Empirical Research of ESG Performance and Firm Performance in Chinese Real Estate Companies

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Abstract. Taking the economic development and environmental protection as the starting point, the relationship between ESG performance and corporate financial performance is investigated empirically. This research analyzes the existing ESG research and puts forward the research hypotheses. In addition, ROE as well as Debt-to-asset ratio were adopted as the explanatory variables and ESG as the explanatory variables. This study used regression analysis to evaluate the annual reports of listed companies in China's A-share real estate industry from 2018 to 2020 to empirically analyze the relationship between ESG performance and ROE and debt-to-asset ratio. The results of the study indicate that there is a significant positive relationship between ESG performance and ROE & debt-to-asset ratio. Based on the research results, and taking into account the current situation of enterprises in the real estate industry, this paper suggests that companies should strengthen the ESG information disclosure requirements for enterprises in the real estate industry; formulate corresponding ESG policies and continuously deepen the application of enterprise ESG management.

Keywords: ESG · Firm performance · Real estate

1 Introduction

1.1 Background

In order to cope with climate change, achieve green and low-carbon development, China proposes the goal of "Carbon Peak" by 2030 and "Carbon Neutral" by 2060. In recent years, it is increasingly essential for firms to make greater efforts on environmentally responsible and sustainable development in their daily operating life [1]. Also, here are exponential growth in the number of companies that measure and report ESG data, which includes Environment (environmental protection and sustainable development, covering climate change, environmental management mechanisms, energy consumption, pollution, use of renewable energy and circular economy, etc.), Social (Employee rights protection, supply chain management, consumer protection policy), and Governance (Management structure, compensation, internal control, audit independence, risk management, technology innovation, etc.) [2]. Aiming to explore the relationship

between corporate financial performance (CFP) and ESG performance, quantitative body of papers working on the relationship between ESG and CFP have been published, and more than 78% of works present the positive relationship between them [3].

The reason for focusing on the Chinese real estate firms can be divided to two perspectives. Firstly, it is estimated that 20% of greenhouse gas emissions came from real estate industry, resulting in that real estate industry play an important role in the process of coping with climate change and achieving "Carbon Neutral" in 2060 [4]. Secondly, compared to other countries, the overall ESG construction in China's real estate industry is still in the initial stage. Although the ESG concept is gradually obtaining attention in Chinese real estate industry, and increasingly numbers of listed real estate companies have begun to publish ESG reports and actively carrying out ESG practices, there is still a long way to go in practicing ESG activities and disclosing annual ESG reports in real estate industry.

1.2   Related Research

With the popularity of ESG, many empirical studies have investigated whether the application of the ESG concept into firm's core processes yielded higher profits, or enhanced its valuation [5]. According to Friede, by combining more than 2200 individual studies, he found that about 90% of the studies showed a non-negative ESG-CFP relationship, and even most of the studies reported positive results [6]. Among them, Atan did the an empirical analysis to investigate the impact of ESG factors on the performance of Malaysian companies, and found that the separately E, S, G do not effect CFP of Malaysian companies, but the composite ESG score has a positive and significant impact on the company's cost of capital (WACC) [7]. In addition, the non-linear model applied by Nollet provides evidence of a U-shaped relationship between CSR (corporate social responsibility, the origination of ESG) and CFP, suggesting that the impact on CFP is positive in the long run [8]. Andrea's results show a positive relationship between IFDI (Islamic Finance Development Indicator) and ESG scores after investigating 224 banks from sixteen emerging and advanced countries in the period 2014–2017 [9].

Some studies argue that although the empirical results of 235 European banks prove that there is significant positive impact of ESG on the performance, the separately Social disclosure negatively affects ROA, ROE and Tobin's Q, and the separately Governance disclosure negatively affects the ROA, ROE [10].

However, some studies show negative impact of ESG on company performance, for example, after surveying U.S. real estate companies during the period of 2003–2010, noted that lower ESG scores lead to higher returns, especially in the short term, but high scores have no significant impact on returns in both short run and long run [11]. Sanches Garcia examined the relationship between ESG and financial performance from data of 365 listed companies in BRICS countries [12]. The analysis shows that the profitability of corporate assets is only related to Environmental pillar and the sign of the association between the two indicates is negative, showing that the companies with the best ESG performance tend to achieve lower return. In addition, Farooq said that ESG exposure is negatively associated with firm performance in environments with low information asymmetry [13].

