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GREEN FINANCE AND ENVIRONMENTAL AND SOCIAL GOVERNANCE: EVIDENCE FOR FTSE100 COMPANIES

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Abstract

Scholars have focused increasingly on green finance in recent years, and public corporations have come to a general understanding about the need of timely disclosure of environmental, social, and governance (ESG) information. It is possible to ascertain whether green money compels corporations to actively publish ESG due to the strong relationship between the two. The study's sample comprises non-financial Breton companies that were listed between 2015 and 2023. The empirical findings demonstrate that green finance has a beneficial impact on listed companies' ESG performance. This study's research of heterogeneity leads to the following conclusions: businesses that are owned by the state, polluters, and those based in low-carbon pilot cities outperform businesses when it comes to the promotion of ESG ratings by green financing. Additionally, this study adds market concentration and social trust as moderating variables to the already rich framework of research on green financing. The 'black box' influence of green finance on ESG is exposed through the examination of moderating variables; this offers industry and government theoretical backing to enhance their comprehension of the impact of policies and serves as a guide for change and advocacy.

Keywords: Green finance; ESG; Market concentration; Social trust; Heterogeneity; UK

INTRODUCTION

Environmental pollution and the climate disasters brought about by industrial civilization have forced people to reevaluate how humans and nature relate to each other in terms of development; sustainable development is now humanity's main goal. During the 2015 United Nations climate conference, the world's leading nations signed the Paris Agreement, and the United Nations adopted the agenda 2030. International organizations have proposed transformation programs aimed at carbon neutrality and carbon reduction (Crisan-Mitra et al. 2016; Vagin et al. 2022). According to Wu et CY Liew (2023) the UK suggested in 2020 that "carbon dioxide emissions should peak by 2030 and aim for carbon neutrality by 2060" to the UN General Assembly. The financial backing required for the shift to a low-carbon economy can be obtained through the resource allocation function of green finance. The notion of "green finance" was born out of the financial sector's awareness of environmental challenges, and as the economy and society progress, so do its definition, implications, and applications. The expansion of green finance efforts is a growing area of interest for many governments and financial organizations worldwide, making green finance a popular issue. International attention has been drawn to green financing since the 1997 signing of the Kyoto Protocol.

Green finance has gained more attention since the start of the Paris Agreement. Green finance is a form of financing used to support green growth that integrates an emphasis on the environment and the economy (Jeucken et Bouma 1999; Berrou et al. 2019). The UK has seen tremendous economic growth in recent years, and to provide sustainable economic development, the Breton government has looked to green growth and finance.

A green finance scheme was first put up by the UK government in March 2015. The UK then released guidelines for the creation of a green financial system in the summer of 2015, which aided in the funding of green projects and sped up the creation of markets for green bonds and funds. The first set of pilot projects for the creation of unique pilot zones for green financial innovation and reform were chosen by the UK government in the summer of 2016. Green finance was introduced and put into practice with this decision (Falcone, 2020).

By emphasizing non-financial returns and stakeholder values, Environmental, Social, and Governance (ESG) is a development concept that seeks to reconcile economic and social values and pushes businesses to adapt to economic globalization and sustainable development (Leins 2020). Environmental, social, and governance factors are referred to as ESG. These elements are thought to be crucial to a company's long-term worth and serve

as crucial benchmarks for investors evaluating the opportunities and dangers associated with a given company. Encouraging corporations to actively disclose environmental, social, and governance (ESG) information is a baseline and goal for green finance reform and innovation. Globally, as financial globalization and socialization have grown, there has been a consensus among businesses in recent years regarding the necessity of timely ESG disclosure.

The term "green finance" refers to an investment and financial strategy that aims to support long-term environmental and climate goals (Ozili 2022). The use of green finance has the potential to improve environmental circumstances through the funding of projects including environmental protection projects, renewable energy projects, and long-lasting buildings (Muganyi et al. 2021). Investing in renewable energy initiatives has the potential to increase carbon emissions and hence lower environmental risks. The growing desire among investors for long-term investments has resulted in an increase in the availability of green financial products and services within the financial industry. Green bonds, sustainable investment funds, and socially responsible investment (SRI) products are among the previously mentioned offerings. These products help to advance environmental and social goals, such as promoting community development, enhancing social equality, and improving employee well-being, and all in line with ESG principles (Becchetli, 2022; Baid et al. 2022). The growing global attention being paid to climate change and sustainable development has coincided with the rise in relevance of green finance in the financial and investment domains. Concurrently, investors and financial institutions are realizing more and more how crucial ESG factors are to the decision-making process when it comes to investing and risk management. Due to its recent emergence, the body of research on green finance in Britain is still lacking (Hafner et al. 2020; Guttmann, 2018).

