ผลกระทบของผลประกอบการด้านความยั่งยืนและคุณลักษณะของกิจการต่อมูลค่าการส่งออก

Impact of Sustainability Performance and Firm Characteristics on Export Value

เสี่ยว ลู[1] ธัญวรัตน์ สุวรรณะ[2] และ นภาพร นิลาภรณ์กุล[3]
Xiao Luo[1], Thanwarat Suwanna[2] and Napaporn Nilapornkul[3]

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บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาผลกระทบของการพัฒนาสู่ความยั่งยืน และคุณลักษณะของกิจการส่งผลต่อมูลค่าการส่งออกโดยมุ่งเน้นกลุ่มธุรกิจส่งออกของจีน เป็นการวิจัยเชิงปริมาณจากข้อมูลทุติยภูมิแบบข้อมูลพาแนลระหว่าง ปี พ.ศ. 2558 – 2565 กลุ่มตัวอย่างเป็นบริษัทส่งออกที่จดทะเบียนของจีนจำนวน 431 บริษัท สถิติที่ใช้เป็นสถิติเชิงพรรณนา และการวิเคราะห์การถดถอยพหุคูณ ผลการศึกษาพบว่า ผลประกอบการด้านความยั่งยืน หรือ ESG ส่งผลเชิงบวกต่อมูลค่าการส่งออก คุณลักษณะของกิจการ ได้แก่ จำนวนพนักงาน ผลผลิตจากแรงงาน และรายจ่ายค่าจ้าง มีผลกระทบต่อมูลค่าการส่งออก จากผลการวิจัยทำให้ทราบถึงผลกระทบเชิงบวกของปัจจัยการพัฒนาสู่ความยั่งยืน และคุณลักษณะของกิจการต่อมูลค่าการส่งออก ซึ่งสามารถนำไปสร้างเป็นกลยุทธ์สำคัญในการเพิ่มประสิทธิภาพการส่งออก

คำสำคัญ: การพัฒนาสู่ความยั่งยืน นวัตกรรมทางเทคโนโลยี มูลค่าการส่งออก

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[1] นักศึกษาปรัชญาดุษฎีบัณฑิต, คณะบริหารธุรกิจ มหาวิทยาลัยเทคโนโลยีราชมงคลธัญบุรี
Ph.D. Student Program, Faculty of Business Administration, Rajamangala University of Technology Thanyaburi.
[2] อาจารย์ ดร., คณะบริหารธุรกิจ มหาวิทยาลัยเทคโนโลยีราชมงคลธัญบุรี
Lecturer, Ph.D., Faculty of Business Administration, Rajamangala University of Technology Thanyaburi.
[3] ผู้ช่วยศาสตราจารย์ ดร., คณะบริหารธุรกิจ มหาวิทยาลัยเทคโนโลยีราชมงคลธัญบุรี
Assistant Professor, Ph.D., Faculty of Business Administration, Rajamangala University of Technology Thanyaburi
Corresponding author email: tanwarat@rmutt.ac.th

Abstract

This research aims to study the impact of sustainability development, firm characteristics and technological innovation affecting export value, focusing on China's export group. Furthermore, it tests the intermediate variable of technological innovation. This is quantitative research based on secondary panel data from 2015 - 2022. The sample group consisted of 431 registered Chinese export companies. The statistics used were descriptive statistics. and multiple regression analysis. The research result shows that sustainability performance, or ESG, has a positive impact on export value. Firm characteristics as the number of employees, labor productivity and wage expenses have a great impact on technological innovation and export value. It also reveals that technological innovation plays a partial intermediary variable between labor productivity and export value. The research results reveal the positive impact of sustainability development and technological innovation on export value. This can be used to create an important strategy for increasing export efficiency.

Keywords: Sustainability development, Technological innovation, Export value

Introduction

In recent years, international trade restrictions surged, presenting unprecedented challenges to export trade through mechanisms such as carbon tariffs, new ESG regulations, and various trade barriers. Investigating the impact of corporate ESG performance and corporate heterogeneity on export performance was crucial for companies to adapt to the evolving international trade landscape, fulfill social responsibilities, enhance the competitiveness of the entire industrial chain, and improve export performance. At fact, export performance was identified as one of the most important single-factor indicators of competitiveness.

