Moderating Role of Capital Market Openness Between ESG and Firm Value Among Public Listed Companies in China

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ABSTRACT

ESG is the abbreviation of Environmental, Social, and Governance. It pursues the co-development of economic and social values and reflects sustainable development issues at the micro level of enterprises. Based on the exogenous policies by China's government to promote capital market openness via the two platforms, "Shanghai-Hong Kong Stock Connect" and "Shenzhen-Hong Kong Stock Connect" (Stock Connect), this study selected the data of 6818 firm-years of China public listed companies (2009-2022) as samples and used fixed effects models to investigate how ESG affected firm value and how capital market openness moderated this relationship. The results showed that ESG performance enhanced firm value, and capital market openness policy positively moderated the relationship. The study contributes to the Sustainable Development Theory, Signaling Theory, Agency Theory and Stakeholder Theory to explain the moderating role of capital market openness. From a policy perspective, implementing capital market openness plays an important role in promoting ESG practices to enhance economic growth and globalization amongst China's public listed companies. Practically, investors and firms should take advantage of capital market openness policies to integrate ESG into their decision-making processes to achieve stable and sustainable long-term value.

Keywords: Capital market openness, Firm value, ESG, China publicly listed companies

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INTRODUCTION

Compared with firms in developed countries, China's public listed companies lack theoretical guidance and practical experience in enhancing ESG performance (Lian et al., 2019). Therefore, the Chinese government has introduced foreign investors to its escalating capital market openness policy, hoping to introduce advanced foreign technology and management experience regarding ESG. In 2014 and 2016, China launched the Stock Connect mechanisms, which established convenient connectivity between the mainland market and the Hong Kong Stock Exchange market, allowing mainland and Hong Kong investors to invest directly in in the Chinese market, thus realizing the two-way opening of China's capital market for the first time (Li & Chen, 2021).

Compared to earlier attempts to open the stock market, such as Qualified Foreign Institutional Investor (QFII) and RenMinbi Qualified Foreign Institutional (RQFII), the Stock Connect policy imposed fewer restrictions on cash flow and had no approval requirements for qualification, thus attracting more foreign capital into China's capital market (Huang, 2021). Foreign investors have advanced ESG practice experience, which can guide China's enterprises to understand and emphasize ESG, and actively improve their ESG performance, so as to promote China's high-quality and sustainable economic development (Wang, 2023). Existing studies have focused on the impact of firms' ESG performance on financial performance (Li et al., 2021), financing ability (Qiu & Yin, 2019), investment decisions (Pedersen et al., 2021), and market value (Wong et al., 2021) and found that ESG had positive economic consequences. However, there is a dearth of evidence on whether and how capital market openness moderated the association between ESG and firm value. Some studies have explored this from the perspectives of external institutional pressure (Zhang & Huang, 2022), the implementation of the Environmental Protection Tax Law (Wang et al., 2022), and the participation of party organizations in governance (Liu et al., 2022).

Unlike the previous ones, this study addressed how the national policy of capital market openness moderated the association between ESG performance and firm value, providing unique insights into policy implementation effects. Therefore, based on the exogenous policy of the

Chinese government to promote capital market openness through the platforms of Stock Connect, this study aimed to find evidence on how capital market openness moderated the ESG-firm value effect mechanism, thereby filling the research gap in this area. Theoretically, this study contributes to the Sustainable Development Theory, Signaling Theory, Agency Theory and Stakeholder Theory in order to explain the moderating effect of capital market openness on ESG performance and firm value.

This study offers empirical evidence to inform regulatory decision-making regarding the formulation and refinement of capital market openness policies. The Chinese government should moderately increase the breadth and depth of foreign capital participation in the market. Supervisory authorities should strengthen the supervision of listed companies, especially those companies under the Stock Connect policy and create a conducive market environment for the foreign investors' participation.

