

THE INFLUENCE OF BOARD CHARACTERISTICS ON FINANCIAL PERFORMANCE: EVIDENCE FROM S&P 500 HEALTHCARE COMPANIES

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Abstract: *The field of corporate finance is constantly changing, with a strong focus on various performance metrics. This study examines 64 healthcare companies listed on the S&P 500 index over the period from 2014 to 2023. Using a range of analytical techniques, including linear and nonlinear regression models, as well as interaction-based models, this research seeks to uncover the effects of key corporate governance factors on profitability. The analysis reveals that board size has a consistently negative impact on the performance of these healthcare companies, regardless of whether the period is marked by crisis or stability. Moreover, the frequency of annual board meetings also negatively affected financial performance; however, this relationship shifted to a positive impact during crisis periods. The study further underscores the significant role of gender diversity within companies. Gender diversity demonstrated a positive influence on performance, particularly during crises. Conversely, board independence, while beneficial in non-crisis periods, showed a negative effect during crises. The research also identified a turning point for board independence, indicating that the optimal level of independence may vary depending on the context. Overall, this study provides insights into how various corporate governance policies impact financial performance, transparency, and shareholder protection. It highlights the importance of evaluating board characteristics, including size, meeting frequency, diversity, and independence, to understand their effects on company performance. The findings emphasize the need for companies to adapt their corporate governance strategies in response to evolving conditions to maintain robust financial health and effective leadership.*

Key words: *corporate finance, corporate governance, board characteristics, regression models*

JEL: G30, G34, G39

1. Introduction

Profitability remains a central focus in corporate finance, with ongoing discussions about the variables that affect it. This paper seeks to identify key corporate governance indicators impacting firm performance, particularly within the healthcare sector of the S&P 500 index, from 2014 to 2023. The motivation of selection of the healthcare sector is due to its significant role in the economy and its notable performance changes during recent years, influenced by rapid advancements and increased demand. The S&P 500 serves as a relevant benchmark, representing a large segment of the American market and ensuring a robust environment for analyzing corporate governance's role.

The research question of this study aims to investigate how corporate governance factors affect the profitability of healthcare companies. Understanding these relationships is crucial for stakeholders aiming to enhance firm performance and navigate challenges effectively.

This paper's originality is grounded in several key criteria. This research stands out due to its extensive 10-year timeframe, which offers a comprehensive dataset. Additionally, the use of nonlinear regression models provides deeper insights into complex relationships that linear models might miss. Including a dummy variable for the pandemic crisis allows the analysis to capture its specific impacts and interactions, adding nuance to the findings.

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The study's global relevance lies in its exploration of how governance practices influence profitability, contributing to better transparency and ethical business management. This insight can attract international investors and strengthen global business practices.

The paper is structured as follows: an introduction to the research topic, a review of relevant literature, methodology including data and econometric techniques, presentation and discussion of findings, and a concluding summary.

2. Basic content

2.1 Literature Review

In recent studies examining the impact of various corporate governance and financial indicators on profitability, a range of methodologies and results has emerged. Board size has been a critical focus of research due to its potential implications for corporate governance and financial performance. (Pucheta-Martínez & Gallego-Álvarez, 2020) conducted a study across 34 countries, including regions from Africa, Asia, Europe, Latin America, North America, and Australia, spanning from 2004 to 2015. Their multivariate data analysis, supported by robustness checks, demonstrated that larger boards generally have a positive effect on company performance. This positive correlation suggests that increased board size can enhance oversight and strategic decision-making, leading to improved financial performance. Conversely, (Augusto, Pascoal, & Reis, 2020) found a negative impact of board size on profitability, suggesting that excessively large boards might introduce inefficiencies and dilute financial performance.

