The Promotional Effect of FinTech on Corporate Green Governance Performance: Empirical Evidence Based on A-share Listed Companies

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Abstract. Driven by big data, artificial intelligence, and other cutting-edge technologies, FinTech has entered a stage of deep integration and innovation. Empowered by FinTech, corporate green governance performance breaks free from the shackles of traditional paradigms and enters a new chapter of innovation and advancement. This paper adopts the data of A-share listed companies from 2009 to 2023 to study the impact of FinTech on corporate green governance performance. The study results show that FinTech has a significant promotional effect on green governance performance, which still holds after endogeneity treatment and other robustness tests. Second, the impact of FinTech on corporate green governance performance is heterogeneous. The effect is greater for enterprises in non-technology-intensive, heavily polluting industries and industries with a low degree of competition. Third, FinTech improves the green governance performance of enterprises by promoting green innovation and increasing green credit. The research in this paper is of great practical significance for green sustainable development and provides strong support for enterprise policy making and resource allocation.

Keywords: FinTech; Green Governance Performance; Green Innovation; Green Credit.

1. Introduction

With the rapid development of information technology, FinTech has become an important driver of change in the global financial industry. The development of FinTech has had a far-reaching impact on the financial industry and the economy, improving the quality and efficiency of financial services while promoting the inclusion of financial services. While FinTech improves operational efficiency and innovates service models, it also brings challenges such as the security and stability of FinTech products and talent training. The Chinese National Financial Regulatory Administration, the Chinese Ministry of Science and Technology, and the Chinese National Development and Reform Commission jointly issued the *Implementation Program for High-Quality Development of Science and Technology Finance in the Banking and Insurance Industry* in 2025, which put forward 20 measures in 7 aspects from strengthening the mechanism of financial services in science and technology, the product system, the professional capacity and the construction of risk control capacity, and at the same time clarified the 5-year target for high-quality development of science and technology finance. and promotes high-quality full employment. The development of banking FinTech finance promotes the foreign direct investment of Chinese enterprises, which has a positive economic effect of enhancing enterprises' overseas operating income and reducing financial risks (Li et al., 2025).

Green governance is an important way to address global ecological and environmental challenges. The State Council of China put forward its views on accelerating the comprehensive green transformation of economic and social development in 2024, stating that the new development concept should be fully implemented, with carbon peaking and carbon neutrality leading the way, and that a sound green development mechanism should be put in place. Simultaneously, green credit, as a key initiative to guide green allocation, also influences enterprises to chase the development of green origins in the production and operation process, realizing the win-win situation of economic benefits and environmental governance (Zhang al., 2023). Green credit provides financial support for enterprises, promotes their green development transformation, and lays the foundation for the

improvement of green governance performance. The government encourages the development of green financial instruments, which provides support for promoting the green transformation of enterprises and improving green governance performance. The success of green innovation will bring enterprises more personalized green governance tools, which will help consolidate the long-term competitive advantage of enterprises' green development (Zhao et al., 2025).

FinTech, as an important part of the modern technology system, has a key impact on corporate green governance performance. The environmental governance performance of enterprises, as market economy subjects, is directly related to the implementation of the national "dual-carbon" strategy. However, the traditional financial system faces many bottlenecks in supporting the green transformation process, such as information asymmetry leading to the high cost of identifying green projects. These structural contradictions have given rise to the demand for the integration and innovation of FinTech and green governance. FinTech can also better identify and capture key risk sources in the green governance process (Tan et al., 2023), giving precise and sound decision-making assistance for corporate green development. FinTech can also improve the green governance ability and strengthen the willingness to govern, which will have a positive impact on the green transformation of enterprises (Hu et al., 2024) and enhance the importance of green governance in corporate governance.

This paper provides a literature review in the second part, uses model data and performs variable setting in the third part, performs benchmark regression, endogeneity treatment, and robustness test in the fourth part, and then analyzes the differences between different enterprises, as well as through green innovation and green credit transmission mechanism. Finally, conclusions and corresponding policy recommendations are drawn from this study.

