International Journal of Energy Economics and Policy

ISSN: 2146-4553

available at http: www.econjournals.com

International Journal of Energy Economics and Policy, 2025, 15(6), 626-637.

Who Turns the Green Gear? Stakeholder and TPB, Environmental Uncertainty, and the Finance Innovation Performance Chain in Chinese SME

Gao Yuran[1], Ahsan Anwar[2,3,4,5]*

[1]UCSI Graduate Business School, UCSI University, Kuala Lumpur, Malaysia, [2]Centre for Business Informatics and Industrial Management, UCSI Graduate Business School, UCSI University, Kuala Lumpur, Malaysia, [3]College of International Studies, Korea University, Seoul, South Korea, [4]Advanced Research Centre, European University of Lefke, Lefke, Northern Cyprus, TR-10 Mersin, Turkey, [5]Department of Business Administration, ILMA University, Karachi, Pakistan. *Email: ahsananwar786@gmail.com

Received: 19 May 2025 **Accepted:** 06 September 2025 **DOI:** https://doi.org/10.32479/ijeep.20852

ABSTRACT

Chinese small and medium-sized enterprises experience pressure to be "green" in pursuit of green finance, as the Chinese government has established dual-carbon goals in addition to the Sustainable Development Goals (SDG). This paper applies the Theory of Planned Behaviour, Stakeholder Theory, and the concept of environmental uncertainty to explain the process by which green finance intentions lead to green innovation and to further understand the sustainability implications in terms of their impact on triple-bottom-line performance. Drawing on a SmartPLS analysis of 526 SMEs across nine Chinese cities, we find that managers' green attitudes and peer-driven norms are the primary drivers of financing intent; self-efficacy and supportive conditions indirectly boost intent via perceived control. Green leadership and environmental literacy forge positive attitudes, while regulatory and competitive signals reinforce norms. Once intention crystallizes into funding, SMEs unlock green innovations that yield clear economic, social, and environmental returns. Even amid turbulence, regulatory mandates and managerial confidence remain reliable anchors. These findings provide a roadmap for policymakers to issue stable and transparent green finance mandates. Financial institutions can tailor their credit based on behavioral cues, and SMEs should invest in leadership and capacity building.

Keywords: Green Innovations, Green Finance, Sustainable Performance, Sustainable Development Goals
JEL Classifications: O13, Q01 Q28, Q5, D81

1. INTRODUCTION

The growing issues related to environmental degradation and climate change globally have made the green and sustainable transformation of economies and societies a shared strategic goal for governments, businesses, and the international community (Anwar et al., 2025). Flagship policy frameworks, such as the Paris Agreement and the United Nations Sustainable Development Goals (SDGs), impose immediate obligations on nations and businesses to reduce greenhouse gas emissions and address climate change (Lewis et al., 2021; Krannich & Reiser, 2023). Consequently, green finance is of great importance. Green bonds and green loans are clearly showing significant market potential and generating considerable value. (Lou, 2025). Green finance reduces the environmental degradation (Sharif et al., 2024). Green finance also supports environmental improvement and sustainable development, has quickly become a vital link connecting capital markets to the needs of green industries (Li et al., 2021). Most economies are dominated by SMEs, which account for more than 90% of all companies worldwide and in China; hence, their sustainable transitional role is crucial to reaching worldwide carbon neutrality targets (Raihan, 2024; Li et al., 2025). However,

SMEs' sustainable development initiatives are severely hampered by limited resources and technological capacity, which creates financing challenges for green innovation (Aliano et al., 2024).

Considering the dynamic socio-economic features of China, SMEs are influenced by several factors, both within the organization and by external factors, such as the role of stakeholders (Cheng et al., 2025). Ongoing disruptions in global markets and the persistence of international trade frictions have substantially increased environmental uncertainty worldwide. Consequently, many Chinese companies are now favoring more conservative, stable-oriented strategies instead of increasing leverage. Given that there has been a continued decline in total social financing since 2024, this also indicates a general softening in demand for credit, rather than a supply constraint on credit (Xia et al., 2022). Meanwhile, China's pivot from a property driven model toward green innovation elevates SMEs' creative role but exacerbates financing barriers, as green technologies demand significant upfront investments, entail high risks, and yield long payback periods (Xu et al., 2022). Therefore, stimulating SMEs' green finance initiatives is essential to facilitate sustainable innovation and achieve high-quality, low-carbon development.

Despite the growing body of research on green finance and sustainable innovation in recent years, several critical gaps remain in the literature, particularly concerning Chinese small and medium-sized enterprises (SMEs). First, most existing studies focus on large enterprises or developed economies, while SMEs in emerging markets—characterized by limited resources and exposure to multiple external pressures—have not been adequately explored. Second, the current literature mainly examines the direct relationship between green finance and firm performance, with insufficient empirical attention paid to the formation mechanisms of managerial behavioral intentions and the complex behavioral pathways shaped by diverse stakeholders. Third, few studies have systematically integrated internal factors (such as green leadership and environmental awareness) with external pressures (such as regulation and competition) to examine their synergistic effects on green finance adoption and innovation outcomes. Fourth, in the context of China's highly dynamic policy and market environment, the moderating effect of environmental uncertainty—a key contextual variable—on the green finance–innovation–performance chain has rarely been empirically tested. Finally, the literature lacks sufficient investigation into the disaggregation of green innovation types and their differentiated impacts on economic, social, and environmental performance.

This paper thus focuses on SMEs and the pathway of "green-finance adoption → green innovation → triple-bottom-line performance." The study intends to clarify three important issues by combining the Theory of Planned behaviour (TPB) with stakeholder theory and creatively introducing environmental uncertainty as a moderating variable: (1) How do internal (e.g., green transformational leadership, environmental awareness, self-efficacy) and external (e.g., customer, regulatory, and competitive pressures) factors together drive SMEs' intentions to adopt green finance? (2) In what ways does environmental uncertainty balance the influence of these internal and external variables on that intention? (3) Can green finance intention improve corporate social, environmental and financial performance through green innovation?

2. THEORETICAL BACKGROUND AND DEVELOPMENT OF HYPOTHESES

2.1. Stakeholder Theory

Stakeholder Theory proposed by Freeman (1984) posits that companies operate within a complicated web of relationships among regulators, financial institutions, customers, suppliers, employees, managers, and other individuals that shape strategy and resource allocation based on legitimacy, resource control, and information disclosure (Freeman et al., 2021). In the context of China's dual carbon and under global ESG pressure, these stakeholders are now providing the impetus for greener capabilities (Wu et al., 2025). For instance, regulators have imposed enforced or designed environmental performance through taxes, evaluations, and green credit policies (Shi et al., 2023). Some key customers and international buyers have pressured suppliers to increase supply-chain transparency and reduce carbon emissions, which affects market access for some SMEs (Sindakis et al., 2023). Additionally, real-time monitoring by the public through social media prompts firms to fulfil their environmental commitments or risk reputational damage (Kishore et al., 2024). Therefore, Stakeholder theory provides a lens to identify the factors that either facilitate or inhibit SMEs' willingness to adopt green finance.

2.2. TPB

The Theory of Planned Behaviour (TPB) proposed by Ajzen (1991), has been widely used to demonstrate the relationship between intentions and behaviors, comprising attitude (ATT), subjective norm (SN), and perceived behavior control (PBC) (Cao et al., 2022). Between the introduction and the last decade or so, TPB has been validated in micro contexts, such as green consumption, energy savings, travel, and household waste sorting (Le et al., 2023; Raza et al., 2024). However, evidence of the whole chain variable integration, as green-finance adoption → green innovation → sustainability performance, using TPB is limited and primarily focused on financial institutions or services/products for large manufacturers, neglecting the Chinese SME context. Due to limited financing channels and limited resources, much of the research stops at ATT/SN/PBC → adoption intention. It does not delve into the actual level of innovation investment and performance. In addition, PBC is influenced by funding limitations and policy stability.

