

Corporate Sustainability and Firm Value: Evidence from China

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Abstract: In recent years, sustainable development has become a hot topic globally, and more and more people are realizing the crucial importance of environmental, social, and governance (ESG) factors in corporate decision-making and long-term development. Using the sample from China, we testify whether corporate sustainability have effect on firm value. We find that corporate sustainability improves firm value, as it reduces the information risks and operating risks. ESG is a win-win measure for both regulators and listed firms, therefore there is a shared interest in ensuring that ESG considerations are integrated into business practices. In theory we enrich the literature on the economic consequences of corporate sustainability and complement to the literature on determinants of firm value. In practical significance, this study provides implications for both government and listed firms to focus on ESG.

Keywords: ESG; Corporate Sustainability; Corporate Value; Tobin's Q.

1. Introduction

In recent years, there has been extensive discussions and researches on how to achieve sustainable development, and the United Nations has been advocating for countries to collectively focus on climate issues and strengthen climate governance. The concept of ESG was first introduced in 2004, and the trend of disclosing ESG reports by companies gradually formed in the following decade.

ESG contains three dimensions of information: environment, society, governance. Environment information has drawn regulators' attention, as the climate risk is getting more serious. Society relates to the responsibility the firm take to the whole society, such as the responsibility of employment, charity. Governance are focuses on the corporate strategy and operation. Stock market performance of a firm is reflected by the return rate and the volatility. As the good firm is matched to a higher share price, the capital allocation is effective in an effective market. Previous studies have already researched the impact of ESG on analysts' earnings forecast accuracy, firm performance, market value [1]-[3]. Existing literatures document that firm size and industry influence ESG performance [4],[5]. While literatures of the stock market performance showed that democracy, political risks and corporate governance have effects on stock market performance [6],[7].

In this paper, we testify whether the ESG ratings have effect on the firm stock market performance using the sample from China and OLS (ordinary least squares) to evaluate the goodness of fit and predictive ability of the regression model. We find that ESG ratings significantly improve the firm stock market performance. ESG impacts on stock market performance by reducing the information risk and operation risk. In theory we enrich the literature on the economic consequences of corporate sustainability and complement to the literature on determinants of firm value. In practical significance, this study provides implications for both government and listed firms to focus on ESG. Government officials should strengthen their attention and support for sustainable development, promote the development and

implementation of relevant laws and policies, encourage companies to take social responsibilities, improve their ESG performance, and promote sustainable development. Companies should realize the importance of ESG to their long-term development and value creation, incorporate it into their corporate strategy and business decision-making, establish related ESG management systems and policies, strengthen the collection and disclosure of ESG data, enhance transparency and trustworthiness, and increase market competitiveness.

The paper can be organized as follows. Section 2 presents literature review, while section 3 develops hypotheses. Section 4 demonstrates the research design. Section 5 discusses the baseline empirical results.

2. Literature Review

2.1. Literature Review on ESG

Previous studies have documented the economic consequence of ESG. Buallay documents that ESG disclosure has a positive effect on firm's financial and operational performance [2]. ESG disclosure includes three dimensions: environment, society, governance. In environmental dimension, the ESG disclosure has positive effect on return on assets (ROA) and tobin's Q(TQ). ESG performance ascension of listed company improves the firm's market value. Company's financial performance has obvious intermediary role. The operational capacity is also a vital intermediary role [3]. Incorporate ESG into investment appraisal creates a better decision-making. And the best situation depends on fund manager's preference and deviate from the fund manager has not basis [8]. Firms with ESG concerns benefits from ESG related disclosure. But when they increase the disclosure, firm with ESG strength suffer lower value estimate [9]. Shakil documents that ESG disclosure has a negative effect on financial risks. Firm performs reasonably on ESG has lower total risk [10].

As for the determinants of ESG, firm scale, availability of ESG data the firm provide has a positive effect on the firm's ESG performance [4]. Sensitivity industries perform better in

environment dimension of ESG. Systematic risk and ESG performance relationship assume the inverted u-shaped curve. Firm's negative profitability is associated with the environmental performance [5].

