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Empirical Study on ESG Investment Preferences of Social Security Fund Holdings

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Abstract

This paper examines the advantages of pension funds and ESG (environmental, social, and corporate governance) portfolio formation and the importance of ESG investing in the context of changing global pension fund management strategies. This paper examines the advantages of pension fund and ESG (environmental, social, and corporate governance) portfolio formation and the importance of ESG investing in the context of changing global pension fund management strategies. The study points out that companies can significantly enhance their environmental, social responsibility and governance quality through ESG practices, which in turn attracts long-term investors and enhances intrinsic value. The study points out that companies can significantly enhance their environmental, social responsibility and governance quality through ESG practices, which in turn attracts long-term investors and enhances intrinsic value. As global pension funds become an important force in sustainable investment, they are incorporating As global pension funds become an important force in sustainable investment, they are incorporating ESG factors in their investment decisions to address international trends and global challenges. This paper further analyzes the differences in the impact of social security funds on firms. This paper further analyzes the differences in the impact of social security funds on firms with different ESG levels, as well as the differences in the impact of social security funds' shareholdings on ESG levels under different levels of geographic market. The study contributes to empirically verifying the ESG governance ability and geographic variability of social security funds, providing an opportunity for social security funds to enhance their impact on ESG levels, as well as the impact of social security funds' shareholdings on ESG levels. The study contributes to empirically verifying the ESG governance ability and geographic variability of social security funds, providing theoretical support and practical guidance for pension funds' ESG investment. It aims to reveal the potential value of pension funds' participation in ESG investment. The study contributes to empirically verifying the ESG governance ability and geographic variability of social security funds, providing theoretical support and practical guidance for pension funds' ESG investment.

Keywords

Pension Funds; Social Security Funds; ESG; Investments.

1. Introduction

On September 22, 2022, General Secretary Xi Jinping announced to the world at the General Debate of the United Nations General Assembly that "China will increase the strength of its national autonomous contribution, adopt more vigorous policies and measures, and strive to peak carbon dioxide emissions by 2030, and strive to achieve carbon neutrality by 2060." Realizing carbon peak and carbon neutrality is a major strategic decision made by the Party Central Committee with Comrade Xi Jinping as the core, integrating both domestic and international situations. In the process of realizing the goal, green investment shows its important role, while the reference and practice of corporate ESG has become an effective tool

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to promote China's economic development and lead the way in realizing the goal of "Carbon Peak and Carbon Neutrality". and lead the way to realize the goal of "carbon peak and carbon neutrality".

ESG consists of three dimensions: Environment, Social and Governance. Through ESG practices, companies can not only improve their environmental protection, social responsibility fulfillment and corporate governance quality, but also attract more long-term investors, enhance risk management capabilities, improve employee satisfaction and attract talent. Generally speaking, a higher ESG rating score proves that the company has achieved better results in environmental protection, social responsibility, and corporate governance, and its intrinsic value based on non-financial factors is increasing. Fang Xianming et al. (2023)[10] found that ESG can increase the increase in corporate innovation output and help improve the quality of innovation. ESG performance emphasizes more on environmental governance and sustainable development, which is consistent with the concept of green investment, which is an investment model based on environmental, social, and monetary return criteria, which takes into account the triple bottom line of economy, society, and environment, and follows the strategy of sustainable development, taking into account economic, social, and monetary returns in an integrated way. It takes into account the triple bottom line of economy, society and environment, conforms to the strategy of sustainable development, comprehensively considers economic, social and environmental factors, and urges enterprises to actively undertake corresponding social responsibilities while pursuing economic benefits, thus bringing sustainable development value to investors and society, and conforming to a series of emission reduction tasks in China as specified in the National "14th Five-Year Plan" and the Vision 2035. According to the Trend Report of the Global Sustainable Investment Alliance (GSIA), the total amount of global assets incorporating ESG factors in investments at the beginning of 2016 amounted to US$2,289 trillion, of which Europe, the U.S., and Canada accounted for 52.6%, 38.1%, and 4.8%, respectively, of the total amount, with a combined share of 95.5%. In the European and American markets, ESG investment has become mainstream. According to the official website of the United Nations Principles for Responsible Investment Agency, since the launch of the United Nations Principles for Responsible Investment (Principles for Responsible lnvestment, PRl) in 2006, the number of signatory organizations has increased from 1,384 in 2015 and 5,022 in June 2022, and the total size of assets managed by the signatories accounted for global more than 50% of the professional asset management scale (Hu Jie et al., 2023)[15] . In the future process of green and low-carbon transformation, ESG provides an important entry point for enterprises to enhance the benefits and long-term value of green investment.

Currently, global pension funds have become important players in sustainable investment, with a larger base of pension funds incorporating ESG factors in their investment decisions to adapt to international trends and respond to global challenges such as climate change. The Norwegian Government Pension Fund (GPFG), one of the world's largest sovereign wealth funds, actively considers ESG factors in its investment process and is gradually shifting its funds to green industries such as clean energy and energy conservation. The investment objective of the pension fund is to make a return while ensuring a small loss of principal, yet the social structure of an aging population has led to a widening gap in pension fund contributions, which requires higher investment returns. Bai Xueshi,Ren Qiao,Liu Xin et al. (2021)[2] show that ESG sustainable investment can create excess returns beyond the broader market, which has been verified by sufficient empirical data. In the face of the reality of aging demographics, the management strategy of pension funds is undergoing a profound change. At the heart of this change is the adoption and deepening of Environmental, Social and Governance (ESG). Unlike in the past, when financial returns were pursued exclusively, today's pension funds are more inclined to select projects that simultaneously promote environmental protection, social

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responsibility, and demonstrate excellence in corporate governance, a shift that signals an emerging trend in the field of financial investment. Long-term value investing theory suggests that companies with higher ESG performance and green innovation will earn higher quantitative investment returns (Alex Edmans, 2011)[33] . Good corporate ESG performance positively affects corporate surplus sustainability and stock return (Xi Longsheng et al., 2022)[18] This fit is not only reflected in the consistency of objectives, but also in the common pursuit of sustainable development and social responsibility. Therefore, the integration of ESG investment concepts into the management of pension funds is not only a revolution of the traditional investment model, but also an important embodiment of the responsibility for the sustainable development of society in the future.