Regarding the number of board meetings is another crucial indicator of corporate governance. (Bettinelli, Bosco, Gentry, & Dibrell, 2023) explored this factor within 172 non-financial enterprises listed on the Italian Stock Exchange from 2004 to 2013. Their linear regressions with panel data revealed a positive effect of frequent board meetings on profitability, suggesting that regular meetings enhance oversight and decision-making, which in turn improves financial performance. In contrast, (Tejerina-Gaite & Fernández-Temprano, 2021) found a negative effect of the number of board meetings on profitability ratios, possibly due to inefficiencies or increased costs associated with frequent meetings. Gender diversity has been increasingly recognized for its potential to influence corporate outcomes. (Brahma, Nwafor, & Boateng, 2020) investigated 100 United Kingdom companies within the FTSE100 from 2005 to 2016, utilizing linear regressions with panel data and GMM. Their study found a positive effect of gender diversity on profitability, indicating that diverse boards enhance financial performance through a wider range of perspectives and improved decision-making. However, (Dodd & Zheng, 2022) studied 213 companies in the ASX200 index from 2004 to 2018, using both linear and nonlinear regressions. Their findings were mixed, with linear models showing a positive effect on profitability, while nonlinear models indicated that the impact of gender diversity varies with its level, suggesting complex dynamics in its influence on financial performance. Board independence is another vital aspect of governance. (Mohan & Chandramohan, 2018) analyzed 30 companies listed on the Bombay Stock Exchange from 2007 to 2016, using linear regressions with panel data. Their study revealed a positive effect of board independence on ROE and ROA, suggesting that independent boards provide better oversight and governance. In contrast, (Herenia & Julián, 2024) examined 30 manufacturing companies listed on the Amman Stock Exchange from 2017 to 2021. Their study used linear regressions with panel data and found a negative effect of board independence on ROE and ROA, possibly reflecting challenges in maintaining effective oversight in specific contexts.

Firm size has shown varied effects on profitability. (Mercè, 2023) found a positive effect of firm size on ROE and ROA. Regarding firm age has also been a subject of interest. (Bettinelli, Bosco, Gentry, & Dibrell, 2023) examined 172 non-financial enterprises listed on the Italian Stock Exchange from

2004 to 2013. Their findings revealed a negative effect of firm age on profitability ratios, possibly suggesting that older firms face performance decline due to outdated practices.

Sales revenue growth rate has produced mixed results in terms of profitability. (Hsu, Lin, Chen, & Huang, 2021) focused on non-financial companies listed on the Taiwan Stock Exchange from 2000 to 2012. Their linear regressions with panel data showed a positive effect of sales revenue growth. Concerning effective tax rate has varied effects on profitability across different sectors. (Vintilă, 2024) examined 466 pharmaceutical companies in Europe and the United States from 2012 to 2021, using linear regressions with panel data. The study found a negative impact of effective tax rates on ROE and ROA, suggesting that higher tax rates reduce profitability.

The indicator measuring current ratio has shown mixed effects on profitability. (Asmaul & Ibnu, 2019) analyzed 138 companies listed on the Indonesian Stock Exchange from 2013 to 2016, using linear regressions with panel data. Their findings indicated a negative effect of the current ratio on profitability ratios, suggesting that higher current ratios might be associated with lower financial performance due to inefficient asset utilization. Debt to capital has revealed a generally negative impact on profitability. (Tripathi, Aziz, & Joshi, 2024) studied non-financial companies listed on the Indian Stock Exchange from 2000 to 2021, using linear regressions with panel data. Their research found a negative effect of debt to capital on ROE and ROA, indicating that higher debt levels reduce profitability due to increased financial risk. Pandemic crisis studies have uniformly shown negative effects on profitability. (Cho & Saki, 2021) analyzed 55 textile and apparel companies listed on the New York Stock Exchange in 2020, using time series analysis. Their research revealed a negative impact of the pandemic crisis on profitability ratios, highlighting the severe adverse effects of pandemic crisis on the textile industry.

