
Academic Articles

Driving Green Innovation in an Emerging Economy: The Moderating Role of Policy Support on the ESG Innovation Link in Thailand

Tharinee Suesatsakul^{1*}, Junping Yang²

1. Zhejiang Sci-Tech University, School of Economics and Management, China. E-mail: uratchayaphon.s@gmail.com

2. Zhejiang Sci-Tech University, School of Economics and Management, China. E-mail: junping_yang@gmail.com

*Corresponding Author E-mail: uratchayaphon.s@gmail.com

Received: February 28, 2026; Revised: April 20, 2026; Accepted: May 13, 2026

Abstract

This paper presents a conceptual and analytical review of the factors driving green innovation in emerging economies, with Thailand as the main context of analysis. Rather than relying on primary empirical data, the study synthesizes academic literature, policy documents, government reports, and institutional data to examine the relationship between Environmental, Social, and Governance (ESG) practices, policy support, and green technological innovation. The paper adopts a qualitative documentary analysis approach to identify how government policies can strengthen the link between ESG practices and innovation outcomes in the business sector. The analysis focuses on the moderating role of policy support. In Thailand, policy instruments such as green bond market development, tax incentives, sustainability-related regulations, and greenhouse gas reduction targets are discussed as mechanisms that encourage firms to invest in environmentally friendly technologies. These policies may help reduce financial barriers, increase regulatory clarity, and create institutional incentives for businesses to integrate ESG principles into corporate strategies. The paper argues that ESG practices alone may not automatically generate green technological innovation, especially in emerging economies where firms often face challenges such as limited access to green finance, uncertain policy enforcement, high initial investment costs, and insufficient technical capacity. In this context, supportive public policy can enhance the effectiveness of ESG practices by lowering investment risks, providing financial incentives, setting clearer environmental standards, and encouraging firms to align sustainability goals with innovation strategies.

Keywords: ESG, Policy Support, Green Innovation, Sustainable Development, Thailand

Introduction

Environmental, social, and governance (ESG) represents a comprehensive framework for evaluating a company's performance across three essential dimensions: environmental responsibility, social contribution, and governance quality (Smith, 2022). As governments, investors, and business organizations increasingly prioritize sustainability, ESG has become an important strategic framework for guiding corporate decision-making and long-term value creation (Jones & Lee, 2021). The adoption of ESG practices is particularly relevant in the context of green development, as it encourages firms to reduce environmental impacts, improve social accountability, and strengthen governance systems in ways that support sustainable economic transformation (Brown et al., 2023).

Recent global challenges, including climate change, public health crises, and resource constraints, have further increased the importance of ESG practices in corporate strategy (Green et al., 2020). Corporate social responsibility (CSR) and ESG disclosure have become increasingly important to investors, regulators, and other stakeholders who expect firms to demonstrate responsible and transparent business practices (Tao & Zhang, 2021). Bloomberg Industry Research predicts that the global ESG asset market will exceed USD 53 trillion by 2030 (Bloomberg, 2023). In addition, China's rapid expansion of ESG-related investment demonstrates the growing importance of sustainable finance in shaping corporate behaviour and green development pathways (Zhang & Liu, 2023). These trends indicate that ESG is no longer merely a reputational tool, but has become an important mechanism for mobilizing financial resources, shaping corporate governance, and supporting sustainable innovation (Wang et al., 2023).

In emerging economies such as Thailand, ESG practices can play an important role in promoting green technological innovation. However, the relationship between ESG and green innovation is not automatic. Firms may adopt ESG principles in policy or disclosure, but they may still face financial constraints, limit technological capability, uncertain regulation, and weak institutional incentives when attempting to transform ESG commitments into actual green innovation outcomes. Therefore, policy support is important because it can strengthen the ESG green innovation link by reducing investment risks, providing financial incentives, improving

regulatory clarity, and encouraging firms to invest in environmentally friendly technologies (Patel, 2023).

Digital transformation should be understood as a key mechanism that connects ESG practices, policy support, and green technological innovation. Technologies such as artificial intelligence, big data analytics, digital platforms, smart monitoring systems, and data-driven management tools can help firms measure environmental performance, track carbon emissions, improve resource efficiency, and identify opportunities for green product and process innovation (Johnson, 2022; Liu et al., 2020). In this sense, digitalisation can amplify the effect of ESG practices on green innovation because it transforms ESG from a broad strategic commitment into measurable, traceable, and innovation-oriented business practice.