Second, this study will help investors and companies correctly understand the effect mechanism between capital market openness, ESG, and firm value, and avoid investment risks. Chinese investors can learn with foreign investors through the capital market openness to bring ESG performance into their investment analysis procedure, and to pursue stable and sustainable forward-looking investment returns rather than short-term returns. Companies should actively seek ways to integrate into the capital market openness, learn from foreign corporate governance experience, and incorporate ESG performance evaluation indicators into management performance assessment in order to foster long-term corporate value creation.

LITERATURE REVIEW

ESG and Firm Value

From a short-term financial performance standpoint, ESG implementation requires substantial resource allocation toward environmental initiatives, social programs, and governance improvements, including but not limited to philanthropic engagements, workforce welfare enhancements, and anti-corruption mechanisms. These activities will increase the current

operating cost of the enterprise and further reduce accounting profits (Pushpika et al., 2020). This puts companies that are actively improving their ESG performance at a competitive disadvantage condition compared to those that do not actively engage in ESG activities (Govindan et al., 2020).

However, from a long-term value creation perspective, the progressive enhancement of ESG practices ultimately manifests in improved corporate valuation through operational performance. First, the Stakeholder and Resource Dependence Theories believe that actively taking environmental and social responsibilities can help enhance firm value (Cillo et al., 2019). The Stakeholder Theory points out that the enterprise's environmental and social responsibility can transmit the trustworthy signal of the enterprise to the stakeholders and enhance the efficiency of stakeholder participation in firm value creation (Beck & Storopoli, 2021; Freeman & Evan, 1990). The Resource Dependence Theory emphasizes that environmental and social responsibilities can help companies acquire essential strategic resources mastered by stakeholders to build their competitive advantages (Henisz et al., 2019). Good ESG performance means that the companies can fulfill high-quality contracts with their stakeholders, thereby gaining their trust and support and access to the resources and environment needed for sustainable development (Hwang, Kim, & Jung, 2021).

Second, the Sustainable Development Theory points out that the environmental protection activities of companies and the activities of fulfilling social responsibilities need time to influence firm value (Bruna et al., 2022). The improvement of ESG-rating is conducive to companies obtaining social recognition and social capital, promoting sustainable development of companies (Fatemi et al., 2018). The triad of environmental stewardship, social commitment, and governance quality exerts a direct impact on ESG rating outcomes, with such evaluations demonstrating significant positive correlation with long-term firm valuation improvements. Drawing on the established literature foundation, this study proposed the following hypothesis to advance current understanding:

H_1: ESG positively impacts firm value.

Moderating Effect of Capital Market Opening

Capital market openness introduces many overseas investors who adhere to a long-term investment strategy and have a relatively independent status. They are actively involved in supervising their investment companies globally (Fisch & Momtaz, 2020), prompting managers to invest in long-term projects and alleviating the principal-agent problem between managers and shareholders (Iliev et al., 2021). Robust supervision will increase the efficiency of company operations, improve firm performance, and ultimately increase firm value (Luo, 2021). Supervision by foreign investors also helps to improve the internal control system of the company and inhibit the fraudulent and irregular behavior of the company's management, which increases the positive impact on the firm value of ESG (Huang et al., 2020).

Secondly, those non-resident investors will actively participate in business governance and help to improve the corporate governance structure, thus assuring ESG's contribution to firm value. Dyck, Lins, Roth, and Wagner (2019) found that foreign shareholders were positively associated with ESG performance and that firms gained financial and social returns after ESG performance improved. Foreign investors played an important role in formulating employment policies for companies and promoting employment stability (Ghaly et al., 2020). Foreign investment entry can promote firms' research and development investment (Zhou et al., 2019) and improve their technological capabilities to fulfill their social responsibilities. Li, Wang, and Wu (2021) found that foreign investors brought about an increase in ESG, as well as lowerede firm's financing costs and improved firm performance.