In summary, the current body of research provides a diverse perspective on how different corporate governance and financial indicators affect profitability. Despite extensive research on corporate indicators and their impact on profitability, a notable gap exists in the current literature. Specifically, there has been no investigation into the performance of healthcare companies within the S&P 500 index, utilizing nonlinear regressions and interaction variables. This sector remains underexplored, particularly regarding how the pandemic crisis has influenced governance variables for these companies. Addressing this gap could provide valuable insights into the unique challenges faced by healthcare firms during the crisis and their governance dynamics, offering a more comprehensive understanding of the pandemic’s impact on corporate performance and governance in a critical industry. The healthcare sector is crucial in the S&P 500 index because it represents a significant portion of the economy, influencing public health outcomes and economic stability, and driving substantial investment and innovation.

Table 1 provides a synthesis of the discussed literature, summarizing key research findings on various indicators affecting corporate governance and profitability.

Table 1. Summary of the Literature Review

Indicators	Study	Companies	Years	Methodology	Effect
Board Size	(Pucheta-Martinez & Gallego-Álvarez, 2020)	34 countries grouped geographically: Africa, Asia, Europe, Latin America, North America, and Australia	2004 – 2015	Multivariate data analysis Robustness analysis	+
	(Augusto, Pascoal, & Reis, 2020)	858 companies from the United States and 560 companies from Europe	2016	Multiple regression	-
Number of Board Meetings	(Bettinelli, Bosco, Gentry, & Dibrell, 2023)	172 non-financial enterprises listed on the Italian Stock Exchange	2004 – 2013	Linear regressions with panel data	+

	(Tejerina-Gaite & Fernández-Temprano, 2021)	87 non-financial companies listed on the Spanish Stock Exchange	2005 – 2015	Generalized Method of Moments (GMM)	-
Gender Diversity	(Brahma, Nwafor, & Boateng, 2020)	100 companies in the UK, integrated into FTSE100	2005 – 2016	Linear regressions with panel data	+
	(Dodd & Zheng, 2022)	213 companies integrated into the ASX200 index	2004 – 2018	Linear regressions with panel data	-
Board Independence	(Mohan & Chandramohan, 2018)	30 companies listed on the Bombay Stock Exchange	2007 – 2016	Linear regressions with panel data	+
	(Herenia & Julián, 2024)	30 manufacturing companies listed on the Amman Stock Exchange	2017 – 2021	Linear regressions with panel data	-
Firm Size	(Mercè, 2023)	Agricultural companies in Spain	2008 – 2020	Linear regressions with panel data	+
Firm Age	(Bettinelli, Bosco, Gentry, & Dibrell, 2023)	172 non-financial enterprises listed on the Italian Stock Exchange	2004 – 2013	Linear regressions with panel data	-
Sales Growth	(Hsu, Lin, Chen, & Huang, 2021)	Non-financial companies listed on the Taiwan Stock Exchange	2000 – 2012	Interaction variable regressions	+
Effective Tax Rate	(Vintilă, 2024)	466 pharmaceutical companies in Europe and the United States	2012 – 2021	Linear regressions with panel data	-
Current Ratio	(Asmaul & Ibnu, 2019)	138 companies listed on the Indonesian Stock Exchange	2013 – 2016	Linear regressions with panel	-
Debt to Capital	(Tripathi, Aziz, & Joshi, 2024)	Non-financial companies listed on the Indian Stock Exchange	2000 – 2021	Linear regressions with panel	-
Pandemic Crisis	(Cho & Saki, 2021)	55 companies listed on the New York Stock Exchange in the textile and apparel industry	2020	Time series analysis	-

Source: Authors' work

The hypotheses guiding this research study are as follows:

- H₁: Board size has a positive effect on profitability.
- H₂: The number of board meetings has a positive effect on profitability.
- H₃: Gender diversity has a positive effect on profitability.
- H₄: Board independence has a positive effect on profitability.

2.2 Methodology

2.2.1 Description of Database and Variables

This study investigates healthcare companies listed in the S&P 500 index from 2014 to 2023. Using data from the Thomson Reuters Eikon platform, the research explores the sector's performance and financial trends over the past decade. Given the sector's critical importance in today's world, this analysis aims to reveal how recent developments have influenced financial and governance indicators in the healthcare industry. Their performance reflects broader trends in healthcare innovation, making them key indicators of economic and social well-being.

