

# ESG DISCLOSURE, GREEN INNOVATION, AND CORPORATE PERFORMANCE: EMPIRICAL EVIDENCE FROM LISTED CHINESE A-SHARE COMPANIES

Xiaoyuan Zhang<sup>1</sup>, Shenglian Wang<sup>2</sup>, Raja Adzrin Raja Ahmad<sup>3</sup>, Nurul Azlin Azmi<sup>4\*</sup>

<sup>1,2</sup> Faculty of Economics and Management, Beibu Gulf University, Qinzhou, Guangxi, 535011, China

<sup>1,2,3,4</sup> Faculty of Accountancy, Universiti Teknologi MARA, Johor Branch, Segamat Campus, Jalan Universiti Off, KM 12, Jalan Muar, 85000 Segamat, Johor, Malaysia

<sup>3</sup> Accounting Research Institute, Universiti Teknologi MARA, Shah Alam, Malaysia.

\*Corresponding Author

Email: nurul516@uitm.edu.my

Received: 21 July 2024

Accepted: 10 September 2024

## ABSTRACT

*In recent years, the ESG concept has been highly aligned with China's sustainable development strategy and green and low-carbon transition goals. ESG disclosure and green innovation have become a hot issue for shareholders, governments and investors. This study examines the relationship between ESG, green innovation and performance. This paper uses Chinese A-share listed companies in the software and information technology service industry from 2015 to 2022 as research samples to investigate the impact of ESG disclosure and green innovation on corporate performance. Using panel fixed effect regression, this study found that ESG disclosure and green innovation can significantly improve corporate performance. Furthermore, ESG disclosure and green innovation are complementary in promoting corporate performance. The finding of this study incentivises corporates to invest in ESG disclosure and green innovation to pursue sustainable performance. This study only uses a sample of a single industry, so the conclusions of this study do not have explanatory power for corporates in other industries.*

**Keywords:** ESG disclosure, corporate performance, green innovation

## 1.0 INTRODUCTION

In recent decades, economic growth and development have become the consensus of all countries worldwide. China's GDP has grown at an average annual rate of 6.6% in the past ten years (Ai, 2022). China has entered the stage of high-quality development in 2020. Under this macro background, micro-economic entities must achieve "high-quality development". "High-quality development" refers not only to the reduction of expenses or the increase of revenue and profits but also to the sustained and stable growth of corporate performance, which is even more critical. Improving corporate performance is one of the complex problems that has always been a concern in management practice and academic research.

China's software and information technology service industry has contributed to economic growth. In 2022, China's software and information technology service industry completed a total software business revenue of 10,812.6 billion yuan, an increase of 11.2%

(Central People's Government of the People's Republic of China, 2023). As the main body of scientific and technological support to promote China's economic development, improving its corporate performance is conducive to transforming and upgrading the information technology industry and the high-quality development of China's economy. How to guide software and information technology service corporates to achieve value creation and high-quality development.

In the report *Who Cares Wins* written by the United Nations Global Compact in 2004, ESG was formally proposed. The Environmental, Social and Governance (ESG) value management concept, which represents the environmental, social, and governance and focuses on long-term value and sustainable development, is increasingly attracting the attention of stakeholders (Yuan & Cao, 2022). The concept of ESG is highly compatible with the requirements of high-quality development. Therefore, promoting corporate ESG practice activities is gradually becoming the focus of promoting high-quality economic development.

ESG disclosure by Chinese corporations started late, and there is still a big gap compared with Countries where ESG started earlier. By 2022, 1,755 of the 5034 listed corporates in China have disclosed ESG-related reports, with a disclosure rate of 34.32% (Xie, 2023). In the same period, there were 336 listed corporates in the Chinese A-share software and information technology service industry, of which 76 disclosed ESG-related reports, with a disclosure rate of 22.62%, lower than the industry-wide level of 34.42%. In terms of ESG rating, 63 corporates were rated as A, accounting for 18.75%; There were 96 corporates rated as B, accounting for 28.57%; The number of corporates that obtained C was the largest, 105, accounting for 31.25%; and 72 corporates were rated D, accounting for 21.43% (Huang, 2023). It shows that the ESG disclosure rate of the Chinese A-share software and information technology service industry is low, and the ESG performance is poor. Therefore, it is significant to promote software and information technology service corporates to improve ESG practice and disclosure to achieve value creation and high-quality development.

