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ORIGINAL PAPER

Breaking barriers: assessing the influence of female directors on financial performance beyond the boardroom

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Abstract
The persistent under representation of women in executive committees continues to challenge gender equality in corporate leadership. Legislative interventions promoting gender quotas have led to improvements in boardroom gender diversity but have fallen short in addressing executive committee imbalances. This study investigates the impact of women's inclusion in executive committees on financial performance. Spanning large European corporations from 2015 to 2022, a difference-in-differences approach coupled with fixed effects estimations evaluates whether firms that incorporated women into these committees exhibited greater performance improvements compared to those maintaining all-male executive compositions. Contrary to expectations, the findings reveal a lack of positive influence on financial performance metrics, showcasing negative effects on accounting-based indicators. Notably, higher female representation in the executive committee, beyond critical mass, fails to alter financial performance. Furthermore, the study dismisses the notion that the level of gender equality in a firm's country of origin moderates this relationship. The implications of the findings are discussed.

Keywords Female executive directors · Executive committee · Financial performance · Critical mass theory · Difference-in-differences

JEL Classification G30 · M40

1 Introduction

Although there has been a gradual rise in women's representation in leadership roles, the situation remains unsatisfactory (Cabaleiro and Buch 2023; EWOB, 2021; Fernández-Méndez and Pathan 2023). Whereas legislative measures, like enforcing

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gender quotas for corporate board membership, have spurred progress (Terjesen et al. 2015), these efforts often fall short when applied to executive committees and crucial decision-making positions (Dobbin and Jung 2011). Moreover, the enduring gender wage gap (Blau and Kahn 2017) and persistent barriers to career advancement, notably the 'glass ceiling' (Hymowitz and Schellhardt 1986), alongside the added 'double burden' of work and domestic duties (Hochschild and Machung 2012), emphasize the incomplete journey towards gender equality in leadership. These enduring challenges not only perpetuate systemic inequalities but also raise ethical concerns about the efficacy and scope of gender-equality policies (Rhode 2003; Terjesen et al. 2015).

In the corporate realm, the progress made in enhancing gender diversity within boardrooms primarily stems from appointing women as independent directors, rather than integrating them into executive roles (Seierstad and Opsahl 2011). While a significant step, this approach overlooks the deeper issue of gender disparity in operational leadership, especially within executive committees (Adams and Kirchmaier 2016). Independent directors, while potentially influential, do not exert the same day-to-day impact on company operations and culture as their executive committee counterparts (Hillman and Dalziel 2003). Barnes et al. (2019) note that women are often appointed as "independent directors involved with company boards for only a few days a year". Accordingly, focusing solely on boardroom gender composition without addressing executive committees or key positions like CEO and CFO provides an incomplete portrayal of women's roles in management leadership. In that regard, the primary challenge lies not just in including women on boards but in ensuring their presence in executive committees and critical executive roles that influence organizational direction and culture (Terjesen et al. 2016). The absence of women in these crucial roles perpetuates gender inequity at the highest levels of corporate governance, hindering meaningful organizational change (Joecks et al. 2013). Hence, the main conclusion of Daily et al. (1999) when evaluating the presence of women in corporate leadership during the last decade of the 20th century, as succinctly summarized in the article's title ("(….) some progress in the boardroom, none in the executive suite"), remains highly pertinent and applicable in the first two decades of the 21st century.

The primary motivation for this study stems from the social relevance of the topic. Although the representation of women on corporate boards has increased in many countries, the next challenge is to achieve comparable progress in top executive roles. To tackle this issue, a growing number of countries are introducing additional measures to enhance gender diversity within executive committees. For instance, in Germany, the FüPoG II regulation, introduced in August 2021, mandates that corporations with executive committees comprising four or more members must include at least one woman and one man in their composition. Similarly, France passed a resolution in December 2021, aiming to achieve a minimum gender representation of 30% in executive committees by 2027, and 40% by 2030. Switzerland also implemented gender quota guidelines in January 2021, requiring a 20% representation of women on executive boards over the next decade (Deloitte 2022).[1]

[1] The German regulation applies to listed companies with more than 2000 employees, whereas the French and Swiss regulations affect firms with more than 1,000 and 250 employees, respectively.

Concurrently, fueled by the increased attention from regulators and policymakers aimed at enhancing the representation of women on corporate boards, a plethora of studies have emerged examining how the presence of women on boards may influence a firm's financial performance (e.g., Ahern and Dittmar 2012; Garcia-Blandon et al. 2023; Yang et al. 2019). Furthermore, Liu et al. (2014) and Brahma et al. (2021) differentiate between female executive and non-executive directors, acknowledging the different functions performed by both types of directors. Nevertheless, no study to date has focused the attention on the gender composition of the executive committee. This study addresses this research gap.

Continuing this line of research, the main objective of this study is to provide evidence on whether the appointment of women to executive committees has a relevant impact on financial performance. As additional goals, we explore whether the critical mass theory regarding the incorporation of women to leadership roles applies to the case of the executive committee, and also examine if gender equality in the firm's home country moderates the impact of gender diversity within the executive committee on financial performance. We conduct an empirical analysis focused on large European corporations spanning from 2015 to 2022. Employing a difference-in-differences approach (hereinafter, D-i-D), our research design involved creating a control group comprising firms that consistently lacked female representation on their executive committees throughout the study period. In contrast, the treated group comprised companies initially devoid of women on their executive committees but later incorporated at least one woman during the observation period.

To the best of our knowledge, this study represents the first attempt to specifically examine how gender diversity within the executive committee influences financial performance. While previous research has concentrated on gender diversity at the board level, our study investigates a distinct dimension. Kesner et al. (1988) point out that examining the composition of the specific committees of the board can be more meaningful than focusing on the whole board. The interest of the analysis of gender diversity at the committee level lies in the fact that most important board decisions originate at the committees (Kesner 1988). Furthermore, according to Vance (1983), the executive committee is one of the board's committees with a stronger influence in corporate activities. Elaborating on this idea, Xie et al. (2002) maintain that the executive committee represents the full board when urgent actions are needed. It reviews proposals from the CEO before they are discussed by the full board and can significantly shape the board's agenda, and the decisions finally adopted, with a direct impact on financial performance. Whereas findings from board-level studies may offer some insights; nonetheless, there are substantial differences in the roles played by boards and executive committees in steering corporate outcomes (Daily et al. 1999). Furthermore, disparities in the accomplishment of women in supervisory versus executive roles (Baghdadi et al. 2023; Cambrea et al. 2020; García-Lara et al. 2017) further complicate the direct application of board-level findings to the executive committee. In that regard, if women perform better than men in monitoring roles but not in executive roles, the positive impact of board gender diversity on financial performance should not be automatically extended to the executive committee. Another significant contribution of our study is its cross-national approach, which permits us to explore the influence of gender equality in a firm's home country

as a potential moderator of the relationship between gender diversity in the executive committee and financial performance. This analysis is supported by the findings of Schwartz and Rubel-Lifschitz (2009) and Chen et al. (2016), among others, who contend that gender disparities in values tend to widen in regions with greater gender equality.

The empirical analysis dismisses any positive effect stemming from the inclusion of women in the executive committee on financial performance. Instead, our findings reveal a somewhat negative influence on accounting-based performance indicators and no significant effects on market-based performance measures. Furthermore, even when women are integrated into the executive committee in larger numbers, the negative impact on accounting-based performance becomes insignificant, while the results remain insignificant for market-based performance. Notably, we observe that these outcomes are not influenced by the level of gender equality in the firm's home country. These findings have theoretical implications, in particular, for the gender studies literature and for the critical mass theory.

The study continues as follows: the next Section provides a succinct overview of the literature review and outlines the hypotheses. Following that, Sect. 3 elucidates the research design and offers detailed insights into the sample. Moving forward, Sects. 4 and 5 present and discuss the results, respectively. Finally, the concluding Section focuses on the implications of the study, its limitations, and provides some ideas for further research.

2 Theoretical review and hypothesis development

Resource dependence theory (Pfeffer and Salancik 1978) provides a usual framework for the study of the effects of female directors on firm's financial performance (e.g., Brahma et al. 2021; Garcia-Blandon et al. 2023; Liu et al. 2014; Reguera-Alvarado et al. 2017; Terjesen et al. 2016). The use of this framework in our study is particularly appropriate, as it emphasizes the strategic management of external resources and dependencies. In this context, the presence of female directors on the executive committee could enhance access to crucial resources and relationships, potentially leading to a direct impact on the financial performance of firms. To illustrate this, Hillman et al. (2007) delineate three specific advantages of the inclusion of female directors on the board, that can be extended to the executive committee. First, it leads to more diverse boards, fostering a broader spectrum of viewpoints. This diversity can enhance the efficiency of the committee, especially in tasks such as information gathering and decision-making. Secondly, directors play a pivotal role in conferring legitimacy upon a firm (Certo 2003; Davis and Mizruchi 1999). Consequently, gender-diverse boards contribute significantly to bolstering the firm's reputation. The inclusion of female directors can signal the company's commitment to diversity and corporate social responsibility, thereby enhancing its standing in the eyes of stakeholders, including investors and the public. Lastly, Hillman et al. (2007) emphasize the distinctive qualities of women in the realms of communication, commitment, and resource management. Their varied life experiences, beliefs, and perspectives can enable female directors to connect organizations with different constituencies than

their male counterparts. This unique ability to bridge gaps between the firm and various stakeholders is especially beneficial. As a result, Reguera-Alvarado et al. (2017) argue that gender diversity on corporate boards facilitates improved relationships between the firm, its customers, and competitors. Additionally, it can enhance the company's industry knowledge and broaden its access to external sources of finance.

