



**BOARD GENDER DIVERSITY
AND PERFORMANCE IN GAZELLES:
EVIDENCE FROM A SAMPLE OF ITALIAN PRIVATE HOSPITALS**

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Abstract

Purpose: This paper examines the influence of board composition in terms of gender diversity on the performance of high-growth firms, offering evidence from the health sector.

Methodology: The sample is composed of 27 startups operating in the health sector. Enterprises are born in Italy in 2014 and became gazelles in 2018 or 2019, respectively, in the fourth or fifth year of life.

To analyse the effect of board gender diversity, multiple regression models were utilised, using return on assets (ROA) as a measure of financial performance.

Findings: Results show that there is a statistically significant and positive relationship between board gender diversity and financial performance. In other words, as the percentage of women on board of directors increases, financial performance grows by approximately 6.41%.

Originality of the study: The impact of board gender diversity on firms' performances is widely investigated in the literature. However, this study is original both for the type of firms (gazelles) and for the sector investigated (private hospitals).

Practical implications: Managers of high-growth startups may find advantages in including women in executive and board positions. This is particularly relevant for the private healthcare sector, where governance structure plays a key role in achieving performance objectives.

1. Introduction

Corporate research recognizes the importance of diversity on the board of directors (BoDs). It has a key role in improving firms' performance (Mahadeo *et al.*, 2012; Hillman *et al.*, 2000, 2002).

The term "diversity" refers to any kind of difference among members and is assumed to add value to the firm (Arfken *et al.*, 2004).

The research on board diversity focused on different dimensions, such as educational and functional background (Goodstein *et al.*, 1994; Golden and Zajac, 2001; Westphal and Zajac, 1995), race, ethnicity, and nationality (Arfken *et al.*, 2004; Burke, 1997; Carter *et al.*, 2003; Daily *et al.*, 1999; Erhardt *et al.*, 2003; Shrader *et al.*, 1997; Oxelheim and Randøy, 2003; Ruigrok *et al.*, 1999, 2005).

Given the growing number of women on corporate boards, scholarly attention has recently shifted to board "gender" diversity (Rose, 2007; Smith *et al.*, 2006; Nielsen and Huse, 2010). The academic debate is still open, and the results of the empirical literature are still mixed: some studies showed a positive impact on financial performance with women on the BoD (Erhardt *et al.*, 2003; Adler, 2001; Mahadeo *et al.*, 2012), while others found no correlation (Shrader *et al.*, 1997; Adams and Ferreira 2009; Marinova *et al.*, 2016).

Little is known about how the board gender diversity affects firm performance in startups, especially those with exceptional growth potential, so-called "Gazelles" (Sterk *et al.*, 2021).

The term "gazelle" was coined by Birch and Medoff (1994) to denote a small group of high-growth firms which - starting from a base-year turnover of at least \$ 100,000 - achieved a minimum of 20% turnover growth each year over a three-year interval. These companies play an important role in the economic system of all countries for their contribution to the creation of new net jobs (Birch, 1979; Henrekson and Johansson, 2010).

Interest in gazelle enterprises is growing, but no standard definition exists. In this study, we assume the definition provided by the Organization for Economic Cooperation and Development (OECD). OECD defined gazelles as "*enterprises up to five years old with average annualized growth greater than twenty percent per annum over a three-year period, and with ten or more employees at the beginning of the observation period*" (Eurostat-OECD, 2007).

This paper aims to investigate the influence of board gender diversity on the financial performance in a sample of young, high-growth firms. We focused on gazelles operating in the healthcare sector because of the importance of the private hospital sector in the Italian context.

Italy is a country based on the National Health System (NHS) (Fattore, 2019). A large portion of hospitals in Italy are accredited and backed by the NHS. They provide for 30.4% of the beds nationally, although there are wide discrepancies between the different regions (Belfiore *et al.*, 2022).

In the last decades, healthcare systems are facing conflicting trends (Mauro and Giancotti, 2021; Tartaglia Polcini *et al.*, 2021): short- and long-term effects of financial and economic restrictions; increasing demands of an ever-expanding and aging population, which leads to more chronic patients; increasing request and availability of technological innovations; new roles, new skills, and additional responsibilities for the health workforce.

To face the situation, governments have partnered with private hospitals to improve care, increase efficiency, and boost productivity (Mauro and Giancotti, 2021; Vecchi *et al.*, 2022). However, Public-Private Partnerships (PPP) are now under discussion because of the mixed results achieved, and the deteriorated trust between public and private actors (Vecchi *et al.*, 2022).

To date, few studies have dealt with the economic performance, financial profile, and structural growth of private hospitals (Belfiore *et al.*, 2022): “gazelles hospitals” support care processes in the health system, yet factors affecting their economic and financial performance are unclear. In particular, the search for the relevant characteristics to define effective governance has not received proper attention (Tartaglia Polcini *et al.*, 2021).