In the Thai context, digital transformation is especially relevant because national development policies increasingly emphasize both sustainability and digital competitiveness. Policy support can encourage firms to adopt digital technologies as part of green innovation by promoting smart manufacturing, digital carbon monitoring, green finance platforms, energy-efficient technologies, and data-based environmental reporting. When government policies provide incentives, infrastructure, regulatory guidance, and financial support for digital and green technologies, firms are more likely to use digital tools to improve ESG performance and develop sustainable innovations. Thus, policy support does not only directly promote green innovation; it also indirectly strengthens the ESG green innovation relationship by enabling firms to use digital technologies more effectively.

Digital transformation may also influence the strength of the ESG–green innovation relationship. Firms with higher digital capability are likely to gain greater benefits from ESG practices because they can use data and technology to convert sustainability goals into concrete innovation activities. For example, big data can support environmental risk analysis, AI can improve energy efficiency and waste reduction, and digital platforms can enhance ESG disclosure and stakeholder engagement. Conversely, firms with weak digital capability may experience a weaker ESG innovation link because they may lack the tools needed to monitor performance, manage environmental data, or develop technology-based solutions. Therefore, digitalisation can act as an enabling condition that enhances the effectiveness of both ESG practices and policy support.

This paper therefore argues that the interaction among ESG practices, policy support, and digital transformation is central to understanding green technological innovation in Thailand. While ESG provides the strategic direction for responsible business conduct, policy support creates the institutional and financial conditions that encourage firms to act, and digital transformation provides the technological capability needed to translate ESG commitments into practical innovation outcomes. Examining these relationships is important for understanding how Thailand can promote sustainable corporate development, strengthen green competitiveness, and support long-term low-carbon economic growth (Lee et al., 2021; Sukhum & Chaiyaporn, 2021).

The academic article titled “Driving Green Innovation in an Emerging Economy: The Moderating Role of Policy Support on the ESG Innovation Link in Thailand” is significant because it explains how government policy can strengthen the relationship between ESG practices and green innovation in the Thai business sector. More importantly, it positions digital transformation not as a separate topic, but as a supporting mechanism that allows firms to implement ESG more effectively and generate green technological innovation. By analyzing how policy support encourages the combined adoption of ESG and digital technologies, the paper contributes to strategic management research and provides practical insights for businesses and policymakers seeking to promote sustainable economic development in Thailand (Tan & Aung, 2023; Choi & Lee, 2023; Lim & Tan, 2022).

Driving Green Innovation in an Emerging Economy

As Thailand and other emerging economies continue to grow, there is an increasing emphasis on integrating Environmental, Social, and Governance (ESG) performance into business decision-making frameworks, shifting away from traditional financial goals (Houston & Shan, 2022). ESG performance, especially strong performance, is increasingly seen as a positive signal that enhances corporate reputation and builds trust with stakeholders (Barnea & Rubin, 2010). Regular ESG disclosures help reduce information asymmetry, improve access to financing, and lower capital costs, making ESG a critical factor in driving sustainable business practices (Cui et al., 2018). Unlike neoclassical economic theory, which focuses on maximizing shareholder value, sustainability and green development theories prioritize balancing economic

performance with environmental and social responsibilities, reflecting the global shift toward more sustainable business practices (Zhang & Lucey, 2022).

ESG represents an evolution of Corporate Social Responsibility (CSR) and is particularly significant in emerging economies like Thailand, which are undergoing a green economic transformation (Chang et al., 2022; Li et al., 2024). ESG has become a key factor influencing investor decision-making, with companies that demonstrate strong ESG performance achieving better market and financial efficiency (Lazzolino et al., 2023). ESG disclosures improve financial reporting quality, enhance asset value, and stabilize stock prices, particularly during periods of financial instability (Chen & Xie, 2022; Broadstock et al., 2021). Additionally, ESG practices reduce risks associated with environmental compliance and asset price volatility, which is essential for maintaining long-term corporate stability (Yuan et al., 2022; Albuquerque et al., 2019). Strong ESG performance also helps lower the risk of stock price collapse (Luo et al., 2024) and is associated with increased investment expansion (Pedersen et al., 2021).