As highlighted in the previous section of this study, there is a wealth of research on the influence of female directors on financial performance. Rather than delving into individual studies, we find it more practical to focus on comprehensive literature reviews. For instance, Post and Byron (2015) conducted a meta-analysis, incorporating findings from 140 studies. They concluded that the presence of female directors is positively associated with accounting metrics of performance. They also noted that the impact of female board members on market-based indicators of performance is nearly negligible, but in nations characterized by higher gender equality, it turns positive. Conversely, in countries with lower gender equality, this relationship becomes negative. More recently, Zattoni et al. (2022) and Hussain et al. (2022) conducted systematic critical reviews of 184 and 984 studies, respectively. Zattoni et al. (2022) concluded that the empirical evidence regarding the impact of board gender diversity on financial performance remains largely inconclusive. In contrast, Hussain et al. (2023) reported that almost 90% of the reviewed studies found a positive impact of female directors on performance. However, the applicability of these literature reviews to our current study is limited for two primary reasons. First, none of these reviews differentiate between executive and non-executive directors, while our focus is specifically on female executive directors. More importantly, our interest lies not in board gender diversity, but in gender diversity within the executive committee. In this context, Hoobler et al.'s (2018) comprehensive meta-analysis, encompassing 78 studies, provides valuable insights. Their research goes beyond the mere presence of female directors on the board and examines the direct impact of women in leadership roles, including CEOs, top management teams, and board positions, on financial performance. Their findings suggest that women's leadership can indeed exert influence on a company's overall performance.

In addition to the previous comprehensive studies, we have identified two particularly relevant pieces of research closely aligned with our study. They explore the effects of board gender diversity on financial performance, with specific analyses distinguishing between female executive directors and non-executive directors. Liu et al. (2014) conducted their empirical study based on a sample of Chinese companies spanning from 1999 to 2011, while Brahma et al. (2021) examined the situation in the United Kingdom over the period from 2005 to 2016. Liu et al. (2014) and Brahma et al. (2021) argue that they observe a positive relationship between gender diversity on corporate boards and performance. Furthermore, they maintain that female executive directors appear to exert a more substantial positive influence on financial performance when compared to their female independent counterparts, underscoring the significance of their executive roles over their monitoring roles. This evidence would support Barnes et al. (2019) claim that female executive directors have a stronger impact on corporate outcomes than female independent directors.

Building on this discussion, we propose the following hypothesis:

Hypothesis 1 (H1) The incorporation of female directors to the executive committee positively impacts financial performance.

Similar to previous related studies (Liu et al.,2014; Brahma et al. 2021), we also investigate the so-called critical mass theory (Kanter 1977), but in this case applied not to the board of directors but to the executive committee. Kanter (1977) suggests that when women are in the minority, comprising only a small portion of a team or organization, they tend to be viewed primarily as representatives of their gender rather than as individuals with unique qualities. The author maintains that this situation places additional pressure on these "token" women, which can ultimately hinder their ability to perform optimally. On the other hand, once women constitute at least 30% of a team, achieving a more balanced gender representation, this diversity can have a positive impact on the overall performance of the team. The critical mass theory has interesting implications regarding the ability of earlier studies, generally based on samples of firms with a very small presence of female directors on boards (in virtually all cases below 30%), to adequately capture the actual effect of board gender diversity on financial performance. Although neither Liu et al. (2014) nor Brahma et al. (2021) investigate the critical mass theory in the context of the executive committee they do affirm the validity of this theory at the board level. Accordingly, the second hypothesis of this study states:

Hypothesis 2 (H2) The incorporation of female directors to the executive committee beyond a certain threshold (20%, 25%, and 30%) positively impacts financial performance.

The next hypothesis posits that the positive impact of gender diversity on executive committees on financial performance is amplified in countries with higher levels of gender equality. This statement is anchored in the understanding that corporate governance does not operate in isolation but is influenced by broader socio-cultural and economic contexts (Belaounia et al. 2020). Contingency theory (Burns and Stalker 1961; Lawrence and Lorsch 1967) supports this view by suggesting that the effectiveness of organizational structures, including governance frameworks, is contingent upon the environment in which they function. Incorporating female directors into executive committees can enhance financial performance by bringing diverse perspectives, reducing groupthink, and improving decision-making quality (Adams and Ferreira 2009). However, the realization of these benefits is not uniform across all contexts and is heavily dependent on societal norms, including the level of gender equality prevalent in the firm's home country. Gender equality, as defined by the International Labor Organization (ILO, 2023), ensures that all individuals, regardless of gender, have equal access to resources and opportunities. This broader societal factor plays a pivotal role in shaping the influence of female directors on corporate boards. First, in countries with higher gender equality, women generally have greater access to education, professional development, and leadership opportunities. This increased access enables women to acquire the skills, qualifications, and experiences necessary for effective participation in corporate governance. Research indicates that in countries with lower gender equality, women may face barriers to accessing edu-

cation and career advancement, limiting the pool of qualified female candidates for board positions and reducing the potential impact of their inclusion (Terjesen et al. 2009). Second, the societal perception of women in leadership roles is crucial. In cultures that prioritize gender equality, female directors are more likely to be perceived as legitimate and competent leaders, which can enhance their ability to contribute effectively to board discussions and decision-making processes (Eagly and Carli 2003). This acceptance fosters a boardroom environment where female directors can exert substantial influence, as opposed to tokenistic representation that may occur in less gender-equal contexts (Kanter 1977). When women are fully integrated into decision-making processes, rather than being isolated as minority representatives, their contributions are more impactful (Torchia et al. 2011).

Because both Liu et al. (2014) and Brahma et al. (2021) are single-country studies, they are unable to explore how the level of gender equality in the firm's home country shapes the relationship between female directors and financial performance. However, the findings from Post and Byron's (2015) meta-analysis, which indicates a stronger effect of board gender diversity on performance in countries with higher levels of gender equality, align with the principles of contingency theory. Hoobler et al.'s (2018) meta-analysis also supports a similar conclusion, as it suggests that the presence of women in leadership roles is more likely to have a positive association with a firm's financial performance when it operates within a culture that promotes gender equality. As a result, the third hypothesis of this study is formulated as follows:

Hypothesis 3 (H3) The impact of the incorporation of female directors to the executive committee on financial performance is stronger in countries with higher gender equality.

3 Research design, sample, and parallel trend assumption

Endogeneity presents a critical concern when exploring how women's presence in corporate leadership impacts business outcomes. For instance, García-Lara et al. (2017) suggest that the observed positive impact of board gender diversity on accounting quality in many studies might stem from well-governed firms having both diverse boards and superior accounting standards. Consequently, more studies in this domain are adopting D-i-D research designs (e.g., Garcia-Blandon et al. 2023; Matsa and Miller 2013; Yang et al. 2019), due to their effectiveness in tackling complex contexts characterized by potentially endogenous relationships between independent and dependent variables (Abadie 2005; Angrist and Pischke 2010; Antonakis et al. 2014). In line with this approach, our study also employs a D-i-D framework to explore how the incorporation of female directors into executive committees influences financial performance in the context of European large corporations between 2015 and 2022.

Following the framework of D-i-D research designs, we distinguish two groups to test hypothesis 1. The treated group comprises firms that started the research period without any women on their executive committees but subsequently added

at least one female member, maintaining this configuration in the following years.[2] Conversely, the control group consists of similar firms that consistently retained all-male executive committees throughout the study duration. Our hypothesis suggests a positive impact on financial performance following the inclusion of women on the executive committee. Consequently, we anticipate observing improved performance in the treated group after the appointment of women to the committee. Therefore, in conventional D-i-D estimations, this relationship is represented by the model defined in Eq. (1*)* below:

$$PERFORM_{i,t} = \beta_0 + \beta_1 * TREAT_i + \beta_2 * POST_{t-1} + \beta_3 * TREAT * POST_{i,t-1} + \beta_{4-7} * CONTROLS_{i,t-1} + fixed\,effects + \varepsilon_{i,t} \quad (1)$$

The dependent variable is financial performance (*PERFORM*), evaluated through accounting and market-based indicators. Accounting performance is assessed using return on assets (*ROA*) and return on equity (*ROE*), while market-based performance employs Tobin's Q (*TOBINQ*) and the market-to-book ratio (*MB*). These metrics are commonly utilized in related research (e.g., Brahma et al. 2021; Garcia-Blandon et al. 2023; Liu et al. 2014; Yang et al. 2019). Additionally, we introduce two indicator variables: *TREAT*, distinguishing the treated (with a value of 1) and control groups (with a value of 0), and *POST*, differentiating observations between post-treatment (with a value of 1) and pre-treatment periods (with a value of 0). The pre-treatment period refers to years when the firm lacked women on the executive committee, while the post-treatment period encompasses years when at least one woman served on the committee. In the framework of D-i-D models, the key variable of interest is the interaction term between *TREAT* and *POST*, denoted as *TREAT*POST*. However, in our specific research framework, given that *POST* is 0 for all the observations in the control group over all the years of the research period, and 1 for those in the treated group during the post-treatment years, this variable is identical to *TREAT*POST*. Consequently, the final model to be estimated is represented by Eq. (2*)* below:

$$PERFORM_{i,t} = \beta_0 + \beta_1 * TREAT_i + \beta_2 * TREAT * POST_{i,t-1} + \beta_{3-6} * CONTROLS_{i,t-1} + fixed\,effects + \varepsilon_{i,t} \quad (2)$$

D-i-D estimations coupled with fixed effects reduce the necessity of introducing control variables in the model (Yang et al. 2019). This is due to their ability to compare changes over time within treatment and control groups, implicitly accounting for all time-invariant characteristics that might influence the dependent variable. Moreover, D-i-D analyses also address common time trends affecting all firms equally. Nevertheless, and although we do not consider control variables essential, following previous related studies (e.g., Brahma et al. 2021; Garcia-Blandon et al. 2023; Matsa and Miller 2013; Yang et al. 2019), we have included the following control variables: Firm size (*SIZE*), firm age (*AGE*), board size (*BOARDSIZE*), financial lever-

[2] Consistent with prior research (e.g., Biswas et al. 2023; Sealy et al. 2008, b), we define the executive committee as comprising board members classified as executive directors, along with the CEO, CFO, and other executives labelled as "officers."

age (*DEBT*), quality of governance (*GOVQUAL*), social pillar score (*SOCSCORE*), environmental pillar score (*ENVSCORE*), and board gender diversity (*BGENDIV*). In Eq. (2*)*, the estimations incorporate fixed effects for the firm, industry-year, and country, their inclusion varying based on the specific estimation method employed in each instance.[3] To accurately capture the impact of the independent variables on performance, a one-year lag is applied to these variables. This adjustment is because these variables are calculated at the year's end, implying they are likely to impact the subsequent year's performance.