As global resource issues gained increasing attention, concepts like sustainable development and green development were progressively recognized and accepted. Consequently, the concept of Environmental, Social, and Governance (ESG) emerged, emphasizing that companies should not only consider economic benefits but also focus on promoting sustainable development, fulfilling social responsibilities, and improving corporate governance. Scholars held different views on the impact of corporate ESG performance on export performance.

Some believed that corporate ESG performance had a positive impact on export performance, some argued it had a negative impact, and others found no significant impact.

Furthermore, firms' characteristics or corporate heterogeneity, which arose from differences in the number of employees, labor productivity, and wages, directly affected enterprise costs, competitiveness, and technological innovation. This heterogeneity was a key factor for enterprises to maintain a competitive edge in global trade.

All major factors above are key interesting issues for many researchers conducting related research. For example, Ruzekova et al. (2020) took the OECD as the research object and Marta Fernandez-Olmos (2024) studied Spain's export problems. In addition, some studies examined the relationship between corporate ESG performance and export performance, or technological innovation and export performance such as Arora P.et al.,(2020); Ullah Z.et al.,(2020); Tamara Teplova et al.,(2022). The rapid growth of ESG concept stimulates researchers to investigate the impact of the ESG performance and firms' characteristics on export value to fulfill research gap related to sustainability development or ESG in China and focusing on labor productivity. Thus, in this research aims to respond to research questions as followings:

Q1: Does the ESG performance have a positive impact on export value?

Q2: Does firms' characteristics have a positive impact on export value?

Literature review

Sustainability development or ESG

In 2004, the United Nations Environment Program (UNEP) first proposed the concept of ESG, which referred to the performance of firms in three aspects: environment, social responsibility, and governance. Tobias Hahnet et al. (2006) and Schaltegger et al. (2017) believed that corporate responsibility to society was not limited to creating shareholder value but also included caring for the environment, which explained why companies invest in sustainable development. In September 2018, the China Securities Regulatory Commission issued a revised version of the "Corporate Governance Guidelines for Listed Companies," which for the first time required Chinese listed companies to disclose ESG-related information, including their environmental performance, social responsibility performance, and corporate governance performance. ESG performance classified and quantified various indicators of corporate social responsibility to evaluate the actual performance of firms in terms of environment, social responsibility, and corporate governance. (Wu et al.,2022)

Firms' heterogeneity

Firms' heterogeneity referred to the differences within firms in terms of characteristics, resource allocation, capability level, and strategic orientation (Melitz,2003). Baldwin (2022) emphasized that internal differences within firms might be a key factor for gaining competitive advantages. Existing literature generally adopted the method of self-built indicator systems. Based on the trade model of Krugman (1980), Melitz (2003) introduced differences in firms' productivity to explain the variations in international trade and export decision-making behavior among firms, establishing a heterogeneous enterprise model. Melitz (2003) argued that improved production efficiency led to an expansion of market share, increased profits, and higher workers' wages. However, Melitz's model attributed firms' heterogeneity solely to differences in production efficiency, while Baldwin (2011), Li Bo, and Zhang Yuwei (2022) expanded the range of indicators for heterogeneity analysis. This study drew on these methods and selected indicators in four dimensions: firms' age, number of employees, labor productivity, and wages to measure firms' heterogeneity.

Export performance

Cavusgil and Zou (1994) defined export performance as achieving the economic and strategic goals of corporate exports. Radulovich (2008) considered the financial or non-financial benefits of export business as export performance. Export performance was the most direct comprehensive indicator for measuring export effects and was crucial to measuring the economic development of a country or region (Kaur et al., 2011). Given the simplicity of calculating financial indicators and the relatively straightforward data requirements, most current studies (Cheng Kai et al., 2022; Li Bo et al., 2023) used the number of corporate export products or export value as proxy variables for export performance.

Prior research

Some researchers examined the impact of corporate ESG performance on export performance and reported different impact directions. For example, they found the positive impact of corporate ESG performance on export performance such as Antonietti R. et al.,(2014); Wu, Qinglan et al.,(2022), as Corporate Social Responsibility (CSR) enhanced firms' international competitiveness and alleviated trade barriers. On the other hand, some researchers showed a negative relationship between corporate ESG performance and export performance such as Qing Bintao et al.,(2024).