2.3. Hypothesis Development

2.3.1. TPB and green finance intention, green innovation

The basic premise of the Theory of Planned Behaviour is that decision-makers will only shape a meaningful behavioural intention when all three conditions are met at the same time: (1) when decision-makers believe the behaviour is, worth doing (attitude), (2) when the decision-makers believe they "should do it because everyone else is doing it (subjective norms), and (3) when decision-makers believe they can do it without too

much of a problem (perceived behavioural control) (Hagger and Hamilton, 2024). Taking this logic and applying it to green finance, as follows: (1) A company's management feels positive about the benefits of green financing (e.g., saving costs and attracting brand premiums), which captures the idea that when managers perceive a positive attitude toward green financing, it leads directly to a higher intention to finance (Gao et al., 2022). Previous studies have indicated the impact of green finance on enterprises, although this has been explored mainly in large businesses. External pressures, when customers, competitors, or local governments require green criteria to be included in their procurements, awards, or subsidies, reinforce subjective norms and maintain the impetus toward compliance. Perceived behavioral control (PBC) is attributed to both the engagement of internal capabilities and those provided externally. Thus:

H_1: Corporate attitudes positively influence the intention to adopt green financing.

H_2: Corporate subjective norms positively influence the intention to adopt green financing.

H_3: Corporate perceived behavioral control positively influences the intention to adopt green financing.

H_4: Corporate perceived behavioral control positively influences green innovation.

2.3.2. Green Leadership

Green leadership encompasses senior leaders' overt eco-values and commitment to ecological protection that they disseminate throughout the organization via policy and practice to catalyze the firm's green transformation (Begum et al., 2022). Green leadership has been shown to drive green transformation through policy and practice, where senior leaders visibly prioritize ecological goals (Robinson, 2024). Building on a top management established net-zero vision, green transformational leadership stimulates employees' ecological motivation, thereby strengthening their ecological responsibility and participation in sustainability practices (Zhang and Huang 2024). By modeling "green investment = the future" and deploying emotional contagion to influence action, thereby shaping attitudes (Zhao et al., 2022), leaders can prompt managers to seek eco-loans and eco-bonds, creating positive eco-attitudes that engage and mobilize employee support for due diligence, and increase lenders' confidence.Thus:

H_5(a): Green transformational leadership positively influences corporate attitudes.

H_5(b): Attitudes enhance the relationship between green transformational leadershipthe intention to adopt green financing.

2.3.3. Environmental awareness

Environmental awareness for managers' sensitivity and responsibility toward ecological issues enables prompt recognition of environmental risks and evaluation of long-term green investment benefits (Cao et al., 2022). Empirical studies show that decision-makers with high environmental awareness view green strategy as value creation rather than a cost burden, fostering an internal climate favorable to eco-innovation and green finance (Mamary, 2025). For instance, Chinese owners who grasp both dual-carbon policy returns and high-emission premium risks adopt a first-mover mentality, proactively considering green loans or bonds to secure low-carbon advantages (Hu and Jin, 2023). The heightened awareness cultivates a positive attitude toward environmental protection, shifting green finance from an external obligation to an internal aspiration and significantly boosting adoption intent. Thus:

H_6(a): Environmental awareness positively influences corporate attitudes.

H_6(b): Attitudes enhance the relationship between environmental awareness and the intention to adopt green financing.

2.3.4. Customer pressure

The pressure exerted by customers has transformed from traditional price-delivery demand towards strategic requirements reflected in green compliance-low-carbon value, especially through worldwide value-chain transparency (Yousaf, 2021). Concerning financing intentions, two mechanisms govern: (1) normative- mandatory green clauses increase managers' subjective norms and provide urgency to act (i.e., upgrade or lose the market), and (2) opportunity- customers provide long-term contracts or co-funding, which allows predictable cash-flow and reduced de facto product defaults (Nouvan, 2025). With customer pressure created by the dual-carbon strategy and digital traceability, customer pressure has changed from soft asks to hard entry thresholds for SMEs to seek green finance to meet downstream demand and capitalise on green premiums. Thus:

H_7(a): Customer pressure positively influences corporate subjective norms.

H_7(b): Subjective norms enhance the relationship between customer pressureand the intention to adopt green financing.

2.3.5. Regulatory pressure

Government's hard mandates (e.g., stricter emission permits, energy caps, and carbon quotas) and soft stimuli (such as tax breaks and interest subsidies) are the primary external drivers for green-finance adoption among Chinese SMEs, reflecting a clear "stick-and-carrot" strategy (Han et al., 2024). Regulatory pressure shapes subjective norms by instilling legitimacy concerns, motivating managers to seek green financing to avoid compliance risks and benefit from policy incentives. For asset-light SMEs, official green project lists and subsidy catalogues further facilitate access by reducing information asymmetries. As subjective norms strengthen, managers increasingly recognize that regulatory-compliant financing is the most direct path to fulfilling government and societal expectations (Mähönen and Lehtilä, 2023).Therefore:

H_8(a): Regulatory pressure positively influences corporate subjective norms.

H_8(b): Subjective norms enhance the relationship between regulatory pressure, and the intention to adopt green financing.

2.3.6. Self-efficacy

The TPB represents the psychological heart of PBC. Concerning resource-limited Chinese SMEs, the owner-managers competence in green-loan application processes, carbon-reduction calculations, and project evaluation will determine not only if she/he understands thresholds for participation in the applications but also whether that firm intends to act, despite lack of collateral or disclosure for creditworthiness (Hasan et al., 2023). Surveys

show that firms whose managers have completed ESG training or received energy-saving subsidized services scored higher on environmental self-efficacy and received more green loan offers financing and sustainable development help businesses (Chatzimichailidou et al., 2025). Therefore, self-efficacy raises the perceived controllability of costs, paybacks and compliance. Further, its raised effect interacts multiplicatively with PBC: when managers believe in their competency and see external finance within reach, "maybe" turns into "must do now" (Furrebøe and Nyhus, 2022). Thus:

H_9(a): Self-efficacy positively influences corporate perceived behavioral control.

H_9(b): Perceived behavioral control enhances the relationship between self-efficacy the intention to adopt green financing.

2.3.7. Competitive

In acutely competitive environments, first-mover advantages and institutional isomorphism exacerbate competitive pressures (Han and Ito, 2024). When companies can earn above normal profits due to their adoption of green innovations, associations, the media, and major customers then canonize these actions as "best practice" and raise the profile of these actions so that normatively, industry, consumers and the media consider "moving to green" as something to emulate (Lee and Jeong, 2022). Once industry actors and consumers perceive that the best-of-breed companies are going green, they will implement benchmarking, ratings and green-supply-chain audits with "catch-up fast" objectives for all the remaining managers in that industry. In the context of China, this is particularly salient (Liu et al., 2023). Moreover, when managers of SMEs see SME peers raise green loans or bonds to upgrade equipment and support their part to gain green certification, the subjective norms of managers begin to shift to: "not financing, lost bargaining power or reputational capital" (Aliano et al., 2024). Thus:

H_{10}(a): Competitor pressure positively influences corporate subjective norms.

H_{10}(b): Subjective norms enhance the relationship between competitive pressure and the intention to adopt green financing.