2. Literature Review

FinTech development has played an important role in the process of enterprises' improving total factor productivity and innovation capacity. From the perspective of enterprises, the innovation output efficiency of enterprises in FinTech, smart manufacturing, and big data services is significantly higher than that of traditional industries (Li, 2025). Xu et al. (2023) found that FinTech enhances the level of breakthrough innovation of enterprises by guiding and facilitating them to conduct cross-border R&D. The complementary advantages of FinTech and enterprises improve the innovation output efficiency of enterprises. For banks, relevant research on how banks apply FinTech to improve service quality has been conducted. Guo et al. (2022) found that banks can layout FinTech to reduce credit risk and thus promote bank performance. Banks can accelerate their digital transformation by taking FinTech as a strategic partner (Suryono et al., 2020). Some scholars have even studied the impact of FinTech on the green economy from the perspective of spatio-temporal causality. Metawa et al. (2022) investigated the time-varying causality between FinTech indices, cleantechs, and the green economy, concluding that the promotion of the FinTech industry can stimulate the growth of the green economy.

Green governance performance provides the necessary data support for green justice assessment, governance policy correction, and target system establishment. Considering monetary policy, loose monetary policy regulation can stimulate the endogenous motivation of corporate green governance by influencing the supply of external funds and the psychological expectations of the management, which in turn significantly improves the awareness of corporate environmental responsibility and the level of investment expenditure (Lv et al., 2019). Monetary policy, as a means of macro-control, has an impact on micro-enterprise green governance. Hou et al. (2024) found that government green procurement improves corporate carbon performance and green governance from the "conceptual - process - end" level. The above scholars have analyzed the impact of policymaking on green governance performance from the policy perspective, while others have studied green investment. Kim et al. (2025) found that institutional investors can promote enterprises to improve green governance performance, and green investors can help reduce long-term carbon emissions. However,

green investors tend to be more concerned with the long-term value of firms. Jiang et al. (2021) found that firms with more active green actions, higher green expenditures, and better green governance performance are more likely to be recognized by green investors. Green financing tools such as green bonds can enhance green governance performance. Green innovation has a key role in influencing the green governance performance of enterprises.

FinTech has an incentive effect on green governance. Hu et al. (2024) concluded through mechanism analysis that FinTech significantly promotes the progress of green governance, facilitates the green transformation of enterprises, and is able to strengthen the green governance ability and willingness of enterprises. The rapid development of digital finance promotes the green transformation of enterprises through the integration of the Internet, big data, etc., which can provide a new path for FinTech-enabled industrial green transformation (Xue et al., 2025). This, in turn, increases environmental protection investment and incentivizes green innovation to improve the green governance performance of enterprises. Ye et al. (2024) believe that FinTech can identify the risks that may arise in the process of green governance and provide sound decision support for the green development of enterprises. For example, smart contracts based on FinTech are used to set and track the implementation progress of environmental protection goals, which can effectively improve the green governance performance of enterprises. From the perspective of globalization, Lai et al. (2025) argue that the advancement of globalization contributes to some extent to the promotion of FinTech for green development. The corporate pollution emission industry reflects the results of corporate green governance performance. Zhang et al. (2024), starting from green financial instrument innovation, found that FinTech can significantly reduce the carbon emissions of heavy polluters, which provides a valuable reference for the government to explore the modernization of pollution. Green economic growth also reflects the ability of corporate green governance to a certain extent.

First, there are limited studies on the transmission mechanism of FinTech on corporate green governance performance. The research in this paper studies the transmission mechanism from two perspectives, green innovation and green credit. Second, the heterogeneity analysis of previous studies mainly analyzes from the perspectives of regional factors and policy differences. This paper investigates the impact of FinTech on the corporate green governance performance of firms with different characteristics in terms of technology-intensive firms, heavily polluting firms, and the degree of market competition in the industry. Finally, this study utilizes the fixed effect model to explore the impact of FinTech on corporate green governance performance. It can help accelerate the precise allocation of green financial resources, clarify the internal logic of FinTech's influence on green governance, and has strategic value for realizing high-quality development.

2.1 Model Setting, Data, and Variables

2.2 Model Setting

The model used in this paper is the fixed effect model (FE). The specific model is shown in Eq.1, which was analyzed by firm fixed effect and year fixed effect.

$$GGP_{it} = \beta_0 + \beta_1 FinTech_{it} + \beta_2 X_{it} + T_t + \pi_i + \varepsilon_{it} \quad (1)$$

GGP_{it} denotes the green governance performance of firm i at time t. For the purpose of discussing robustness, this paper also used ESG as green governance performance for further examination. $FinTech_{it}$ is the FinTech level of firm i at time t. X_{it} is a control variable affecting firms' green governance performance. T_t is a time dummy variable to control for the average time trend in firms' green governance performance over the sample period. Π_i is a dummy variable for each firm, controlling for firm fixed effects. ε_{it} is a random disturbance term.