Conceptual Framework

The Impact of Firms' ESG Performance on Firms' Export Performance

Existing literature primarily focused on the impact of corporate ESG performance on financial performance and firms' value, with many studies indicating a positive relationship. However, many studies only addressed one aspect of ESG. For instance, Lu Juan et al. (2020) found a positive correlation between corporate environmental information disclosure and exports, while Yang Ye et al. (2020) suggested that moderate environmental legislation positively influenced the domestic value added to corporate exports. Anran, Chen Yimao. (2023) argued that a strong sense of corporate social responsibility could boost willingness to consume abroad and drive product exports. Based on these literature reviews, the following hypothesis was proposed:

Hypothesis 1: Firms' ESG performance had a positive impact on firms' export performance.

Firms' Heterogeneity and Firms' Export Performance

Heterogeneous enterprise trade theory emphasized that differences in enterprise characteristics significantly influenced export behavior, with various factors like productivity and firm size impacting international trade outcomes. Scholars explored factors such as firm size and productivity, with findings indicating a positive correlation with export performance. Bernard et al. (2011) suggested that characteristics such as productivity, firm size, number of employees, and wage level positively affected export choices. Similarly, Zhao Wei et al. (2020) found productivity and firm size to have a positive impact on exports. Nonetheless, findings regarding the impact of firms' age and wage level on export performance varied. This paper contended that examining firms' heterogeneity facilitated a deeper understanding of the mechanism linking firms' ESG performance to export performance. Based on these literature reviews, the following hypothesis was proposed:

Hypothesis 2: Firms' heterogeneity had an impact on firms' export performance.

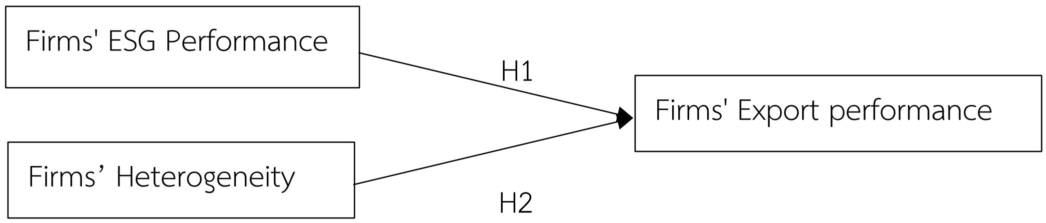

Figure 1 Conceptual Framework

Research Methodology

Sample selection

To respond to research questions and hypothesis, this paper selected listed companies engaged in export activities in China's A-share market from 2015 to 2022 and excluded delisted companies and companies with unavailable data. As a result, the study included a total of 431 companies. The researchers employed panel data of 431 companies for 8 years, finally obtained 3,348 observations.

Definition of Variables

This study encompassed three primary variables: firms' ESG, firms' heterogeneity, and export performance. Firms' heterogeneity was represented by four indicators, The export performance of firms was primarily assessed through firms' export value. The specific definitions of the variables were presented in Table 1.

Table 1 Variant, mnemonic and sources

variant		mnemonic	define	Data sources
Independent variables				
Firms' Heterogeneity	Total assets	LnSass	Natural logarithm of total assets	Annual reports of listed firms; CSMAR database
	Firms' age	Age	Current time - Listing time+1	Annual reports of listed firms; CSMAR database

Table 1 Variant, mnemonic and sources (Continued)

variant		mnemonic	define	Data sources
	Productivity	LnP	Natural logarithm of firms' labor productivity (Firms' labor productivity = revenue/total number of employees)	Annual reports of listed firms; CSMAR database
	Wage	Wage	Wage expenditure	Annual reports of listed firms; CSMAR database
Firms’ ESG performance	Environment, society corporate governance	ESG	1. Use of the CSI Environmental, Social, and Corporate Governance (ESG) Index. 2. The composite score of listed companies using CSI ESG ranges between 0 and 100, with 0 being the lowest and 100 being the highest.	CSI ESG Index https://www.chindices.com/
Dependent variable				
Export performance	export value	Lnev	Natural logarithm of Firm overseas revenue	Annual reports of listed companies; Wind database