Table 2 provides an overview of the research variables, their symbols, and their economic definitions, along with how they are calculated.

Table 2. Presentation of Variables

Dependent variables	Symbol	Meaning	Measurement
Return on Equity	ROE	Represents the yearly profit shareholders earn from their investment in the company's equity.	$ROE = \frac{\text{Net profit}}{\text{Equity}}$
Return on Assets	ROA	Represents the annual financial gain shareholders receive from their investment in the company's assets.	$ROE = \frac{\text{Net profit}}{\text{Total assets}}$

Independent variables	Symbol	Meaning	Measurement
Board Size	BS	Represents the total number of directors serving on the board.	$BS = \sum \text{number directors}$
Number of Board Meetings	BM	Indicates how often the directors meet annually.	$BM = \sum \text{number meetings}$
Gender Diversity	GD	Represents the percentage of women serving on the board of directors.	$GD = \frac{\text{Number of women in board}}{\text{Total members of board}}$
Board Independence	BI	Indicates the percentage of independent directors on the board.	$BI = \frac{\text{Number of independent members}}{\text{Total members of board}}$
Firm Size	FS	Firm size is determined by taking the natural logarithm of sales revenue.	$FS = \ln(\text{Sales Revenue})$
Firm Age	FA	Firm age refers to the number of years the firm has been active in the market.	$FA = \text{Year}_t - \text{Year}_{\text{foundation}}$
Sales Revenue Growth Rate	SRGR	Represents the annual percentage change in sales revenue.	$SRGR = \left(\frac{\text{Sales revenue}_t}{\text{Sales revenue}_{t-1}} \right) - 1$
Effective Tax Rate	ETR	Indicates the ratio of corporate income tax to gross profit.	$ETR = \frac{\text{Profit Tax}}{\text{Gross Profit}}$
Current Ratio	CR	Represents a business's capacity to cover short-term liabilities.	$CR = \frac{\text{Current assets}}{\text{Short term liabilities}}$
Debt to Capital	DC	Represents a company's ability to meet long-term obligations.	$DC = \frac{\text{Long term liabilities}}{\text{Equity} + \text{Long term liabilities}}$
Pandemic Crisis	COVID	Denotes the occurrence of a pandemic crisis within a given year.	Binary variable: 1 if the year is 2020, 2021, or 2022; 0 otherwise.

Source: Authors' work

The calculation formulas listed in Table 2 align with those found in various expert publications.

2.2.2 Description of Econometric Methods

This study uses Stata for econometric analysis, including descriptive statistics and Pearson correlation calculations. It utilizes baseline, linear, and nonlinear regression models, incorporating both fixed and random effects. Model selection follows the Hausman test at a 5% significance level. Interaction variables related to Covid-19 are explored to assess the pandemic's impact on company indicators, with both fixed and random effects models tested. Nonlinear regressions are also explored using the same methodology to find a turning point. The regression models are:

Linear Regression Model: $Firm\ profitability_{it} = a_0 + a_1 Governance\ variables + a_2 Financial\ variables + a_3 COVID_{it} + \varepsilon_{it}$ (1)

Nonlinear Regression Model: $Firm\ profitability_{it} = a_0 + a_1 Governance\ variables + a_2 Governance\ variables^2 + a_3 Financial\ variables + a_4 Financial\ variables^2 + a_5 COVID_{it} + \varepsilon_{it}$ (2)

-Interaction Variable Regression Model: $Firm\ profitability_{it} = a_0 + a_1 Governance\ variables + a_2 Governance\ variables * COVID_{it} + a_3 Financial\ variables + a_4 Financial\ variables * COVID_{it} + a_5 COVID_{it} + \varepsilon_{it}$ (3)

Where a_0 is the constant, $a_1 \dots a_{11}$ are coefficients, ε represents errors, and firm profitability metrics include ROE and ROA. Financial variables are FS, FA, SRGR, ETR, CR, DC, COVID and governance variables are BS, BM, GD, BI. Also, $i = [1; 64]$ and $t = [2014; 2023]$.