This paper focuses on the ESG impact mechanism of social security fund shareholding on enterprises, with a view to exploring the potential value of pension fund participation in the capital market in promoting the ESG performance of enterprises in the context of the development of this era. The research content of this paper contains two main aspects: first, to verify that social security funds have a better ability to improve enterprises with high ESG levels; second, to verify that the ESG levels of enterprises held by social security funds are differently affected by the degree of marketization in different geographic regions.

2. Literature Review

The combination of green investment and pension funds is a research hotspot in the financial field, especially in the context of promoting sustainable development and combating climate change on a global scale, pension funds, as the main provider of long-term capital, play an increasingly important role in green investment. Foreign countries are relatively rich in research and practical experience of pension funds' participation in social investment. In Australia, the United Kingdom and the United States, the proportion of pension funds investing in domestic equities in all assets is as high as 43%, 52% and 53%, respectively, and the investment of Dutch pension funds in foreign assets reaches 42% (Guo Xisi et al., 2005)[25] . Domestic theoretical exploration of pension funds in the field of ESG investment is still in the initial stage, and has not yet constructed a complete set of framework. Xu Xian et al. (2013)[19] believe that compared with the prudent investment of foreign social security funds, the investment field of China's social security fund is more diversified, involving the real economy, equity investment, trust, funds, bonds and stocks. The pension fund system should progressively build a rule system with ESG evaluation system as a pillar, and incorporate localized ESG assessment standards when conceptualizing pension product design. Proposing ESG construction can disclose higher-quality financial information at the same time, and will also send a positive signal to the outside world that the enterprise is in good operating condition (Huang.2022)[35] . Li Huiyun et al. (2022)[12] pointed out that ESG information disclosure has certain uniqueness and can have an important impact on corporate green innovation performance. Listed enterprises have behaviors such as uneven quality of ESG information disclosure and "bleaching green", which inhibit the promotion effect on corporate innovation performance (Gu Haifeng et al., 2024)[24] . Zhang Changjiang et al. (2019)[31] suggest that different environmental regulation intensity in different geographical areas may have an impact on the level and quality of corporate environmental information disclosure. Xu Xuegao et al. (2023)[32] found through statistics on the number of leading agricultural enterprises in each region and the number of disclosure quality that the central and western regions, such as Jiangxi, Qinghai, Hunan, and Yunnan provinces, only had corporate ESG reports in recent years, and the awareness of corporate ESG is relatively weak, but Inner Mongolia Autonomous Region, which is also located in the western region, already had corporate ESG reports disclosed during 2007-2008. This suggests that the level of ESG development in

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different regions cannot be differentiated by regional division alone, but should take into account the types of local enterprises and the effectiveness of internal corporate governance.

With the continuous development of China's capital market, China has developed multi-level institutional investors, including social security funds, investment funds, QFII, insurance and brokerage firms, etc., and institutional investors have become an important force in the capital market (Cai Hongbiao et al., 2015)[1] . Guercio & Hawkins (1999)[36] By examining a wide range of global pension funds between 1987 and 1993, concluded that pension funds are institutional investors that actively participate in corporate governance and that their governance effects significantly exceed researchers' expectations. Regarding the research on the impact of social security funds on corporate ESG, by synthesizing the existing literature, it is found that scholars mainly elaborate on the governance role of social security funds on corporate ESG by examining the characteristics of social security funds (Zheng Bingwen et al., 2022[6] , Du Qiuxuan et al., 2023[5]): firstly, the public attributes that social security funds have. Shi Yongdong (2014)[21] believes that social security funds are long-term institutional investors. Long-term investment pursues long-term return ability, so investment decisions will avoid significant negative social and environmental impacts. Compared with other institutional investors, social security funds and others are more effective in suppressing corporate violations, probably because of their relatively low risk appetite, the pursuit of long-term stable return ability, usually adopting a more conservative, stable investment strategy (Lu Yao et al., 2012)[20] . In addition, Zhang Xianzhi et al. (2014)[28] believe that the investment strategy of social security funds can often represent the direction of the development of the national macroeconomic policy and the key support direction, and the companies held by social security funds send a signal to the outside world that the operation is good, which can help to bring cash flow to the company and enhance the value of the company. Second, the investment attributes of social security funds. The investment philosophy of social security fund is value investment, long-term investment and responsible investment, and the basic principle of investment operation is to emphasize the value-added of fund assets while ensuring the safety and flexible use of funds (Yang Haiyan et al., 2012)[27] . Its investment decisions consider long-term socio-economic factors, and according to the 2021 China ESG Development White Paper, the disclosure of ESG-related reports by Chinese listed companies has increased from 371 in 2009 to 1,121 in 2021, and ESG is gradually becoming an important measurement dimension in the evaluation of sustainable development and long-term investment value of listed companies (Jiang Yifen et al., 2024)[29] . When attracting different types of institutional investors, enterprises should also rationally choose stable, active, and long-term return-seeking institutional investors to participate in corporate governance (Haiyan Duan, 2016)[30] . It can be concluded that social security funds and corporate ESG investment have compatible long-term return objectives. However, the financial market risk is highly cohesive, how to seek the maximum return when there is a risk, which not only depends on the investment strategy of the fund itself, but also requires the control of exogenous forces, of which regulatory constraints are crucial (Jiang Yurong, 2015)[26] . However, China's current research on the direct relationship between the social security fund and ESG is less, and lies more in the exploration of social security fund or ESG unilaterally on the financial performance of enterprises, the direct impact of social security fund on ESG, as well as for the research on the premise of geographic division, the current lack of relevant research.