Furthermore, research shows that green innovation is also a driving force for promoting high-quality corporate development. Green innovation can effectively improve energy utilisation and reduce waste generation by using alternative energy, improving processes, and recycling resources (Yu et al., 2017), and ensuring the production and manufacturing processes of corporates comply with environmental regulations, thus avoiding environmental pollution penalties (Xie et al., 2016). Moreover, green innovation can enhance production efficiency through improved processes (Xie et al., 2019), bring technological leadership to corporates, build better recycling systems, and promote cost minimisation through reduced resource use, thereby bringing financial returns to the corporate (Fernando et al., 2019).

This paper examines the relationship between ESG disclosure, green innovation, and corporate performance in Chinese A-share software and information technology service companies from 2015 to 2022. The main contributions of this study are as follows: Firstly, this study investigates the impact of ESG disclosures on corporate performance based on Chinese A-share listed companies in the software and information technology services sector, this enriches the existing literature on the economic implications of ESG disclosure and its effects on corporate performance. Secondly, the study explores the link between green innovation and corporate performance, this offers new evidence about green innovation can improve corporate performance from China's software and information technology service listed companies. This adds to the relevant literature on the economic consequences of green innovation. Lastly, the study considers green innovation as a moderating variable to further examine its effect with ESG disclosure on corporate performance.

This article is organized as follows: Section 2 provides an overview of the literature and outlines the research hypotheses. Section 3 describes the research design, including the sample description, variable definitions, and the adopted analyses. The main empirical results are presented and discussed in section 4. Finally, conclusions are provided in section 5.

## **2.0 LITERATURE REVIEW AND RESEARCH HYPOTHESIS**

According to the stakeholder theory, the excellent development of a corporation is the result of the joint governance of managers and stakeholders. Corporations can gain competitive advantages such as social reputation and media attention by adopting positive environmental management measures, undertaking corporate social responsibility, and strengthening corporate governance. These competitive advantages are conducive to improving the overall performance of corporates.

ESG disclosure can positively affect corporate performance in three ways. First, the quality of ESG disclosure can improve the internal governance and internal control of corporates (Ronalter et al., 2023), thus reducing the risk of financial violations (Chen & Zhao, 2022), reducing the cost of capital (Khanchel & Lassoued, 2022), and ultimately improving corporate performance (Zhao et al., 2018).

Second, voluntary ESG disclosure reports can be used as a communication channel with stakeholders, alleviate information asymmetry, improve the financial transparency of corporates, gain reputation and good image, increase the trust of investors, ease financing constraints (Wang & Xie, 2022), attract experienced institutional investors (Rau & Yu, 2023), and thus obtain economic benefits (Oncioiu et al., 2020).

Third, good ESG performance can improve corporates' investment and operation efficiency. On the one hand, ESG disclosure can reduce overinvestment by reducing agency costs (Tang, 2022); On the other hand, the higher the ESG disclosure was able to attract more institutional investors and increase inefficient investment (Wang & Li, 2022). Therefore, this study puts forward the first hypothesis:

H1: Corporate with good environmental disclosure is positively related to corporate performance.

According to the resource-based view theory, rare, imitable and irreplaceable heterogeneous resources are the source of organisational performance improvement and long-term competitive advantage. When a corporation has the advantage of resources and capabilities and can allocate them efficiently, it is easier to innovate than other corporations. Green innovation involves technological improvements that save energy, prevent pollution, or enable waste recycling. It encompasses green product design and has gained more attention due to its contributions to resource conservation, environmental protection, and financial performance.