Under this framework, the primary aim of this article was to explore whether and to what extent the board gender diversity affects financial performance of the “gazelles hospitals” that collaborate with the Italian NHS. The topic of gender diversity is investigated in terms of proportion of women on company board (Hillman, 2015; Post and Byron, 2015). Specifically, we seek to answer, from an empirical standpoint, the following research question: *what is the impact of increased female representation on health-care gazelles’ financial results?*

To answer this research question, an empirical approach based on a panel regression analysis was employed. Our data comprises 27 startups operating in the health sector born in Italy in 2014, which became gazelles in 2018 or 2019. These enterprises were observed for six years following their birth (from 2014 to 2019). Therefore, the last sample comprised a panel of 126 observations.

Financial performance was measured as the return on assets (net income divided by total assets - ROA). ROA is the most frequently financial ratio used in studies on gender diversity on company boards (Erhardt *et al.*, 2003; Marinova *et al.*, 2016; Adler, 2001).

Our study provides the following theoretical and practical contributions.

First, board gender diversity research has been inconclusive because of contradictory findings in prior literature, requiring additional research and testing.

Second, this study addresses the gap in the literature on studies focused on the role of the BoD in high-growth firms (Garg, 2013; Rasmussen *et al.*, 2018), and how the composition of the BoD, in terms of gender diversity, affects the financial performance of gazelles. In fact, to the best of our

knowledge, no empirical studies exist testing the relationship between gender diversity and performance in healthcare gazelles.

From a practical point of view, this topic is relevant for the private healthcare sector: the governance and organizational structure of private hospitals shall be such as to ensure the measurement and achievement of the performance objectives (Taylor, 2000). Indeed, while public hospitals are not required to make profits and therefore their boards are not under any pressure to maximize shareholder value (Tartaglia Polcini *et al.*, 2021), this situation is very different in private hospitals, especially profit-making hospitals (Belfiore *et al.*, 2022). Their boards are required to return profit to their shareholders, while ensuring effective and efficient health delivery (Belfiore *et al.*, 2022).

The paper is organized as follows. The next section provides a review of the literature preceding the development of the hypotheses. In section 3, we present the research methods and the econometrics analysis; in section 4, we discuss the results of the empirical analysis. Finally, in section 5, last remarks and future research directions are presented.

2. Review of literature and hypotheses development

In the last years, the issue of board diversity has received an increasing attention from both academics and practitioners, becoming one of the key issues on corporate governance.

Of whatever kind it may be - of gender, nationality, age, professional background - diversity is deemed to broaden the debate within the boards and help to avoid the danger of homogenization of thinking, increase creativity and innovation, improve problem solving, and promote the exchange of ideas, providing new insights and perspectives to the board (Watson *et al.*, 1993; Siciliano, 1996; Coffey and Wang, 1998; Carter *et al.*, 2003; Schippers *et al.*, 2003).

In this framework, the relationship between board diversity and firms' performance has become one of the major topics explored in the literature.

The empirical literature has produced mixed results: while some authors find a positive relationship between diversity and performance (Campbell and Minguez-Vera, 2008; Carter *et al.*, 2010; Cook and Glass, 2015), some others find a negative or no significant relationship (Shrader *et al.*, 1997; Zahra and Stanton, 1988; Rose, 2007; Adams and Ferreira, 2009).

Overall, the literature on the relationship between board diversity and corporate performance had not reach conclusive evidence on this topic.

As pointed out by Adams and Ferreira (2009), the impact of board diversity on performance is probably a heterogeneous phenomenon.

This could be due to contextual factors: diverse boards may be more use-

ful in large firms operating with complex asset structures and need more intensive monitoring from directors and complex advice (Coles *et al.*, 2008).

This paper is focused on gender diversity, measured by the presence of women on the BoDs (Hillman, 2015; Post and Byron, 2015).

The topic of gender diversity has its roots in the transition from a “think-manager-think-male” culture (Schein, 1973) to a leadership style known as “transformational leadership” (Burns, 1978; Bass and Avolio, 1990).

The first has prevailed for a long time, attributing the characteristic of a leader - such as competition, ambition, analytical skills, emotional stability, aggressiveness, and so on - exclusively to the male gender (Schein *et al.*, 1996).

Later, the value of alternative leadership styles to more directive ones was recognized: transformational leadership is characterized by the ability to inspire, combine different approaches (Athanasopoulou *et al.*, 2018), foster empathetic involvement of employees (Post and Byron, 2015), and motivate by leveraging values, ideals, and a sense of mission (Burns, 1978; Bass and Avolio, 1990).

In this context, previous studies observe that this leadership style is found more frequently in women than in men (Eagly and Carli, 2003), raising the debate on gender diversity and its impact on the economic and financial firm’s performance.

The academic literature on this topic provided mixed results.

Some studies hypothesized a number of organizational level benefits associated with gender diversity on the BoD. These include improved board decision-making quality (Milliken and Martins, 1996), more effective board strategic control (Nielsen and Huse, 2010), more stringent board monitoring (Adams and Ferreira, 2009).

Intangible and complex resources derive from board gender diversity. These include: market insight, creativity and innovation (McMahan *et al.*, 1998; Ismail and Manaf, 2016; Wu *et al.*, 2022), better quality decisions (Milliken and Martins, 1996), corporate reputation (Fombrun, 2006; Bear *et al.*, 2010), effective organizational control (Westphal and Zajac, 1995; Bear *et al.*, 2010), improved problem-solving (McMahan *et al.*, 1998) and created a positive impact on cognitive conflict (Matolcsy and Wyatt, 2006).