There is currently less scholarly investigation of the precise effects of policy results on ESG performance, with most of the study concentrating on the macro-level, broader implications of green finance regulations. It is crucial to understand that the association between green finance and ESG criteria may not always be consistent with study results. These variables can include the research technique employed, the industrial environment, geographic location, and temporal considerations. To close this research gap, this study is written.

Green finance and ESG practices ought to be more prominent in fostering sustainable growth and reducing environmental hazards as the UK works toward being a greener and more sustainable economy. This is an opportunity to investigate whether green

finance in the UK requires corporations to actively publish ESG information, given the tight relationship between green finance and ESG.

This study aims to make the following contributions: first, analyze the impact of green finance establishment on policy from a microeconomic perspective; second, add to the body of knowledge on green finance; and third, provide fresh insights into the variables influencing ESG. Second, the effects of policy may be impacted by the exclusion of other financing channels, as most study solely looks at how corporate behavior is affected by the introduction of green finance policies. By providing a more thorough presentation of market concentration and social trust, this paper enhances the existing research framework on green financing. By examining modulating variables, we can open the "black box" of how green finance affects ESG, give businesses and the government theoretical support to better understand the impact of policies, and serve as a decision-making tool for green finance reform monitoring and pilot program promotion.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Green finance and ESG

In the Green Finance Research Handbook, Sachs et al. (2019) have methodically expanded on the global development of green finance and have analyzed and compiled the environmental financing practices of developed nations like Germany and Britain. One area of contemporary financial innovation is green finance. The theoretical underpinnings of green finance are derived from the study of traditional financial structure theory and financial function theory; on the other hand, the field of green finance is closely associated with the study of sustainable growth theory and corporate social responsibility theory. The notion of sustainable growth serves as the theoretical foundation for green finance, which combines ecological, social, and economic sustainability to practice high-quality macroeconomic development (Carson 1962). The theoretical foundation of green finance, which is centered on the sustainable microeconomic development of businesses, is the principle of corporate social responsibility (Sheldon 1924). Green financial institutions prioritize the environmental and social performance of businesses while offering finance and investment opportunities that align with sustainable development and eco-friendly values.

To receive green financial assistance, companies must provide ESG information that demonstrates their commitment to environmental and social responsibility and aligns with the goals and values of green finance institutions. Green finance has drawn a lot of attention lately to fight climate change and advance sustainable development. Given its significant role in global warming, the UK has worked hard to grow its green finance industry.

Numerous scholarly investigations have underscored the significance of green finance in promoting economic expansion and enhancing environmental quality. Sun (2023) examine how green financing affects the expansion of renewable energy, whereas Akomea et al. (2022) investigate how green credit policy affects the environment. Measurements of UK green finance development and possibilities have been made in several research.

To monitor the expansion of green financing in Britain, Wang et al. (2021) developed a green finance index. A lot of study has been done on how green finance regulations affect listed businesses' ESG performance. Akomea et al. (2022) examine the encouraging effects of green rules on green investment using UK ESG investment trends. The impact of green finance policy on the ESG performance of manufacturing enterprises in the United Kingdom is examined by Sun et al. (2023). The impact of green financing legislation on the ESG performance of UK enterprises is examined by Wang et al. (2022). Furthermore, in the area of green finance, Akomea-Frimpong et al. (2022) look at research gaps and prospective future directions. Yang et al. (2022) investigates the volatile fields of green finance, clean energy, and green economic practices to explore how these factors impact long-term success as shown by ESG indices. Overall, the assessment of the literature indicates that green finance is becoming more popular in Britain and that more research is needed to understand how green finance laws have affected sustainability and ESG performance over time. Companies that wish to get funding from green financial institutions must submit pertinent ESG data that demonstrates their performance in terms of environmental and social responsibility. Companies have been motivated to voluntarily provide ESG information by this demand. Thus, the following hypothesis is put out by this study:

H1: Green finance has a significant positive relationship with ESG in companies listed on the London FTSE 100.

Moderating effects of market concentration on green finance and ESG

One widely used indicator of market concentration is the HHI index. In recent years, there has been a growing body of research on the connection between HHI and ESG concerns. Numerous investigations have examined the mechanism via which the HHI and environmental performance are related. For instance, Wu and Zhu's (2020) study discovered a positive correlation between market concentration and the adoption of clean technologies in the Breton industrial sector, while Lin et al. (2019) found that higher market concentration in the electricity industry was linked to lower carbon emissions. Few investigations have focused on the relationship between HHI and social variables. Finally, a number of studies have examined the connection between governance concerns and HHI.