1.3   Research Content and Methodology

This study hopes to get a glimpse of the relationship between ESG and CFP in China's real estate industry, explore the behind reasons, so as to promote the leapfrog development of ESG management practice in China's real estate industry. The objective of the study is to validate the relationship of ESG scores and CFP in Real Estate companies from Profitability and Solvency ability of a company. The study can be divided to four parts. Firstly, present the background of this paper, review the current researches of the relationship between ESG and CFP, and explain the research content as well as the methodology. Secondly, design the empirical analysis, including raising hypothesis and research ideas, sample selection and variable definition. Thirdly, analysis the empirical results through descriptive statistics, correlation analysis and regression analysis, and explore the reasons. Finally, draw the conclusion, give the suggestions, and explain the limitations of the study.

2   Methods

2.1   Sample Selection

The variables can be divided to three parts, which include independent variable, dependent variables and control variables.

(1) **Independent variable:** In this paper, the ESG scores of all A-share listed real estate firms will be considered as the independent variable.

(2) **Dependent variables:** According to the three facets of a company that can reflect the performance of a company, which include profitability, solvency and operating capacity, the ROE, debt to asset ratio and the asset turnover rate can be considered as the dependent variables.

(3) **Control variables:** The study also includes the following set of control variables: firm size, whether the company is SOE, the expense ratio, and the firm age.

2.2   Measurements of Variables

The definition and measurement of all variables used in the research are provided in the following (Table 1).

2.3   Hypothesis Formulated

Companies with high ESG levels tend to perform better in cost control, productivity, operational efficiency, as well as corporate risk management and corporate governance, resulting in a strong competitive advantage among all the listed companies, and this competitive advantage will lead the companies to perform better in financial performance among the peers. As a result, the following hypothesis can be raised.

H_1: ESG score is positively related to ROE

H_2: ESG score is negatively related to Debt-to-asset ratio

Table 1. Definitions and Measurements of Variables

Variables	Label	Calculation method
Independent Variable		
ESG	ESG	Based on the company's exposure
Dependent Variables		
Return on Equity	ROE	Net income/Average balance of shareholders' equity
Debt to asset ratio	Lev	Total Debt/Total Asset
Control Variables		
Firm size	Ln(size)	Natural logarithm of total assets at the end of the year
SOE or not	SOE	0 for non-SOEs, 1 for SOEs
Expense ratio	Efee	(Administrative expenses + Financial expenses + Selling expenses)/operating revenues
Firm age	FirmAge	Current year - year of company establishment + 1

2.4 Constructing Regression Models

Based on the above research hypothesis and variables design, in order to study the relationship between ESG level and company performance of A-share listed real estate companies, the following multiple regressions can be constructed:

$$ROE = \alpha_0 + \alpha_1 ESG + \alpha_2 Ln(size) + \alpha_3 SOE + \alpha_4 Efee + \alpha_5 FirmAge \quad (1)$$

$$Lev = \beta_0 + \beta_1 ESG + \beta_2 Ln(size) + \beta_3 SOE + \beta_4 Efee + \beta_5 FirmAge \quad (2)$$

Among them, α_0 and β_0 are constant term, and $\alpha_1 \sim \alpha_5$, $\beta_1 \sim \beta_5$ are regression coefficient.

2.5 Date Sources

In this paper, all real estate companies listed on A-shares in the period of 2018–2020 are taken as the sample. The reason for choosing this period is that ESG was already attracting attention in the international market and begins to be popular in China. 56 firms are selected by excluding ST, *ST and PT, and companies without the whole historical ESG scores and ESG exposure. The data were obtained from bloom-berg, wind, and the annual reports of listed companies. This paper uses excel2003 and spss23.0 software for statistical analysis of data (Table 2).

Table 2. Descriptive statistics for all variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
ROE	168	0.09	0.008	−0.70	0.31
Lev	168	0.71	0.01	0.33	0.92
ESG	168	21.26	6.92	12.81	46.69
Ln(size)	168	24.91	1.41	22.11	28.26
SOE	168	0.52	0.50	0	1
Efee	168	0.13	0.008	−0.01	0.70
FirmAge	168	3.25	0.01	2.56	3.74

3   Results

3.1   Descriptive Results

After the descriptive statistics for the sample companies above, multiple regressions are conducted for the correlation between ESG scores and corporate performance of A-share listed real estate companies in China. The regression results are presented in Table 3 and Table 4.

3.2   Regression Analysis Result

3.2.1   Economic Significance Test

The results of the estimated standard regression coefficients of the above variables are all consistent with economic significance, in line with the previous discussion and assumptions.