These advantages seem to be based on cognitive differences between men and women, in terms of core values, risk attitudes, backgrounds, and perspectives (Adams and Funk, 2012; Perryman, *et al.*, 2016; Simpson *et al.*, 2010).

In particular, several studies suggest that women directors tend to hold more college degrees and more marketing and sales experiences compared to their male counterparts (Carter *et al.*, 2010). Additionally, women directors are more prudent to risks, pay more attention to corporate social responsibility and philanthropy (Burgess and Tharenou, 2002; Post and Byron, 2015), have different socialization experiences compared to their male counterparts (Simpson *et al.*, 2010).

Finally, women directors are prone to value different opinions, elicit information from all board members, and adopt a cooperative decision-making approach to stimulate collaboration within the group (Post and Byron, 2015).

As a result, a gender diverse board may benefit firms through these unique knowledge, information, experiences, and skills of women directors (Hillman *et al.*, 2007; Miller and Triana, 2009). Many authors have documented that a higher proportion of women directors on boards is associated with positive accounting, financial, or market performance (Terjesen *et al.*, 2009; Campbell and Mnguez-Vera, 2008; Carter *et al.*, 2003; Conyon and He, 2017; Dani *et al.*, 2019; Aguinis and Glavas, 2012; Bocquet *et al.*, 2019; Salloum *et al.*, 2019; Shehata *et al.*, 2017; Galletta *et al.*, 2021; Naciti *et al.*, 2021; Moreno-Gómez *et al.*, 2018).

Other studies have found the opposite by showing a negative association between female board representation and firm performance (Ahern and Dittmar, 2012; Matsa and Miller, 2013), while other studies have concluded that there is no clear relationship between female board representation and firm performance (Adams and Ferreira, 2009; Carter *et al.*, 2010; Jurkus *et al.*, 2011; Bianchi *et al.*, 2020).

Although the literature has widely investigated the relationship between board gender diversity and firm performance, there is a surprising lack of empirical works on the effect of gender diversity on startups performance.

In effect, the topic is particularly relevant for these firms: board gender diversity effects on the decision-making process at the top level (Adams *et al.*, 2010); this aspect is especially crucial for startups in which early-stage entrepreneurial decisions may have an important effect on survival and performance (Colombo and Grilli, 2010; Shrader and Siegel, 2007).

Despite this, the role of board composition in startups' functioning and survival has been studied mostly in terms of outside status, while the role of gender board composition is rarely investigated (Li *et al.*, 2020), most probably because women are underrepresented in young startups (Dai *et al.*, 2019; Bacchin *et al.*, 2022).

This paper contributes to this stream of literature, investigating on the role of gender diversity in terms of female representation in BoDs of high-growth startups, and offering evidence from the private healthcare sector. The choice to focus on the healthcare sector is justified by the lack of studies in this area: despite the research on the effects of gender diversity has grown substantially, little is focused on the healthcare industry, leaving organizations to make decisions based on conflicting findings regarding the association of diversity with quality and financial outcomes (Gomez *et al.*, 2019). Studies are mainly focus on other determinants of financial performance in healthcare sector (Nurettin Oner, 2016). Only recently, a review

of studies focused on the impact of diversity in general (Gomez *et al.*, 2019) (differences in race, age, ethnicity, educational background and gender of workers, managers, customers or teams, including nurses, technicians and physicians) on the performance and outcomes of healthcare organizations, offers some useful considerations: a) workforce diversity in healthcare sector is associated with better financial performance and a higher quality of patient care; b) gains from diversity are maximized when reflected in top management and board positions (Gomez *et al.*, 2019; Muller-Kahle *et al.*, 2011; Miller and Triana, 2009; Carter *et al.*, 2010). Despite the contribution, the study concludes by emphasizing the need to clarify which type of diversity contributes to the improvement of overall performance. In this sense, our aim is to investigate about the role of gender diversity in improving financial performance of healthcare companies.

Based on the above arguments, we propose the following first hypothesis (H1):

H1: there is a positive relationship between board gender diversity (in terms of proportion of women on company board) and financial performance in gazelles operating in the private healthcare sector.

However, in recent years, a stream of research on gender diversity based on the critical mass perspective (Kanter, 1977a; 1977b), has highlighted that female representation on the board can have a relevant influence on the decision-making and strategic processes of companies only when their subgroup (i.e., the number of women directors) on the board reaches a certain size (Lesch *et al.*, 2022). This theory suggests that only when the number of women directors reaches a large enough number to become the majority group (compared to the subgroup of male directors) and therefore, a critical mass, is it able to significantly influence board discussions (García-Meca *et al.*, 2022) and therefore corporate performance (Brahma *et al.*, 2021). Consequently, it is reasonable to assume that the impact of gender diversity on financial performance depends on the number of women directors on BoDs. Below a certain critical threshold of the female representation, on the contrary, we believe that the influence of women on the board and therefore on company performance is less. Following the main body of literature (Joecks *et al.*, 2013; Torchia *et al.*, 2010; Brahma *et al.*, 2021; Erkut *et al.*, 2008), we assume that the number of women directors needed to form a “critical voice” capable of exerting a significant influence on company performance is equal to 3. This is especially the case for companies whose BoDs are multi-gender (i.e., composed of men and women). Accordingly, we propose the following second hypothesis (H2):

H2: Gazelles with three or more women on the BoDs perform better financially than others.