The research contribution of this paper is to verify the governance ability of the NSSF on corporate ESG performance in the form of an empirical study, and to analyze the preferences of the NSSF under the differences in the strength of corporate ESG, as well as the differences in ESG governance aspects of NSSF holdings under different geographical conditions.

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3. Research Hypotheses

The source of funds of China's social security fund includes five types of social insurance: pension insurance, medical insurance, unemployment insurance, work injury insurance and maternity insurance, and the social pension insurance fund accounts for the most important part. Therefore, the main source of funds for social security fund is the pension insurance fund, and the research on the utilization of funds for social security fund in foreign literature also focuses mainly on the pension fund (Xu Xian et al., 2013)[19] . Asian Sustainable and Responsible Investment Association (ASRIA) allows ESG investors should consider more non-financial factors such as environmental protection, social harmony, economic development and other non-financial factors, as well as traditional financial index factors when making investment strategies. Based on the characteristics of social security funds, it can be concluded that social security fund investment pursues stability and long-term returns, so in the investment process it will certainly pay high attention to the long-term market environment and enterprise development prospects, and the research of Lai Wenjing et al. (2015)[22] shows that the proportion of long-term institutional investors' shareholding is positively correlated with the environmental performance of enterprises. And enterprises have begun to pay attention to ESG investment concepts in order to strengthen their internal strengths as well as to cater to the new directions of the market, which include the control of greenhouse gas emissions, the use of renewable energy, and so on. Friendly to the environment will cause investors' favor, and at the level of social contribution, ESG also joins the protection of employees' rights, coupled with the catalyst of today's external environment, ESG advantages are reflected in the government support, long-term investment value, sustainable development, etc., which coincides with the characteristics of the pension fund, so the social security fund shareholding has the conditions to participate in the ESG governance of the enterprise. Based on the above analysis, the first hypothesis of this paper is proposed:

Hypothesis 1: The shareholding behavior of SSFs has a positive effect on the ESG performance of firms.

Since the social security fund is characterized by stability, long-term, and it has strong social attributes, every position of the social security fund's holdings will attract external attention, so social security fund investors have higher requirements on the selection of investment enterprises. Generally speaking, enterprises with higher ESG ratings will achieve better results in terms of social responsibility, sustainable strategies and corporate governance, and relevant studies at home and abroad have also proved that good ESG performance of enterprises can gain the attention of institutional investors. Other things being equal, the better the overall ESG responsibility and stakeholder responsibility performance of listed companies, the more institutional investors hold shares. This shows that institutional investors in the A-share market already have a clear preference for ESG-responsible investments (Zhou Fangzao et al., 2020)[13] ; According to the Global Sustainable Investment Review, the preference rate of institutional investment for green innovation and socially responsible investments was higher in 2016-2018 (Aman Jin, 2022)[14] . Yao Yi and Liu Zhiyuan (2009)[23] analyzed the ability of domestic institutional investors to supervise shareholding companies, and found that institutional investors led by social security funds and others have a very significant role in improving other aspects such as corporate governance capacity, and their shareholding percentage shows a significant positive correlation with the performance of that company in the next two years.In a study by Juan Carlos Matallín et al. (2019)[34] points out that sustainability theory suggests that companies with higher ESG performance have higher sustainability possibilities and long-term capital value. Based on the above analysis, the second hypothesis of this paper is proposed:

Hypothesis 2: SSFs are better able to improve firms with high ESG levels.

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As an important institutional investor, the social security fund's investment decision and shareholder behavior may be affected by the market environment. Jin Qinglu et al. (2016)[17] found that there is a positive correlation between social security fund shareholding on the level of company dividends. Social security funds can effectively exercise public supervision functions, which in turn catalyzes the performance improvement of listed companies; once social security funds take shares, the details of their positions are announced by enterprises, which will attract additional attention from other institutional and individual investors, not only enhancing the visibility of enterprises, but also strengthening the intensity of market supervision. In more market-oriented regions, enterprises face more intense competitive pressure and need to improve ESG levels to enhance corporate image and attract investment, and this demand may affect the enterprise's changes in the treatment and benefits of employees, and high-intensity work may lead to the enterprise to make measures to increase production or recruit more employees, which in turn affects the enterprise's ESG G (Corporate Governance); highly market-oriented region's energy structure is dominated by coal, and the proportion of high-pollution and high-energy-consumption industries is large, and all these factors exacerbate the environmental pollution problem. The study of Li Huiyun et al. (2022)[12] shows that ESG disclosure has certain uniqueness and can have an important impact on corporate green innovation performance. The government should accelerate the construction of ESG disclosure framework for heavy polluters to promote green innovation in heavy polluters. This highlights the importance of corporate governance in realizing sustainable development of enterprises, which helps attract investors and reduce investment risks. Before the ESG disclosure policy is clear, at this stage, some enterprises in the eastern region are slightly deficient in E (environment), and social security fund investors are not as favorable to such enterprises as other enterprises. In regions with a lower degree of marketization, enterprises face less competitive pressure and may pay less attention to ESG, which may lead to the neglect of environmental and social considerations in the pursuit of economic benefits, and the effect of social security fund shareholding on the ESG level of enterprises may not be as obvious as in regions with a medium or high degree of marketization. As an important part of the social security system, the social security fund is mainly used to protect the basic needs of citizens, such as old age and medical care, while inclusive finance is committed to providing a wide range of convenient and low-cost financial services, especially financial support for disadvantaged groups such as micro and small enterprises, farmers, and low-income people in cities and towns. The development of inclusive finance helps to increase the participation rate and coverage of the social security fund. By reducing the cost and threshold of financial services, inclusive finance can attract more people to participate in social insurance, thus expanding the beneficiary scope of the social security fund (Wang Yannan et al., 2020)[3] . In this paper, we refer to the fact that in studying the impact of financial inclusion under different levels of development in China, Li et al. (2020)[4] categorize the regions into East (Beijing, Fujian, Guangdong, Hainan, Hebei, Jiangsu, Liaoning, Shandong, Shanghai, Tianjin), Central (Chongqing, Anhui, Heilongjiang, Henan, Hubei, Hunan, Jiangxi, Jilin, Shanxi), West (Gansu, Guangxi, Guizhou, Inner Mongolia, Ningxia, Qinghai, Shaanxi, Sichuan, Xinjiang, Yunnan, and Tibet) regions, the third hypothesis of this paper is proposed in order to analyze the impact of social security fund shareholding on corporate ESG under regional development imbalance:

Hypothesis 3: In the central region, SSF shareholding has a significant effect on firms' ESG.

4. Study Design

4.1. Sample Selection

In this paper, Chinese A-share listed companies are taken as the research sample, and the year 2013-2022 (2012-12-31__2022-12-31) is selected as the observation time interval, and the

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data are obtained from CSMAR database and Wind database. Among them, the data on social security fund holdings, ESG ratings and market-oriented geography are from Wind database, and other data are from CSMAR database. All data are annualized. A total of 30,536 initial observations are obtained by screening the sample.

The following treatment is given to the values:

(1) Excluding financial listed companies due to the special nature of the regulation of financial companies.

(2) Since ST firms usually do not apply normal accounting standards, there are extreme value disturbances and ST-type listed companies are excluded.

(3) Exclusion of data with missing values of key variables

(4) To eliminate the effect of extreme values, continuous-type variables are reduced-tailed at the 1% and 99% quantiles.

4.2. Modeling

To test the first hypothesis that the shareholding behavior of social security funds has a positive effect on the ESG performance of firms, this study constructs the following model:

Model I:$ESG_{it+1} = \beta + \beta_1 Sinf_{it} + \gamma controls_{it} + Ind_t + Year_t + \theta_{it}$

where the explanatory variables areESG_{it+1} is the ESG score of firm i in year t+1, and$CNSSF_{it}$ is the proportion of shares held by the social security fund in firm i in year t;$controls_{it}$ is a series of control variables for firms in year t. In this paper, firm size Size, gearing ratio Leverage, first largest shareholder holding Fhold, other institutional holding Other_IO, Tobin's Q value TQ, and return on total assets ROA are used;Ind_t are industry fixed effects;$Year_t$ is a time fixed effect;θ_{it} is the random perturbation term.

For the test of hypothesis two, the paper is divided into three equal parts based on the ESG scores in the sample data, which are low ESG group, medium ESG group, and high ESG group, and the model of hypothesis one is applied to test it.

For the test of hypothesis three, this paper constructs the following model to test hypothesis three based on the regional division of east, center, and west as proposed in (P):

Model III:$ESG_{it+1} = \beta + \beta_1 Sinf_{it} + \gamma controls_{it} + Area + Ind_t + Year_t + \theta_{it}$

Where Area represents the region, with reference to Wang Fashuo et al. (2021)[16] the assignment of the region: 1 for the eastern region, 2 for the central region, and 3 for the western region, respectively, to carry out the regression equations, if the social security fund shareholding is not significant for the ESG development of the western region and the eastern region, then it means that in the two regions there are their respective environmental factors and control variables that make corporate decision-making have a negative effect on ESG. On the other hand, it means that for the regions with moderate and stable economic development, social security fund shareholding does not contribute to the ESG performance of enterprises.

(1) Main Variables

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Table 1. Main Variables

Variable type	Variable Code	Variable Definition
Corporate ESG Levels	ESG	The CSI ESG ratings are categorized into nine grades: AAA, AA, A, BBB, BB, B, CCC, CC, C. Here, they are assigned with a number from 9 to 1, and all the quarterly data are annualized for the purpose of measuring the ESG level of the companies.
Social Security Fund holdings	Sinf	Shareholding of the Social Security Fund in an enterprise× 100%
Social Security Fund holdings	Sinfdum	Dummy variable for SSF holdings, with holdings taken as "1" and no holdings taken as "0"
Company size	Size	Natural logarithm of total assets of the enterprise at the end of the year
gearing	Leverage	Total liabilities/total assets× 100%
Shareholding of the largest shareholder	Fhold	Shareholding ratio of the largest shareholder× 100%
Other institutional holdings	Other_IO	(Percentage of shares held by institutional investors - percentage of shares held by social security funds)× 100%
Tobin's Q	Tq	(Market capitalization of the enterprise's stock + total liabilities)/total assets× 100%
return on total assets	ROA	Net profit/average total assets× 100%

(2) Descriptive Statistics

Table 2. Descriptive Statistics

Variable	n	Mean	Std. Dev.	Min	Max.
Sinf	30536.00	0.41	1.27	0.00	38.65
sinfdum	30536.00	0.17	0.38	0.00	1.00
leverage	30536.00	0.40	0.20	0.01	3.51
fhold	30536.00	34.50	15.19	0.00	100.00
other_io	30536.00	41.39	25.61	0.00	101.47
tq	30536.00	1.95	1.41	0.00	31.40
size	30536.00	18.27	8.78	0.00	28.64
roa	30536.00	0.04	0.07	-1.92	0.60
esg	26446.00	4.14	1.08	1.00	8.00

In this study, 30,536 sample sizes are selected, in which ESG data have some missing values, and linear interpolation is applied in the following regression for data correction. According to the descriptive statistics, it can be concluded that the median value of the SSF shareholding data is 0.41%, and the maximum value is 38.65%, which indicates that the SSF has not yet invested heavily in listed A-share companies during the period 2012-2022; the mean value of the dummy variable for the SSF's shareholding is 0.17, which indicates that on average, there are 17 companies in every 100 companies that are held by the SSF; and the mean value of the ESG of the companies is 4.14 with a minimum value of 1.00 and a maximum value of 8.00.