2.3.8. Conditions for green finance facilitation

The CGFF entail the blend of external resource plus internal absorptive capacities, that will jointly signify whether an SME can convert the idea of green borrowing into an actual project (Larsen, 2023; He and Liu, 2023). Green finance facilitates not only a company's team capabilities, technological reserves, etc., but also external. Externally, it includes friendly green credit provided under the PBoC's carbon-pledge program, municipal guarantee funds, interest-rate subsidies, tax rebates, and one-stop digital platforms to elaborate requirements and applications (Mazzucato et al., 2024). Internally, it includes a firm's ESG knowledge, the existence of staff trained in carbon accounting, and managerial routines to monitor use-of-proceeds. When decision-makers have access to and an ability to exploit these conditions, their PBC will be increases (Galloppo, 2025). Thus:

H_{11}(a): Green finance facilitating conditions positively influence corporate perceived behavioral control.

H_{11}(b): Perceived behavioral control enhances the relationship between green finance facilitating conditions the intention to adopt green financing.

2.3.9. Environmental uncertainty

Environmental uncertainty is managers' subjective perception of a rapidly or unpredictably changing policy, economic, market, and technological environment (Veršič et al., 2022). In the context of Chinese SMEs, increased EU often leads to the classic "threat–rigidity" response: macro-level volatility increases cash-flow anxiety and pressure to perform, leading managers to be more likely to conserve cash rather than to invest in high-risk, longer horizon green projects (Farooq et al., 2024). While green transformational leadership can create an engaging environmental vision within the firm, the motivational effect is weakened when government grant criteria are repeatedly revised, technology is iteratively improved, and firm orders are reduced (Niazi et al., 2023). Ultimately, even managers with higher environmental awareness may postpone green-financing discipline in times of reduced "return visibility." Furthermore, stakeholder constraints decline as the EU increases. When there is demand contraction, customers move their willingness to pay from "green value" to "low price" and thus decrease their preferences for sustainable suppliers (Abu-Allan and Alghizzawi, 2024). Periodic changes in local environmental regulations and flexible enforcement reduce regulatory deterrence, and when industry leaders cut their green capital expenditure, the competitive demonstration effect disappears (Zhou et al., 2023). The EU systematically inhibits SMEs' GO intentions, negatively moderating internal psychological drivers and external pressure mechanisms. This helps explain the "Low financing intention" paradox and provides contextual foundations for developing differentiated credit-enhancing tools, stabilizing policy expectations, and increasing information transparency (Akomea-Frimpong et al., 2022).Thus:

H_{12}(a): Environmental uncertainty negatively moderates the positive effect of green transformational leadership on corporate attitudes.

H_{12}(b): Environmental uncertainty negatively moderates the positive effect of environmental awareness on corporate attitudes.

H_{13}(a): Environmental uncertainty negatively moderates the positive effect of customer pressure on corporate subjective norms.

H_{13}(b): Environmental uncertainty negatively moderates the positive effect of regulatory pressure on corporate subjective norms.

H_{13}(c): Environmental uncertainty negatively moderates the positive effect of competitive pressure on corporate subjective norms.

H_{14}(a): Environmental uncertainty negatively moderates the positive effect of self-efficacyon corporate perceived behavioral control.

H_{14}(b): Environmental uncertainty negatively moderates the positive effect of green finance facilitating conditions on corporate perceived behavioral control.

2.10. Green Finance, Green innovation and Sustainable

Fewer than 3% of SMEs apply for available green finance, indicating a critical gap between intent and access, as mentioned by Wendt

(2021) that managers deem green-finance viable only if they (1) expect clear economic returns, (2) face both customer and regulatory pressures, and (3) meet eligibility criteria—otherwise funds remain idle. Transitioning from intent to application triggers a virtuous "Intention to adopt green finance → innovation → performance" cycle, suggesting that activating SME intent, rather than expanding product offerings, is the main bottleneck (Taghizadeh et al., 2024). Green finance products also include earmarked use clauses, mandatory disclosures, and performance covenants that drive technical and process upgrades (Taheri, 2025). Thus:

H_{15}: The intention to adopt green financing positively influences corporate green innovation behaviour.

Green innovation has a direct and synergistic effect on all three dimensions of corporate performance. In the first dimension, economic performance and green technologies typically enhance energy efficiency and allow firms to substitute raw materials. This reduces operating costs and facilitates the capture of rapidly growing green market segments with the possibility of earning extra profit (Ge, 2024). In the second dimension, the social performance dimension - cleaner production and green products enhance employee safety, improve the protection of consumers' health, and enhance the welfare of the surrounding community, which builds social trust and reputation capital (Zheng et al., 2023). In the third dimension – the environmental performance dimension – green processes directly reduce greenhouse gas emissions, solid waste, and the depletion of natural resources, all of which have the most immediate and measurable ecological benefits (Nwaogbe et al., 2025). The green innovation offers a triple synergy of economic value creation, social responsibility, and environmental impact reduction, thus clearly laying the groundwork for sustainable development. Thus:

H_{16}(a): Green innovation positively influences corporate sustainable development in terms of economic performance.

H_{16}(b): Green innovation positively influences corporate sustainable development in terms of social performance.

H_{16}(c): Green innovation positively influences corporate sustainable development in terms of environmental performance.

Following an "input-output" logic, adoption intention alone cannot directly generate performance; only when intention materializes into concrete innovation projects and yields outcomes does it translate into financial, environmental, and social value (Yasir et al., 2021; Barrios-Álvarez et al., 2024). For Chinese SMEs—where capital–technology coupling is inherently low—this is especially critical: if green loans are used merely to plug liquidity gaps rather than fund innovation upgrades, firms risk falling into "greenwashing" traps or increasing repayment burdens. Therefore, green innovation is the "engine" and "transmission" linking financing intention to sustainable performance.

H_{17}(a): Green innovation mediates the relationship between green finance adoption intention and corporate economic performance.

H_{17}(b): Green innovation mediates the relationship between green finance adoption intention and corporate environmental performance.

H_{17}(c): Green innovation mediates the relationship between green finance adoption intention and corporate social performance.

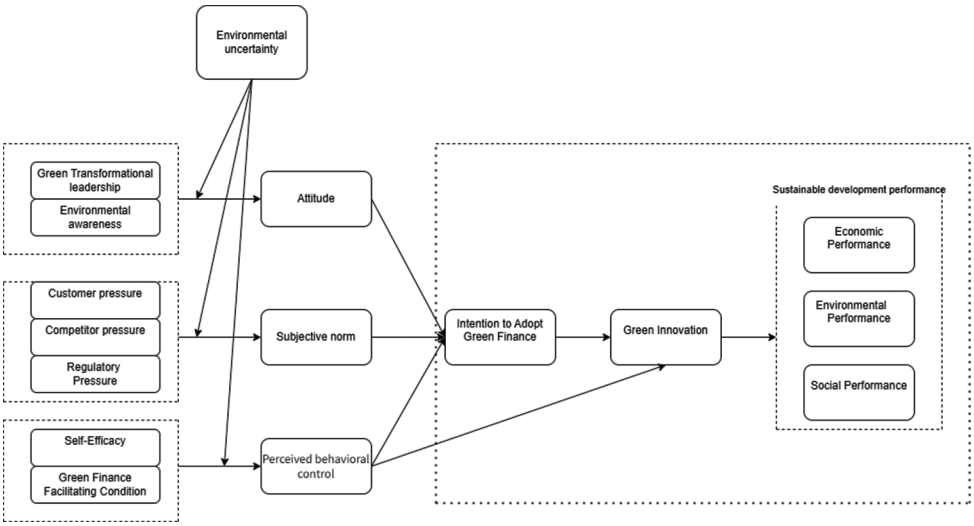
The theoretical model of the study has been illustrated in Figure 1.

3. RESEARCH METHODS

3.1. Measurement Instrument

This study employed a quantitative, survey based design with 75 items drawn from recent, highly cited scales to measure fifteen constructs: green transformational leadership, environmental awareness, customer pressure, competitive pressure, regulatory pressure, self-efficacy, green finance facilitating conditions, environmental uncertainty, attitude, subjective norm, perceived behavioural control, intention to adopt green financing, green innovation, and economic, environmental, and social performance. All items used a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) for consistency (Koo and Yang, 2025).

