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The impact of implementing social responsibility and disclosing social responsibility report on capital cost－Takes the China's listed companies as an example

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ABSTRACT : *This study is to explore the effect of the implement and information disclosure of ESG on the capital cost.Considering the different operating conditions under different capital costs, quantile regression and OLS are used for comparative analysis.The three research findings are: 1. On the whole, the performance of corporate social responsibility has no significant impact on the cost of capital, but disclosure of social responsibility report is helpful to reduce the cost of capital. 2. For the companies with medium capital cost, the better the performance of social responsibility, the higher the capital cost. But for the companies with low or high capital cost, the performance of social responsibility has no significant impact on the capital cost. 3. The disclosure of social responsibility report can effectively reduce the cost of capital, and the higher the cost of capital, the more significant the effect.*

KEYWORDS -*Social responsibility, ESG, Cost of Capital, Disclosure of social responsibility report, CAPM, Quantile regression*

I. INTRODUCTION

ESG indicators can reflect the sustainable development ability of a company. Different from years of full development in the western world, it is insufficient in China for ESG research. China's national conditions are quite different from foreign countries, and the foreign research results of ESG may not appropriate in China. This study will take the Chinese listed companies as a sample to probe the effect of the implement and information disclosure of ESG on the capital cost. Different from other studies, this study tries to divide the research samples as five levels according to the capital cost to observe the impact of ESG rating and information disclosure on the cost of capital, in order to provide the companies the useful suggestions for making ESG and financing strategies with different operating environment.

II. Literature review

2.1 The ESG and the cost of capital

The traditional company evaluation mainly considers the basic situation of the company, such as operating environment, production status, revenue and expenditure, profit, cash flow, debt repayment source and debt repayment ability. With the popularization of the concept of corporate social responsibility and sustainable development, the concept of responsible investment is becoming more and more popular, that is, investors are making investment decisions, in addition to considering the traditional financial indicators, and they will consider whether the enterprise has undertaken social responsibility. ESG investment method is an indicator to evaluate the performance of enterprises in social responsibility. E、S and G represent the concept of environment, society and governance respectively. E focuses on the company's impact on the environment, mainly on whether the company's green investment in the production and operation process, the rational use and recycling of energy and resources, the proper treatment of toxic and harmful substances and the protection of biodiversity are consistent with the government's regulatory policies. S focuses on the impact of the company on the society, which means whether the company and its stakeholders can achieve coordination and balance. G focuses on corporate governance. It mainly investigates whether the company's ownership structure, board structure, business ethics and management compensation are in line with the norms. Specific issues include the independence and professionalism of board members, the company's development strategy and vision, the adequacy of information transparency and disclosure, and anti-corruption measures. Enterprises that focus on these three aspects are operating in a mode of long-term sustainable development and long-term benefits. The reason why ESG investment law is favoured by investors is that investors think that enterprises with good ESG performance should also have the concept of sustainable development.

These institutions play an extremely important role in supporting investors and asset management institutions in China. Chen and Sun (2019) suggested that although the research for ESG in China is still not abundant enough, as long as the willingness of companies to disclose relevant information increases, it can provide a good basis for investors to find high-quality companies. In 2017, about 24% of A-share listed companies disclosed social responsibility reports, and one third of these companies voluntarily disclosed ESG indicators. With the promotion of ESG investment concept, the effect of ESG guiding investment in China is gradually emerging. Introduction to capital cost Capital Asset Pricing Model (CAPM) It is a model to describe the relationship between risks and expected return. It is developed on portfolio theory and expounded the formation of market equilibrium under the condition that investors adopt. Markowitz's theory for investment management and expresses the theoretical relationship between the expected return and the expected risk of an asset with a simple linear relationship, that is, there is a positive correlation between the expected return of an asset and a measure of the risk of the asset. The researches of W.Sharpe (1964), J.Lintner (1965) and J.Mossin (1966) established the formula of CAPM. It shows as below：

$$\boldsymbol{E(R_i) = R_f + \beta_i\left[E(R_m) - R_f\right]}$$

Note： $E(R_i)$means the expected return ratio；R_f means risk free interest rate；$E(R_m)$means the expected return of market portfolio；βimeans the systematic risk.

2.2 The literatures of ESG and cost of capital

Xu and Huang (2015) pointed out that good social responsibility performance could significantly reduce the cost of equity capital. Furthermore, compared with non-state-owned enterprises, the performance of social responsibility of state-owned enterprises is better and the cost of equity capital is lower, however, positive social responsibility behaviour can play a more important role in reducing the cost of equity capital in non-state-owned samples. From the empirical research of Feng et al. (2018), the performance of corporate social responsibility is negatively related to the cost of equity capital, and actively undertaking social responsibility helps to reduce the cost of equity capital. Moreover, compared with non-state-owned enterprises, the effect of actively undertaking social responsibility on reducing the cost of equity capital of state-owned enterprises is more obvious. According to the research of Qiu and Yin (2019), there are different effects between social responsibility and the financing cost of enterprises. The financing cost of enterprises with good performance in environment and corporate governance will be significantly reduced, and the quality of information disclosure plays an important role in the above relationship. In recent years, the effect of environmental performance on the financing ability of enterprises is gradually increasing.

