

Environmental Auditing Shapes Industrial Green Transformation

Yi Yao*

School of Digital Economy and Management, Chongqing Polytechnic University of Electronic Technology, Chongqing, 401331, China

*Corresponding author: Yi Yao, 201825001@cqupt.edu.cn

Copyright: 2026 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY-NC 4.0), permitting distribution and reproduction in any medium, provided the original author and source are credited, and explicitly prohibiting its use for commercial purposes.

Abstract: Environmental auditing has become an important instrument for aligning industrial development with ecological accountability. Existing studies link natural-resource accountability audits to corporate green innovation, environmental investment, pollution control, carbon efficiency and green productivity. Yet these outcomes are usually examined in isolation. The chain connecting public accountability to firm behaviour and industrial transformation therefore remains fragmented. Here, we develop a multilevel mechanism framework through a structured integrative review of research on environmental auditing, regulation, corporate environmental strategy and green total factor productivity. The framework distinguishes three audit functions: detection, deterrence and prevention. These functions alter local government incentives, environmental information, corporate governance and stakeholder monitoring. Their interaction determines whether firms pursue symbolic compliance, incremental adjustment or substantive transformation. Firm responses then aggregate through technological progress, efficiency improvement and resource reallocation. Fiscal pressure, enforcement capacity, market development, ownership, pollution intensity and public participation condition each transition. The framework explains why similar audit arrangements can produce contrasting effects across firms, industries and regions. It also identifies feedback from industrial outcomes to later audit priorities and standards. Environmental auditing is therefore most likely to support durable green transformation when credible findings lead to corrective responsibility, organisational learning and future decision constraints. This framework offers testable propositions and a bounded basis for audit design.

Keywords: Environmental Auditing; Natural-Resource Accountability; Industrial Green Transformation; Green Innovation; Green Total Factor Productivity; Multilevel Governance

Published: Sep 10, 2026

DOI: <https://doi.org/10.62177/apemr.v3i5.1644>

1. Introduction

Industrial production generates employment, infrastructure and technological capability, but it also concentrates energy use and environmental damage. Green transformation seeks to change that relationship without replacing development with simple production restraint. It requires cleaner technologies, more efficient resource use and credible environmental governance. It also requires institutions that can identify responsibility when environmental commitments are not translated into operational change.

Most environmental policies influence firms through standards, prices, disclosure requirements or administrative

enforcement. Their productivity effects depend on regulatory design, measurement and industrial context^[1-3]. Environmental auditing introduces a different form of pressure. It evaluates whether public officials and responsible organisations have fulfilled defined duties for natural resources and environmental assets. This responsibility-based approach can change which information is produced, who must explain weak outcomes and how failures affect later decisions.

China's natural-resource accountability audit of outgoing officials makes this distinction especially visible. The reform connects ecological responsibility with official evaluation and creates a formal channel from audit evidence to rectification and accountability. Its influence can extend beyond the audited official. Local regulators may alter enforcement, firms may reassess investment, and external stakeholders may revise their expectations. Environmental auditing can therefore reshape the institutional setting within which industrial transformation occurs.

Recent research has examined several parts of this process. Studies associate accountability audits with corporate green strategies^[4], regional environmental governance^[5] and environmental investment^[6]. Other work links the reform to carbon efficiency^[7] and industrial green total factor productivity (GTFP)^[8]. These studies establish that auditing can reach environmental and economic outcomes beyond conventional financial compliance.

The reported effects are not uniform. Some studies identify stronger green responses or higher productivity. Others report cost pressure, weaker innovation input or a preference for incremental and compliance-oriented innovation^[9-11]. Such variation should not be dismissed as measurement noise. It may reveal distinct audit functions, organisational responses, time horizons and institutional conditions.

Two analytical limitations make these differences difficult to interpret. First, environmental auditing is often represented by a single policy indicator. This treatment obscures whether the operative function is problem detection, deterrence, rectification or prevention. Second, most studies examine one organisational level and one outcome. Public accountability, corporate decisions and industrial productivity are consequently separated, although they belong to one transmission process.