To evaluate hypothesis 2 (H2), the approach mirrors the one previously outlined, with the distinction that the treated group comprises firms that surpass particular thresholds (20%, 25%, and 30%) at any time during the research period. Consequently, in this analysis the variable *TREAT* is defined as 1 for those firms that were below the specified threshold at the beginning of the research period but exceeded it before the period's conclusion, and 0 for the remaining firms.[4] Likewise, *POST* takes a value of 1 for observations in the post-treatment period, representing the years in which women on the executive committee exceeded the specified threshold, and 0 for all other observations.

Concerning hypothesis 3 (H3), we introduce a new variable denoted as gender equality in the firm's home country (*GENEQUAL*) and generate the interaction variable *TREATxPOSTxGENEQUAL*. Subsequently, we construct the new model outlined in Eq. (3*)* below. As per this hypothesis, we anticipate a positively significant coefficient for the interaction variable. This would signify that the positive impact on financial performance associated with the incorporation of women into the executive committee is more prominent in countries with higher levels of gender equality. For detailed definitions of all variables used in this study, refer to Table 1.

$$\begin{aligned} PERFORM_{i,t} = {} & \beta_0 + \beta_1 * TREAT_i + \beta_2 * TREAT * POST_{i,t-1} + \beta_3 * GENEQUAL_i \\ & + \beta_4 * TREAT * POST * GENEQUAL_{i,t-1} + \beta_{5-8} * CONTROLS_{i,t-1} \\ & + fixed\,effects + \varepsilon_{i,t} \end{aligned} \quad (3)$$

The empirical analysis is based on companies listed in the Standard & Poor's Europe 350 stock market index (S&P 350) as of 2022. This selection serves two key purposes: firstly, it aligns with the primary motivation of the study which is to contribute to the ongoing debate on the establishment of mandatory gender quotas for executive committees. Considering that this debate is particularly intense in Europe and that gender quotas for executive boards have been legislated exclusively in Europe, focusing on European companies is especially relevant. Secondly, to investigate how gender equality in a firm's home country moderates the effects of including women in executive committees on financial performance, a cross-national sample was necessary. Additionally, the choice of constituents from a well-recognized stock market

[3] In the estimations conducted with fixed effects, only firm and industry-year fixed effects can be utilized, whereas in the estimations with random effects, country and industry-year fixed effects will be used.

[4] Consistent with the approach used to evaluate hypothesis H1, a company qualifies for inclusion in the treated group if it surpasses the threshold and maintains this status in subsequent years. Companies failing to meet this criterion are omitted from the sample.

Table 1 Variables definition

Dependent variable. PERFORM (Financial Performance)	
ROA (Return on assets)	Earnings before interest and taxed divided by total assets, in percentage.
ROE (Return on Equity)	Net income divided by the book value of equity, in percentage.
TOBINQ (Tobin's Q)	The market value of equity plus the book value of debt divided by the book value of total assets.
MB (Market to book ratio)	The market value of a share divided by its book value.
Variables of interest	
TREAT (Treated group)	A dummy variable which takes the value of 1 when the observation corresponds to Treated group, and 0 otherwise.
POST (Post treatment period)	A dummy variable which takes the value of 1 for the observations of the post treatment period, and 0 otherwise.
GENEQUAL (Gender equality)	A dummy variable which takes the value of 1 for the observations from the most gender-equal countries according to EWOB (2021) (Denmark, France, Finland, Netherlands, Norway, and Sweden), and 0 otherwise.
TREATxPOST (Interaction variable)	The interaction variable resulting from multiplying *TREAT* and *POST*.
TREATxPOSTxGENEQUAL (Interaction variable)	The interaction variable resulting from multiplying *TREAT*, *POST and GENEQUAL*.
Control variables	
SIZE (Firm's size)	Logarithm of total assets.
AGE (Firm's age)	Number of years since the company was founded in logs.
BOARDSIZE (size of the board)	Number of directors of the board in logs.
DEBT (Financial Leverage)	Total liabilities divided by total assets.
GOVQUAL (Quality of governance)	Firm score in the governance pillar as provided by Refinitiv database.
SOCSCORE (social score)	Firm score in the social pillar as provided by Refinitiv database.
ENVSCORE (environmental score)	Firm score in the environmental pillar as provided by Refinitiv database.
BGENDIV (Board gender diversity)	Percentage of female directors on the boardroom.

index ensures comparability among the firms. The S&P 350 focuses on the largest and most liquid stocks in Europe, which enhances its representativeness in terms of blue-chip companies that are important drivers of the European economy. The study covers the period from 2015 to 2022, with 2022 as the final year due to data availability at the start of the study. The choice of 2015 as the starting year allows for a sufficient number of years and ensures a relatively homogeneous period in terms of the incorporation of women into corporate leadership roles. Nevertheless, as the inde-

pendent variables are incorporated into the model with a one-year lag, the data for the year 2015 remains unused in the estimations. Refinitiv Workspace provides the database for constructing variables (Eq. (1*)* to *(3)*), except for *GENEQUAL*, derived from the gender equality index (EWOB, 2021).

The initial sample consisted of the 350 constituent firms of the S&P 350, representing 2,450 firm-year observations. After excluding 27 banks and financial companies (189 observations) and 229 firms (1,603 observations) that did not meet the criteria for inclusion in either the treated or control groups, the sample was reduced to 94 firms, (658 observations). Of these, 60 firms (420 observations) formed the treated group, while 34 firms (238 observations) comprised the control group. Following the exclusion of 47 observations due to insufficient data, the final sample included 94 firms with 611 firm-year observations. The sample's geographic distribution by country of origin is as follows[5]: Austria (3%), Denmark (5%), France (7%), Germany (24%), Ireland (4%), Italy (5%), the Netherlands (6%), Sweden (2%), Switzerland (20%), and the United Kingdom (23%). In terms of industry distribution, the sample comprises firms from Basic Materials (56%), Consumer Cyclicals (24%), Consumer Non-Cyclicals (6%), Energy (4%), Industrials (4%), and Technology (6%).

Table 2 summarizes the sample's descriptive statistics. To mitigate issues arising from outlier observations, all the variables are winsorized at the top and bottom 1% level. It is worth highlighting the relatively high quality of governance in the sample (*GOVQUAL*), with an average score of 64, despite the indicator's range spanning from 0 to 100. Furthermore, the average female representation on the board of directors (*BGENDIV*) stands at 30%, still below the 40% threshold set by several European countries (e.g., Norway, France, Spain). The results for *GOVQUAL* and *BGENDIV* need to be contextualized in the nature of the sample which includes the largest European companies.

Table 3 displays the pairwise correlation coefficients for the variables employed in the empirical analysis. Concerning the dependent variables in Eq. (1*)* to *(3)*, the table reveals the anticipated positive and significant correlations among them in all cases. Furthermore, the correlations are stronger for variables measuring performance in the same way (e.g., *ROA* with *ROE* and *TOBINQ* with *MB*). It is interesting to observe that the primary variable of interest, *TREAT*POST*, exhibits insignificant correlations with all performance indicators. Surprisingly, there are negative and significant correlations between *GOVQUAL* and all four financial performance measures. One would intuitively expect better-governed firms to exhibit stronger performance. However, as anticipated, we observe positive correlations of *GOVQUAL* with *SIZE*, *DEBT*, and *BGENDIV*, suggesting that larger, more indebted firms and those with more gender-diverse boards are associated with higher governance quality. Notably, *BGENDIV* shows no significant correlation with any of the four performance indicators. Finally, with the exception of the correlation between *SOCSCORE* and *ENVSCORE*—which, as expected, indicates that firms with greater social concerns

[5] Notably, countries such as France and Italy are underrepresented in the final sample compared to their presence in the S&P 350 index. This discrepancy arises because the majority of firms from these countries had women on their executive committees throughout the research period, rendering them ineligible for inclusion in either the treated or control group.