Statistics usage

Researchers employed descriptive statistics, Pearson correlation and multiple regression in terms of a fixed effects model due to rejecting the null hypothesis of the Hausman specification test. To verify the impact of firms' ESG performance and heterogeneity on export performance, the following specification models were constructed below:

$$lnev_{it} = \beta_0 + \beta_1\, esg_{it} + \sum industry_t + \sum year_i + \epsilon_{it} \quad (1)$$

$$lnev_{it} = \beta_0 + \beta_1\, age_{it} + \beta_2\, lnsass_{it} + \beta_3\, lnp_{iti} + \beta_4\, wage_{it} + \sum industry_t + \sum year_i + \epsilon_{it} \quad (2)$$

$$lnev_{it} = \beta_0 + \beta_1\ age_{it} + \beta_2\ lnsass_{it} + \beta_3\ lnp_{iti} + \beta_4\ wage_{it} + \beta_5\ esg_{it} + \sum industry_t + \sum year_i + \epsilon_{it} \quad (3)$$

Note: In the model, 'i 'represents firms and 't 'represents years.

Empirical Findings

Descriptive Statistics

The descriptive statistics for each variable were performed as shown in Table 2.

Table 2 Descriptive statistics for each variable

Variable	Obs	Mean	Std. Dev.	Min	Max.
lnev	3448	20.969	1.415	18.648	24.885
age (years)	3448	14.653	6.808	2.000	29.000
lnsass	3448	23.000	1.312	20.633	27.269
lnp	3448	13.970	0.729	12.403	15.912
wage	3448	2.792	7.254	0.009	52.475
esg	3448	74.126	5.211	58.480	85.190

Table 2 presented the statistical characteristics of each variables The results of the descriptive statistics indicated that: the standard deviation of export value was 1.415, suggesting minimal variance in the export scale of the sample companies; the mean value of corporate ESG performance was 74.126, ranging from a minimum score of 58.48 to a maximum score of 85.19, with a standard deviation of 5.211, indicating a significant disparity in the overall scores of listed companies' ESG performance.

Pearson's Correlation

The correlation coefficient matrix reflected the relationship between two variables as shown in Table 3.

Table 3 Pearson's correlation

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) lnev	1.000					
(2) age	0.225***	1.000				
(3) lnsass	0.762***	0.325***	1.000			
(4) lnp	0.432***	0.226***	0.521***	1.000		
(5) wage	0.543***	0.072***	0.628***	0.295***	1.000	
(6) esg	0.199***	0.028*	0.283***	0.170***	0.220***	1.000

Table 3 reveals that all variables are significant, exhibiting a positive correlation among corporate ESG performance, heterogeneity and export performance. As a result, this study has no multicollinearity problem because of the Pearson's correlation below 0.8 and VIF below 10.

Multiple Regression results

The specification models were employed for conducting multiple regression. The regression results were presented in Table 4 below.

Table 4 Regression results

Model	(1)	(2)	(3)
VARIABLES	lnev	lnev	lnev
esg	0.044***		-0.010***
	(10.01)		(-3.17)
age		-0.006**	-0.007**
		(-2.29)	(-2.53)
lnsass		0.727***	0.737***
		(40.82)	(40.80)
lnp		0.103***	0.105***
		(3.99)	(4.06)
wage		0.018***	0.018***
		(6.48)	(6.65)
Observations	3,448	3,448	3,448
R^2	0.156	0.609	0.610
Adj.R^2	0.150	0.606	0.607
F-Statistics	28.73***	213.05***	205.78***

Note: t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 4 showed that all models provide statistical significance at 1%, reflecting the model fitness. From model 1, the results of the regression analysis of firms' ESG performance on export value are presented and it provides R^2 and *Adj*.R^2 of 0.156 and 0.150 respectively. The coefficient associated with corporate ESG performance was significantly positive at a 1% confidence level, indicating a substantial promotion of export performance due to improved corporate ESG performance. Enhanced corporate ESG performance facilitated international market recognition, leading to steady growth in overseas operating income and improved export performance. Additionally, it reduced export costs and risks, enhanced corporate efficiency, and augmented export performance. Therefore, Hypothesis 1 was supported.

