota contributed to a negative effect of women on boards on FP. We shed new light on the challenge of leveraging board gender diversity by offering a new explanation for the contradictory empirical results related to women on corporate boards and FP.

Keywords: *Board gender diversity; Gender quota; Firm performance; France*

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The relationship between women on corporates boards (WOCB) and financial performance (FP) is a prominent issue in the corporate governance literature (e.g., Kirsch, 2018; Zattoni et al., 2023). Even after two decades of research, there is still no clear answer as to whether board gender diversity is beneficial for the firm's FP (Kirsch, 2018; Nguyen et al., 2020). From a theoretical perspective, the upper echelons theory, agency theory, and resource dependence theory argue for the business case of WOCB, while the critical mass theory, configurational theory, and contingency theory put forward counter-arguments, highlighting the contingent nature of the WOCB–FP relationship. Empirical research mirrors these diverse perspectives. For instance, Kirsch (2018) or Nguyen et al. (2020) document three opposing streams: positive impact, negative impact, and no role for WOCB in a firm's FP.

To promote gender equality, several countries, such as Norway and Belgium, adopted a 'hard' approach of implementing a board gender quota by relying on penalties or financial sanctions.[4] France followed their footsteps by introducing in January 2011 the Copé-Zimmermann law, which imposes on

[4] A country may adopt a 'hard' or 'soft' approach in introducing board gender quotas. The former refers to binding instruments forcing firms to achieve a quota of female directors under the penalty of sanctions such as delisting (in Norway) or nullity of appointments (in Belgium); the latter is non-binding and requires firms to explain their governance practices (as in Denmark, Ireland, Greece or the United Kingdom).

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companies a quota of having 20% of women directors on corporate boards by 2014 and 40% by 2017. In this context, empirical research has investigated the WOCB–FP relationship in such 'hard' gender quota environments and suffered from the same indecisive conclusion.

These contradictory results can be explained by endogenous factors, such as prior performance (Conyon & He, 2017) and industry type (Frink et al., 2003), or exogenous factors such national culture (Hoobler et al., 2018), and specific features of gender quota law in the country (Comi et al., 2020). However, scholars have omitted the fact that a board of directors is a social group, in which gender diversity enhances decision-making, but also triggers social categorization that leads to negative consequences due to bias and lack of cohesion within the board (Havrylyshyn et al., 2023).

Therefore, our study aims to attend to this omission by examining the WOCB–FP relationship in the French context based on the theories of similarity-attraction (Byrne, 1971) and social identity (Ashforth & Mael, 1989; Tajfel & Turner, 1986), and by the person-group fit literature (Seong et al., 2015). We extend the literature by adopting the perspective that people categorize themselves and others according to social categories. People resist out-group members' influence and devalue their inputs during group decision-making. With corporate boards typically being homogeneous groups of corporate elites (Singh et al., 2008), the effective integration and contribution of newly appointed female directors may largely depend on their alignment with the existing members in terms of certain characteristics. Thus, women directors' contribution to the firm's FP depends on whether they fit with the incumbents. Fit is defined here as the similarity in three dimensions: demographics (age and nationality), human capital (top executive, functional and industrial background), and social capital (education and elite school background) (Johnson et al., 2013; Zattoni et al., 2022).

Following Ginglinger and Raskopf (2023), we employ a difference-in-differences (DiD) estimation approach to study changes in the impact of WOCB on FP after the gender quota in France relative to firms unaffected by the quota law. Our main sample comprised the French firms listed in the SBF 120 (treatment group), which we compare with firms in the S&P 500 (control group). We chose the United States as the control group because in contrast to European countries that are culturally and institutionally closer to France, there were no requirements for companies to have women on boards in the US before California implemented gender quotas in 2018. We use a sample of US firms matched by size, industry, and return on assets (ROA) prior to the implementation of the quota law and keep this sample for the post-law period. The study period is from 2006 to 2017.

The results of the univariate and multivariate analyses lead us to conclude that the decrease in *fit* of the WOCB following the gender quota in France contributes to a decrease in the impact of WOCB on FP. Specifically, we provide evidence that changes in the demographic, social, and human capital fit of WOCB negatively impacted ROA and Tobin's Q. The contribution of our work is threefold. First, we shed new light on the discussion about WOCB–FP by offering a new explanation for the contradictory empirical results related to this relationship. We find that the WOCB–FP relationship following enactment of the gender quota depends on the fit between new female directors and incumbent directors. This result goes further than the extant studies (e.g., Ahern & Dittmar, 2012), which consider the attributes of expertise and experience but do not take into consideration the complex nature of the relationships between board members generated by their fit. Second, as most existing empirical studies rely principally on the Norwegian context, our study adds to the empirical literature by providing insights about the WOCB–FP relationship in France, which has not been studied as extensively. Third, by using the implementation of the gender quota law as a quasi-natural experiment, our empirical approach addresses the endogeneity concern that is inherent in studies of the WOCB–FP relationship.

The remainder of the article is as follows. We first present the theoretical framework and hypotheses before describing the research design (sample construction and variables). We then present estimation methods and empirical results. The paper ends with a discussion and concluding remarks.

Theoretical framework and hypotheses development

Theoretical perspectives on WOCB and FP

Different theoretical perspectives provide diverse points of view about the contribution of WOCB to FP. The theories most used to study the WOCB–FP relationship include upper echelons theory, agency theory, resource dependence theory, critical mass theory, and configurational theory/contingency theory (Kirsch, 2018; Nguyen et al., 2020).

According to the upper echelon theory, firms should recruit female directors because WOCB can help in making more balanced and better decisions thanks to their different norms, behavior, beliefs, and perspectives (Graham et al., 2017). For example, they can help avoid too risky projects as they are generally more risk-averse (Byrnes et al., 1999) and less overconfident (Barber & Odean, 2001). Similarly, the agency theory and resource dependence theory consider women directors useful resources for the firm. They are more vigilant in monitoring the firm (Adams & Ferreira, 2009), bring important advice, counsel, and legitimacy, and help the firm establish connections with influential figures in the community (Hillman et al., 2007). Thus, WOCB can help improve FP through their

ability to better advise and monitor managers and thereby minimize agency costs (Reguera-Alvarado et al., 2017). They also contribute by bringing their skills in risk management, regulatory/legal/compliance, political/government, human resources, sustainability, and/or corporate governance, which male directors do not necessarily possess (Kim & Starks, 2016).

Other theories provide a more nuanced perspective on the positive link between WOCB. First, according to critical mass theory, a subgroup of people may be able to affect the decisions of the group as a whole only when it reaches a certain critical mass in terms of size (Torchia et al., 2011). More specifically, when there are one or two female directors, they are simply tokens or presences. Only when there are three or more of them can female directors have a positive impact on firm performance (Liu et al., 2014). Second, both contingency theory and configurational theory suggest that the impact of WOCB on FP is dependent upon the context/situation and the relationship should not be studied in isolation from other factors such as board characteristics. For example, Pandey et al. (2023) found that the impact of WOCB on FP depends on other board and firm characteristics.

WOCB and FP in hard gender quota environment

Mirroring the plurality of theoretical perspectives on the WOCB–FP relationship, empirical research is inconclusive regarding this issue, with studies reporting mixed findings, including positive, negative, or no relationship (for a review see Kirsch, 2018; Nguyen et al., 2020). In the context of a hard gender quota environment, the empirical results are also contradictory. Ahern and Dittmar (2012) found a significant drop in the stock price on the announcement of the quota law in Norway and a large decline in Tobin's Q over the following years. Similarly, Matsa and Miller (2013) reported a decrease of 4% in the ratio of operating profits to assets among firms affected by quota constraints, while Yang et al. (2020) revealed a negative effect of mandated female representation on firm performance, which is measured by operating income divided by assets, return-on-assets, market-to-book ratio, and Tobin's Q. In the US, Greene et al. (2020) also found a negative market reaction following the first mandated board quota in the State of California.

The above results are contested by other empirical studies, which argue that WOCB can contribute to the economic gains of the firm. The work of Campbell and Mínguez-Vera (2008) suggested that investors in Spain did not penalize companies with a gender-diverse board. Similarly, Allen and Wahid (2024) suggested nonnegative (if not positive) consequences to California firms arising from SB826, countering the claims that board gender quotas are detrimental to firm value. Ferrari et al. (2022) and Gordini and Rancati (2017) shared a similar point of view, providing evidence of the significant impact of WOCB on Italian listed firms' financial indicators such as Tobin's Q.

Other research rather emphasizes the insignificant WOCB–FP relationship. For example, Dale-Olsen et al. (2013) found that the impact of the reform in Norway on firm performance was negligible. Return on total assets and operating revenues and costs did not experience changes due to imposed gender quotas. In a more recent study, Eckbo et al. (2022) replicated the work of Ahern and Dittmar (2012) and observed that the valuation effect of Norway's quota law was statistically insignificant, arguing that the drop identified previously was probably due to firm characteristics and the macroeconomic environment (e.g., the financial crisis).

In the case of France, the conclusion also remains an open issue. Sarang et al. (2024) reported that women directors helped to reduce the cost of equity for French firms. The positive relationship between WOCB and FP, which was measured by return on equity, return-on-assets, Tobin's Q, was confirmed in the study of French firms listed in the CAC40 by Sabatier (2015). By contrast, Comi et al. (2020) found a negative impact of WOCB on firm profitability in a multi-country study involving Belgium, France, Italy, and Spain. Labelle et al. (2015) supported this result in their cross-country analysis of countries adopting soft and hard gender quotas.

Leveraging the potential of board gender diversity: issues and challenges

The literature has provided some explanations for the contradictory results of the WOCB–FP relationship. The endogenous factors include prior performance (Conyon & He, 2017), industry type (Frink et al., 2003), and critical mass of WOCB (Torchia et al., 2011). The exogenous factors include the degree of cultural egalitarianism in the focal firm's country (Hoobler et al., 2018), the design of the law across the countries studied (Comi et al., 2020), and the national context of gender parity and shareholder protection of the focal firm (Post & Byron, 2015). In addition, the methodology used in empirical analysis also influences results (Yang et al., 2019).

In this paper, we argue that the effectiveness of WOCB depends on their inclusion and integration in board activities. Scholars have pointed out that the board of directors is a dynamic social group, in which members interact with one another and engage in social categorization and intergroup bias (Zhu et al., 2014). The contributions of women directors are useful only if they are included in board decision-making. This perspective is largely absent from the literature on WOCB–FP, which is a significant omission (Havrylyshyn et al., 2023).

Considering the board of directors as a social group, diversity can lead simultaneously to two different pathways that influence whether women directors can truly contribute to

generating positive outcomes for the firm (Havrylyshyn et al., 2023). On the one hand, it can lead to more diverse perspectives, and thus richer group discussion and improved decision-making. On the other hand, it can trigger social categorization that causes bias and reduced cohesion within the board and ultimately have a negative impact on governance. In other words, there are two perspectives related to the presence of WOCB: (1) the business case for board gender diversity; new members can contribute to positive group attitude and performance only when they are similar to the incumbents (Kristof, 1996) or (2) a high level of heterogeneity within an organization or group may even lead to an increase in conflicts and turnover rate, a decrease in the level of social integration, and ultimately lower performance (Williams & O'Reilly, 1998). The WOCB–FP relationship therefore depends on the number of female directors, as well as social interactions and relationships between board directors.

Given these pathways, it is useful to consider when and how some boards are more likely to benefit from the inclusion of female members, especially in the context of gender quota law. In the next section, we mobilize the similarity-attraction theory (Byrne, 1971) and social identity theory (Ashforth & Mael, 1989; Tajfel & Turner, 1986), and person-group fit literature (Seong et al., 2015) to theorize how board gender diversity can lead the board to recalibrate differently according to the fit between new female directors and existing directors. These theories have rarely been used in research on the WOCB–FP relationship (Kirsch, 2018; Nguyen et al., 2020).

The fit between new female directors and existing directors: impact of board gender diversity on financial performance

According to the theories of similarity-attraction (Byrne, 1971) and social identity (Ashforth & Mael, 1989; Tajfel & Turner, 1986), and the person-group fit literature (Seong et al., 2015), current directors prefer to work and surround themselves with people who are similar to them. This perspective is empirically supported by the study of Gregorič et al. (2017), which found that the diversity level of male board members influences the number of female directors on boards, implying that the incumbents exhibit resistance toward diversity.

New directors, including female directors, are often recruited based on their fit with the board incumbents along three dimensions: demographics, human capital, and social capital (Johnson et al., 2013). Demographics include factors such as age, gender, and nationality; human capital characteristics are the skills and experience that directors bring to the decision-making process, which often come from previous occupations; social capital is derived from directors' social relationships originating from their ties with other firms and their social standing. The fit between the new entrants and the existing members of the board means that there is some compatibility between them regarding these characteristics (Johnson et al., 2013; Kristof, 1996).

