

# Revealing the effects of corporate governance on green investment and innovation: do law and policy matter?

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## Abstract

Green investment and innovation performance are key factors of sustainable green development. Green investment and innovation have become a trendy solutions to minimize environmental issues in the previous few decades. We investigate the effects of corporate governance, environmental law, and environmental policy stringency on green investment and environmental innovation using Chinese time-series data from 1998 to 2020. Short and long-run findings indicate that corporate governance has a positive and significant impact on green investment and innovation in China. However, environmental law has positive and significant effects on green investment and innovation in the short-run and long-run. Furthermore, environmental policy stringency has an insignificant impact on green investment but stimulates green innovation in the short and long-run. The study also reveals that education has a significant positive impact on green innovation in short-run and long-run. The short and long-run results propose essential policy implications.

**Keywords:** Corporate governance. Environmental law and policy. Green investment and innovation.

## Introduction

- Modern enterprises are increasingly emphasizing investment in green research and development activities to achieve ecological innovation. However, transitioning to green requires changing the research and development culture, introducing new technologies, investing in green technologies, and promoting new ideas. Therefore, successful reduction and prevention of waste emissions require additional management efforts. It is generally believed that management conservatism is an obstacle to management's tendency towards complex activities. Modern perspectives suggest that environmental goals and corporate interests can go hand in hand, and laws and regulations may provide a "win-win" situation for businesses as they can enhance long-term profitability and improve competitive position. Previous studies have attempted to identify various factors that influence green investment and innovation, but have not focused on the impact of corporate governance on green investment and innovation in China. This study will fill this literature gap and analyze the impact of corporate governance on green investment and innovation in China.

## Empirical method

- The main aim of this paper is to identify the effect of corporate governance, environmental law, and environmental policy stringency on green investment and innovation, using the China data over the period 1998–2020. Our empirical model is based on stakeholder–agency theory and porter's innovation theory. Theoretically, standard green investment and innovation are associated with corporate governance, environmental law, and environmental policy stringency.

$$EI_t = \pi_0 + \pi_1 BI_t + \pi_2 ER_t + \pi_3 EPS_t + \pi_4 Education_t + \varepsilon_t \quad (1)$$

$$GI_t = \pi_0 + \pi_1 BI_t + \pi_2 ER_t + \pi_3 EPS_t + \pi_4 Education_t + \varepsilon_t \quad (2)$$

$$\Delta EI_t = \pi_0 + \sum_{k=1}^n \beta_{1k} \Delta EI_{t-k} + \sum_{k=0}^n \beta_{2k} \Delta BI_{t-k} + \sum_{k=1}^n \beta_{3k} \Delta ER_{t-k} + \sum_{k=0}^n \beta_{4k} \Delta EPS_{t-k} + \sum_{k=1}^n \beta_{5k} \Delta Education_{t-k} + \pi_1 EI_{t-1} + \pi_2 BI_{t-1} + \pi_3 ER_{t-1} + \pi_4 EPS_{t-1} + \pi_5 Education_{t-1} + \lambda ECM_{t-1} + \varepsilon_t \quad (3)$$

$$\Delta GI_t = \pi_0 + \sum_{k=1}^n \beta_{1k} \Delta GI_{t-k} + \sum_{k=0}^n \beta_{2k} \Delta BI_{t-k} + \sum_{k=1}^n \beta_{3k} \Delta ER_{t-k} + \sum_{k=0}^n \beta_{4k} \Delta EPS_{t-k} + \sum_{k=1}^n \beta_{5k} \Delta Education_{t-k} + \pi_1 GI_{t-1} + \pi_2 BI_{t-1} + \pi_3 ER_{t-1} + \pi_4 EPS_{t-1} + \pi_5 Education_{t-1} + \lambda ECM_{t-1} + \varepsilon_t \quad (4)$$

## Conclusion and implications

- This study intends to explore the impact of corporate governance, environmental regulation, and environmental policy stringency on green investment and innovation. In this study, corporate governance is measured by board independence. Environmental law is measured through environmental regulations, while environmental policy is measured through environmental stringency policy. Education role has been included as a control variable. For deducing long-run and short-run estimates, the study adopted the ARDL approach and reported the following findings. Firstly, the long-run finding reveals that board independence reports a significant and positive effect on green investment and environmental innovation revealing that corporate governance can be adopted as a policy tool to enhance green investment and environmental innovation in China. Secondly, environmental regulations also show a positive association with green investment and environmental innovation confirming that implementation of environmental laws is necessary to enhance green investment and environmental innovation in China. Thirdly, environmental policy stringency shows a positive association with environmental innovation confirming that the effectiveness of environmental policies can contribute significantly to enhancing environmental innovation in China. Lastly, education is proved to be positively associated with green investment and environmental innovation.

## Data

Table 1: Definitions and data sources

Variables	Abbreviations	Definitions	Data sources
Green investment	GI	Nuclear, renewables, and other (quad Btu)	EIA
Environmental innovation	EI	Environment-related-technologies	OECD
Board Independence	BI	Board Independence refers to the proportion of independent directors to the total number of directors on board.	CSMAR
Environmental regulation	ER	Environmentally related taxes, % total tax revenue	OECD
Environmental policy stringency	EPS	Environmental policy stringency index ranges from 0 (not stringent) to 6 (highest degree of stringency)	OECD
Year of schooling	Education	Average year of schooling	Barro and Lee

## References

- Abebe, M., & Myint, P. P. A. (2018). Board characteristics and the likelihood of business model innovation adoption: evidence from the smart home industry. *International Journal of Innovation Management*, 22(01), 1850006.
- Amore, M. D., & Bennedsen, M. (2016). Corporate governance and green innovation. *Journal of Environmental Economics and Management*, 75, 54-72.
- Chen, J., Rojniruttikul, N., Kun, L. Y., & Ullah, S. (2022). Management of green economic infrastructure and environmental sustainability in one belt and road enitiative economies. *Environmental Science and Pollution Research*, 29(24), 36326-36336.
- Khan, M. K., Ali, S., Zahid, R. A., Huo, C., & Nazir, M. S. (2022). Does Whipping Tournament Incentives Spur CSR Performance? An Empirical Evidence From Chinese Sub-national Institutional Contingencies. *Frontiers in psychology*, 13, 841163-841163.
- Kock, C. J., Santaló, J., & Diestre, L. (2012). Corporate governance and the environment: what type of governance creates greener companies?. *Journal of Management Studies*, 49(3), 492-514.

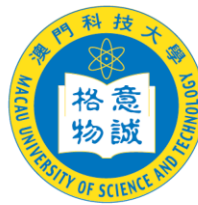
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