3. Method

3.1 Sample and data

The empirical analysis is based on a longitudinal dataset of 27 high-growth startups operating in the healthcare sector.

The study covers the five-year period from 2015 to 2019.

Data were collected from AIDA-Bureau van Dijk (AIDA-BvD), a digital database contains comprehensive information and financial statements of the Italian companies.

The process of data collection comprises two phases.

First, we collected from AIDA-BvD the list of the entire population of startups born in Italy in 2014. Among these companies, we then isolated the startups that achieved the status of gazelles in 2018 or 2019, respectively, in their fourth or fifth year of life.

We defined gazelles as companies of up to 5 years, growing 20% over 3 years and employing 10+ employees - according to the OECD-Eurostat (2007) definition.

As a measure of growth, we used the annualized average growth rate in terms of the number of employees [1] and turnover [2].

$$\textit{Employment growth rate} = \sqrt[3]{\frac{\textit{Employees}_{(t)}}{\textit{Employees}_{(t-3)}}} - 1 > 0.2 \quad [1]$$

$$\textit{Turnover growth rate} = \sqrt[3]{\frac{\textit{Turnover}_{(t)}}{\textit{Turnover}_{(t-3)}}} - 1 > 0.2 \quad [2]$$

Where (t) and (t-3) represent, respectively, the beginning and the end of the three-year growth period.

Companies in our sample were established in 2014 and analysed from 2014 to 2019. We identified two periods of growth: 1) from 2015 (t-3) to 2018 (t) for companies that had 10 employees in 2015; 2) from 2016 (t-3) to 2019 (t) for companies that reached this threshold at the third year of age (2016).

At the end of this first phase of the selection process, 2,183 Italian gazelles have been identified.

The second phase of the selection process was aimed at identifying the gazelle companies operating in the health sector (hospital gazelles). We used the four-digits ATECO-ISTAT 2007 classification code.

We considered as hospital gazelles only the companies carrying out one

of the following economic activities: 1) Hospitals and general care homes (86.10.10); 2) Specialized hospitals and nursing homes (86.10.20); 3) Institutes, clinics, and university polyclinics (86.10.30); 4) Hospitals and long-term care homes (86.10.40); 5) Residential social work services (87). In table 1 we reported the distribution of gazelles by sector of economic activity.

Tab. 1: Distribution of the hospital gazelles by economic sector of activities (at the four-digit level of ATECO-ISTAT 2007)

4 digit code	Description	Number of gazelles	%
873000	Residential care activities for the elderly and disabled	12	44.44%
879000	Other residential welfare facilities	8	29.64%
871000	Residential nursing facilities for the elderly	5	18.52%
861010	Hospitals and general care homes	1	3.70%
861020	Specialized hospitals and nursing homes	1	3.70%
N		27	100.00%

In table 2, we report the distribution by regions of the hospital gazelles included in our sample.

Following the ISTAT-Eurostat classification, we found that about half of the hospital gazelles (48,14%) are in the regions of Southern Italy (i.e., Campania, Sardinia, Sicily, Puglia); 33,35% in the regions of Northern Italy (i.e., Emilia-Romagna, Lombardy, Piedmont, Friuli Venezia-Giulia) and the remaining 18.51% in the Central Italy (i.e., Lazio, Umbria, Marche, Tuscany).

Tab. 2: Distribution of hospital gazelles by regions

Regions	Number of gazelles	Perc. (%)
Campania	4	14.81%
Emilia-Romagna	4	14.81%
Sardinia	4	14.81%
Sicily	3	11.11%
Lombardy	3	11.11%
Puglia 2		7.41%
Lazio	2	7.41%
Umbria	1	3.70%
Piedmont	1	3.70%
Friuli Venezia-Giulia	1	3.70%
Marche	1	3.70%
Tuscany	1	3.70%
N	27	100.00%

3.2 Variables and measurements

To measure the dependent variable as a proxy of financial performance of the hospital gazelles, we used the ROA. This indicator is a powerful accounting-based indicator that summarizes the firm's performance; it represents the most used indicator in similar studies (e.g., Inostroza and Espinosa-Méndez, 2022; Simionescu *et al.*, 2021; Satriyo and Harymawan, 2018). As suggested by Kennedy *et al.* (1992), to mitigate the impact of outliers on the regression results, we winsorized the values of our dependent variable at the 5th and 95th percentile of its distribution (command *winsor2* in STATA 14.0). In this way, the outliers were replaced with values from the fifth and ninety-fifth percentiles of the sample population (see Cox *et al.*, 2003).

The explanatory variables include the independent variable and a set of variables related to the characteristics of companies and the composition of the BoDs. The independent variable is the gender diversity, in terms of proportion of women directors on corporate boards. Following previous studies (e.g., Singh *et al.*, 2023; Dwaikat *et al.*, 2021; Ahmadi *et al.*, 2018; Conyon and He, 2017; Byoun *et al.*, 2016; Low *et al.*, 2015), we measure this variable as the ratio of the total number of women directors and the total number of directors on board.