However, the introduction of gender quotas disrupts this director-selection process. In order to comply with the gender quota, some companies have appointed female directors regardless of their knowledge and experience (Ahern & Dittmar, 2012). Although the supply of qualified female director candidates can be high enough to avoid the appointment of unqualified female directors (Eckbo et al., 2022), gender quota laws may lead to the recruitment of new female directors who are not necessarily similar to the incumbents. For example, evidence from Norway and Spain shows that, on average, they have significantly less experience (as CEO, e.g.,) and tend to be younger than existing male directors (Ahern & Dittmar, 2012; Bertrand et al., 2019; Bøhren & Staubo, 2014). In contrast, their education exceeds that of male directors after the gender quota, but not before (Bertrand et al., 2019). They are also more visible in the media than their male counterparts (De Anca & Gabaldon, 2014). In California, there is no observable decline in the quality of newly appointed female directors following the Senate Bill 826, but their age, network size, achievements, and professional activities are of a lower level than the female directors recruited before the regulation (Allen & Wahid, 2024).

Therefore, it appears that the adoption of a board gender quota leads to upheavals within the board. New female directors are likely to have demographic characteristics, human and social capital that differ from those of existing directors. We propose the following:

> *Hypothesis 1: All else being equal, the fit between new female directors and the incumbents in terms of demographics, human capital, and social capital changes after board gender quotas.*

WOCB have an impact on the FP of the firm, whether it is positive or negative, as documented in the literature (Kirsch, 2018; Nguyen et al., 2020). Following the implementation of gender quota law, a higher number of WOCB will modify this relationship, in one way or another. Specifically, the literature highlights the fact that gender quotas entail costs to meet the quota requirements. Bøhren and Staubo (2014) document evidence of high costs associated with making boards compliant with gender quota, which they label 'compliance costs': (1) costs for searching for new directors; (2) increased compensation costs for these new directors; and (3) reduced private benefits for owners. There are also costs related to the trade-off between monitoring and advice within the board when women directors are recruited to comply with the law. In other words, as female directors have the status of independent director more often than their male counterparts, there is a shift in boards' skills from advice to monitoring when more women are in the board, leading to inefficiencies at both the organization and board levels (Bøhren & Staubo, 2014).

In addition, the lack of female candidates in the pipeline for board appointments is the most frequently cited reason to explain the under-representation of WOCB (Gabaldon et al., 2016). Therefore, firms that are not already in compliance will have difficulty finding female candidates, as the best candidates are already taken or are busy with their existing directorships. There is no guarantee that these new directors are as qualified as the incumbents (Ferreira, 2015), and these suboptimal appointments can be detrimental to firms' performance (Ahern & Dittmar, 2012).

On the other hand, a higher number of WOCB can be beneficial for the firm's FP in several ways. For example, Allen and Wahid (2024) found that following the implementation of Senate Bill 826 in California, there was an increase in the number of female directors with financial expertise. Compared to their male counterparts, they had greater qualifications, network size, achievements, and professional activities in both the pre- and the post-regulation periods. Similarly, Martínez- García et al. (2022) found that after the introduction of the quota law in Spain, boards seek to appoint new female directors having human capital attributes that are useful for reducing uncertainty and bringing new resources to the firm.

Based on insights from this discussion, we assert the following:

Hypothesis 2: All else being equal, the relationship between WOCB and FP changes after the introduction of board gender quotas.

As mentioned previously, the similarity-attraction theory (Byrne, 1971), social identity theories (Ashforth & Mael, 1989; Tajfel & Turner, 1986), and person-group fit literature (Seong et al., 2015) support the argument that board incumbents collaborate better with new directors who are similar to them. Boards can be seen as 'groups of diverse individuals who have different biases and prejudices and whose behavior is affected by social constraints and power relations' (Ferreira, 2010, p. 225). Variety in director characteristics can enhance strategic decisions but can also lead to social categorization processes and may evoke some of the negative consequences such as conflict, lower satisfaction, and social isolation (Tasheva et al., 2019). Thus, the fit among board members, that is, the interpersonal compatibility of board members, is fundamental to ensure cohesion and performance via congruence and attraction.

Among the attributes often described in the literature, human capital, social capital, and demographic characteristics are often considered essential in influencing a group's attitude and behavior, and consequently its performance and that of the organization (Tsui & O'Reilly, 1989). According to Tasheva et al. (2019), human capital includes skills, knowledge, expertise obtained through education and experience; social capital represents the resources and opportunities available through the individual's networks of relationships; and demographic characteristics include age, gender, race, ethnicity, and nationality. Several studies have put forward evidence suggesting that the similarity among board directors in terms of these attributes contributes to the firm's performance (Adams et al., 2018; Havrylyshyn et al., 2023).

Based on these insights, we propose the following hypothesis:

Hypothesis 3: All else being equal, the fit between new women directors and incumbent directors in terms of demographics, human capital, and social capital influences the relationship between WOCB and FP after the board gender quotas.

Data and descriptive statistics

Sample construction

Our initial sample includes all the firms listed in the SBF 120 (Société des bourses françaises) Index. The control sample includes all the firms listed in the S&P 500 Index. Our analysis period extends from 2006 to 2017. Following standard practice (e.g., Sila et al., 2016), we exclude financial firms (SIC codes 6000–6799) and utilities (SIC codes 4900–4999) from the initial sample, essentially because of their special financial structure, regulatory requirements, and accounting standards. The final French sample comprises 822 firm-year observations and 10,368 director-year observations, while the US sample comprises 2,317 firm-year observations and 21,813 director-year observations

Financial and governance data are retrieved from Compustat and from Bloomberg using the Bloomberg Server API. When these databases have missing data, we manually collect missing information from Bloomberg or from companies' websites. The data regarding the functional and industry background of each director was manually collected by reviewing the director's biography and career history.

Variable definitions

Dependent variables

Consistent with the existing literature (e.g., Adams & Ferreira, 2009; Sila et al., 2016), this study uses Tobin's Q and ROA to measure the dependent variable. Tobin's Q is calculated using Chung and Pruitt's (1994) method, more specifically, the ratio of the sum of the market value of a firm and the book value of its debt to the total value of its assets. We also use ROA because Tobin's Q can be seen as a proxy for growth opportunities rather than a measure of performance (Wintoki et al., 2012).

Independent variables

The representation of WOCB is measured by the ratio of female directors to the total number of directors (e.g., Adams & Ferreira, 2009). In our difference-in-difference setting, *France*

is a dummy variable that equals 1 if the firm is listed in the SBF 120 (the treatment group), and 0 if the firm is listed on the S&P 500 (the control group). *Post* is a dummy variable that equals 1 if the year is 2011 or later, and 0 otherwise.

Consistent with Zhu et al. (2014), we construct measures of similarity across different dimensions. Specifically, we consider the following dimensions: gender, age, nationality, top executive experience, functional background, industry background, education, highest degree obtained, and school prestige (Westphal & Zajac, 2013; Zhu et al., 2014). To construct our fit measures, we first compare each female director with each of the remaining board members in a certain dimension and attribute the value of 1 in case of fit, and 0 otherwise. Then, we take the average fit for each woman (or the proportion of the remaining board members that are similar), and finally we average across all women to obtain measures at the firm level.

We define *demographic fit* as the average fit of age and nationality (Johnson et al., 2013). Specifically, *age fit* is obtained by first finding the proportion of the remaining board members of a similar age for each female director and then averaging across all female directors. We consider the age to be similar age when the difference is less than one standard deviation, which in our sample is 8 years (Westphal & Zajac, 2013; Zhu et al., 2014). We calculate *nationality fit* as the average across all female directors of the proportion of the rest of the board members having the same nationality.

Human capital fit is the mean between the director's top executive, function, and industry fit (Johnson et al., 2013). More specifically, consistent with Zhu et al. (2014), a director's top executive experience is measured via a dummy variable equal to 1 if a director is/was a top executive, and 0 otherwise. We define a top executive to be a CEO, a chairman, a VP (vice-president), an executive director, or a member of an Executive Board. We calculate *Top executive fit* as the average across all female directors of the proportion of the remaining board members who have the same top executive experience.

We calculate *function fit* as the average across all female directors of the proportion of the remaining board members having the same functional background. More specifically, inspired by Hambrick and Mason (1984) and categories used by Hambrick et al. (1996), a director's functional background is measured using the following scale: (0), if 'top executive' (see above) is equal to 1; (1), if the director's main function is in the output function (i.e., sales, marketing, or R&D – research and development); (2), if the director's main function is in the throughput function (i.e., production, operation, process engineering or accounting); (3), if the director's main function is in the peripheral function (i.e., finance, law, labor relations, or HRM – human resource management).

We calculate a director's *industry fit* as the average across all female directors of the proportion of the remaining board members having the same industry background. Specifically, consistent with Zhu et al. (2014), we measure a director's primary industry background (using a four-digit SIC code) using his/her history data on Bloomberg based on two criteria: (1) if the director has C-suite positions in a company, we choose that industry as the director's primary industry background; (2) otherwise, we look at the industry in which a director has worked most years of his/her career.

Social capital fit is the mean of education and prestige school fit (Johnson et al., 2013). We calculate *education fit* as the average across all female directors of the proportion of the rest of the board members having the same level of education. *Education* is coded into four categories using the following scale: no diploma or degree (0); bachelor's degree (1); master's degree (2); and PhD degree or equivalent (e.g., lawyer) (3) (Zhu et al., 2014).

We calculate *prestige school fit* as the average across all female directors of the remaining of the board members having the same level of elite school. Two directors are considered similar if both attended an elite school. *Elite school* is a dummy variable that equals 1 if the director graduates from the French so-called Grandes écoles (if the director is French) or top 20 US and European universities, based on Shanghai Ranking 2010 (if the director is not French) (Miller & Xu, 2020; Nguyen, 2012; Westphal & Stern, 2006) – see Appendix A for details.

Control variables

We control for firm and board characteristics that may influence a firm's financial and economic performance.

Regarding firm characteristic variables, we include *firm size*, *leverage*, *R&D*, *capex intensity*, *market-to-book*, and *family firm*. Firm size (measured by the natural logarithm of total assets) controls for the firm's complexity (Adams & Ferreira, 2009; Sila et al., 2016). *Leverage* is calculated as the ratio of total debt to total assets. It is an important governance mechanism underlying FP, because managers are required to generate cash flow in order to pay the interest and debt principal (Shleifer & Vishny, 1997). *R&D intensity* is measured as the ratio of R&D to sales. Higher R&D is usually associated with superior FP (Eberhart et al., 2004). *Capex intensity*, or capital intensity, is measured as the ratio of capital expenditures to assets from the previous year. It is known to be positively and significantly related to FP (Dezsö & Ross, 2012). *Market-to-book*, which is measured as the ratio of market capitalization to total assets, is included to control for a firm's investment opportunities (Hutchinson & Gul, 2004). Finally, *family firm* is a dummy variable that equals 1 if the firm is a family firm, and 0 otherwise. Consistent with Sraer and Thesmar (2007), a firm is considered a family firm if the founder or a member of the founder's family is a blockholder (holds at

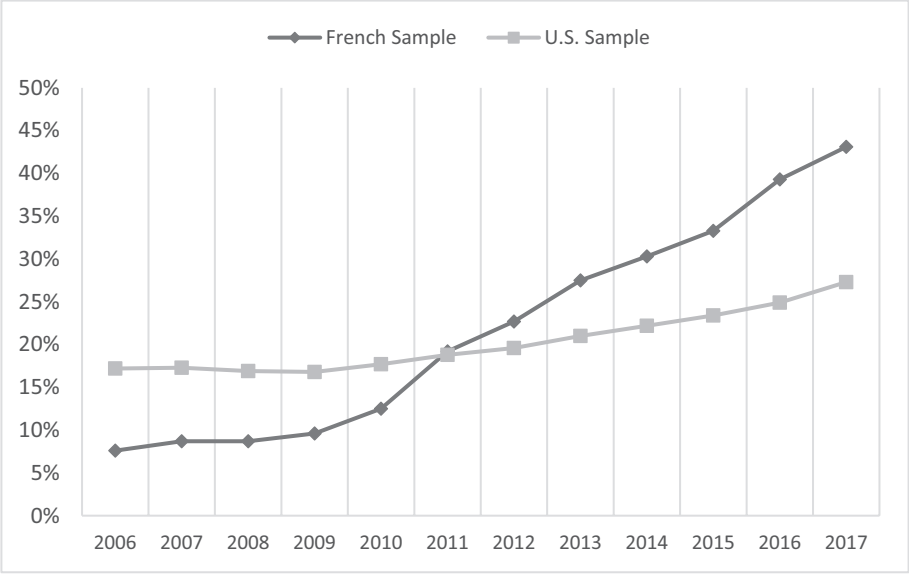


Figure 1. Average proportion of women on boards.
Source: Own elaboration.

least 20% of the voting rights) of the company. In the French context, 70% of listed companies are family firms which often outperform publicly held firms (Sraer & Thesmar, 2007).

