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# Ties that bind: exploring corporate networks, decision-making dynamics in the financial market, labor-management relations, and organizational performance

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## Abstract

Corporate governance relies significantly on the board of directors, who act as custodians of shareholders' interests. The dynamics of social connections between Chief Executive Officers (CEOs) and board members form a critical element that influences information exchange within this vital governance structure. This study seeks to assess the impact of these social connections on organizational performance. We conducted a comprehensive analysis of the professional backgrounds of CEOs and board members to measure the extent of their social connections. Employing multiple regression analysis with robust error corrections, we considered essential economic and financial metrics, including Return on Assets (ROA), Return on Equity (ROE), and Earnings before Interest, Taxes, Depreciation, and Amortization (EBITDA). Our findings reveal that professional social connections have a positive influence on ROA ( $\beta = 0.0230$  |  $p\text{-value} \leq 0.05$ ) and EBITDA ( $\beta = 420,517,1$  |  $p\text{-value} \leq 0.05$ ), while educational connections exhibited no significant effect, and familial connections were found to adversely affect EBITDA ( $\beta = -516,307,0$  |  $p\text{-value} \leq 0.05$ ). This study highlights the real influence of social connections on firm performance, shedding light on the complex interplay between social dynamics and corporate success. These insights contribute to a more comprehensive understanding of corporate governance and the factors driving organizational performance.

**Keywords** Governance, Social connections, Board of directors, Performance

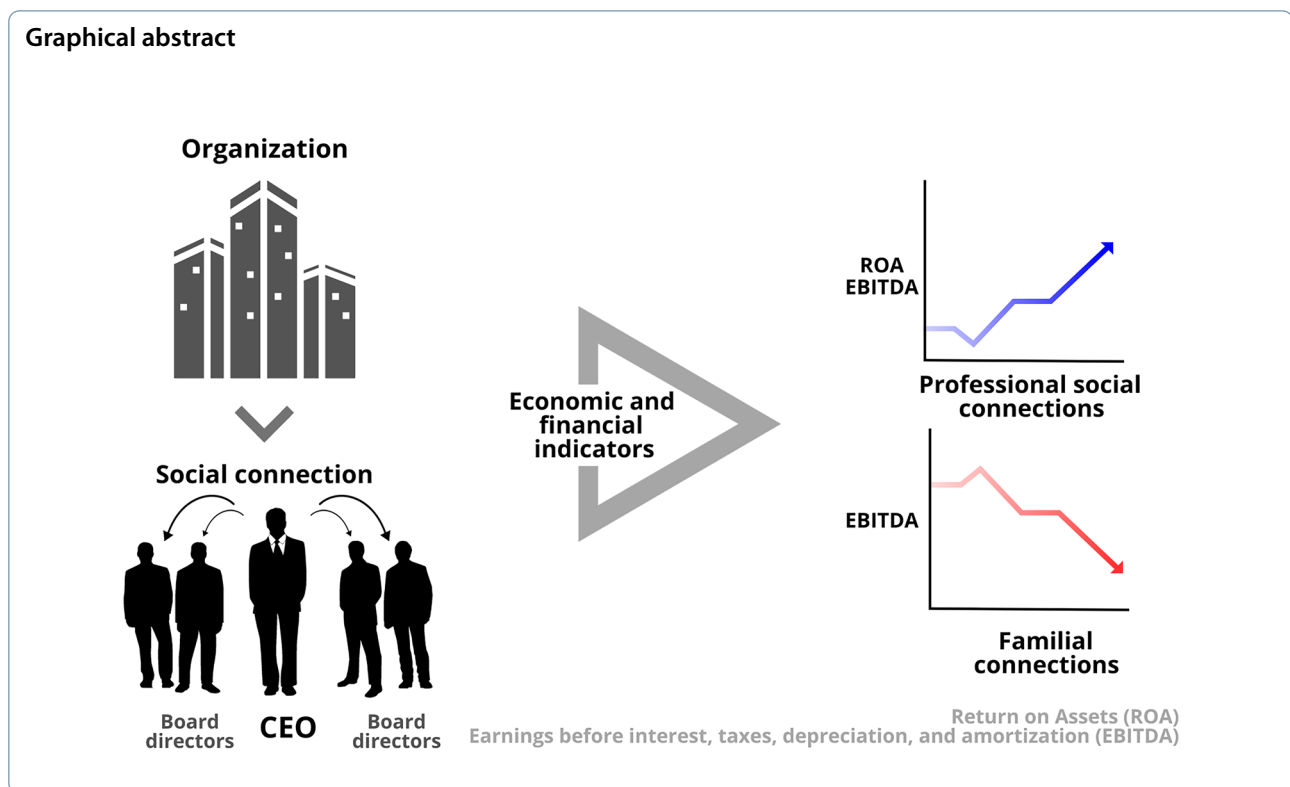
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## Introduction

Corporate governance is a complex concept that involves a selection of mechanisms designed to ensure the alignment of an organization's operational activities with its strategic goals, while concurrently safeguarding the interests of a diverse range of stakeholders [1]. A central and critical component within the framework of corporate governance is the board of directors. The board of directors is the main instrument for aligning and reconciling the interests of the organizations' partners and those responsible for managing the companies [2]. In this sense, the function of the board of directors is considered essentially as control, based on agency theory, where the board seeks to reduce the opportunism of agents, ensuring that management does not have objectives and interests antagonistic to those of shareholders and owners [3–5]. The board serves as a crucial intermediary, facilitating communication between managers and shareholders. Its multifarious responsibilities include the formal review and authorization of financial and business decisions, as well as leveraging the collective expertise of its members to provide strategic guidance [6].

Current normative frameworks and the extensive body of corporate governance literature emphasize the importance of board independence, positing that boards with a higher degree of independence can yield substantial benefits for organizations and their investors. This

perspective is focused on the behavioral aspect of governance, arguing that in less independent boards, the monitoring function may be restricted by the psychological tendencies of senior management, while more independent boards have greater autonomy to make inquiries and demands [7–10].

In general, social connections are intrinsic to the professional and corporate environment [10], and it is important not to neglect the impact and influence they can have on the decision-making process and the organization's results. Some studies report different results about socially connected boards, presenting benefits of the connection between the CEO and members of the board of directors, such as improving the advisory role, the flow of information, and enhancing internal controls [11–17]. Interestingly, studies have revealed the presence of social connections between directors and CEOs, underscoring the significance of these social linkages within the realm of corporate governance [13, 14, 18–20]. These connections can span various dimensions, such as educational, professional, and familial ties. Its development aims to contribute to filling the research gap left by studies by Park [10], Locatelli et al. [13, 14], Bhuyan et al., [11], and Ramos et al. [17] regarding the impacts of social connections on organizational performance in the face of various corporate governance structures, ownership dynamics, and cultural nuances.