The regression analysis also included additional firm-specific and governance-related variables to control other variables potentially affecting a firm's financial performance. To control for corporate governance characteristics, we used the total number of directors on the company board (Kathuria and Dash, 1999), the age of the youngest and the oldest director (Eulerich *et al.*, 2014). Second, to control firm-level effects, we applied the logarithmic transformation of the total number of employees (Ali *et al.*, 2014) and of a total asset (Singh *et al.*, 2023) as proxies of business size. We also controlled for liquidity by using the current ratio, calculated as the current assets divided by the current liabilities (Delen *et al.*, 2013).

Table 3 summarizes the variables used in the regression models, their description, and measurements.

Tab. 3: List of variables used in the regression model and measures

Variables	Abbrev.	Definition and measures	Authors
Dependent variable			
Financial performance			
Return on Asset	ROA	ROA is computed as the ratio of the annual Earning Before Interests and Taxes (EBIT) to Total Asset in a financial year t	Singh <i>et al.</i> , 2023; Dwaikat <i>et al.</i> , 2021; Ahmadi <i>et al.</i> , 2018; Conyon and He, 2017; Byoun <i>et al.</i> , 2016; Low <i>et al.</i> , 2015.
Independent variables			
Gender diversity ratio (GDR)			
Proportion of Women Directors (%)	P-WD	Percentage of women directors on the board of a company measured as the ratio of the total number of women directors to the total number of directors	Ahmadi <i>et al.</i> , 2018; Conyon and He, 2017; Dwaikat <i>et al.</i> , 2021.
Level of female representation in the BoDs (F-REPR)			
1 Woman Director	1-WD	Dummy variable that assumes the value of 1 if there is one woman director, 0 otherwise	Brahma <i>et al.</i> , 2021; Joecks <i>et al.</i> , 2013.
2 Women Directors	2-WD	Dummy variable that takes the value of 1 if there are two women directors and zero otherwise	Brahma <i>et al.</i> , 2021; Joecks <i>et al.</i> , 2013.
3 Women Directors	3-WD	Dummy variable that takes the value of 1 if there are three or more women directors and zero otherwise	Brahma <i>et al.</i> , 2021; Joecks <i>et al.</i> , 2013.
Control variables			
Corporate governance variables			
Board size	B-SIZE	Number of directors present in the board of the firm	Kathuria and Dash, 1999.
Youngest Director	Y-DIR	Age of the youngest director in the board of the firm	Eulerich <i>et al.</i> , 2014; Simionescu <i>et al.</i> , 2021;
Older Director	O-DIR	Age of the older director in the board of the firm	Eulerich <i>et al.</i> , 2014; Simionescu <i>et al.</i> , 2021.
Firms-level control variables			
Operational firm size	EMPL	Natural logarithm of the number of employees for the firm I at time (year) t	Ali <i>et al.</i> , 2014; Simionescu <i>et al.</i> , 2021.
Structural firm size	ASSET	Natural logarithm of a total asset for company i at time (year) t	Singh <i>et al.</i> , 2023.
Current ratio	LIQ	Current assets/Current liabilities	Delen <i>et al.</i> , 2013.
Year dummies	YEARS	Time trending dummy variables reflecting years 2014-2019	Barron and Waddell, 2003; Grinstein and Hribar, 2004.

3.3 Descriptive statistics and correlation matrix

Table 4 summarizes the descriptive statistics of the variables used in the regression analysis. It also summarizes the gender composition of the BoDs of the sampled gazelles.

The mean ROA of the full sample was 1.17%. The proportion of women on company boards was about 0.46. This value ranges from a minimum of 0 (in the hospital gazelle where there is no woman on the BoD) and a maximum of 1.00. We also found that the BoDs of the companies examined had an average of 4 directors during the observation period, with a minimum of 1 (in companies with sole director) and a maximum of 10. The average age of the directors was 53 years. The average age of the youngest directors was approximately 44 years, compared to the average of 62 of the older directors.

Almost all the hospital gazelles observed had an average of 32 employees and total assets of 1,225.88 thousand euros in the observation period. Therefore, according to the size parameters established by Directive 2013/34/EU, most of the gazelle companies in our sample are small and medium-sized enterprises (SMEs).

Tab. 4: Descriptive statistics of the variables used in the regression analyses

Variables	Obs.	Mean	St.Dev.	Min	Max
Return on Asset (ROA)	145	1.17	19.87	-49.44	32.13
Proportion of women Directors (%)	162	0.46	0.41	0	1.00
Board size	162	3.63	2.38	1	10
Youngest director	162	44.56	8.90	23	64
Older director	162	62.37	11.09	42	79
Total asset	145	1225.88	3551.06	1.577	20258.11
Number of employees	145	32.32	75.55	0	569
Current ratio	143	1.20	0.86	0.02	5.14

Table 5 reports the correlation matrix of the variables used in the regression analyses. Most correlation coefficients are low, thus suggesting that the multicollinearity was not a concern in our study. This is further confirmed by the mean value of the Variance Inflation Factor (VIF) that was below the critical threshold of 2.50 indicated by Gujarati (2022) (see Tab. 5).