Regarding board characteristics, we include *board size* (measured as the logarithm of the number of directors on the board) because theoretical and empirical literature suggests that board size in one way or another influences FP (Wintoki et al., 2012; Yermack, 1996). *Board independence* is calculated as the proportion of outside – non-executive – directors on the board (e.g., Adams & Ferreira, 2009). *CEO duality* is measured using a dummy variable equal to 1 if the CEO is also the chair, and 0 otherwise. Many studies (e.g., Bennouri et al., 2018) have shown that CEO duality influences FP. Finally, *board tenure* is measured as the average tenure, in years, of all directors. This variable is also known to be associated with FP (Huang & Hilary, 2018).

Finally, all variables, except for the dummy variables, are winsorized at the 1 and 99% levels to reduce the potentially spurious effects of outliers. Appendix A provides a summary of the variables used in this study and their definition.

Empirical estimation and results

Descriptive statistics and univariate analysis

According to the Copé-Zimmermann law, companies were required to reach target quotas only by 2014 (quota of 20%) and 2017 (quota of 40%). Figure 1 shows that the proportion of WOCB in France started to drastically increase after 2010. Until 2010, the trend in the proportion of WOCB in the US and France was parallel, although the proportion of WOCB in France was lower. After 2010, the increase in the proportion of WOCB in France clearly outpaced the increase in the US. Figure 2 shows that while the proportion of new women on corporate boards is similar in the two countries before 2010, French firms were clearly hiring a much larger proportion of women after the quota was introduced.

The descriptive statistics for our sample are presented in Table 1. The average proportion of WOCB in France before the gender quota was 8.7%, increasing to 30.7% following the implementation of the law, while the ratio was 17.2%, increasing to 22.7% in the US sample.[5] The average firm in our sample has total assets of $8.8 billion before 2010, and $9.08 billion after 2010. The mean ROA is 4.59 and 3.85%, before and after 2010 respectively, and the mean Tobin's Q is 1.589 before 2010 and 1.569 after. The average firm has a proportion of 51.4% of boards filled with independent directors, 50.3% from elite schools, and 75.6% are top executives before 2010 (these numbers are 58.9, 47.3, and 68.3% after 2010). About 10% of the directors are new directors before 2010 and 12.3% after. The average proportion of new women directors increased from 1.2 to 6.1% after the introduction of the quota law.

Table 1 also shows the average values for the *fit* variables in 2010, the year before the introduction of the quota law, and in 2017. The numbers suggest a decrease in the average demographic, human capital, and social capital fit of the women on boards from 2010 to 2017. More specifically, the average value of *demographic fit* decreased from 37.8 to 35.9%, the average

[5] For the sake of simplicity and to focus on the French sample, we do not include the summary statistics for the US sample in Table 1. But we compare some key metrics between these two samples in Figures 1–3.

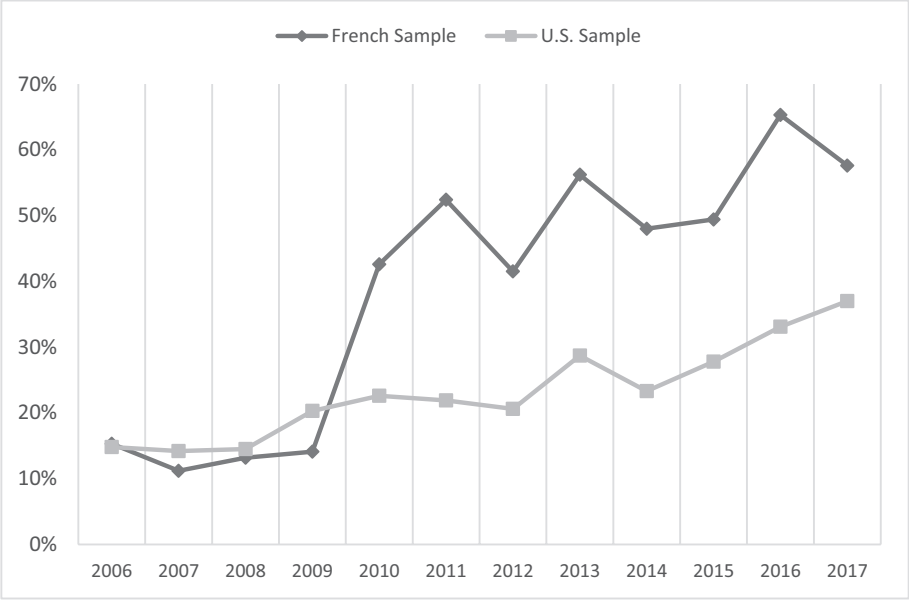


Figure 2. Average proportion of new women directors amongst new board members.
Source: Own elaboration.

value of *human capital fit* decreased from 26.9 to 24.1%, and the average value of *social capital fit* decreased from 47.3 to 38.4%.

Table 2 presents the correlation coefficients for the variables used in the empirical analysis. The coefficients suggest a significant positive association between the proportion of women and Tobin's Q, but the correlation with ROA is insignificant, even though the two performance measures are strongly correlated. The correlation coefficients do not indicate a strong positive association between fit and FP. Although the correlation between some of the control variables is statistically significant, the variance inflation factor (VIF) is no greater than five for all variables, indicating that multicollinearity is not a concern.

Empirical method

A way of addressing endogeneity is using quasi-experimental methods and the DiD approach (e.g., Yang et al., 2019), which is applicable when an unexpected and exogenous shock affects a treatment group but does not affect a comparable control group. Our empirical strategy is to use the mandatory quota regulation in France as an exogenous shock in a design akin to DiD. Therefore, we control for endogeneity by accounting for the differential effect of WOCB on FP between a sample of French firms (the treatment group) and a sample of US firms (the control group) brought up by the regulation. The analysis presented in appendices B and C shows that our methodology is valid. Appendix B presents the trends for our outcome variables in France (the treatment group) and in the US (the control group). The graphs show that for most years in the time period covered in our sample, the trends for Tobin's Q and ROA are similar in France and in the US. In Appendix C, we test the common trend assumption on ROA and Tobin's Q in our samples of French and US firms. The results for both ROA and Tobin's Q indicate a common trend before 2010, but not after 2010.

To further address concerns regarding comparability between French and US firms, we follow Ginglinger and Raskopf (2023) by excluding 2010 and matching each French firm to a US firm on a yearly basis for 2007, 2008, and 2009. This is done through propensity score matching based on three criteria: size, industry, and ROA using the nearest neighbor method. For the years after 2009, we retain only the firms matched in 2009.

To account for serial correlation in the time series of within-firm variation in DiD estimations, we cluster standard errors at the firm level in all regressions (Bertrand et al., 2004). We also estimate the models with firm fixed effects to rule out time-invariant firm characteristics and time trends.

Change in the proportion of women on boards

The univariate analysis indicates that the proportion of WOCB significantly increased in France, and at a larger rate than in the US. To validate these findings, we estimate a DiD model where the dependent variable indicates if a board member is a new woman. Specifically, we estimate the following model:

$$new\ women_{i,t} = a + b_1 \times Post + b_2 \times France + b_3 \times post \times France + c \times control\ variables_{i,t} + e_{i,t} \quad [1]$$

Table 1. Descriptive statistics

	Before(338 firm-year obs.)		After(544 firm-year obs.)		
Firm-level variables	Mean	Standard Deviation	Mean	Standard Deviation	*t*-test
Proportion of women	0.087	0.084	0.307	0.119	29.9***
Average tenure	5.618	3.5	6.267	3.098	2.8**
Proportion independent	0.514	0.227	0.589	0.208	5.1***
Proportion of top executive	0.764	0.172	0.687	0.176	−6.4***
Proportion elite school	0.493	0.208	0.471	0.198	−1.6
Number of independent Women	0.959	0.952	3.805	1.709	28.1***
Board size	10.837	3.575	12.325	3.005	6.7***
Duality	0.544	0.499	0.537	0.499	−0.2
Family firm	0.21	0.408	0.246	0.431	1.3
Market-to-book	2.24	1.881	2.365	2.157	−0.9
Firm size	8.808	1.421	9.269	1.273	5.0***
Leverage	0.249	0.149	0.245	0.14	−0.4
ROA	4.591	6.127	3.852	4.786	−2.0**
R&D intensity	0.023	0.054	0.022	0.047	0.1
Capex intensity	0.052	0.051	0.041	0.035	3.9***
Tobin's Q	1.589	0.92	1.569	0.877	0.35
	Before (3,663 director obs.)		After (6,705 director obs.)		
Director-level variables	Mean	Std. Dev.	Mean	Std. Dev.	*t*-test
Female	0.088	0.284	0.309	0.462	26.2***
Top executive	0.756	0.429	0.683	0.465	−7.8***
Tenure	5.643	6.157	6.228	6.631	4.4***
Type admin.	1.618	0.776	1.587	0.843	−1.9*
Age	58.663	10.117	58.855	9.688	−0.9
Education	1.846	0.659	1.942	0.556	7.4**
Elite school	0.503	0.5	0.473	0.499	−2.9***
Function	2.525	0.692	2.53	0.656	−0.2
New member	0.1	0.3	0.123	0.328	3.5***
New woman	0.012	0.109	0.061	0.24	11.8***
	Before (338 firm-year obs.)		After (544 firm-year obs.)		
Fit variables	Mean	Std. Dev.	Mean	Std. Dev.	*t*-test
Demographic fit	0.378	0.024	0.359	0.011	−0.720
Human capital fit	0.269	0.018	0.241	0.008	−1.455*
Social capital fit	0.473	0.0183	0.384	0.010	−4.247***

Notes: This table displays the mean and standard deviation for the variables used in the analysis. The sample consists of 882 firm-year observations and 10,368 director-year observations for the companies in the SBF 120 from 2006 to 2017. All variables are defined in Appendix A or in the text. All continuous control variables are winsorized at 1st and 99th percentiles.
Source: Own elaboration.

where *i* denotes firms in the sample, *t* refers to the time period and $e_{i,t}$ is a random error term. In eq. [1], we control for board and firm characteristics that could affect the decision to appoint female directors.

The results presented in Table 3 provide evidence that the gender quota has a significant impact on the director appointment process. In column (1), the coefficient on the interaction term of *France* and *post* is positive and statistically significant at the 1% level. This result shows that the odds of hiring a new female director are significantly higher in France after the gender quota law when compared with the odds in the US in the same period. In column (2), we add the variable *proportion of women* to the model. The results help us draw a complete picture: the odds of hiring

Table 2. Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) Tobin's Q	1.00																		
(2) Proportion of women	**0.05**	1.00																	
(3) Demographic fit	−0.01	**0.14**	1.00																
(4) Human capital fit	**0.19**	**0.09**	**0.56**	1.00															
(5) Social capital fit	−0.04	**0.08**	**0.29**	**0.21**	1.00														
(6) Average tenure	**0.11**	−0.01	**0.04**	**0.16**	−0.01	1.000													
(7) Proportion independent	**0.19**	0.01	**0.15**	**0.65**	0.02	**0.08**	1.00												
(8) Proportion top executive	**−0.28**	−0.01	**−0.20**	**−0.69**	0.00	**−0.13**	**−0.73**	1.00											
(9) Proportion elite school	**−0.06**	**0.04**	**0.02**	**−0.13**	**−0.05**	**−0.10**	**−0.09**	**0.27**	1.000										
(10) Number of. independent women	−0.01	**0.84**	**0.15**	**0.15**	**0.04**	**-0.02**	**0.20**	**-0.09**	**0.08**	1.00									
(11) Board size	**−0.23**	**0.18**	**0.15**	**-0.06**	**0.12**	**−0.07**	**−0.26**	**0.28**	**0.15**	**0.39**	1.00								
(12) Duality	**−0.16**	**0.06**	**−0.10**	**−0.45**	0.00	**−0.08**	**−0.49**	**0.55**	**0.13**	0.01	**0.23**	1.00							
(13) Family firm	**−0.05**	**0.10**	**−0.07**	**−0.29**	**0.03**	**0.17**	**−0.39**	**0.44**	**0.05**	**−0.02**	**0.17**	**0.24**	1.00						
(14) Market-to-book	**0.34**	**0.07**	0.00	**0.12**	−0.01	**0.04**	**0.12**	**−0.17**	**−0.05**	**0.07**	**−0.05**	**−0.11**	**−0.06**	1.00					
(15) Firm size	**−0.24**	**0.18**	**0.21**	**0.27**	**0.07**	**−0.05**	**0.28**	**−0.22**	**0.10**	**0.34**	**0.38**	**−0.08**	**−0.03**	**−0.02**	1.00				
(16) Leverage	**−0.03**	**0.09**	**0.05**	**0.05**	**0.05**	**−0.02**	0.00	**−0.03**	0.00	**0.11**	**0.09**	**−0.02**	**−0.09**	−0.01	**0.09**	1.00			
(17) ROA	**0.56**	−0.02	0.02	**0.20**	0.00	**0.13**	**0.19**	**−0.27**	−0.01	**−0.02**	**−0.12**	**−0.16**	**−0.08**	**0.17**	**−0.10**	**−0.14**	1.00		
(18) R&D intensity	**0.17**	**−0.08**	**−0.04**	−0.00	**−0.08**	**0.06**	**0.07**	−0.01	**0.03**	**−0.06**	**−0.15**	0.01	0.02	**0.13**	**−0.15**	**−0.22**	**−0.04**	1.00	
(19) Capex intensity	0.00	**−0.11**	**−0.03**	**−0.03**	**−0.07**	−0.02	−0.01	−0.00	**−0.03**	**−0.08**	**−0.09**	0.00	**−0.02**	−0.02	−0.01	−0.00	**0.03**	**−0.08**	1.00
VIF	1.91	5.85	1.75	3.77	1.52	1.15	3.83	3.92	1.18	7.46	2.50	1.54	1.48	1.16	1.69	1.11	1.60	1.17	1.06

Notes: This table reports the Pearson correlation coefficients among variables. Correlation coefficients with significance at 1 and 5% levels (two-tailed) are bolded. All variables are defined in Appendix A or in the text. All continuous control variables are winsorized at 1st and 99th percentiles.
Source: Own elaboration.