Higher market concentration in the UK pharmaceutical industry was linked to lower levels of board independence, according to a study by Gao and Li (2020), while higher market concentration in the Breton banking industry was found to be associated with lower corporate governance scores by Li et al (2020). Ali et al. (2022) investigated the variables affecting the efficacy of ESG and non-ESG corporate social performance in research of Southeast Asian nations.

According to the study, HHI has a detrimental impact on non-ESG companies' social performance, whereas this impact is negligible for ESG companies. This shows that, in terms of their social performance, ESG enterprises are less affected by market concentration than non-ESG firms. According to research by Harjoto et al. (2019), businesses with low HHI have a higher chance of being certified, indicating a favorable correlation between low market concentration and social and environmental performance. The relationship between ESG performance and board network centrality was examined by Harjoto and Wang (2020).

The study discovered a relationship between ESG performance and board network centrality. This positive association, however, is less pronounced in companies with high HHI, suggesting that excessive market concentration may restrict the beneficial impact of board network centrality on ESG performance. Research has been done on the ESG effects of traditional pension fund investments and SRI investments (Alda 2021). The study discovered that SRI funds make investments in businesses that have lower HHI and higher ESG scores, suggesting that market concentration has a detrimental impact on ESG performance.

The relationship between economic policy uncertainty, stakeholder involvement, and ESG practices was studied by Vural-Yavaş (2021) in relation to competition. Indicating that market concentration may restrict the good effect of stakeholder engagement on ESG performance, strong competition increases the beneficial impact of stakeholder engagement on ESG practices.

Overall, these research point to a negative relationship between ESG performance and market concentration as determined by HHI. These findings should be carefully considered by investors and policy makers who wish to enhance ESG performance in highly concentrated markets. The association between HHI and GSE is better understood thanks to current research, but further study is required to properly comprehend this relationship. More research is specifically required to investigate the mechanisms underlying the connections that have been found and to find out how market concentration might interact

with other factors to affect ESG outcomes. Because of this, the following hypothesis is put out in this study:

H2: Market concentration significantly and negatively moderates the relationship between green finance and ESG among companies listed on the London FTSE 100.

Moderating effects of social trust on green finance and ESG

The confidence and faith that people or groups have in the integrity, dependability, and moral behavior of other people or institutions is known as social trust. It is founded on transparency, accountability, and moral behavior and is a necessary part of a stable society (Guiso et al. 2008). According to Kanagaretnam et al. (2019), a high level of social trust encourages people to work together, participate in economic activities, and socialize with others. These actions promote societal prosperity and positive connections, which in turn stimulate economic growth and the expansion of financial markets. Chen and Wan (2020) contend that the social norms approach and the social networks method are the two schools of thought that try to explain the relationship between social trust and corporate social responsibility (CSR) behavior. Social trust influences managerial decisions and CSR behavior. These two findings imply that when social trust is prevalent in the workplace, managers may be motivated to take socially responsible acts and prevented from engaging in activities that are not. In areas with higher levels of social trust, the community holds the values of honesty and reliability in higher regard.

Managers consequently incorporate these principles into their personalities, which affects the judgments they make. Consequently, this integrity and dependability support managers in giving stakeholders' interests and the bonds they build with them more weight, allowing organizations to embrace and follow socially conscious activities (Miranda et al. 2023). Conventionally, corporate social responsibility (CSR) refers to the steps businesses take to enhance their corporate citizenship and social responsibility. One significant difference between ESG and CSR is that ESG explicitly incorporates governance, whereas CSR addresses governance issues subtly in relation to social and environmental considerations. Gillan et al. (2021) claim that ESG is a more expansive idea than CSR.

Enhancing social trust in the UK can help the country fully benefit from market participation in resource allocation, address issues of information asymmetry, lower the cost of transactions in the economy, support business financing needs, and promote market vigor. Companies might be properly guided to focus on ESG management by a robust social credit system, which creates imperceptible behavioral limitations.

Companies can obtain moral capital by gaining the favor of creditors and future investors through effective management systems. According to Almubarek et al. (2023), social trust empowers managers to protect the interests of stakeholders and promotes the adoption of ESG practices by both parties. Consequently, the following theory is put forth by this study:

H3: Among London FTSE 100 listed companies, social trust considerably and favorably moderates the association between green financing and ESG.