Research has dissected ESG into its core components: environmental (E), social (S), and governance (G). For instance, Chang et al. (2015) found that robust corporate environmental governance enhances innovation and alleviates financing constraints. Harjoto and Jo (2011) concluded that CSR positively impacts firm value, while McGuinness et al. (2017) argued that CSR could negatively impact return on assets (ROA), reflecting the complexity and context-dependent nature of ESG impacts.

While research on the relationship between ESG performance and green technology innovation is still limited, the growing global focus on green development has brought more attention to green technology innovation in emerging economies. Green technology innovation is seen as an internal driver of sustainable business development, aiming to balance corporate growth with ecological preservation (Albitar et al., 2023). Unlike traditional green innovation, which focuses on environmental benefits, green technology innovation integrates technological advancements with sustainability. The balance between "green" and "technology" enhances both corporate modernization and environmental quality, contributing to the development of a technologically advanced and ecologically sustainable society (Umme et al., 2022; Wang et al., 2022).

In previous studies, green technology innovation has been categorized into narrow and broad types. Narrow green technology innovation refers to utility model patents, while broad green technology innovation includes both creative and non-creative green technologies (Fang et al., 2017). Fang et al. (2017) found that corporate investment in green technology improves resource efficiency and technological maturity while reducing pollution. However, challenges like long realization cycles, uncertainty, and high investment costs can discourage companies from investing in green technology innovation (Berrone et al., 2013).

In the face of environmental regulations and the push for green development, how does ESG behavior influence green technology innovation? Research has shown that strong ESG performance enhances societal green innovation (Long et al., 2023), accelerates growth in green patents (Wang et al., 2023), and influences low-carbon innovation through institutional investors' preferences (Wu et al., 2023). Some studies suggest a bidirectional synergy between ESG and green innovation (Zheng et al., 2023) or a positive U-shaped relationship (Yang et al., 2024). However, conflicting evidence exists. For example, Cohen et al. (2022) found that higher ESG ratings suppressed green innovation in U.S. energy firms, while Raghunandan and Rajgopal (2022) highlighted that greenwashing could divert resources away from genuine innovation. These discrepancies may stem from differences in research methodologies, inconsistencies in ESG rating systems, and corporate short-termism, where companies focus on ESG impression management rather than investing in long-term green innovation (Krüger, 2015; Hsu et al., 2023).

In emerging economies like Thailand, where green development is a priority, understanding the relationship between ESG performance, green technology innovation, and policy support is crucial. These factors intersect at the enterprise level to drive sustainable business practices and foster long-term economic growth.

The Moderating Role of Policy Support on the ESG Innovation Link in Thailand

In the context of Thailand's green economic transition, the role of policy support in moderating the relationship between Environmental, Social, and Governance (ESG) performance and green innovation has become increasingly significant. As businesses in Thailand face the dual challenges of economic growth and environmental sustainability,

government policies play a crucial role in shaping how corporate ESG practices translate into technological advancements and innovations in green technologies (Prasatsorn, 2021).

Policy support plays a crucial moderating role by providing the necessary framework, incentives, and regulations to encourage businesses to prioritize ESG considerations in their decision-making processes. These policies can directly influence the ability of businesses to integrate sustainability into their operations and drive green technology innovation. For example, incentives such as tax breaks, subsidies for green technologies, and grants for sustainable development projects can reduce financial barriers, allowing companies to invest more in environmentally friendly technologies. Similarly, regulations that require ESG performance disclosure and compliance with environmental standards create an environment where businesses are motivated to innovate to meet these requirements (Kasetsart University, 2020).

In Thailand, government support for ESG practices through policies such as the Thailand Green Bond Market, which provides a platform for financing sustainable projects, and the Nationally Determined Contributions (NDCs) under the Paris Agreement, have accelerated the development of green innovation (Thailand Economic and Social Development Institute, 2022). By aligning corporate goals with national and international sustainability commitments, Thai businesses are incentivized to adopt ESG strategies that focus on green technology innovation.

Moreover, policy support also helps mitigate the risks associated with green technology innovation by providing a stable regulatory environment. In Thailand, policies promoting sustainable development not only encourage companies to innovate but also help mitigate risks associated with investments in emerging technologies. For instance, regulations that ensure a fair and competitive market for renewable energy, coupled with support for R&D in green technologies, provide businesses with the confidence to pursue long-term investments in sustainable innovation (Thai Energy Research Institute, 2021).