Table 3. Probability of appointing new female directors

	(1)	(2)
Post	0.765***	−0.095
	(0.000)	(0.742)
France	−0.095	−0.465
	(0.629)	(0.132)
Post×France	1.063***	1.888***
	(0.000)	(0.000)
Proportion of women		4.176***
		(0.000)
Proportion of women×post		1.247
		(0.140)
Proportion of women×France		5.907***
		(0.000)
Proportion of women×post×France		−8.442***
		(0.000)
Independent director	0.500***	0.499***
	(0.000)	(0.000)
Board size	0.046***	0.057***
	(0.007)	(0.001)
Duality	−0.018	−0.097
	(0.848)	(0.311)
Family firm	−0.239*	−0.379***
	(0.081)	(0.009)
Market-to-book	0.009	0.004
	(0.146)	(0.502)
Firm size	−0.008	−0.044
	(0.839)	(0.278)
Leverage	−0.125	−0.164
	(0.633)	(0.550)
Return-on-assets	−0.001	0.001
	(0.878)	(0.892)
R&D Intensity	0.577	1.184
	(0.524)	(0.210)
Capex intensity	1.028	1.431
	(0.326)	(0.160)
Constant	−4.832***	−5.279***
	(0.000)	(0.000)
Year controls	Yes	Yes
FF-38 industry controls	Yes	Yes
Wald chi²	391.6	576.6
Pseudo R^2	0.0430	0.0619
Observations	32,181	32,181

Notes: The sample includes director-year observations. The dependent variable, *new women*, is a dummy variable that takes value 1 if the new director is a female and 0 otherwise. The sample includes French firms listed in the SBF 120 (the treatment group) and, alternately, matched US firms listed in the S&P 500 (the control group). *France* is a dummy variable that takes value 1 if the firm is in the treatment group listed in the SBF 120 (the treatment group), and 0 if the firm is listed in the S&P 500 (the control group). *Post* is a dummy variable that takes value 1 if fiscal year is after 2010, and 0 otherwise. The results are from probit models that estimate the probability that the new director is female before and after the regulation (fiscal year 2010) using a DiD design. Column (1) includes all the controls without the independent variable *proportion of women*. Column (2) includes the triple-difference interaction effect from *post*, *France* and *proportion of women*. Industry controls use the Fama and French's (1997) 38 industry classification. Standard errors are clustered at the firm level. Robust *p*-values are in parentheses; *, **, and *** denote statistical significance at 10, 5, and 1% respectively.
Source: Own elaboration.

a new female director after the Copé-Zimmermann law increase in France, but decrease as the proportion of WOCB increases, as indicated by the negative coefficient of the three-way interaction term. This result suggests that the odds of hiring women directors increase in France after the law, but firms with a higher proportion of women directors are less likely to hire new female directors for compliance, since they are closer to the levels required by the regulation.

Change in the fit of WOCB

The descriptive statistics presented in Table 1 indicate that the fit of WOCB decreased after the quota regulation. In Table 4, we confirm this conclusion. This table reports DiD estimates of the ordinary least square regressions of *fit* measures on the proportion of WOCB, with industry and year controls. The results show that the coefficient on the triple interaction term with *post*, *France*, and *proportion of women* is negative and statistically significant at the 1% level in the model with *demographic fit*, at the 15% level in the model with *human capital fit*. The results are not statistically significant in the model with *social capital fit*, but the *p*-value is close to 10%. These results imply that as companies increase the proportion of WOCB to comply with gender quota, the fit of WOCB decreases. Consequently, our findings suggest a negative effect of the gender quota on boards' ability to appoint female directors with social capital, human capital, and demographic characteristics fitting incumbent board members. Therefore, as the Copé-Zimmermann law requires firms to bring in more female directors to their board, we observe a decrease in the level of fit of the WOCB over the years after the law was passed. Our results also suggest that the fit of WOCB increases with board size and board independence and decreases when the proportion of board members who hold top executive functions is higher.

These results provide support for hypothesis 1, which predicts that the fit of WOCB changes after the gender quota. Our findings suggest that the average fit of WOCB decreases as companies increase the number of female directors to reach the proportion set by the gender quota. The results in Table 3 also suggest that the change is more pronounced for *demographic fit* and *social capital fit* than for *human capital fit*.

Proportion of WOCB and FP

To test whether the prediction from hypothesis 2 that gender quota adoption changes the WOCB–FP relationship is true, we estimate the following model:

$$financial\ performance_{i,t+1} = a + b_1 \times proportion\ of\ women_{i,t} + post \times France + c \times control\ variables_{i,t} + e_{i,t+1} \quad [2.1]$$

$$financial\ performance_{i,t+1} = a + b_1 \times low\ women\ representation_{i,t} + post \times France + c \times control\ variables_{i,t} + e_{i,t+1} \quad [2.2]$$

$$\begin{aligned} financial\ performance_{i,t+1} &= a + b_1 \times proportion\ of\ women_{i,t} + b_2 \\ &\times proportion\ of\ women_{i,t} \times post + b_3 \\ &\times proportion\ of\ women_{i,t} \times France + b_4 \\ &\times proportion\ of\ women_{i,t} \times post \times France + c \\ &\times control\ variables_{i,t} + e_{i,t+1} \end{aligned} \quad [2.3]$$

In eq. [2.1] and eq. [2.2], the interaction term post × France captures the average effect of the gender quota law in France relative to the US. This term reflects the overall impact of the policy without considering how varying levels of female representation influence outcomes. In contrast, eq. [2.3] incorporates the three-way interaction term, Proportion of $women_{i,t}$ × post × France, which provides valuable insights into the heterogeneity of the policy's effects across firms with different levels of female board representation. Our theoretical framework posits that firms with varying initial levels of gender diversity may experience distinct impacts from the implementation of the quota law.

The model control for board and firm level characteristics that could impact the effect of female directors on FP. For a sample of French firms, Bennouri et al. (2018) show that certain attributes in female directors affect the WOCB–FP relationship. To control for these attributes, we include variables representing the proportion of women who are top executives, hold degrees from elite schools, and serve as independent directors. To account for the moderating effect of the ratio of women on board, we include variables such as the proportion of women and the dummy measure of low women representation. Finally, we include measures of demographic, human capital, and social capital fit to also capture the potential impact of female directors on board activity.

Table 5 presents the regression results estimating the models specified in eq. [2.1], eq. [2.2], and eq. [2.3], where firm performance (FP) is measured using Tobin's Q and ROA. Columns (1) and (2) correspond to the estimations based on eq. [2.1], while columns (3) and (4) follow eq. [2.2]. Columns (5) and (6) are based on eq. [2.3]. The models incorporate Tobin's Q lagged 1 year and contemporaneous ROA to capture different dimensions of FP over time.

The columns (1)–(4) of Table 5 results show that the interaction term with *post* and *France* is negative and statistically significant at the 1% level in the models with both Tobin's Q and ROA. These results indicate that the effect of WOCB on FP is negative and significant after the enactment of the Copé-Zimmermann law when compared with the US sample. Specifically, the reduction in Tobin's Q and

Table 4. Fit of women before and after the gender quota

	Demographic fit	Human capital fit	Social capital fit
	(1)	(2)	(3)
Proportion of women×post×France	−0.739***	−0.332**	−0.228
	(0.000)	(0.030)	(0.105)
Proportion of women×France	0.769***	−0.194	0.253
	(0.002)	(0.373)	(0.121)
Proportion of women×post	−0.945***	−1.130***	−0.427***
	(0.000)	(0.000)	(0.000)
Proportion of women	1.211***	1.704***	0.599***
	(0.000)	(0.000)	(0.000)
Average tenure	0.002	0.003	−0.001
	(0.361)	(0.117)	(0.615)
Proportion independent	0.099**	0.481***	0.135***
	(0.026)	(0.000)	(0.001)
Proportion top executive	−0.106***	−0.192***	0.100***
	(0.003)	(0.000)	(0.000)
Proportion elite school	0.044	−0.014	−0.069**
	(0.219)	(0.691)	(0.030)
Number of independent women	−0.041***	−0.070***	−0.033***
	(0.000)	(0.000)	(0.000)
Board size	0.019***	0.028***	0.011***
	(0.000)	(0.000)	(0.000)
Duality	0.001	−0.029**	−0.001
	(0.936)	(0.031)	(0.887)
Family firm	−0.055*	−0.013	−0.026
	(0.055)	(0.579)	(0.242)
Market-to-book	−0.001	−0.001	−0.001
	(0.294)	(0.172)	(0.142)
Firm size	0.014**	0.004	0.001
	(0.034)	(0.408)	(0.864)
Leverage	0.052	0.041	0.037
	(0.161)	(0.228)	(0.206)
Return-on-assets	−0.001	−0.000	−0.000
	(0.413)	(0.788)	(0.588)
R&D intensity	0.098	0.090	−0.142
	(0.515)	(0.531)	(0.283)
Capex intensity	0.013	0.087	−0.023
	(0.948)	(0.659)	(0.859)
Constant	−0.303***	−0.335***	0.022
	(0.000)	(0.000)	(0.648)
Year controls	Yes	Yes	Yes
FF-38 industry controls	Yes	Yes	Yes
Observations	3,139	3,139	3,139
R-squared	0.252	0.661	0.127

Source: Own elaboration.

Notes: This table reports results from DiD estimations. The dependent variable is *demographic fit* in model (1), *human capital fit* in model (2), and *social capital fit* in model (3). The sample includes French firms listed in the SBF 120 (the treatment group) and, alternately, matched US firms listed in the S&P 500 (the control group). *France* is a dummy variable that takes value 1 if the firm is in the treatment group. *Post* is a dummy variable that takes value 1 if fiscal year is after 2010, and 0 otherwise. Description of all the variables can be found in Table 1; *p*-values based on robust standard errors clustered at the firm level are reported in parentheses; *, **, and *** denote statistical significance at 10, 5, and 1% respectively.