Prior studies have discovered a positive relationship between green innovation and corporate performance (Chouaibi et al., 2022; Li et al., 2020). First, green product innovation encourages the efficient use of raw materials, leading to lower raw material costs and guiding corporates to convert waste into product revenue. Second, green innovation improves existing production technology to reduce adverse environmental effects, thereby improving the corporate's environmental compliance, helping to shape a green brand image, gaining consumer trust, and gaining market competitive advantages. Third, as the number of

patents representing a corporation's green innovation output increases, it can effectively improve its financial performance. So, this study proposes the following hypothesis:

H2: Green innovation is positively related to corporate performance.

The green innovation investment can increase ESG disclosure and corporate performance as this factor can beat resource-based view in supporting ESG disclosure and corporate performance. Prior studies can prove that high-quality ESG disclosure and green innovation impact corporate performance (Gong et al., 2021).

Some scholars discover that the moderating between ESG disclosure and green innovation may be a complementary effect. They believe that ESG disclosure and green innovation do not conflict, ESG can be internalised into the corporate culture, and jointly promote corporate innovation and performance improvement. High-quality ESG disclosure can alleviate information asymmetry and deepen cooperation and communication with stakeholders, thus contributing to corporates' green innovation activities (Ma et al., 2022). Therefore, this study puts forward the following hypotheses:

H3: There is a moderating effect between green innovation and ESG disclosure on corporate performance.

### **3.0 DATASOURCE AND MODEL DESIGN**

#### **3.1 Sample Selection and Data Source**

This study uses the data of Software and Information technology services in Chinese A-share listed corporates from 2015 to 2022. The chosen time frame is because China's ESG disclosure developed rapidly during this period. ESG data were obtained from the ESG score provided by China Securities Database. Meanwhile, corporate performance and control variables data were gathered from the China Stock Market & Accounting Research Database (CSMAR), and green innovation data were gathered from the China Research Data Service Platform (CNRDS).

The samples were screened and processed according to the following steps: (1) ST, \*ST and PT corporates were excluded; (2) IPO-listed corporates and delisted corporates from 2015 to 2022; (3) Eliminate the corporates with missing core data; After the above screening, finally, 1132 sample observations were obtained. All continuous variables were interned by 1% up or down to eliminate the effect of extreme values.

#### **3.2 Description of Variables**

##### **(1) Explained variables**

The explained variable is firm performance (Tobin's Q). Tobin's Q measures the corporate's market value ratio to total assets. Tobin's Q has advantages because it is difficult for management to manipulate it. Tobin's Q ratio can predict the corporation's future cash flow and long-term performance and is less sensitive to inflation. Tobin's Q value can reflect corporate performance from market and profit dimensions (Rahman & Zahid, 2021).

##### **(2) Explanatory variables**

The explanatory variable was ESG disclosure (ESG score). This paper adopts the Huazheng ESG score, a mainstream rating agency in China. Huazheng ESG rating gives the evaluated corporation a nine-grade rating of "AAA-C", with an ESG score ranging from 0 to 100. The higher the score, the better the ESG performance of the evaluated corporation.

(3) Moderating variables

The Moderating variable is green innovation. This study uses the number of green patents as a proxy variable for green innovation (Xu et al., 2021). This study follows Xu et al. (2021), which uses the natural logarithm of (number of greens patents granted + 1) as a proxy variable for green innovation. The higher the number, the higher the corporate's green innovation level.

Drawing on existing research, this paper introduces the following control variables: corporate size (Size), type of corporate ownership (Ownership), cash holding ratio (Cash), proportion of the largest shareholder (Top1), and total asset turnover (Turnover). See Table 1 for details.