2.3 Findings and Discussions

2.3.1 Descriptive Statistics and Correlation Matrix

Table 3 displays the descriptive statistics for the database. Variables with a standard deviation above the mean are highly volatile, while those below the mean are less volatile. Notably, return on equity, sales revenue growth rate and COVID show higher volatility. The table also includes the minimum and maximum values for the variables analyzed.

Table 3. Descriptive Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max	Skew.	Kurt.
ROE w	576	.206	.236	-.176	.903	1.489	5.406
ROA w	630	.074	.062	-.042	.215	.507	3.056
BS	603	10.461	1.941	2	17	.162	3.517
BM	594	8.455	3.397	2	25	1.622	6.38
GD	603	24.188	10.264	0	100	.756	7.428
BI	603	85.277	8.112	45.455	100	-1.637	6.044
FS	633	23.074	1.566	17.913	26.641	.109	2.698
FA	608	37.452	30.805	1	136	1.443	4.367
SRGR w	631	10.165	12.281	-8.077	42.612	1.055	3.89
ETR w	583	.201	.113	-.004	.447	.294	2.717
CR w	602	2.162	1.197	.907	5.112	1.152	3.291
DC w	604	.942	.934	.015	3.801	1.876	5.967
COVID	640	.3	.459	0	1	.873	1.762

Source: Authors' work

Skewness measures distribution symmetry. In the database, indicators like board meetings, firm age and debt to capital show significant skewness, indicating highly skewed distributions. Board independence have negative skewness, suggesting left-skewed distributions, while others are positively skewed, indicating right-skewed distributions.

Kurtosis measures distribution flatness. Indicators such as firm size, effective tax rate and COVID have kurtosis below 3, suggesting platykurtic distributions, while others exceed 3, indicating leptokurtic distributions with higher peak and tails.

Table 4 shows the correlation coefficient matrix.

Table 4. Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) ROE_w	1.000										
(2) ROA_w	0.646	1.000									
(3) BS	-0.045	-0.164	1.000								
(4) BM	-0.047	-0.148	0.049	1.000							
(5) GD	0.022	-0.025	0.083	0.022	1.000						
(6) BI	-0.008	-0.070	0.283	0.019	0.193	1.000					
(7) FS	0.003	-0.288	0.508	0.226	0.228	0.142	1.000				
(8) FA	-0.096	-0.059	0.321	-0.033	0.211	0.178	0.164	1.000			
(9) SRGR_w	0.060	0.150	-0.079	0.027	-0.089	0.028	-0.097	-0.174	1.000		
(10) ETR_w	-0.106	-0.170	-0.125	0.142	-0.040	-0.236	0.100	-0.277	0.013	1.000	
(11) CR_w	-0.066	0.326	-0.237	-0.216	-0.102	-0.044	-0.527	-0.148	0.110	-0.110	1.000

(12) DC_w	0.594	-0.062	0.037	0.082	0.039	0.050	0.110	-0.144	-0.053	0.051	-0.259
(13) COVID	0.146	0.125	0.078	-0.033	0.316	0.067	0.056	-0.005	0.107	-0.129	-0.058
Variables	(12)	(13)									
(12) DC_w	1.000										
(13) COVID	0.064	1.000									

Source: Authors' work

In this study, a correlation above 0.6 signifies a strong positive relationship, while below -0.6 indicates a strong negative relationship. No correlation was found for this dataset.

2.3.2 Results

The results of this study are highlighted in the tables 5 and 6. Table 5 shows the linear regression models without effects, as well as the linear regression models with effects. Additionally, the nonlinear regression models are outlined in models 7 and 8. It can be observed that, according to the Hausman test, the regression models suitable are those with random effects.