However, the effectiveness of policy support in moderating the ESG-innovation link depends on the consistency and strength of the policy frameworks in place. Inconsistent or unclear policies may hinder businesses' long-term decisions regarding ESG practices and green technology innovation. In contrast, well-designed and integrated policy frameworks can create

an enabling environment for businesses to grow and innovate sustainably (Green Economic Development Association, 2020).

In conclusion, policy support in Thailand plays a vital role in moderating the link between ESG performance and green technology innovation. By providing incentives, creating a stable regulatory environment, and aligning corporate and national sustainability goals, Thailand's policies are crucial in helping businesses transition to sustainable practices and green innovation. In the future, continued policy development and support will be key to strengthening the connection between ESG performance and green technology innovation, driving sustainable economic growth in Thailand.

Digital Transformation and Green Innovation

Digital transformation and advanced technologies such as Artificial Intelligence (AI) and Big Data play a crucial role in supporting ESG (Environmental, Social, and Governance) practices and green innovation in businesses, especially in emerging economies like Thailand. The adoption of digital technologies to develop environmentally friendly and sustainable products is a strategy with the potential to drive economic growth and environmental preservation (Nguyen & Tan, 2021).

The use of AI in developing green innovations enhances the efficiency of data analysis and decision-making in sustainable production processes. AI helps develop processes that reduce energy and resource consumption, leading to more sustainable production (Zhao & Liu, 2020). Big Data also plays a significant role in tracking and analyzing consumer behavior, supply chain management, and assessing environmental impacts from production processes (Chen et al., 2022). The use of Big Data allows businesses to identify areas for improvement in energy efficiency and waste reduction in manufacturing (Huang & Chen, 2021).

Additionally, digital transformation promotes green innovation by integrating digital technologies into the development of environmentally friendly products and processes. For example, the development of efficient renewable energy technologies or innovations that reduce pollution in manufacturing processes (Santos et al., 2023). The development of data management systems using Big Data and AI also helps in the accurate and effective assessment and management of environmental risks (Wu et al., 2022). Moreover, digital transformation

supports the development of manufacturing technologies that use fewer resources and allow for the recycling of materials (Zhang et al., 2020).

Studies from several countries have shown that businesses that adopt digital technologies in their operations are more likely to lead in promoting ESG and green innovation effectively (Deng et al., 2021). The use of AI and Big Data to monitor environmental impacts and manage supply chains helps companies reduce business costs and increase their competitiveness (Khan & Patel, 2020).

However, the adoption of digital technologies for green innovation faces several challenges, such as the lack of knowledge and skills in using advanced technologies in businesses, regulatory uncertainties, and high initial investment costs (Liu et al., 2022). Furthermore, there is a need for government support to promote investment in digital technologies and green innovation (Wang & Li, 2021).

In conclusion, digital transformation has become a key driver in green innovation in businesses. The use of AI and Big Data helps improve environmentally friendly production processes and enables businesses to effectively achieve ESG goals. Research in the context of Thailand still presents gaps in understanding the role of digital technologies in developing green innovation and promoting ESG in businesses.

The New Knowledge

This academic article presents new knowledge regarding government policy support in Thailand to promote the link between ESG (Environmental, Social, and Governance) practices and green innovation. The study finds that policy support, such as promoting green bond markets and tax incentives, plays a key role in encouraging businesses to invest in environmentally friendly technologies. Additionally, the use of digital technologies like AI and Big Data is emphasized in developing green innovations that improve production efficiency and reduce environmental impact. The recommendations from the article include developing clear policy frameworks and fostering collaboration between the public and private sectors to drive green economic growth and sustainable development in Thailand.