Thus, considering that boards are made up of individuals who may relate to the CEO, and that these connections may interfere with economic decisions in management, this study aims to evaluate the effect of social connections between the CEO and the board of directors on the performance of organizations [21–23].

This study aims to contribute to the existing literature by highlighting the specific influence of professional, educational, and familial social connections. Additionally, the findings aim to provide insights into corporate governance and guide nomination and selection practices for leadership positions. Similarly, by contextualizing the study in an emerging market, it raises awareness of the importance of considering specific cultural contexts and offers tangible implications for regulatory policies, business practices, and future research directions in the field.

Given the unique characteristics of the Brazilian market, this study seeks to shed light on how these social connections impact organizational performance within the context of distinct corporate governance structures, ownership dynamics, and cultural nuances. This research holds significance for both the academic and practical realms. It enriches the discourse on the effects of social connections within an emerging market context, characterized by unique cultural, economic, and governance attributes. Additionally, it offers practical insights, serving as a resource for governance advocates looking to reevaluate best practices and helping organizations tailor their policies regarding the selection of CEOs and board members. These adjustments can foster a more dynamic and informed board of directors, promoting the sharing of critical information among its members. Thus, the primary aim of this study was to comprehensively evaluate the influence of social connections between the CEO and the board of directors on organizational performance.

### Literature review

The separation between ownership and control of organizations has led to the emergence of conflicts inherent to this reallocation, known as agency conflicts. Thus, Agency Theory focuses on a rational analysis of the relationship between the agent and the principal, along with the mechanisms that can mitigate the problems of this relationship. Corporate governance is a set of rules and instruments aimed at reducing the problems arising from information asymmetry, conflicts of interest, and opportunistic behavior in business relationships, termed agency conflicts [24]. It involves the relationships between stakeholders such as shareholders, the board of directors, management, oversight, and control bodies [25], enabling the translation of an organization's principles and values into actions that generate positive impacts on company management [24, 26, 27].

The board of directors is a fundamental pillar of the management system, aiding in professionalizing business management for the benefit of shareholders [28]. It is responsible for controlling and advising top management and minimizing decisions that prioritize executives' interests to the detriment of shareholder interests [29, 30]. The literature highlights that social connections between CEOs and board members should be considered [13, 14, 31–33] because they can influence the restriction or sharing of information between individuals, as well as providing a sense of belonging [34, 35].

The influence of social connections on personal and professional relationships has been discussed in scientific studies, being classified as a sign of well-being in the context of personal life and the possibility of maximizing integration between professionals from different areas. The psychosocial aspect considers connections as a driving factor for people's better performance and for individuals' sense of belonging and well-being in a group [36].

Social connections can occur based on different social elements, linked to the individual's history, including professional, educational, and family connections. Professional connections refer to connections created in the corporate environment; they are professionals who have already shared professional experiences in the same company or who, at a certain point, worked in the same organization [10, 37, 38]. Educational connections, similarly, refer to connections created in the educational training environment, which may arise through sharing the same educational institution or through specific training in which interaction between participants is possible [15, 39–42]. Family connections, as the name suggests, refer to connections created by individuals who are part of the same family, a consequence of family coexistence that occurs throughout life [43]. In addition to these elements, connections can also occur based on religious, generational, political aspects, fraternity, sports clubs, geographic proximity, interactions on social networks, among others.

Social connections can give an individual a feeling of belonging to the group they are part of, thereby increasing their well-being, trust with other individuals, and commitment to the organization [44–47]. In this way, it is possible to argue that social connections between the CEO and members of the board of directors can favor the sharing of information and thus mitigate information asymmetry.

The literature reports positive and negative aspects of social connection in the corporate environment. Among the benefits that social connection can provide are increased creativity, agility in problem-solving, greater productivity, increased commitment, higher employee

retention rate, and reduced information asymmetry [12, 17, 48–51]. However, social connections can generate less efficiency in processes, in addition to generating internal conflicts and enabling the creation of an environment conducive to providing benefits to managers [8, 52].

There is growing research on the impact of social connections in the corporate environment, with some studies focusing on the effects of social connections on CEO turnover, management practices, earnings management, and corporate performance [11, 13–17]. Lee et al. [8] found that political affinity between CEOs and board members is associated with a decrease in board monitoring, while Jang et al. [53] found that social connections between CEOs and board members can negatively impact board monitoring, although they can positively impact company performance [54].

Furthermore, Zhang et al. [1] found that family ties between CEOs and board members impair board monitoring and result in greater internal conflicts and operating costs in China. However, larger shareholders can reduce the negative effects of family ties. Nguyen & Ouhadouch [16] found that French companies with socially connected CEOs and board members have easier access to financing. On the other hand, Gaon et al. [55] identified that socially connected boards increase the likelihood of operational risks in American companies. In Brazil, Locatelli et al. [13, 14] found that CEOs with social connections to board members are less likely to engage in earnings management. Additionally, the probability of involuntary CEO dismissal decreases as the social connection index increases, indicating the impact of social connections on the board's monitoring role.

The recognition of duality concerning social connections mitigates information asymmetry and contributes to addressing agency conflicts. Similarly, it brings the possibility of greater effectiveness in decision-making, assertiveness, and enhanced internal controls. The differentiation between organizational environments and the Brazilian market in terms of market and governance underscores the need for specific analyses focused on the context in which companies operate. In essence, the ambiguous nature of social connections serves as the foundation for a more contextually relevant and insightful investigation into their effects on organizational performance.

Due to the ambiguous nature of these aspects, it is essential to evaluate separately the effects of different social elements, such as educational, professional, and family social connections, which may arise from ties established through the sharing of similar experiences [10, 15, 37, 42, 43, 76]. The social connection between the CEO and the board of directors can mitigate the problem of information asymmetry, enhancing decision-making

effectiveness and assertiveness [6, 12, 21, 22, 48, 56], although it may also generate agency conflicts [8]. Social connections can promote the sharing of information, improvement of internal controls, and enhancement of the quality of accounting and financial information and reports [35, 44, 50]. Previous studies have presented ambiguous results regarding the effects of social connections between the CEO and the board of directors [57, 58]. Still, these studies were conducted in Anglo-Saxon environments, differing from the Brazilian market in terms of market context, governance, and ownership of companies. Therefore, there is still room to evaluate the effect of social connections on the performance of Brazilian companies. Thus, the following hypotheses are proposed and based in literature review:

**H1**—The degree of educational social connection between the CEO and the members of the board of directors has a positive impact on the organization's performance.