Table 5. WOCB and FP – Tobin's Q and ROA

	Tobin's Q	ROA	Tobin's Q	ROA	Tobin's Q	ROA
	(1)	(2)	(3)	(4)	(5)	(6)
Proportion of women×post×France					−0.343	−9.939***
					−0.361	−0.001
Proportion of women×post					0.688***	2.376
					−0.007	−0.263
Proportion of women×France					−0.341	8.811**
					−0.481	−0.029
Post×France	−0.174***	−1.906***	−0.168***	−2.010***		
	−0.002	0.000	−0.002	0.000		
Low women representation			−0.041	−0.233		
			−0.436	−0.598		
Proportion of women	0.163	−2.833			−0.002	−5.851*
	−0.579	−0.246			−0.996	−0.06
Demographic fit	0.102	−1.145	0.101	−1.189*	0.128	−1.538**
	−0.233	−0.108	−0.237	−0.096	−0.145	−0.035
Human capital fit	0.087	0.372	0.093	0.141	0.124	0.67
	−0.377	−0.649	−0.334	−0.86	−0.217	−0.424
Social capital fit	−0.085	−0.72	−0.09	−0.732	−0.107	−0.961
	−0.415	−0.409	−0.392	−0.402	−0.305	−0.269
Average tenure	−0.004	0.266***	−0.004	0.270***	−0.003	0.258***
	−0.562	0.000	−0.522	0.000	−0.636	0.000
Proportion independent	0.059	2.947**	0.035	3.292**	0.055	2.590*
	−0.713	−0.028	−0.821	−0.011	−0.736	−0.055
Proportion top executive	−0.396***	−5.239***	−0.422***	−5.098***	−0.440***	−4.997***
	−0.008	0.000	−0.005	0.000	−0.004	0.000
Proportion elite school	0.095	0.735	0.093	0.728	0.09	0.745
	−0.371	−0.406	−0.385	−0.411	−0.398	−0.401
Number of independent women	−0.033	0.255	−0.014	0.05	−0.043	0.27
	−0.255	−0.296	−0.417	−0.735	−0.145	−0.273
Board size	0.023**	0.081	0.019**	0.122*	0.025**	0.054
	−0.025	−0.332	−0.034	−0.098	−0.015	−0.521
Duality	−0.005	−0.145	−0.006	−0.137	0.000	−0.17
	−0.906	−0.652	−0.884	−0.671	−0.993	−0.598
Family firm	0.041	−0.389	0.047	−0.459	0.047	−0.523
	−0.659	−0.616	−0.612	−0.552	−0.612	−0.501
Market-to-book	0.019***	0.031	0.019***	0.031	0.019***	0.031
	0.000	−0.104	0.000	−0.104	0.000	−0.104
Firm size	−0.580***	−2.213***	−0.580***	−2.228***	−0.580***	−2.157***
	0.000	0.000	0.000	0.000	0.000	0.000
Leverage	0.872***	−12.440***	0.863***	−12.503***	0.882***	−12.207***
	0.000	0.000	0.000	0.000	0.000	0.000
Return-on-assets	0.023***		0.023***		0.023***	
	0.000		0.000		0.000	
R&D intensity	−0.272	−2.47	−0.277	−2.409	−0.276	−2.691
	−0.689	−0.662	−0.684	−0.67	−0.684	−0.635
Capex intensity	−0.355	23.518***	−0.375	23.825***	−0.372	24.017***
	−0.485	0.000	−0.46	0.000	−0.095	−0.408

(*Continued*)

Table 5. (Continued) WOCB and FP – Tobin's Q and ROA

	Tobin's Q	ROA	Tobin's Q	ROA	Tobin's Q	ROA
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	7.007***	26.561***	7.091***	25.906***	7.009***	27.145***
	0.000	0.000	0.000	0.000	0.000	0.000
Year controls	Yes	Yes	Yes	Yes	Yes	Yes
FF-38 industry controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,139	3,139	3,139	3,139	3,139	3,139
R-squared	0.242	0.122	0.242	0.122	0.244	0.12
Number of firms	315	315	315	315	315	315

Notes: This table reports results from DiD estimations. The dependent variable is firm financial performance, measured by Tobin's Q and ROA. The sample includes French firms listed in the SBF 120 (the treatment group) and, alternately, matched US firms listed in the S&P 500 (the control group). *France* is a dummy variable that takes value 1 if the firm is in the treatment group. *Post* is a dummy variable that takes value 1 if fiscal year is after 2010, and 0 otherwise. All models are estimated with firm and year fixed effects. Description of all the variables can be found in Appendix A; *p*-values based on robust standard errors clustered at the firm level are reported in parentheses; *, **, and *** denote statistical significance at 10, 5, and 1% respectively.
Source: Own elaboration.

ROA suggests that the quota's impact may be attributed to increased challenges in achieving board effectiveness or unintended organizational frictions introduced during the transition to gender-diverse boards.

The columns (5)–(6) of Table 5 show that the three-way interaction term with *post*, *France*, and *proportion of women* is negative and statistically significant at the 1% level in the models with ROA, but are not statistically significant in the model with Tobin's Q. Consistent with the findings in columns (1)–(4), the moderating role of variables such as the proportion of women on boards or low female representation does not exhibit statistically significant effects on FP. These results align with our core research question, which posits that the proportion of women on boards may not directly influence FP in isolation but rather interacts with other factors, such as board fit. This interaction will be further explored in the next section using the difference-in-differences (DiD) design.

Regarding the control variables, we notice that *firm size* is negatively and significantly correlated with FP (either Tobin's Q or ROA). This finding is consistent with previous studies (e.g., Adams & Ferreira, 2009), suggesting that larger firms are more complex to run and more difficult to be monitored.

Overall, Table 5 shows that the French board gender quota has a negative and significant effect on the WOCB–FP relationship. Therefore, the results support hypothesis 2.

Fit of WOCB and FP

Having established that the gender quota changes the influence of WOCB on FP, we next check if this change is associated with the change in fit. In Section 5.4., we show that the fit of WOCB decreases after the gender quota. If the differential effect of fit on FP after the gender quota is significant, then the effect of WOCB on FP could be attributed, at least in part, to the change in fit. The confirmation of this assumption would support hypothesis 3, which predicts that fit influences the effect of the gender quota on the WOCB–FP relationship. To test this prediction, we estimate the follow model:

$$\begin{aligned} &financial\ performance_{i,t+1} \\ &= a + b_1 \times proportion\ of\ women_{i,t} + b_2 \times fit_{i,t} + b_3 \times fit_{i,t} \times post \\ &+ b_4 \times fit_{i,t} \times France + b_5 \times fit_{i,t} \times post \times France + c \\ &\times control\ variables_{i,t} + e_{i,t+1} \end{aligned} \quad [3]$$

In eq. [3], the three-way interaction term indicates the effect of WOCB's fit on FP after gender quota relative to the US. A negative coefficient on this term indicates that the change in fit negatively impacts FP after the gender quota.

We examine the impact of changes in board fit dimensions – demographic fit, human capital fit, and social capital fit – on FP, as measured by Tobin's Q and ROA, following the implementation of the French gender quota law. Tables 6A, 6B, and 7 present a comprehensive analysis of this relationship by first examining the overall impact (Table 6A), then exploring heterogeneity across firms based on fit trajectories (Table 6B), and finally breaking down the fit dimensions into specific components to uncover nuanced effects (Table 7).

Table 6A shows the results for the model estimated with Tobin's Q and ROA as the dependent variable. Columns (1), (2), and (3) show a negative differential impact on Tobin's Q from *demographic fit* at the 10% level and from *social capital fit* at the 5% level. The impact from *human capital fit* is not statistically significant. In general, these results suggest a more significant negative effect of the changes in *demographic fit* and *social capital fit* on Tobin's Q. The differential impact of fit on ROA is negative and significant at the 1% level for the three dimensions of fit, as presented in columns (4), (5), and (6).

Table 6A. Impact of the fit of WOCB on FP: Tobin's Q and ROA

	Tobin's Q			ROA		
	(1)	(2)	(3)	(4)	(5)	(6)
Demographic fit×post×France	−0.294*			−3.399***		
	(0.082)			(0.001)		
Demographic fit×post	0.244			1.235		
	(0.122)			(0.333)		
Demographic fit×France	0.089			2.432*		
	(0.662)			(0.058)		
Human capital fit×post×France		−0.187			−4.433***	
		(0.313)			(0.001)	
Human capital fit×post		0.229			0.590	
		(0.114)			(0.544)	
Human capital fit×France		0.146			2.415	
		(0.441)			(0.118)	
Social capital fit×post×France			−0.447**			−3.819***
			(0.029)			(0.003)
Social capital fit×post			0.287			0.598
			(0.270)			(0.742)
Social capital fit×France			0.695**			3.282*
			(0.021)			(0.084)
Proportion of women	0.151	0.167	0.158	−3.729	−3.778	−3.542
	(0.760)	(0.741)	(0.747)	(0.203)	(0.199)	(0.227)
Demographic fit	−0.025	0.098	0.068	−2.246	−1.401*	−1.312*
	(0.906)	(0.454)	(0.595)	(0.100)	(0.076)	(0.088)
Human capital fit	0.133	−0.000	0.150	0.647	0.259	0.550
	(0.338)	(0.998)	(0.281)	(0.523)	(0.843)	(0.578)
Social capital fit	−0.111	−0.119	−0.470	−0.930	−0.939	−1.642
	(0.484)	(0.452)	(0.123)	(0.327)	(0.325)	(0.382)
Constant	7.076***	7.128***	7.161***	26.758***	26.950***	26.872***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,139	3,139	3,139	3,139	3,139	3,139
R-squared	0.246	0.246	0.248	0.123	0.123	0.123
Number of firms	315	315	315	315	315	315

Notes: The dependent variable is Tobin's Q in columns (1)–(3) and ROA in columns (4) – (6). All variables are defined in Appendix A. All models are estimated with firm and year fixed effects; *p*-values based on robust standard errors clustered at the firm level are reported in parentheses; *, **, and *** denote statistical significance at 10, 5, and 1% levels, respectively.
Source: Own elaboration.

To further investigate the heterogeneity in firms' responses to the gender quota law, Table 6B categorizes firms into two groups based on changes in board fit following the implementation of the gender quota law. Columns (1)–(3) report the results for the decreasing fit group, which includes firms whose fit (*demographic fit*, *human capital fit*, or *social capital fit*) decreased after the law. In contrast, columns (4)–(6) report the results for the non-decreasing fit group, encompassing firms whose fit did not decrease – these firms either maintained or improved their board fit levels.

The results reveal significant differences between the two groups. In the decreasing fit group, the post×France interaction term is negative and statistically significant across all models. This indicates that firms with a declining fit experienced a notable decrease in Tobin's Q after the law was implemented. In contrast, the post×France interaction term is not statistically

Table 6B. Impact of the fit of WOCB on FP: change of fit on firm performance (Tobin's Q)

	Decreasing Fit Group			Non-decreasing Fit Group		
	Demographic fit	Human capital fit	Social capital fit	Demographic fit	Human capital fit	Social capital fit
	(1)	(2)	(3)	(4)	(5)	(6)
Proportion of women	0.371	0.495	0.949	0.139	0.050	−0.452
	(0.410)	(0.486)	(0.285)	(0.845)	(0.922)	(0.375)
Demographic fit	0.137	0.067	0.037	0.294*	0.084	0.100
	(0.377)	(0.700)	(0.838)	(0.059)	(0.603)	(0.549)
Human capital fit	0.102	0.177	0.219	0.009	0.051	0.157
	(0.503)	(0.414)	(0.289)	(0.969)	(0.764)	(0.338)
Social capital fit	0.001	−0.062	0.131	−0.288	−0.075	−0.208
	(0.992)	(0.778)	(0.551)	(0.176)	(0.620)	(0.291)
Post*France	−0.173**	−0.251**	−0.359**	−0.187	−0.134	−0.017
	(0.042)	(0.039)	(0.013)	(0.124)	(0.224)	(0.863)
Constant	7.344***	4.219***	4.702***	4.528***	7.097***	8.365***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,969	1,167	1,551	1,170	1,972	1,588
R-squared	0.251	0.237	0.277	0.242	0.238	0.253

Notes: The dependent variable is Tobin's Q. Columns (1)–(3) report the results for firms in the decreasing fit groups – demographic fit, human capital fit, and social capital fit-before and after the law – while columns (4)–(6) correspond to firms in the non-decreasing fit groups for the same dimensions. All variables are defined in Appendix A. All models are estimated with firm and year fixed effects; *p*-values based on robust standard errors clustered at the firm level are reported in parentheses; *, **, and *** denote statistical significance at 10, 5, and 1% levels, respectively.
Source: Own elaboration.

significant in the non-decreasing fit group, suggesting that firms with stable or increasing fit were not adversely affected in terms of Tobin's Q.

These findings highlight the heterogeneity in firms' responses to the gender quota law. Firms in the decreasing fit group, which struggled to maintain alignment between board composition and organizational needs, were more negatively impacted. On the other hand, firms in the non-decreasing fit group, which adapted to or benefited from the quota, did not experience significant performance declines.

The results further suggest that the relationship between the fit of WOCB and FP weakened after the gender quota law. As shown in Table 4, the implementation of the gender quota led to a decline in the fit of WOCB for some firms. Taken together, this evidence implies that the observed negative impact of the gender quota on FP is driven by a decrease in the fit of newly appointed female directors.

This analysis underscores the importance of considering firm-specific contexts and the challenges associated with a one-size-fits-all policy. While the gender quota law aimed to improve board diversity, its implementation may have inadvertently disrupted the alignment between board composition and firm needs, particularly in firms where fit decreased. Future policies should incorporate measures to support firms in maintaining or improving board fit during transitions to more diverse boards.

To better understand which aspects of fit contribute to the observed performance effects, Table 7 disaggregates the three fit dimensions into their component measures.

The results indicate that the coefficients for the three-way interaction with fit in age, nationality, function, education, and prestige school are negative and statistically significant at the 1% level or below, suggesting that changes in these components of fit had a negative impact on the contribution of WOCB to FP. This negative effect of Age fit on FP is in line with the findings in Ahern and Dittmar (2012) for the Norwegian case, where the youth of new female directors appointed is noted. The coefficient of fit on industry background is not statistically significant, indicating that changes in this measure of fit did not impact the relationship between WOCB and FP.