2.3 Data

This paper used the annual report data of A-share listed companies from 2009-2023 to start the analysis, in which the microfinancial data of the enterprises were derived from the CSMAR database.

The core explanatory variable, FinTech development level data, comes from the annual reports of each enterprise, which were compiled to include six dimensions of FinTech development level data, involving artificial intelligence, blockchain, cloud computing, big data, online and mobile transformation. In this paper, the initial samples were processed as follows. First, the sample data with missing values was eliminated. Second, in order to eliminate the influence of outliers, the main continuous variables were winsorized at a rate of 1% up and down.

2.4 Variables

3.3.1 Dependent Variable: Corporate Green Governance Performance

Corporate green governance performance refers to the comprehensive performance of a company in achieving environmental, economic, and social responsibility through a series of green strategies, management, technology, and cultural practices in the green governance process. The data in this paper mainly refer to Yun et al. (2024), which used Janis-Fadner coefficient (JF coefficient) based on the positive and negative scores of the company's participation in green governance to measure its green governance performance, and scored according to the number of items achieved by the sample company in the positive score criterion. Each item was worth 1 point. p is the negative green governance score, which was scored according to the number of items achieved by the sample company in the negative score criterion. Each item was scored at -1. r is the sum of the absolute values of p and q, i.e., $r=p+|q|$. The range of values is [-1, 1]. The larger its value, the higher the firm's green governance performance, and vice versa. JF coefficient can be used to compare the differences in green governance performance among different firms. In the robustness test, this study also used ESG as a proxy variable for corporate green governance performance to further verify the reliability of the research results.

3.3.2 Core Explanatory Variable: FinTech Development Level

The level of FinTech development is a collective term for the use of new technologies, especially the Internet, mobile technology, and information technology, to innovate and improve financial services and products. The data in this paper refer to Huang et al. (2023), who extracted 124 FinTech keyword word frequency counts covering six dimensions, including artificial intelligence, blockchain, cloud computing, big data, online and mobile transformation, from the annual reports of the enterprises by using a machine learning method as an indicator of the level of FinTech development. This study sifted, organized, and standardized the collected data for subsequent analysis and comparison. In this paper, the word frequency data were logarithmized to eliminate the dimensional influence and obtain the FinTech development level of each enterprise.

3.3.3 Mechanism Variables: Green Innovation and Green Credit

Green innovation is an innovative activity aimed at maximizing economic, social, and environmental benefits through the adoption of technological means such as environmental protection, energy saving, emission reduction, and recycling. This paper drew on the methodology of Guo et al. (2024) to use the total number of patents for green utility model inventions as a measure of green innovation. Green credit is a financial activity that aims to support economic activities such as environmental improvement, combating climate change, and the economical and efficient use of resources. This study referred to the research of Zhong et al. (2023), which took green credit as a mechanism variable and the balance of green credit of enterprises as a measure. All the above data are available from the CSMAR database.

3.3.4 Other Control Variables

Control variables contain a set of variables. This study referred to previous studies (Wui et al. 2024; Sun et al. 2021; Li et al. 2019; Jiang et al. 2021), which selected the development management level and the financial level as the control variables. The development management level included the shareholding ratio of the top five shareholders and the Tobin's Q value. The ratio of shares held by the top five shareholders reflects the concentration of equity. Tobin's Q serves as an important

indicator of firm performance or firm growth. The control variables at the financial level were selected as sustainable growth rate, bank borrowings, current asset ratio, gearing ratio, and return on assets. Sustainable growth rate, a key financial indicator, was used to measure the company's maximum potential for sales growth without additional external financing and without changing existing operating efficiencies and financial policies. Bank borrowings reflect the financial needs of the enterprise. Gearing ratio is a key indicator of the solvency of a business. Return on assets is an important financial indicator for assessing the profitability of a business. Table 1 gives the descriptive statistics of the main variables.