RESEARCH METHODOLOGY

Data sources and Sample selection

Using information from the UK Stock Market database, the Accounting Research Database (CSMAR), the Bloomberg database, and the list of firms listed on the FTSE 100 London Stock Exchange between 2015 and 2023 comprise the sample. To guarantee the dependability and scientific validity of the data outcomes, we do data processing and eliminate the subsequent: (1) Financial sector companies; (2) Specially treated (ST) listed corporations; and (3) Missing data listed companies. The sample results in this study are generated after the sample variable data has been winsorized at the 1% and 99% levels.

Definition of variables

Green finance: The UK Statistical Yearbook was the source of data used to generate the Green Finance Development Index. The green finance development score is determined at the prefecture level using green insurance and government backing in addition to green loans and green investment.

ESG: ESG data from Bloomberg and the technique of Chouaibi et al. (2022) are used in this study. It measures ESG and the three dimensions, respectively, using the overall ESG score, environmental score, social responsibility score, and corporate governance score that are made available by the Bloomberg database. Other ESG rating systems have issues with a large range of indicator ratings and the lack of ratings for the environmental, social responsibility, and corporate governance dimensions when compared to Bloomberg's ESG ratings (Widyawati 2021).

Market concentration: The most basic and significant element influencing market structure is market concentration, which indicates the level of monopoly and competition in the market. The HHI index is used in this study to calculate market concentration (Spiegel, 2021).

Table 1: Descriptive statistics of main variables

Variable	N	Mean	St-Dev	Min	Max
ESG	*873*	*31.145*	*9.515*	*9.758*	*70.045*
E	*873*	*9.578*	*13.209*	*0.000*	*78.980*
S	*873*	*13.411*	*8.117*	*0.000*	*56.713*
G	*873*	*69.084*	*15.316*	*29.737*	*98.714*
GF	*873*	*0.458*	*0.257*	*0.090*	*0.678*
HHI	*873*	*0.179*	*0.182*	*0.017*	*1.000*
Trust	*873*	*80.139*	*7.632*	*65.741*	*93.886*
Size	*873*	*28.733*	*1.535*	*26.741*	*31.075*
Lev	*873*	*0.498*	*0.406*	*0.075*	*0.898*
ROA	*873*	*0.065*	*0.073*	*- 0.135*	*0.235*
ATO	*873*	*0.688*	*0.490*	*0.086*	*2.511*
Cashflow	*873*	*0.071*	*0.074*	*- 0.121*	*0.247*
Growth	*873*	*0.179*	*0.073*	*- 0.453*	*0.261*
Indep	*873*	*0.382*	*0.073*	*0.378*	*0.583*
Top1	*873*	*0.397*	*0.178*	*0.093*	*0.768*
ListAge	*873*	*2.525*	*0.510*	*0.000*	*3.389*

The total of the squares of the market shares of all the companies that operate in a certain sector is how the HHI is determined. The ratio of a company's core business revenue to the total core business revenue of the industry in which it works is known as its market share (Kong et al. 2023). This allows us to get a value between 0 and 1, where 0 denotes perfect competition (a decentralized market) and 1 denotes a total monopoly (a highly concentrated market).

Social trust

According to Sharma et al. (2019) and Bag et al. (2023), the primary metric used in the UK to gauge social trust promotes businesses to voluntarily share information and actively fulfill their social obligations. Each major indication in the four hierarchical levels of the IEC indicator system encompasses a multitude of secondary and tertiary indicators. There are twenty-three sub-indicators, forty-one tertiary indicators, and seven headline indicators in this set. Numerous sources, including as statistical data, economic and financial directories, press stories, numerous rules and regulations, and data from research agencies, offer the information for the indicators (Borgman, 2017). The CEI is used in this study to gauge social trust at the prefecture level in the UK.

Control variables

Control variables are primarily used to reduce the impact of variables that can potentially skew research study results (Bernerth and Aguinis 2016). The firm scale (Size), asset-liability ratio (Lev), return on assets (ROA), asset turnover ratio (ATO), cash flow ratio (Cashflow), revenue growth rate (Growth), largest shareholder ownership ratio (Top 1), percentage of independent directors (Indep), and number of years established (ListAge) are the selections made by this study in accordance with the body of existing literature.

As control variables, the FTSE 100 database (Singh and Pillai 2022). ATO, Lev, ROA, and Size are important measures of a company's financial health. According to Adel Necib (2023), these factors may have an impact on a company's inclination to participate in green financing efforts. Indicators such as cashflow and growth can shed light on a business's financial status and future growth possibilities. The capacity and desire of businesses to commit funds to enhancing ESG procedures and promoting sustainable projects may be the cause of the possible association (Giese et al. 2019; Azmi et al. 2021). One way to evaluate a company's governance structure is to look at the Top 1 and Indep. Various variables might potentially influence the decision-making processes of companies, particularly in relation to the adoption of social and environmental ben- eficial initiatives (He et al. 2022). ListAge might serve as a reflection of the historical development and experiential trajectory of the company (Duppati et al. 2023). Established enterprises with a lengthy operational history may possess a greater wealth of knowledge and resources, enabling them to effectively execute initiatives related to green finance and ESG projects (Reber et al. 2022).