**H2**—The degree of professional social connection between the CEO and the members of the board of directors has a positive impact on the organization's performance.

**H3**—The degree of family social connection between the CEO and the members of the board of directors has a positive impact on the organization's performance.

## Methods

### General approach

This research adopts a descriptive, documentary, and quantitative approach. Concerning its objectives, the study aims to delineate the effects of social connections between members of the board of directors and CEOs on the performance of publicly traded companies listed on B3. The social ties under scrutiny include educational, professional, and family connections. The documentary data collection strategy relies on the reference forms submitted by the companies to the Securities and Exchange Commission and the financial statements of the analyzed companies. Additionally, the quantitative approach employs econometric models to estimate the effect of social connections on the performance of the sample companies.

The selection of methodology to assess the influence of social connections between CEOs and the board of directors on organizational performance is guided by several crucial factors. Firstly, the complex and subjective nature of these relationships necessitated a quantitative approach to quantify and comprehend their impacts. Second, the availability of relevant data, found in corporate documents and financial reports, made document analysis a fitting choice for data exploration [59].

Moreover, the chosen methodology facilitates the quantification and visualization of social connections, identification of patterns, and measurement of relationship strength [60]. This is particularly pertinent when examining the influence of social connections within corporate settings.

Additionally, the quantitative approach, particularly through econometric methods like multiple linear regression, is deemed vital for comprehending how social connections affect organizational performance while controlling for other influencing factors. It also allows for a holistic understanding by considering various dimensions of social connections, including educational, professional, and familial aspects.

The statistical rigor provided by the methodology, including statistical analysis and econometric tests, validates the results and assesses the significance of the relationships between social connections and organizational performance [61]. Lastly, the chosen methodology contributes to both practical and theoretical knowledge in the domains of corporate governance and organizational strategy, making it a comprehensive and well-grounded approach for investigating the research problem.

The methodology adopted in this research aims to address the following question: "What is the effect of social connections between the CEO and the board of directors on organizational performance?" It was designed to deepen the understanding of the effects of social connections between CEOs and board members on the performance of companies listed on B3. Given the subjective complexity of these relationships, opting for a quantitative approach allows for the objective quantification of the effects of these social connections. The documentary analysis, supported by data from reference forms and financial statements, was deemed appropriate, leveraging the availability of relevant information. This methodology facilitates the quantification, visualization, and identification of patterns in social connections, especially when examining educational, professional, and familial influences. The application of econometric models, such as multiple linear regression, is crucial for understanding the impact of these connections on organizational performance while controlling for influencing factors. The statistical validation provided by analyses and econometric tests reinforces the reliability of the results. Moreover, this approach contributes to advancing both practical and theoretical knowledge in corporate governance and organizational strategy, offering a comprehensive and well-grounded investigation of the research problem, particularly in the context of the emerging Brazilian market.

### Sampling

The study population comprised all publicly traded companies listed on B3 from 2011 to 2019, and the sample represents a subset of that population selected in accordance with the research rules and prerequisites [62]. The selection of this timeframe is attributed to the availability of data without the influence of unforeseen events resulting from the Covid-19 Pandemic. The initial year was defined based on the demand for information provided in the Reference Form of organizations, which includes available information on the curricula of the board of directors' members and CEOs, as well as the mandatory publication of financial statements according to the International Financial Reporting Standards (IFRS).

The study aimed for a target sample of 646 active companies listed on the Brazilian Stock Exchange B3 in December 2022. The criteria used to define the sample involved the exclusion of financial institutions, companies with less than five years of available data, and those lacking all the necessary data for the defined study variables. This criterion was established to maintain a balanced set of observations and ensure the availability of information for the measurement of variables. After applying these criteria, the final sample consisted of 190 companies and 1,147 observations.

### Data processing

Considering the required data, three databases were organized: (1) registration data; (2) financial information; (3) CEO and board member data. Table 1 outlines the variables utilized in the study along with their respective operationalization.

The variables selected for the model were employed in similar studies. For instance, Mubeen et al. [23] explored the relationship between the board chairman and firm performance, while Jaffar et al. [59] investigated firm performance. Additionally, Zhang et al. [1] examined corporate governance and the role of the board of directors in monitoring top management. Jensen [2] highlighted the board of directors as a bridge between managers and shareholders, providing insights into board dynamics and how social connections can influence this relationship. Gupta and Wowak [7] focused on the individual characteristics of directors and how these factors may constrain board monitoring, addressing the effects of board monitoring based on social connections. Furthermore, Boivie et al. [18] and Locatelli et al. [13, 14] investigated the influence of social connections in the context of corporate governance, offering valuable insights into the implications of these connections on firm performance.

When it comes to organizational performance, three indicators are empirically used by both industry and previous studies: ROA, ROE, and EBITDA [63, 64]. ROA,



**Table 1** Variable descriptions

Variable	Operationalization
Dependent variables	
ROA	Measured by the ratio of the net income of company <i>i</i> at time <i>t</i> to the total assets of company <i>i</i> in time <i>t</i> – 1
ROE	Measured by the ratio between the net income of company <i>i</i> in time <i>t</i> and the shareholders' equity of company <i>i</i> in time <i>t</i> – 1
EBITDA	Earnings before financial results, depreciation, and taxes
Independent variables	
Educational Social Connection (CSEduc)	Measured by the proportion of directors of company <i>i</i> who have a social connection with the CEO based on educational elements such as undergraduate and graduate degrees
Professional Social Connection (CSProj)	Measured by the proportion of directors who have a social connection with the CEO based on professional elements
Family Social Connection (CSFam)	Measured by the proportion of directors who have a family connection with the CEO
Control variables	
Company size	Measured by the natural logarithm of total assets
Leverage	Ratio between the sum of current and non-current liabilities by total assets
Growth	Measured in percentage terms of the evolution of revenue in year <i>t</i> concerning net revenue in <i>t</i> – 1
Free Cash Flow	Ratio of free cash flow to average assets
Operational Cycle	Obtained from the sum of the average storage period and the average sales receipt period
Board Size	Number of members on the board of directors
Female participation in the CA	Measured by the proportion of the number of women on the board of directors concerning the total number of directors
Board Independence	Measured by the proportion of the number of members of the board of directors declared as independent
Duality	Dummy variable that assumes 1 if the CEO is also the chairman of the board of directors
Big four	Dummy variable assumes 1 if the company audit is Big4 and otherwise assumes 0
Novo Mercado	Dummy variable assumes 1 when the company is in the Novo Mercado listing segment and otherwise assumes 0
CEO Gender	Dummy variable assumes 1 if the CEO is female, and otherwise assumes 0
Family business	Dummy variable assumes 1 if the company is family-owned, and otherwise assumes 0
Age Company	Measured by the difference between the year of observation and the date of incorporation
Sector	Dummy variables established from the economic sector are classified by B3
Year	Dummy variables were established for each year of observation

