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Article

CEO social capital and ESG: Evidence from China

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Abstract: This study empirically examines the relationship between CEO social capital and corporate ESG practices using a sample of A-share listed companies on the Shanghai and Shenzhen stock exchanges from 2009 to 2021. The research findings indicate that CEO social capital significantly enhances the level of corporate ESG practices, and the results are robust. Building upon this foundation, the study further reveals that CEO tenure and CEO overconfidence positively moderate the impact of CEO social capital on ESG practice levels. Furthermore, the additional research findings indicate that corporate ESG practices under the influence of CEO social capital contribute positively to enhancing the overall value of the firm. Our research results deepen the understanding in both academic and practical realms regarding the value creation function of CEO social capital. This provides empirical evidence for listed companies to recognize and leverage CEO social capital to enhance the level of sustainable development within the organization.

Keywords: CEO social capital; ESG practices; CEO tenure; overconfidence; corporate value

1. Introduction

ESG is s gradually becoming a consensus and trend in contemporary society. An increasing number of enterprises are recognizing the importance and necessity of integrating sustainable development goals as a part of the societal organism. They actively undertake ESG transformation in promoting economic development, safeguarding employee rights, accelerating innovation investment, intensifying environmental protection, and engaging in philanthropy. With the increasing attention from various sectors of society on corporate ESG, scholars have engaged in extensive discussions about the factors influencing corporate ESG. Some scholars, from a macro or meso perspective, explore the impact of external formal and informal institutions on corporate sustainable development. Research suggests a high degree of synergy between fulfilling corporate social responsibility and economic and social development (Wang et al., 2019). The economic development level and legal institutional environment of the country or region in which the enterprise operates significantly influence the fulfillment of corporate social responsibility. As the company grows, the scope of corporate social responsibility also expands to include responsibilities towards shareholders and employees internally, and towards customers, community, environment, and social charity externally.

Research has thus focused on factors at the corporate level and among stakeholders. They have found that internal governance mechanisms, external stakeholders, and media attention can all impact the sustainable development of companies (Stohl et al., 2017). Considering that the management team plays a central role in formulating company policies, some scholars, grounded in the higher-order theory, explore the impact of executives on corporate sustainable development.

Executives, especially CEOs, are gradually gaining attention regarding their social capital (Durán and Aguado, 2022). However, whether the CEO's social capital influences the level of corporate ESG practices lacks relevant empirical evidence in current research.

On one hand, CEOs inevitably engage in social interactions with various internal and external stakeholders in their daily work and life, thereby forming their social capital. On the other hand, CEO's social capital, as a complementary aspect of their external traits, significantly influences their cognitive processes and decision-making. Moreover, the potential resources behind social capital can bring additional intangible benefits and advantages to the company. Following this line of thought, this paper anticipates that the CEO's social capital, whether at the individual cognitive level or the social resource level, will exert a certain influence on corporate ESG decision-making.

Drawing on the sample of A-share listed companies on the Shanghai and Shenzhen stock exchanges from 2008 to 2021 and adopting the approach from (Zhao and Zhang, 2019), this paper comprehensively calculates the CEO's social capital using five indicators. Subsequently, it empirically examines the impact of CEO social capital on corporate ESG practices. The research findings indicate a significant positive correlation between CEO social capital and the level of corporate ESG practices. Moreover, as CEO tenure increases and confidence levels rise, the positive impact of CEO social capital on the level of corporate ESG practices becomes more pronounced. Furthermore, examinations of individual dimensions within ESG reveal a positive and significant impact of CEO social capital on each. Further tests suggest that CEO social capital enhances the value of the company by increasing ESG practice levels.

The primary contributions of this paper are twofold: Firstly, in recent years, academia has gradually started to emphasize the role of executive social capital in corporate governance. However, there is relatively little research on the impact of CEO social capital on corporate governance. This study examines the mechanism of how CEO social capital affects corporate sustainable development, thereby expanding the research framework on the influence of CEO social capital on corporate governance. Secondly, despite the considerable research on factors influencing corporate ESG, including studies on CEO's external traits, there is still a gap in the exploration of CEO social capital. CEO social capital is an indispensable and influential resource, affecting the CEO's behavioral choices and ultimately influencing corporate governance decisions. Therefore, this study enriches the research scope of factors influencing corporate ESG by examining CEO social capital. Thirdly, through a more in-depth analysis of the relationship between CEO social capital and corporate ESG practices, this paper clarifies the motivations behind CEOs driving sustainable development in companies. Furthermore, it examines the economic consequences of corporate ESG practices under the influence of CEO social capital. This contributes to a better understanding of the driving factors behind corporate sustainable development strategies for both academia and practitioners. Additionally, it provides reference points for CEO personal development choices, executive appointments by companies, and policy formulation by regulatory authorities.