Table 1 Results of Descriptive Statistics of Variables

	Sample Size	Mean Value	Standard Deviation	Minimum	Maximum
Green Governance Performance	22,330	0.6000	0.4490	0.0000	1.0000
FinTech Development	22,330	3.1285	1.4272	0.0000	6.3261
Shareholding Ratio of Top 5 Shareholders	22,330	0.5157	0.1980	0.2156	0.9491
Sustainable Growth Rate	22,330	0.0490	0.0998	-0.3961	0.3356
Tobin's Q	22,330	1.8486	1.0706	0.8207	6.9443
Bank Borrowings	22,330	0.1670	0.1288	0.0000	0.5428
Current Asset Ratio	22,330	0.5416	0.2069	0.0868	0.9450
Gearing Ratio	22,330	0.4708	0.1935	0.0590	0.8844
Return on Assets	22,330	0.0352	0.0534	-0.1839	0.1838

3. Empirical Results and Robustness Discussion

3.1 Benchmark Regression Results

This paper empirically analyzed the impact of FinTech on firms' green governance performance. In this paper, after adding the fixed effect of enterprises and years and control variables to each column, the regression results show that fintech significantly promotes the performance of corporate green governance at the 1% level. FinTech is not only a key factor in promoting the improvement of corporate green governance performance but also an important driving force for realizing green sustainable development.

Table 2 Results of Benchmark Regression

	(1)	(2)	(3)
FinTech Development	0.0315*** (0.0021)	0.0189*** (0.0048)	0.0185*** (0.0048)
Firm Fixed Effects	No	Yes	Yes
Year Fixed Effect	No	Yes	Yes
Constant Term	0.4999*** (0.0074)	0.5393*** (0.0153)	0.4977*** (0.0349)
Observations	22330	22330	22330
Adjusted R^2	0.0100	0.2854	0.2858

Note: (1) ***, **, and * indicate significant at the 1%, 5%, and 10% levels, respectively; (2) Numbers in parentheses are standard deviations, same below.

3.2 Robustness Tests

First, the corporate green governance performance lagging by one period was tested during the regression. Column 1 of Table 4 indicates that the FinTech development level lagging by one period has a positive contribution to corporate green governance performance, and the results are still

significant. This demonstrates that the impact of FinTech on corporate green governance performance not only exists in the current period but also has a certain degree of continuity, i.e., the FinTech development level in the early period can also have a positive impact on the green governance performance in the later period. Then, ESG was used as an indicator to replace the green governance performance during the regression. Column 2 of Table 4 shows that the level of FinTech development significantly contributes to ESG, suggesting that FinTech can significantly improve the measurability, investability, and monitorability of ESG performance through data penetration, tool innovation, and governance restructuring. This further validates the positive impact of FinTech on corporate green governance performance and suggests that this impact is not limited to specific green governance performance measures but has broader applicability. Finally, the study further winsorized to reduce the impact of extreme values on the level of FinTech for corporate green governance performance. Column 3 indicates that the results are still significant.

Table 4 Results of Robustness Test

Variable	(1)	(2)	(3)
	Lag	Indicator Replacement	Winsor
L. FinTech Development	0.0237***		
	(0.0053)		
FinTech Development		0.0470***	0.0185***
		(0.0080)	(0.0057)
Shareholding Ratio of Top 5 Shareholders	-0.0072	-0.0179	-0.0076
	(0.0363)	(0.0549)	(0.0404)
Sustainable Growth Rate	0.0413	0.0803	0.0087
	(0.0263)	(0.0820)	(0.0308)
Tobin's Q	-0.0070*	-0.0226***	-0.0091***
	(0.0037)	(0.0056)	(0.0031)
Bank Borrowings	-0.0289	0.0926	0.0107
	(0.0582)	(0.0900)	(0.0608)
Current Asset Ratio	0.0071	0.3950***	0.0970**
	(0.0419)	(0.0611)	(0.0416)
Gearing Ratio	0.0592	-0.5959***	0.0211
	(0.0471)	(0.0714)	(0.0482)
Return on Assets	-0.1305	0.3806**	-0.0280
	(0.0840)	(0.1699)	(0.0791)
Firm Fixed Effects	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
Constant Term	0.5190***	4.1412***	0.4977***
	(0.0402)	(0.0607)	(0.0419)
Observations	17490	22322	22330
Adjusted R^2	0.3159	0.4939	0.2858