Finally, due to the late start of market economy construction, Chinesepublic listed companies performed poorly in terms of professional division of labor, technology level, management level, and financing ability (Tan & Wang, 2007; Wang & Han, 2020), and had less experience in improving ESG level, so the positive effect brought by ESG was relatively limited. The entry of foreign capital can bring advanced technological knowledge and management experience (Paul & Feliciano, 2021) and transfer mature ESG practices to China, which not only plays a role in modeling the ESG responsibilities of China's companies but also helps to solve the problems of ESG practices of China companies and improves the positive impact of improving ESG performance. Based on the discussion above, the next hypothesis was as follows:

H_2: The degree of capital market openness exerts a statistically significant positive moderating effect on the ESG-firm value relationship.

This conceptual framework elucidated the tripartite relationship among ESG performance, firm valuation, and capital market openness.

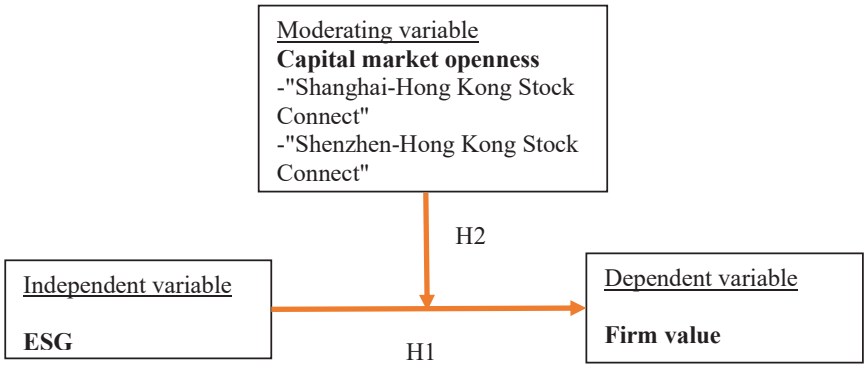

Figure 1: Conceptual Framework

METHODOLOGY

Population and Sample Selection

This study used all non-financial publicly traded firms listed in the Shanghai and Shenzhen Stock Exchange between 2009 and 2022. 2009 was when the earliest available ESG rating data was available, and 2022 was when the latest available data was available.

Table 1 presents our sample construction process. The initial sample comprised 3,199 A-share listed companies on the Shanghai and Shenzhen Stock Exchanges during 2009-2022. To ensure a balanced panel, we excluded 1,633 firms that went public after 2009. Following standard practice, we further eliminated: (1) financial and real estate sector firms, (2) companies under special treatment (ST) status, (3) firms that underwent industry reclassification during the sample period, and (4) observations with missing key variables or negative book values.

Table 1: Sample Selection

Selection Criteria	Total
Number of A-share listed companies until 2022	3199
Listing after 2009	(1633)
Special treatment	(570)
Realty businesses and financial institutions	(93)
Industry change	(267)
Missing ESG rating data	(37)
Initial sample	599
Firm-year (14 years)	8386
Outlier - R-studentized >|2|	(1568)
Final sample	6818

After applying these screening criteria, the final sample consisted of 599 unique firms, yielding 8,386 firm-year observations. Due to the outlier of extreme value, which could disturb analysis (Gujarati, 2022; Imdadullah et al., 2016), 112 firms were removed. The final balanced panel dataset comprised 487 cross-sectional units (N=487) observed over 14 periods (T=14), yielding a total of 6,818 firm-year observations.

Variable Measurement

Dependent variable

The dependent variable was firm value. This research employed Tobin's Q as the primary firm value metric. Since Tobin's Q considered the current and future situation of the firms, reflected the share price fluctuations in the external capital market, represented the long-term feedback results of the market on the market value of the firm, and measured the firm value in a relevant way (Dzahabiyya et al., 2020).