This fragmentation leaves a specific question unresolved: through which connected mechanisms does environmental auditing shape industrial green transformation across government, firm and industry levels? Addressing this question requires more than another list of audit effects. It requires an architecture that identifies the relevant actors, explains the sequence of their responses and states where the proposed mechanisms may fail.

This article develops such an architecture. It distinguishes detection, deterrence and prevention as three related audit functions. It then links these functions to four transmission mechanisms: government governance, environmental information, corporate governance and stakeholder monitoring. Corporate responses are classified as symbolic compliance, incremental adjustment or substantive transformation. These responses aggregate through technology, efficiency and resource reallocation, with feedback to later audit design.

The framework makes three contributions. First, it treats environmental auditing as a functional process rather than a binary intervention. Second, it connects public accountability to corporate behaviour without assuming that pressure automatically creates productive innovation. Third, it explains how heterogeneous firm responses can produce different industry-level productivity paths. The framework remains conceptual. Its propositions identify relationships for future testing rather than reporting effects established by this article.

2. Analytical Approach

2.1 Review Design

This study uses a structured integrative review and conceptual synthesis. An integrative design is appropriate because the relevant evidence spans auditing, public governance, environmental regulation, corporate strategy and productivity research. These fields use different outcomes and units of analysis. Statistical pooling would therefore conceal, rather than resolve, important conceptual differences.

The studies address natural-resource accountability audits, environmental governance, corporate green responses, carbon performance and green productivity. They were organised into five groups: audit institutions and measurement; green innovation and investment; governance and information; environmental and carbon outcomes; and productivity.

Each study was coded by policy treatment, analytical level, outcome, proposed mechanism and reported boundary conditions.

The synthesis retained conflicting findings because disagreement can reveal competing pathways. Studies were not ranked by whether they supported a positive audit effect. They were used to identify which institutional link each design could illuminate.

The framework was developed in four stages. The first stage identified recurring audit functions. The second mapped those functions onto actors and governance mechanisms. The third classified corporate responses by their depth and time horizon. The final stage traced how firm-level changes could aggregate into industrial outcomes and feedback.

2.2 Scope and Evidential Boundary

The review is explanatory rather than exhaustive. It does not claim the coverage of a registered systematic review. Nor does it estimate the prevalence or average magnitude of any pathway. Its purpose is to organise verified studies into a testable causal sequence.

The evidence is concentrated in China. This concentration is analytically useful because official accountability gives environmental auditing a clear institutional form. However, it limits direct generalisation to jurisdictions that rely on corporate assurance, litigation or investor disclosure. Comparative research is needed before the framework can be treated as institutionally universal.

The distinction between evidence and proposition is maintained throughout. Existing studies support the plausibility of individual links. The complete multilevel chain remains a conceptual model. No single cited study has tested every transition in that chain.

3. Conceptual Foundations

3.1 Environmental Auditing as a Bundle of Functions

Environmental auditing combines verification with responsibility. Its detection function identifies environmental problems, resource losses, control failures and implementation gaps. Detection reduces uncertainty about what occurred and which evidence can support a finding. However, detection alone may produce a report without changing later behaviour.

The deterrence function raises the expected cost of non-compliance. Disclosure, rectification requirements, performance evaluation and accountability can make environmental failure consequential. Deterrence may change decisions before the next audit because actors anticipate scrutiny. Yet intense deterrence can also encourage defensive compliance when organisations lack time or resources for deeper change.

The prevention function converts findings into durable improvements. It uses recurrent problems to revise rules, data systems, approval procedures and monitoring routines. Prevention therefore depends on follow-up and organisational learning. An audit that closes after a written response may detect and deter without preventing recurrence.

The three functions form a potential sequence, not an automatic cycle. Weak evidence undermines deterrence. Weak rectification breaks the transition from deterrence to prevention. The first implication is therefore functional: audit presence is a poor proxy for audit completeness.

3.2 Industrial Green Transformation as Behaviour, Capability and Performance

Industrial green transformation contains at least three analytical layers. The first is behaviour. Firms invest in environmental equipment, modify production, adopt cleaner energy, develop green technology and disclose environmental information. These actions reveal managerial response, but they do not establish environmental success.