Overall, the results suggest that the decrease in the contribution of WOCB to FP can be explained, at least partially, by the decrease of the fit of the new female directors

Table 7. Impact of the fit of WOCB on FP for different dimensions (Tobin's Q)

	Age (1)	Nationality (2)	Function (3)	Top executive (4)	Industry (5)	Education (6)	Prestige school (7)
Fit dimension×post×France	−0.357**	−0.413***	−0.334*	−0.041	0.181	−0.333*	−0.518**
	(0.022)	(0.009)	(0.089)	(0.744)	(0.597)	(0.075)	(0.011)
Fit dimension×post	−0.073	0.422**	0.210	0.453***	0.342***	0.193	0.321*
	(0.614)	(0.016)	(0.197)	(0.001)	(0.003)	(0.431)	(0.093)
Fit dimension×France	0.107	−0.014	0.317	−0.059	−0.499*	0.693***	0.154
	(0.548)	(0.939)	(0.161)	(0.836)	(0.088)	(0.006)	(0.510)
Proportion of women	0.723	1.004*	0.750	0.977*	1.012*	0.761	0.876*
	(0.172)	(0.059)	(0.150)	(0.070)	(0.060)	(0.144)	(0.083)
Age fit	−0.058	−0.142	−0.140	−0.134	−0.140	−0.138	−0.140
	(0.656)	(0.117)	(0.125)	(0.142)	(0.126)	(0.130)	(0.125)
Nationality fit	0.207*	0.058	0.218*	0.253**	0.253**	0.221*	0.238*
	(0.090)	(0.709)	(0.076)	(0.043)	(0.039)	(0.066)	(0.062)
Function fit	−0.205	−0.132	−0.369*	−0.162	−0.197	−0.247	−0.164
	(0.231)	(0.424)	(0.098)	(0.369)	(0.261)	(0.136)	(0.332)
Top executive fit	−0.081	−0.018	−0.083	−0.246	−0.056	−0.061	−0.062
	(0.525)	(0.892)	(0.515)	(0.448)	(0.665)	(0.643)	(0.631)
Industry fit	0.228	0.119	0.307	0.166	0.057	0.336**	0.191
	(0.126)	(0.495)	(0.107)	(0.528)	(0.749)	(0.019)	(0.276)
Education fit	−0.036	−0.026	−0.036	−0.025	−0.025	−0.335*	−0.032
	(0.801)	(0.856)	(0.803)	(0.861)	(0.862)	(0.091)	(0.826)
Prestige school fit	−0.035	0.001	−0.041	−0.007	−0.005	−0.067	−0.197
	(0.807)	(0.995)	(0.785)	(0.963)	(0.971)	(0.645)	(0.330)
Constant	2.477***	2.587***	2.572***	2.639***	2.580***	2.494***	2.542***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,139	3,139	3,139	3,139	3,139	3,139	3,139
R-squared	0.548	0.550	0.548	0.550	0.550	0.549	0.549
Number of firms	315	315	315	315	315	315	315

Notes: The dependent variable is Tobin's Q. All variables are defined in Appendix A. All models are estimated with firm and year fixed effects; *p*-values based on robust standard errors clustered at the firm level are reported in parentheses; *, **, and *** denote statistical significance at 10, 5, and 1% levels, respectively.
Source: Own elaboration.

appointed, especially regarding changes in demographic and social capital fit. These results provide support to hypothesis 3.

Discussion and conclusion

Summary of main findings and contributions

Our work studies the impact of WOCB on FP in France, using the Copé-Zimmermann law as a quasi-natural experiment. Based on a DiD research design with French firms in the treatment group and US firms in the control group, we find a negative differential impact of the proportion of WOCB on both Tobin's Q (market-based performance measure) and ROA (accounting measure of operational performance) after the gender quota in France. Our finding is further supported by the result that the proportion of women, when considered as a mediator variable, does not impact firm performance (Table 5). We also document that when the demographic, social capital, and human capital fit of the women on boards in France decreased after the quota was implemented, this change in fit negatively impacted FP. The results are stronger for the ROA measure than for the Tobin's Q measure (Tables 6

and 7). This analysis leads us to conclude that the decrease in fit explains some of the negative impact of the gender quota on FP. This effect is more pronounced for demographic and social fit than for human capital fit.

Thanks to our results, we make several contributions to the literature. First, empirical research is inconclusive regarding the impact of WOCB on FP (e.g., Ahern & Dittmar, 2012; Yang et al., 2019). From a theoretical perspective, scholars have put forth diverse and contradicting arguments. However, what is missing in the discussion is the role of board dynamics as a social group in shaping the WOCB–FP relationship (Havrylyshyn et al., 2023). We do not know how the characteristics of the directors themselves influence the contribution of WOCB. By attending to this particular issue, our work makes a theoretical contribution by reconciling the heterogeneity of previous findings and offering fit as a possible explanation. We highlight that diversity within corporate boards is a double-edged sword by providing empirical evidence that the fit, or lack of fit, of female directors with the incumbents may explain the positive or negative impact of increasing women's representation on boards. It is important to note that compared to extant studies investigating the attributes of board members (e.g., Ahern & Dittmar, 2012; Ferreira et al., 2017), we delve deeper by considering the complex nature of the relationships between board members' attributes, rather than simply comparing their attributes before and after the quota implementation. In short, our work sheds new light on the diverse findings regarding the WOCB–FP relationship by providing new insights into the understanding of the role of director characteristics and the need to examine them in the broader social context of the board.

Second, we also contribute to the empirical literature that studies the French context. The work of Sabatier (2015) is one of the few studies that consider this particular setting. It uses ROA as the measure of FP but has a limited sample size (CAC40-listed companies) and a short period of study (from 2008 to 2012). Sarang et al. (2024) also examine French companies but focus only on cost of equity rather than FP. The works of Comi et al. (2020) and Labelle et al. (2015) investigate the WOCB–FP relationship comparatively across multiple countries, including France. The former measure FP by ROA and labor productivity, while the latter use only ROA. From a methodological point of view, our work goes further than these studies by having a larger sample size and a longer period of study. We use not only ROA but also Tobin's Q, which have been considered more accurate measures of FP (Adams & Ferreira, 2009; Sila et al., 2016).

Importantly, the above studies examine the link between WOCB and FP from a linear perspective, testing the direct relationship between the two variables. However, France is a particular institutional context with a strong historical and cultural heritage. As mentioned earlier in the text, it is a highly elitist society, in which it is difficult to climb up the corporate ladder if one does not graduate from a Grande école (Bourdieu, 1996). Integrating the specificities of the French culture, we demonstrate that the fit of new female directors with the incumbents on a board is particularly important.

Third, we contribute by addressing the endogeneity concern that remains unsolved in the studies of the WOCB–FP relationship. Endogeneity in studies of WOCB arises because board characteristics are endogenously selected by firms and determined by the firm's characteristics and environment (e.g., Ahern & Dittmar, 2012; Sila et al., 2016). Prior empirical studies use several approaches to address the endogeneity problem. The instrumental variable approach is one possible solution, but finding an exogenous instrumental variable for board diversity (that satisfies the orthogonal condition and is not correlated with the error term) is challenging. Sila et al. (2016) use the system GMM method (generalized method of moments). As explained in Roodman (2009), this method also has limitations, as it relies on the assumption of orthogonality of internal instruments, which can become weaker as the number of lags and explanatory variables increases.

We make a methodological contribution by offering a solution to solve the endogeneity concern, which is to employ quasi-experimental methods and the DiD approach. In the current context, where gender quotas are not mandatory across all countries, this solution is applicable in future studies. However, it should be noted that this methodology has certain limitations that are relevant to our study. One is the constraint of the cross-national DiD design. While a standard DiD design often uses firms from the same nation or region to account for potential confounding factors such as regulatory disparities, economic conditions, and cultural differences (Yang et al., 2019), our focus diverges. Our treatment group consists of publicly traded firms in France, mandated to adhere to the Copé-Zimmermann law. Ideally, our control group would encompass private firms exempt from this law or firms from EU nations without such a gender quota regulation. However, sourcing fit variable data for private firms proved challenging. Moreover, throughout our focal research span (2006–2017), many EU nations instituted various gender quota regulations, as detailed in our literature review.

Another constraint of the DiD approach adopted in our study pertains to the extended post-treatment duration. In typical DiD frameworks, the post-treatment phase immediately follows the external shock. The primary concern with elongated duration is the potential emergence of other unanticipated interventions or events influencing the outcome variable. Such factors can introduce confounding variables, thereby biasing the DiD estimator. Notably, an extended post-treatment period is prevalent in Gender Diversity Reform studies, as observed in Fauver et al. (2022), primarily due to the inherent long grace periods associated with most related policies.

In light of the aforementioned limitations, we undertook parallel trend tests and other robustness tests, as described in this paper. These measures confirm the validity of our DiD approach in addressing our research questions and yielding reliable results. Future studies should adopt similar measures to handle the limitations inherent to this methodological approach.

Policy and managerial implications

Governments across different countries have adopted gender quotas to increase diversity in corporate boards. While gender quotas may impact board effectiveness, concerns have been raised about the potential impact on board dynamics, such as conflicts, and the appointment of female directors that potentially undermines the principle of meritocracy. In this context, our results are relevant for companies, investors, and policy-makers. By putting forward the hitherto unexplored notion of fit between women directors and the incumbents, we contribute to the understanding of the factors that could damage the effect of gender quotas. Specifically, while it is important to foster women's representation in corporate boards through gender-balancing quotas (Sarang et al., 2024), it is also essential to ensure the similarity between new female members and the incumbents in terms of social capital, human capital, and demographics.

Policy-makers can evaluate the economic effects of legal measures to enhance equality on boards by investigating the degree of fit between newly recruited WOCB and the incumbents. In doing so, they should be able to identify whether the ultimate impact of these measures is on board functioning or simply on recognizing gender equality. Importantly, it should be noted that gender is only one source of diversity. Imposing gender quotas on corporate boards helps increase the number of female directors, but there might be other sources of diversity, such as social capital, human capital, and demographics. These diversities operate along the different dimensions of fit in influencing the effectiveness of policy measures. Policy-makers should go further than promoting equality between men and women to recognize equality between social groups within boards (e.g. between ethnic groups or age groups).

References

Adams, R. B., Akyol, A. C., & Verwijmeren, P. (2018). Director skill sets. *Journal of Financial Economics, 130*(3), 641–662. https://doi.org/10.1016/j.jfineco.2018.04.010

Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics, 94*(2), 291–309. https://doi.org/10.1016/j.jfineco.2008.10.007

Ahern, K. R., & Dittmar, A. K. (2012). The changing of the boards: The impact on firm valuation of mandated female board representation. *The Quarterly Journal of Economics, 127*(1), 137–197. https://doi.org/10.1093/qje/qjr049

Allen, A., & Wahid, A. S. (2024). Regulating gender diversity: Evidence from California Senate Bill 826. *Management Science, 70*(4), 2023–2046. https://doi.org/10.1287/mnsc.2023.4825

Ashforth, B. E., & Mael, F. (1989). Social identity theory and the organization. *Academy of Management Review, 14*(1), 20–39. https://doi.org/10.5465/amr.1989.4278999

Barber, B. M., & Odean, T. (2001). Boys will be boys: Gender, overconfidence, and common stock investment. *Quarterly Journal of Economics, 116*(1), 261–292. https://doi.org/10.1162/003355301556400

Bennouri, M., Chtioui, T., Nagati, H., & Nekhili, M. (2018). Female board directorship and firm performance: What really matters? *Journal of Banking & Finance, 88*(March), 267–291. https://doi.org/10.1016/j.jbankfin.2017.12.010

Bertrand, M., Black, S. E., Jensen, S., & Lleras-Muney, A. (2019). Breaking the glass ceiling? The effect of board quotas on female labour market outcomes in Norway. *The Review of Economic Studies, 86*(1), 191–239. https://doi.org/10.1093/restud/rdy032

Bertrand, M., Duflo, E., & Mullainathan, S. (2004). How much should we trust differences-in-differences estimates? *The Quarterly Journal of Economics, 119*(1), 249–275. https://doi.org/10.1162/003355304772839588

Bøhren, Ø., & Staubo, S. (2014). Does mandatory gender balance work? Changing organizational form to avoid board upheaval. *Journal of Corporate Finance, 28*(October), 152–168. https://doi.org/10.1016/j.jcorpfin.2013.12.005

Bourdieu, P. (1996). *The state nobility: Elite schools in the field of power* [trans. L. C. Clough]. Stanford University Press.

Byrne, D. E. (1971). *The attraction paradigm*. Academic Press.