Furthermore, many researchers noticed the importance of disclosure of social responsibility report. Li et al. (2013) found that the disclosure of social responsibility report helps to reduce the cost of equity capital.Moreover, the impact of social responsibility report disclosure on the cost of equity capital has a "first disclosure" effect.However, for companies that also disclose social responsibility report, the impact of the quality of social responsibility report on the cost of equity capital is not significant, This shows that investors in China have begun to pay attention to the information disclosure of social responsibility reports. Investors generally believe that the release of social responsibility reports is a favourable signal. However, due to the low quality of corporate social responsibility reports in China, the quality of corporate social responsibility reports is generally low; the signals these reports send to investors do not reduce their assessment of corporate risk. Xiao et al, (2015) argued that the results show the overall level of social responsibility information disclosure in China is low and the industry difference is large.There is a certain negative correlation between the level of corporate social responsibility information disclosure and the cost of capital, and the effect of the level of corporate social responsibility information disclosure on the cost of capital varies with the industry.

After inducing the relevant literature and theory, this study summarizes the research hypothesis: the better the performance of corporate social responsibility, the better the quality of social responsibility report disclosure and the joint performance of the two may help to reduce the cost of capital. Therefore, this study will explain the process of research design in the next section.

III. Research Method

3.1 Sample selection: This study takes the listed companies of CSI300 that ESG rating period is in 2019 and rating result released in 2020 as samples.

3.2 The sources of data: The total ESG ratings, cost of capital and related financial information are obtained from WIND database and CSMAR database.

3.3 Data processing: After downloading all the data, first, delete the sample with missing data, and then delete the extreme values, total 227 samples got.

3.4 Research design: This study uses regression analysis for empirical research. Considering the different operating conditions under different capital costs, quantile regression and OLS are used for comparative analysis. In the quantile regression, the capital costs are divided into three grades: low, medium and high, which are 25%, 50% and 75%. The regression model is shown as follow：

$$CAPM_{it} = \alpha_0 + \alpha_1 ESG_{it} + \alpha_2 GRI_{it} + \alpha_3 SCALE_{it} + \alpha_4 LIAB_{it} + \alpha_5 EPS_{it} + \alpha_6 STATE_{it} + \alpha_7 IND_{it} + \alpha_8 AGE_{it} + \varepsilon_{it} \quad (1)$$

The definition of variables：

3.4.1 The dependent variable is cost of capital (CAPM)： Due to the samples of this study are the listed companies, so it is appropriate to take the CAPM model as the independent variable. The formula of CAPM model is shown as follow：

$$E(R_i) = R_f + \beta_i [E(R_m) - R_f]$$

Note: $E(R_i)$means the expected return ratio；R_f means risk free interest rate；$E(R_m)$means the expected return of market portfolio；$\beta_i$means the systematic risk.

3.4.2 The independent variables

3.4.2.1 Social responsibility rating (ESG): the ESG rating results of CSI Alliance on 300 constituent stocks of Shanghai and Shenzhen are adopted. China alliance of Social Value Investment (Shenzhen) is short for social investment alliance. This is China's first international public welfare platform with the core of promoting sustainable development finance. Nearly 50 institutions, including Youcheng entrepreneur foundation for poverty alleviation, China Association for social governance research and investment, Jifu investment and Mingde Public Welfare Research Institute of Qinghua University, jointly found it. The rating standard of social investment alliance is divided into AAA, AA, a, BBB, BB, B, CCC, CC, C and D, and each level from B to AA is fine-tuned with "+" and "-", with 20 small levels. This study takes each level from 1 to 28 as the substitute variable of the level.

3.4.2.2 Actively disclosing the social responsibility report (GRI): because summarizing the research results of relevant literature, whether the enterprise will actively disclose the corporate social responsibility behavior to the public is also the key to affect the investment decision-making of the investing public. Therefore, this study also includes whether the enterprise actively disclose the social responsibility report according to the GRI reporting guidelines into one of the independent variables. This variable is set as dummy variable. If the social responsibility reported is disclosed according to GRI reporting guidelines, it is set as "1". If not, it is set as "0".

3.4.3 Control variables

3.4.3.1 Company scale (SCALE): Choi and Wang (2009) suggested that enterprise scale affect enterprise performance and brand equity, because large enterprises have advantages of scale economy and more risks. In order to minimize the absolute value of the sample data and not affect the relative relationship between the samples, this study uses the natural logarithm of the total assets at the end of the period to measure.