Tab. 5: Pairwise correlation matrix of the variables used in the regression models

	1	2	3	4	5	6	7	8	VIF
1. Return on Asset (ROA)	1.00								
2. Proportion of women Directors (%)	0.09	1.00							1.20
3. Board size	0.03	0.13	1.00						2.29
4. Youngest director	0.05	-0.13	-0.62*	1.00					1.94
5. Older director	-0.03	0.29*	0.32*	0.02	1.00				1.50
6. Total asset	-0.10	-0.20*	0.01	-0.03	-0.28*	1.00			2.11
7. Number of employees	0.00	-0.05	0.01	-0.07	-0.20*	0.52*	1.00		2.19
8. Current ratio	0.42*	0.15	0.26*	-0.10	0.03	-0.13	-0.06	1.00	1.15
Mean VIF									1.77
Asterisks indicate the level of significance at 0.05 (<i>p-value</i> < 0.05)									

3.4 Statistical procedure and econometric modelling

As stated in the previous sections, we are interested in examining the influence of the board gender diversity on the hospital gazelles' financial performance. This relationship can be represented by the following basic general equation [1]:

$$ROA = f(\text{Gender diversity in the BoD, control variables}) \quad [1]$$

This model represented the starting point of our hypothesis and the empirical analysis. For this purpose, in line with previous study (e.g., Simionescu *et al.*, 2021; Arioglu, 2020; Satriyo and Harymawan, 2018; Julizaerma and Sori, 2012), we first estimated the following Pooled Ordinary Least Squares (OLS) linear model [2] to test our H1:

$$ROA_{it} = a + \text{Gender diversity}_{it} + \text{Corporate governance}_{it} + \text{Firm controls}_{it} + \epsilon_{it} \quad [2]$$

where β is the regression coefficient of the variable used as a proxy of gender diversity in the BoD of the hospital gazelles. γ represents the vector of the other variables related to the characteristics of the BoD (i.e., age of the youngest director, age of the oldest director and total number of directors on company boards). δ is the vector of the control variables as reported in the table 3 above and ϵ_{it} denotes the error term for gazelle i at the time (year) t .

Considering the longitudinal structure of our data set, we estimated a panel multivariate regression model where the financial performance is

assumed to be a function of the gender diversity. The use of a panel regression model provides a more reliable and powerful analysis than cross-sectional analysis because it allows better control for unobservable heterogeneity and omitted variables biases (see Campbell and Minguez-Vera, 2008; Low *et al.*, 2015). However, as stated by Low *et al.* (2015) and Hermalin and Weisbach (2001), issues of reverse causality and endogeneity are common in the analysis of the relationship between gender diversity and financial performance. In these cases, OLS may no longer be the Best Linear Unbiased Estimator (BLUE) and the results of the regression analysis could be biased (Bhagat and Black, 2001). To evaluate the robustness of Pooled OLS estimates, we performed a series of regression models using different estimators and a different proxy of gender diversity. First, we have replaced the independent variable “Gender diversity ratio” with a categorical variable that expresses the number of female directors on the company board (see table 3). According to Brahma *et al.* (2021) and Joecks *et al.* (2013), we coded this variable by taking the following three dummy variables: (1) dummy variable “1 woman director” that take a value of 1 if there is one woman director on the company board, 0 otherwise; (2) “2 women directors” that assume a value of 1 if on the company board there are 2 women, 0 otherwise; (3) “3 women directors” that take a value of 1 if there are at least 3 women directors on the company board, 0 otherwise.

Second, in line with previous empirical studies on the relationship between gender diversity and financial performance (e.g., Fernández-Temprano and Tejerina-Gaite, 2020; Kimanzi *et al.*, 2020; Inostroza and Espinosa-Méndez, 2022), we employed Generalized Least Square (GLS) with Random-Effects specification and a hierarchical regression analysis as alternative models to further explain the effect of gender diversity on corporate performance by controlling for reverse-causality and unobservable effects.

4. Results

The results of Pooled OLS and GLS Random-Effects regression analyses summarised in table 6 highlights a positive relationship between the female representation in the BoDs and the financial performance of hospital gazelles. In addition, the results suggest that all the four models are overall statistically significant at the level of 99%, as showed by the *p-value* (<0.01) associated to the *F-test* for the Pooled OLS estimations (Models 1 and 3) and to the Wald Chi-square for GLS Random-Effects estimates (Models 2 and 4). Looking at the value of the R^2 , we also find that Model 1 explains 27.35%, Model 2 explains 25.88%, Model 3 explains 31.81% and Model 4 explains 30.76% variation in financial performance, respectively.

Regarding the independent variable (i.e., proportion of women directors), we noted that the estimated regression coefficient is positive and statistically significant at the level of 5% in both Models 1-2, thus confirming our H1 that gender diversity on company board matters. These results are consistent with those of previous studies that found a positive relationship between the female representation in the BoDs and financial performance (e.g., Abdelzaher and Abdelzaher, 2019; Low *et al.*, 2015; Lückerath-Rovers, 2013).