Independent variable

The independent variable was ESG. This study selected ESG-rating data of the Sino-Securities ESG evaluation system from the Wind Information Financial Database to examine the comprehensive performance of listed companies in the sample in terms of environmental performance (E), social responsibility (S), and corporate governance (G) (Wang et al., 2022). Sino-Securities ESG evaluation system referred to the structure of mainstream ESG systems in Western countries, eliminating indicators that didnot apply to China or were not available in China and incorporated China-

specific dimensions, such as poverty eradication performance metrics and Rural revitalization contributions. Thus, it created a set of localized ESG evaluation systems with more Chinese characteristics (Li et al., 2023). The nine grades of rating results given by Sino-Securities ESG were assigned ranges from the more excellent grade, AAA to the worst grade, C (Gao et al., 2021). Sino-Securities' ESG ratings were numerically coded on an ordinal scale from 9 (AAA, highest grade) to 1 (C, lowest grade), maintaining the descending order of the original rating system.

Moderating Variable

The moderating variable was capital market openness (CMO). Since the underlying stocks of Stock Connect were only part of the A-share companies in the Shanghai Stock Exchange and Shenzhen Stock Exchange (Huang & Xia, 2022), this study measured CMO by whether listed companies were underlying stocks under the policy. Because the "Shanghai-Hong Kong Stock Connect" mechanism was launched in 2014, if the firms in the Shanghai Stock Exchange under the policy, CMO1was one for 2014 and onwards; otherwise, CMO1 = 0. Since the "Shenzhen-Hong Kong Stock Connect" mechanism was launched in 2016, if the firms on the Shenzhen Stock Exchange were under the policy, CMO2 = 1 was defined in 2016 and onwards; otherwise, CMO2 = 0.

Control variable

To mitigate potential bias arising from unobserved firm heterogeneity, this study incorporated a comprehensive set of control variables to ensure the accuracy of the results. In reference to an existing study (D'Amato & Falivena, 2020), this study controlled for other factors that may affect firm value, mainly in terms of the firm's financial position and level of internal governance.

This paper controlled for other factors that may affect firm value, mainly in terms of the firm's financial position and internal governance (Cao & Guo, 2020). The financial status mainly included the following factors: size, number of employees, age, total liabilities, and whether it was loss-making. Loss-making firms were usually under more pressure to allocate resources and may cut back on investment in ESG, thus affecting firm value(Espinosa-Méndez, Maquieira, & Arias, 2023) and may not be able to fully utilize the capital inflows and market opportunities brought by the

policy due to financial pressure when facing capital market openness, which may further affect their ESG performance and firm value. By controlling for whether a firm is loss-making, the interference of this variable in the effect mechanism between capital market openness policies and ESG and firm value can be reduced.

The corporate governance factors included the proportion of shares held by the ownership concentration ratio (top 10 shareholders' stake), the board independence (ratio of independent directors), and CEO duality (a binary indicator of chairman-CEO role consolidation). The control variables were measured as shown in Table 2.

Table 2: Variable Measurement

Symbol	Name of variable	Measurement	Citation
ESG	ESG performance	Monthly average of ESG ratings (1-9)	(Gao, Chu, Lian, & Zheng, 2021)
TBQ	Firm value	Tobin Q= Market value/total assets	(Dzahabiyya, Jhoansyah, & Danial, 2020)
CMO	Capital market openness	Dummy variable, if it is the target stock, then CMO=1. Otherwise, CMO= 0	(Huang & Xia, 2022)
SIZE	Company size	Total assets at year-end (Yuan)	(Cao & Guo, 2020)
AGE	Enterprise age	The number of years a company has been listed in the Shanghai and Shenzhen exchange	(D'Amato & Falivena, 2020)
TL	Total liability	Total liability at year-end (Yuan)	(Wang & Cheng-Han, 2020)
LABOR	Labor number	The number of staff	(Zhou, Xia, & Liang, 2019)
LOSS	Loss company	If the company's profit before tax is negative, the value is 1, otherwise 0	(Espinosa-Méndez, Maquieira, & Arias, 2023)
TOP10	Ownership concentration	shares held by the top ten shareholders/ the total share capital (0-100%)	(Gao, Chu, Lian, & Zheng, 2021)
INDE	board independence	Number of independent directors/ board size	(Huang & Xia, 2022)
DUAL	holding two jobs	If the chairman and CEO of the company is one person, the value is 1, otherwise 0	(Dzahabiyya, Jhoansyah, & Danial, 2020)

Finally, the study also controlled for the year and individual fixed effects.