By exerting control over these variables, the assessment of the influence of green finance on ESG issues may be conducted with more precision, minimizing the interference of extraneous elements.

Table 2: Correlation test of the main variables

	ESG	E	S	G	GF	HHI	Trust	Size	Lev	ROA	ATO	Cash flow	Growth	Indep	Top1	List Age
ESG	*1*															
E	*0.844*	*1*														
S	*0.679*	*0.671*	*1*													
G	*0.793*	*0.381*	*0.249*	*1*												
GF	*0.233*	*0.131*	*0.132*	*0.254*	*1*											
HHI	*0.056*	*0.021*	*0.045*	*0.059*	*0.003*	*1*										
Trust	*0.091*	*0.050*	*0.129*	*0.063*	*0.135*	*0.059*	*1*									
Size	*0.450*	*0.367*	*0.303*	*0.340*	*0.100*	*0.100*	*0.127*	*1*								
Lev	*0.091*	*0.055*	*0.038*	*0.042*	*-0.028*	*0.008*	*0.028*	*0.523*	*1*							
ROA	*0.022*	*0.050*	*0.035*	*-0.020*	*0.028*	*-0.052*	*-0.029*	*-0.135*	*-0.078*	*1*						
ATO	*0.015*	*0.058*	*0.054*	*-0.059*	*-0.029*	*-0.005*	*-0.047*	*-0.020*	*0.082*	*0.199*	*1*					
Cashflow	*0.119*	*0.113*	*0.065*	*0.093*	*0.014*	*-0.046*	*-0.069*	*-0.024*	*0.261*	*0.499*	*0.053*	*1*				
Growth	*0.030*	*0.031*	*-0.008*	*0.028*	*0.019*	*-0.021*	*-0.009*	*0.004*	*-0.006*	*0.273*	*0.120*	*0.066*	*1*			
Indep	*0.078*	*0.053*	*0.053*	*0.075*	*0.075*	*0.034*	*0.075*	*0.085*	*0.017*	*0.022*	*0.005*	*0.023*	*-0.004*	*1*		
Top1	*0.021*	*0.051*	*0.039*	*-0.035*	*-0.022*	*0.083*	*0.100*	*0.225*	*0.094*	*0.060*	*0.084*	*0.074*	*-0.028*	*0.079*	*1*	
ListAge	*0.127*	*0.049*	*-0.030*	*0.160*	*-0.007*	*0.035*	*-0.047*	*0.239*	*0.267*	*-0.08*	*-0.063*	*-0.093*	*-0.139*	*-0.010*	*-0.069*	*1*

Table 3 : Multicollinearity test

	VIF	1/VIF
LEV	*1.952*	*0.512*
ROA	*1.949*	*0.513*
Size	*1.587*	*0.630*
Cashflow	*1.371*	*0.729*
ListAge	*1.258*	*0.794*
Top 1	*1.222*	*0.818*
Growth	*1.225*	*0.816*
ATO	*1.116*	*0.896*
GF	*1.038*	*0.963*
Indep	*1.020*	*0.980*
Mean VIF	*1.373*	

Model design

According to Zikmund et al. (2010), the regression equation $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3\ldots$ is obtainable through multiple regression analysis. This study develops model (1) to test Hypothesis 1 regarding the impact of green finance on ESG. X_2 as a moderating variable in the regression equation $Y = \beta_0 + \beta_1X_1 + \beta_2 X_1X_2\ldots$ is deter- mined by evaluating β2, the parameter estimates for the interaction term (Helm and Mark 2012). The purpose of model (2) is to test Hypothesis 2, regarding the moderat- ing effects of market concentration on the relationship between green finance and ESG. Model (3) evaluates Hypothesis 3, on the moderating effects of social trust on the relationship between green finance and ESG.