Byrnes, J. P., Miller, D. C., & Schafer, W. D. (1999). Gender differences in risk taking: A meta-analysis. *Psychological Bulletin, 125*(3), 367–383. https://doi.org/10.1037/0033-2909.125.3.367

Campbell, K., & Mínguez-Vera, A. (2008). Gender diversity in the boardroom and firm financial performance. *Journal of Business Ethics, 83*, 435–451. https://doi.org/10.1007/s10551-007-9630-y

Chung, K. H., & Pruitt, S. W. (1994). A simple approximation of Tobin's Q. *Financial Management, 23*(3), 70–74. https://doi.org/10.2307/3665623

Comi, S., Grasseni, M., Origo, F., & Pagani, L. (2020). Where women make a difference: Gender quotas and firms' performance in three European countries. *ILR Review, 73*(3), 768–793. https://doi.org/10.1177/0019793919846450

Conyon, M. J., & He, L. (2017). Firm performance and boardroom gender diversity: A quantile regression approach. *Journal of Business Research, 79*(October), 198–211. https://doi.org/10.1016/j.jbusres.2017.02.006

Dale-Olsen, H., Schøne, P., & Verner, M. (2013). Diversity among Norwegian boards of directors: Does a quota for women improve firm performance? *Feminist Economics, 19*(4), 110–135. https://doi.org/10.1080/13545701.2013.830188

De Anca, C., & Gabaldon, P. (2014). The media impact of board member appointments in Spanish-listed companies: A gender perspective. *Journal of Business Ethics, 122*(3), 425–438. https://doi.org/10.1007/s10551-013-1768-1

Dezsö, C. L., & Ross, D. G. (2012). Does female representation in top management improve firm performance? A panel data investigation. *Strategic Management Journal, 33*(9), 1072–1089. https://doi.org/10.1002/smj.1955

Eberhart, A. C., Maxwell, W. F., & Siddique, A. R. (2004). An examination of long-term abnormal stock returns and operating performance following R&D increases. *The Journal of Finance, 59*(2), 623–650. https://doi.org/10.1111/j.1540-6261.2004.00644.x

Eckbo, B. E., Nygaard, K., & Thorburn, K. S. (2022). Valuation effects of Norway's board gender-quota law revisited. *Management Science, 68*(6), 4112–4134. https://doi.org/10.1287/mnsc.2021.4031

Fama, E. F., & French, K. R. (1997). Industry costs of equity. *Journal of Financial Economics, 43*(2), 153–193. https://doi.org/10.1016/S0304-405X(96)00896-3

Fauver, L., Huang, M., Taboada, A. G., & Wang, E. J. (2022). Boardroom gender diversity reforms and institutional monitoring: Global evidence. *Review of Accounting Studies, 29*(1), 621–664. https://doi.org/10.1007/s11142-022-09710-3

Ferrari, G., Ferraro, V., Profeta, P., & Pronzato, C. (2022). Do board gender quotas matter? Selection, performance, and stock market effects. *Management Science, 68*(8), 5618–5643. https://doi.org/10.1287/mnsc.2021.4200

Ferreira, D. (2010). Board diversity. In H. K. Baker & R. Anderson (Eds.), *Corporate Governance: A synthesis of theory, research, and practice* (pp. 225–242). Wiley.

Ferreira, D. (2015). Board diversity: Should we trust research to inform policy? *Corporate Governance: An International Review, 23*(2), 108–111. https://doi.org/10.1111/corg.12092

Ferreira, D., Ginglinger, E., Laguna, M.-A., & Skalli, Y. (2017). Closing the gap: Board gender quotas and hiring practices [Working paper, No. 520/2017]. The European Corporate Governance Institute (ECGI) – Finance Working Paper Series.

Frink, D. D., Robinson, R. K., Reithel, B., Arthur, M. M., Ammeter, A. P., Ferris, G. R., Kaplan, D. M., & Morrisette, H. S. (2003). Gender demography and organization performance: A two-study investigation with convergence. *Group & Organization Management, 28*(1), 127–147. https://doi.org/10.1177/1059601102250025

Gabaldon, P., De Anca, C., Mateos de Cabo, R., & Gimeno, R. (2016). Searching for women on boards: An analysis from the supply and demand perspective. *Corporate Governance: An International Review, 24*(3), 371–385. https://doi.org/10.1111/corg.12141

Ginglinger, E., & Raskopf, C. (2023). Women directors and E&S performance: Evidence from board gender quotas. *Journal of Corporate Finance, 83*(December), 102496. https://doi.org/10.1016/j.jcorpfin.2023.102496

Gordini, N., & Rancati, E. (2017). Gender diversity in the Italian boardroom and firm financial performance. *Management Research Review, 40*(1), 75–94. https://doi.org/10.1108/MRR-02-2016-0039

Graham, M. E., Belliveau, M. A., & Hotchkiss, J. L. (2017). The view at the top or signing at the bottom? Workplace diversity responsibility and women's representation in management. *Industrial and Labor Relations Review, 70*(1), 223–258. https://doi.org/10.1177/0019793916668879

Greene, D., Intintoli, V. J., & Kahle, K. M. (2020). Do board gender quotas affect firm value? Evidence from California Senate Bill No. 826. *Journal of Corporate Finance, 60*(February), 101526. https://doi.org/10.1016/j.jcorpfin.2019.101526

Gregorič, A., Oxelheim, L., Randøy, T., & Thomsen, S. (2017). Resistance to change in the corporate elite: Female directors' appointments onto Nordic boards. *Journal of Business Ethics, 141*, 267–287. https://doi.org/10.1007/s10551-015-2703-4

Hambrick, D. C., Cho, T. S., & Chen, M.-J. (1996). The influence of top management team heterogeneity on firms' competitive moves. *Administrative Science Quarterly, 41*(4), 659–684. https://doi.org/10.2307/2393871

Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organizations as a reflection of its top managers. *Academy of Management Review, 9*(2), 193–206. https://doi.org/10.2307/258434

Havrylyshyn, A., Schepker, D. J., & Nyberg, A. J. (2023). In the club? How categorization and contact impact the board gender diversity-firm performance relationship. *Journal of Business Ethics, 184*(2), 353–374. https://doi.org/10.1007/s10551-022-05168-0

Hillman, A. J., Shropshire, C., & Cannella, A. A. (2007). Organizational predictors of women on corporate boards. *Academy of Management Journal, 50*(4), 941–952. https://doi.org/10.5465/amj.2007.26279222

Honoré, F., Munari, F., & Van Pottelsberghe de La Potterie, B. (2015). Corporate governance practices and companies' R&D intensity: Evidence from European countries. *Research Policy, 44*(2), 533–543. https://doi.org/10.1016/j.respol.2014.10.016

Hoobler, J. M., Masterson, C. R., Nkomo, S. M., & Michel, E. J. (2018). The business case for women leaders: Meta-analysis, research critique, and path forward. *Journal of Management, 44*(6), 2473–2499. https://doi.org/10.1177/0149206316628643

Huang, S., & Hilary, G. (2018). Zombie board: Board tenure and firm performance. *Journal of Accounting Research, 56*(4), 1285–1329. https://doi.org/10.1111/1475-679X.12209

Hutchinson, M., & Gul, F. A. (2004). Investment opportunity set, corporate governance practices and firm performance. *Journal of Corporate Finance, 10*(4), 595–614. https://doi.org/10.1016/S0929-1199(03)00022-1

Johnson, S. G., Schnatterly, K., & Hill, A. D. (2013). Board composition beyond independence: Social capital, human capital, and demographics. *Journal of Management, 39*(1), 232–262. https://doi.org/10.1177/0149206312463938

Kim, D., & Starks, L. T. (2016). Gender diversity on corporate boards: Do women contribute unique skills? *The American Economic Review, 106*(5), 267–271. https://www.doi.org/10.1257/aer.p20161032

Kirsch, A. (2018). The gender composition of corporate boards: A review and research agenda. *The Leadership Quarterly, 29*(2), 346–364. https://doi.org/10.1016/j.leaqua.2017.06.001

Kristof, A. L. (1996). Person-organization fit: An integrative review of its conceptualizations, measurement, and implications. *Personnel Psychology, 49*(1), 1–49. https://doi.org/10.1111/j.1744-6570.1996.tb01790.x

Labelle, R., Francœur, C., & Lakhal, F. (2015). To regulate or not to regulate? Early evidence on the means used around the world to promote gender diversity in the boardroom. *Gender, Work & Organization, 22*(4), 339–363. https://doi.org/10.1111/gwao.12091

Liu, Y., Wei, Z., & Xie, F. (2014). Do women directors improve firm performance in China? *Journal of Corporate Finance, 28*(October), 169–184. https://doi.org/10.1016/j.jcorpfin.2013.11.016

Martínez-García, I., Terjesen, S., & Gómez-Ansón, S. (2022). Board gender diversity codes, quotas and threats of supranational legislation: Impact on director characteristics and corporate outcomes. *British Journal of Management, 33*(2), 753–783. https://doi.org/10.1111/1467-8551.12517

Matsa, D. A., & Miller, A. R. (2013). A female style in corporate leadership? Evidence from quotas. *American Economic Journal: Applied economics, 5*(3), 136–169. https://www.doi.org/10.1257/app.5.3.136

Miller, D., & Xu, X. (2020). CEO long-term orientation and elite university education. *Strategic Organization, 18*(4), 520–546. https://doi.org/10.1177/1476127019840740

Nguyen, B. D. (2012). Does the Rolodex matter? Corporate elite's small world and the effectiveness of boards of directors. *Management Science, 58*(2), 236–252. https://doi.org/10.1287/mnsc.1110.1457

Nguyen, T. H. H., Ntim, C. G., & 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, 71*(October), 101554. https://doi.org/10.1016/j.irfa.2020.101554

Pandey, N., Kumar, S., Post, C., Goodell, J. W., & García-Ramos, R. (2023). Board gender diversity and firm performance: A complexity theory perspective. *Asia Pacific Journal of Management, 40*(3), 1289–1320. https://doi.org/10.1007/s10490-022-09817-w

Post, C., & Byron, K. (2015). Women on boards and firm financial performance: A meta-analysis. *Academy of Management Journal, 58*(5), 1546–1571. https://doi.org/10.5465/amj.2013.0319

Reguera-Alvarado, N., De Fuentes, P., & Laffarga, J. (2017). Does board gender diversity influence financial performance? Evidence from Spain. *Journal of Business Ethics, 141*(2), 337–350. https://doi.org/10.1007/s10551-015-2735-9

Roodman, D. (2009). A note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics, 71*(1), 135–158. https://doi.org/10.1111/j.1468-0084.2008.00542.x

Sabatier, M. (2015). A women's boom in the boardroom: Effects on performance? *Applied Economics, 47*(26), 2717–2727. https://doi.org/10.1080/00036846.2015.1008774

Sarang, A. A. A., Aubert, N., & Hollandts, X. (2024). Board gender diversity and the cost of equity: What difference does gender quota legislation make? *International Journal of Finance & Economics, 29*(2), 2193–2213. https://doi.org/10.1002/ijfe.2774

Seong, J. Y., Kristof-Brown, A. L., Park, W.-W., Hong, D.-S., & Shin, Y. (2015). Person-group fit: Diversity antecedents, proximal outcomes, and performance at the group level. *Journal of Management, 41*(4), 1184–1213. https://doi.org/10.1177/0149206312453738

Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *Journal of Finance, 52*(2), 737–783. https://doi.org/10.1111/j.1540-6261.1997.tb04820.x

Sila, V., Gonzalez, A., & Hagendorff, J. (2016). Women on board: Does boardroom gender diversity affect firm risk? *Journal of Corporate Finance, 36*(February), 26–53. https://doi.org/10.1016/j.jcorpfin.2015.10.003

Singh, V., Terjesen, S., & Vinnicombe, S. (2008). Newly appointed directors in the boardroom: How do women and men differ? *European Management Journal, 26*(1), 48–58. https://doi.org/10.1016/j.emj.2007.10.002

Sraer, D., & Thesmar, D. (2007). Performance and behavior of family firms: Evidence from the French stock market. *Journal of the European Economic Association, 5*(4), 709–751. https://doi.org/10.1162/JEEA.2007.5.4.709

Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup behaviour. In S. Worchel & W. G. Austin (Eds.), *Psychology of Intergroup Relations* (pp. 7–24). Nelson-Hall.

Tasheva, S., & Hillman, A. J. (2019). Integrating diversity at different levels: Multilevel human capital, social capital, and demographic diversity and their implications for team effectiveness. *Academy of Management Review, 44*(4), 746–765. https://doi.org/10.5465/amr.2015.0396

Torchia, M., Calabrò, A., & Huse, M. (2011). Women directors on corporate boards: From tokenism to critical mass. *Journal of Business Ethics, 102*(2), 299–317. https://doi.org/10.1007/s10551-011-0815-z

Tsui, A. S., & O'Reilly, C. A. (1989). Beyond simple demographic effects: The importance of relational demography in superior-subordinate dyads. *Academy of Management Journal, 32*(2), 402–423. https://doi.org/10.5465/256368

Westphal, J. D., & Stern, I. (2006). The other pathway to the boardroom: Interpersonal influence behavior as a substitute for elite credentials and majority status in obtaining board appointments. *Administrative Science Quarterly, 51*(2), 169–204. https://doi.org/10.2189/asqu.51.2.169

Westphal, J. D., & Zajac, E. J. (2013). A behavioral theory of corporate governance: Explicating the mechanisms of socially situated and socially constituted agency. *Academy of Management Annals, 7*(1), 607–661. https://doi.org/10.1080/19416520.2013.783669

Williams, K. Y., & O'Reilly, C. A. (1998). Demography and diversity in organizations: A review of 40 years of research. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior* (Vol. 20, pp. 77–140). Elsevier.