The second layer is capability. Durable transformation requires technical knowledge, reliable data, internal control, financing access and coordination across departments. A visible green project can coexist with weak capability. Conversely, process redesign may create capability before its environmental benefits become measurable.

The third layer is performance. Relevant outcomes include emissions, resource efficiency, carbon efficiency and GTFP. GTFP is especially valuable because it relates desirable output to resource inputs and undesirable output. However, it remains a summary outcome. It cannot identify responsibility or distinguish a temporary production contraction from technological improvement.

Separating these layers prevents two errors. More environmental spending or patenting does not necessarily represent substantive transformation. Short-term productivity loss does not necessarily indicate long-term policy failure. Analysis must

connect the quality of behaviour, the formation of capability and the timing of performance.

3.3 The Accountability Difference

Conventional environmental regulation changes the legal or economic consequences of pollution. Accountability auditing also changes who must explain environmental outcomes and how evidence enters evaluation. This difference can redirect official attention, strengthen information demands and connect environmental results with organisational legitimacy.

Accountability does not replace regulation. It can make existing regulation more credible by revealing implementation gaps and assigning responsibility. It can also expose inconsistency between stated policy and actual enforcement. The audit effect therefore depends partly on the regulatory system that it activates.

This distinction explains why environmental auditing should not be modelled as another generic emission standard. Its primary intervention is institutional. Environmental performance changes only after accountability alters decisions, resources and routines.

4. A Multilevel Mechanism Framework

4.1 Government Governance

Natural-resource accountability audits can change local government incentives. When ecological duties are documented and reviewed, officials have stronger reasons to consider environmental consequences in project approval, land allocation and industrial support. Available evidence links the reform to greater environmental attention ^[12] and improved governance ^[5]. These findings support a governance pathway, but they do not imply uniform implementation.

The pathway begins with attention but cannot end there. Officials must translate audit findings into regulatory priorities, budgets and coordination. Environmental agencies require authority and technical capacity. Industrial and fiscal departments must also incorporate environmental consequences into their decisions.

Fiscal pressure creates a central boundary. Governments dependent on pollution-intensive industries may face a conflict between environmental responsibility and revenue stability. Accountability can sharpen this conflict without resolving it. Under such conditions, governments may favour short campaigns or visible projects that preserve major sources of revenue.

Policy coordination creates another boundary. Audit findings may identify problems whose correction falls outside the audit institution's authority. If responsible departments do not act, the audit produces information without transformation. Governance effects should therefore be strongest when findings assign clear responsibilities and trigger monitored follow-up.

Proposition 1: Environmental auditing is more likely to promote industrial green transformation when findings are translated into stable priorities, coordinated enforcement and verified follow-up.

4.2 Environmental Information

Environmental auditing can improve the credibility and comparability of information. Verification reduces opportunities to conceal pollution, misclassify expenditure or present symbolic projects as substantive change. Better information can improve regulatory targeting and help external actors distinguish environmental leaders from laggards.

Credibility has three components. The evidence must be accurate, connected to a responsible entity and interpreted against an appropriate criterion. Large volumes of unstructured data do not meet this standard. Information becomes useful only when users can trace how a conclusion was reached.

Accessibility also matters. Findings that remain internal may support administrative correction but cannot strengthen public or market monitoring. Full disclosure is not always appropriate because audits may contain protected information. A tiered disclosure approach can preserve confidentiality while releasing material findings, correction status and comparable outcomes.

Finally, information must affect decisions. Verified evidence can be connected to future inspections, project approval, procurement, financing and performance evaluation. Without such links, disclosure may increase visibility without changing incentives.

Proposition 2: Environmental auditing exerts stronger transformation effects when environmental information is credible, accessible to relevant users and consequential for later decisions.

4.3 Corporate Governance

External accountability reaches the firm through governance and control systems. Boards and managers may revise investment criteria, environmental responsibilities and risk processes. Firms may also strengthen internal data systems because weak records increase both audit risk and managerial uncertainty.

These changes can create substantive capability. Environmental considerations become part of capital budgeting rather than a separate compliance file. Internal controls can connect pollution data with production and finance. Prior work shows that accountability pressure can alter the environmental strategies selected by firms ^[13]. Long-term incentives can protect projects whose benefits emerge after current management periods.