$ESG_{it} = \beta_0 + \beta_1GF_{it} + \beta$Control Variables + Fixed Effect + Stochastic Error Term (1)

$ESG_{it} = \beta_0 + \beta_1GF_{it} + \beta_2\ HHI_{it} \times GF_{it} + \beta$Control Variables + Fixed Effect + Stochastic Error Term (2)

$ESG_{it} = \beta_0 + \beta_1GF_{it} + \beta_3\ Trust_{it} \times GF_{it} + \beta$Control Variables + Fixed Effect + Stochastic Error Term (3)

Table 4: Regression results of model (1)

Variables	ESG (1)	E (2)	S (3)	G (4)
GF	*58.251*	*44.546*	*19.415*	*110.345*
	(34.785)	*(16.714)*	*14.313)*	*(37.008)*
Size	*3.452*	*3.647*	*2.214*	*4.445*
	(27.151)	*(18.179)*	*(20.351)*	*18.362)*
Lev	*-11.155*	*-9.321*	*-4.252*	*-19.442*
	(-15.125)	*(-7.584)*	*(-6.789)*	*(-17.654)*
ROA	*1.178*	*9.551*	*(-7.754)*	*(16.020)*
	(0.855)	*(4.880)*	*3.335*	*-10.213*
ATO	*-0.250*	*0.955*	*(1.805)*	*(-5.478)*
	(-1.998)	*(2.078)*	*0.543*	*3.576*
Cashflow	*1.255*	*-0.379*	*0.545*	*3.585*
	(1.376)	*(-0.374)*	*(0.675)*	*(1.978)*
Growth	*0.505*	*0.245*	*-0.202*	*1.506*
	(3.175)	*(0.950)*	*(-1.553)*	*(4.905)*
Indep	*6.893*	*12.211*	*5.374*	*3.475*
	(4.821)	*(4.988)*	*(4.403)*	*(1.301)*
Top 1	*-1.940*	*1.485*	*0.515*	*-7.698*
	(-2.166)	*(0.992)*	*(0.695)*	*7.897*
ListAge	*5.895*	*6.455*	*2.955*	*8.001*
	(28.321)	*(19.252)*	*(17.002)*	*(21.010)*
Constant	*-86.145*	*-115.526*	*-58.963*	*(-18.452)*
	(-31.223)	*(-26.897)*	*(-24.425)*	*11.546*
Observations	*11.545*	*11.545*	*11.545*	*11.545*
R-squared	*0.558*	*0.288*	*0.275*	*0.486*
Hausman-test	*6610.16*	*936.78*	*1107.54*	*3755.12*

RESULTS AND DISCUSSION

Descriptive statistics

The descriptive data are shown in Table 1. The variable's ESG score ranges from 9.758 at least to 70,045 at maximum, with an average of 34,145 and a standard deviation of 9,515. Like the dimensions of ESG, these findings show that companies' ESG performance varies. With a mean value of 80,139 and a standard deviation of 7,632, the moderating variable Trust shows that there is a notable variation in the Trust values. The results of the variable's descriptive analysis are consistent with another research (Singh and Pillai, 2022; Cardillo and Harasheh, 2023).

Correlation analysis

A correlation analysis is carried out beforehand to remove the impact of variable autocorrelation on the regression's outcomes (see Table 2). The correlation investigation found that there is no autocorrelation because all of the correlation coefficients between the variables are significantly less than 0.8 (Akoglu 2018).

This study uses the variance inflation factor (VIF)-based multicollinearity test (see Table 3) for further analysis. The bulk of the time, multicollinearity does not exist if the VIF is less than 10 (Ali et al. 2023). Given that all VIFs are less than 10 and that the average VIF is only 1.373, the model does not contain multicol- linearity (Shrestha 2020).

Table 5: Regression results of model (2)

Variables	ESG (1)	E (2)	S (3)	G (4)
GF	*59.045*	*46.478*	*18745*	*114.005*
	(33.145)	*(16.114)*	*(12.256)*	*(34.045)*
HHI	*5.445*	*4.615*	*-2.895*	*16.118*
	(2.978)	*(1.402)*	*(-1.764)*	*(3.858)*
c.GF * HHI	*-10.415*	*-12.287*	*4.992*	*-14.497*
	(-2.498)	*(-1.678)*	*(1.255)*	*(-2.999)*
Size	*4.002*	*3.845*	*2.387*	*4.355*
	(25.456)	*(17.645)*	*(20.000)*	*(18.145)*
Lev	*-10.001*	*-8.211*	*-4.021*	*-17.856*
	(-15.415)	*(-7.189)*	*(-7.513)*	*(-14.725)*
ROA	*1.097*	*9.825*	*3.218*	*-9.758*
	(0.722)	*(4.014)*	*(2.874)*	*(-3.644)*
ATO	*-0.435*	*0.814*	*3.334*	*(-3.756)*
	(-1.815)	*4.858*	*(2.478)*	*(3.758*
Cashflow	*1.188*	*(2.145)*	*0.578*	*3.378*
	(1.204)	*-0.488)*	*(0.715)*	*-1.855)*
Growth	*0.511*	*0.278*	*-0.198*	*1.493*
	(3.142)	*(0.276)*	*(-1.488)*	*(4.105)*
Indep	*6.899*	*12.008*	*5.347*	*4.008*
	(4.814)	*(5.006)*	*(4.442)*	*(1.345)*
Top1	*-1.978*	*1.545*	*0.578*	*-7.975*
	(-2.208)	*(1.103)*	*(0.847)*	*(-4.847)*
ListAge	*5.978*	*7.475*	*3.114*	*8.003*
	28.748	*(18.004)*	*(17.645)*	*(20.113)*