The Regression Model

Our empirical strategy operationalized the hypotheses through this baseline regression model:

The first step was to build a single relationship model of the effect of ESG and firm value depending on H1. The specific model Formulas (1) was set as:

$$TBQ_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 SIZE_{it} + \beta_3 AGE_{it} + \beta_4 TL_{it} + \beta_5 LABOR_{it} + \beta_6 LOSS_{it} + \beta_7 TOP10_{it} + \beta_8 INDE_{it} + \beta_9 DUAL_{it} + \varepsilon_{it} \quad (1)$$

The second step was building a research model of the moderating effect of CMO on the association between ESG and firm value according to H2. The specific model is shown as Formula (2).

$$TBQ_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 CMO_{it} + \beta_3 ESG\_CMO_{it} + \beta_4 SIZE_{it} + \beta_5 AGE_{it} + \beta_6 TL_{it} + \beta_7 LABOR_{it} + \beta_8 LOSS_{it} + \beta_9 TOP10_{it} + \beta_{10} INDE_{it} + \beta_{11} DUAL_{it} + \varepsilon_{it} \quad (2)$$

This paper evaluated H2 by introducing a multiplicative interaction term between ESG and capital market openness. Among them, the ESG_CMO in Model (2) was an interaction item that was used to examine the moderating impact of CMO on the effect mechanism between ESG and firm value.

RESULTS AND DISCUSSION

Descriptive Statistic

Table 3 shows descriptive statistics. As shown in Table 3, the distributional characteristics revealed: (1) Tobin's Q: The 10:1 ratio between maximum (>6) and minimum (0.62) values demonstrated extreme valuation disparities. This substantial dispersion in valuation multiples suggested significant heterogeneity in firms' market valuations, with the most valued firms trading at six times book value while others barely exceed their accounting values. (2) ESG performance: The ESG ratings exhibited considerable dispersion, ranging from the minimum score of 1 to the

maximum of 7.25 (on a 9-point scale), indicating substantial heterogeneity in corporate sustainability performance across the sample. The left-skewed distribution (Mean=4.307 < Midpoint=5) indicated overall mediocre ESG implementation. (3) Capital market openness: Both Stock Connect measures (CMO1=20.15%, CMO2=12.01%) remained at nascent adoption levels.

The distributional characteristics of control variables revealed: (1) The mean index of loss company was 0.068, indicating that most A-share listed companies in the samples were not making losses; (2) The average ownership concentration ratio (top 10 shareholders) reached 55.78%, indicating highly concentrated equity structures among sample firms; (3) The average proportion of independent directors stood at 36.87%, exceeding the CSRC's regulatory minimum threshold of 33.33% (equivalent to one-third board representation); (4) The CEO duality indicator (Dual) had a mean value of 0.143, suggesting that 14.3% of sample firms combined the chairman and CEO positions.

Table 3: Descriptive Statistics

n=6,818	Mean	Standard deviation	Min	Max
Tobin's Q	1.664	0.802	0.620	6.640
ESG	4.307	0.930	1.000	7.250
CMO1	0.2015	0.4011	0	1
CMO2	0.1201	0.3251	0	1
Company size (RMBmillion)	38762.06	149742.6	383.3621	2733190
Company age	15.8696	6.0701	2	31
Total liability (RMBmillion)	22315.98	81178.47	5.1586	1288612
Labor number	13024.84	37954.13	28	551281
Loss company	0.068	0.252	0	1
TOP10(%)	55.783	15.629	12.710	98.590
Board independence (%)	36.865	5.373	20.000	75.000
DUAL	0.143	0.350	0	1

Tobin's Q = Market value/total assets, ESG = Monthly average of ESG ratings, CMO1 = Capital market openness in Shanghai exchange, CMO2 = Capital market openness in Shenzhen exchange, Company size = Total assets at year-end, Company age = The number of years a company has been listed, Total liability = Total liability at year-end, Labor number = The number of staff, Loss company = the negative profit before tax company, TOP10 = shares held by the top ten shareholders/the total share capital, Board independence = Number of independent directors/board size, DUAL = dummy variable that one paper holding chairman and CEO.

