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Study on the influence of ESG on Chinese enterprises' foreign direct investment

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Abstract: *Based on the micro-data of Chinese A-share listed enterprises from 2009 to 2021, this paper empirically tests the impact of ESG on enterprises' OFDI. The results show that ESG can significantly promote enterprises' OFDI, and through the robustness test of reducing sample size and increasing control variables, the conclusion is still robust after endogenous processing. The intermediary mechanism test shows that ESG can significantly ease the financing constraints of enterprises, thus helping enterprises to increase the scale of OFDI. The research of this paper broadens the research perspective of ESG and OFDI, and enriches the relevant research conclusions.*

Keywords: *ESG; Foreign direct investment; Financing constraint*

1. Introduction

Since joining WTO, China's foreign trade has made a leapfrog development, its economy has taken off rapidly as the world's second largest economy, and it has accumulated a large amount of capital. With the increasing pressure of domestic competition, enterprises are eager to go abroad and explore the world market, which promotes the rapid expansion of the scale of Chinese enterprises' foreign direct investment. According to the data of the Statistical Bulletin of China's Foreign Direct Investment in 2022, China's foreign direct investment flow in 2022 was 163.12 billion US dollars, 60 times that of 2002, with an average annual growth rate of 22.8%, second only to the United States in scale, and China's position as a major country of foreign direct investment has been continuously consolidated. However, with the rise of anti-globalization and the implementation of protectionist policies in developed countries, the pace of Chinese enterprises to invest in other countries has met great obstacles. In the process of the rapid growth of OFDI, it is often accompanied by various conflicts with the host country, such as not paying attention to environmental protection, disputes with local people, and infringement of their own rights and interests, which not only damages the image of China as a major country to a certain extent, but also seriously hinders the sustainable development of OFDI. Therefore, when enterprises invest overseas, they must reshape their own business philosophy, pay attention to the comprehensive investment in the environment, society and corporate governance, and build ESG development concepts to help enterprises go more smoothly and go further in the process of going global.

At present, ESG has been paid close attention by many scholars at home and abroad. Although China's ESG started late, but the development is very rapid, the community is more and more attention to the level of enterprise ESG score, and the relevant research results are gradually increasing. Scholars pay more attention to the impact of ESG on various internal financial indicators of enterprises. For example, ESG is conducive to improving the valuation level of enterprises [1], increasing stock returns [2], and reducing the cost of equity capital [3-4] and debt cost [5]. Some scholars also pay attention to the impact of ESG on the overall development of enterprises, for example, ESG improves the productivity and innovation level of enterprises [6-8] and improves the financing channels of enterprises [9-10]. Sheng Mingquan et al. also found that ESG can maintain the stability of the capital market and contribute to the stable development of the economy [11]. Few studies have combined ESG with OFDI and explored its influence mechanism in depth.

Through literature review, this paper finds that there is a lack of research on the relationship between ESG and OFDI. Most of the existing literature focuses on the domestic impact of ESG, and few studies verify its impact mechanism on OFDI. Therefore, the possible marginal contributions of this paper are as follows: First, the combination of ESG and OFDI broadens the research perspective of both. Secondly, from the perspective of micro enterprises, it analyzes the influencing factors of OFDI, which enricfies

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the research conclusions of OFDI. Thirdly, from the perspective of financing constraints, the paper expands the research on the mechanism of ESG affecting enterprises' OFDI.

2. Theoretical basis and research hypothesis

2.1 Analysis of the impact of ESG on enterprises' OFDI

According to the view of traditional economics, the sole purpose of enterprise operation is to maximize profit, and foreign direct investment, as one of the internationalization behaviors of enterprises, is also to maximize profit. After the Second World War, the theory of OFDI developed rapidly. From Hymer's monopoly advantage theory to Dunning's production compromise theory, all of them emphasized that the competitive advantages built by enterprises through technology, products and economies of scale are to serve the maximum profit. However, along with the economic development, a series of social problems have emerged, which has aroused people's thinking on the sustainable development of ESG and OFDI.