Table 1. List of variables

Type of Variables	Variable	Operationalisation
<i>Dependent Variable:</i>		
Corporate Performance	Tobin's Q	The ratio of market value to total assets
<i>Independent Variable</i>		
ESG disclosure	ESG score	Huazheng ESG score
Green Innovation	Green-Patent	Natural logarithm of (number of green patents granted + 1)
<i>Control Variables</i>		
	Size	Natural logarithm of total assets at year-end
	Ownership	1 for state-owned corporates and 0 for non-state-owned
	Cash holding	Net operating cash flow divided by total assets
	Top1	The holding ratio of the first large shareholder
	Turnover	Operating income divided by total assets

### 3.3 Equation Model

The following equation model was constructed to test the hypotheses 1 and 2. The following is the baseline regression model:

$$\text{Tobin's } Q_{i,t} = \beta_0 + \beta_1 \text{ESG}_{i,t} + \beta_2 \text{Green-Patent}_{i,t} + \beta_3 \text{Control}_{i,t} + \text{Year} + \varepsilon_{i,t} \quad (1)$$

Furthermore, to test hypothesis 3, equation Model 2 was constructed to examine the moderating effects of green innovation on ESG disclosure to corporate performance:

$$\text{Tobin's } Q_{i,t} = \beta_0 + \beta_1 \text{ESG}_{i,t} + \beta_2 \text{Green-Patent}_{i,t} + \beta_3 \text{ESG}_{i,t} \times \text{Green-Patent}_{i,t} + \beta_4 \text{Control}_{i,t} + \text{Year} + \varepsilon_{i,t} \quad (2)$$

Where Tobin's  $Q_{i,t}$  represents corporate performance of the explained variable,  $\text{ESG}_{i,t}$  represents corporate ESG disclosure of the explained variable,  $\text{Green-Patent}_{i,t}$  represents green innovation,  $\text{control}_{i,t}$  represents all control variables, Year represents time fixed effect,  $\varepsilon_{i,t}$  represents error term.

## 4.0 RESULT AND DISCUSSIONS

### 4.1 Descriptive Statistics

Please refer to Table 2 for the descriptive results. The standard deviation of Tobin's Q is 2.727, the minimum value is 0.0878, the maximum value is 17.497, and the average value is 3.306, which shows that the performance of different corporates in China's software and information technology service industry varies greatly. The maximum value of ESG disclosure is 83.771, the minimum value is 58.960, and the standard deviation is 4.734, reflecting the different degrees of ESG disclosure of corporates in the software and information technology service industry, which is attributed to the different depth of understanding of ESG of Chinese software and information technology service corporates, coupled with the short development time of ESG, and the uneven growth level of corporates. There is a particular imbalance.

However, the average value is 73.829, showing that the corporates in the sample have a relatively good performance of ESG disclosure, mainly because relevant regulations require mandatory disclosure in specific industries, and corporates' awareness of ESG is strengthened. The maximum value of green patents for green innovation in the software and information technology service industry is 6.457, and the minimum value is only 0, reflecting significant differences in green innovation among different corporates, with an average value of 0.171. Green innovation in the software and information technology service industry is low.

Table2. Descriptive Analysis

Variables	Obs	Mean	SD	Min	Median	Max
Tobin's Q	1132	3.306	2.727	0.878	2.419	17.497
ESG	1132	73.829	4.734	58.960	74.050	83.771
Green-Patent	1132	0.171	0.604	0.000	0.000	6.457
Size	1132	12.878	0.951	10.829	12.842	15.563
Ownership	1132	0.211	0.408	0.000	0.000	1.000
Cash Holding	1132	0.038	0.060	-0.134	0.035	0.217
Top1	1132	0.243	0.122	0.067	0.212	0.574
Turnover	1132	0.501	0.339	0.119	0.428	2.604

Note: Tobin's Q is corporate performance measured by the ratio of market value to total assets; ESG score is total ESG score by the corporations; Green-patent measured by Natural logarithm of (number of green patents granted + 1); Size is measured by Natural logarithm of total assets at year-end; Ownership is a dummy variables of 1 for state-owned corporates and 0 for non-state-owned; Cash holding is measured by net operating cash flow divided by total assets ; Top1 is measured by holding ratio of the first large shareholder; and Turnover is measured by operating income divided by total assets.