Figure 1: Theoretical model



3.2. Study Sites and Data Collection

The present study implemented a stratified random sampling strategy, surveying executives (e.g., owners or any one of the top managements) of small and medium enterprises in four different sectors: traditional manufacturing, technology, renewable energy, and green agriculture from 9 national central cities: Beijing, Shanghai, Guangzhou, Tianjin, Chongqing, Chengdu, Wuhan, Zhengzhou, and Xi'an. We collected the data through a questionnaire during December 2024 and March 2025. A lie-detector item (i.e., our company always prioritizes environmental protection over cost or profit) was also included in the questionnaire. We initially collected data from 550 small and medium enterprises (SMEs). However, after carefully screening and removing incomplete or invalid responses, the final usable sample comprised 526 companies. This data cleaning process was essential to ensure the reliability and accuracy of the analysis. Frequency analysis in SPSS 27 confirmed that there were no missing responses. Thus, 526 cases of valid responses remained, which exceeded the minimum requirement of 311 as determined by G*Power (Kang, 2021).

3.3. Common Method Variance

In order to mitigate the potential for common-method bias resulting from a single survey source, we used the complementary aspect of nonparametric tests, one best practice test, and one popular and original method test (Kock et al., 2021). This included two aspects: (1) following Ahmad et al. (2024)), a full-collinearity VIF analysis was conducted with substantive inter-construct correlations ranging from 1.17 to 2.54, strictly below the conservative cutoff of 3.3; no collinearity was evident. (2) Based upon Lorenzo and Ferrando (2021) the inter construct correlation matrix was explored; where the highest construct correlation within the matrix was 0.73, below the common cutoff of 0.90. Given the lack of evident shared variance across both tests, we have a high enough confidence that common-method variance does not exist and that measurement and structural analyses are, therefore, reliable.

3.4. Sample Profile

Table 1 confirms that the 526 firm sample aligns with the broader SME population. Gender is balanced (53.2% female; 46.8% male), and 33.8% have over 10 years of work experience. In terms of educational background, over 50% hold a bachelor's degree. Firm size is dominated by small enterprises (60.7%), with the remainder classified as micro, small, or medium. The sample is distributed across nine cities—Shanghai (19.2%), Guangzhou (15.2%), Wuhan (13.5%), and the other six core cities each accounting for

Table 1: Demographic profile

Frequency analysis results				
Category	**Option**	**Frequency**	**Percentage**	**Cumulative Percentage**
Gender	Female	280	53.23	53.23
	Male	246	46.77	100.00
Age	18-25	157	29.85	29.85
	26-30	111	21.10	50.95
	31-40	88	16.73	67.68
	41-50	69	13.12	80.80
	51-60	54	10.27	91.06
	Above 60	47	8.94	100.00
Work experience	11-15 years	60	11.41	11.41
	Over 15 years	118	22.43	33.84
	3-6 years	111	21.10	54.94
	7-10 years	66	12.55	67.49
	Less than 3 years	171	32.51	100.00
Educational background	Doctoral	24	4.56	4.56
	College	237	45.06	49.62
	Bachelor's	201	38.21	87.83
	Master's	64	12.17	100.00
Company size	Medium-sized enterprise (more than 100 employees)	143	27.19	27.19
	Small-sized enterprise ((less than to 100 employees)	319	60.65	87.83
	Micro enterprise (less than 50 employees)	64	12.17	100.00
Industry	Traditional Manufacturing	172	32.70	32.70
	Renewable Energy	134	25.48	58.17
	Technology Company	128	24.33	82.51
	Green Agriculture	92	17.49	100.00
Location	Shanghai	101	19.20	19.20
	Beijing	52	9.89	29.09
	Tianjin	32	6.08	35.17
	Guangzhou	80	15.21	50.38
	Chengdu	61	11.60	61.98
	Wuhan	71	13.50	75.48
	Xi'an	39	7.41	82.89
	Zhengzhou	45	8.56	91.44
	Chongqing	45	8.56	100.00
Total		526	100.0	100.0

Table 2: Measurement model

Construct (reflective)	Item code	Standardised loading	Composite reliability (CR)	Average variance extracted (AVE)
Green transformational leadership	GTL1	0.818	0.93	0.689
	GTL2	0.834		
	GTL3	0.844		
	GTL4	0.82		
	GTL5	0.833		
	GTL6	0.831		
Environmental awareness	EA1	0.836	0.92	0.697
	EA2	0.828		
	EA3	0.852		
	EA4	0.822		
	EA5	0.835		
Customer pressure	CUP1	0.792	0.88	0.647
	CUP2	0.82		
	CUP3	0.801		
	CUP4	0.804		
Regulatory pressure	RP1	0.851	0.907	0.71
	RP2	0.843		
	RP3	0.848		
	RP4	0.828		
Competitive pressure	COP1	0.841	0.911	0.72
	COP2	0.844		
	COP3	0.85		
	COP4	0.857		
Green finance facilitating condition	GFFC1	0.877	0.902	0.754
	GFFC2	0.861		
	GFFC3	0.866		
Self-efficacy	SE1	0.864	0.933	0.736
	SE2	0.865		
	SE3	0.862		
	SE4	0.838		
	SE5	0.861		
Attitude	ATT1	0.833	0.917	0.734
	ATT2	0.854		
	ATT3	0.869		
	ATT4	0.871		
Subjective norm	SN1	0.851	0.92	0.696
	SN2	0.818		
	SN3	0.834		
	SN4	0.85		
	SN5	0.818		
Perceived behavioural control	PBC1	0.817	0.928	0.682
	PBC2	0.825		
	PBC3	0.833		
	PBC4	0.817		
	PBC5	0.818		
	PBC6	0.845		
Environmental uncertainty	EU1	0.874	—	—
	EU2	0.905		
	EU3	0.904		
	EU4	0.867		
Intention to adopt green finance	IAGF1	0.849	0.894	0.679
	IAGF2	0.799		
	IAGF3	0.799		
	IAGF4	0.847		
Green innovation	GI1	0.845	0.94	0.724
	GI2	0.865		
	GI3	0.84		
	GI4	0.851		
	GI5	0.844		
	GI6	0.86		
Economic performance	ECP1	0.889	0.917	0.786
	ECP2	0.892		
	ECP3	0.879		
Social performance	SP1	0.875	0.953	0.742
	SP2	0.849		
	SP3	0.87		
	SP4	0.861		
	SP5	0.861		
	SP6	0.853		
	SP7	0.861		
Environmental performance	EP1	0.882	0.932	0.775
	EP2	0.884		
	EP3	0.891		
	EP4	0.863		

6-10%—ensuring high representativeness for analyzing green finance and innovation in Chinese SMEs.

3.5. Statistical Analysis

In accordance with a recognized PLS-SEM approach for research on sustainable business (Rehman Khan and Yu, 2021), we utilized SmartPLS 4 for structural modeling and SPSS 27 to conduct additional analyses. PLS -SEMS can deal with more complex models that include multiple mediators and moderators and addresses our desire to study the psychological and institutional factors affecting green financing intention and green innovation (Cepeda et al., 2024).