Table 2 Summary statistics (number of firms: 94; number of observations: 611)

	Mean	SD	p25	Median	p75
ROA	7.601	7.469	2.678	6.723	10.926
ROE	20.797	19.352	10.604	17.449	27.67
TOBINQ	1.89	1.970	0.646	1.176	2.449
MB	4.667	6.148	1.245	2.782	5.877
TREAT	0.645	0.479	0	1	1
TREATxPOST	0.366	0.482	0	0	1
SIZE	23.693	1.714	22.577	23.237	24.757
AGE	3.147	1.086	2.485	3.091	4.043
BOARDSIZE	2.347	0.322	2.079	2.398	2.485
DEBT	22.973	13.700	12.811	22.465	32.43
GOVQUAL	64.461	19.982	51.253	66.884	80.897
SOCSCORE	71.476	16.738	63.576	73.288	83.815
ENVSCORE	66.76	21.605	53.197	71.904	84.038
BGENDIV	29.784	11.670	22.222	30.769	37.5
GENEQUAL	0.198	0.399	0	0	0

Variables: *ROA*: return on assets; *ROE*: return on equity; *TOBINQ*: Tobin's Q; *MB*: market to book ratio; *TREAT*: 1 if the observation belongs to the treated group, and 0 otherwise; *TREATxPOST*: 1 if the observation corresponds to a treated firm during the post-treatment period, and 0 otherwise; *SIZE*: logarithm of total assets; *AGE*: number of years since the company was founded in logs; *BOARDSIZE*: size of the board in logs; *DEBT*: total liabilities divided by total assets; *GOVQUAL*: firm score in the governance pillar; *SOCSCORE*: firm score in the social pillar; *ENVSCORE*: firm score in the environmental pillar; *BGENDIV*: percentage of female directors on the boardroom; and *GENEQUAL*: level of gender equality in the country of origin of the firm

also tend to demonstrate higher environmental concern—the relatively modest correlations among the control variables do not suggest any significant multicollinearity concerns in the estimations.

Figure 1 illustrates the behavior of *ROA*, *ROE*, *TOBINQ*, and *MB* for both the treated and control groups throughout the pre-treatment period. This analysis is conducted to validate the essential parallel trend assumption in our research context. A close examination of the graphs reveals consistent parallel trends during the pre-treatment period for both the treated and control groups, irrespective of the performance indicator under consideration. The parallel trend assumption is a fundamental pillar for the validity of empirical studies relying on D-i-D estimations. This assumption posits that in the absence of the treatment (in our case, the inclusion of at least one woman in the executive committee), the treated and control groups would have followed similar trends over time concerning the dependent variable. When this assumption is upheld, any observed disparities in post-treatment outcomes can be more confidently attributed to the treatment effect (Angrist and Pischke 2008; Bertrand et al. 2004). Demonstrating parallel trends in the pre-treatment period is, therefore, a crucial prerequisite for establishing a causal impact of the treatment on the dependent variable and for drawing meaningful conclusions in D-i-D estimations (Imbens and Wooldridge 2009). The analysis of Fig. 1 convincingly indicates that the parallel trend assumption holds across all financial performance measures.

Table 3 Pairwise correlations (number of firms: 94; number of observations: 611)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) ROA	1.000						
(2) ROE	0.793***	1.000					
(3) TOBINQ	0.675***	0.519***	1.000				
(4) MB	0.506***	0.622***	0.805***	1.000			
(5) TREAT	-0.072**	0.024	-0.134***	-0.041	1.000		
(6) TREATxPOST	-0.004	0.001	-0.031	0.000	0.563***	1.000	
(7) SIZE	-0.415***	-0.240***	-0.482***	-0.326***	0.257***	0.261***	1.000
(8) AGE	0.135***	0.037	0.043	-0.051	0.015	0.026	-0.016
(9) BOARDSIZE	-0.208***	-0.111***	-0.287***	-0.158***	0.119***	0.089**	0.398***
(10) DEBT	-0.144***	0.026	0.057	0.177***	0.039	0.065*	0.005
(11) GOVQUAL	-0.144***	-0.084**	-0.141***	-0.103***	0.187***	0.334***	0.229***
(12) SOCSCORE	0.017	-0.001	0.047	-0.019	0.146***	0.233***	0.174***
(13) ENVSCORE	-0.115***	-0.091**	-0.162***	-0.155***	0.199***	0.244***	0.410***
(14) BGENDIV	0.042	0.061*	0.036	0.019	0.056	0.202***	0.220***
(15) GENEQUAL	0.037	0.066*	0.082**	0.080**	-0.048	-0.012	0.304***
Variables	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(8) AGE	1.000						
(9) BOARDSIZE	-0.014	1.000					
(10) DEBT	-0.118***	-0.051	1.000				
(11) GOVQUAL	-0.102***	0.142***	0.099***	1.000			
(12) SOCSCORE	0.022	0.154***	0.219***	0.337***	1.000		
(13) ENVSCORE	0.094**	0.229***	0.046	0.286***	0.579***	1.000	
(14) BGENDIV	0.036	0.186***	0.071*	0.325***	0.281***	0.230***	1.000
(15) GENEQUAL	0.103***	-0.093**	-0.008	-0.145***	0.092**	0.054	0.373***

Variables: *ROA*: return on assets; *ROE*: return on equity; *TOBINQ*: Tobin's Q; *MB*: market to book ratio; *TREAT*: 1 if the observation belongs to the treated group, and 0 otherwise; *TREATxPOST*: 1 if the observation corresponds to a treated firm during the post-treatment period, and 0 otherwise; *SIZE*: logarithm of total assets; *AGE*: number of years since the company was founded in logs; *BOARDSIZE*: size of the board in logs; *DEBT*: total liabilities divided by total assets; *GOVQUAL*: firm score in the governance pillar; *SOCSCORE*: firm score in the social pillar; *ENVSCORE*: firm score in the environmental pillar; *BGENDIV*: percentage of female directors on the boardroom; and *GENEQUAL*: level of gender equality in the country of origin of the firm

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

4 Empirical results

4.1 Incorporation of women into the executive committee

The first empirical analysis assesses the impact of incorporating women into a firm's executive committee on financial performance. The model represented by Eq. (2*)* is estimated using panel data estimations with fixed effects. Since the use of fixed-effects controls for any time-invariant factor, the variable *TREAT* that denotes whether a firm belongs to the treated group is automatically dropped from the model. Robust standard errors clustered by firm are utilized for the conducting the significance tests, and the summarized estimates are detailed in Table 4. Following the estimations of Eq. (2*)*, we computed variance inflation factors to evaluate potential multicollinearity in the dataset. The consistently low values of these factors (all below the threshold

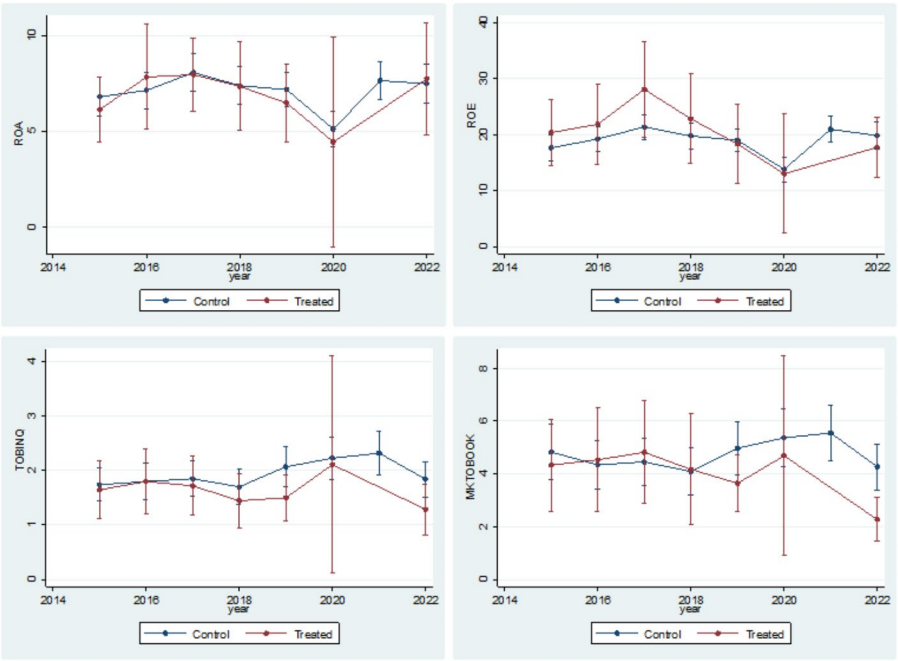

Fig. 1 Parallel trends for the indicators of performance

of 2[6]) affirm our initial assessment, indicating no significant multicollinearity issues in the estimations.

The main finding reveals negative and significant coefficients for *TREATxPOST* in estimations using accounting performance indicators (*ROA* and *ROE*) and insignificant coefficients in the estimations based on market-based indicators of performance (*TOBINQ* and *MB*). Specifically, the results indicate a significant decrease in accounting performance after the appointment of one or more female directors to the executive committee. Conversely, these appointments did not yield significant effects on market-based indicators of performance. Consequently, based on this evidence, hypothesis H1 stands rejected. Additionally, it is noteworthy that *BGENDIV* exhibits an insignificant coefficient across all estimations, implying that board gender diversity lacks a significant impact on financial performance.

We have performed several sensitivity analyses to validate the findings from Table 4. Initially, we tested the robustness of the results against a different estimation method. While we believe that the combined approach of a D-i-D research design and panel data estimations with fixed effects offers an ideal framework to explore gender diversity effects on the executive committee, we re-estimated Eq. (2*)* using random effects. Similar to the previous fixed-effects estimations, robust standard errors clustered by firm were utilized for significance testing. In these random effects

[6] The specific values for the independent variables are: *TREAT* (1.48); *TREATxPOST* (1.61); *SIZE* (1.49); *AGE* (1.06); *BOARDSIZE* (1.22); *DEBT* (1.09); *GOVQUAL* (1.34); *SOCSCORE* (1.74); *ENVSCORE* (1.81), and *BGENDIV* (1.21).