### 4.3 Regression Analysis

The first column of Table 3 lists the regression results of ESG disclosure and green innovation on corporate performance. During the sample period, ESG disclosure in China's software and information technology service industry has a significant positive effect on corporate performance, showing that ESG disclosure can bring economic benefits to corporations and promote corporate performance growth. Hypothesis 1 is verified.

The research results of this paper are consistent with Oncioiu et al. (2020) and Wang (2022). The influence coefficient of ESG disclosure on corporate performance is 0.0459, and it is positive at the significance level of 1%; that is, when a corporation's ESG rating is increased by 1%, its performance will increase by 0.0459%. It shows that good corporate ESG performance plays a positive role in improving corporate performance. Better ESG performance can strengthen the "bond" between corporates and stakeholders. This "bond"

can not only help corporates reduce financing costs to attract external investment but also help corporates obtain the necessary strategic resources in time to form their unique competitive advantages and thus promote the growth of corporate performance. Good ESG disclosure can help corporates improve their performance in the above ways.

The influence coefficient of green innovation on corporate performance is significantly positive at the 5% level, shows that enhancing green innovation is conducive to improving corporate performance, consistent with Chouaibi et al. (2022) and Li et al. (2020). This may be because corporate green innovation can improve corporate performance from the two aspects of cost-benefit and resource effect, respectively. From the cost-benefit perspective, the design of green products and the improvement of cleaner production processes can improve resource utilisation, reduce unnecessary losses, and thus improve production efficiency, which is helpful in reducing the production cost of corporations. In addition, from the resource effect perspective, improving green innovation can help corporates establish an excellent green image and win the support of stakeholders and government departments. With the support of such intangible resources, corporates can obtain the support of tangible resources such as investor financing and special project funds, thus promoting the improvement of corporate performance.

The second column of Table 3 lists the moderating effect between green innovation and ESG disclosure on corporate performance. The regression coefficient of ESG\* Green-patent is positive and significant, which shows that ESG disclosure and green innovation are complementary in promoting corporate performance improvement, this is consistent with the research conclusions of Hang et al. (2022) and Xu et al. (2021). ESG can be internalised into the corporate culture and jointly promote innovation and performance improvement. High-quality ESG disclosure can alleviate information asymmetry and deepen cooperation and communication with stakeholders, thus contributing to corporates' green innovation activities.

Table 3. Empirical Research Result

	(1)	(2)
	Tobin's Q	Tobin's Q
Constant	21.2088*** (4.5057)	21.3944*** (4.4917)
ESG	0.0459*** (0.0139)	0.0437*** (0.0141)
Green-Patent	0.3883** (0.1550)	-1.4244 (1.0110)
ESG*Green-Patent	-	0.0236* (0.0134)
Size	-1.4482*** (0.3574)	-1.4480*** (0.3574)
Ownership	-0.3834 (0.3840)	-0.3766 (0.3839)
Cash	2.7514** (1.3112)	2.7451** (1.3114)
Top1	2.8335 (2.4565)	2.7661 (2.4406)
Turnover	0.8353* (0.4855)	0.8185* (0.4847)
Year FE	YES (4.5057)	YES (4.4917)
<i>Adjusted R</i> <sup>2</sup>	0.5982	0.5984
<i>N</i>	1132	1132

Note: The reported t-statistics are in parentheses. Asterisks denote statistical significance at the 1% (\*\*\*), 5% (\*\*), or 10% (\*) levels, respectively.

Tobin's Q is corporate performance measured by the ratio of market value to total assets; ESG score is total ESG score by the corporations; Green-patent measured by Natural logarithm of (number of green patents granted + 1); Size is measured by Natural logarithm of total assets at year-end; Ownership is a dummy variables of 1 for state-owned corporates and 0 for non-state-owned; Cash holding is measured by net operating cash flow divided by total assets; Top1 is measured by holding ratio of the first large shareholder; and Turnover is measured by operating income divided by total assets.