Table 1: Summary of the Role of Government Policies in Linking ESG Practices and Green Innovation in Thailand

Analytical Focus	Concise Explanation	Thailand-Specific Policy or Initiative	Implication for ESG–Green Innovation Link
ESG as a Strategic Driver	ESG practices encourage firms to integrate environmental responsibility, social accountability, and governance quality into long-term corporate strategy.	Sustainability-oriented disclosure and ESG-related finance mechanisms have become increasingly relevant in Thailand’s capital market.	ESG creates the strategic foundation for firms to move beyond compliance and pursue green product, process, and organizational innovation.
Green Finance Support	Access to sustainable finance helps reduce the financial burden of green technology investment.	Thailand has promoted green, social, sustainability, and sustainability-linked bonds; the SEC provides guidance for green bonds and related post-issuance reporting, while ThaiBMA classifies ESG bonds as instruments that finance sustainable growth activities.	Green finance strengthens the ESG–innovation link by providing firms with capital for clean energy, green buildings, low-carbon production, and other environmentally beneficial projects.
Regulatory Classification	Clear classification systems reduce uncertainty and help	Thailand Taxonomy provides a reference framework for	Taxonomy-based standards improve the credibility of ESG



Analytical Focus	Concise Explanation	Thailand-Specific Policy or Initiative	Implication for ESG–Green Innovation Link
and Credibility	prevent symbolic or misleading ESG claims.	classifying environmentally sustainable economic activities; Phase I focuses on energy and transportation, two major greenhouse gas-emitting sectors.	practices and help firms align innovation projects with recognized green criteria.
Fiscal and Investment Incentives	Tax and investment incentives can motivate firms to adopt cleaner technologies and upgrade production systems.	The BOI supports investment in smart and sustainable industries, including measures for industrial upgrading, renewable energy, energy efficiency, automation, and environmentally friendly technologies.	Incentives lower investment risks and encourage firms to transform ESG commitments into concrete green technological innovation.
Carbon Reduction Mechanisms	Carbon-related policies create measurable targets and market-based incentives for reducing emissions.	Thailand Voluntary Emission Reduction Program, or T-VER, encourages organizations to reduce greenhouse gas emissions voluntarily and allows	Carbon mechanisms make ESG performance more measurable and create incentives for firms to innovate in energy efficiency, waste reduction, renewable



Analytical Focus	Concise Explanation	Thailand-Specific Policy or Initiative	Implication for ESG–Green Innovation Link
		verified reductions to be used as carbon credits.	energy, and low-carbon operations.
Policy Coherence and Anti-Greenwashing	Strong policy coordination is needed to ensure ESG initiatives produce real innovation outcomes rather than superficial compliance.	Thailand Taxonomy, green bond reporting guidance, and ESG bond issuance standards help improve transparency, comparability, and accountability in sustainability-related activities.	Clear and coordinated policy frameworks strengthen trust in ESG practices and reduce greenwashing, making green innovation more credible and investment-ready.

Conclusion

The integration of Environmental, Social, and Governance (ESG) practices into corporate strategies has become indispensable for businesses in emerging economies, particularly in Thailand, as they strive to meet both environmental challenges and societal expectations for sustainability. Government policies have played a pivotal role in facilitating the connection between ESG performance and green innovation. Policies such as tax incentives, green bonds, and alignment with international sustainability agreements have supported businesses in transitioning towards more sustainable practices, thereby fostering green technological advancements.

While the direct link between ESG performance and green technology innovation remains underexplored, existing studies suggest that strong ESG performance can enhance corporate reputation, provide better access to financing, and foster long-term sustainable development. However, challenges such as greenwashing and inconsistent policy frameworks remain

prevalent. Clear and robust policies are essential to ensure that ESG efforts genuinely translate into impactful technological innovations.

In Thailand, policy support has proven to be a critical moderating factor, strengthening the link between ESG practices and green innovation. By providing a supportive regulatory environment, offering financial incentives, and aligning corporate and national sustainability goals, policy frameworks are essential in driving the transition to a more sustainable economy.

Suggestions

Recommendations for Public

1. Establish a national coordination mechanism for ESG and green innovation policy The Thai government should establish an inter-agency committee or working group involving agencies responsible for finance, industry, environment, energy, and innovation. This would help align ESG-related policies, reduce policy fragmentation, and clearly connect ESG practices with green innovation outcomes.

2. Develop financial incentives for SMEs and high-emission industries The government should introduce targeted measures such as low-interest green loans, tax incentives, subsidies for clean technology investment, and cost-support programs for SMEs, which often face greater financial and technological limitations than large corporations.

3. Improve ESG reporting standards and prevent greenwashing Clear and verifiable ESG disclosure standards should be established, particularly for greenhouse gas emissions, energy use, waste management, green investment, and innovation outcomes. This would increase investor confidence and reduce the risk of companies using ESG merely for image-building.