3.3 Endogenous Treatment

This paper treated the data endogenously. The improvement of green governance performance may inversely promote the application and development of FinTech in that firm, i.e., there is a bidirectional causality. There may be errors in the measurement of the level of FinTech development and corporate green governance performance, which may lead to inconsistencies in the estimation results. In order to solve the above endogeneity problem, this study adopted the instrumental variable method, selecting the FinTech mean value of the industry in which the enterprise is located each year as the instrumental variable. The industry FinTech mean value can reflect the overall FinTech development level of the industry, which is correlated with the FinTech application of individual enterprises, but is not directly affected by the green governance performance of individual enterprises.

Industry In this paper, the industry FinTech mean was used as an instrumental variable to regress the level of corporate FinTech development.

The results show that the average level of industry FinTech has a significant positive effect on the level of corporate FinTech development. The fitted value obtained from the first-stage regression, that is, the predicted value of the level of corporate FinTech development, was used as an explanatory variable to regress corporate green governance performance. The results show that after dealing with endogeneity, the level of FinTech development still has a significant positive impact on corporate green governance performance, which is consistent with the results of the benchmark regression. This further validates the promotional effect of FinTech on corporate green governance performance. Furthermore, this study performed the non-identifiable test and found that the Kleibergen-Paap rk LM value of 881.336 is significant at 1% level, indicating that the instrumental variables are identifiable. Secondly, the paper performed the weak instrumental variable test and found that the Cragg-Donald Wald F-value of 1255.911 is greater than the critical value of 16.38 at the 10% level, indicating that the instrumental variable is not a weak instrumental variable.

Table 3 Results of Endogenous Treatment

	(1)	(2)
	FinTech Development	Green Governance Performance
FinTech Development IV	0.5331***	
	(0.0179)	
FinTech Development		0.0615***
		(0.0202)
Shareholding Ratio of Top 5 Shareholders	-0.2400***	0.0024
	(0.0508)	(0.0327)
Sustainable Growth Rate	0.0826*	0.0047
	(0.0508)	(0.0295)
Tobin's Q	-0.0110	-0.0087
	(0.0045)	(0.0026)
Bank Borrowings	0.2410	-0.0007
	(0.0822)	(0.0509)
Current Asset Ratio	0.0555	0.0935*
	(0.0571)	(0.0351)
Gearing Ratio	-0.1035	0.0284
	(0.0645)	(0.0403)
Return on Assets	0.1379	-0.0346
	(0.1088)	(0.0728)
Firm Fixed Effects	Yes	Yes
Year Fixed Effect	Yes	Yes
Kleibergen-Paap rk LM		881.336
Cragg-Donald Wald F		1255.911
Constant Term	0.4999***	0.5393***
	(0.0074)	(0.0153)
Observations	22330	22330
Adjusted R^2		0.2854

3.4 Heterogeneity Analysis

4.4.1 Technology-intensive Industry

Technology is the key to the development of FinTech, and the level of technology determines the level of FinTech development. This paper referred to the method of Yuan et al. (2025), which divided enterprises into two groups of technology-intensive enterprises and non-technology-intensive ones for regression tests based on the proportion of R&D investment, the proportion of technical personnel, the number of patents, and the proportion of revenues from high-technology products or services. According to the regression results in Column 2 of Table 5, FinTech significantly promotes the green governance performance of enterprises in non-technology-intensive industries. From this perspective, FinTech can effectively promote the green governance performance of non-technology-intensive enterprises. For technology-intensive enterprises, clarifying their own strengths and challenges in green governance will help them better utilize FinTech tools to enhance their green governance performance and achieve sustainable development.