3.4.3.2 Debt ratio (LIAB): Companies with higher debt ratio are more likely to face default risk in the future, resulting in failure to repay debts. If the debt ratio is too high, it will affect the use of enterprise funds, and then affect the profitability of enterprises. This paper refers to the practice of Margaritis and Psillaki (2007) and measures it by total liabilities divided by total assets.

3.4.3.3 Earnings per share (EPS): The earnings per share means the profitability of a company, it is related with the degree of capital cost. Therefore, this study takes the earnings per share as one of control variables.

3.4.3.4 The nature of property right (STATE): Liu et al. (2015) and Yu (2013) pointed that in China, the biggest stockholders of most listed companies are government, and they affect the company's performance significantly. Therefore, this study takes the nature of property right as one of control variables. If it is owned by government, sets as "1", if no, sets as "0".

3.4.3.5 Industry category (IND): Refer to the study of Zhuang and Cai (2006), due to the characteristics of traditional industry and digital industry are obvious, this study sets the industry category as a dummy variable, if the sample company is digital industry, sets it as "1", if no, sets as " 0".

3.4.3.6 Company age (AGE): This study uses company age as one of control variables. Coad, Segarra and Teruel (2013) indicate that there is relationship between company age and performance because the profit ability and productivity of company will change with its different age. This study measures the company age by the period from the year of established to the research year.

IV. Results

Table 1 is the descriptive statistic samples for 2019 samples after removing extreme values and review if the distribution of sample.

Table 1 The descriptive statistic of 2019 (N=277)

Variables	Min.	Max.	Ave.	Std.
CAPM	0.1122	0.5138	0.3080	0.0880
ESG	1.0000	25.0000	18.9170	4.4839
GRI	0.0000	1.0000	0.4513	0.4985
SCALE	13.2754	21.6347	16.1496	1.7652
LIAB	0.0922	0.9345	0.5758	0.2170
EPS	-0.7301	8.3800	1.0186	1.3154
STATE	0.0000	1.0000	0.2563	0.4374
IND	0.0000	1.0000	0.1588	0.3662
AGE	7.5178	36.0219	21.1914	5.8284

Note: CAPM means capital cost; ESG means the rating of social responsibility; GRI means whether disclose the social responsibility according GRI; SCALE means Company's scale; LIAB mans the debt ratio; EPS mean the earnings per share; STATE means whether is a state-owned company; IND means industry category; AGE means the company's age.

Table 1 shows that from the distribution of company scale, whether a state-owned company, age and profit status, there are differences in the operating environment and development stage among the sample companies. Therefore, this study takes the quantile regression method in order to obtain more practical research findings. Next, quantile regression and ordinary least squares are performed for all samples, and the results are listed in table 2 and 3 as below.

Table 2 The empirical results of ordinary least square (N=277)

	coefficient	t value	p value	VIF
_CONS	0.57	10.24	0.00***	
ESG	0.00	1.25	0.21	1.16
GRI	-0.03	-3.04	0.00***	1.23
SCALE	-0.03	-6.20	0.00***	2.58
LIAB	0.22	6.66	0.00***	2.35
EPS	0.00	-0.30	0.77	1.04
STATE	0.03	2.35	0.02**	1.06
IND	0.06	4.64	0.00***	1.16
AGE	0.00	0.00	1.00	1.08
Adi R sq.	0.256			
F value	12.844	Significant	0.000***	

Note 1：p <= 0.01 is ***，0.01 < p <= 0.05 is **，0.05 < p <= 0.1 is *.

Note 2：the definition of the variables refers to table 1.

Table 2 shows the empirical results of the least square method, which shows that the empirical results of social responsibility have no significant impact on the cost of capital in the whole sample companies. However, if a company discloses actively the social responsibility report in accordance with GRI reporting guidelines, it will help to reduce the cost of capital. In the ordinary least square method, the meaning of collinearity is used to measure whether the explanatory variables have obvious high correlation, because if more than two explanatory variables have homogeneity, then it is meaningless to carry out the test in the same regression equation. Generally, it is considered with an obvious collinearity when the indicator of collinearity over 10. In the results of Table 2, the highest collinearity of each explanatory variable is only 2.58, which means that each explanatory variable and control variable listed in the regression model in this study have their own independent representative significance, so the design of regression model should be reasonable. The meaning of R square is the explanatory power of the model, which is a value between 0 and 1. Generally, the closer to 1 means the higher the explanatory power. However, due to many factors involved in the regression analysis of social science, the importance of R square is relatively low compared with other fields. The R square value in Table 2 is 0.256, which is not so high. However, we can judge whether the regression model is designed reasonably from the F value. F value is used to judge whether there are significant differences among the groups of variables in the linear regression equation. Table 2 shows that the F value of the regression equation in this paper is 12.844, and the result is significant. Based on the above data, the regression design in this study should

have a reasonable basis. Next, quantile regression is used to analyze whether the sample companies at all levels have different results from the whole company.