Table 5. Linear and Nonlinear Regression Models

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ROE_w	ROA_w	ROE_w	ROE_w	ROA_w	ROA_w	ROE_w	ROA_w
			<i>fe</i>	<i>re</i>	<i>fe</i>	<i>re</i>		
BS	-0.00855 (-1.75)	-0.00148 (-0.99)	-0.0124* (-2.21)	-0.0126* (-2.42)	-0.00295 (-1.79)	-0.00270 (-1.75)	-0.0098* (-2.02)	-0.00183 (-1.22)
BM	-0.00477 (-1.86)	-0.000907 (-1.16)	-0.00701** (-3.15)	-0.00695** (-3.22)	-0.00211** (-3.23)	-0.00201** (-3.15)	-0.0054* (-2.12)	-0.00109 (-1.39)
GD	0.000433 (0.48)	0.0000313 (0.11)	0.00111 (1.14)	0.000372 (0.46)	0.000445 (1.55)	0.000217 (0.90)	0.0004 (0.49)	0.000032 (0.12)
BI	-0.00162 (-1.52)	-0.000533 (-1.63)	0.00129 (1.02)	0.000852 (0.72)	0.000453 (1.21)	0.000319 (0.91)	0.0335* (2.37)	0.00939* (2.18)
FS	0.00837 (1.08)	-0.00440 (-1.87)	0.0289 (0.85)	0.0176 (1.28)	0.0250* (2.50)	-0.0000621 (-0.02)	0.00995 (1.29)	-0.00401 (-1.71)
FA	0.0000677 (0.24)	0.00000603 (0.07)	0.00235 (0.62)	-0.000095 (-0.14)	-0.00145 (-1.30)	-0.0000292 (-0.15)	0.00013 (0.48)	0.000024 (0.29)
SRGR_w	0.00145* (2.15)	0.000496* (2.40)	0.00258*** (4.93)	0.00245*** (4.86)	0.000695*** (4.51)	0.000737*** (4.95)	0.0014* (2.16)	0.00049* (2.41)
ETR_w	-0.273*** (-3.48)	-0.0728** (-3.02)	-0.329*** (-4.92)	-0.342*** (-5.36)	-0.0931*** (-4.75)	-0.0968*** (-5.13)	-0.278*** (-3.55)	-0.0741** (-3.09)
CR_w	0.0127 (1.57)	0.0111*** (4.49)	-0.00874 (-0.99)	-0.00620 (-0.75)	0.00186 (0.71)	0.00366 (1.49)	0.0115 (1.42)	0.0107*** (4.35)

DC_w	0.147*** (16.60)	0.00136 (0.51)	0.102*** (8.67)	0.109*** (10.31)	-0.00280 (-0.82)	-0.00372 (-1.21)	0.148*** (16.76)	0.00148 (0.56)
COVID	0.0443* (2.48)	0.0145** (2.65)	0.0278* (2.02)	0.0353** (2.79)	0.0102* (2.53)	0.0119** (3.19)	0.0443* (2.49)	0.0144** (2.64)
BIxBI							-0.0002* (-2.50)	-0.0006* (-2.31)
_cons	0.175 (0.96)	0.233*** (4.16)	-0.472 (-0.69)	-0.101 (-0.32)	-0.404* (-2.00)	0.113 (1.19)	-1.209* (-2.07)	-0.157 (-0.88)
Obs	486	488	486	486	488	488	486	488
R-sq	0.406	0.180	0.200	0.368	0.000435	0.123	0.413	0.189
F-stat	29.41***	9.477***	18.37***		8.251***		27.78***	9.210***
Mean VIF	1.33	1.33					1.33	1.33
Wald				230.1***		90.47***		
Hausman				9.17		16.08		
Turning point							75.581	75.005

t statistics in parentheses: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, Source: Authors' work

Table 6 shows the regression models with interaction variables.