Table 4 The impact of gender diversity within the executive committee on financial performance. Estimations with fixed effects

Variables	(1) *ROA*	(2) *ROE*	(3) *TOBINQ*	(4) *MB*
TREATxPOST	-1.031**	-5.284***	-0.157	-0.611
	(0.481)	(1.523)	(0.115)	(0.480)
SIZE	-1.075*	-1.548	-0.0541	0.258
	(0.614)	(1.619)	(0.0862)	(0.380)
AGE	-1.552	-5.618	-0.0614	-0.736
	(1.142)	(3.545)	(0.217)	(0.562)
BOARDSIZE	0.861	1.155	-0.201	-1.758
	(2.370)	(6.042)	(0.353)	(1.452)
DEBT	-0.0316	0.330**	0.0117	0.0835**
	(0.0355)	(0.132)	(0.00835)	(0.0347)
GOVQUAL	-0.00194	0.00492	0.00506*	0.0110
	(0.0194)	(0.0513)	(0.00282)	(0.0115)
SOCSCORE	0.0276	0.0455	0.00206	0.0159
	(0.0314)	(0.0730)	(0.00377)	(0.0172)
ENVSCORE	-0.0283	-0.0437	-0.00410	-0.00748
	(0.0176)	(0.0605)	(0.00456)	(0.0143)
BGENDIV	0.0497*	0.0764	-0.000444	-0.0138
	(0.0274)	(0.0837)	(0.00570)	(0.0211)
Constant	33.80*	57.51	2.840	-0.327
	(19.49)	(40.88)	(1.941)	(8.407)
Firm FE	YES	YES	YES	YES
Country FE	NO	NO	NO	NO
Year-Industry FE	YES	YES	YES	YES
R-squared	0.222	0.197	0.303	0.210
Num. of firms	94	94	94	94
Num. of observations	611	611	611	611

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Treated group: Firms initially lacking female executive directors but including and maintaining at least one female director throughout the period. Control group: Firms without any female directors on the executive committee throughout the research period

Variables: *ROA*: return on assets; *ROE*: return on equity; *TOBINQ*: Tobin's Q; *MB*: market to book ratio; *TREATxPOST*: 1 if the observation corresponds to a treated firm during the post-treatment period, and 0 otherwise; *SIZE*: logarithm of total assets; *AGE*: number of years since the company was founded in logs; *BOARDSIZE*: size of the board in logs; *DEBT*: total liabilities divided by total assets; *GOVQUAL*: firm score in the governance pillar; *SOCSCORE*: firm score in the social pillar; *ENVSCORE*: firm score in the environmental pillar; and *BGENDIV*: percentage of female directors on the boardroom

estimations, both the variable *TREAT* and country effects were incorporated into the model, aligning with this estimation method. The outcomes of these new estimations, detailed in Table 5, mirror those presented in Table 4. In both instances, the key variable of interest, *TREATxPOST*, exhibits negative and significant coefficients in models gauging the impact of female executive directors on accounting-performance indicators and insignificant coefficients in the models using market-based performance measurements.

Table 5 The impact of gender diversity within the executive committee on financial performance. Estimations with random effects

Variables	(1) *ROA*	(2) *ROE*	(3) *TOBINQ*	(4) *MB*
TREAT	1.388	5.697	-0.0976	0.275
	(1.548)	(3.950)	(0.375)	(0.942)
TREATxPOST	-0.965**	-5.206***	-0.200	-0.729
	(0.483)	(1.583)	(0.123)	(0.491)
SIZE	-2.221***	-3.566***	-0.528***	-1.049***
	(0.385)	(0.792)	(0.120)	(0.261)
AGE	-0.284	-1.749	-0.0310	-0.452
	(0.559)	(1.447)	(0.114)	(0.300)
BOARDSIZE	0.768	2.963	-0.288	-0.902
	(1.933)	(4.822)	(0.306)	(1.075)
DEBT	-0.0414	0.232**	0.0139	0.0784**
	(0.0309)	(0.108)	(0.00855)	(0.0316)
GOVQUAL	-0.00608	0.00536	0.00386	0.0116
	(0.0166)	(0.0461)	(0.00273)	(0.0105)
SOCSCORE	0.0263	0.0224	0.00515	0.0169
	(0.0304)	(0.0718)	(0.00420)	(0.0171)
ENVSCORE	0.000290	0.00806	-1.77e-05	-0.00187
	(0.0178)	(0.0599)	(0.00440)	(0.0135)
BGENDIV	0.0525*	0.0814	0.00308	-0.00574
	(0.0271)	(0.0825)	(0.00560)	(0.0170)
Constant	55.55***	89.80***	13.44***	26.97***
	(13.61)	(25.18)	(2.845)	(6.515)
Firm FE	NO	NO	NO	NO
Country FE	YES	YES	YES	YES
Year-Industry FE	YES	YES	YES	YES
R-squared.	0.293	0.1717	0.447	0.345
Num. of firms	94	94	94	94
Num. of observations	611	611	611	611

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Treated group: Firms initially lacking female executive directors but including and maintaining at least one female director throughout the period. Control group: Firms without any female directors on the executive committee throughout the research period

Variables: *ROA*: return on assets; *ROE*: return on equity; *TOBINQ*: Tobin's Q; *MB*: market to book ratio; *TREAT*: 1 if the observation belongs to the treated group, and 0 otherwise; *TREATxPOST*: 1 if the observation corresponds to a treated firm during the post-treatment period, and 0 otherwise; *SIZE*: logarithm of total assets; *AGE*: number of years since the company was founded in logs; *BOARDSIZE*: size of the board in logs; *DEBT*: total liabilities divided by total assets; *GOVQUAL*: firm score in the governance pillar; *SOCSCORE*: firm score in the social pillar; *ENVSCORE*: firm score in the environmental pillar; and *BGENDIV*: percentage of female directors on the boardroom

The second sensitivity check aims to assess the robustness of the outcomes outlined in Table 4 to the possibility of having included "bad controls" in the estimations. Yang et al. (2019) argue that incorporating control variables in D-i-D estimations poses some concerns. First, because the D-i-D estimations coupled with fixed effects

minimize the need to introduce control variables in the model. By comparing changes over time within treatment and control groups, D-i-D implicitly controls for all time-invariant characteristics of the groups that could potentially influence the dependent variable. Besides, this approach also controls for the existence of time trends that affect all firms equally. Furthermore, there is always a risk of incorporating bad controls in estimations—these variables are endogenous to the treatment. Consequently, their connection with the treatment variable might yield misleading outcomes, potentially resulting in inaccurate conclusions about the treatment's impact (Angrist and Pischke 2008). Table 6 illustrates the estimates of Eq. (2*)* without any control variables. The coefficients for *TREATxPOST* appear significant in the estimations for *ROA*, *TOBINQ* and *MB*, and significant with negative sign in the estimation for *ROE*. With the exception of the *ROA*, in all cases the results are consistent with those reported in Table 4.

The following analysis explores the potential influence of country-specific regulations regarding women's presence on boards on the estimation results. Garcia-Blandon et al. (2023) highlight that the approach to appointing women to boards—whether through mandatory quotas, soft quotas, or voluntary recommendations—can significantly impact the financial performance outcomes associated with gender diversity in executive committees. Mandatory quotas, while effective at driving rapid change, may initially face challenges related to perceived legitimacy and integration (Terjesen et al. 2015). In contrast, voluntary recommendations often result in slower progress but tend to cultivate a more inclusive culture that genuinely values diversity. Given this distinction, including firms operating under both voluntary and mandatory quota regimes could lead to misleading results. To address this concern, we performed separate estimations of Eq. (2*)* for firms subject to mandatory and volun-

Table 6 The impact of gender diversity within the executive committee on financial performance. Estimations with fixed effects and without control variables

Variables	(1) *ROA*	(2) *ROE*	(3) *TOBINQ*	(4) *MB*
TREATxPOST	-0.850	-5.084***	-0.169	-0.704
	(0.515)	(1.628)	(0.117)	(0.440)
Constant	6.221***	16.84***	1.385***	2.499**
	(0.810)	(3.259)	(0.239)	(1.056)
Firm FE	YES	YES	YES	YES
Country FE	NO	NO	NO	NO
Year-Industry FE	YES	YES	YES	YES
R-squared	0.183	0.149	0.259	0.155
Number of panel	94	94	94	94
Observations	611	611	611	611

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Treated group: Firms initially lacking female executive directors but including and maintaining at least one female director throughout the period. Control group: Firms without any female directors on the executive committee throughout the research period

Variables: *ROA*: return on assets; *ROE*: return on equity; *TOBINQ*: Tobin's Q; *MB*: market to book ratio; and *TREATxPOST*: 1 if the observation corresponds to a treated firm during the post-treatment period, and 0 otherwise

tary quota regulations. The results of these estimations (not tabulated) are consistent with those presented in Table 4 for firms under voluntary quota regulations. Specifically, the interaction term *TREATxPOST* is negative and significant in the estimations with *ROA* and *ROE* as dependent variables but insignificant in the estimations with *TOBINQ* and *MB*. Conversely, for the subsample of firms under mandatory quota regulations, the coefficient of *TREATxPOST* is insignificant across all cases. These findings indicate that the effects reported in Table 4 are most likely driven by firms operating under voluntary quota regulations.