The subsequent sections of the article are organized as follows: Part Two encompasses a review of relevant literature and the development of hypotheses. Part Three outlines the research design. Part Four entails empirical testing and analysis, including robustness checks and further exploration. Lastly, Part Five presents the research conclusions and practical insights.

2. Literature review and hypothesis development

2.1. Literature review

2.1.1. Economic consequences of executive social capital research

Nahapiet and Ghoshal (1998) refined the definition of social capital as "the aggregate of various explicit and implicit resources embedded in social networks, obtainable and derivable from these networks." Regardless of whether it is a company or its executives, they all maintain varying degrees of connections with external organizations or individuals. These connections include associations with entities such as banks, government agencies, competitors, customers, suppliers, industry associations, alumni, and other groups. Correspondingly, these connections transform into the social capital of both the enterprise and its executives.

As a supplementary external resource for enterprises, scholars both domestically and internationally have attempted to explore the potential economic consequences that the social capital of companies and their executives may bring in corporate governance. On one hand, executive social capital can bring about several positive impacts for companies. Executives with financial backgrounds (Shipilov and Danis, 2006) and political connections (Infante and Piazza, 2014) can assist companies in obtaining more funds and venture capital at lower interest rates (Shao and Sun, 2021). This, in turn, reduces the cost of equity capital for the company (Doh and Zolnik, 2011), significantly improves investment efficiency (Zhao, 2021), enhances the performance of cross-border mergers and acquisitions (Chen et al., 2023), directly influences the diversification strategy of the company (Antonietti and Boschma, 2021), increases the company's risk-taking capacity, and contributes to the enhancement of corporate value (Durán and Aguado, 2022). For innovative companies, executive social capital also helps in acquiring valuable information required for innovation (Wen et al., 2021). On the other hand, executive social capital may also exert certain negative influences on companies. For instance, executives holding positions in industry associations may lead to overinvestment by the company (Di Meo, 2014). The political and social capital of executives may result in a "crowding-out effect" on the company's research and development investments (Wang et al., 2022), while the business social capital of CEOs might inhibit green innovation (Ren et al., 2021).

2.1.2. Factors influencing corporate ESG practices

Existing literature categorizes the driving factors for ESG into three main perspectives: external institutional, internal governance, and executive characteristics. From an external institutional perspective, under substantial competitive pressure in the product market, companies may prioritize short-term financial performance over investments in ESG (Martins, 2022). Stakeholder pressure is also a crucial factor

driving companies to make ESG decisions. Companies that attract attention from securities analysts tend to exhibit better ESG performance (Adhikari, 2016), and media coverage contributes to enhancing corporate ESG investments (Borghesi et al., 2014). Economic resources, cultural factors, and institutional aspects at the regional and national levels are also significant drivers of ESG disclosure (Cai et al., 2016). Baldini et al. (2018) conducted a study based on the levels of corruption, labor systems, and cultural institutions. They found that companies in countries with lower corruption levels, higher labor protection, higher unemployment rates, lower social cohesion, and equal opportunity are more likely to disclose ESG. From an internal governance perspective, financial pressures can impose constraints on companies' fulfillment of ESG responsibilities (Mu et al., 2023), even limiting the sustainability of the company (Iliev and Roth, 2023). Publicly listed companies with strong financial capabilities, well-structured capital, and a positive corporate culture tend to exhibit better ESG performance (Ferrell et al., 2016). Corporate ownership structure also plays a crucial role in influencing ESG (Raimo et al., 2020). Companies with foreign ownership and state ownership exhibit significant motivations for ESG disclosure, while block-holder ownership tends to decrease the extent of ESG disclosure. From the perspective of executive characteristics, Borghesi et al. (2014) found that female CEOs, younger CEOs, and managers who contribute to both Republican and Democratic parties are more likely to invest in corporate social responsibility. A study by McWilliams and Siegel (2000) found a negative correlation between CEO confidence and the level of corporate social responsibility. Furthermore, Cronqvist and Yu (2017) discovered that when a company's CEO has a daughter, the company's social responsibility rating is approximately 9.1% higher than that of average companies. On the other hand, Jang et al. (2022) found that share pledging activities by corporate executives have a negative impact on the ESG performance of the company.