or return on assets, indicates the profitability of investments in assets, providing insights into their return capacity [65]. ROE, or return on equity, demonstrates a company's ability to generate value for the business from the total invested capital [66]. EBITDA is one of the most used indicators to verify a company's performance. It measures the potential for resource generation, already discounting taxes, depreciation, and financial results. Its primary function is to verify whether the organization can generate sufficient cash through its activity to sustain the business sustainably [67].

To identify social connections given by educational aspects, the education level of the CEO and board members was considered, including their undergraduate and graduate education. Connected individuals were considered those who studied at the same institution, regardless of the year or academic degree. To characterize social connections based on professional aspects, the companies where the CEO and board members had

their professional experiences were considered. Professionals were considered connected if they had worked at the same company, served on the board of the same company, or currently work for the same company.

Family social connections were determined by the declaration of family relationships in the reference form. Connected individuals were considered those who presented a proven family relationship by the declaration. Thus, performance indicators were used as dependent variables, and social, educational, professional, and family connection indicators were used as independent variables.

The company's data record, sector, and year of incorporation were obtained, respectively, through the sector classification provided by B3 and consulting the CNPJ in the Federal Revenue database. Financial and economic information was collected from the Economática® database, allowing the construction of a financial information base and consequently, performance and economic and financial control variables. The variables that characterize

the company in terms of governance and ownership were obtained by consulting the reference form sent to the Securities and Exchange Commission and obtained in this research using the GetDFPData package via R® software.

To calculate the social connection index, it was necessary to obtain information about the resumes of CEOs and board members of companies, including the educational institution of academic formation, companies where professional experiences occurred, and family relationships. Thus, the database on CEOs and board members was also obtained.

### Data analysis

In the first stage of the study, univariate descriptive statistical techniques were employed to analyze the dataset and the characteristics of companies concerning financial, governance, and social connection variables. Subsequently, in the second stage, econometric estimates were derived from the multiple linear regression test with cross-section pools and robust errors clustered at the company level. Equations (1) were used to evaluate the effect of social connections between CEOs and board members on company performance. Multiple linear regression is a widely used technique in social and economic sciences to capture the relationship between dependent and independent variables [68]. Tests of assumptions, including multicollinearity, autocorrelation, normal distribution of residuals, and heteroscedasticity, were performed, concluding that the estimation by multiple linear regression was adequate.

To evaluate the study's hypotheses, econometric models were applied, with the dependent variable being the organization's performance index, measured using three different metrics: ROA, ROE, and EBITDA. For each performance proxy utilized, variables were progressively incorporated. This process led to the development of nine distinct econometric estimations designed to assess the initial hypotheses, considering social connections in professional, educational, and familial aspects. Equation (1) was utilized to evaluate the presence of an impact of social connections on organizational performance.

variables. Previous studies [13, 14, 17, 31, 61] have already employed this methodological approach to analyze the effects of CEO-board social connections.

### Results and Discussion

This study categorizes variables used in the financial and governance perspectives, and presents the descriptive statistics of the variables for data observation. Observing the results, all variables have the same number of observations, which is 1,147 observations, and the average ROA of companies is 0.00971, a value like that found in Ramos' [35] study. It is important to highlight that ROA is a relevant metric to evaluate organizational performance as it indicates the company's ability to generate returns on its assets [64, 65]. ROE, which is the return on equity, represents the organization's ability to generate returns for shareholders on the total invested capital [66]. From the results presented in Table 2, it is possible to note that the average ROE of companies is 0.0488, which is lower than the obtained ROA.

EBITDA is a crucial indicator for assessing organizations' performance and their capacity for sustainable maintenance [63, 67]. There is substantial variation in EBITDA values among companies, as indicated by an average of \$200 billion and a standard deviation of \$745.51 billion, with some companies showing negative EBITDA, while others present high values [69]. Social connections between CEOs and members of the board of directors are established through professional experiences, which can be positive but may also lead to competition among individuals [31, 41]. In Brazil, it is common for board members to have connections through professional aspects, given the density of the board members' network [35, 77]. Connections based on educational and family aspects are less frequent, aligning with international studies [31, 38, 41, 53, 78].

Despite family businesses being predominant in Brazil, as demonstrated by the observed dataset where 47.9% are family businesses, social connections based on family aspects are lower. This could be attributed to the existence of corporate governance guidelines, with functional segmentations, aiming to prevent family interests from

$$Performance_{it} = \beta_0 + \beta_1 CSEduc_{it} + \beta_2 CSProf_{it} + \beta_3 CSFam_{it} + \sum_{k=1}^{32} \{\gamma_k Control_{k,it}\} + \varepsilon_{it} \quad (1)$$

The model was operationalized across three distinct phases: the first phase exclusively incorporated the respective social connection indices (educational, professional, and familial) as the explanatory variables. In the second phase, financial variables were added, and the third estimation introduced governance

overshadowing the organization's interests and providing mitigation of the risk of this overlap. Connections based on educational aspects also exhibit a lower index compared to connections based on professional aspects. While there might not be a more pronounced culture of the concept of brotherhood, as seen in Anglo-Saxon

**Table 2** Descriptive statistics of the variables

Variable	Obs	Mean	Stand. Dev	Minimum	Maximum
ROA	1147	0.00971	0.209	-2.261	4.073
ROE	1147	0.0488	2.332	-63.57	28.36
EBITDA	1147	1.111e+06	4.004e+06	-1.480e+07	6.000e+07
CSeduc	1147	0.0905	0.139	0	0.800
CSprof	1147	0.527	0.333	0	1
CSfam	1147	0.0740	0.166	0	1
Size	1147	14.97	1.586	9.437	19.73
Leverage	1147	0.684	0.698	0.0847	12.23
Growth	1147	162,890	1.457e+06	-1.090e+07	2.600e+07
Cash flow	1147	0.0667	0.0892	-0.481	0.492
Operational cycle	1147	50.48	219.5	-596.2	4224
Board size	1147	7.123	2.441	2	17
% Female board	1147	0.0786	0.132	0	0.929
% Independent board	1147	0.259	0.225	0	1
Duality	1147	0.102	0.303	0	1
Big four	1147	0.814	0.389	0	1
Novo Mercado	1147	0.527	0.500	0	1
CEO gender	1147	0.0262	0.160	0	1
Family business	1147	0.479	0.500	0	1
Age of company	1147	33.34	19.27	1	128