4. RESULTS

4.1. Evaluating the Measurement Model

Table 2 shows the measurement quality for each reflective construct is displayed in Table 2. To begin with, each item loading was above 0.79 (the highest was 0.905), which is considerably higher than the 0.70 minimum threshold; therefore, there is strong indicator reliability. Second, except for Environmental Uncertainty (EU) because it is specified as a formative construct and so found it is impossible to assess the CR/AVE, the remaining 14 constructs showed composite reliability (CR) ranging from 0.88 to 0.953, which is above the 0.70 minimum threshold, and confirms internal

Table 3: HTMT

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Subjective Norm															
Customer Pressure	0.259														
Attitude	0.522	0.27													
Perceived Behavioral Control	0.445	0.222	0.244												
Environmental Uncertainty	0.132	0.205	0.034	0.071											
Environmental Awareness	0.421	0.307	0.661	0.243	0.052										
Environmental Performance	0.534	0.288	0.498	0.394	0.115	0.441									
Regulatory Pressure	0.614	0.251	0.288	0.314	0.246	0.316	0.352								
Social Performance	0.53	0.271	0.526	0.334	0.143	0.439	0.719	0.351							
Competitive Pressure	0.643	0.226	0.382	0.216	0.259	0.441	0.348	0.471	0.389						
Economic Performance	0.512	0.241	0.515	0.326	0.173	0.462	0.737	0.337	0.735	0.401					
Green Innovation	0.561	0.185	0.509	0.374	0.125	0.415	0.814	0.327	0.812	0.368	0.842				
Green Transformational Leadership	0.443	0.255	0.623	0.312	0.08	0.534	0.451	0.356	0.439	0.38	0.465	0.418			
Green Finance Facilitating Conditions	0.397	0.383	0.354	0.669	0.148	0.404	0.422	0.43	0.386	0.338	0.398	0.314	0.486		
Green Finance Adoption Intention	0.733	0.243	0.702	0.541	0.043	0.535	0.709	0.415	0.7	0.443	0.698	0.8	0.566	0.436	
Self-efficacy	0.328	0.265	0.285	0.738	0.152	0.263	0.306	0.327	0.356	0.242	0.301	0.284	0.306	0.675	0.359

Table 4: Path analyze

Hypotheses	Path relationship	Original sample (O)	Sample mean (M)	STDEV	T	P-values
H_1	Attitude -> Green Finance Adoption intention	0.383	0.384	0.036	10.752	0.00***
H_2	Subjective norm -> Green Finance Adoption intention	0.361	0.361	0.043	8.441	0.00***
H_3	Perceived behavioral control -> Green Finance Adoption intention	0.245	0.246	0.037	6.607	0.00***
H_4	Perceived behavioral control-> Green Innovation	0.011	0.01	0.035	0.324	0.746
H_5(a)	Green Transformational Leadership -> Attitude	0.315	0.32	0.048	6.55	0.00***
H_6(a)	Environmental Awareness -> Attitude	0.386	0.385	0.049	7.809	0.00***
H_7(a)	Customer Pressure -> Subjective Norms	0.056	0.06	0.038	1.475	0.14
H_8(a)	Regulatory Pressure -> Subjective Norms	0.331	0.332	0.049	6.695	0.00***
H_9(a)	Competitive Pressure -> Subjective Norms	0.445	0.445	0.049	9.176	0.00 ***
H_{10}(a)	Self-Efficacy -> Perceived Behavioural Control	0.476	0.476	0.052	9.196	0.00 ***
H_{11}(a)	Green Financial Support Conditions -> Perceived Behavioural Control	0.308	0.31	0.049	6.238	0.00 ***
H_{15}	Green Finance Adoption intention -> Green Innovation	0.7	0.7	0.03	23.081	0.00 ***
H_{16}(a)	Green Innovation -> Economic Performance	0.753	0.753	0.028	26.917	0.00 ***
H_{16}(b)	Green Innovation -> Social Performance	0.759	0.759	0.024	31.122	0.00 ***
H_{16}(c)	Green Innovation -> Environmental Performance	0.743	0.743	0.026	28.517	0.00 ***

*P<0.05; **P<0.01; ***P<0.001

consistency (Sabo et al., 2025). The AVE ranged from 0.647 to 0.786, which exceeded the 0.50 threshold and confirms convergent validity (Kannadasan et al., 2024).

4.2. HTMT

Table 3 shows HTMT coefficients can be seen in Table 3, ranging from 0.034 to 0.842, with none exceeding the acceptable (and perhaps overly strict) threshold of 0.85 and most being under 0.70 (Schukat and Heise,2021). There is no real risk to discriminant validity in any of the latent variable pairings too, even with the latent variable pairs that are conceptually closest: "Competitive Pressure–Subjective Norm" (0.643) and "Green-financing intention–Subjective Norm" (0.733).

4.3. Structural Model Analysis

4.3.1. Path analyze

Table 4 demonstrates that attitude (β = 0.383, t = 10.75), subjective norm (β = 0.361, t = 8.44), and perceived behavioural control (β = 0.245, t = 6.61) all have a significant impact (P < 0.001) on SMEs' intention to adopt green finance, confirming the critical role of both motivational and socio-cognitive factors. Green transformational leadership (β = 0.315, t = 6.55) and environmental awareness (β = 0.386, t = 7.81) strongly drive pro-environmental attitudes, while regulatory (β = 0.331) and especially competitive pressures (β = 0.445, t = 9.18) shape subjective norms. Customer pressure, however, is not significant (β = 0.056, t = 1.48, P = 0.14), indicating that institutional and industry influences outweigh market demand for Chinese SMEs. Self-efficacy (β = 0.476, t = 9.20) and green-finance conditions (β = 0.308, t = 6.24) significantly boost perceived behavioural control. Importantly, the intention to adopt green finance strongly predicts green innovation (β = 0.700, t = 23.08), which in turn enhances economic (β = 0.753, t = 26.92), social (β = 0.759, t = 31.12), and environmental performance (β = 0.743, t = 28.52), supporting the "finance–innovation–performance" chain. Notably, perceived behavioural control does not directly influence innovation (β = 0.011, t = 0.32),

Table 5: Mediation effect test

Hypotheses	Path relationship	(O)	(M)	STDEV	T	P	LLCI	ULCI
H_5(b)	GTL -> ATT-> IAGF	0.121	0.123	0.022	5.408	0	0.08	0.167
H_6(b)	EA -> ATT -> IAGF	0.148	0.148	0.023	6.325	0	0.106	0.198
H_7(b)	CUP -> SN -> IAGF	0.02	0.022	0.014	1.45	0.147	−0.006	0.048
H_8(b)	RP -> SN -> IAGF	0.119	0.12	0.023	5.244	0	0.078	0.167
H_9(b)	COP -> SN ->IAGF	0.161	0.161	0.026	6.301	0	0.116	0.215
H_{10}(b)	SE-> PBC -> IAGF	0.117	0.117	0.021	5.587	0	0.08	0.164
H_{11}(b)	GFFC -> PBC -> IAGF	0.076	0.076	0.017	4.408	0	0.046	0.114
H_{17}(a)	IAGF -> GI -> ECP	0.527	0.527	0.032	16.597	0	0.463	0.587
H_{17}(b)	IAGF -> GI-> EP	0.52	0.521	0.03	17.137	0	0.459	0.578
H_{17}(c)	IAGF -> GI -> SP	0.531	0.532	0.03	17.479	0	0.471	0.588