From model 2, the regression outcomes for firms' heterogeneity on export value are displayed and it provides R^2 and *Adj*.R^2 of 0.609 and 0.606 respectively. This means that firms' characteristics have higher explanatory power on export value than the ESG performance. As mentioned earlier, the firms' heterogeneity includes company age, number of employees, labor productivity, and wages. The results showed that total assets, labor productivity and wage expenditure were statistically significant positive correlated with export performance at 1%. In contrast, the firm's age provides a negative corelated at 5%. This might be that a long-aged companies may lack of adapt ability of the rapidly changing circumstances. Therefore, Hypothesis 2 was supported except for the firms' age.

From model (3) presents the results of integrated regression analysis of firms' ESG performance and heterogeneity and it provides R^2 and *Adj*.R^2 of 0.610 and 0.607 respectively. Importantly, the relationship between firms' ESG performance and export performance shifted from a significant positive correlation to a significant negative correlation. This change was primarily due to increased costs and reduced export performance in the short term. However, improved ESG enhanced product quality, reputation, and efficiency over time, ultimately boosting export performance. The direction and significance of each variable of firm heterogeneity remained unchanged. Hence, firms faced a choice between short-term benefits and long-term gains.

Robustness tests

To bolster the reliability of the regression results, this paper conducted a robustness test by replacing the core explanatory variables with data, using methodologies from previous studies (Zhang L. et al., 2023). Researchers created a new explanatory variable (esg1) for regression by ranking the ESG performance in terms of score grades (from the highest AAA grade to the lowest C grade) in descending order and assigned values from 9 to 1. The results of regression analysis were shown in Table 5.

Table 5 Robustness tests (Comparing the results of esg and esg1)

	(1)	(3)
VARIABLES	lnev	lnev
esg	0.044***	
	(10.01)	
esg1		0.159***
		(9.91)
Observations	3,448	3,448
R^2	0.156	0.155
Adj.R^2	0.150	0.150
F-Statistics	28.73***	28.62***

Note: t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Tabel 5 shows that both esg and esg1 provide a statistical significance at 1%, indicating that the conclusion that firms' ESG performance significantly enhanced firms' export performance was robust.

Conclusion and Recommendations

Research conclusion

This study used panel data from 431 Chinese A-share listed companies engaged in export business from 2015 to 2022 to empirically analyze the impact of corporate ESG performance and firms' heterogeneity on export performance. The major findings of this study included: 1) The ESG performance had a positive impact on export performance in line with prior papers as Antonietti R. et al.,(2014) and Wu, Qinglan et al., (2022). This reflected that the higher ESG performance will stimulate the higher export performance. 2) The higher asset scale, the higher labor productivity and higher wage expenditure will lead to higher export value. Importantly, this study fulfills the research gap by focusing on labor productivity, which is different from Li Xiaoping et al., (2008) and Shen Yuting et al., (2022). Researchers found that the companies with higher labor productivity will have higher export performance. The firms age had a negative direction impact on export value because the longer establishment may lack of adapt ability for the changes.

Research contribution

Based on the major findings, researchers recommend the export group as follows: 1) the executives should actively improve ESG performance to enhance export performance such as enhance environmental awareness, enhancing employee welfare and loyalty, and engaging in public welfare activities to better fulfill environmental and social responsibilities. This may increase export value due to associating with international trade regulation and customer loyalty. 2) the executive of long-age companies may focus on the adaptation ability of the change's circumstances. This important ability assists the firms to maintain or increase competitive potential. 3) the executives should strive to improve labor productivity, increase wage levels, and increase total assets to increase export value. They should focus on the training and development of labor, especially innovative talents, to further improve export performance.

Limitation and directions for future research

The study limitation was lack of the other sources of the ESG score and the score of each aspect as environment, social and corporate governance.

Future research may include other firms' productivity variables and /or technology innovations. In addition, the comparative study between two or more countries will provide more benefits for the firms' executives to increase competitive potential.

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