Regression Results

To ensure the robustness of our variable selection, we conducted formal multicollinearity diagnostics for all regression specifications, calculating Pearson correlation for each independent variable. The results are shown in Table 4. The baseline regression revealed a statistically significant but economically modest negative association between ESG and Tobin's Q (β = -0.097, $p < 0.01$), which may reflect omitted variable bias in this parsimonious specification. The control variables all had a significant effect on firm value, suggesting that the selected control variables were suitable. There was no significant multicollinearity between the variables, as the Pearson coefficient was less than 0.8 (Cooper & Schindler, 1998). Subsequently, this study calculated variance inflation factors (VIFs) to verify the level of multicollinearity. The mean VIF was 1.49, suggesting that the multicollinearity insignificant as the mean value of the VIF was less than 10 (Hair, 2009).

Next, this study performed formal heteroskedasticity diagnostics using Breusch-Pagan tests and White tests to evaluate variance stability in our regression residuals. The diagnostic tests were performed using the Breusch-Pagan and White model (White, 1980). As reported in Table 5, both tests yielded statistically significant χ^2 statistics ($p < 0.01$), rejecting the null hypothesis of homoskedasticity at the 1% significance level. Hence, this study used the Hausman test to decide the estimated model. The Hausman test's results ($p < 0.0001$) rejected the null hypothesis of exogenous individual effects at the 1% significance level. When the unobservable random variables were correlated with variables, the fixed effects model should be used (Bell & Jones, 2015).

Table 4: Pearson Correlation Matrix

n=6,818	Tobin Q	ESG	CMO1	CMO2	Company size	Company age	Total liability	Labor number	Loss company	TOP10(%)	Board independence (%)	DUAL
Tobin Q	1.000											
ESG	-0.097***	1.000										
CMO1	-0.126***	0.198***	1.000									
CMO2	0.026**	0.020*	0.293***	1.000								
Company size	-0.111***	0.029**	-0.170***	-0.072***	1.000							
Company age	0.078***	0.015	-0.073***	-0.205***	0.063***	1.000						
Total liability	-0.510***	0.278***	0.422***	0.173***	0.150***	-0.037***	1.000					
Labor number	-0.342***	0.108***	0.189***	0.051***	0.175***	-0.007	0.251***	1.000				
Loss company	-0.184***	0.189***	0.269***	0.221***	-0.012	-0.053***	0.580***	-0.004	1.000			
TOP10(%)	-0.311***	0.236***	0.324***	0.101***	0.082***	-0.005	0.758***	0.117***	0.500***	1.000		
Board independence (%)	-0.066***	-0.071***	-0.030**	-0.008	0.004	-0.036***	-0.003	0.059***	-0.009	0.000	1.000	
DUAL	-0.056***	0.093***	0.191***	0.113***	-0.010	-0.027**	0.420***	-0.184***	0.316***	0.314***	-0.065***	1.000

t statistics in parentheses* p < 0.1, ** p < 0.05, *** p < 0.01

Tobin's Q = Market value/total assets, ESG = Monthly average of ESG ratings, CMO1 = Capital market openness in Shanghai exchange, CMO2 = Capital market openness in Shenzhen exchange, Company size = Total assets at year-end, Company age = The number of years a company has been listed, Total liability = Total liability at year-end, Labor number = The number of staff, Loss company=the negative profit before tax company, TOP10 = shares held by the top ten shareholders/ the total share capital, Board independence = Number of independent directors/ board size, DUAL = dummy variable that one paper holding chairman and CEO.