While D-i-D models offer a valuable tool for analyzing contexts with potentially endogenous relationships between independent and dependent variables (Abadie 2005; Angrist and Pischke 2010; Antonakis et al. 2014), a potential limitation of this methodology is the presence of biases in the initial sample selection. If the firms in the treated and control groups differ in characteristics that are related to both the likelihood of having women on the executive committee and financial performance, the results could be misleading. To address this issue, it is common in D-i-D studies to use estimations based on a matched sample, which ensures comparability between the treated and control groups (e.g., Stuart et al. 2014; Wing et al. 2018). In the context of this study, the use of firms from the S&P 350 should mitigate some of these concerns as it guarantees a certain homogeneity of the firms in the sample. However, to further address potential selection biases, we constructed a matched sample using propensity score matching, where each firm in the treated group is paired with a similar peer in the control group based on size and industry. The new estimates of Eq. (2*)* using the matched sample are presented in Table 7. Consistent with the findings in Table 4, the variable of interest *TREATxPOST* exhibits a negative and significant coefficient in the estimation with *ROE*, while the coefficients remain insignificant in the estimations with *TOBINQ* and *MB*. However, in the case of *ROA*, the coefficient, which was significant in Table 4, becomes insignificant in Table 7.

To strengthen the robustness of our findings, we incorporate Heckman two-step estimations to account for potential selection bias stemming from unobserved factors influencing the decision to appoint women to executive committees. In the first stage, a probit regression predicts the likelihood of firms having women on their executive committees, distinguishing firms with female representation from those without. The estimation leverages industry average gender diversity on executive committees as an instrument. This instrument captures exogenous variation at the industry level, reflecting trends that influence firm decisions without being directly correlated with the dependent variable, such as financial performance. The first stage generates the inverse Mills ratio (*INVMILLS*), which is included in the second-stage D-i-D regression to correct for selection bias. This approach addresses the possibility that firms adding women to their executive committees may systematically differ from those that do not, in ways that also affect financial outcomes. Results are presented in Table 8. The first column shows that the instrument is statistically significant with the anticipated positive sign. In subsequent columns, the interaction term *TREAT*×*POST* yields results consistent with those in Table 4: significant negative coefficients for *ROA* and *ROE*, and insignificant coefficients for *TOBINQ* and *MB*. While *INVMILLS* is significant in all estimations except for *ROE*, indicating the presence of selection

Table 7 The impact of gender diversity within the executive committee on financial performance. Estimations with fixed effects and a matched sample

Variables	(1)	(2)	(3)	(4)
	ROA	*ROE*	*TOBINQ*	*MB*
TREATxPOST	-1.057	-5.534**	-0.0875	-0.448
	(0.776)	(2.142)	(0.182)	(0.736)
SIZE	0.224	1.342	-0.0815	0.227
	(0.800)	(2.038)	(0.115)	(0.505)
AGE	-2.260	-9.161**	-0.231	-1.568*
	(1.369)	(3.856)	(0.319)	(0.874)
BOARDSIZE	-0.359	-1.474	-0.303	-2.117
	(2.349)	(6.585)	(0.437)	(1.868)
DEBT	-0.0306	0.383**	0.0132	0.0909**
	(0.0411)	(0.162)	(0.0108)	(0.0427)
GOVQUAL	-0.00631	0.0357	0.00641	0.0179
	(0.0268)	(0.0752)	(0.00412)	(0.0161)
SOCSCORE	0.00633	0.00668	0.00416	0.0282
	(0.0306)	(0.0770)	(0.00558)	(0.0248)
ENVSCORE	-0.0268	-0.0649	-0.0122	-0.0282
	(0.0240)	(0.0922)	(0.00750)	(0.0221)
BGENDIV	0.00794	-0.0614	0.00671	-0.00839
	(0.0355)	(0.118)	(0.00880)	(0.0328)
Constant	11.32	12.56	4.409*	3.854
	(20.18)	(46.51)	(2.527)	(10.86)
Firm FE	YES	YES	YES	YES
Country FE	NO	NO	NO	NO
Year-Industry FE	YES	YES	YES	YES
R-squared	0.266	0.237	0.428	0.308
Num. of firms	68	68	68	68
Num. of observations	426	426	426	426

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Treated group: Firms initially lacking female executive directors but including and maintaining at least one female director throughout the period. Control group: Firms without any female directors on the executive committee throughout the research period

Variables: *ROA*: return on assets; *ROE*: return on equity; *TOBINQ*: Tobin's Q; *MB*: market to book ratio; *TREATxPOST*: 1 if the observation corresponds to a treated firm during the post-treatment period, and 0 otherwise; *SIZE*: logarithm of total assets; *AGE*: number of years since the company was founded in logs; *BOARDSIZE*: size of the board in logs; *DEBT*: total liabilities divided by total assets; *GOVQUAL*: firm score in the governance pillar; *SOCSCORE*: firm score in the social pillar; *ENVSCORE*: firm score in the environmental pillar; and *BGENDIV*: percentage of female directors on the boardroom

bias in most cases. However, the correction does not alter the primary findings. This demonstrates that the observed effects are robust to potential selection issues.

4.2 Critical mass theory

Subsequently, we examine hypothesis H2, which delves into the critical mass theory (Kanter 1977), suggesting that a critical mass of women within an organization or

Table 8 Heckman two-stage estimations

Variables	First stage estimations	Second stage estimations			
		(1) *ROA*	(2) *ROE*	(3) *TOBINQ*	(4) *MB*
TREATxPOST		-1.010**	-5.245***	-0.154	-0.604
		(0.485)	(1.532)	(0.116)	(0.481)
SIZE	0.754*	-1.061*	-1.520	-0.0519	0.264
	(0.456)	(0.615)	(1.619)	(0.0868)	(0.382)
AGE	0.433	-1.485	-5.487	-0.0515	-0.710
	(0.594)	(1.139)	(3.560)	(0.218)	(0.564)
BOARDSIZE	0.906	0.895	1.221	-0.196	-1.744
	(2.275)	(2.373)	(6.055)	(0.353)	(1.455)
DEBT	-0.0227	-0.0306	0.332**	0.0118	0.0839**
	(0.0354)	(0.0357)	(0.133)	(0.00835)	(0.0347)
GOVQUAL	0.000845	-0.000305	0.00808	0.00530*	0.0116
	(0.0203)	(0.0195)	(0.0514)	(0.00285)	(0.0116)
SOCSCORE	0.125***	0.0271	0.0446	0.00200	0.0157
	(0.0415)	(0.0313)	(0.0729)	(0.00377)	(0.0173)
ENVSCORE	0.0160	-0.0287	-0.0444	-0.00416	-0.00763
	(0.0249)	(0.0176)	(0.0606)	(0.00457)	(0.0143)
BGENDIV	0.0237	0.0498*	0.0766	-0.000430	-0.0137
	(0.0367)	(0.0274)	(0.0838)	(0.00570)	(0.0211)
INVMILLS		0.0000**	0.0000	0.0000**	0.0000**
		(0.0000)	(0.0000)	(0.0000)	(0.0000)
INSTRUMENT	0.544***				
	(0.154)				
Constant	-65.14***	33.02*	56.01	2.727	-0.625
	(15.03)	(19.54)	(40.97)	(1.962)	(8.499)
Firm FE	NO	YES	YES	YES	YES
Country FE	YES	NO	NO	NO	NO
Year-Industry FE	YES	YES	YES	YES	YES
R-squared		0.223	0.197	0.305	0.210
Num. of firms	94	94	94	94	94
Num. of observations	611	611	611	611	611

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Treated group: Firms initially lacking female executive directors but including and maintaining at least one female director throughout the period. Control group: Firms without any female directors on the executive committee throughout the research period

Variables: *ROA*: return on assets; *ROE*: return on equity; *TOBINQ*: Tobin's Q; *MB*: market to book ratio; *TREAT*: 1 if the observation belongs to the treated group, and 0 otherwise; *TREATxPOST*: 1 if the observation corresponds to a treated firm during the post-treatment period, and 0 otherwise; *SIZE*: logarithm of total assets; *AGE*: number of years since the company was founded in logs; *BOARDSIZE*: size of the board in logs; *DEBT*: total liabilities divided by total assets; *GOVQUAL*: firm score in the governance pillar; *SOCSCORE*: firm score in the social pillar; *ENVSCORE*: firm score in the environmental pillar; *BGENDIV*: percentage of female directors on the boardroom; *INVMILLS*: inverse Mills ratio; and *INSTRUMENT*: average of gender diversity in the executive committee by year and industry

committee is crucial to observing gender-related effects on corporate outcomes. To test this hypothesis, we delineate a new treated group that includes firms initially below a certain gender diversity threshold on their executive committees but subsequently surpass and maintain that threshold. Implementing Kanter's (1977) 30% threshold in our context yields a relatively small treated group as few companies have maintained over 30% gender diversity in their executive committees. Hence, we evaluate thresholds of 20%, 25%, and 30% and define treated groups and post-treatment periods accordingly.

Table 9 presents the estimations of Eq. (2*)* for the resulting sample using the 30% threshold. All estimations include fixed effects, and significance tests are conducted using robust standard errors clustered by firm. Across all estimations, the variable *TREATxPOST* consistently shows insignificant coefficients. For simplicity, the results of the estimations for the samples using the 20% and 25% thresholds are not reported, as they are qualitatively similar to those in Table 9. Thus, regardless of the threshold applied or the financial performance metric used, even when the incorporation of women to executive committees occurs in relatively large numbers it has not a significant impact on financial performance.

Three sensitivity analyses were conducted to assess the robustness of the findings presented in Table 9. Firstly, we examined whether the results held under different estimation methods by re-estimating the models using random effects instead of fixed effects for the three defined thresholds. The results from these new estimations (untabulated) align qualitatively with those displayed in Table 9. Secondly, we removed control variables from the estimations (results untabulated). As in previous cases, *TREATxPOST* maintains its lack of significance in all the estimations. Finally, a third analysis explored the impact of defining alternative control groups. In Table 9, the control group for each estimation comprised firms with gender diversity within the executive committee below the 30% threshold throughout the research period. For this new analysis, first, we use the same control group defined for the assessment of hypothesis H1, that is firms with no female representation within the executive committee over the research period. Afterward, we have defined a control group comprising firms that consistently maintained a female presence on the executive committee at 15% or lower. The results obtained from estimations using the new control groups (not tabulated) mirror qualitatively those reported in Table 9.