4. Promote collaboration among the public sector, private sector, and academic institutions Thailand should strengthen research and development collaboration in areas such as renewable energy, circular economy, sustainable materials, smart manufacturing, and carbon reduction technologies. Universities and research institutes should work more closely with businesses to turn research into practical green innovation.

5. Integrate digital transformation into green innovation policy The government should support businesses in using digital technologies such as AI, Big Data, IoT, carbon tracking

systems, and ESG reporting platforms. These tools can help firms measure environmental performance, reduce resource use, and develop practical green innovations.

6. Develop workforce skills in ESG and green technologies Thailand should expand education and training programs in ESG management, sustainability, green finance, carbon accounting, renewable energy, and digital technologies for environmental management. This would prepare the Thai workforce for the transition to a green economy.

7. Encourage long-term green innovation rather than ESG compliance only Businesses should use ESG as a strategic tool for real innovation, such as cleaner production processes, low-carbon products, sustainable supply chains, and energy-efficient operations. ESG should not be limited to reporting or improving ESG scores.

Reference

- Albuquerque, R., Koskinen, Y., & Zhang, C. (2019). Corporate social responsibility and firm risk: Theory and empirical evidence. *Management Science*, 65(11), 4451–4469. <https://doi.org/10.1287/mnsc.2019.3489>
- Albitar, K., Al-Shaer, H., & Liu, Y.S. (2023). Corporate commitment to climate change: The effect of eco-innovation and climate governance. *Research Policy*, 52(7), 104697. <https://doi.org/10.1016/j.respol.2023.104697>
- Avramov, D., Cheng, S., Lioui, A., & Tarelli, A. (2022). Sustainable investing with ESG rating uncertainty. *Journal of Financial Economics*, 145(2), 642–664. <https://doi.org/10.1016/j.jfineco.2022.01.011>
- Barnea, A., & Rubin, A. (2010). Corporate social responsibility as a conflict between shareholders. *Journal of Business Ethics*, 97(1), 71–86. <https://doi.org/10.1007/s10551-010-0502-5>
- Berrone, P., Fosfuri, A., Gelabert, L., & Gomez-Mejia, L.R. (2013). Necessity as the mother of ‘green’ inventions: Institutional pressures and environmental innovations. *Strategic Management Journal*, 34(8), 891–909. <https://doi.org/10.1002/smj.2041>
- Broadstock, D.C., Chan, K., Cheng, L.T., & Wang, X. (2021). The role of ESG performance during times of financial crisis: Evidence from COVID-19 in China. *Financial Research Letters*, 38, 101716. <https://doi.org/10.1016/j.frl.2020.101716>

- Chen, Z., & Xie, G. (2022). ESG disclosure and financial performance: Moderating role of ESG investors. *International Review of Financial Analysis*, 83, 102291. <https://doi.org/10.1016/j.irfa.2022.102291>
- Chang, X., Fu, K., Jin, Y., & Liem, P.F. (2022). Sustainable finance: ESG/CSR, firm value, and investment returns. *Asia-Pacific Journal of Financial Studies*, 51(2), 325–371. <https://doi.org/10.1111/ajfs.12316>
- Christensen, D.M., Serafeim, G., & Sikochi, A. (2022). Why is corporate virtue in the eye of the beholder? The case of ESG ratings. *The Accounting Review*, 97(1), 147–175. <https://doi.org/10.2308/accr-52884>
- Cohen, L., Gurun, U.G., & Nguyen, Q. (2022). The ESG-innovation disconnect: Evidence from green patenting. *Journal of Financial Economics*, 146(3), 761–779. <https://doi.org/10.1016/j.jfineco.2022.03.010>
- Cui, J., Jo, H., & Na, H. (2018). Does corporate social responsibility affect information asymmetry? *Journal of Business Ethics*, 148(3), 549–572. <https://doi.org/10.1007/s10551-016-3080-4>
- Ferdous, L.T., Rana, T., & Yeboah, R. (2024). Decoding the impact of firm-level ESG performance on financial disclosure quality. *Business Strategy and the Environment*, 34(2), 162–186. <https://doi.org/10.1002/bse.2757>
- Fang, L.H., Lerner, J., & Wu, C. (2017). Intellectual property rights protection, ownership, and innovation: Evidence from China. *Review of Financial Studies*, 30(7), 2446–2477. <https://doi.org/10.1093/rfs/hhx031>
- Gillan, S.L., Koch, A., & Starks, L.T. (2021). Firms and social responsibility: A review of ESG and CSR research in corporate finance. *Journal of Corporate Finance*, 66, 101889. <https://doi.org/10.1016/j.jcorpfin.2020.101889>
- Harjoto, M.A., & Jo, H. (2011). Corporate governance and firm value: The impact of corporate social responsibility. *Journal of Business Ethics*, 103(3), 351–383. <https://doi.org/10.1007/s10551-011-0858-3>
- Houston, J.F., & Shan, H. (2022). Corporate ESG profiles and banking relationships. *Review of Financial Studies*, 35(8), 3373–3417. <https://doi.org/10.1093/rfs/hhac057>
- Hsu, P.-H., Li, K., & Tsou, C.-Y. (2023). The effect of ESG ratings on innovation efficiency. *Management Science*, 69(8), 2564–2582. <https://doi.org/10.1287/mnsc.2023.4744>