Table 5 Results of Heterogeneity Analysis of Technology-intensive Firms

	(1)	(2)
	Technology-intensive	Non-technology-intensive
FinTech Development Level	0.0133 (0.0082)	0.0212*** (0.0061)
Shareholding Ratio of Top 5 Shareholders	-0.0263 (0.0548)	-0.0079 (0.0405)
Sustainable Growth Rate	0.0222 (0.0441)	0.0071 (0.0373)
Tobin's Q	-0.0110*** (0.0040)	-0.0064* (0.0037)
Bank Borrowings	0.0743 (0.0863)	-0.0108 (0.0627)
Current Asset Ratio	0.2209*** (0.0567)	0.0010 (0.0449)
Gearing Ratio	-0.0716 (0.0646)	0.1049** (0.0525)
Return on Assets	-0.0109 (0.1151)	-0.0527 (0.0919)
Firm Fixed Effects	Yes	Yes
Year Fixed Effect	Yes	Yes
Constant Term	0.4588*** (0.0602)	0.5156*** (0.0433)
Observations	9682	12595
Adjusted R^2	0.2971	0.2893

4.4.2 Heavily Polluting Industries

This classification can better locate enterprises that are more polluting to the environment and improve the effectiveness and targeting of green governance. This study referred to the method of Zhang et al. (2025), which divided the enterprise into two groups of heavy pollution industry and non-heavy pollution industry to carry out regression tests based on the pollutant emissions, the type of emissions, the environmental risk level, and other factors in the production process. According to the regression results in Column 1 of Table 6, it can be found that FinTech has a significant promotion

effect on the green governance performance of heavy polluters. FinTech means can be utilized to provide enterprises with services such as green transformation consulting and financial support for technological transformation, helping them to reduce pollution emissions and improve resource utilization efficiency.

Table 6 Results of Heterogeneity Analysis of Heavy Pollution Industry

	(1)	(2)
	Heavily Polluting Industries	Non-heavily Polluting Industries
FinTech Development Level	0.0334*** (0.0089)	0.0122** (0.0058)
Shareholding Ratio of Top 5 Shareholders	0.0336 (0.0577)	-0.0394 (0.0391)
Sustainable Growth Rate	-0.0012 (0.0471)	0.0283 (0.0349)
Tobin's Q	-0.0091 (0.0059)	-0.0079*** (0.0029)
Bank Borrowings	0.0189 (0.0941)	0.0011 (0.0606)
Current Asset Ratio	0.1109 (0.0699)	0.0985** (0.0410)
Gearing Ratio	0.1145 (0.0804)	-0.0129 (0.0469)
Return on Assets	-0.1702 (0.1518)	-0.0078 (0.0805)
Firm Fixed Effects	Yes	Yes
Year Fixed Effect	Yes	Yes
Constant Term	0.4907*** (0.0610)	0.5133*** (0.0428)
Observations	5654	16644
Adjusted R^2	0.2341	0.2964

4.4.3 Degree of Market Competition

By understanding the degree of market competition, companies can clearly determine their position in the market. This study referred to the research methodology of Zhao et al. (2025), which divided the degree of competition in the industry based on the Herfindahl Index (HHI). In this study, HHI equal to 0.15 was set as the boundary to divide the enterprises. Enterprises with an HHI higher than 0.15 were defined as those with a high degree of competition in the market, and vice versa. According to the regression results in Column 2 of Table 7, it can be found that FinTech significantly promotes the green governance performance of enterprises with a low degree of market competition. For enterprises with a lower degree of competition, more green financial support policies, such as green credit and green bonds, can be provided to support their green projects and technological transformation. Simultaneously, it encourages enterprises with a higher degree of competition to improve their green governance performance through innovation, forming a benign competitive environment.

Table 7 Results of Heterogeneity Analysis of the Degree of Market Competition

	(1)	(2)
	High Degree of	Low Degree of

	Market Competition	Market Competition
FinTech Development Level	0.0111 (0.0076)	0.0210*** (0.0068)
Shareholding Ratio of Top 5 Shareholders	-0.0372 (0.0517)	-0.0018 (0.0457)
Sustainable Growth Rate	-0.0425 (0.0556)	0.0261 (0.0363)
Tobin's Q	-0.0003 (0.0033)	-0.0148*** (0.0037)
Bank Borrowings	-0.1291* (0.0783)	0.1019 (0.0725)
Current Asset Ratio	0.0802 (0.0560)	0.1580*** (0.0500)
Gearing Ratio	0.1918*** (0.0642)	-0.0886 (0.0576)
Return on Assets	0.0726 (0.1152)	-0.0560 (0.1010)
Firm Fixed Effects	Yes	Yes
Year Fixed Effect	Yes	Yes
Constant Term	0.4684*** (0.0560)	0.4965*** (0.0488)
Observations	9965	11833
Adjusted R^2	0.2778	0.3215