Regarding the control variables, only the business size and the liquidity levels were significant, although at different *p-values*. The coefficient of the variables used as a proxy of the operational firm size (natural log of the number of employees) is negative and statistically significant at the level of 10% both in Models 1-2, suggesting a negative relationship between firm size and financial performance. This result is also consistent with the findings of similar previous studies (Inostroza and Espinosa-Menéndez, 2022; Singh *et al.*, 2023). As expected, the regression coefficient of the liquidity control variable is positive and statistically significant at the level of 1% (*p-value* < 0.01).

To further confirm our results, we also performed some robustness checks. First, in our regression analyses (Model 3-4 in table 6) we introduced an alternative measure as a proxy of gender diversity in the BoDs, namely the level of female representation on company board. This information was captured by a categorical variable of 4 categories, ranging in a scale of values between 0 (if in a company board there are 0 women directors) and 3 (if in a company board there are 3 or more women directors). In the regression analyses, this variable was proxied by the following 4 dummy variables: (1) No women directors (No-WD), (2) One woman director (1-WD), (3) Two women directors (2-WD) and (4) Three or more women directors (3-WD).

However, we included in the regression model only three of the four dummy variables to prevent the dummy variable trap due to the perfect multicollinearity (Hirschberg and Lye, 2001).

Consistent with the objectives of our study, we excluded from the model the variable “No women directors”, which represents the term of comparison with the variables included in the regression.

The results of the estimates (Model 3-4) reported in table 6 overall show a positive relationship between the female representation in the BoDs and financial performance (ROA), thus confirming the H2.

Regarding the variable “One woman director” (1-WD), we found a positive and statistically significant regression coefficient in both Models 3-4. These same conclusions are also valid for the variable “3 or more women directors” (3-WD), whose coefficient is positive and statistically significant in both regression models (i.e., Models 3-4). It can conclude that the presence of three or more women directors on company boards can lead to a

significant increase in financial performance compared to the companies where there is a low representation of women on BoD. These results appear coherent with our expectation and previous studies that, assuming the critical mass perspective, have pointed out that 3 or more women in the BoDs represent a voice and their positive impact on financial performance (Brahma *et al.*, 2021; Joecks *et al.*, 2013).

Tab. 6: Results of the Pooled OLS regression analysis

Independent variables	Proportion of Women Directors (%)		Number of Women Directors	
	Model 1 (Pooled OLS)	Model 2 (Random- Effects)	Model 3 (Pooled OLS)	Model 4 (Random- Effects)
Proportion of Women Directors (%)	6.20** (2.642)	6.994** (3.345)		
1-WD			13.093** (5.084)	14.031*** (5.323)
2-WD			-1.332 (4.344)	-0.508 (5.204)
3-WD			12.593*** (4.682)	13.762** (5.427)
Board size	0.265 (1.014)	0.241 (1.232)	-1.394 (1.35)	-1.481 (1.237)
Youngest director	0.215 (0.234)	0.182 (0.299)	0.274 (0.256)	0.254 (0.276)
Older director	-0.212 (0.166)	-0.194 (0.229)	0.032 (0.163)	0.035 (0.202)
Natural log of Total Asset	0.551 (1.418)	2.954 (1.906)	0.991 (1.384)	3.015* (1.748)
Natural log of the Number of employees	-3.699* (1.996)	-6.002* (3.069)	-1.793 (2.128)	-4.163 (3.107)
Current ratio	8.343*** (2.078)	8.463*** (2.192)	8.829*** (1.962)	8.772*** (2.098)
Temporal dummies				
2015	14.768 (9.357)	13.255 (9.715)	11.975 (9.332)	11.565 (9.737)
2016	20.637** (8.685)	18.030* (9.707)	16.949* (8.776)	15.684 (9.712)
2017	16.493* (9.353)	13.124 (9.939)	12.635 (9.257)	10.650 (9.757)
2018	16.146* (9.478)	12.073 (10.657)	11.916 (9.443)	9.454 (10.557)
2019	19.332** (9.17)	14.999* (9.047)	15.093 (9.331)	12.33 (8.918)
_Intercept	-16.102** (15.796)	-19.928 (19.169)	-34.504* (18.78)	-36.867* (22.088)
N. obs.	134	134	134	134

N. groups		26		26
R-square	0.2735	0.2588	0.3181	0.3076
F-stat	2.88***		3.46***	
Wald Chi-square		55.34***		97.37***

Note: The Robust Standard Errors of the regression analyses are reported in parentheses. Asterisks show the level of significance at 0.01 (***), 0.05 (**) and 0.10 (*), respectively.

Table 7 reports the results of the hierarchical regression (Models 5, 5a., 5b.). In the first step (Model 5) we estimated a model that includes the dependent variable (ROA) and the firm-level control variables.

In the second step (Model 5a.), we added the variables related to the characteristics of the company boards.

In a third step (Model 5b.), we included in the regression model the gender diversity (in terms of proportion of women in the BoD) (Hillman, 2015; Post and Byron, 2015).

Consistent with the results of the OLS and GLS Random-Effects estimates, we found a positive and statistical relationship between the proportion of women on the company board and ROA. This result is also in line with the findings of previous studies (Isidro and Sobral, 2015; Erhardt *et al.*, 2003; Campbell and Minguez-Vera, 2008; Shrader *et al.*, 1997; Moreno-Gómez *et al.*, 2018).