4.3 Gender equality in the firm's home country

The third hypothesis explores the relationship between the level of gender equality in the firm's home country and the impact of incorporating women into the executive committee on financial performance. To conduct this analysis, Eq. (3*)* is estimated with fixed effects, and significance tests are based on robust standard errors clustered by firm. Given their time-invariant nature, the variables *TREAT* and *GENEQUAL* are automatically removed from the estimations with fixed effects. The key variable of interest, *TREATxPOSTxGENEQUAL*, aims to capture any distinctive effect of incorporating women into the executive committee on financial performance linked to the level of gender equality in the firm's country of origin. *GENEQUAL* is defined as 1 if the observation belongs to a country with a relatively high level of gender equality

Table 9 The impact of gender diversity exceeding 30% within the executive committee on financial performance. Estimations with fixed effects

Variables	(1) *ROA*	(2) *ROE*	(3) *TOBINQ*	(4) *MB*
TREATxPOST	2.015	0.476	0.075	-0.142
	(1.530)	(3.435)	(0.083)	(0.355)
SIZE	-3.393***	-6.178***	-0.260***	-0.744
	(0.727)	(1.812)	(0.0900)	(0.572)
AGE	-1.586	-4.468	-0.0322	-0.459
	(1.377)	(3.255)	(0.266)	(0.741)
BOARDSIZE	1.614	1.905	0.192	0.0404
	(1.407)	(3.723)	(0.186)	(0.0250)
DEBT	-0.0446	0.252**	0.00477	0.000948
	(0.0366)	(0.111)	(0.00553)	(0.00775)
GOVQUAL	0.00767	0.0207	0.00219	0.00342
	(0.0147)	(0.0360)	(0.00206)	(0.0110)
SOCSCORE	0.000322	-0.0210	-0.00156	0.00792
	(0.0225)	(0.0585)	(0.00361)	(0.00786)
ENVSCORE	0.00612	0.0240	0.00310	-0.00742
	(0.0164)	(0.0399)	(0.00298)	(0.0135)
BGENDIV	0.00866	-0.0101	0.00151	17.97**
	(0.0261)	(0.0672)	(0.00388)	(7.437)
Constant	90.30***	169.3***	7.278***	3.854
	(20.29)	(42.45)	(2.204)	(10.86)
Firm FE	YES	YES	YES	YES
Country FE	NO	NO	NO	NO
Year-Industry FE	YES	YES	YES	YES
R-squared	0.266	0.237	0.428	0.308
Num. of firms	249	249	249	249
Num. of observations	1,604	1,604	1,604	1,604

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Treated group: Firms with less than 30% gender diversity on the executive committee initially but surpassed this threshold and maintained it in subsequent years. Control group: Firms with female directors on the executive committee below 30% throughout the research period

Variables: *ROA*: return on assets; *ROE*: return on equity; *TOBINQ*: Tobin's Q; *MB*: market to book ratio; *TREATxPOST*: 1 if the observation corresponds to a treated firm during the post-treatment period, and 0 otherwise; *SIZE*: logarithm of total assets; *AGE*: number of years since the company was founded in logs; *BOARDSIZE*: size of the board in logs; *DEBT*: total liabilities divided by total assets; *GOVQUAL*: firm score in the governance pillar; *SOCSCORE*: firm score in the social pillar; *ENVSCORE*: firm score in the environmental pillar; and *BGENDIV*: percentage of female directors on the boardroom

according to EWOB (2021) (Denmark, France, Finland, Netherlands, Norway, and Sweden), and 0 otherwise. Hypothesis H3 anticipated a positive and significant coefficient for this variable. The estimates of Eq. (3*)* are summarized in Table 10. Consistent with previous findings, *TREATxPOST* shows negative and significant coefficients

Table 10 The role of the level of gender equality in the country of origin of the firm as moderator of the impact of gender diversity on the executive committee on financial performance. Estimations with fixed effects

Variables	(1) *ROA*	(2) *ROE*	(3) *TOBINQ*	(4) *MB*
TREATxPOST	-1.066** (0.487)	-5.350*** (1.526)	-0.147 (0.117)	-0.594 (0.482)
TREATxPOSTxGENEQUAL	0.669 (0.564)	1.235 (1.897)	-0.193 (0.135)	-0.336 (0.506)
SIZE	-1.060* (0.617)	-1.520 (1.618)	-0.0585 (0.0872)	0.250 (0.382)
AGE	-1.545 (1.144)	-5.604 (3.550)	-0.0635 (0.217)	-0.740 (0.563)
BOARDSIZE	0.924 (2.378)	1.271 (6.071)	-0.219 (0.353)	-1.789 (1.453)
DEBT	-0.0320 (0.0355)	0.329** (0.132)	0.0118 (0.00831)	0.0837** (0.0347)
GOVQUAL	-0.00155 (0.0194)	0.00563 (0.0513)	0.00495* (0.00283)	0.0108 (0.0116)
SOCSCORE	0.0271 (0.0315)	0.0446 (0.0729)	0.00221 (0.00376)	0.0161 (0.0172)
ENVSCORE	-0.0282 (0.0176)	-0.0435 (0.0605)	-0.00413 (0.00457)	-0.00753 (0.0143)
BGENDIV	0.0487* (0.0276)	0.0744 (0.0844)	-0.000132 (0.00570)	-0.0132 (0.0210)
Constant	33.30* (19.58)	56.60 (41.00)	2.984 (1.966)	-0.0784 (8.476)
Firm FE	YES	YES	YES	YES
Country FE	NO	NO	NO	NO
Year-Industry FE	YES	YES	YES	YES
R-squared	0.223	0.197	0.305	0.210
Num. of firms	94	94	94	94
Num. of observations	611	611	611	611

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Treated group: Firms initially lacking female executive directors but including and maintaining at least one female director throughout the period. Control group: Firms without any female directors on the executive committee throughout the research period

Variables: *ROA*: return on assets; *ROE*: return on equity; *TOBINQ*: Tobin's Q; *MB*: market to book ratio; *TREATxPOST*: 1 if the observation corresponds to a treated firm during the post-treatment period, and 0 otherwise; *GENEQUAL*: level of gender equality in the country of origin of the firm; *SIZE*: logarithm of total assets; *AGE*: number of years since the company was founded in logs; *BOARDSIZE*: size of the board in logs; *DEBT*: total liabilities divided by total assets; *GOVQUAL*: firm score in the governance pillar; *SOCSCORE*: firm score in the social pillar; *ENVSCORE*: firm score in the environmental pillar; and *BGENDIV*: percentage of female directors on the boardroom

in estimations relying on accounting-based performance indicators, while displaying insignificant coefficients in estimations based on market-based performance measurements. However, the most interesting result is that *TREATxPOSTxGENEQUAL* shows insignificant coefficients across all estimations. These results imply that the influence of gender diversity on the executive committee on performance remains consistent (negative for accounting-based performance and insignificant for market-based performance) regardless of the level of gender equality in the firm's home country.

For robustness checks, estimations of Eqs. (1*)* and *(2)* were conducted using random effects. Similarly, we re-estimated Eq. (3*)* with random effects to further examine the role of gender equality in the home country as a moderator. To better assess this, we performed two estimations for each dependent variable: the first included the moderating variable (*GENEQUAL*), and the second included both the moderating variable and the new interaction term (*TREATxPOSTxGENEQUAL*). The results of these estimations, presented in Table 11, show that the coefficients for *GENEQUAL* are insignificant across all models at the usual levels (p-value<0.05). A similar pattern is observed for *TREATxPOSTxGENEQUAL*, with the exception of the model using Tobin's Q as the measure of financial performance, which displays a negative and significant effect. Overall, these results support the findings reported in Table 10, particularly concerning the rejection of hypothesis H3, which posited that the positive effect of incorporating women into executive committees on financial performance would be stronger in countries with greater gender equality.

5 Discussion

The first hypothesis of this study posited a positive impact of the incorporation of women into the executive committee on financial performance. However, the empirical findings strongly and consistently refute this hypothesis. Across numerous estimations, there is no evidence supporting a positive and significant coefficient for the variable of interest, *TREATxPOST*. Instead, the results show an insignificant impact on market-based performance indicators and even suggest a negative effect on accounting-based performance measures. While, to our knowledge, no prior study has investigated the impact of gender diversity within the executive committee on performance, a few previous studies have addressed the relationship between the presence of female executive directors on the board and financial performance. While Liu et al. (2013) argue that their findings for the Chinese market suggest a positive influence of female executive directors on performance,[7] a closer analysis of the results reveals that the results became insignificant in the estimations conducted using the Arellano and Bond (1991) method, which, according to the authors, offers better control over endogeneity concerns. Afterward, Brahma et al. (2021) explored the context of the United Kingdom, revealing that the inclusion of female executive directors on the board has only a marginal impact on accounting and market-based performance indicators. Notably, these effects were observed in the estimations con-

[7] It should be noted that the authors only used accounting-based indicators of performance.