4. Mechanism Analysis

This paper analyzes the transmission mechanism of FinTech on corporate green governance performance from two perspectives, green innovation and green credit. First of all, this paper took green innovation as the mechanism of FinTech to promote enterprises' green governance performance, which was measured by the total number of green utility model patents applied for in total. According to the regression results in Column 1 of Table 8, the level of FinTech development significantly promotes green innovation. The development of FinTech has provided enterprises with more efficient and accurate technical support, and lowered the threshold and cost of green innovation, thus incentivizing them to increase the number of green utility model patent applications. The total number of applications for green utility model patents reflects the innovation ability and activity of enterprises in the field of green technology. The accumulation and application of these patents can directly enhance the green governance performance of enterprises, including reducing pollution emissions and improving resource utilization efficiency.

In this paper, green credit was used as a mechanism for the level of FinTech development to promote corporate green governance performance. According to the results in Column 2 of Table 8, the level of FinTech development significantly promotes green credit at the 1% level. This indicates that green credit, as an important tool of FinTech-enabled green governance, effectively promotes green transformation and sustainable development of enterprises. The application of FinTech has enhanced the ability of financial institutions to identify and assess green projects, enabling green credit to flow more accurately to enterprises and projects that meet environmental standards.

Table 8 Results of Mechanism Analysis

Variable	(1)	(2)

	Green Innovation	Green Credit
Level of FinTech Development	0.1715** (0.0847)	0.0103*** (0.0013)
Shareholding Ratio of Top 5 Shareholders	-0.4479 (0.3314)	-0.0277*** (0.0093)
Sustainable Growth Rate	-0.5817 (0.4361)	0.0631*** (0.0129)
Tobin's Q	0.0326 (0.0260)	-0.0015 (0.0010)
Bank Borrowings	0.9959 (0.8503)	0.0140 (0.0167)
Current Asset Ratio	0.0879 (0.3306)	0.0750*** (0.0106)
Gearing Ratio	-1.0072 (0.7732)	0.3899*** (0.0129)
Return on Assets	0.6831 (0.7712)	0.1764*** (0.0265)
Firm Fixed Effects	Yes	Yes
Year Fixed Effect	Yes	Yes
Constant Term	1.2403*** (0.3600)	-0.1972*** (0.0104)
Observations	20352	21467
Adjusted R^2	0.5584	0.2037

5. Conclusions

This paper empirically analyzes the impact of FinTech on corporate green governance performance using data from A-share listed companies from 2009 to 2023, and draws the following conclusions. First, FinTech significantly promotes corporate green governance performance, which provides strong theoretical support for corporate green governance and policy making through innovative financial products and services. Second, the impact of FinTech on corporate green governance performance is heterogeneous. Enterprises in non-technology-intensive and heavily polluting industries, as well as those with a lower degree of competition, benefit more from the development of FinTech, which is of great significance in optimizing resource allocation and improving the relevance and effectiveness of green financial policies. Third, FinTech promotes corporate green governance performance by realizing green innovation and increasing green credit. On the one hand, the development of FinTech reduces the threshold and cost of green innovation, and incentivizes enterprises to increase the application of green utility model patents. On the other hand, FinTech optimizes the approval process of green credit and improves the efficiency of credit. The findings of this study reveal the specific mechanism of FinTech's role in promoting corporate green governance and also provide practical guidance for financial institutions and enterprises.

This paper has the following three policy implications. The first is that enterprises should track the green performance in each link by establishing a transparent supply chain and innovating green financing models, and improve their green governance performance by innovating green financing models and strengthening cooperation with FinTech companies. Second, FinTech development for corporate green governance performance has obvious differences in enterprises with different characteristics. From a technology-intensive perspective, companies can simplify the green

certification process for the upstream and downstream of the supply chain to help non-technology-intensive companies integrate quickly. Considering heavily polluting enterprises, the government can mandate the deployment of environmental monitoring equipment. Third, enterprises should apply FinTech technology to accelerate green innovation and broaden green credit access. For example, big data and AI analysis can be used to accurately identify the direction of green innovation, so as to achieve a win-win situation in terms of the economic and environmental benefits of enterprises' green governance.

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