First, the ESG concept pushes companies to focus more on long-term sustainability rather than short-term profits. Such long-term values can help companies better plan and manage ODI, reduce investment risks and increase returns. Second, ESG factors take into account environmental, social and governance risks to help companies better identify and manage potential risks. Taking these ESG factors into account in OFDI can help companies reduce investment risk and protect asset values. In addition, by investing in ESG, enterprises can enhance their brand value and reputation, and attract more investors and consumers. In outward direct investment, good ESG performance can enhance the competitiveness of enterprises in the international market and enhance their image and recognition in the target market. Finally, building ESG to a high standard, which can meet the relevant laws, regulations and standards of the host country, can not only gain market access rights, but also help to establish good relations with the local government and society, thus facilitating OFDI. Accordingly, this paper proposes the following research hypotheses:

H1: ESG can significantly promote enterprises' OFDI.

2.2 Analysis of the influence mechanism of ESG on enterprises' OFDI

More and more studies have shown that when enterprises pay attention to ESG issues and take corresponding measures, it is easier for them to gain investors' support and trust, thus reducing financing costs [12-14]. First, paying attention to environmental and social issues can help enterprises reduce risks. By managing and reducing environmental pollution, improving resource efficiency, and improving employee welfare, companies can reduce the potential impact of environmental and social risks, thereby improving their sustainability and resilience to adverse events. This provides investors with greater confidence and makes them more willing to support these companies with financing. Second, focusing on governance issues can improve corporate transparency and financial stability. Strengthening governance structures and improving internal controls and oversight mechanisms can help prevent corruption and misconduct and increase the credibility of companies. Investors tend to partner with high-quality governance companies and are more willing to finance these companies. In addition, ESG factors also have a significant impact on long-term value creation. Issues related to ESG, such as climate change, human rights, and community relations, can have a profound impact on a company's reputation, brand value, and market competitiveness. As a result, investors are increasingly inclined to support businesses that can demonstrate good management and sustainability on these issues.

The easing of financing constraints can promote enterprises' foreign direct investment. When enterprises get more financing opportunities and financial support, their ability to expand international business and increase foreign direct investment will be enhanced accordingly. By easing financing constraints, companies can more easily access the necessary capital to expand their operations, launch new projects, or enter new markets. This financial support provides more flexibility and opportunities for companies to pursue outbound investment opportunities more aggressively. In addition, the easing of financing constraints can also enhance the credibility and reputation of enterprises, increase investors' trust in enterprises, and thus attract more investment, including domestic and foreign investment. The injection of these funds can help companies expand their scale, enhance their competitiveness, and facilitate the implementation of OFDI. Accordingly, this paper proposes the following research hypotheses:

H2: ESG can promote the development of OFDI by easing financing constraints.

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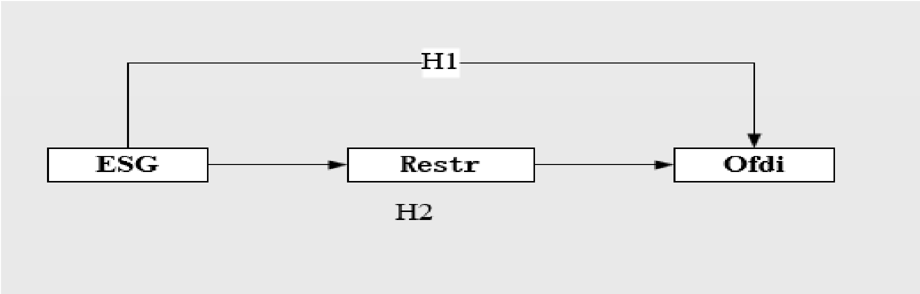

Figure 1: Mechanism of ESG influencing OFDI

To sum up, the mechanism of ESG on enterprises' OFDI is shown in Figure 1. ESG can directly promote enterprises' OFDI through H1, and can also play an active role through H2's financing constraint intermediary mechanism.