(3) Multicollinearity test

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Table 3. Multicollinearity test

Variable	VIF	1/VIF
Sinf	2.56	0.39
Sinfdum	2.63	0.38
other_io	1.40	0.71
leverage	1.37	0.73
fhold	1.34	0.75
roa	1.24	0.81
tq	1.16	0.87
size	1.14	0.88
Mean VIF	1.60	

In order to prevent the existence of serious multicollinearity problems between the variables, which affects the regression results of this paper, this paper carried out the Variance Inflation Factor (VIF) test between the variables, and the results of the test are shown in Table 3, and the value of the VIF of each variable is much less than 10, which proves that there is no multicollinearity problem between the variables used in the hypothesis test of this paper.

5. Empirical Analysis and Stability Tests

5.1. Can Social Security Fund Holdings Affect Corporate ESG Performance?

Table 4. Social Security Fund Holdings and Corporate ESG Performance

	(1)	(2)	(3)	(4)
VARIABLES	Esg	Esg	Esg	Esg
Sinf	0.013*	0.014*	0.019**	0.019**
	(0.01)	(0.01)	(0.01)	(0.01)
Leverage		0.022	0.013	0.054
		(0.05)	(0.12)	(0.11)
Other_io		-0.000	-0.000	-0.000
		(0.00)	(0.00)	(0.00)
Tq		-0.011	-0.032***	-0.017
		(0.01)	(0.01)	(0.01)
Size			-0.004**	-0.002
			(0.00)	(0.00)
Roa				0.171
				(0.27)
Fhold				-0.004**
				(0.00)
Constant	4.131***	4.149***	4.278***	4.299***
	(0.01)	(0.03)	(0.08)	(0.09)
Observations	17,906	17,906	17,906	17,906
Adjusted R-squared	0.000	0.000	0.001	0.089
Number of id			1,835	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

r(1), r(2), r(3), and r(4) represent the results of the regression of the explanatory variable Sinf Social Security Fund shareholding with the explanatory variable ESG alone, after adding individual explanatory variables, after adding individual fixed effects, after adding time fixed

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effects and industry fixed effects, respectively. r(4) is the result of adding all the control variables with fixed effects, and it can be additionally noticed that: the Fhold (first major shareholder holding) has a negative and significant coefficient, indicating that the first major shareholder holding has a negative correlation on corporate ESG. For the core explanatory variable Sinf, the four regression coefficients increase sequentially and change from 10% significant to 5% significant, indicating that the shareholding of social security fund has a certain influence on the ESG performance of enterprises and is less affected by external factors. Hypothesis one is valid.

Differences in the Impact of Social Security Funds on Firms with Different Levels of ESG

Table 5. Social Security Fund Holdings and Companies with Different ESG Levels

	(1)	(2)	(3)
VARIABLES	Esg	Esg	Esg
Sinf	0.002	0.003	0.018**
	(0.01)	(0.00)	(0.01)
Leverage	0.088	0.072	0.036
	(0.13)	(0.05)	(0.11)
Other_io	0.002*	-0.001	0.000
	(0.00)	(0.00)	(0.00)
Tq	-0.046***	-0.011**	0.003
	(0.01)	(0.01)	(0.01)
Size	-0.000	-0.001	0.004**
	(0.00)	(0.00)	(0.00)
Roa	0.014	0.116	-0.513*
	(0.30)	(0.12)	(0.26)
Fhold	0.000	-0.001	-0.001
	(0.00)	(0.00)	(0.00)
Constant	2.842***	4.307***	5.393***
	(0.12)	(0.04)	(0.09)
Observations	6,014	6,238	4,988
Adjusted R-squared	0.255	0.039	0.380

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5 reports the results of regression analysis of SSF shareholding on low ESG firms, medium ESG firms, and high ESG firms, in which the coefficient of column (3) is six times as large as that of column (2) and significant, which indicates that the SSF shareholding has a strong improving effect on high ESG level development firms, and hypothesis two is valid.

5.2. Differences in the Impact of Social Security Fund Holdings on the ESG of Firms in Regions with Different Levels of Development.

Table 6 shows the results of the impact of social security fund shareholding on the ESG level of enterprises in the eastern region, central region and western region. The results are significant in the central region, indicating that the role of social security fund shareholding on the governance of ESG enterprises in the central region is higher than the other two regions.

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Table 6. Differences in the Impact of Social Security Fund Shareholding on Corporate ESG Levels under Different Regions

	(1)	(2)	(3)
VARIABLES	Esg	Esg	Esg
Sinf	0.019	0.050*	0.047
	(0.02)	(0.03)	(0.05)
Sinfdum	-0.013	-0.095	-0.064
	(0.04)	(0.09)	(0.11)
Constant	4.145***	4.140***	4.063***
	(0.01)	(0.02)	(0.03)
Observations	12,155	3,247	2,047
Adjusted R-squared	0.087	0.092	0.105

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6. Robustness Tests

6.1. Replacement of Core Explanatory Variables

This paper verifies the stability of the main test findings by replacing the core explanatory variables. For hypothesis two, the social security fund shareholding is replaced with the social security fund shareholding dummy variable in Table 7 and regressed with model (1), and the results are shown in Column (3). It can be seen that for the social security fund shareholding dummy variable is also significant at the 10% level for firms with high ESG levels. Hypothesis two robustness is passed. For hypothesis three, in Table 8, the shareholding of social security fund is replaced by the shareholding proportion of other institutions, and regressed with model (3), the coefficients obtained are negative, indicating that the shareholding of other institutions has an inverse effect on the ESG governance of the enterprises in the central region, which side by side proves that the significance of social security fund's shareholding is established, and the hypothesis three is proved.