Table 11 The role of the level of gender equality in the country of origin of the firm as moderator of the impact of gender diversity on the executive committee on financial performance. Estimations with random effects

Variables	(1) *ROA*	(2) *ROA*	(3) *ROE*	(4) *ROE*	(5) *TOBINQ*	(6) *TOBINQ*	(7) *MB*	(8) *MB*
TREAT	1.388	1.343	5.697	5.522	-0.0976	-0.0626	0.275	0.306
	(1.548)	(1.547)	(3.950)	(3.951)	(0.375)	(0.373)	(0.942)	(0.944)
TREATx-POST	-0.965**	-0.997**	-	-	(0.123)	-0.178	-0.729	-0.708
	(0.483)	(0.487)	5.206***	5.326***	-0.200	(0.124)	(0.491)	(0.496)
			(1.583)	(1.601)				
GENEQUAL	0.340	0.151	-7.451	-8.173	1.610	1.738*	6.169	6.284
	(4.134)	(4.249)	(10.72)	(11.12)	(1.004)	(0.956)	(4.516)	(4.583)
TREATx-POSTxGEN-EQUAL		0.449		1.813		-0.360**		-0.349
		(0.732)		(1.964)		(0.166)		(0.532)
SIZE	-	-	-	-	-0.528***	-0.523***	-	-
	2.221***	2.221***	3.566***	3.582***	(0.120)	(0.120)	1.049***	1.041***
	(0.385)	(0.386)	(0.792)	(0.793)			(0.261)	(0.261)
AGE	-0.284	-0.284	-1.749	-1.737	-0.0310	-0.0350	-0.452	-0.456
	(0.559)	(0.563)	(1.447)	(1.456)	(0.114)	(0.113)	(0.300)	(0.300)
BOARDSIZE	0.768	0.785	2.963	3.014	-0.288	-0.306	-0.902	-0.924
	(1.933)	(1.942)	(4.822)	(4.854)	(0.306)	(0.304)	(1.075)	(1.077)
DEBT	-0.0414	-0.0413	0.232**	0.232**	0.0139	0.0140	0.0784**	0.0786**
	(0.0309)	(0.0309)	(0.108)	(0.108)	(0.00855)	(0.00853)	(0.0316)	(0.0317)
GOVQUAL	-0.00608	-0.00589	0.00536	0.00588	0.00386	0.00374	0.0116	0.0115
	(0.0166)	(0.0166)	(0.0461)	(0.0459)	(0.00273)	(0.00273)	(0.0105)	(0.0105)
SOCSCORE	0.0263	0.0262	0.0224	0.0225	0.00515	0.00520	0.0169	0.0169
	(0.0304)	(0.0304)	(0.0718)	(0.0716)	(0.00420)	(0.00420)	(0.0171)	(0.0171)
ENVSCORE	0.000290	5.45e-05	0.00806	0.00771	-1.77e-05	-5.43e-05	-0.00187	-0.00186
	(0.0178)	(0.0178)	(0.0599)	(0.0599)	(0.00440)	(0.00444)	(0.0135)	(0.0135)
BGENDIV	0.0525*	0.0518*	0.0814	0.0791	0.00308	0.00353	-0.00574	-0.00536
	(0.0271)	(0.0273)	(0.0825)	(0.0828)	(0.00560)	(0.00561)	(0.0170)	(0.0171)
Constant	55.55***	55.56***	89.80***	90.22***	13.44***	13.33***	26.97***	26.80***
	(13.61)	(13.66)	(25.18)	(25.27)	(2.845)	(2.835)	(6.515)	(6.500)
Firm FE	NO	NO	NO	NO	NO	NO	NO	NO
Country FE	YES	YES	YES	YES	YES	YES	YES	YES
Year-Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
R-squared	0.280	0.280	0.154	0.155	0.388	0.396	0.299	0.298

Table 11 (continued)

Variables	(1) *ROA*	(2) *ROA*	(3) *ROE*	(4) *ROE*	(5) *TOBINQ*	(6) *TOBINQ*	(7) *MB*	(8) *MB*
Num. of firms	94	94	94	94	94	94	94	94
Num. of observations	611	611	611	611	611	611	611	611

Robust standard errors clustered by firm in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Treated group: Firms initially lacking female executive directors but including and maintaining at least one female director throughout the period. Control group: Firms without any female directors on the executive committee throughout the research period

Variables: *ROA*: return on assets; *ROE*: return on equity; *TOBINQ*: Tobin's Q; *MB*: market to book ratio; *TREAT*: 1 if the observation belongs to the treated group, and 0 otherwise; *TREATxPOST*: 1 if the observation corresponds to a treated firm during the post-treatment period, and 0 otherwise; *GENEQUAL*: level of gender equality in the country of origin of the firm; *SIZE*: logarithm of total assets; *AGE*: number of years since the company was founded in logs; *BOARDSIZE*: size of the board in logs; *DEBT*: total liabilities divided by total assets; *GOVQUAL*: firm score in the governance pillar; *SOCSCORE*: firm score in the social pillar; *ENVSCORE*: firm score in the environmental pillar; and *BGENDIV*: percentage of female directors on the boardroom

ducted using ordinary least square regression, a method that is not robust to endogeneity issues. Therefore, the previous support for the favorable influence of female executive directors on financial performance seems relatively weak and possibly influenced by endogeneity. Given this context, it is not surprising that utilizing D-i-D estimations with fixed effects, a design known for its resilience against endogeneity, yields a lack of impact of female executive directors on performance.

The second hypothesis proposed that gender diversity within the executive committee would have a significant positive effect on financial performance once women reached a critical mass within the committee. However, our empirical findings reject this hypothesis, as the variable of interest consistently shows insignificant coefficients across all estimations, regardless of the critical mass threshold, the financial performance proxy used, or the estimation method applied. A common argument in studies reporting no impact of board gender diversity on corporate outcomes is that the level of gender diversity in their samples is below the minimum threshold required to observe a significant effect. In contrast, our findings suggest that even when women are incorporated into executive committees in large numbers, there is no significant impact on firm financial performance. Thus, critical mass theory does not hold in our study. We cannot compare our results with previous studies since neither Brahma et al. (2021) nor Liu et al. (2013) have specifically explored the critical mass theory in the context of female executive directors.

The final hypothesis, asserting that the beneficial impact of incorporating women into the executive committee would be stronger in countries with higher levels of gender equality, faces rejection based on our empirical findings. Post & Byron's (2015) meta-analysis, although not centered on gender diversity within the executive committee specifically, indicated that the impact of diversity within the broader boardroom context was stronger in countries exhibiting greater levels of gender equality. Afterward, Hoobler et al. (2018) came to a similar conclusion in a meta-analysis study examining the effect of the presence of women in leadership roles on

performance. We interpret our findings in the context of these prior works, considering that unlike them our study focuses exclusively on firms from European countries. As a result, a relative homogeneity in terms of gender equality across these European nations could explain our results, as compared to studies encompassing countries with widely differing levels of gender equality.

6 Concluding remarks

This study aimed to assess the impact of women joining executive committees on financial performance. The empirical analysis is based on D-i-D models and panel data estimations and conducts various sensitivity analyses. The results do not support the initial hypotheses of a positive impact of the incorporation of women into the executive committee on performance. Contrary to expectations, this situation did not positively impact performance; in fact, it showed a negative or insignificant effect on both accounting-based and market-based performance measures. Notably, even when a larger number of women joined these committees, their impact on financial performance remained insignificant across accounting and market-based indicators. Finally, the findings also diverged from the idea that the level of gender equality in a firm's home country influences the relationship between female directors and performance.

The findings of this study may have several significant implications. From an academic perspective, the observed lack of a positive impact on financial performance from appointing female directors to executive committees contrasts with previous research on gender diversity at the board level, which generally reports a positive effect. The gender studies literature suggests that women typically excel in monitoring roles rather than executive roles. Given that women are often appointed as independent directors, board gender diversity tends to reflect the impact of women in monitoring capacities. In this context, our findings, which indicate an insignificant or negative effect of women in executive positions on performance, are consistent with these studies. Furthermore, the lack of a significant impact on financial performance, even when a substantial number of women are appointed to executive committees, provides no evidence in support of the critical mass theory. From a practical standpoint, our results contribute to the ongoing debate about gender quotas in executive committees. While the findings of this study do not directly pertain to mandatory quotas—since the appointments in our sample were voluntary decisions by firms—they suggest that such quotas may not necessarily result in improved financial performance. Although implementing gender quotas can be justified on broader societal grounds, such as promoting gender equality, providing role models, and influencing societal norms around leadership, our results indicate that simply increasing the presence of women on executive committees is unlikely to directly enhance firms' financial performance.

There are at least two limitations to consider when interpreting the study's results. Firstly, concerning hypothesis H2, focusing on the critical mass theory, there are very few firms in our sample where women constitute consistently above 30% on the executive committee throughout the post-treatment period. Thus, the rejection

of this hypothesis in our case might be due to the relatively low gender diversity on executive committees in our sample. However, it is worth noting that our study features a larger percentage of female directors compared to previous related studies, which mitigates this limitation to some extent. The second limitation refers to the assessment of hypothesis H3 and, more specifically, to the ability of the sample to adequately represent the influence of gender equality in the firm's home country on the impact of gender diversity on financial performance. Most firms in our sample hail from countries with similar levels of gender equality, potentially limiting the variance necessary to draw conclusive findings regarding this aspect.

Future studies will greatly benefit from the ongoing integration of women into executive committees and other top-tier management roles. This increased representation of women in such positions will facilitate more thorough investigations into the potential impact of gender on performance, in particular regarding the critical mass theory. Finally, expanding the scope of this study to include various geographical contexts, encompassing countries with diverse levels of gender equality, could offer richer insights. Investigating how gender equality in the home country moderates the impact of gender diversity in leadership roles on performance would provide a more nuanced understanding of these dynamics.

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