Table 5 presents the regression analysis results, with controlling for firm and year-fixed effects. Column (2) reports the multivariate estimates for Model 1, which supports Hypothesis 1 by demonstrating a statistically significant positive association between ESG performance and firm value ($\beta = 0.0290$, $p < 0.05$). The result showed that the coefficient on ESG was significantly positive at the 5% level. In terms of economic significance, if a firm's ESG rating improved by one level, the resulting increase in Tobin's Q was 0.029. This suggested that good ESG performance can significantly increase firm value, thus supporting H1, in line with Wang et al. (2022) and Xu, Liu, Hu, and Yue (2021). Listed companies can significantly increase their firm value by increasing environmental investment, taking on social responsibility, and improving corporate governance (Xu et al., 2021). Firms focusing on ESG performance can help release positive signals to the market, enhance investor confidence, and improve firm value (Wang et al., 2022). Therefore, the results were in line with both Stakeholder Theory and Signalling Theory, that ESG positively impacted firm value.

Table 5: Regression Results

	Model 1	Model 2	Model 2
ESG	0.0290**	0.0358***	0.0279**
	(2.2076)	(3.2599)	(2.2459)
CMO1		-0.0299	
		(-0.9574)	
ESG * CMO1		0.0518**	
		(2.0945)	
CMO2			0.0154
			(0.3269)
ESG * CMO2			0.0755**
			(2.4438)
Company size	-0.4448***	-0.4320***	-0.4408***
	(-9.8969)	(-11.5761)	(-9.8158)
Company age	-0.2194**	-0.2411**	-0.2301**
	(-2.0147)	(-2.4124)	(-2.1840)
Total liability	0.0000***	0.0000***	0.0000***
	(4.3693)	(4.3906)	(4.4436)
Labor number	0.0715**	0.0741***	0.0631*
	(2.0298)	(2.7291)	(1.8915)
Loss company	-0.0897***	-0.0659***	-0.0830***
	(-3.7845)	(-3.0421)	(-3.4815)

	Model 1	Model 2	Model 2
TOP10(%)	0.0102***	0.0093***	0.0100***
	(6.8091)	(6.8884)	(6.9292)
Board independence (%)	-0.0015	-0.0018	-0.0011
	(-0.7639)	(-0.9323)	(-0.5418)
Constant	11.5170***	-0.0246	-0.0203
	(12.4739)	(-0.7353)	(-0.5649)
YEAR FE	Yes	Yes	Yes
Adjusted r-squared	0.4433	0.4762	0.4552
Breusch-Pagan	1482.52***	1563.84***	1541.13***
White test	660.48***	703.54***	710.84***
n	6818	6818	6818

t statistics in parentheses* p < 0.1, ** p < 0.05, *** p < 0.01
Tobin's Q = Market value/total assets, ESG = Monthly average of ESG ratings, CMO1 = Capital market openness in Shanghai exchange, CMO2 = Capital market openness in Shenzhen exchange, Company size = Total assets at year-end, Company age = The number of years a company has been listed, Total liability = Total liability at year-end, Labor number = The number of staff, Loss company = the negative profit before tax company, TOP10 = shares held by the top ten shareholders/ the total share capital, Board independence = Number of independent directors/board size, DUAL = dummy variable that one paper holding chairman and CEO

This study further examined whether CMO played a moderating role in the linkage between ESG performance and firm value. Columns (3)-(4) present Model 2's results, confirming Hypothesis 2 through the significant interaction terms for Shanghai stocks (ESG*CMO1) and Shenzhen stocks (ESG * CMO2), respectively indicating capital market openness' moderating role in enhancing ESG valuation effects. The coefficients of the cross terms ESG*CMO1 (β =0.0518) and ESG*CMO2 (β = 0.0755) were both significantly positive at the 5% level, indicating that after the implementation of Shanghai-Hong Kong and Shenzhen-Hong Kong Stock Connections, the ESG performance of underlying stocks had a better effect on the value of firms than that of non-underlying stocks.

Finally, it was common that ESG coefficient and R-squared value within the China context to be low. For example, the coefficient of ESG was 0.003 and the R-squared value was 0.303 (Zhang et al., 2024), and the coefficient of ESG was 0.036 and the R-squared value was 0. 27 (Yu & Xiao, 2022). This was because the unique policy environment of the Chinese capital market which had its unique policy environment. Policy intervention, market volatility, and institutional imperfections may have interfered with the relationship between ESG and firm value.