3. Research design

3.1 Model design

Since the amount of foreign direct investment of enterprises is non-negative and there are a large number of 0 values, the Tobit model with the left limit point being 0 is selected for estimation. The formula is as follows:

$$Ofdi_{it}=\alpha_0+\alpha_1 ESG_{it}+\alpha_3 Control_{it}+\mu_{it}+\tau_{it}+\delta_{it}+\varepsilon_{it} \tag{1}$$

$$Restr_{it}=\beta_0+\beta_1 ESG_{it}+\beta_3 Control_{it}+\vartheta_{it}+\mu_{it}+\tau_{it}+\delta_{it}+\varepsilon_{it} \tag{2}$$

Where, $Ofdi_{it}$ represents the foreign direct investment of the explained variable enterprise, ESG_{it} is the core explanatory variable, $Restr_{it}$ is the financing constraint of the intermediary variable, $Control_{it}$ is the set of control variables. ϑ_{it},μ_{it}, τ_{it}, and δ_{it} represent the dummy variables of firm, year, industry, and province, respectively. ε_{it} is the random disturbance term, and subscripts i and t represent firm and year, respectively.

3.2 Variable description and measurement

3.2.1 Explained variables

Corporate Foreign Direct Investment (Ofdi): With reference to the research of Xie Hongjun and Lv Xue [15], this paper obtains the data of greenfield investment amount and M&A amount at the enterprise level respectively through Fdi Markets database of Financial Times and SDC Global M&A database of Thomson Reuters. Then, according to the enterprise English name and enterprise securities code provided in the database, the financial data in the CSMAR database were fuzzy matched, and then the matched data were manually screened one by one. Finally, the OFDI data of enterprises from 2009 to 2021 were obtained by sum.

3.2.2 Core explanatory variables

Enterprise ESG Score (ESG). At present, many institutions have released ESG rating data on Chinese A-share listed enterprises, among which the ESG rating data of China Securities has more advantages in localization, time span and coverage, and this data has been widely recognized by the academic community [16], so the ESG rating data of China Securities is chosen as the explanatory variable. China Securities ESG rating divides the scores of listed companies into 9 grades from high to low: AAA, AA, A, BBB, BB, B, CCC, CC and C, and assigns 9 to 1 points respectively. The higher the value, the more obvious the ESG advantage.

3.2.3 Control variables

Enterprise Age: the longer an enterprise lasts, the more complete its internal management mechanism is, and it can often achieve certain competitive advantages in the market. It usually actively participates in international competition. In this paper, the age of the enterprise is measured by adding the year of existence of the enterprise to 1 and taking the logarithm. The duration of the enterprise established in 2021 is 1 year. Enterprise Size (Size): expressed by the logarithm of the total assets of the enterprise. Share concentration (Shrz): The ratio of the largest and the second largest shares of shareholders is

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multiplied by 100 and then expressed as the natural logarithm. Two rights Separation index (Sepe): The enterprise two rights separation index plus 1 and then take the natural logarithm. Overseas Background (Sea): expressed as a logarithm of the number of directors with overseas education and work background.

3.2.4 Intermediary variables

Financing constraints (Restr): This paper uses the net operating cash flow, asset-liability ratio, cash dividends, Tobin's Q value and cash holding level of listed companies provided in the CSMAR database to build a KZ index to measure the level of corporate financing constraints.

3.3 Data Sources

The explained variable data of this paper were collected through Fdi Markets database and SDC Global M&A database of Thomson Reuters. The core explanatory variable data came from Wind financial terminal, while the control variable and intermediary variable data came from CSMAR database of Guotai 'an.

Table 1: Descriptive statistics of variables

VarName	Obs	Mean	SD	Min	Max
Ofdi	28059	0.101	0.667	0.000	9.522
ESG	28059	4.083	1.146	1.000	8.000
Age	28059	2.084	0.896	0.000	3.434
Size	28059	7.701	1.381	0.000	13.223
Shrz	28059	1.434	1.098	0.000	6.423
Sepe	28059	1.012	1.223	0.000	4.116
Sea	28059	0.525	0.534	0.000	2.639

In summary, the descriptive statistical results of each variable are shown in Table 1. Among them, the minimum value of the explained variable Ofdi is 0.000, the maximum value is 9.522, and the standard deviation is 0.667; the minimum value of the core explanatory variable ESG is 1 and the maximum value is 8, indicating that there is a big gap between the OFDI level and ESG development level of different enterprises.