Table 7. Replace the core explanatory variable SSF holdings with the SSF holdings dummy variable

	(1)	(2)	(3)
VARIABLES	Esg	Esg	Esg
Sinfdum	-0.014	-0.007	0.041*
	(0.03)	(0.01)	(0.02)
Leverage	0.090	0.072	0.034
	(0.13)	(0.05)	(0.11)
Other_io	0.002*	-0.001	0.000
	(0.00)	(0.00)	(0.00)
Tq	-0.046***	-0.011**	0.002
	(0.01)	(0.01)	(0.01)
Size	-0.000	-0.001	0.004**
	(0.00)	(0.00)	(0.00)
Roa	0.030	0.131	-0.512*
	(0.30)	(0.12)	(0.26)
Fhold	0.000	-0.001	-0.001
	(0.00)	(0.00)	(0.00)
Constant	2.841***	4.309***	5.399***
	(0.12)	(0.04)	(0.09)
Observations	6,014	6,238	4,988
Adjusted R-squared	0.255	0.039	0.380

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

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Table 8. Replacing the core explanatory variable SSF holdings with other institutional holdings

	(1)	(2)	(3)
VARIABLES	Esg	Esg	Esg
Other_io	0.000	-0.005**	-0.002
	(0.00)	(0.00)	(0.00)
Constant	4.133***	4.355***	4.172***
	(0.05)	(0.10)	(0.14)
Observations	12,155	3,247	2,047
Adjusted R-squared	0.087	0.093	0.105

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.2. High-dimensional Fixed Effects

In panel data analysis, fixed effects models can be used to absorb individual-specific time-invariant characteristics, thereby reducing omitted variable bias. When the dataset contains multiple dimensions of fixed effects, such as countries, industries, and firms, the traditional fixed effects model may lead to inefficient model estimation due to the excessive number of fixed effects variables. In this paper, in order to reduce the impact of multiple fixed effects for the regression results, high-dimensional fixed effects are utilized for the test (e.g., Table 9). Company fixed effects, year fixed effects, industry fixed effects, and city year fixed effects are fixed in the test, and the conclusion is significant.

6.3. Removal of Fixed Years

Table 9. Higher Dimensional Fixed Effects and Removal of Fixed Years

	High-dimensional fixation	Excluding new crown outbreaks
	(1)	(2)
	Esg	Esg
Sinf	0.0206**	0.0201**
	(0.0098)	(0.0094)
Leverage	0.0904	-0.0923
	(0.1154)	(0.1152)
Other_io	-0.0005	-0.0009
	(0.0011)	(0.0011)
Tq	-0.0091	-0.0042
	(0.0121)	(0.0119)
Size	0.0005	-0.0006
	(0.0020)	(0.0019)
Roa	0.4042	0.2510
	(0.2975)	(0.2896)
Fhold	-0.0048**	-0.0025
	(0.0019)	(0.0018)
_cons	4.2640***	4.3141***
	(0.0976)	(0.0964)
Firm fe	YES	YES
Year fe	YES	YES
Industry fe	YES	YES
City-year fe	YES	YES
r2_a	0.0944	0.1078
F	2.0289**	1.4424

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

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Due to the stagnant development of the economic situation of domestic enterprises during the epidemic, the financial situation of many enterprises in the period of 2020-2022 has great fluctuations, which can not be used as one of the indicators to measure the normal operation of the enterprise. In order to ensure that the regression results are not affected by abnormal years, this paper excludes the data of the years after 2919 from the regression (as shown in Table 9), and the test results are obtained to be significant, which indicates that the results of the study have a strong robustness.

6.4. Tool Variable Method

Since the regression model for this experiment only incorporates one key explanatory variable, the proportion of shares held by the Social Security Fund, and some of the control variables, there is a certain degree of error. Since the industry average data is not correlated with the model error term, the industry average is determined by the data of all the companies in the industry, while the error term is usually related to the factors specific to individual companies, which do not affect the average level of the whole industry. In order to avoid errors due to the model error term in the regression process, this paper refers to Li, Zhibin et al. (2022)[7] using the industry annual mean of the explanatory variables as instrumental variables. From Table 10 (1), it can be concluded that the explanatory variables have a strong significance of 1% with the instrumental variables, using the least squares method (2SLS) of estimation, after the estimation check the F-statistic, the p-value of the F-statistic is less than the level of significance, which can be the instrumental variables are significantly correlated with the endogenous variables. The results of the second stage regression show that Sinf remains significant for ESG, indicating that the findings of this paper are robust when endogeneity is considered.

Table 10. instrumental variable approach

	(1)	(2)
	Sinf	Esg
IV	0.9966***	
	(0.0017)	
Sinf		0.0183*
		(0.0087)
Leverage	-0.0244*	0.0537
	(0.0131)	(0.1391)
Other_io	-0.0003**	-0.0000
	(0.0001)	(0.0017)
Tq	0.0013	-0.0174
	(0.0015)	(0.0136)
Size	0.0002	-0.0019
	(0.0001)	(0.0012)
Roa	0.0373	0.1718
	(0.0342)	(0.2328)
Fhold	0.0005*	-0.0036
	(0.0003)	(0.0023)
Firm fe	YES	YES
Year fe	YES	YES
Industry fe	YES	YES
r2_a		-0.0036
F		2.5590*
N	17906	17906