The same pressure can produce symbolic responses. Firms may expand disclosure, rename existing expenditure or favour patent applications that are visible and relatively inexpensive. Research indicates that accountability pressure can favour incremental or technology-proximate innovation ^[4]. Other evidence identifies lower innovation input under cost constraints ^[9]. These results suggest a strategic choice between visible compliance and capability building.

Financing capacity conditions that choice. Cleaner production may require equipment, experimentation and temporary disruption. Constrained firms can face strong pressure but lack the means to respond substantively. Ownership, political connections and bargaining power can further affect access to finance and the credibility of enforcement.

Managerial time horizons also matter. Short evaluation periods reward actions that generate immediate evidence. Longer horizons make process innovation and organisational learning more attractive. Audit design should therefore avoid relying solely on annual activity counts.

Proposition 3: Environmental auditing is more likely to induce substantive innovation when corporate governance converts external accountability into long-term investment and control criteria.

4.4 Stakeholder Monitoring

Public participation, media attention, creditors and supply-chain partners can amplify audit signals. Audits provide focal information that helps stakeholders coordinate expectations. Evolutionary-game research indicates that public participation can alter strategic interaction among governments, firms and citizens ^[14]. Dual public and governmental supervision may also support more substantive strategies ^[15].

External monitoring is not unconditionally beneficial. Stakeholders often rely on indicators that are easy to communicate. Patent counts, disclosure length or announced investment can dominate attention. Firms may then optimise the signal rather than the underlying process.

Monitoring quality depends on interpretability. Stakeholders need information that distinguishes commitments, activities and verified outcomes. Recurrent reporting should also show whether earlier findings were corrected. This temporal link makes superficial responses harder to sustain.

Financial stakeholders can provide an additional transmission route. Creditors and investors may price environmental risk when audit evidence is credible and material. However, market discipline will remain weak where ownership or implicit guarantees shield firms from financing consequences.

Proposition 4: Stakeholder monitoring strengthens audit-induced transformation when evaluation emphasises verified operational outcomes and continuity rather than disclosed activity alone.

4.5 Organisational Response Pathways

The four mechanisms shape three broad corporate responses. Symbolic compliance changes presentation more than production. It can include generic disclosure, short-lived campaigns and easily counted outputs. Such action may satisfy immediate scrutiny while leaving environmental capability unchanged. Direct evidence indicates that accountability audits can reshape corporate green responses, ESG outcomes and governance quality, although the estimated direction depends on the monitoring channel and institutional setting ^[16-18].

Incremental adjustment modifies existing processes without changing the firm's technological trajectory. It can improve energy management, maintenance and end-of-pipe treatment. These changes may yield meaningful gains, especially where earlier management was weak. Their potential remains bounded by the existing production system. Audit exposure has also been linked to corporate emissions reduction and greater environmental investment ^[19-20].

Substantive transformation alters technology, product design, energy structure or organisational capability. It often requires larger investment and longer learning periods. It can also create uncertainty because cleaner technologies may not immediately match established production routines. These positive pathways are not automatic: evidence of weaker ESG performance under some accountability-audit pilots shows that pressure can outpace organisational capacity ^[21].

These responses should not be treated as fixed firm types. A firm may begin with defensive compliance and later build capability. It may also reverse direction when financing tightens or enforcement weakens. The framework therefore treats transformation as a path-dependent process. Evidence from central environmental inspection, mandatory disclosure and public information programmes further shows that external scrutiny can redirect green innovation, but its quality depends on how firms convert information pressure into technological capability ^[22-24]. Recent government environmental-audit evidence reinforces this conditional rather than automatic innovation pathway ^[25].

4.6 From Firms to Industrial Outcomes

Firm responses aggregate through three channels. The first is technological progress. Substantive research, adoption and diffusion can shift the industrial production frontier. The second is efficiency improvement. Better management can move firms closer to the existing frontier. The third is resource reallocation. Persistent accountability can redirect capital and market share towards cleaner producers.