ROA = Ratio of the net income of company *i* in *t* to the total assets of company *i* in *t* - 1; ROE = Ratio of the net income of company *i* in *t* to the equity of company *i* in *t* - 1; EBITDA = Earnings before financial results, depreciation, and taxes; CSeduc = Proportion of directors of company *i* who have a social connection with the CEO based on educational elements such as undergraduate and graduate degrees; CSprof = Proportion of directors who have a social connection with the CEO based on professional elements; CSfam = Proportion of directors who have a family connection with the CEO; Size = Natural logarithm of total assets; Leverage = Ratio between the sum of current and non-current liabilities to total assets; Growth = Percentage of evolution of revenue in year *t* concerning net revenue in *t* - 1; Cash Flow = Ratio between free cash flow and average assets; Operational Cycle = Sum of the average storage period and the average sales receipt period; Board size = Number of members on the board of directors; % Female board = Proportion of the number of women on the board of directors concerning the total number of directors; % Independent board = Proportion of the number of members of the board of directors declared as independent; Sector = Established from the economic sector classified by B3; Duality = Dummy that assumes 1 if the CEO is also the chairman of the board of directors; Big four = Dummy that assumes 1 if the company's audit is Big Four and otherwise assumes 0; Novo Mercado = Dummy that assumes 1 when the company is in the Novo Mercado listing segment and otherwise assumes 0; CEO Gender = Dummy that assumes 1 if the CEO is female, and otherwise assumes 0; Family business = Dummy that assumes 1 if the company is family-owned, and otherwise assumes 0; Age of Company = Measured by the difference between the year of observation and the date of incorporation

contexts, the index of social connection based on the educational aspect found in this investigation is comparable to that found in the study by Nguyen and Ouhadouch [16].

Table 3 also presents the descriptive statistics of the control variables used in this investigation: company size, leverage, growth rate, cash flow, operational cycle, size and independence of the board, female presence, duality on the board, big four audit, companies listed on the new market, gender of the CEO, and age of the company. In summary, it was found that the board size ranges from 2 to 17 members, while female CEOs constitute only 2.62%. There is a prevalence of companies audited by Big Four audit firms (81.40%), and duality occurs in 10.58% of the observed companies, meaning the chairman of the company and the board of directors is the same individual.

The study presented descriptive statistics and discussed the results obtained from econometric tests to examine the hypotheses raised. To assess whether social connections impact the performance of the analyzed

companies, three models were estimated using ROA as a performance metric. According to Souza and Clemente [64], ROA is an excellent metric for evaluating the performance of organizations. The results of the tests are reported in Table 3. It was found that the variable measuring social connection based on professional elements, such as having served on boards of directors, shared professional experiences in the same organization, or when the board member is also a member of the executive board, was significant and had a positive coefficient on the ROA variable in all estimations. This indicates that connections based on professional aspects can generate a positive effect on company performance when measured by ROA.

Additionally, based on the identified effects of CSprof, it is possible to indicate that the impact of this type of social connection on organizational performance, as measured by the ROA variable in estimations 1, 2, and 3, is respectively 0.0382, 0.0231, and 0.0230. Thus, these results suggest that an increase of 1 point in the level of



**Table 3** Summary of the model's estimated ROA

	(1)	(2)	(3)
	ROA	ROA	ROA
CSeduc	0,00385 (0,0286)	0,00910 (0,0188)	0,00547 (0,0188)
CSprof	0,0382*** (0,0119)	0,0231** (0,00942)	0,0230** (0,00981)
CSfam	-0,0726** (0,0348)	-0,00820 (0,0192)	-0,0368 (0,0225)
Size		0,00502** (0,00200)	0,00708** (0,00297)
Leverage		-0,157*** (0,0174)	-0,150*** (0,0174)
Growth		1,92e-09 (2,79e-09)	-1,52e-09 (4,09e-09)
Cash flow		0,418*** (0,0437)	0,427*** (0,0439)
Operational cycle		-0,0000385 (0,0000245)	-0,0000693** (0,0000328)
Board size			0,00198* (0,00118)
% Female board			0,0334 (0,0239)
% Independent board			-0,0373** (0,0167)
Duality			0,0150 (0,00926)
Big four			0,0130 (0,00853)
New Market			0,00929 (0,00768)
CEO gender			-0,000430 (0,00933)
Family business			0,0173** (0,00810)
Age of company			0,000143 (0,000135)
_cons	-0,00647 (0,00820)	-0,00305 (0,0294)	-0,0683 (0,0418)
Sector	No	No	Yes
Year	No	No	Yes
Observations	1147	1147	1147
R2 adjusted	0.014	0.406	0.442
Statistic F	4,481	33,266	14,188

Standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Estimates are from the multiple linear regression test with cross-sectional pools and robust errors clustered at the company level. ROA = Ratio between the net income of company  $i$  in year  $t$  by the total assets of company  $i$  in year  $t - 1$ ; CSeduc = Proportion of directors of company  $i$  who have a social connection with the CEO based on educational elements such as undergraduate and graduate degrees; CSprof = Proportion of directors who have a social connection with the CEO based on professional elements; CSfam = Proportion of directors who have a family connection with the CEO; Size = Natural logarithm of total

**Table 3** (continued)

assets; Leverage = Ratio between the sum of current and non-current liabilities by total assets; Growth = Percentage of evolution of revenue in year  $t$  in relation to net revenue in year  $t - 1$ ; Cash Flow = Ratio between free cash flow and average assets; Operational Cycle = sum of the average storage period and the average sales receipt period; Board size = Number of members on the board of directors; % Female board = Proportion of the number of women on the board of directors in relation to the total number of directors; % Independent board = Proportion of the number of members of the board of directors declared as independent; Sector = Established from the economic sector classified by B3; Duality = Dummy that assumes 1 if the CEO is also the chairman of the board of directors; Big four = Dummy that assumes 1 if the company's audit is by the Big Four and otherwise assumes 0; Novo Mercado = Dummy that assumes 1 when the company is in the Novo Mercado listing segment and otherwise assumes 0; CEO Gender = Dummy that assumes 1 if the CEO is female, and otherwise assumes 0; Family business = Dummy that assumes 1 if the company is family-owned, and otherwise assumes 0; Age of Company = Measured by the difference between the year of observation and the date of incorporation

social connection through professional aspects may lead to an increase of up to 0.0382 in return on assets (ROA). Therefore, these results indicate that social connections through professional aspects may improve the return on assets of companies.