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

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7. Mechanism Test

7.1. Quality of Information Disclosure

According to Du Qiuxuan et al. (2023)[5] , the quality of information disclosure can enable more social forces to supervise the behavior of enterprises, thus promoting the improvement of corporate ESG. Yi Zhihong et al. (2010)[8] proposed that in order to provide listed companies with the most reasonable governance mechanism, it is necessary to improve the quality of information disclosure to protect investors' interests. In a study by Wei Zhu et al. (2019)[9] , it is suggested that western countries no longer rely solely on legal and market tools, but use environmental disclosure quality policy as an important tool to measure environmental pollution. In this paper, the corporate disclosure quality indicator is used as a mediator variable to conduct empirical tests, and the regression results are shown in Table 11: the regression coefficient of the explanatory variable and the mediator variable in Column (1) is 0.0114 (significant at the 5% level), and the regression results of the proportion of the social security fund's shareholding and the quality of the corporate disclosure to the explanatory variable ESG are both significant in Column (2), which indicates that the quality of the corporate disclosure is positively related to the ESG performance is positively correlated, corresponding to the strong public good attribute that SSF has. Further, through Bootstrap estimation method with put-back sampling 1000 times, the results show that the 95% confidence interval of the product of coefficients does not contain 0, indicating that the mediation effect is significant, which shows that the social security fund promotes the enhancement of corporate disclosure quality, and then promotes the enhancement of corporate ESG.

Table 11. Mechanism test - quality of disclosure

	(1)	(2)
	Quality of disclosure	Esg
Sinf	0.0114**	0.0191*
	(0.0049)	(0.0100)
Quality of disclosure		0.0749***
		(0.0230)
Leverage	-0.1430**	0.0128
	(0.0600)	(0.1287)
Other_io	0.0017***	-0.0006
	(0.0006)	(0.0013)
Tq	-0.0115*	-0.0158
	(0.0061)	(0.0122)
Size	0.0011	-0.0028
	(0.0010)	(0.0019)
Roa	2.3826***	-0.0098
	(0.1503)	(0.3018)
Fhold	0.0045***	-0.0020
	(0.0010)	(0.0020)
_cons	2.8524***	4.0447***
	(0.0495)	(0.1197)
r2_a	0.4312	0.1751
F	51.8550***	2.5111**
N	10482	10382

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

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8. Key Conclusion and Policy Recommendations

The Chinese government has played a key role in promoting the development of ESG, with a clear policy orientation and positive market response. Since 2023, a series of policies have been introduced to promote ESG development. For example, the State Council has issued the "Implementation Opinions on Promoting the High-Quality Development of Inclusive Finance", which calls for giving full play to the role of inclusive finance in support of green and low-carbon development, and promoting the innovation of green financial products. ESG investment is not only a revolution in traditional investment concepts, it is also a key part of building China's diversified pension protection system. Especially in the process of promoting the dual goals of "carbon peak" and "carbon neutrality", pension funds are regarded as a powerful driving force, which can not only provide the necessary financial support for green transformation. This paper analyzes the shareholding of social security funds in China's A-share market from 2012 to 2022, and finds that the shareholding of social security funds has a positive effect on the ESG performance of enterprises, and then explores the fact that shareholding of social security funds has a stronger effect on enterprises with good ESG performance. In addition, based on the correlation between social security funds and financial inclusion, this paper introduces the division of regions into the analysis of financial inclusion, and obtains the following results Social security fund shareholding has a stronger ESG governance effect on firms in the central region.

In the process of realizing China's "dual carbon goals", pension funds and ESG investments are in a win-win relationship. However, pension funds face challenges such as difficulties in obtaining data, inconsistencies in evaluation standards, and less stringent disclosure requirements when formulating ESG investment strategies. In order to enhance the transparency and comparability of pension funds in the field of ESG investment, it is recommended to establish a comprehensive data collection and analysis framework, harmonize ESG evaluation standards, and promote the implementation of mandatory information disclosure policies. These measures will help pension funds identify and manage ESG risks more effectively, while seizing sustainable investment opportunities for long-term asset appreciation and social responsibility.

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References

[1] Cai Hongbiao,Rao Pinggui. Institutional investors, tax administration and corporate tax avoidance[J]. Accounting Research,2015,(10):59-65+97.

[2] Bai Xueshi,Ren Qiao,Liu Xin,et al. Opportunities and Practical Strategies for China's Insurance Institutions to Carry Out ESG Sustainable Investment[J]. Insurance Theory and Practice,2021,(05):76-86.

[3] WANG Yannan,TAN Zhuohong,ZHENG Lekai. Research on the impact of digital financial inclusion on social security[J]. Research on Quantitative and Technical Economics,2020,37(07):92-112. DOI:10.13653/j.cnki.jqte.2020.07.005.

ISSN: 2692-7608 DOI: 10.6981/FEM.202411_5(11).0020

[4] LI Jianjun,PENG Yuchao,MA Sichao. Financial inclusion and China's economic development: Multidimensional connotation and empirical analysis[J]. Economic Research,2020,55(04):37-52.

[5] DU Qiuxuan,JIANG Yan,HOU Deshuai. Empirical analysis of social security fund shareholding on corporate ESG improvement[J]. Insurance Research,2023,(12):55-70.DOI:10.13497/j.cnki.is. 2023.12.005.

[6] Zheng Bingwen,Li Chen,Pang Xi. Theory, Practice and Trend of ESG Investment of Pension Funds[J]. Economic Research Reference,2022,(03):18-38.DOI:10.16110/j.cnki.issn2095-3151.2022.03.009.

[7] Li ZB, Shao YM, Li ZZ, et al. ESG disclosure, media monitoring and corporate finance constraints[J]. Scientific Decision Making,2022,(07):1-26.

[8] YI Zhihong,JIANG Fuxiu,QIN Yihu. Product market competition, corporate governance and disclosure quality[J]. Management World,2010,(01):133-141+161+188.DOI:10.19744/j.cnki.11-1235/f.2010.01.015.

[9] ZHU Wei, SUN Yuxing, TANG Qian. Substantial disclosure or selective disclosure:The impact of corporate environmental performance on the quality of environmental information disclosure[J]. Accounting Research,2019,(03):10-17.