The regression coefficient of the independent variable of our interest in the Model 5b is positive (5.38) and significant at a level of 5% (p -value <0.05). We also found that the value of R² increased significantly in the third step when the proportion of women on the BoDs was added in the model (Model 5b.). The R² changed from a value of 0.2090 in the second step (Model 5a.) to a value of 0.2212 (Model 5b.) in the complete regression model.

This change in R² values suggests that a not insignificant part of the variance in financial performance is explained by gender diversity and the female representation on the BoDs.

Tab. 7: Results of the hierarchical regression analysis

	Model 5	Model 5a.	Model 5b.
Step 1			
_Intercept	-9.683 (7.446)	-10.851 (14.721)	-10.656 (14.679)
Natural log of Total Asset	1.520 (1.370)	1.300 (1.292)	1.599 (1.316)
Natural log of the Number of employees	-2.536 (1.971)	-2.360 (1.900)	-2.888 (1.953)

Current ratio	9.324*** (1.932)	9.615*** (2.124)	9.115*** (2.071)
Step 2			
Board size		-0.144 (0.997)	0.014 (1.001)
Youngest director		0.119 (0.250)	0.164 (0.255)
Older director		-0.051 (0.159)	-0.128 (0.159)
Step 3			
Proportion of women Directors (%)			5.38** (2.616)
R ²	0.2029	0.2090	0.2215
R ² diff.		0.06	0.013
F-test	8.53***	4.06***	3.79***
F-change		0.327	2.035

Note: The Robust Standard Errors of the regression analyses are reported in parentheses. Asterisks show the level of significance at 0.01 (***), 0.05 (**) and 0.10 (*), respectively.

5. Conclusions

Despite the increased challenges that healthcare organizations have faced in recent years, corporate governance in this field has not received sufficient attention by scholars (Tartaglia Polcini *et al.*, 2021). The continuous increase in healthcare costs, the emergence of new diseases and treatments, technological advances, and the growing weight of the needs of the community are all factors that make it necessary to identify how the different aspects of board composition contribute to define a governance effective.

One of these aspects is gender diversity: literature in this field is still lacking.

In this paper, we showed the results of a first-step research project aimed at analyzing the impact of gender diversity on financial performance of high-growth startups, offering evidence from the private Italian healthcare sector.

Findings show that the presence of women in the BoDs positively affects the financial performance of the observed hospital gazelles. Accordingly, we can confirm our research hypotheses.

Being an exploratory analysis, this study is not without limitations. First, the small size of the sample poses some problems regarding the generalizability of the data. The future steps include the expansion of the sample to

overcome the limit of the reduced sample size.

Second, we studied the relationship between board gender diversity and financial performance by focusing on the national context (Italy). We recognize that the institutional and cultural context might be of importance when analyzing board gender diversity and its effects. Hence, further studies should incorporate cross-country analyses.

Finally, by considering gender as the only diversity dimension, this study neglects the complex and multidimensional nature of the diversity construct. To overcome this limitation, future directions look to the concept of 'intersectionality' to determine the effect on financial performance of various dimensions of diversity (Styhre *et al.*, 2008). Indeed, previous studies suggest that firms need to contemplate the multiple configurations of board diversity simultaneously (Asad and Georgakakis, 2023).

Despite these limitations, the article has important theoretical and practical implications.

From a theoretical point of view, we confirm that financial performance is a significant factor in the study of board gender diversity. We provide additional empirical evidence on the influence of female representation on the BoDs on financial performance and organizational outcomes.

From a practical point of view, we offer additional insight for corporate boards and policymakers into one central issue in most countries' corporate governance codes: the gender diversity. Our study suggests the importance of increasing the number of women in BoDs to benefit from the diversity in value, perspectives, backgrounds and skills they bring to boardrooms, as suggested in previous studies (Hillman *et al.*, 2007; Miller and Triana, 2009; Simpson *et al.*, 2010).

Our results can help managers comprehend the significance of gender diversity in increasing financial performance of startups and high-growth startups: they may discover benefits in women being involved in the BoDs and executive positions. These results are particularly relevant for the private healthcare sector, where governance and organizational structure play a key role in achieving performance objectives (Taylor, 2000). In this sense, we are contributing to the limited literature on the healthcare sector by concluding that gender diversity in board positions may lead to better performance in private hospitals.

Finally, although focused on the private healthcare sector, this study offers useful evidence also in the field of public healthcare sector: governance models found to be effective in the private sector can provide useful comparisons in the field of good governance in public healthcare organizations (Eeckloo *et al.* 2004; Tartaglia Polcini *et al.*, 2021).

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Authors' contributions

All authors were involved in the research design and contributed to writing the manuscript. Marianna Mauro conceived the study and wrote Sections 1. Monica Giacotti wrote Section 5. Giulia Cattafi conducted the analysis and wrote Sections 3 and 4. Elisa Rita Ferrari wrote Section 2. Monica Giacotti and Giulia Cattafi revised the manuscript according to the comments of the reviewers. All authors approved the final version of the manuscript.