---

## **5.0 CONCLUSION**

In recent years, the ESG concept has been highly aligned with China's sustainable development strategy and green and low-carbon transition goals. This paper uses China's software and information technology service listed companies from 2015 to 2022 as research samples to explore the relationship between ESG disclosure, green innovation, and corporate performance. The main conclusions are: (1) ESG disclosure has a long-term positive impact on corporate performance improvement. (2) Green innovation has a positive impact on corporate performance improvement. (3) ESG disclosure and green innovation complement and jointly promote corporate performance improvement. This study shed light on the corporations investing in ESG and green innovation to pursue sustainable performance.

ESG disclosure and green innovation have become focal points for shareholders, governments, and investors. The following specific recommendations are put forward. First, from the perspective of corporates, good ESG disclosure can bring good brand image to corporates and improve their own management and development capabilities. Therefore, corporates should pay attention to the long-term positive effects of non-financial information disclosure on corporate value, such as environmental, social responsibility, and corporate governance. Moreover, it will be incorporated into the construction of corporate culture and the incentive mechanism design framework system. In addition, to promote the sustainable development of corporates, corporates should not only pay attention to the improvement of green innovation ability but also provide fundamental impetus for the development of corporates.

Second, from the perspective of the government and regulatory authorities, it is necessary to learn from the regulatory standards of international organisations on ESG disclosure to gradually improve the rating standards and system of China's ESG responsibility performance and implement reward and punishment measures to promote corporates to disclose ESG responsibility performance information in a timely and accurate manner. In addition, the government should conduct green innovation incorporating weak research and development capabilities, provide financing support and policy support for green innovation of corporates, and promote high-quality development of the local economy.

Third, from the perspective of investors, investors should attach importance to the disclosure of ESG information of corporates, incorporate both corporate financial information and ESG non-financial information into the evaluation framework of investment projects, and measure the future development prospects of corporates through the long-term social value and sustainable development value of corporates. At the same time, while better managing investment risks to obtain sustainable investment returns, more funds will continue to flow to green industries to achieve industrial transformation and upgrading in China.

This study uses an empirical analysis of listed companies in China's software and information technology service industry. Therefore, the findings have no explanatory power for corporates in other industries. Future research could extend the method of this study to



other industries or even all listed corporates to provide more comprehensive confirmation of the relationship between ESG disclosure, green innovation, and corporate performance.