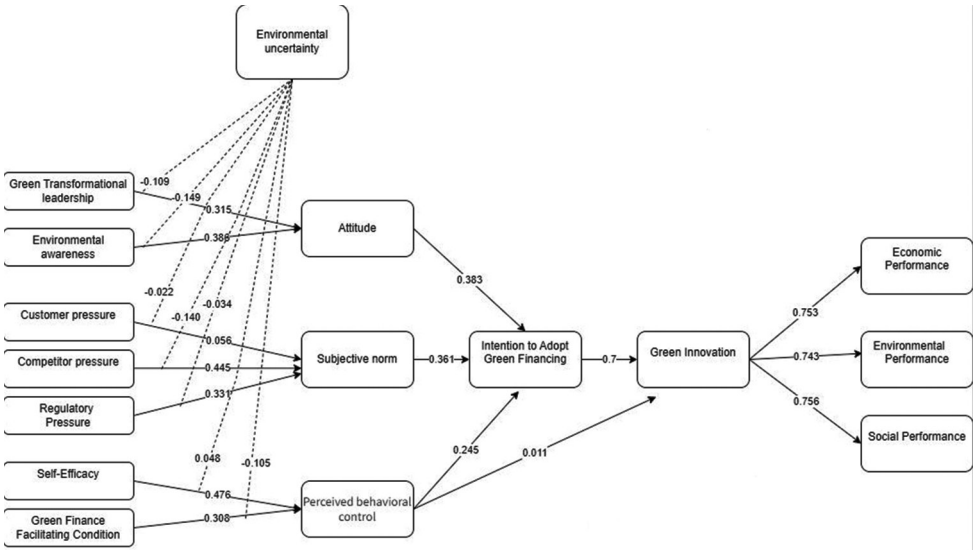
(2) (1) GTL stands for Green Transformational Leadership, ATT stands for Attitude, IAGF stands for Intention to Adopt Green Finance, EA stands for Environmental Awareness, CUP stands for Customer Pressure, SN stands for Subjective Norm, COP stands for Competitive Pressure, RP stands for Regulatory Pressure, SE stands for Self-Efficacy, PBC stands for Perceived Behavioral Control, GFFC stands for Green Finance Facilitating Conditions, GI stands for Green Innovation, ECP stands for Economic Performance, EP stands for Environmental Performance, and SP stands for Social Performance. (2) Original sample stands for O, Sample mean stands for M, Standard deviation stands for STDEV, (3) *P<0.05; **P<0.01; ***P<0.001

Table 6: Moderating variables

Hypotheses	Path relationship	O	M	STDEV	T statistic	P-values
H12(a)	EU × GTL → ATT	−0.109	−0.11	0.055	1.979	0.048
H12(b)	EU × EA → ATT	−0.149	−0.144	0.049	3.03	0.002
H13(a)	EU × CUP → SN	−0.022	−0.021	0.038	0.589	0.556
H13(b)	EU × RP → SN	0.034	0.036	0.06	0.562	0.574
H13(c)	EU × COP → SN	−0.14	−0.139	0.061	2.288	0.022
H14(a)	EU × SE → PBC	0.048	0.05	0.058	0.833	0.405
H14(b)	EU × GFFC → PBC	−0.105	−0.105	0.052	2.024	0.043

*P<0.05; **P<0.01; ***P<0.001

Figure 2: Theoretical model result



showing that capability alone is insufficient without the intention to seek green finance.

4.3.2. Mediation effect test

Table 5 shows Mediation analyses reveal two distinct pathways by which antecedents drive green-finance intention and downstream performance. First, green transformational leadership (β = 0.121, T = 5.408) and environmental awareness (β = 0.148, T = 6.325) each bolster pro-environmental attitudes, which in turn increase financing intention. In contrast, regulatory (β = 0.119, T = 5.244) and competitive pressures (β = 0.161, T = 6.301) shape intention via subjective norms, whereas customer pressure is nonsignificant (β = 0.020, T = 1.450), underscoring that Chinese SMEs respond more to policy and peer benchmarks than market demand (Liu and Wang, 2022). Second, self-efficacy (β = 0.117, T = 5.587) and supportive financing conditions (β = 0.076, T = 4.408) enhance perceived behavioural control, further strengthening intent (Hashmi et al., 2021). Crucially, financing intention then drives green innovation, which delivers substantial economic (β = 0.527, T = 16.597), environmental (β = 0.520, T = 17.137), and social (β = 0.531, T = 17.479) gains—demonstrating green finance as the pivotal link between managerial cognition and sustainable performance (Hussain et al., 2024).

4.3.3. Moderating variables

Table 6 shows that environmental uncertainty (EU) weakens several key pathways in the model. As uncertainty rises, the positive impacts of green transformational leadership and environmental awareness on managerial attitudes significantly decrease ($\beta = -0.109$, $T = 1.98$; $\beta = -0.149$, $T = 3.03$). EU also reduces the influence of competitive pressure on subjective norms ($\beta = -0.140$, $T = 2.29$), indicating that firms are less motivated by peers during turbulent times. However, EU does not significantly affect the impact of customer or regulatory pressures on norms, meaning these remain stable drivers. While managers' self-efficacy is unaffected ($\beta = 0.048$, $T = 0.83$), the effect of green finance facilitating conditions on perceived behavioral control weakens ($\beta = -0.105$, $P = 0.043$). Overall, environmental uncertainty dampens internal motivation and the benefits of external support but leaves the effects of regulatory mandates and personal capability intact (Chandra and Andrian, 2024). Moreover, the results of the theoretical model have been summarized in Figure 2.

5. CONCLUSIONS AND POLICY IMPLICATIONS

5.1. Conclusions

This study integrates the Theory of Planned Behavior, Stakeholder Theory, and Environmental Uncertainty Theory into a comprehensive model tracing the full pathway from green-financing intention to green innovation and triple-bottom-line performance. Addressing gaps in prior research focused mainly on banks or large enterprises, our findings show: (1) All three TPB components directly influence financing intention, but attitude and subjective norm are most critical, highlighting the importance of shared values and legitimacy for SMEs. (2) Green transformational leadership and environmental awareness drive intention primarily through attitudes, while regulatory and competitive pressures work through subjective norms—underscoring the stronger impact of institutional and industry forces over customer demand. (3) Green-financing intention robustly predicts economic, social, and environmental performance via green innovation, evidencing the systemic value of targeted green investments. (4) Environmental uncertainty dampens the effects of internal motivation and peer benchmarking, but not regulatory pressure or self-efficacy, suggesting SMEs depend more on institutional frameworks and internal capabilities in volatile contexts. These results help explain sluggish corporate financing among Chinese SMEs and offer new insight into extending TPB for financial decision-making and stakeholder dynamics.

5.2. Policy Implications

Considering the outcomes generated, the study proposes a set of comprehensive policies that would help China not only to strengthen its use of financial resources but also to secure SDG 09, SDG 12, and specifically, SDG 13. Therefore, it has been suggested to the policy-making bodies to promote green finance; there should be some arrangements to introduce targeted green finance schemes providing incentives to adopt green technologies. This would help SMEs in the adoption of green innovations and ensure the triple-bottom-line implications of the financial resources. Moreover, raising the intellectual base of the SMEs through training programs and capacity-building initiatives would promote not only the environmental awareness among the SMEs but also would prepare them to take climate actions by focusing on the sustainable use of financial resources. In the meantime, the efficient regulatory system of institutions is considered indispensable in making environmental policies, tax rebates, and subsidies aligned with sustainable financial resources allocation. Furthermore, the role of industry-academia linkages for the creation of innovation hubs and collaborative practices could also not be ignored. It would help SMEs to implement innovative technologies in their business models and allocate financial resources directly, generating sustainable output. In the same manner, avoiding the adverse impacts of the geopolitical conditions in China, focusing on the adaptive technologies and risk-mitigating policies would help SMEs to sustain innovative techniques of production with the effective use of green finance.

5.3. Limitations and Future Research Directions

This study has three main limitations. First, it relies on cross-sectional, which may introduce common-method bias; future work should use longitudinal or multi-source designs. Second, focusing on central city SMEs in select industries limits generalizability; replicating the model with micro firms, larger SMEs, rural companies, or in other countries would test its broader applicability. Third, while we included TPB constructs, stakeholder pressures, and environmental uncertainty, we omitted factors like firms' financial health, governance, and digital infrastructure; future research should incorporate these variables.