4. Analysis of empirical results

4.1 Baseline regression results

Table 2: Results of baseline regression.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Ofdi	Ofdi	Ofdi	Ofdi	Ofdi	Ofdi
ESG	0.030***	0.032***	0.013***	0.013***	0.013***	0.013***
	(8.644)	(9.054)	(3.680)	(3.765)	(3.723)	(3.530)
Age		0.017***	-0.004	-0.002	-0.002	0.001
		(3.742)	(-0.976)	(-0.437)	(-0.378)	(0.196)
Size			0.063***	0.063***	0.063***	0.060***
			(20.798)	(20.860)	(20.888)	(19.620)
Shrz				-0.010***	-0.010***	-0.007*
				(-2.779)	(-2.709)	(-1.931)
Sepe					-0.004	-0.004
					(-1.247)	(-1.097)
Sea						0.056***
						(7.395)
Constant	-0.045*	-0.087***	-0.431***	-0.421***	-0.417***	-0.424***
	(-1.886)	(-3.296)	(-13.906)	(-13.466)	(-13.315)	(-13.534)
Year Fixed	Yes	Yes	Yes	Yes	Yes	Yes
Province Fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed	Yes	Yes	Yes	Yes	Yes	Yes
Observations	28,059	28,059	28,059	28,059	28,059	28,059
Pseudo R^2	0.004	0.004	0.012	0.012	0.012	0.013

Note: ***, ** and * are significant at the level of 1%, 5% and 10% respectively.

ESG can reshape the competitive advantage of enterprises, and then provide impetus for the growth

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of enterprises' OFDI scale. In this paper, the Tobit model is used to verify the effect of ESG on enterprises' OFDI, and the fixed effect of year, industry and province is controlled. The regression results are listed in Table 2.

As can be seen from Table 2 (1), the regression coefficient of ESG on enterprises' OFDI is 0.030 and passes the significance test at 1% level, indicating that ESG can significantly promote enterprises' OFDI. Columns (2) to (6) of Table 2 add control variables successively, and the direction and significance of core explanatory variable coefficients do not change significantly, indicating that the conclusion that ESG significantly promotes enterprises' OFDI is stable, and the research hypothesis H1 is verified.

4.2 Robustness test

In order to further test the stability of the conclusion, the following robustness test was conducted in this paper, and the results are shown in Table 3. First, change the sample size to exclude st and st* firms because they are in serious financial trouble. The results are shown in Table 3 (1). The ESG regression coefficient is 0.014 and passes the 1% significance level test, indicating that the conclusion that ESG can significantly promote enterprises' OFDI is robust. Secondly, the control variable Roa was added, and the regression results were shown in Table 3 (2). The ESG regression coefficient was 0.013, and the significance and coefficient did not change significantly, which once again verified the robustness of the conclusion of the research hypothesis H1.

Considering that the development of enterprises' OFDI may also promote the improvement of enterprises' ESG rating, thus creating a two-way causal relationship, it is necessary to deal with the endogeneity of the model. In this paper, ESG mean values of the same industry and city in the same year are used as instrumental variables to deal with the endogenous problem of the model, and the results are shown in columns (2) and (3) of Table 3. The regression results of the first stage in column (3) of Table 3 show that F value is 2124.260 and corresponding P value is 0.000, indicating that there is no weak instrumental variable problem. The results of the second stage regression in column (4) of Table 3 showed that the direction and significance of ESG regression coefficient after endogenetic treatment did not change significantly, indicating the robustness of the conclusion of hypothesis H1.