Summarizing relevant literature from both domestic and international sources, current research on the economic consequences of executive social capital indicates that both individual executives and executive teams with social capital can bring more information and resources to the company. This can lead to reduced transaction costs, risk mitigation in operations, influence on corporate strategy, and improvement in operational performance and corporate value. As one of the strategies for corporate sustainable development, ESG has been predominantly studied by scholars in terms of its influencing factors. These studies often focus on external formal and informal institutions, internal governance within the company, and characteristics of the management team. However, there is a limited exploration of the impact of a CEO's social capital on a company's ESG practices. The CEO is a crucial member of the company's management team, and their social capital is an important asset. Therefore, studying the relationship between the CEO's social capital endowment and the company's ESG practices holds significant theoretical and practical value.

2.2. Research hypotheses

2.2.1. CEO social capital and corporate ESG practices

Corporate ESG practices refer to sustainable development activities that companies undertake while achieving economic benefits. These activities encompass

aspects of social development, the natural environment, and various stakeholders. The implementation and disclosure of corporate ESG activities not only convey signals of sound business operations to the external environment but also help companies garner positive evaluations from stakeholders, build a positive image, enhance product competitiveness, improve credit ratings, attract investments through various channels, alleviate financial pressure, and enhance financial performance and corporate value. The extensive social connections of a CEO can extend to various stakeholder groups, including customers, suppliers, competitors, partners, and government agencies. According to the social capital theory, these connections beyond the company boundaries can form the CEO’s social capital, providing tangible and potential resources for both the CEO personally and the company. Social capital can influence executives’ decisions through three “channels”: Soft information, labor market insurance, and groupthink (Dbouk et al., 2020).

Firstly, a CEO with extensive connections may be in a favorable position to access hotspots or critical information. This information advantage alleviates information asymmetry, and the rich social capital of the CEO broadens the company’s financing channels, reduces capital costs, and mitigates the concerns of the CEO about the financial burden caused by ESG investments. And the CEO is more inclined to make decisions regarding ESG investments. Secondly, CEOs often interact with top executives of various companies or organizations, making their social networks valuable invisible workplace resources. In the event of the worst-case scenario, where the CEO is indeed dismissed due to making a detrimental ESG investment decision that negatively impacts the company, their robust social capital can aid them in seeking new job opportunities. Consequently, this, to a certain extent, reduces the CEO’s uncertainty concerns when making current decisions about ESG investments for the company. Additionally, social network theory posits that individuals within a social network are influenced by the cognition or behavior of other entities within the network. Within the CEO’s social network, factors such as government regulations and policies regarding corporate ESG investment and disclosure, community advocacy for corporate social responsibility, a positive atmosphere created by peers in the industry actively engaging in ESG investment, increasing awareness among customers (consumers) about products and services, and the growing consciousness of rights protection collectively exert societal pressure on CEOs. In this context, actively participating in corporate ESG activities becomes a viable choice for CEOs to respond to this implicit societal pressure.

According to upper echelons theory, the personal traits of the CEO determine their cognitive abilities and values, subsequently influencing the formulation and selection of corporate strategic decisions (Hambrick and Mason, 1984). CEOs with a greater amount of social capital may experience an enhanced sense of power, leading to increased confidence (Dbouk et al., 2020). Moreover, influenced by the celebrity effect, these CEOs may prioritize the accumulation of personal reputation. Consequently, they are more likely to utilize corporate social responsibility as a means to showcase their altruism and uphold their reputation. Additionally, traditional Confucian culture in China advocates “benevolence” and upholds collectivism, emphasizing organizational identity. Principles such as “reciprocity” and “gratitude for kindness, not forgetting the source” reflect the ideology of mutual benefit. Under

such influence, CEOs, while benefiting from the resources provided by social capital, tend to adopt principles of mutual benefit and reciprocity. This leads them to place greater emphasis on integrating the demands of stakeholders, thus becoming more proactive in ESG-related investment activities. Based on the above, this paper proposes Hypothesis 1:

- Hypothesis 1: CEO social capital positively influences corporate ESG practices.

2.2.2. CEO social capital, CEO Heterogeneity and corporate ESG practices

Research indicates that CEOs with longer tenures are more adept at establishing and utilizing social capital (Adler and Kwon, 2002). They can build stronger social relationships, and the accumulated rich human capital and social network from long-term service reduce financing constraints faced by the company (Oware et al., 2023). CEOs with longer tenures have a better understanding of internal governance, organizational culture, and development plans (Rueda-Manzanares et al., 2008). They are more receptive to the company's values, leading to increased loyalty to the organization. During this period, CEOs are more likely to leverage their social capital and contribute to ESG activities.