It is believed that this positive effect is because social connections can facilitate the flow and sharing of information within companies, build trust among individuals, and increase commitment to the organization, thus mitigating information asymmetry [44, 46, 70].

The results reported in Table 1 indicate that the variable measuring social connection through family elements was significant with a negative coefficient on the ROA variable only in estimation 1, where only independent variables were run as predictors of the dependent variable. However, when financial and governance control variables were added in estimations 2 and 3, this variable lost significance, indicating that familial connections on the board of directors cannot affect company performance due to the professionalization of management and governance practices and regulations.

Furthermore, the variable measuring social connection through educational elements did not show significance on the ROA variable in any of the models, suggesting that it is not possible to affirm that connections based on educational aspects generate a positive or negative effect on company performance as measured by ROA.

The results obtained from the econometric tests presented in Table 1 are aligned with previous studies cited, confirming the H2 of this research, which proposed a positive effect of professional social connections between CEO and CA on organizational performance as evaluated by the ROA index. However, this only occurs when social connections are based on professional aspects, as connections based on educational and familial aspects did not show signs or effects on ROA. The results of the econometric models estimated

to test the second hypothesis of this research are presented in the next section.

The study evaluated the effects of social connections on the ROE (return on equity) of companies, assessing three aspects of social connections: professional, educational, and familial. The results indicate that none of these variables had a significant effect on ROE in any of the estimations conducted. This means that social connections were unable to generate a positive or negative effect on company performance, neither adding nor destroying value. Therefore, it can be concluded that social connections through professional, educational, and familial aspects have no impact on the return on equity of the studied companies [71].

This result differs from that found by Jang et al. [53], who identified a positive effect of social connections on ROE but a negative effect when moderated by corporate social responsibility. According to the authors, while prior studies have shown that social connections can facilitate information exchange, they also believe that they may lead to more negligent monitoring advice, prioritizing business profitability over corporate social responsibility.

Therefore, it is possible to indicate that the results obtained from the estimations of the econometric tests presented in Table 3 do not support any of the research hypotheses suggesting a positive effect of CEO-to-board social connections on organizational performance when measured by ROE. In the next section, the results of the econometric models estimated to evaluate the third hypothesis of this research are reported.

To verify if social connections impact the performance of the analyzed companies, EBITDA was used as a performance metric, and three different models were estimated. EBITDA is the most used index in the market to assess the potential cash generation capacity of a company, in other words, to evaluate if the organization can sustainably generate cash to maintain its operations [21, 67, 72]. The test results are reported in Table 4.

From the presented results, it can be observed that in estimation 1, where only independent variables are run as predictors of the dependent variable, all social connection variables, whether related to professional, educational, or familial aspects, were significant for the EBITDA variable. However, the professional aspect connection variable showed a positive coefficient, while the educational and familial aspect connection variables had negative coefficients. This indicates that, based on estimation 1, when measured by EBITDA, social connections based on professional aspects can generate a positive effect, while those based on educational and familial aspects can generate a negative effect on organizational performance.

**Table 4** Summary of ROE estimated models

	(1)	(2)	(3)
	ROE	ROE	ROE
CSeduc	0,0157 (0,0882)	0,0231 (0,0918)	0,0491 (0,0868)
CSprof	0,0104 (0,0496)	0,00935 (0,0514)	0,00372 (0,0538)
CSfam	- 0,0131 (0,0712)	0,0340 (0,0786)	0,0300 (0,0916)
Size		- 0,00700 (0,0101)	- 0,00766 (0,0157)
Leverage		0,105** (0,0408)	0,143*** (0,0415)
Growth		3,35e-08 (2,41e-08)	1,27e-08 (2,99e-08)
Cash flow		0,946*** (0,237)	0,911*** (0,249)
Operational cycle		- 0,0000206 (0,000231)	- 0,000183 (0,000310)
Board size			0,00206 (0,00652)
% Female board			0,0455 (0,146)
% Independent board			- 0,102 (0,109)
Duality			- 0,0344 (0,0424)
Big four			0,135** (0,0525)
New Market			- 0,0469 (0,0418)
CEO gender			- 0,0645 (0,0392)
Family business			0,0370 (0,0432)
Age of company			0,000344 (0,000627)
_cons	0,0552 (0,0345)	0,0217 (0,152)	0,00397 (0,218)
Sector	No	No	Yes
Year	No	No	Yes
Notes	1147	1147	1147
R2 adjusted	- 0,003	0,024	0,037
Statistic F	0,032	3,422	2,936

Standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Estimates are from the multiple linear regression test with cross-section pools and robust errors clustered at the company level. ROE = Ratio between the net income of company  $i$  in year  $t$  by the equity of company  $i$  in year  $t - 1$ ; CSeduc = Proportion of directors of company  $i$  who have a social connection with the CEO based on educational elements such as undergraduate and graduate degrees; CSProf = Proportion of directors who have a social connection with the CEO based on professional elements; CSFam = Proportion of directors who have a family connection with the CEO; Size = Natural logarithm of total assets;

**Table 4** (continued)

Leverage = Ratio between the sum of current and non-current liabilities by total assets; Growth = Percentage of evolution of revenue in year  $t$  in relation to net revenue in year  $t - 1$ ; Cash Flow = Ratio between free cash flow and average assets; Operational Cycle = sum of the average storage period and the average sales receipt period; Board size = Number of members on the board of directors; % Female board = Proportion of the number of women on the board of directors in relation to the total number of directors; % Independent board = Proportion of the number of members of the board of directors declared as independent; Sector = Established from the economic sector classified by B3; Duality = Dummy that assumes 1 if the CEO is also the chairman of the board of directors; Big four = Dummy that assumes 1 if the company's audit is by the Big Four and otherwise assumes 0; Novo Mercado = Dummy that assumes 1 when the company is in the Novo Mercado listing segment and otherwise assumes 0; CEO Gender = Dummy that assumes 1 if the CEO is female, and otherwise assumes 0; Family business = Dummy that assumes 1 if the company is family-owned, and otherwise assumes 0; Age of Company = Measured by the difference between the year of observation and the date of incorporation

Based on the results reported in Table 4, it can be noted that in estimation 2, where financial variables are included, social connection variables (professional, educational, and familial) lose significance on the EBITDA variable, i.e., they are not capable of generating a positive or negative effect on the performance of the studied companies when measured by EBITDA.