Constant	*-83.117*	*-110.255*	*-51.776*	*-85.946*
	(-26.499)	*(-21.885)*	*(-20.714)*	*(-15.133)*
Observations	*11.545*	*11.545*	*11.545*	*11.545*
R-Squared	*0.558*	*0.288*	*0.275*	*0.486*

Table 5…

Regression analysis

Fixed effects primarily regulate unobservable factors that remain constant throughout time and avoid endogeneity issues brought on by missing variables. In order to ascertain if fixed effects are employed for regression analysis, this study used the Hausman test (Baltagi et al. 2003; Frondel and Vance 2010).

The regression results of model (1) are shown in Table 4. Column (1) shows the outcomes of a regression with ESG as the dependent variable. The three ESG dimensions regression findings are shown in columns (2) through (4). There is a considerable positive correlation between GF and ESG, as indicated by the GF regression coefficient, which is substantially positive at the 1% significance level. As a result, the Hausman test validates H1 by confirming the validity of the regression result. Green finance allocates funds to projects that support social responsibility and environmental preservation, such as projects that improve social welfare and develop renewable energy, energy-efficient technology, and sustainable water resource management. Funding for these projects acts as a stimulant, encouraging businesses and investors to adopt and use socially and environmentally responsible practices (Sadiq et al. 2022). By offering financial incentives, attending to investor needs, reducing financing costs, and complying with regulatory frameworks, green finance is essential in promoting the adoption and improvement of ESG practices (Yang et al. 2022).

Table 6: Regression results of model (3)

Variables	ESG (1)	E (2)	S (3)	G (4)
GF	*-51.748*	*49.225*	*-69.144*	*-130.456*
	(-3.154)	*(2.211)*	*(-6.789)*	*(-5.146)*
Trust	*-0.598*	*0.398*	*-0.378*	*-1.998*
	(-8.278)	*(3.345)*	*(-5.785)*	*(-13.714)*
c.GF * Trust	*1.398*	*-0.097*	*1.178*	*3.274*
	(8.201)	*(-0.378)*	*(8.122)*	*(11.125)*
Size	*3.397*	*3.748*	*2.345*	*4.497*
	(25.205)	*(17.789)*	*(19.007)*	*(18.033)*
Lev	*-9.736*	*-8.479*	*-4.798*	*-16.173*

Table 6…

	(-14.736)	*(-8.115)*	*(-7.119)*	*(-14.788)*
ROA	*1.522*	*9.992*	*3.667*	*-10.442*
	(1.110)	*(4.522)*	*(2.998)*	*(-3.667)*
ATO	*-0.345*	*0.812*	*0.511*	*-2.647*
	(-1.206)	*(1.645)*	*(2.245)*	*(-4.671)*
Cashflow	*1.465*	*-0.095*	*0.888*	*3.744*
	(1.552)	*(-0.036)*	*(0.998)*	*(1.996)*
Growth	*0.486*	*0.347*	*-0.193*	*1.236*
	(2.945)	*(1.345)*	*(-1.366)*	*(4.311)*
Indep	*6.678*	*12.445*	*5.106*	*3.321*
	(2.945)	*(4.990)*	*(4.233)*	*(1.345)*
Top1	*-1.647*	*1.345*	*0.788*	*-6.945*
	(-1.578)	*(0.922)*	*(1.098)*	*(-3.945)*
ListAge	*5.822*	*6.611*	*3.004*	*7.553*
	(27.008)	*(20.045)*	*(17.033)*	*(19.745)*
Constant	*-33.423*	*-138.478*	*-24.008*	*64.887*
	(-5.122)	*(-12.745)*	*(-4.533)*	*(11.144)*
Observations	*11.545*	*11.545*	*11.545*	*11.545*
R-Squared	*0.562*	*0.286*	*0.279*	*0.491*

Additionally, this study investigates whether market concentration affects how GF and ESG are related. After creating model (2), the subsequent regression results are obtained and shown in Table 5. The regressions in columns (1), (2), and (4) exhibit a significant negative value for the interaction term c.GF × HHI. This aligns with the findings of Ali et al.'s research from 2022 regarding the connection between HHI and social dimension. Businesses with a high market concentration ratio may prioritize profit maximization over actively fulfilling their social obligations because they lack the motivation to do so.