## REFERENCES

- Ai, L. (2022). *In the past ten years, China's GDP has grown at an average annual rate of 6.6%, and its average contribution to world economic growth has exceeded 30%*. [Www.Xinhuanet.Com](http://www.Xinhuanet.Com).
- Central People's Government of the People's Republic of China. (2023). *Software and Information Technology Services Industry Statistical Bulletin 2022*. [www.Gov.Cn](http://www.Gov.Cn).
- Chen, R., & Zhao, X. (2022). The impact of ESG performance on financing costs. *Journal of Scientific Decision*, 11, 24–40.
- Chouaibi, S., Chouaibi, J., & Rossi, M. (2022). ESG and corporate financial performance: the mediating role of green innovation: UK common law versus Germany civil law. *Euro Med Journal of Business*, 17(1), 46–71.
- Fernando, Y., Chiappetta Jabbour, C. J., & Wah, W. X. (2019). Pursuing green growth in technology firms through the connections between environmental innovation and sustainable business performance: Does service capability matter? *Resources, Conservation and Recycling*, 141, 8–20.
- Gong, Y., Yan, C., & Ho, K. C. (2021). The effect of managerial ability on corporate social responsibility and firm value in the energy industry. *Corporate Social Responsibility and Environmental Management*, 28(2), 581–594.
- Hang, Y., Sarfraz, M., Khalid, R., Ozturk, I., & Tariq, J. (2022). Does corporate social responsibility and green product innovation boost organizational performance? a moderated mediation model of competitive advantage and green trust. *Economic Research-Ekonomskastrazivanja*, 35(1), 5379–5399.
- Huang, Z. (2023). *The disclosure rate of ESG reports in software and information technology services is 22.62%*. National Business Daily.
- Khanchel, I., & Lassoued, N. (2022). ESG disclosure and the cost of capital: Is there a ratcheting effect over time? *Sustainability*, 14(15), 1–19.
- Li, L., Msaad, H., Sun, H., Tan, M. X., Lu, Y., & Lau, A. K. W. (2020). Green innovation and business sustainability: New evidence from energy intensive industry in China. *International Journal of Environmental Research and Public Health*, 17(21), 1–18.
- Ma, X., Ock, Y. S., Wu, F., & Zhang, Z. (2022). The effect of internal control on green innovation: corporate environmental investment as a mediator. *Sustainability*, 14(3), 1–19.
- Oncioiu, I., Popescu, D. M., Aviana, A. E., Serban, A., Rotaru, F., Petrescu, M., & Marin-Pantelescu, A. (2020). The role of environmental, social, and governance disclosure in financial transparency. *Sustainability*, 12(8), 1–16.
- Rahman, H. U., & Zahid, M. (2021). Women directors and corporate performance: firm size and board monitoring as the least focused factors. *Gender in Management*, 36(5), 605–621.
- Rau, P. R., & Yu, T. (2023). A survey on ESG: investors, institutions and firms. *China Finance Review International*.
- Ronalter, L. M., Bernardo, M., & Romani, J. M. (2023). Quality and environmental management systems as business tools to enhance ESG performance: a cross-regional empirical study. *Environment, Development and Sustainability*, 25(9), 9067–9109.
- Tang, H. (2022). The effect of ESG performance on corporate innovation in China: The mediating role of financial constraints and agency cost. *Sustainability*, 14(7), 1–21.
- Wang, N., & Li, Y. (2022). Research on ESG performance and corporate investment efficiency: examination of impact effects and mechanisms. *Accounting and Finance*, 6, 23–31.

- Wang, R. (2022). Research on ESG performance and inefficiency investment level of enterprises. *Enterprise Economy*, 41(06), 89–100.
- Wang, Y., & Xie, M. (2022). The impact of ESG information disclosure on corporate financing costs: Empirical evidence based on China's A-share listed companies. *Nankai Economic Studies*, 11, 75–94.
- Xie, R. (2023). More than 1,700 A-share companies have disclosed ESG reports for 2022, the impact of capital decisions is deepening. *Securities Daily*, 1–2.
- Xie, X., Huo, J., Qi, G., & Zhu, K. X. (2016). Green process innovation and financial performance in emerging economies: Moderating effects of absorptive capacity and green subsidies. *IEEE Transactions on Engineering Management*, 63(1), 101–112.
- Xie, X., Huo, J., & Zou, H. (2019). Green process innovation, green product innovation, and corporate financial performance: A content analysis method. *Journal of Business Research*, 101, 697–706.
- Xu, J., Liu, F., & Shang, Y. (2021). R&D investment, ESG performance and green innovation performance: evidence from China. *Kybernetes*, 50(3), 737–756.
- Yu, W., Ramanathan, R., & Nath, P. (2017). Environmental pressures and performance: An analysis of the roles of environmental innovation strategy and marketing capability. *Technological Forecasting and Social Change*, 117, 160–169.
- Yuan, B., & Cao, X. (2022). Do corporate social responsibility practices contribute to green innovation? The mediating role of green dynamic capability. *Technology in Society*, 68(5), 1–15.
- Zhao, C., Guo, Y., Yuan, J., Wu, M., Li, D., Zhou, Y., & Kang, J. (2018). ESG and corporate financial performance: Empirical evidence from China's listed power generation companies. *Sustainability*, 10(8), 1–18.