The aggregate outcome depends on the distribution of responses. Widespread incremental improvement may raise average efficiency without changing frontier technology. A small group of innovators may shift the frontier while most firms remain unchanged. Exit by inefficient polluters can raise measured productivity even without within-firm innovation.

These channels have different timing. Compliance expenditure and production disruption may appear quickly. Efficiency gains may follow after routines stabilise. Technological progress and diffusion can require longer periods. Evidence of negative firm productivity ^[10] and positive industrial GTFP ^[8] may therefore capture different stages or aggregation mechanisms.

Spatial effects further complicate aggregation. Strict accountability may reduce local pollution while shifting production elsewhere. Alternatively, shared standards and technology diffusion may create positive spillovers. Industrial transformation cannot be inferred from local emissions alone when production location changes.

Proposition 5: Environmental auditing shapes industrial GTFP through changing contributions from efficiency, technological progress and resource reallocation across time and space.

4.7 Feedback and Institutional Learning

Industrial outcomes can influence later audit design. Recurrent problems can reveal weak standards or missing data. Successful correction can identify controls that deserve wider adoption. Unexpected productivity losses can also signal that accountability pressure lacks supporting finance or technology.

This feedback separates transformation governance from one-way inspection. Audits do not only judge past action. They can refine future risk assessment, evidence requirements and policy coordination. However, institutional learning requires records that connect findings, correction and later performance.

Feedback may also create strategic adaptation. Firms learn which indicators auditors prioritise and may redirect effort towards them. Audit standards must therefore evolve when measured activity becomes detached from environmental value.

Proposition 6: Environmental auditing supports durable transformation when audit results modify later standards, risk models and support policies while limiting indicator gaming.

5. Boundary Conditions and Alternative Pathways

Six conditions recur across the framework. Fiscal pressure affects government willingness to enforce. Administrative capacity determines whether findings become action. Market development influences whether information changes finance and competition. Ownership affects resource access and exposure to pressure. Pollution intensity shapes both need and cost. Public participation determines external visibility.

These conditions interact rather than operate independently. Public monitoring can strengthen weak market discipline, but it cannot finance costly technology. Strong enforcement can increase investment incentives, but excessive uncertainty can

discourage long-term projects. State ownership can protect employment and financing while weakening exit pressure. Alternative pathways should also be considered. Pollution may fall because firms reduce output rather than transform production. GTFP may improve because inefficient firms exit, while surviving firms do not innovate. Green patent counts may rise because classification or disclosure changes. Future empirical designs should distinguish these explanations. The framework also allows negative feedback. If audits generate repeated campaigns, firms may delay investment until enforcement priorities become clear. If disclosed findings are not corrected, stakeholder trust may weaken. Accountability without credible support can therefore reduce both compliance quality and transformation capacity.

6. Discussion

6.1 Theoretical Implications

The framework reframes environmental auditing as a functional and multilevel process. Detection, deterrence and prevention perform different jobs. Their effects cannot be inferred from a single treatment indicator. This distinction offers one explanation for mixed findings across studies.

The framework also connects the Porter and compliance-cost perspectives without treating them as mutually exclusive. Immediate compliance can raise costs. Later capability building and reallocation can improve productivity. The relevant question is which pathway dominates under a given audit function, time horizon and institutional setting.

A further contribution is the separation of behaviour, capability and performance. This prevents visible environmental activity from being treated as equivalent to transformation. It also makes delayed benefits analytically visible without assuming that every short-term cost will be recovered.

The framework also clarifies the difference between an audit mechanism and an audit outcome. Detection, deterrence and prevention describe institutional work performed by the audit process. Innovation, emissions and productivity describe responses that occur after several intervening decisions. Collapsing these categories encourages premature causal claims. A reported association between audit exposure and GTFP does not identify which function generated the change.

This distinction offers a more disciplined basis for theory building. A study of detection should measure information quality, finding specificity or problem exposure. A study of deterrence should examine expected consequences and anticipatory response. A study of prevention should test recurrence, control redesign or learning. The dependent variable can remain green transformation, but the proposed mechanism must be matched to evidence that actually represents it.