Furthermore, newly appointed CEOs often face stringent assessments of their competence by the board (Karaevli and Zajac, 2013). CEOs lacking job security may feel a pressing need to demonstrate their professional abilities through short-term performance to internal and external stakeholders. Consequently, they might overlook investments in corporate ESG initiatives (Chen et al., 2019). Moreover, CEOs who can maintain their positions for an extended period to some extent indicate that their professional capabilities have been recognized by the board. At this point, CEOs experience reduced professional concerns, and with the increasing tenure, their power within the company grows, establishing a relatively stable position. Consequently, they are likely to dedicate more attention to investments in corporate ESG initiatives. Therefore, based on the above analysis, this study proposes Hypothesis 2:

- Hypothesis 2: The positive promoting effect of the CEO's social capital on corporate ESG practices becomes more pronounced as the CEO's tenure increases.

High-order theory suggests that the personality traits of corporate executives often influence their judgments about themselves and their environment, thereby reflecting in the company's decision-making. Overconfidence, a crucial personality trait of CEOs who play a central role in the corporate executive team, is considered widespread and objective (Xi et al., 2021). Research indicates that overconfident CEOs may adopt relatively aggressive strategies, such as overinvestment (Wu, 2020), excessive indebtedness (Yang, 2023), or even engage in more corporate misconduct (Xi et al., 2021). These behaviors can lead to greater operational risks for the company. However, it cannot be denied that overconfident CEOs often display decisive and prompt actions, leading to more efficient and timely completion of decision-making tasks by the team (Rizka and Handoko, 2020). At the same time, overconfident CEOs are often more inclined to take risks, which is beneficial for the increase in innovation investment and innovative performance of the company. Although it elevates the company's risk to some extent, it also enhances the competitive advantage in the product market compared to competitors (Xi et al., 2021). However, Jang and Lee

(2023) found that the impact of managerial overconfidence on corporate social responsibility behavior exhibits an interval effect. When managerial confidence is insufficient or moderate, there is a negative correlation between their confidence level and the level of corporate social responsibility. However, when managerial overconfidence is present, it positively influences the level of corporate social responsibility.

This study posits that overly confident CEOs tend to overestimate their probability of success and believe they possess sufficient capabilities to handle adverse events. Moreover, as their confidence increases, CEOs are often more eager to achieve greater self-fulfillment and public attention. The strong desire to realize their personal life values may motivate CEOs to engage in more ESG practices (Chatterjee and Hambrick, 2011). Therefore, based on the above analysis, this paper proposes Hypothesis 3:

- Hypothesis 3: The positive impact of the CEO's social capital on corporate ESG practices becomes more pronounced when the CEO is more confident.

3. Research design

3.1. Sample selection

This study utilizes data from the Shanghai and Shenzhen A-share listed companies for the period from 2009 to 2021. CEO social capital data and major financial indicators are sourced from the CSMAR database and manually curated. Data on corporate ESG practices are obtained from the China National Research Data Service Platform (CNRDS). To ensure the validity of the data, the following filtering processes were applied: (1) Exclude companies with missing CEO data or financial data. Exclude companies with missing ESG practice evaluation index. (2) Exclude samples of ST and ST* companies. (3) Exclude samples from the financial and insurance sectors. In the end, a total of 30,887 annual observations for companies were obtained. Additionally, a winsorization process was applied to all continuous variables, trimming the top and bottom 1%.

3.2. Variable definitions

3.2.1. Explained variable

Following the approach of Zhao and Zhang (2019) the collective indicator of CEO embeddedness in social action networks with other stakeholders is adopted as the proxy variable for CEO social capital. (1) CEO's financial social capital (SC1), where SC is 1 if the CEO has previously held positions in financial institutions such as banks, otherwise, it is 0. (2) Business social capital (SC2), measured by the number of other companies where the CEO serves as a director, using the sample mean as the threshold. If it is greater than the sample mean, SC2 is 1; otherwise, it is 0. (3) Overseas social capital (SC3), when the CEO has worked or studied abroad, SC3 is 1; otherwise, it is 0. (4) If the CEO has pursued an (executive) MBA or studied at China Europe International Business School (CEIBS) or Cheung Kong Graduate School of Business (CKGSB), SC4 is 1; otherwise, it is 0. (5) If the CEO has worked in a university or research institution, SC5 is 1; otherwise, it is 0. (6) If the CEO has held positions in

industry associations or chambers of commerce, SC6 is 1; otherwise, it is 0. We sum the CEO capital from the six different dimensions mentioned above to derive the CEO social capital variable used in this paper.