REFERENCES

Abu-Allan, A., Alghizzawi, M. (2024), Environmental uncertainty awareness and organisational performance: A review and suggestions for future research. Opportunities and Risks in AI for Business Development, 1, 345-355.

Ahmad, N.R., Shariff, M.N.M., Hafeez, M.H., Cherdchom, N. (2024), Strategic orientations, access to finance, and SMEs performance in Thailand: Data screening and preliminary analysis. Asia Social Issues, 17(6), e267964-e267964.

Ajzen, I. (1991), The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50(2), 179-211.

Aliano, M., Cestari, G., Madonna, S. (2024), Financial instruments for green finance tailored to SMEs. In: Sustainable Finance for SMEs: The Role of Capital for Sustainable and Inclusive Growth. Cham: Springer Nature Switzerland. p73-91.

Al-Mamary, Y.H. (2025), Factors shaping green entrepreneurial intentions towards green innovation: an integrated model. Future Business Journal, 11(1), 21.

Anwar, A., Hamid, A., Radulescu, M., Sharif, A. (2025), Impact of green policies, geopolitical risks, and imports on green production: Formulating the SDG policies for G7 countries. Environmental Sciences Europe, 37(1), 1-19.

Bindeeba, D.S., Bakashaba, R., Tukamushaba, E.K., Atuhaire, S. (2025), From green HRM to sustainable business performance: A two-Stage meta-analytic SEM of the mediating role of green innovation. Cogent Business and Management, 12(1), 2536678.

Cao, C., Tong, X., Chen, Y., Zhang, Y. (2022), How top management's

environmental awareness affects corporate green competitive advantage: Evidence from China. Kybernetes, 51(3), 1250-1279.
Cepeda, G., Roldán, J.L., Sabol, M., Hair, J., Chong, A.Y.L. (2024), Emerging opportunities for information systems researchers to expand their PLS-SEM analytical toolbox. Industrial Management and Data Systems, 124(6), 2230-2250.
Chandra, M., Andrian, T. (2024), Do corporate social responsibility, green culture, and environmental uncertainty enhance sustainable performance? Exploring the role of social media moderation. International Journal of Sustainable Development and Planning, 19(10), 3861-3870.
Chatzimichailidou, P., Reppa, A., Karava, Z., Reppa, G., Kanakaris, V., Serdaris, P. (2025), The contribution of training to employee engagement for successful ESG strategy implementation. In: Sustainability through Green HRM and Performance Integration. United States: IGI Global. p59-82.
Cheng, P., Wu, S., Xiao, J. (2025), Exploring the impact of entrepreneurial orientation and market orientation on entrepreneurial performance in the context of environmental uncertainty. Scientific Reports, 15(1), 1913.
Cheng, P., Zhang, J., Chen, J., Zheng, Y., Li, Z. (2025), Stakeholder attention and ambidextrous green innovation: Evidence from China. Business Strategy and the Environment, 34(1), 1007-1026.
Freeman, R.E., (1984), Strategic Management: A Stakeholder Approach. London: Pitman Publisher.
Freeman, R.E., Dmytriyev, S.D., Phillips, R.A. (2021), Stakeholder theory and the resource-based view of the firm. Journal of Management, 47(7), 1757-1770.
Furrebøe, E.F., Nyhus, E.K. (2022), Financial self-efficacy, financial literacy, and gender: A review. Journal of Consumer Affairs, 56(2), 743-765.
Galloppo, G. (2025), How and why asset managers use ESG. In: A Journey into ESG Investments: The Theory and Practice of the CSR-Financial Performance Nexus. Cham: Springer Nature Switzerland. p3-64.
Gao, D., Zhou, X., Mo, X., Liu, X. (2024), Unlocking sustainable growth: Exploring the catalytic role of green finance in firms' green total factor productivity. Environmental Science and Pollution Research, 31(10), 14762-14774.
Ge, H., Zhang, X. (2025), From uncertainty to sustainability: How climate policy uncertainty shapes corporate ESG? International Review of Economics and Finance, 98, 104011.
Ge, Y., Xia, Y., Wang, T. (2024), Digital economy, data resources and enterprise green technology innovation: Evidence from A-listed Chinese Firms. Resources Policy, 92, 105035.
Hagger, M.S., Hamilton, K. (2024), Longitudinal tests of the theory of planned behaviour: A meta-analysis. European Review of Social Psychology, 35(1), 198-254.
Han, F., Mao, X., Yu, X., Yang, L. (2024), Government environmental protection subsidies and corporate green innovation: Evidence from Chinese microenterprises. Journal of Innovation and Knowledge, 9(1), 100458.
Han, S., Ito, K. (2024), What explains the spread of corporate social responsibility? The role of competitive pressure and institutional isomorphism in the diffusion of voluntary adoption. Journal of Management and Organization, 30(3), 765-786.
Hashmi, F., Aftab, H., Martins, J.M., Nuno Mata, M., Qureshi, H.A., Abreu, A., Mata, P.N. (2021), The role of self-esteem, optimism, deliberative thinking and self-control in shaping the financial behavior and financial well-being of young adults. PLoS One, 16(9), e0256649.
He, Y., Liu, R. (2023), The impact of the level of green finance development on corporate debt financing capacity. Finance Research Letters, 52, 103552.
Hu, Y., Jin, Y. (2023), Unraveling the influence of green bonds on environmental sustainability and paving the way for sustainable energy projects in green finance. Environmental Science and Pollution Research, 30(52), 113039-113054.
Hunjra, A.I. (2025), The green intentions of capital: How green finance is changing the boundaries of corporate sustainability strategies. Journal of Environmental Management, 390, 126362.
Hussain, S., Rasheed, A., Rehman, S.U. (2024), Driving sustainable growth: exploring the link between financial innovation, green finance and sustainability performance: Banking evidence. Kybernetes, 53(11), 4678-4696.
Kang, H. (2021), Sample size determination and power analysis using the G* Power software. Journal of Educational Evaluation for Health Professions, 18.
Kannadasan, K., Dahlui, M., Hairi, F.M., Azzeri, A. (2024), Development and validation of a malay version questionnaire to evaluate remote health monitoring of COVID-19 via telehealth applications: Navigating Telehealth Evolution. Cureus, 16(8), e67579.
Kapoor, S. (2025), The Role of SmartPLS in Optimizing Statistical Analysis: A Case Study Approach. In: 2025 5th International Conference on Innovative Research in Applied Science, Engineering and Technology (IRASET). IEEE. p1-5.
Kishore, M.K., Shaik, S., Panda, B.S. (2024), Exploration of the sentiment-driven forecasting models for predicting consumer purchase patterns on social media. International Journal of Innovative Research In Technology, 10(12), 714-724.
Kock, F., Berbekova, A., Assaf, A.G. (2021), Understanding and managing the threat of common method bias: Detection, prevention and control. Tourism management, 86, 104330.
Koo, M., Yang, S.W. (2025), Likert-type scale. Encyclopedia, 5(1), 18.
Krannich, A.L., Reiser, D. (2023), United Nations Sustainable Development Goals 2030, The. In: Encyclopedia of Sustainable Management. Cham: Springer International Publishing. p3862-3867.
Kumari, S., Shirodkar, V., McGuire, S. (2025), The impact of home institutions on the internationalization of emerging market SMEs: A systematic review. Multinational Business Review, 33(1), 68-96.
Larsen, M.L. (2023), Bottom-up market-facilitation and top-down market-steering: Comparing and conceptualizing green finance approaches in the EU and China. Asia Europe Journal, 21(1), 61-80.
Le-Anh, T., Nguyen, M. D., Nguyen, T. T., Duong, K. T. (2023), Energy saving intention and behavior under behavioral reasoning perspectives. Energy Efficiency, 16(2), 8.
Lee, M. H., Wang, C., Yu, M. C. (2023), A multilevel study of change-oriented leadership and commitment: The moderating effect of group emotional contagion. Psychology Research and Behavior Management, 637-650.
Lee, S. H., Jeong, G.Y. (2022), The effect of corporate social responsibility compatibility and authenticity on brand trust and corporate sustainability management: For Korean cosmetics companies. Frontiers in Psychology, 13, 895823.
Lewis, D.J., Yang, X., Moise, D., Roddy, S.J. (2021), Dynamic synergies between China's belt and road initiative and the UN's sustainable development goals. Journal of International Business Policy, 4(1), 58.
Li, C., Sampene, A.K., Khan, A., Wiredu, J. (2025), Environmental orientations to Innovation Ecosystem: The role of green transition, perceived environmental uncertainty and green transformational leadership. Operations Management Research, 18(1), 48-71.
Li, J., Ma, L., Li, B. (2025), Financial agglomeration, bank enterprise distance, and SME performance: Evidence from China. Journal of the Knowledge Economy, 16(2), 8172-8197.
Li, L., Wu, W., Zhang, M., Lin, L. (2021), Linkage analysis between finance and environmental protection sectors in China: An approach to evaluating green finance. International Journal of Environmental