Table 3: Robustness test results

	(1)	(2)	(3)	(4)
VARIABLES	Ofdi	Ofdi	ESG	IV-Tobit
ESG	0.014***	0.013***		0.446***
	(3.604)	(3.530)		(2.876)
IV-ESG			0.979***	
			(184.751)	
F Statistic			2124.260	
Wald Statistic				428.021
P			[0.000]	[0.000]
Age	0.001	0.001	-0.082***	-0.559***
	(0.183)	(0.194)	(-15.901)	(-3.726)
Size	0.061***	0.060***	0.101***	1.815***
	(19.446)	(19.614)	(29.490)	(16.589)
Shrz	-0.008*	-0.007*	0.018***	-0.175
	(-1.955)	(-1.931)	(4.352)	(-1.524)
Sepe	-0.003	-0.004	-0.006	-0.156
	(-0.861)	(-1.097)	(-1.601)	(-1.575)
Sea	0.057***	0.056***	0.015*	1.345***
	(7.357)	(7.395)	(1.812)	(6.063)
Roa		-0.000		
		(-0.049)		
Constant	-0.441***	-0.424***	-0.661***	-30.235***
	(-13.473)	(-13.529)	(-12.440)	(-21.153)
Year Fixed	Yes	Yes	Yes	Yes
Province Fixed	Yes	Yes	Yes	Yes
Industry Fixed	Yes	Yes	Yes	Yes
Observations	26,825	28059	26699	26699

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4.3 Mediation mechanism test

Table 4 reports the test results of the financing constraint intermediary mechanism, and (1) is listed as the benchmark regression result, indicating that ESG can significantly promote enterprises' OFDI. In Table 4 (2), OLS model is used to report the impact of ESG on financing constraints. The results show that the regression coefficient of ESG is -0.125 and passes the 1% significance level test, indicating that ESG can significantly alleviate the financing constraints of enterprises. The easing of financing constraints can reduce the financing cost of enterprises and improve the profitability and competitiveness of enterprises' OFDI. At the same time, the reduction of enterprise financing costs can help enterprises broaden financing channels, improve their financial stability and anti-risk ability, and establish a good international image. The easing of financing constraints can also reduce the capital threshold of enterprises' OFDI projects, thus promoting the development of enterprises' OFDI. Therefore, ESG can promote the growth of OFDI by easing financing constraints, and the research hypothesis H2 is verified.

Table 4: Inspection of financing constraint intermediary mechanism

	(1)	(2)
VARIABLES	Ofdi	Restr
ESG	0.013***	-0.125***
	(3.530)	(-10.333)
Age	0.001	0.752***
	(0.196)	(35.681)
Size	0.060***	0.062***
	(19.620)	(4.491)
Shrz	-0.007*	0.108***
	(-1.931)	(7.072)
Sepe	-0.004	-0.027**
	(-1.097)	(-2.072)
Sea	0.056***	-0.052*
	(7.395)	(-1.889)
Constant	-0.424***	0.269**
	(-13.534)	(2.259)
Year Fixed	Yes	Yes
Province Fixed	Yes	Yes
Industry Fixed	Yes	Yes
Firm Fixed	NO	Yes
Observations	28,059	28059
R^2/Pseudo R^2	0.013	0.141

5. Conclusions and Suggestions

Based on the data of China's A-share listed enterprises from 2009 to 2021, this paper empirically tests the impact of ESG on Chinese enterprises' OFDI and its internal mechanism, and draws the following conclusions:

First of all, ESG has significantly promoted enterprises' OFDI. After the robustness test of reducing sample size, increasing control variables and endogenous processing, the conclusion remains unchanged. Secondly, the intermediary mechanism test results show that ESG can effectively alleviate the financing constraints of enterprises, thus helping the development of OFDI. Finally, there is a close relationship between financing constraints and OFDI, and the influence of financing constraints cannot be ignored when studying OFDI.

Based on the above research conclusions, this paper puts forward the following suggestions: First, we should increase the publicity and cultivation of ESG concept. In view of the current situation of enterprise ESG information opacity, listed companies can be forced to disclose ESG-related information to form an ESG value in society. Second, it is necessary to broaden the financing channels for enterprises, effectively alleviate the financing difficulties and expensive problems of enterprises, and remove financing obstacles for enterprises to participate in the international market and carry out foreign direct investment activities. Third, we should encourage more enterprises to go global and learn advanced management experience from foreign countries in the process of OFDI, so as to help the development of

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domestic economy.

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