[10] Fang Xianming,Hu Ding. Corporate ESG performance and innovation-Evidence from A-share listed companies[J]. Economic Research,2023,58(02):91-106.

[11] LI Chuntao,XUE Yuan,HUI Lili. Social security fund shareholding and corporate surplus quality:Evidence from A-share listed companies[J]. Financial Research,2018,(07):124-142.

[12] LI Huiyun,LIU Qianying,LI Shuyi,et al. Environmental, social and governance disclosure and corporate green innovation performance[J]. Statistical Research,2022,39(12):38-54.DOI:10.193 43/j.cnki.11-1302/c.2022.12.003.

[13] ZHOU Fangzhao,PAN Wanying,FU Hui. ESG Responsibility Performance of Listed Companies and Institutional Investors' Shareholding Preferences - Empirical Evidence from Chinese A-share Listed Companies[J]. Scientific Decision Making,2020,(11):15-41.

[14] Aman Kim. The impact of institutional investors' ESG preferences on the value of green innovation[J]. Financial Theory and Practice,2022,(01):65-75.

[15] Hu Jie,Yu Xianrong,Han Yiming.Can ESG ratings promote corporate green transformation? -- Validation based on multi-temporal double-difference method[J]. Research on Quantitative Economics and Technical Economics,2023,40(07):90-111.DOI:10.13653/j.cnki.jqte.20230517.002.

[16] WANG Fashuo,XIANG Jiainan. A study of factors influencing the proliferation of open data policies of Chinese local governments--an event history analysis based on data from 283 prefecture-level cities[J]. Journal of Intelligence,2021,40(11):113-120.

[17] JIN Qinglu,XUAN Yang,LI Gang,et al. Social security fund shareholding and corporate dividend policy[J]. Accounting Research,2016,(05):34-39+95.

[18] XI Longsheng,ZHAO Hui. Role mechanism and data test of corporate ESG performance affecting surplus persistence[J]. Management Review,2022,34(09):313-326.DOI:10.14120/j.cnki.cn11-5057/f.20221024.001.

[19] XU Xian, SHEN Yu. "Whether to Seek Others or Rely on Ourselves: A Study on the Efficiency of the National Social Security Fund's Stock Market Investment[J]. Financial Research,2013,(09):193-206.

[20] LU Yao,ZHU Yujie,HU Xiaoyuan. An Empirical Study on Institutional Investors' Shareholding and Listed Companies' Violation Behavior[J]. Nankai Management Review,2012,15(01):13-23.

[21] Shi YD, Wang ZL. Have Chinese institutional investors really stabilized the market? [J]. Economic Research,2014,49(12):100-112.

[22] Lai, W.J., Lu, X.Y.. Do institutional investors pay attention to firms' environmental performance? -- Empirical Evidence from Listed Companies in Heavily Polluted Industries in China[J]. Financial Research,2015,(12):97-112.

[23] Yao Yi,Liu Zhiyuan. Do institutional investors have a monitoring role? [J]. Financial Research, 2009,(06):128-143.

ISSN: 2692-7608 DOI: 10.6981/FEM.202411_5(11).0020

[24] Gu Haifeng,Zhang Xiaojie. Financial flexibility, ESG performance and corporate innovation performance[J/OL]. Securities Market Herald,1-12[2024-09-18].http://kns.cnki.net/kcms/detail/44.1343.F.20240913.1111.002.html.

[25] GUO XISHI, CHEN WEICHENG. Research on the Investment of Basic Pension Insurance Individual Account Fund under Split Account System[J]. China Soft Science, 2005,(10):58-65.

[26] JIANG Yurong. Pension Fund System Reform Prospects and Implications[J]. Academia,2015, (10):217-226+328.

[27] YANG Haiyan,SUN Jian,WEI Dehong. The Impact of Institutional Investor Independence on Agency Cost[J]. Securities Market Herald,2012,(01):25-30.

[28] ZHANG Xianzhi,JIA Xingfei. Research on the Impact of Social Security Fund's Shareholding on Firm Value--Based on the Perspective of Heterogeneity of Shareholding Characteristics[J]. Research on Financial Issues,2014,(05):45-52.

[29] Jiang Yi-Yin,Yao Shujie.ESG disclosure,external concerns and corporate risk[J]. Journal of Systems Management,2024,33(01):214-229.

[30] Duan Haiyan. Research on the impact of different sources of financial capital on enterprise R&D investment--Taking small and medium-sized board listed companies as an example[J]. Science and Technology Progress and Countermeasures,2016,33(14):88-92.

[31] ZHANG Changjiang,SHI Yuning,ZHANG Longping. Green culture, environmental performance and corporate environmental performance information disclosure[J]. Finance and Economics Series,2019,(06):83-93.DOI:10.13762/j.cnki.cjlc.2019.06.007.

[32] XU Xuegao,ZHANG Zhao,ZHAO Peifang. Visualization research on ESG disclosure of agricultural leading enterprises--an analysis based on knowledge mapping[J]. Jiangsu Agricultural Science, 2023,51(11):241-250.DOI:10.15889/j.issn.1002-1302.2023.11.034.

[33] Does the stock market fully value intangibles? Employee satisfaction and equity prices[J]. Alex Edmans. Journal of Financial Economics, 2011

[34] Does socially responsible mutual fund performance vary over the business cycle? New insights on the effect of idiosyncratic SR features[J]. Juan Carlos Matallín-Sáez;;Amparo Soler-Domínguez;; Diego Víctor de Mingo-López;;Emili Tortosa -Ausina.Business Ethics: a European Review,2019

[35] Huang, D.Z.X. 2022, "Environmental, social and governance factors and assessing firm value: valuation, signaling and stakeholder perspectives" , Accounting and Finance,62,1983-2010. Accounting and Finance, 62, 1983-2010.

[36] The motivation and impact of pension fund activism[J]. Diane Del Guercio;; Jennifer Hawkins.