2.2. Literature Review on Stock Market Performance

Previous studies have documented the determinants of stock market performance. There is a parabolic relationship between level of democracy and political risk. And the political risk has a positive effect on the equity return [6]. Governance institutions environment has a positive effect on stock market performance. Quality of governance has a negative effect on total risk and specific risk [7].

The better ESG performance of a firm, the higher stock returns of a firm, and the lower stock volatility. As to the influence channel, the firm with better ESG performance often has a better performance in financial performance, quality of earnings and investment efficiency, which is the reason of better stock market performance [11]. Further study shows that shareholder responsibility, environmental responsibility and social responsibility have positive effect on stock market performance, while staff responsibility, supplier responsibility, customer responsibility and consumer's right and interest have negative responsibility on financial performance.

3. Hypotheses Development

ESG expresses more information of the firm to investors. ESG provide to investors more non-financial and financial information, mitigating the information asymmetry. Firm with strengths in ESG can send out optimistic information to externals, and investors can understand the firm's advantage better. As the investor's confidence on the firm improved, they may increase the investments of the firm and the externals will hold optimistic attitude to the firm, which reflects on stock market higher share prices and return rate in effective market. And the share will be less volatile, and be more steadily increased.

ESG factors have a significant impact on the operation of a company. According to Henriksson et al. (2019), companies with better ESG scores tend to have lower equity capital costs and higher credit ratings [12]. This is because investors require a higher return when information transparency is low, and ESG provides more information to investors. Therefore, companies with better ESG performance can enjoy a lower cost of capital and a better reputation among investors. Moreover, Luo et al. (2022) demonstrate that incorporating ESG information into the forecast process can improve analysts' earnings forecast [1]. This is because external stakeholders can better monitor the company's management actions and governance practices, which reduces the likelihood of earnings management and improves earnings quality. Companies with better ESG performance also tend to follow good business ethics and regulations, which is good for the long-term development of the firm. As a result, the risk of stock failure is reduced, and the image, reputation, and goodwill of the company improve. As managements and those in charge of governance strive to improve the effectiveness of governance, they can avoid the misuse of capital and improve the efficiency of investment appraisal. This, in turn, leads to better financial and operational performance, resulting in improved profitability and earnings,

and reducing operational risks. By adopting ESG strategies, companies can also gain a competitive advantage and foster innovation, as they are better able to meet the needs of socially conscious consumers and stakeholders. Moreover, companies with better ESG performance are more attractive to socially responsible investors. Verheyden et al. (2016) show that incorporating ESG information into each investment method can facilitate better decision-making [8]. The optimal allocation depends on the fund manager's preference and willingness to deviate from the benchmark before screening. These investors tend to consider a company's social and environmental impact, as well as its financial performance, when making investment decisions. Therefore, companies with better ESG performance are more likely to attract socially responsible investors, which can lead to increased demand for their shares and a higher valuation of their stock.

In summary, we argue that ESG information strengthen the firm's stock market performance by reducing the information and operating risks. Based on the above analyses, this study proposes the following hypothesis.

Hypothesis 1: firm ESG factor improves the stock market performance.

4. Research Design

4.1. Sample and Data Sources

Our sample consists of all Chinese listed firms on Shanghai and Shenzhen stock exchanges during the period of 2009-2020. Our sample starts from 2009 because ESG rating of Sino-Securities Index began to rate in 2009, and the newest data is updated in 2020. We exclude: (1) firms in financing industry as they have different regulation environment and accounting reporting regulations. (2) firms with financial difficulties and listing suspension (ST). Observations are 32044.

The data of financial and corporate governance are obtained from CSMAR Database. The ESG data are from Sino-Securities Index, Wind Database.