Furthermore, based on the results presented in Table 4, it can be observed that in estimation 3, where financial and governance control variables are included, social connection variables related to professional and familial elements are significant, with positive and negative coefficients, respectively. This indicates that when EBITDA is measured with the presence of financial and governance variables, social connections related to professional aspects can have a positive effect on performance, while social connections related to familial aspects can harm the performance of organizations. Social connections related to educational aspects did not show significance on the EBITDA variable, indicating that this type of connection does not have a positive or negative effect on the performance of the studied companies.

The significance and positive impact observed in social connections related to professional aspects on the EBITDA variable align with previous studies [35, 48, 50, 51] that argue that professional connections can improve information flow, increase commitment and productivity, and lead to faster decision-making. Similarly, the significance and negative impact observed in social connections related to familial aspects on the EBITDA variable align with studies [8, 52, 53] that argue that familial social connections can create an environment that favors benefits to managers, leading to increased operational costs, reduced efficiency in organizational operations, and lower quality monitoring by the board.

The results obtained from the econometric tests presented in Table 5 are consistent with previous studies,

as mentioned earlier. However, contrary to what was predicted in H3, we identified a negative effect of familial connections on performance measured by EBITDA. Nevertheless, a positive effect was identified when social connections were related to professional aspects, which allows us to accept H2. Social connections related to educational aspects did not show significance, which does not allow us to accept the stated H1.

### Implication and limitations

The study has demonstrated that social connections based on professional aspects positively impact organizational performance, particularly when measured by ROA. This implies that developing and leveraging professional networks among CEOs and board members can be beneficial for companies aiming to improve their financial performance. The findings indicate that familial connections between CEOs and board members can have a negative effect on company performance when measured by EBITDA. This suggests the importance of establishing governance practices and regulations to mitigate potential conflicts of interest arising from familial connections in corporate governance.

In contrast, social connections based on educational aspects did not show a significant impact on organizational performance. This implies that such connections may not be as influential as professional or familial connections in shaping company performance. The study's focus on the Brazilian context, an emerging market, provides valuable insights into the impact of social connections on company performance. This context-specific analysis fills a gap in the literature, which has focused on Anglo-Saxon environments. It highlights the relevance of considering the local business culture and dynamics in understanding the effects of social connections. These findings have broader implications for corporate governance, executive appointments, and decision-making processes. Regulators, shareholders, and stakeholders should be aware of the social connections between CEOs and board members and their potential impact on organizational performance, especially in emerging markets.

It is worth noting that cultural nuances in Brazil play a crucial role in shaping social connections within corporate environments, consequently influencing organizational performance. The socio-cultural landscape of Brazil is characterized by a strong emphasis on interpersonal relationships, familial ties, and longstanding professional networks. These connections often extend into the business realm, impacting the dynamics between CEOs and board members.

These are collectivist relationships grounded in interpersonal connections. In the context of corporate

**Table 5** Summary of estimated EBITDA models

	(1)	(2)	(3)
	EBITDA	EBITDA	EBITDA
CSeduc	-1,681,995.5*** (359,168,1)	61,882,4 (297,613,3)	200,358,3 (278,209,0)
CSprof	891,624.0*** (256,488,5)	276,019,9 (202,000,0)	420,517,1** (208,707,2)
CSfam	-1,804,524.0*** (305,664,7)	220,647,2 (254,659,9)	-516,307.0** (246,087,2)
Size		786,095,8*** (77,998,7)	688,183,5*** (68,339,6)
Leverage		167,552,9 (118,401,8)	-20,698,4 (115,283,5)
Growth		0,706*** (0,238)	0,734*** (0,233)
Cash flow		4,117,339,6*** (891,908,6)	3,772,715,3*** (771,175,5)
Operational cycle		-416.9 (307.4)	434,6 (426,2)
Board size			126,471,7*** (31,018,5)
% Female board			551,272,8 (352,546,3)
% Independent board			-1,573,171,1*** (352,044,0)
Duality			406,699,2*** (136,715,8)
Big four			-11,196,7 (132,981,2)
New Market			-567,446,2*** (192,930,7)
CEO gender			87,131,8 (131,762,6)
Family business			-427,526,8*** (153,839,5)
Age of company			-7500,4** (3229,8)
_cons	810,724,5*** (130,629,7)	-11,390,163,8*** (1,163,990,9)	-10,679,303,8*** (1,121,633,2)
Sector	No	No	Yes
Year	No	No	Yes
Observations	1147	1147	1147
R2 Adjusted	0.025	0.329	0.423
Statistic F	13,050	17,821	8.943

Standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Estimates are from the multiple linear regression test with cross-section pools and robust errors clustered at the company level. EBITDA = Earnings before financial results, depreciation, and taxes; CSeduc = Proportion of directors of company  $i$  who have a social connection with the CEO based on educational elements such as undergraduate and graduate degrees; CSprof = Proportion of directors who have a social connection with the CEO based on professional elements; CSfam = Proportion of directors who have a family connection with the CEO;

**Table 5** (continued)

Size = Natural logarithm of total assets; Leverage = Ratio between the sum of current and non-current liabilities by total assets; Growth = Percentage of the evolution of revenue in year  $t$  in relation to net revenue in year  $t - 1$ ; Cash Flow = Ratio between free cash flow and average assets; Operational Cycle = sum of the average storage period and the average sales receipt period; Board size = Number of members on the board of directors; % Female board = Proportion of the number of women on the board of directors in relation to the total number of directors; % Independent board = Proportion of the number of members of the board of directors declared as independent; Sector = Established from the economic sector classified by B3; Duality = Dummy that assumes 1 if the CEO is also the chairman of the board of directors; Big four = Dummy that assumes 1 if the company's audit is by Big4 and otherwise assumes 0; Novo Mercado = Dummy that assumes 1 when the company is in the Novo Mercado listing segment and otherwise assumes 0; CEO Gender = Dummy that assumes 1 if the CEO is female, and otherwise assumes 0; Family business = Dummy that assumes 1 if the company is family-owned, and otherwise assumes 0; Age of Company = Measured by the difference between the year of observation and the date of incorporation

governance, this collectivism can foster strong social connections and influence decision-making processes and organizational dynamics. Trust and loyalty, intrinsic values in Brazilian culture, can not only deepen these connections but also contribute to a sense of unity within the leadership team. Similarly, familial ties can permeate corporate structures. The identification in the study of familial social connections capable of impacting organizational performance aligns with the cultural inclination toward familial bonds in Brazil. Familial connections can create a sense of loyalty and support, but they can also lead to favoritism or conflicts of interest.