3.2.2. Dependent variable

The dependent variable is ESG. The ESG data from the CNRDS are designed under the three main themes of Environment, Social Responsibility, and Corporate Governance. The design process refers to international ESG disclosure standards such as GRI Standards and SASB Standards, along with renowned ESG databases both domestically and internationally. It incorporates the design philosophy of relevant policies regarding ESG information disclosure in China. The framework includes 14 detailed topics (secondary indicators) and extensively captures 44 underlying data points as the third-level indicators for assessing the ESG levels of companies. ESG-R has designed positive advantage indicators and negative risk indicators, encompassing both qualitative and quantitative metrics. It comprehensively measures corporate ESG from various perspectives. The scoring comprises the overall ESG practice score and individual scores for the E, S, and G subcategories, with each subcategory scoring ranging from 0 to 100. The detailed description of ESG is shown in **Table 1**.

Table 1. Specific Indicators of ESG-R.

Primary indicators	Secondary indicator	Tertiary indicator
E	Climate change	Green patent
		Emergency response plan for sudden environmental risks
		Environmental management systems and regulations
	Pollution control	Measures to reduce three wastes (waste gas, waste water, and solid waste)
	Circular economy	Green office
		Resource recycling
	Environmental risk	Emissions of the three wastes (waste gas, waste water, and solid waste)
S	Employee rights	Employee compensation
		Employee incentives
		Presence of women in director and senior management positions
		Proportion of women in director and senior management positions
		Employee training and education
	Product liability	Quality certification
		After-sales service
	Social contribution	Charitable donations
		Education
		Community welfare
		Employee growth rate
		Rural revitalization
	R&D innovation	Patent application status
		Ratio of R&D staff
		R&D expenditure as a percentage of revenue

Table 1. (*Continued*).

Primary indicators	Secondary indicator	Tertiary indicator
S	Health and safety	Safety management system
		Safety production training
	Social risk	Negative business incidents
		Product disputes
		Employee disputes
		Incidents of employee suicide, mining disasters, occupational diseases, etc., in news reports
		Impairment of intangible assets
G	Financial performance	Internal evaluation
		Audit report
		Solvency
	Corporate governance	Management stability
		Board of directors' shareholding ratio
		Whether an audit committee is established
		Number of committee meetings held
		Proportion of independent directors
		Investor relations
	Information disclosure	ESG disclosure
		Change of accounting firm
	Governance risk	Legal litigation
		Major shareholder pledge ratio
		Tax disputes
		Debt disputes

3.2.3. Moderating variables

(1) CEO tenure: CEO tenure is measured in years, calculated by subtracting the CEO's year of entry from the current year of the executive's term. (2) CEO overconfidence: CEO overconfidence is measured by the proportion of CEO compensation to the total executive compensation.

3.2.4. Control variables

In addition to being influenced by the CEO's social capital, a company's corporate social responsibility is also affected by other company-level factors. Therefore, this study controls for conventional variables that influence corporate social responsibility in the model, including company size (Size), financial leverage (Lev), company growth (Growth), profitability (Roe), equity concentration (Top3), institutional ownership (Insto), company age (Ln_Age), and industry concentration (HHI) (**Table 2**).

Table 2. Variable definitions.

Variable type	Variable symbol	Variable name	Variable definition
Dependent Variable	ESG	Total ESG Score	Company's ESG rating on China Research Data Service platform
	E	Environmental Practice Score	Company's E rating on China Research Data Service platform
	S	Social Practice Score	Company's S rating on China Research Data Service platform
	G	Governance Practice Score	Company's G rating on China Research Data Service platform
Independent Variable	CEO_SC	CEO Social Capital	The sum of six categories of social capital based on the descriptions above
Moderating Variable	Tenure	CEO Tenure	The duration calculated as the year of CEO tenure in the current year minus the year of executive entry
	Overconfidence	CEO Overconfidence	The proportion of CEO compensation to total executive compensation
Control Variables	Lev	Financial Leverage	Total liabilities divided by total assets at the end of the period
	Growth	Company Growth	Revenue growth rate of the company at the end of the period
	Roe	Company Profitability	Net return on equity of the company at the end of the period
	Top3	Ownership Concentration	Percentage of shares held by the top three largest shareholders
	Insto	Institutional Ownership	Percentage of shares held by institutional investors in total outstanding shares
	Ln_Age	Company Age	The number of years the company has been listed
	HHi	Industry Concentration	Herfindahl-Hirschman Index (HHI), calculated as the square of the industry's share in total revenue

3.3. Empirical model setting

To test hypothesis H1, we construct the following baseline equation:

$$ESG_{ijt} = \alpha_0 + \alpha_1 CEO_SC_{ijt} + \beta_n \sum X_{ijt} + \sum D^{Year} + \sum D^{Ind} + \varepsilon_{ijt} \quad (1)$$

where $\sum X_{ijt}$ represents the company-level control variables. According to model (1), if the coefficient α_1 is significantly positive, it indicates that hypothesis H1 is supported, suggesting a positive influence of CEO social capital on corporate ESG practices.