4.2. Variance Definition

Independent Variables. Following the previous study (Luo and Wu, 2022) [1], we use CSI ESG rating (ESG) as the proxy of ESG fulfilment. The CSI ESG rating system is based on international mainstream methods and practical experience, as well as the core tenets of international ESG, combined with China's national conditions and the characteristics of the capital market, from the three dimensions of environmental, social and corporate governance. This score captures how firms report their ESG initiatives along 16 indicators and 44 sub-indicators, and use 9 ratings from C to AAA scoring the firms' performance. AAA indicates best ESG rating. We acknowledge that there is a divergence between different ESG ratings provided by distinct rating organizations.

Dependent Variables. Following Buallay (2019)'s study [2], this paper uses Tobin's Q (TobinQA; TobinQB; TobinQC; TobinQD) as the proxy of stock market performance of firms. Tobin's Q is the ratio of the market value of capital to its replacement cost. The higher of the value of Tobin's Q, the better performance of stock market.

Control Variables. In line with extant literature (Francis et al, 2019; Wang et al, 2017) [13] [14], this paper controls for firm size(size), firm leverage (lev), proportion of operation

cash flow (cfo), mortgage ability (PPE), board of director size (board), Independence of board of directors (indep). The higher of ratio, the more independence of firm board of directors.

Table 1. Variable Definition.

Variable Type	Variable Name	Variable Value Description
Explained Variables	TobinQA	Market value A/ total assets; When the denominator is not published or is zero or less than zero, it is indicated as NULL.
	TobinQB	Market value A/ (total assets - net intangible assets - net goodwill)
	TobinQC	Market value B/ total assets
	TobinQD	Market value B/ (Total assets - net intangible assets - net goodwill)
Explanatory Variables Control Variables	ESG	C;CC;CCC;B;BB;BBB;A;AA;AAA
	Size	Natural Logarithm of the total assets of the company
	PPE	The net value of the original price of fixed assets after deducting accumulated depreciation and impairment provisions for fixed assets.
	Cfo	Operating cashflow/ total assets
	lev	Total liabilities/ total assets
	Indep	number of non-executive directors/ number of total directors.
	Board	Natural logarithm of number of directors

4.3. Empirical Model

The core purpose of this study is to testify whether ESG will improve the firm stock market performance. To effectively examine the casual effects of ESG on firm stock market performance, the study implements OLS method.

$$TobinQA_{i,t+1} = \alpha_0 + \beta_0 ESG_{i,t} + \sum_1^j \beta_j controls + yearFE + firm FE + e \quad (1)$$

5. Empirical Results

5.1. Descriptive Statistics

Table 2 presents the descriptive statistics. The mean(median) value of TobinQA is 2.102(1.625), and the standard deviation is 1.481. The first quartile of the TobinQA is 1.243, and the third quartile is 2.355. The mean(median) value of TobinQB is 2.311(1.767), and the standard deviation is 1.692. The first quartile of the TobinQB is 1.330, and the third quartile is 2.609. The mean(median) value of TobinQC is 2.650 (1.985), and the standard deviation is 2.051. The first quartile of the TobinQC is 1.365, and the third quartile is 3.121. The mean(median) value of TobinQD is 2.910 (2.165), and the standard deviation is 2.316. The first quartile of the TobinQD is 1.468, and the third quartile is 3.440. The mean (median) value of ESG is 6.461 (6.000), and the standard deviation is 1.116. The first quartile of the ESG is 6.000, which is same as the median value of ESG and the third quartile is 7.000. The mean value of the size is 22.163, and the

standard deviation is 1.438. The mean value of the PPE is 0.210, and the standard deviation is 0.165. The mean value of the operating cashflow is 0.044, and the standard deviation is 0.074. The mean value of the leverage is 0.439, and the standard deviation is 0.222. The mean value of the independence of the board of directors is 0.380, and the standard deviation is 0.071. The mean value of the number of board of directors is 2.288, and the standard deviation is 0.258.

Table 2. Descriptive Statistics.