Furthermore, the country's communication style, characterized by implicit communication and reliance on contextual cues, can amplify the importance of social connections. These cues often nurture and maintain social ties and influence strategic decision-making processes. Thus, it is evident that, in terms of organizational performance, these cultural nuances can have both positive and negative effects.

The study recognizes the need for robust testing in future research, indicating that the results should be interpreted with caution. Regulatory changes or contextual variations could influence the conclusions, and these should be considered in future research to provide a more comprehensive understanding of the relationship between social connections and performance.

**Policy recommendations**

To enhance corporate governance and transparency, regulatory bodies and government agencies should consider implementing guidelines mandating more comprehensive and transparent disclosure of social connections between CEOs and board members within companies. This increased transparency allows stakeholders to better evaluate the potential impact of social connections on organizational performance. Companies themselves can

further strengthen their governance practices by assessing the social connections of CEOs and board members as part of the nomination process. This ensures that appointments are made based on objective criteria, and social connections are considered in a balanced manner. Additionally, promoting inclusion and diversity policies within boards can mitigate biases arising from social connections, as a diverse board composition reflects different perspectives and experiences. Furthermore, companies may consider enhancing their corporate governance practices, including reinforcing board independence and implementing more robust monitoring mechanisms, to mitigate potential conflicts of interest stemming from social connections.

It is crucial to recognize the limitations of these policy recommendations. Future research should delve into the influence of specific regulatory factors in different countries on social connections and their impact on organizational performance, allowing for a nuanced understanding of the regulatory landscape. Investigating how inclusion policies, like gender quotas on boards, affect social connections and organizational performance can shed light on how such policies might mitigate or amplify these effects. The role of political and cultural context in shaping social connections warrants further examination, and case studies of companies managing social connections in various political contexts can provide valuable insights. Longitudinal studies can track the evolution of social connections and their implications over time, considering dynamic political, economic, and regulatory factors. Additionally, research evaluating the impact of public policies aimed at fostering transparency and effective governance in companies regarding social connections is essential to inform regulatory development and corporate practices.

## Conclusions

When evaluating the impact of social connections on organizational performance, it was possible to observe that professional social connections have a positive influence on ROA and EBITDA, while educational connections did not exhibit a significant effect. Familial connections were identified as detrimental to EBITDA (as seen in [8, 35, 48, 50–53]).

This study provides valuable insights into the intricate relationship between CEOs and the Board of Directors concerning social connections and their impact on organizational performance, specifically within the emerging market of Brazil. Our findings notably indicate that professional connections can enhance performance by facilitating information flow, strengthening internal controls, and improving advisory functions. Conversely,

family connections exert a negative influence, potentially leading to decisions that prioritize familial interests over organizational goals.

The implications of this research extend to a diverse selection of stakeholders, including regulatory bodies, shareholders, and organizations themselves. Regulatory authorities may contemplate the feasibility of mandating the disclosure of a CEO x board of directors' social connection index in corporate reports, providing stakeholders with invaluable insights into corporate governance. Furthermore, these findings can guide governance policies, helping organizations make informed decisions regarding board composition and the degree of social connections, based on their unique needs and challenges.

Additionally, this study contributes to the discourse on corporate governance by illuminating the nuanced dynamics of social connections within the Brazilian context, an emerging market. It underscores the significance of comprehending social connections in markets characterized by distinct governance structures, ownership patterns, and market attributes. Notably, this research distinguishes itself by evaluating the direct influence of social connections on the performance of Brazilian companies, a dimension that has not been comprehensively explored heretofore.

The conclusions of this study should be interpreted with caution, considering various factors that may impact the validity of the findings. Firstly, the specificity of the sample consisting of companies listed on a specific Brazilian stock exchange may limit the generalizability of the results to non-listed companies or different market contexts. Additionally, the reliance on data from secondary sources, such as corporate reports and financial databases, introduces the possibility of inaccuracies and reporting bias, which could influence the quality of the data used in the analysis.

Another limitation to be considered is the exclusion of unexplored variables that could influence organizational performance, as the study focused on educational, professional, and familial connections, neglecting to examine other relevant factors. Furthermore, the study did not delve into the investigation of the influence of political and regulatory dynamics, which could impact social connections and their effect on organizational performance. The observational and cross-sectional nature of the study prevents establishing causal relationships, underscoring the need for future research with a longitudinal approach to understand the evolution of social connections over time. These limitations highlight the importance of interpreting the results within the context of methodological constraints and encourage the conduct of more comprehensive studies to deepen the understanding of this



complex interplay between social connections and corporate success.

Future research in the field of corporate governance and social connections can take several directions to deepen the understanding of this relationship. Firstly, an exploration of the impact of specific regulatory factors across different countries on social connections and their consequences for organizational performance could provide valuable insights. This comparative analysis may uncover variations in the influence of regulatory environments, shedding light on how social connections adapt to diverse governance structures.

Secondly, an investigation into the cross-cultural influences on social connections would contribute to understanding how these dynamics vary across different cultural contexts. The study of social connections within diverse cultural settings could reveal nuanced patterns and behaviors, further enhancing our comprehension of their role in corporate decision-making.

Additionally, future research could focus on the effects of inclusion policies, such as gender quotas on boards, on social connections and organizational performance. This line of inquiry to whether these policies act as mitigating factors or exacerbate the impact of social connections, providing insights into the interplay between diversity initiatives and corporate governance.

Longitudinal studies represent another avenue for research, tracking the evolution of social connections over time. These studies, considering dynamic political, economic, and regulatory factors, could capture the changing nature of social connections and their implications for organizational decision-making processes. This longitudinal perspective would offer a more nuanced understanding of the temporal dynamics of social connections.

Moreover, conducting case studies on how companies manage social connections in various political contexts would provide practical insights. Analyzing organizational strategies to navigate potential conflicts of interest arising from social connections could offer valuable lessons for effective corporate governance practices.

Lastly, a critical area for exploration involves evaluating the impact of public policies aimed at fostering transparency and effective governance regarding social connections. Understanding how these policies influence disclosure practices and decision-making processes can inform both regulatory development and corporate practices, contributing to the ongoing discourse on corporate governance effectiveness.

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