Market concentration among Chinese listed businesses significantly and negatively moderates green financing and ESG, supporting hypothesis H2. High levels of market concentration could make it more difficult for the industry to take ESG issues into account and apply them (Moskovics et al., 2023). There could be several factors causing this, such as a lack of competition, information asymmetry, limited options, and a possible deterioration in ESG standards (Krell 2022).

One possible explanation for the lack of market concentration in the area connecting green finance and social responsibility is that certain businesses view social responsibility as a

crucial part of their long-term goals rather than merely as a means of gaining market share or making quick money (Ali et al. 2022).

We do the regression using model (3) to ascertain whether social trust moderates the relationship between GF and ESG. The results are shown in Table 6. At the 1% level, the c.GF × Trust interaction term is significantly positive in the regressions of columns (1), (3), and (4). Perhaps because of the intricacy of the sector or area in which the company works, social trust has no bearing on the environmental performance of listed corporations. H3 is confirmed by the fact that social trust significantly and favorably moderates the association between green financing and ESG among UK listed enterprises. According to Pan et al. (2021), the existence of social trust creates an environment that is favorable for the promotion of cooperation and collaboration among stakeholders. Businesses are more likely to disclose information related to environmental, social, and governance (ESG) factors when operating in an environment where trust is high (Chouaibi et al. 2021).

CONCLUSION

Scholars, particularly in developed nations, are becoming more aware of the policy impact of green financing due to its extensive application worldwide (Bibri et al. 2017). The empirical results of this study, which looks at Bretagnic non-financial listed companies from 2015 to 2023, confirm that green finance can help listed companies perform better in terms of environmental, social, and governance (ESG) factors. They also confirm that market concentration and social trust play a moderating role in the relationship between green finance and ESG, with market concentration moderating the relationship negatively and social trust moderating it positively. This study also finds, using heterogeneity analysis, that listed firms in low-carbon pilot cities, heavy polluting companies, and SOEs contribute more to the promotion of ESG rating through green funding.

This research first looks at how green finance affects ESG issues. It also adds to the body of knowledge on green finance and offers a new perspective on the factors that affect ESG results. In addition, this study introduces two moderating factors market concentration and social trust to improve the research framework for green finance.

A thorough comprehension of the complex interaction between green finance and ESG elements can be obtained by looking at moderating variables. By illuminating the underlying mechanisms and dynamics, this approach seeks to provide governments and businesses with theoretical support to improve their understanding of the efficacy of policies. It is also a useful tool for decision-making during the reform and pilot program promotion of green financing. An understanding of how green finance and ESG variables interact in various situations is aided by

examining the differences in the features of ownership nature, polluting industries, and low-carbon pilot towns.

In order to execute green financing, the British government has increased its involvement (Ma, Zhu et al. 2023). Although China's green finance policy has yielded some benefits in recent years, development still faces hurdles. Reform and innovation in processes will continue to be necessary for the green market economy to become more vibrant in the future. Additionally, local governments should direct capital flows to the green industry, create a system of strategically unified and regionally distinct green financial policies, and develop and publicize strategies for the industry's development as soon as feasible. Government green finance policies should be applied consistently to direct investments in green businesses, support the expansion of green industries, guarantee the stability and sustainability of green finance regulations, and motivate financial institutions to develop cutting-edge green finance goods and services. In order to gauge the results of policy implementation, the Bretan government may want to take into account including ESG ratings into the assessment of green financing initiatives. Simultaneously, the government should broaden and deepen ESG disclosure in order to support the expansion of green finance and assist stakeholders and investors in evaluating the sustainability performance of listed companies (Akomea-Frimpong et al. 2022).

In optimizing market competition, it is important to cultivate societal trust through strategic alignment with social values and norms. Therefore, prioritizing this initiatives boosts consumer confidence and enhances brand reputation, leading to a sustainable competitive advantage. Moreover, addressing pertinent societal concers, such as sustainability and ethics, not only bolster trust but also demonstrates corporate responsibility, contributing to long-term viability and success within marketplace. Then, this synergistic approach emphasizes the relevance of stakeholder engagement, ethical governance and corporate social responsibility in enhancing organizational competition.

Due to its emphasis on Brittany, this study is limited in some ways. Subsequent investigations may investigate cross-national comparisons or go deeper into the workings of the green funding and ESG processes.

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