To test hypotheses H2 and H3, this study extends Equation (1) by incorporating the moderation variables CEO tenure and CEO overconfidence, along with their interaction terms with CEO social capital. The resulting equations are expressed as follows: (2) and (3).

$$ESG_{ijt} = \alpha_0 + \alpha_1 CEO_SC_{ijt} + \alpha_2 CEO_SC_{ijt} \times Ture_{ijt} + \alpha_3 Ture_{ijt} + \beta_n \sum X_{ijt} + \sum D^{Year} + \sum D^{Ind} + \varepsilon_{ijt} \quad (2)$$

$$ESG_{ijt} = \alpha_0 + \alpha_1 CEO_SC_{ijt} + \alpha_2 CEO_SC_{ijt} \times Overconfidence_{ijt} + \alpha_3 Overconfidence_{ijt} + \beta_n \sum X_{ijt} + \sum D^{Year} + \sum D^{Ind} + \varepsilon_{ijt} \quad (3)$$

4. Main results and analysis

4.1. Descriptive statistical analysis

Table 3 reports the descriptive statistics of the variables relevant to this study. From the data in the table, it can be observed that the mean value of the ESG practice total score for the sample companies is 24.713, with a standard deviation of 10.153.

The minimum and maximum values are 3.939 and 58.664, respectively, indicating significant variation in ESG practice scores among the sampled companies.

Table 3. Descriptive statistics.

Variable	Observations	Mean	Standard deviation	Minimum	Median	Maximum
ESG	30887	24.713	10.153	3.939	22.723	58.664
E	30887	10.911	13.034	0	5.991	91.361
S	30887	23.572	12.155	0	22.690	80.482
G	30887	24.733	10.771	0	23.791	90.052
CEO_SC	30887	0.693	0.765	0	1	5
Ture	30887	4.709	3.667	3.678	0833	17.167
Overconfidence	30887	0.130	0.119	0.064	0.010	0.452
Size	30887	22.081	1.300	18.271	21.893	26.375
Lev	30887	0.424	0.210	0.026	0.417	0.998
Growth	30887	0.179	0.455	−0.759	0.107	4.679
Roe	30887	0.083	4.671	−72.155	0.072	13.201
Top3	30887	0.495	0.156	0.006	0.492	0.983
Insto	30887	0.448	0.246	0.001	0.471	0.949
Ln Age	30887	2.030	0.927	0	2.197	3.434
HHI	30887	0.129	0.132	0.014	0.085	0.960

4.2. Regression result analysis

4.2.1. Baseline regression result

This study employs Equation (1) to test Hypothesis 1. The regression results are presented in **Table 4**. In the first column (1), where the dependent variable is the total score of corporate ESG practices (ESG), the regression coefficient for CEO social capital is 0.262, passing the significance test at the 1% level. In the second column (2), where the dependent variable is the total score of corporate environmental practices (E), the regression coefficient for CEO social capital is 0.074, passing the significance test at the 10% level. In the third column (3), where the dependent variable is the total score of corporate social practices (S), the regression coefficient for CEO social capital is 0.241, passing the significance test at the 1% level. In the fourth column (4), where the dependent variable is the total score of corporate governance practices (G), the regression coefficient for CEO social capital is 0.651, passing the significance test at the 1% level. The results above support hypothesis H1, and empirical findings indicate a significantly positive impact of CEO social capital on corporate ESG practices.

Table 4. Baseline regression result.

Variable Name	(1)	(2)	(3)	(4)
	ESG	E	S	G
CEO_SC	0.262***	0.074*	0.241***	0.651***
	(4.17)	(1.81)	(2.83)	(9.59)
Size	1.477***	1.114***	0.980***	1.669***
	(29.82)	(16.58)	(14.31)	(27.07)

Table 4. (*Continued*).

Variable Name	(1)	(2)	(3)	(4)
	ESG	E	S	G
Lev	0.655**	−0.204	−0.634*	4.649***
	(2.32)	(−0.53)	(−1.65)	(14.25)
Growth	−0.222**	−0.542***	−0.222	0.304**
	(−2.18)	(−4.54)	(−1.58)	(2.33)
Roe	−0.006	−0.012**	−0.014*	0.032***
	(−1.37)	(−2.18)	(−1.90)	(6.03)
Top3	0.972**	−0.056	0.221	3.932***
	(2.56)	(−0.10)	(0.42)	(8.91)
Insto	−1.197***	0.625*	−0.182	−4.393***
	(−4.95)	(1.65)	(−0.54)	(−16.87)
Ln_Age	0.558***	0.164*	−0.185**	2.504***
	(8.76)	(1.68)	(−2.09)	(33.67)
HHI	−1.550**	2.366***	−4.335***	−2.987***
	(−2.18)	(2.90)	(−4.18)	(−3.40)
cons	−15.342***	−16.420***	−1.369	−20.362***
	(−7.32)	(−3.46)	(−0.65)	(−8.30)
Year	Yes	Yes	Yes	Yes
Ind	Yes	Yes	Yes	Yes
N	30887	30887	30887	30887
adj. R^2	0.400	0.250	0.216	0.320

Note: ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively, with the t-statistic shown in parentheses.