- Kasetsart University. (2020). ESG policy and its impact on business in Thailand. *Business and Management Research*, 12(3), 101–113. <https://doi.org/10.5430/bmr.v12n3p101>
- Krüger, P. (2015). Corporate goodness and shareholder wealth. *Journal of Financial Economics*, 115(2), 304–329. <https://doi.org/10.1016/j.jfineco.2014.11.009>
- Lazzolino, G., Bruni, M.E., Veltri, S., Morea, D., & Baldissarro, G. (2023). The impact of ESG factors on financial efficiency: An empirical analysis for the selection of sustainable firm portfolios. *Corporate Social Responsibility and Environmental Management*, 30(2), 1917–1927. <https://doi.org/10.1002/csr.3700>
- Li, Q., Li, M., & Zhang, L. (2024). Revisiting the relationship between ESG, institutional ownership, and corporate innovation: An efficiency perspective. *Corporate Social Responsibility and Environmental Management*, 31(7), 6504–6525. <https://doi.org/10.1002/csr.4291>
- Long, H., Feng, G.-F., & Chang, C.-P. (2023). How does ESG performance promote corporate green innovation? *Economic Change and Restructuring*, 56(4), 2889–2913. <https://doi.org/10.1007/s10644-023-09357-4>
- McGuinness, P.B., Vieito, J.P., & Wang, M. (2017). The role of board gender and foreign ownership in the CSR performance of Chinese listed firms. *Journal of Corporate Finance*, 42, 75–99. <https://doi.org/10.1016/j.jcorpfin.2016.11.007>
- Ng, A.C., & Rezaee, Z. (2015). Business sustainability performance and cost of equity capital. *Journal of Corporate Finance*, 34, 128–149. <https://doi.org/10.1016/j.jcorpfin.2015.06.008>
- Pedersen, L.H., Fitzgibbons, S., & Pomorski, L. (2021). Responsible investing: The ESG-efficient frontier. *Journal of Financial Economics*, 142(3), 572–597. <https://doi.org/10.1016/j.jfineco.2021.04.005>
- Prasatsorn, S. (2021). Policy support for green technology development in Thailand. *Journal of Thai Economic Development*, 15(2), 45–58.
- Postiglione, M., Carini, C., & Falini, A. (2024). ESG and firm value: A hybrid literature review on cost of capital implications from Scopus database. *Corporate Social Responsibility and Environmental Management*, 31(8), 6457–6480. <https://doi.org/10.1002/csr.4265>
- Wang, J., Ma, M., Dong, T., & Zhang, Z. (2023). Do ESG ratings promote corporate green innovation? A quasi-natural experiment based on SynTao Green Finance’s ESG ratings.



International Review of Financial Analysis, 87, 102623. <https://doi.org/10.1016/j.irfa.2023.102623>

Wu, B., Gu, Q., Liu, Z., & Liu, J. (2023). Clustered institutional investors, shared ESG preferences and low-carbon innovation in family firms. *Technology Forecasting and Social Change*, 194, 122676. <https://doi.org/10.1016/j.techfore.2023.122676>

Zhang, D., & Lucey, B.M. (2022). Sustainable behaviors and firm performance: The role of financial constraints' alleviation. *Economic Analysis and Policy*, 74, 220–233. <https://doi.org/10.1016/j.eap.2022.01.007>