Robustness Tests

Main regressions showed that better ESG performance was associated with higher firm value, but this result was likely because firms with higher value had more ability and willingness to improve their ESG, which bought about a reverse causality-type endogeneity problem (Wang et al., 2022). To address potential reverse causality between ESG and firm valuation, we employed a dynamic specification using both one-period (t-1) and two-period (t-2) lagged ESG scores as independent variables, which by construction cannot be influenced by current-period Tobin's Q. The lagged regression analyses revealed persistent ESG valuation effects: the one-period lagged ESG coefficient remained statistically significant at the 5% level ($\beta = 0.0290$, $p < 0.05$), while the two-period lag maintains significance at the 10% level ($\beta = 0.0204$, $p < 0.10$). This temporal pattern suggested ESG performance enhancements exerted sustained positive impacts on firm valuation over multiple years.

DISCUSSION

First, according to the Sustainable Development Theory, firms should actively realize green transformation in order to maintain their advantages in the future business environment and achieve steady growth with sustained profitability (Zheng & Jin, 2023).ESG adheres to the concept of sustainable development, which combines with the Stakeholder Theory and advocated that enterprises should simultaneously undertake the economic responsibility of creating profits for shareholders, the social responsibility of promoting better human development, and the environmental responsibility of protecting and improving the earth's ecology. By improving ESG performance, enterprises can obtain key social resources by satisfying the needs of stakeholders to help them in enhancing firm value, thus realizing sustainable development (Wang et al., 2022).

In addition, according to the Signaling and Agency Theories by disclosing ESG information, firms can transmit much more information to investors and reduce the information asymmetry between shareholders and managers, thus reducing agency costs. Foreign investors have strong information processing ability and value analysis tools (Bailey et al., 2007),

which can accurately assess the firm value and reflect the true value of ESG in the stock price through market trading, thus reducing the possibility of undervaluation of the listed companies (Paul & Feliciano-Cestero, 2021). The stronger ability of foreign investors to interpret corporate information also has a monitoring effect on the behavior of controlling shareholders (Paul & Feliciano-Cestero, 2021). Under stronger external monitoring conditions, firms' incentives to misappropriate benefits through manipulation of information and financial statements will be weakened (Iliev et al., 2021), thus enhancing the quality of corporate governance. At the same time, if firms actively improve their ESG performance and focus on green and sustainable development, their information can also send positive signals to the market, thus gaining a good social reputation (Chen & Xie, 2022).

CONCLUSION

Utilizing a comprehensive sample of China's A-share listed firms (2009-2022), our two-way fixed effects estimations revealed that superior ESG performance significantly enhanced firm valuation. Furthermore, the Stock Connect program moderated this relationship positively, underscoring the value-amplifying role of capital market liberalization in ESG pricing.

The study contributes to the Agency Theory, Stakeholder Theory, and Signaling Theory to explain the moderating role of CMO. From the perspective of policy, the implementation of CMO plays an important role in promoting ESG practices as an approach to enhancing economic growth and globalization among China's companies. Practically, investors and firms should take advantage of CMO policies to incorporate ESG into their decision-making with to achieve stable and sustainable long-term value.

The "Shanghai-Hong Kong Stock Connect" and "Shenzhen-Hong Kong Stock Connect" represent groundbreaking bilateral market access mechanisms that establish reciprocal investment channels between Mainland China and Hong Kong's capital markets. These innovative programs serve dual purposes: facilitating foreign capital inflows into China's A-share market through northbound trading, while enabling Mainland investors to access Hong Kong-listed securities via southbound trading. Since this study examined the moderating role of capital market openness between ESG and

enterprise value among Chinese public listed companies, future research may examine the moderating role of capital market openness within Hong Kong's stock market so that richer empirical evidence to promote the two-way liberalization policy can be obtained.

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