Variable	N	Mean	SD	p25	p50	p75
Tobin QA	32425	2.102	1.481	1.243	1.625	2.355
Tobin QB	32425	2.311	1.692	1.33	1.767	2.609
Tobin QC	32425	2.65	2.051	1.365	1.985	3.121
Tobin QD	32425	2.91	2.316	1.468	2.165	3.44
ESG	32425	6.461	1.116	6	6	7
Size	32425	22.163	1.438	21.157	21.936	22.9
PPE	32425	0.21	0.165	0.08	0.175	0.303
Cfo	32425	0.044	0.074	0.005	0.044	0.087
Lev	32425	0.439	0.222	0.261	0.428	0.6
Indep	32425	0.38	0.071	0.333	0.364	0.429
Board	32425	2.288	0.258	2.197	2.303	2.485

Table 3 presents the distribution of accounting year. It described the frequency of each accounting year and transfer into a percentage. The minimum frequency is 4.81%, and the maximum frequency is 12.46%.

Table 3. Year Distribution.

Year	Freq.	Percent	Cum.
2009	1,560	4.81	4.81
2010	1,861	5.74	10.55
2011	2,166	6.68	17.23
2012	2,366	7.3	24.53
2013	2,347	7.24	31.77
2014	2,373	7.32	39.08
2015	2,554	7.88	46.96
2016	2,778	8.57	55.53
2017	3,221	9.93	65.46
2018	3,502	10.8	76.26
2019	3,657	11.28	87.54
2020	4,040	12.46	100
Total	32,425	100	

5.2. Main Results

Table 4 presents the baseline results of firm stock market performance. Columns (1), (2), (3), (4) of Table 4 report the regression results for the TobinQA, TobinQB, TobinQC and TobinQD, respectively. As shown in column (1), the coefficient on ESG is significantly positive at the 1% level (coefficient = 0.030), suggesting that after controlling for corporate governance level characteristics and operational level characteristics, corporate sustainability increases corporate value. As shown in column (2), t value is 2.52 and coefficient is 0.022, so the coefficient on ESG is significantly positive at the 5% level, suggesting that after controlling for

corporate governance level characteristics and operational level characteristics, corporate sustainability increases corporate value. As shown in column (3), t value is 4.27 and coefficient is 0.040, so the coefficient on ESG is significantly positive at the 5% level, suggesting that after controlling for corporate governance level characteristics and operational level characteristics, corporate sustainability increases corporate value. As shown in column (4), t value is 2.72 and coefficient is 0.029, so the coefficient on ESG is significantly positive at the 1% level, suggesting that after controlling for corporate governance level characteristics and operational level characteristics, corporate sustainability increases corporate value.

Table 4. Main Results.

	Tobin QA	Tobin QB	Tobin QC	Tobin QD
ESG	0.030*** -4.13	0.022** -2.52	0.040*** -4.27	0.029*** -2.72
Size	-0.851*** (-68.32)	-0.847*** (-58.46)	-1.072*** (-68.17)	-1.056*** (-58.07)
PPE	-0.368*** (-5.10)	-0.843*** (-10.03)	-1.203*** (-13.21)	-1.798*** (-17.07)
Cfo	0.978*** -10.96	1.205*** -11.6	1.333*** -11.83	1.629*** -12.51
Lev	0.857*** -17.06	0.984*** -16.84	-0.004 (-0.06)	0.03 -0.41
Indep	0.357*** -3.72	0.382*** -3.42	0.108 -0.89	0.111 -0.79
Board	0.018 -0.6	0.028 -0.79	0.088** -2.31	0.116*** -2.62
Constant	20.260*** -72.62	20.448*** -62.99	26.102*** -74.1	26.095*** -64.1
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
N	32044	32044	32044	32044
Adj R2	0.613	0.599	0.67	0.656

Note: *, ** and *** indicate significance at the 10%, 5% and 1% levels (two-tailed), respectively. Refer to Table 1 for the variable definition and measurement.

6. Conclusion

Corporate ESG improves the corporate stock market performance. To be more specific, ESG rating is the proxy of corporate sustainability, and Tobin's Q is the proxy of corporate value. Our deficiency is that we use the sample of single country of China, and we hope in future there will be more further researches using cross-country samples.

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