Table 3 The empirical results of quantile regression and OLS (N=277)

	25%	50%	75%	OLS
_CONS	0.49***	0.56***	0.62***	0.57***
ESG	0.00	0.00*	0.00	0.00
GRI	-0.01	-0.02*	-0.04**	-0.03***
SCALE	-0.02***	-0.02***	-0.02***	-0.03***
LIAB	0.16***	0.17***	0.26***	0.22***
EPS	0.00	-0.01	0.00	0.00
STATE	0.02	0.03*	0.02	0.03**
IND	0.08***	0.08***	0.08***	0.06***
AGE	0.00	0.00	0.00	0.00
Adi R sq.	0.1549	0.1581	0.1948	0.2556

Note 1：p <= 0.01 is ***, 0.01 < p <= 0.05 is **, 0.05 < p <= 0.1 is *.

Note 2：the definition of the variables refers to table 1.

It can be found from table 3 that in the empirical results of the ordinary least square method, overall, the performance of social responsibility has no significant impact on the cost of capital, but the disclosure of social responsibility reports can help to reduce the cost of capital. From the quantile regression and further analysis, the low cost of capital companies will not have any significant impact on the cost of capital, whether in the performance of social responsibility or whether the social responsibility report is actively disclosed or not. However, the higher the level of capital cost, the impact of social responsibility related behavior on capital cost begins to change. In the middle level companies, the better the performance of social responsibility, the higher the capital cost. However, if we can actively disclose the social responsibility report according to GRI reporting guidelines, we can effectively reduce the capital cost. For the companies with high-level capital cost, the implementation of social responsibility has no obvious effect on capital cost, but the disclosure of social responsibility report can effectively reduce capital cost. This result shows the importance of information disclosure. In addition, this effect is more significant in higher-level companies.

V. CONCLUSION

This study takes the ESG rating companies of CSI 300 as samples to explore the impact of the performance of social responsibility and the behavior of social responsibility information disclosure on the company's cost of capital.In addition,run an empirical study with quantile regression and ordinary least square method, hoping to analyze the implementation of ESG in enterprises with different levels of cost of capital in a more in-depth way whether there are differences in policy can also enhance the practicability of the research findings. The research results are as follows：

1. On the whole, the performance of corporate social responsibility has no significant impact on the cost of capital, but disclosure of social responsibility report is helpful to reduce the cost of capital.
2. For the companies with medium capital cost, the better the performance of social responsibility, the higher the capital cost. However, for the companies with low or high capital cost, the performance of social responsibility has no significant impact on the capital cost.
3. The disclosure of social responsibility report can effectively reduce the cost of capital, and the higher the cost of capital, the more significant the effect.

According to the conclusions of this study, the following suggestions are put forward, hoping to provide the research results to investors, enterprises, government regulatory agencies and future scholars who are interested in this field

1. For enterprises: in general, simply implementing social responsibility will lead to the increase of capital cost or no effect, but actively disclosing social responsibility information can improve the interaction with stakeholders and reduce capital cost. This also confirms the previous scholars' view that the implementation of corporate social responsibility is to increase the extra cost of the enterprise, which has only a negative impact on the company.
2. For investors: when making investment decisions, investors should collect more investment target sites and disclose information. The concept of sustainable development represents a company's responsible behavior to all stakeholders. Although it cannot make investors earn huge profits, it can bring investors stable investment returns and bear the obligations of the enterprise to all stakeholders.
3. For the relevant government regulators: according to the empirical results of this study, the disclosure of corporate social responsibility report is a key factor for enterprises to reduce the cost of capital, but so far the

requirements of Chinese laws on the degree of corporate social responsibility have not been specified, and the provisions of Shanghai and Shenzhen Stock Exchange on the social responsibility report of listed companies are still limited to the stage of encouragement, and there is no mandatory. Therefore, it is suggested that the regulatory authorities should consider how to revise the specific requirements for the implementation of social responsibility and the provisions on the disclosure of social responsibility reports. If the listed companies are generally willing to implement corporate social responsibility and disclose social responsibility reports, then reducing the cost of capital will also help the development of enterprises, form a virtuous circle, and truly achieve a win-win situation for enterprises and stakeholders.

4. Rating agencies: at present, there are no specific requirements for the implementation degree of corporate social responsibility, mainly due to the different operating conditions and financial resources of each company. Therefore, it is suggested that rating agencies can design more reasonable rating indicators and popularize rating objects to a wider range, so as to provide investors with a more reasonable and rigorous judgment basis.

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