4.2.2. Test results for moderating effects

Table 5 reports the test results for CEO tenure as a moderating variable. From the perspective of the overall ESG practice score, the coefficient of the interaction term between CEO social capital and CEO tenure (CEO_SC*T) in the first column is 0.065, significant at the 5% confidence level, indicating that CEO tenure plays a positive moderating role in the impact of CEO social capital on corporate ESG. The results in columns (2) to (4), where the ESG sub-dimensions are the dependent variables, also yield consistent conclusions. In summary, the findings support the hypothesis H2 of this study.

Table 6 reports the results of CEO overconfidence as the moderating variable. Regarding the overall ESG practice score, the coefficient of the interaction term between CEO social capital and CEO overconfidence (CEO_SC*O) in column (1) is 3.971, significant at a 5% confidence level. This indicates that CEO overconfidence plays a positive moderating role in the impact of CEO social capital on corporate ESG. Results for the ESG sub-dimensions as the dependent variables in columns (2) to (4) also yield consistent conclusions. In summary, the findings support Hypothesis H3 in this study.

Table 5. Results of the moderation effect test for CEO tenure.

Variable name	**(1)**	**(2)**	**(3)**	**(4)**
	ESG	**E**	**S**	**G**
CEO_SC	0.364*	−0.027	0.495	0.067
	(1.78)	(−0.75)	(1.37)	(1.17)
Turn	−0.026	0.002	−0.018	0.001
	(−0.87)	(0.20)	(−0.51)	(1.20)
CEO_SC*Turn	0.065**	0.009**	0.065**	0.019**
	(2.16)	(2.02)	(2.16)	(2.33)
Control Variable	Yes	Yes	Yes	Yes
Year/Industry	Yes	Yes	Yes	Yes
N	30887	30887	30887	30887
adj. R2	0.401	0.251	0.216	0.321

Note: ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively, with the t-statistic shown in parentheses.

Table 6. Results of the moderation effect test for CEO overconfidence.

Variable Name	**(1)**	**(2)**	**(3)**	**(4)**
	ESG	**E**	**S**	**G**
CEO_SC	0.323*	−0.028	0.498	0.097
	(1.69)	(−0.47)	(1.31)	(0.97)
Overconfidence	−5.365***	−1.540***	−7.982***	−2.595***
	(−2.68)	(−3.27)	(−2.91)	(−3.60)
CEO_SC*O	3.971**	0.987*	3.407**	1.166*
	(2.47)	(1.88)	(2.35)	(1.76)
Control Variable	Yes	Yes	Yes	Yes
Year/Industry	Yes	Yes	Yes	Yes
N	30887	30887	30887	30887
adj. R2	0.401	0.250	0.217	0.321

Note: ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively, with the t-statistic shown in parentheses.

4.3. Endogeneity issues and robustness tests

4.3.1. Endogenous problem

The relationship between CEO social capital and corporate Environmental, Social, and Governance (ESG) practices may be influenced by endogeneity issues arising from reverse causality. This is because companies with higher levels of corporate social responsibility attract CEOs with abundant social capital due to their elevated social reputation. Therefore, this study employs the Propensity Score Matching (PSM) model to alleviate the impact of endogeneity issues on empirical results. **Table 6**, column (1), reports the test results after 1:1 matching. The statistical results indicate that the impact of CEO social capital on corporate ESG practices remains significantly positive, supporting Hypothesis H1.

4.3.2. Robustness test

To mitigate potential errors arising from the choice of regression methods and variable measurements in the previous results, robustness tests are conducted here through alternative statistical methods and variable substitutions. Specifically, in the baseline test mentioned earlier, a mixed OLS model was used. In this case, it is replaced with a fixed effects model, and the results are reported in column (2) of **Table 7**. The coefficient of CEO_SC remains significantly positive. When replacing variables, the ESG ratings for listed companies in China provided by HuaZheng Institution were used as the dependent variable. The results of this test are presented in column (3) of **Table 6**. The coefficient of CEO_SC remains significantly positive. In summary, the results of these three robustness checks confirm the robustness of the empirical findings in this study.