Research and Public Health, 18(5), 2634.
Liu, T., Cao, X. (2025), Going green: how executive environmental awareness and green innovation drive corporate sustainable development. Journal of the Knowledge Economy, 16(2), 6577-6604.
Liu, Y., Wang, M. (2022), Entrepreneurial orientation, new product development and firm performance: The moderating role of legitimacy in Chinese high-tech SMEs. European Journal of Innovation Management, 25(1), 130-149.
Liu, Y., Wang, Q., Huang, B., Zhang, X., Wang, X., Long, Y. (2023), Status and challenges of green manufacturing: Comparative analysis of China and other countries. Resources, Conservation and Recycling, 197, 107051.
Lohmöller, J.B. (1989), Latent Variable Path Modeling with Partial Least Squares. Heidelberg: Physica-Verlag.
Lorenzo-Seva, U., Ferrando, P.J. (2021), Not positive definite correlation matrices in exploratory item factor analysis: Causes, consequences and a proposed solution. Structural Equation Modeling: A Multidisciplinary Journal, 28(1), 138-147.
Lou, Y. (2025), Green finance market and carbon neutralization capacity in China. Humanities and Social Sciences Communications, 12(1), 1-8.
Nouvan, R. (2025), Transforming financial systems for sustainability: The role of green financing in social-environmental progress and economic resilience. EcoProfit: Sustainable and Environment Business, 3(1), 33-50.
Nwaogbe, G., Urhoghide, O., Ekpenyong, E., Emmanuel, A. (2025), Green construction practices: Aligning environmental sustainability with project efficiency. International Journal of Science and Research Archive, 14(1), 189-201.
Okeke, N.I., Bakare, O.A., Achumie, G.O. (2024), Integrating policy incentives and risk management for effective green finance in emerging markets. International Journal of Frontiers in Science and Technology Research, 7(1), 76-88.
Pan, T., Lin, B. (2025), Is the green credit policy useful for improving energy intensity? Evidence from cities in China. Financial Innovation, 11(1), 30.
Raihan, A. (2024), A review of the digitalization of the small and medium enterprises (SMEs) toward sustainability. Global Sustainability Research, 3(2), 1-16.
Raza, S.A., Khan, K.A., Qamar, B. (2024), Understanding the influence of environmental triggers on tourists' pro-environmental behaviors in the Pakistan's tourism industry. Journal of Tourism Futures, 10(1), 38-67.
Rehman Khan, S.A., Yu, Z. (2021), Assessing the eco-environmental performance: An PLS-SEM approach with practice-based view. International Journal of Logistics Research and Applications, 24(3), 303-321.
Robinson, E. (2024), Leadership Strategies Business Managers Use to Improve Diversity and Inclusion in the Workplace (Doctoral Dissertation, Walden University).
Sabo, A., Kuan, G., Abdullah, S., Kuay, H.S., Kueh, Y.C. (2025), Development and validation of the individual potentials questionnaire (IP-Q), Scientific Reports, 15(1), 10708.
Schukat, S., Heise, H. (2021), Towards an understanding of the behavioral intentions and actual use of smart products among German farmers. Sustainability, 13(12), 6666.
Sharif, A., Sofuoglu, E., Kocak, S., Anwar, A. (2024), Can green finance and energy provide a Glimmer of hope towards sustainable environment in the midst of chaos? An evidence from Malaysia. Renewable Energy, 223, 119982.
Shi, X., Jiang, Z., Bai, D., Fahad, S., Irfan, M. (2023), Assessing the impact of green tax reforms on corporate environmental performance and economic growth: Do green reforms promote the environmental performance in heavily polluted enterprises? Environmental Science and Pollution Research, 30(19), 56054-56072.
Sindakis, S., Showkat, S., Su, J. (2023), Unveiling the influence: Exploring the impact of interrelationships among e-commerce supply chain members on supply chain sustainability. Sustainability, 15(24), 16642.
Sun, K., Ooi, K.B., Wei-Han Tan, G., Lee, V.H. (2025), Small and medium-sized enterprises' path to sustainable supply chains: Exploring the role of supply chain finance and risk management. Supply Chain Management: An International Journal, 30(1), 1-18.
Taghizadeh, S.K., Al Riyami, S., Rahman, S.A., Khan, G.M., Al Abri, S. (2024), Does entrepreneurial intention for innovation at firm-level matter to affect performance? The International Journal of Entrepreneurship and Innovation, 25(4), 263-273.
Taghizadeh, S.K., Al Riyami, S., Rahman, S.A., Khan, G.M., Al Abri, S. (2024), Does entrepreneurial intention for innovation at firm-level matter to affect performance? The International Journal of Entrepreneurship and Innovation, 25(4), 263-273.
Taheri Hosseinkhani, N. (2025), Green finance and the circular economy transition: Policy frameworks, financial instruments, and impact metrics. Financial Instruments, and Impact Metrics.
Wen, H., Lee, C.C., Zhou, F. (2022), How does fiscal policy uncertainty affect corporate innovation investment? Evidence from China's new energy industry. Energy Economics, 105, 105767.
Wendt, K. (2021), Green and Social Economy Finance. United States: CRC Press.
Wu, Y., Ivashkovskaya, I., Besstremyannaya, G., Liu, C. (2025), Unlocking green innovation potential amidst digital transformation challenges-The evidence from ESG transformation in China. Sustainability, 17(1), 309.
Xia, Y., Hu, W., Su, Z. (2022), Economic policy uncertainty, social financing scale and local fiscal sustainability: Evidence from local governments in China. Sustainability, 14(12), 7343.
Xu, R., Guo, T., Zhao, H. (2022), Research on the path of policy financing guarantee to promote SMEs' green technology innovation. Mathematics, 10(4), 642.
Yousaf, Z. (2021), Go for green: green innovation through green dynamic capabilities: Accessing the mediating role of green practices and green value co-creation. Environmental Science and Pollution Research, 28(39), 54863-54875.
Zhang, H., Huang, H. (2024), Low-carbon transformational leadership: Conceptualization, measurement, and its impact on innovation outcomes. Sustainability, 16(24), 10844.
Zheng, S.Y., Chen, R., Liu, H., Li, J., Fahad, S., Li, B. (2023), Corporate social responsibility initiatives and their role in firms' reputation and green economic recovery through organizational trust. Environmental Science and Pollution Research, 30(45), 101817-101828.
Zhou, P., Song, F.M., Huang, X. (2023), Environmental regulations and firms' green innovations: Transforming pressure into incentives. International Review of Financial Analysis, 86, 102504.