Table 3. The regression results. Dependent variable: ROE

Variable	Non-standardized coefficient		standardized coefficient	t	p	VIF
	B	Standard Error	Beta			
Constants	0.049	0.165	-	0.297	0.767	
ESG	0.003	0.001	0.186	2.623	0.010***	1.226
Ln(Size)	0.013	0.005	0.164	2.371	0.019**	1.174
SOE	−0.034	0.015	−0.159	−2.298	0.023**	1.173
Efee	−0.441	0.062	−0.472	−7.1	0.000***	1.082
FirmAge	−0.079	0.0403	−0.138	-1.949	0.053*	1.223

Note: '***', '**', and '*' denote 1%, 5% and 10% significance levels respectively.

Table 4. Regression results. Dependent variable: Debt-to-Asset ratio

Variable	Non-standardized coefficient		Standardized coefficient	t	p	VIF
	B	Standard Error	Beta			
Constants	−0.852	0.185	-	−4.613	0.000***	
ESG	−0.002	0.001	−0.122	−1.985	0.049**	1.226
Ln(Size)	0.074	0.006	0.754	12.542	0.000***	1.174
SOE	0.014	0.017	0.049	0.824	0.411	1.173
Efee	0.137	0.069	0.114	1.977	0.050**	1.082
FirmAge	−0.080	0.045	−0.11	−1.786	0.076*	1.223

Note: '***', '**', and '*' denote 1%, 5% and 10% significance levels respectively.

3.2.2 Significance Test of Individual Regression Coefficients

Through the regression analysis and significance test showed on Table 4, it can be concluded that the ESG Scores, Firm Size, SOE, and Firm Age have significant effects on ROE. Among them, the firm age has the P-Value = 0.053 < 0.1, which indicated that it positively affects the ROE of the company at 10% significance level. All other variables affect at 5% or 1% level of significance.

As the results show, ROE has the positive relationship with ESG scores, which means with the ESG score increase 1 point, the ROE will correspondingly increase 0.3%, the possible reasons for this that companies with high ESG scores tend to be more resilient to risk, especially when companies encounter some unexpected situations, companies that are willing to focus their resources on protecting stakeholders in the context of a profit-damaging period tend to gain more invisible advantages and favorable positions as a result, and are more efficient in the post-epidemic recovery process. The size of company also has the positive relationship with ROE. According to DuPont that ROE = net margin * asset turnover * (leverage + 1), many companies tend to use additional financing and other means to achieve high-speed development of company size, which means they have the higher leverage, leading the higher ROE.

Through the results represented on Table 5, the P-Value of SOE = 0.411 > 0.1, which indicates that SOE has not significant effect on the Debt-to-Asset ratio, and the P-Value for Firm Age is 0.076 < 0.1, indicating that the age of firm positively affects the Debt-to-Asset ratio of the company at 10% significance level. All other variables affect at 5% or 1% level of significance.

As the result shows, Company's Debt to Asset ratio has the negative relationship with ESG, which means when the ESG point increase by 1 point, the Leverage ratio will correspondingly decrease 0.2%. This is probably because companies that are focus on the ESG and sustainable development, they usually have cautious attitude towards leverage. Also, the size of company also has the positive relationship with leverage rate, because larger companies tend to use additional financing to keep the operation of company.

3.2.3   Multi-collinearity Test

For the performance of variable co-variance, VIF are all less than 10, so the model is well constructed with no multicollinearity problem. Accordingly, the equation of the modal can be calculated:

$$ROE = 0.049 + 0.003 * ESG + 0.013 * Ln(size) - 0.034 * SOE - 0.441$$
$$* Efee - 0.079 * FirmAge \tag{3}$$

$$Lev = -0.852 - 0.002 * ESG + 0.074 * Ln(size) + 0.014 * SOE + 0.137$$
$$* Efee - 0.008 * FirmAge \tag{4}$$

4   Suggestion

4.1   Government Perspective

At the technical level, ESG information disclosure guidelines for listed companies should be accelerated and improved, and a complete ESG performance evaluation method and index system should be proposed.

At the information base level, information linkage and sharing among relevant government departments should be strengthened to create an platform for ESG information and further enhance the transparency and timeliness of government information.

At the incentive level, central and local governments can give certain incentives to companies with leading ESG ratings in land bidding, procurement, tax relief, etc. financial regulators can increase ESG auxiliary conditions in IPO, refinancing, bond issuance, trust and investment funds, etc., and give priority facilities to companies with high ESG ratings.

4.2   Company Perspective

Real estate enterprises should use green design, standardize green building products, and green construction, to save resources and reduce pollution. Moreover, they should use renewable energy and artificial intelligence to achieve intelligent management of energy, and then achieve the goal of reducing building carbon emissions.