Wintoki, M. B., Linck, J. S., & Netter, J. M. (2012). Endogeneity and the dynamics of internal corporate governance. *Journal of Financial Economics, 105*(3), 581–606. https://doi.org/10.1016/j.jfineco.2012.03.005

Yang, P., Riepe, J., Moser, K., Pull, K., & Terjesen, S. (2019). Women directors, firm performance, and firm risk: A causal perspective. *The Leadership Quarterly, 30*(5), 101297. https://doi.org/10.1016/j.leaqua.2019.05.004

Yermack, D. (1996). Higher market valuation of companies with a small board of directors. *Journal of Financial Economics, 40*(2), 185–211. https://doi.org/10.1016/0304-405X(95)00844-5

Zattoni, A., Leventis, S., Van Ees, H., & De Masi, S. (2023). Board diversity's antecedents and consequences: A review and research agenda. *The Leadership Quarterly, 34*(1), 101659.

Zhu, D. H., Shen, W., & Hillman, A. J. (2014). Recategorization into the in-group: The appointment of demographically different new directors and their subsequent positions on corporate boards. *Administrative Science Quarterly, 59*(2), 240–270. https://doi.org/10.1177/0001839214530951

Appendices

Appendix A. Variables' definition.

Variable	Definition
Panel A – Dependent variables	
Tobin's Q	[Share price at end of calendar year * number of common stock outstanding at end of calendar year + liquidating value of the firm's preferred stock + current liabilities − current assets + book value of long-term debt] / book value of total assets (Chung & Pruitt, 1994)
ROA	Ratio of operating income to total assets
Panel B – Independent variables	
Proportion of WOCB	Total number of WOCB divided by the total number of directors (Adams & Ferreira, 2009)
Low women representation	This variable equals 1 if a firm's board had zero female directors or a proportion of women below the target set by the French gender quota before its implementation, and 0 otherwise
France	Dummy variable that equals 1 if the country is France, 0 if US. The sample includes French firms listed in the SBF 120 (the treatment group) and, alternately, matched US firms listed in the S&P 500 (the control group). France is a dummy variable that takes value 1 if the firm is in the treatment group.
Post	Dummy variable that equals 1 if the year is 2011 or later, 0 otherwise
Gender	Dummy variable that equals 1 if the director is female, 0 otherwise
Demographic fit	Mean of age fit and nationality fit
Age fit	First, for each female director, we find the proportion of the remaining board directors who have similar age. Then, we take the average across all female directors.
	Age: director's age by the fiscal year
	We code directors as having similar age when the age difference is less than one standard deviation.
Nationality fit	First, for each female director, we find the proportion of the remaining board directors who have the same nationality. Then, we take the average across all female directors.
Human capital fit	Mean of top executive fit, function fit and director industry fit
Top executive fit	First, for each female director, we find the proportion of the remaining board directors who have the same value of the top executive experience variable. Then, we take the average across all female directors.
	Director's top executive fit is equal to 1 if a director is or was a top executive, 0 otherwise
	Top executives encompass: CEO, chairman, VP (vice-president), executive director, or member of executive board
Function fit	First, for each female director, we find the proportion of the remaining board directors who have the same functional background. Then, we take the average across all female directors.
	Director's function background is a numerical variable equal to: 0, if 'top executive' (see above) is equal to 1; 1, if the director's main function is in the output function (i.e., sales, marketing or R&D); 2, if the director's main function is in the throughput function (i.e., production, operation, process engineering or accounting); 3, if the director's main function is in the peripheral function (i.e., finance, law, labor relations, or HRM)
Director industry fit	First, for each female director, we find the proportion of the remaining board directors who have the same industry background. Then, we take the average across all female directors.
	Director's primary background (using four-digit SIC code), two criteria: (1) if the director has C-suite positions in a company, we choose that industry as the director's primary industry background; (2) otherwise, we look at the industry in which a director has worked most years of his or her career
Social capital fit	Mean of education fit and prestige school fit

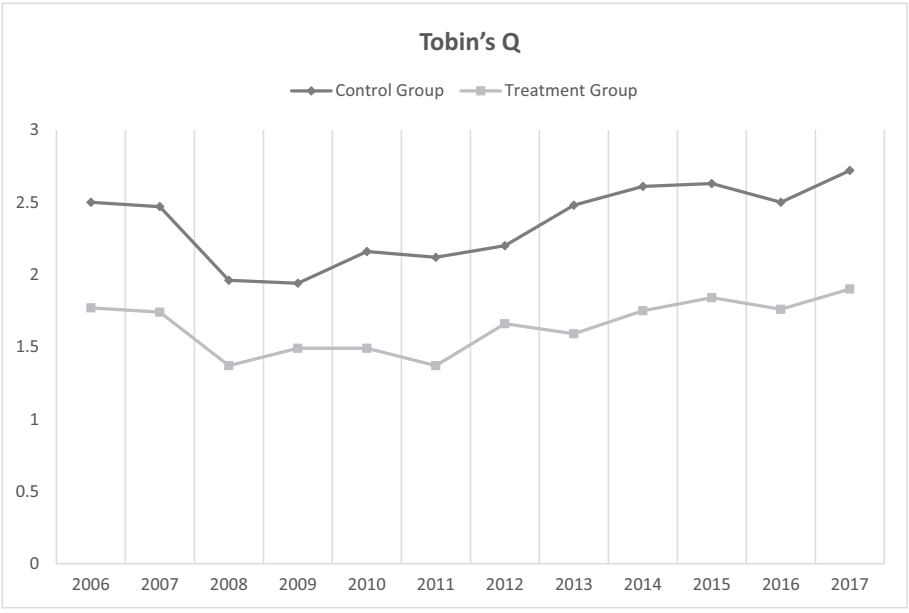
(*Continued*)

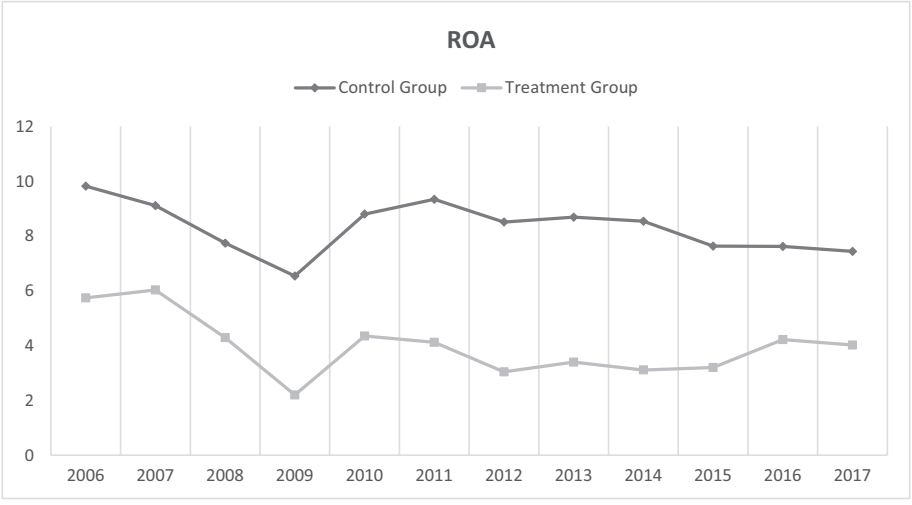
Appendix A. (Continued) Variables' definition.

Variable	Definition
Education fit	First, for each female director, we find the proportion of the remaining board directors who have the same level of education. Then, we take the average across all female directors.
	Education was coded into four categories: no diploma or degree (0); bachelor's degree (1); master's degree (2); and PhD degree or equivalent (e.g., lawyer) (3)
Prestige school fit	First, for each female director, we find the proportion of the remaining board directors who have the same value for the variable 'elite school'. Then, we take the average across all female directors.
	Following Nguyen (2012), we limited the French *grandes écoles* to the following:
	Engineering schools: École polytechnique, Mines Paris – PSL,[4] École des Ponts ParisTech, CentraleSupélec,[5] and ISAE-Supaéro;[6]
	Business schools: HEC School of Management, ESSEC Business School and ESCP Business School;
	Three French elite institutions: École nationale d'administration; École normale supérieure (rue d'Ulm, Paris); and SciencesPo Paris.
	This variable was coded using a dichotomous scheme, with 1 indicating that a board member had graduated from one of these *grandes écoles*, and 0 otherwise.
	Top 20 US universities (based on Shanghai Ranking 2010): Harvard University, University of California, Berkeley; Stanford University; Massachusetts Institute of Technology (MIT) and California Institute of Technology; Princeton University; Columbia University; University of Chicago; Yale University; Cornell University; University of California, Los Angeles; University of California, San Diego; University of Pennsylvania; University of Washington and University of Wisconsin – Madison; The Johns Hopkins University; University of California, San Francisco; University of Michigan – Ann Arbor; University of Illinois at Urbana-Champaign; and University of Minnesota Twin Cities
	Top 20 universities in Europe (based on Shanghai Ranking 2010): University of Cambridge; University of Oxford; University College London; Federal Institute of Technology Zurich and Imperial College of Science, Technology and Medicine; Pierre and Marie Curie University; University of Copenhagen; Karolinska Institute; The University of Manchester and Paris-Sud University; Utrecht University; University of Zurich; Ludwig Maximilian University of Munich; The University of Edinburgh and King's College London; University of Heidelberg; University of Bristol; Uppsala University; Leiden University; and University of Helsinki
Panel C – Control variables	
Firm characteristics	
Firm size	Natural logarithm of total assets
Leverage	Ratio of total debt to total assets
R&D intensity	R&D-to-sales ratio (Honoré et al., 2015)
Capex intensity	Ratio of capital expenditures to assets from the previous year
Market-to-book	Ratio of market capitalization to total assets
Family firm	Dummy variable that equals 1 if the firm is a family firm, 0 otherwise
	Any firm whose founder or a member of the founder's family is a blockholder (at least 20% of the voting rights) of the company is considered a family firm.
Board characteristics	
Board size	The logarithm of the number of directors on the board (Wintoki et al., 2012)
Board independence	The proportion of outside – non-executive – directors on the board
CEO duality	Dummy variable that equals 1 if the CEO is also the Chairman of the board, 0 otherwise (Wintoki et al., 2012)
Board tenure	The average tenure – in years – of all directors

Source: Own elaboration.

4. École des mines de Paris, also known as Les Mines
5. CentraleSupélec is the merger between two *grandes écoles* in France: École centrale Paris (also known as École centrale or Centrale) and Supélec (École supérieure d´électricité).
6. Institut supérieur de l'aéronautique et de l'espace





Appendix B. Trend analysis – Tobin's Q and ROA in France and in the US over the sample period

Source: Own elaboration.

Appendix C. Statistical tests of the common trend assumption on ROA and Tobin's Q in France and the US

	ROA Before 2010		ROA After 2010		Tobin's Q Before 2010		Tobin's Q After 2010	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	coefficient	*p*	coefficient	*p*	coefficient	*p*	coefficient	*p*
France	98.99	0.807	−687.52	0.000	−40.77	0.293	74.53	0.005
France*year	−0.45	0.000	−0.27	0.000	−0.07	0.000	0.05	0.000
Constant	−0.05	0.799	0.34	0.000	0.02	0.300	-0.04	0.005
Observations	920.49	0.000	551.15	0.000	144.73	0.000	−103.70	0.000
Controls	1,423	1,423	2,423	2,423	1,423	1,423	2,423	2,423
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports results from random-effects GSL regressions to test the common trend assumption on ROA and Tobin's Q in our samples of French and US firms. The variable France defines the treatment and control groups. The variable *Year* represents the sample years, taking values from 2006 to 2017. Columns (1) and (2) present results on the ROA trend between France and the US before 2010. The *p*-value implies that we do not reject the null hypothesis that the trend is different before 2010 (*p*-value is 0.799 on the interaction term France×year). Following the same analysis, the ROA columns (3) and (4) show that the change between the treatment group and control group is significantly different after 2010 (*p*-value is 0.000). Columns (5) and (6) show that the change in Tobin's Q between the treatment and control group is NOT significantly different before 2010 (*p*-value is 0.3). Columns (7) and (8) show that change in Tobin's Q between the treatment and control group is significantly different after 2010 (*p*-value is 0.000).
Source: Own elaboration.