Table 6. Interaction Variable Regression Models

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ROE_w	ROA_w	ROE_w	ROE_w	ROA_w	ROA_w	ROA_w	ROA_w
			<i>fe</i>	<i>re</i>	<i>fe</i>	<i>re</i>	<i>fe</i>	<i>re</i>
BS	-0.0082 (-1.70)	0.000223 (0.13)	-0.0122* (-2.19)	-0.0123* (-2.38)	-0.00123 (-0.69)	-0.00091 (-0.55)	-0.00285 (-1.74)	-0.00262 (-1.71)
BM	-0.008** (-2.82)	-0.00088 (-1.13)	-0.006** (-3.12)	-0.006** (-3.21)	-0.0021** (-3.31)	-0.0020** (-3.21)	-0.00213** (-3.27)	-0.00202** (-3.17)
GD	0.0003 (0.41)	0.00009 (0.03)	0.0019 (1.85)	0.00105 (1.21)	0.00048 (1.71)	0.00026 (1.10)	0.000486 (1.70)	0.000261 (1.09)
BI	-0.0016 (-1.56)	-0.00055 (-1.70)	0.00168 (1.32)	0.00116 (0.99)	0.000424 (1.14)	0.000283 (0.81)	0.000691 (1.79)	0.000573 (1.57)
FS	0.00714 (0.92)	-0.00424 (-1.81)	0.0355 (1.05)	0.0195 (1.42)	0.0236* (2.37)	-0.00047 (-0.12)	0.0255* (2.56)	0.0000618 (0.02)
FA	0.00008 (0.31)	0.000005 (0.07)	0.00255 (0.67)	-0.00011 (-0.18)	-0.0014 (-1.26)	-0.00003 (-0.16)	-0.00150 (-1.35)	-0.000032 (-0.16)
SRGR_w	0.0015* (2.33)	0.00049* (2.40)	0.002*** (4.69)	0.0023*** (4.61)	0.00068*** (4.48)	0.0007*** (4.90)	0.000689*** (4.49)	0.00073*** (4.97)

ETR_w	-0.26*** (-3.36)	-0.073** (-3.05)	-0.33*** (-5.01)	-0.349*** (-5.49)	-0.096*** (-4.91)	-0.099*** (-5.29)	-0.0906*** (-4.64)	-0.0946*** (-5.03)
CR_w	0.0124 (1.55)	0.0112*** (4.53)	-0.0085 (-0.97)	-0.00612 (-0.74)	0.00188 (0.73)	0.00367 (1.50)	0.00186 (0.72)	0.00367 (1.50)
DC_w	0.148*** (16.73)	0.00120 (0.45)	0.104*** (8.86)	0.110*** (10.46)	-0.00241 (-0.71)	-0.00335 (-1.10)	-0.00242 (-0.71)	-0.00347 (-1.14)
COVID	-0.0567 (-1.21)	0.0699* (2.54)	-0.0644 (-1.47)	-0.0528 (-1.25)	0.0544** (2.94)	0.0599** (3.25)	0.0990* (2.54)	0.0997* (2.56)
BSxCOVID		-0.0051* (-2.05)			-0.00414* (-2.45)	-0.0045** (-2.66)		
BMxCOVID	0.0124* (2.32)							
GDxCOVID			0.00330* (2.22)	0.00320* (2.19)				
BlxCOVID							-0.00103* (-2.29)	-0.00102* (-2.27)
_cons	0.230 (1.25)	0.214*** (3.79)	-0.649 (-0.94)	-0.157 (-0.49)	-0.389 (-1.94)	0.108 (1.16)	-0.435* (-2.16)	0.0878 (0.92)
Obs	486	488	486	486	488	488	488	488
R-sq	0.412	0.187	0.183	0.370	0.0000503	0.133	0.000365	0.128
F-stat	27.66***	9.098***	17.41***		8.153***		8.079***	
Mean VIF	2.54	6.25						
Wald				236.8***		98.66***		96.49***
Hausman			12.43		15.21		14.84	

t statistics in parentheses: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, Source: Authors' work

Regarding board size, a negative and statistically significant influence of this corporate governance variable on return on equity was discovered, while the influence on return on assets is not statistically significant. Additionally, during the health crisis period, the negative influence of this indicator persisted. This finding does not validate the research hypothesis but is consistent with researchers such as (Augusto, Pascoal, & Reis, 2020). Larger boards can face difficulties in achieving effective coordination and decision-making, resulting in slower and less efficient responses to emerging issues. This inefficiency is particularly critical during crises, such as the pandemic crisis, where timely and decisive actions are essential. For healthcare companies in the United States, the pandemic has intensified these issues, as larger boards may struggle with increased complexity in strategic and operational decisions. The diverse interests and potential conflicts within a larger board can further exacerbate these challenges, leading to diminished financial performance and suboptimal asset management during periods of crisis.