5   Conclusion

Aiming to study the correlation between ESG practices and financial performance of real estate companies in China, this paper adopted 168 samples of A-share listed real estate companies were selected. By taking ROE and debt-to-asset ratio as indicators to measure the company's performance, and five variables affecting the company's operating performance as the control variables including company size, whether the company is State-owned Company, firm size, expense ratio and the firm age, the correlation between

ESG scores and financial performance of listed real estate companies is obtained and the proposed hypothesis are verified.

The results indicate that there is a positive relationship between ESG performance and ROE of real estate companies and a negative relationship with gearing ratio, revealing that a good ESG score is conducive to improving economic efficiency of enterprises and maintaining a relatively low level of debt, which enables enterprises to achieve long-term sustainable development. There are still some limitations in this study, such as only A-share listed companies in China's real estate industry are selected as research objects, the research sample is small and the research method is single. In future studies, the sample will be expanded to verify the generalizability of the findings. Meanwhile, this paper did nor examine the effect of E,S,G separately, so it is possible to have deeper analysis regarding to the three pillar independently.

References

1. M. Cajias, et al, Can investing in corporate social responsibility lower a company's cost of capital?, Studies in economics and finance, vol. 31, no. 2, 2014, pp. 202-222. https://doi.org/10.1108/SEF-05-2013-0067
2. A. Amel-Zadeh, G. Serafeim, Why and How Investors Use ESG Information: Evidence from a Global Survey, Financial analysts journal, vol. 74, no. 3, pp. 87–103. https://doi.org/10.2469/faj.v74.n3.2
3. I.A. Jadoon, et al, The impact of sustainability reporting quality on the value relevance of corporate sustainability performance, Sustainable Development, vol. 29, no. 1, 2021, pp. 155-175. https://doi.org/10.1002/sd.2138
4. F. Fuerst, P. Mcallister. Green Noise or Green Value? Measuring the Effects of Environmental Certification on Office Values, Real estate economics: Journal of the American real estate and urban economics association, vol. 39, no.1, 2011, pp.45-69. https://doi.org/10.1111/j.1540-6229.2010.00286.x
5. R.E. Khoury, et al, ESG versus corporate financial performance: Evidence from east Asian firms in the industrials sector, Studies of Applied Economics, vol. 39, no. 3, 2021. DOI: http://dx.doi.org/https://doi.org/10.25115/eea.v39i3.4457
6. G. Friede, T. Busch, A. Bassen, ESG and financial performance: aggregated evidence from more than 2000 empirical studies, Journal of Sustainable Finance & Investment, vol. 5, no, 4, 2015, pp. 210-233. https://doi.org/10.1080/20430795.2015.1118917
7. R. Atan, et al. The impacts of environmental, social, and governance factors on firm performance: Panel study of Malaysian companies, Management of Environmental Quality, Vol. 29 No. 2, pp. 182–194. https://doi.org/10.1108/MEQ-03-2017-0033
8. J. Nollet, et al, Corporate social responsibility and financial performance: A non-linear and disaggregated approach. Economic Modelling, vol. 52, 2016, pp. 400-407. https://doi.org/10.1016/j.econmod.2015.09.019
9. A. Paltrinieri, et al. Islamic finance development and banking ESG scores: Evidence from a cross-country analysis. Research in International Business and Finance, vol. 51 2020. https://doi.org/10.1016/j.ribaf.2019.101100
10. A. Buallay, Is sustainability reporting (ESG) associated with performance? Evidence from the European banking sector. Management of Environmental Quality: An International Journal, Vol. 30, No. 1, 2018, pp. 98-115. https://doi.org/10.1108/MEQ-12-2017-0149
11. M. Cajias, et al. Do responsible real estate companies outperform their peers?, International Journal of Strategic Property Management, vol. 18, no. 1, 2014, pp. 11-27. https://doi.org/10.3846/1648715X.2013.866601

12. A. Garcia, et al, Sensitive industries produce better ESG performance: Evidence from emerging markets, Journal of cleaner production, vol. 150, 2017, pp. 135-147. DOI: https://doi.org/10.1016/j.jclepro.2017.02.180.

13. O. Farooq, Financial Centers And The Relationship Between ESG Disclosure And Firm Performance: Evidence From An Emerging Market, Journal of Applied Business Research (JABR), vol. 31, no. 4, 2015, pp. 1239–1244. https://doi.org/10.19030/jabr.v31i4.9298