Table 7. Endogeneity and robustness tests.

Variable name	PSM	Replacement methods	Variable substitution
	(1) ESG	(3) ESG	(5) ESG
CEO_SC	0.801***	0.038**	0.041**
	(4.58)	(2.25)	(2.13)
Control Variable	Yes	Yes	Yes
Year/Industry	Yes	Yes	Yes
N	14897	30887	30887
R2	0.403	0.436	0.416

Note: ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively, with the t-statistic shown in parentheses.

4.4. Further examination: CEO social capital, ESG practices, and corporate performance

Engaging in ESG practices by businesses not only aligns with the interests of stakeholders, enhancing social reputation for CEOs and companies, but also fosters increased trust from shareholders, improved financing efficiency, heightened satisfaction among customers and suppliers, augmented sales revenue, and reduced transaction costs. However, it is crucial to acknowledge that the costs associated with ESG initiatives, such as investing in environmental equipment and enhancing the working environment for employees, also introduce a certain degree of financial burden (McWilliams and Siegel, 2001). Hence, it is imperative to delve deeper into whether the positive value derived by companies from ESG practices outweighs the costs incurred in assuming social responsibility. Therefore, this study incorporates the CEO's social capital multiplied by the company's ESG practice score as a focal explanatory variable into the model, with EBIT (earnings before interest and taxes divided by total assets) serving as the dependent variable for interpretation. As shown in **Table 8**, the coefficients for CEO_SC × ESG are significantly greater than zero at the 10% and 5% levels, indicating that under the influence of CEO social capital, ESG practices significantly enhance corporate performance.

Table 8. CEO social capital, ESG practices, and corporate performance.

Variable name	(1)	(2)
	EBIT	**EBIT**
CEO_SC	−0.007	−0.007*
	(−1.62)	(−1.92)
ESG	−0.000	−0.000
	(−0.34)	(−0.48)
CEO_SC×ESG	0.001*	0.001**
	(1.69)	(2.08)
_cons	−0.163***	−0.162***
	(−6.50)	(−6.45)
Control Variable	No	Yes
Year/Industry	Yes	Yes
N	30887	30887
R2	0.254	0.254

Note: ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively, with the t-statistic shown in parentheses.

5. Research conclusions and practical implications

This study empirically examines the impact of CEO social capital on corporate ESG practices using a sample of listed companies on the Shanghai and Shenzhen stock exchanges from 2009 to 2021. The results indicate a significant positive correlation between CEO social capital and corporate ESG practices. Building upon this finding, the study further investigates the moderating effects of CEO tenure and CEO overconfidence on the relationship between CEO social capital and corporate ESG practices. The findings suggest that the positive facilitating effect of CEO social capital on corporate ESG practices becomes more pronounced when CEO tenure is longer and CEO overconfidence is higher. Furthermore, the additional research in this paper indicates that ESG practices facilitated by CEO social capital are conducive to enhancing the overall value of the corporation.

Based on the aforementioned research conclusions, the article draws several practical implications: Firstly, CEOs should recognize the importance of social capital and actively broaden their networks in finance, business, technology, international relations, and associations. Continuously enriching personal social capital is crucial. Moreover, having a long-term career development perspective is essential, as it allows CEOs to effectively translate social capital into resource endowments, optimizing strategic decision-making for corporate ESG practices. Secondly, enterprises should not only recognize and cultivate CEO social capital but also utilize it judiciously. Providing CEOs and other executives with appropriate opportunities for social interactions helps them actively engage externally, expand their social circles, and accumulate social capital. Additionally, implementing scientifically designed compensation incentives for CEOs, meeting their reasonable salary expectations, enhances CEO accountability and reduces agency costs. Simultaneously, there should be an attempt to formulate a diverse CEO performance evaluation mechanism. In addition to short-term performance metrics, introducing indicators related to corporate

social performance and reputation can create a comprehensive assessment of the CEO's professional competence. This approach encourages CEOs to enhance their focus on social capital and corporate ESG practice strategies. Thirdly, regulatory authorities should, on one hand, strengthen the construction of the professional manager market, establishing communication platforms that facilitate CEOs in expanding their social networks. This support helps CEOs enhance their social capital. On the other hand, regulatory authorities should continue to foster a positive atmosphere for companies to actively engage in ESG practices. Simultaneously, they can introduce necessary evaluation mechanisms for corporate ESG practices, complemented by an exposure mechanism for assessments. This allows information users to access relevant information more conveniently, encouraging companies to prioritize the implementation of sustainable development strategies.

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