The number of annual board meetings is another indicator investigated in this study. According to linear regression models, this indicator negatively and statistically significantly affects financial performance rates. This finding does not validate the research hypothesis and aligns with the results obtained by (Tejerina-Gaite & Fernández-Temprano, 2021). However, during the pandemic crisis, the influence shifted to become positive. Frequent meetings may lead to excessive administrative overhead and disrupt operational focus, detracting from strategic decision-making and performance. Additionally, increased meeting frequency could signal underlying governance issues, such as lack of alignment or ineffective oversight, further impairing financial performance. During a health crisis, more frequent board meetings can improve financial performance by enabling quicker decision-making and better crisis management, which are critical in rapidly changing situations.

Gender diversity has a positive but statistically insignificant impact on performance, validating the study's hypothesis and aligning with authors such as (Brahma, Nwafor, & Boateng, 2020). However, during the health crisis, this influence became significant, highlighting that this aspect is important during a crisis because it enhances decision-making by incorporating a wider range of perspectives and experiences, which is crucial for effective crisis management.

Board independence has a positive but statistically insignificant impact on financial performance, validating the hypothesis and aligning with researchers such as (Mohan & Chandramohan, 2018). However, during the health crisis, its influence became negative and statistically significant. During a crisis, board independence might negatively impact financial performance due to potential disconnects between the board and operational realities. Independent board members, who may have limited industry-specific experience, could struggle with rapidly changing conditions and fail to make timely, informed decisions critical for navigating the crisis effectively. Additionally, there is a turning point in this case: up to a level of 75, the influence of board independence on financial performance is positive, after which it becomes negative.

In terms of the control variables used in this study, firm size, sales revenue growth rate, current ratio, debt to capital, and the pandemic crisis had a positive impact on financial performance, while firm age and effective tax rate negatively impacted profitability. Thus, this study revealed both positive and negative impacts, and 2 of the study's hypotheses were validated.

3. Conclusions

In this quantitative research, I examined the primary corporate governance variables impacting the profitability of United States healthcare companies from 2014 to 2023, analyzing a sample of 64 firms. All the examined companies are part of the S&P 500 stock index. The aim was to understand the relationships between key independent variables and firm performance. The study utilized a robust methodology, featuring both linear and nonlinear regression models, as well as interaction models that included a dummy variable for the pandemic crisis.

The results show that board size negatively impacted the performance of these companies both during non-crisis and crisis periods. Additionally, the number of annual board meetings had a negative influence, which turned positive during the crisis. The study also highlighted the importance of gender diversity at the company level, with a positive impact, especially during crises. Lastly, board independence showed a positive effect in non-crisis periods, but its impact turned negative during the crisis, with an identified turning point. Control variables improved the specificity of the regression models.

Policy recommendations suggest that healthcare companies should regularly evaluate how external events and financial metrics influence their profitability. Also, firms should carefully calibrate their board size to avoid negative impacts on performance. Regular evaluations of board composition can help ensure it remains efficient and effective, particularly during times of crisis. While frequent board meetings can enhance oversight, companies should balance meeting frequency to avoid excessive administrative burdens. During crises, increasing meeting frequency may be beneficial for agile

decision-making, but it should be managed to prevent inefficiencies. Furthermore, promoting gender diversity on the board is crucial for leveraging diverse perspectives and improving decision-making, especially in crisis situations. Finally, while board independence generally supports unbiased decision-making, companies should assess its impact during crises.

Regarding the limitations of the study, the findings are relevant to the specified period and sample of companies. Future research could expand by including more independent variables and extending the time frame, considering macroeconomic factors and employing advanced regression techniques.

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