The multilevel structure further shows why firm and industry evidence need not agree. Firm-level estimates usually describe within-firm response among observed enterprises. Industry GTFP can also change through entry, exit and market-share reallocation. A positive industrial effect can therefore coexist with weak innovation in the average incumbent. Future interpretations should state which aggregation channel their design can observe.

6.2 Empirical Research Agenda

Future studies should measure audit implementation quality. Candidate dimensions include evidence credibility, finding materiality, correction completion, disclosure and preventive improvement. These measures would clarify why formally similar audits differ in effect.

Research should distinguish green innovation quantity from quality. It should also decompose GTFP into efficiency, technology and technology-gap components where data permit. Such decompositions can test the aggregation channels proposed here.

Multilevel designs are especially valuable. City-level accountability can be linked to firm behaviour, industry reallocation and regional outcomes. These designs should allow for staggered policy timing, spatial relocation and competing environmental policies.

Comparative work could examine accountability institutions outside China. Corporate assurance, environmental courts and investor-led disclosure may activate similar information mechanisms but different responsibility channels. Such comparison would reveal which parts of the framework travel across institutional settings.

Research should also examine sequencing. An audit may first increase disclosure, then induce control redesign, and only later affect technology or productivity. Models that impose one immediate response can miss this progression. Event-time designs

and repeated measures of audit quality would help distinguish temporary compliance from capability formation. Measurement should account for strategic adaptation. Once organisations understand the indicators used in audit evaluation, they may change reporting or reclassify activities. Researchers can compare disclosed activity with operational evidence, including energy, emissions or production data. Divergence between the two provides a useful signal of symbolic response, although it does not establish intent by itself.

Finally, future work should specify failure criteria. The framework would be challenged if audit functions do not predict the proposed intermediate responses. It would also require revision if productivity changes consistently precede governance and corporate adjustments. Stating these possibilities makes the framework falsifiable rather than merely comprehensive.

6.3 Limitations

This article develops a conceptual synthesis rather than a causal test. The propositions therefore require independent empirical evaluation. The review is also concentrated in one national setting and may understate institutional alternatives.

Several concepts require operational refinement. Symbolic compliance and substantive transformation form a continuum, although the framework presents them as categories. Audit functions may also overlap within one project. Future measurement should preserve this complexity rather than forcing mutually exclusive labels.

7. Practical Implications

Environmental audits should be designed as linked stages. Planning should identify material responsibilities and transformation processes. Findings should name responsible actors, corrective actions and verification dates. Follow-up should assess whether correction changed operations, not only whether documents were submitted.

Public disclosure should distinguish commitments, activities and verified outcomes. This distinction can reduce rewards for symbolic behaviour. It can also help financial and public stakeholders interpret audit evidence more consistently.

Industrial enterprises should integrate environmental responsibility into capital budgeting, internal control and technology strategy. Audit preparation should not remain an isolated reporting task. Managers require systems that connect financial records, production data and environmental performance.

Differentiated standards are necessary. Industries vary in pollution intensity, technology and transition cost. Smaller firms may require proportionate evidence demands and technical support. Strong accountability without feasible adjustment routes can encourage closure or relocation rather than cleaner production.

8. Conclusion

Environmental auditing can shape industrial green transformation because it links ecological responsibility to verified evidence and organisational consequences. Its influence depends on the sequence connecting detection, deterrence and prevention. That sequence operates through government governance, information, corporate controls and stakeholder monitoring.

The resulting corporate response may remain symbolic, produce incremental improvement or support substantive transformation. These responses aggregate through technological progress, efficiency and resource reallocation. Their balance changes across time, industries and institutional settings.

The framework does not imply that auditing alone can deliver green development. Durable effects require credible evidence, enforceable correction, organisational learning and feasible transformation resources. This boundary is central to both future testing and responsible audit design.

Funding

Social Science Planning Project of Chongqing (Grant No. 2023PY37)

Conflict of Interests

The authors declare that there is no conflict of interest regarding the publication of this paper.

Reference

[1] Luo, Y., Mensah, C. N., Lu, Z., et al. (2022). Environmental regulation and green total factor productivity in China:

- A perspective of Porter's and compliance hypotheses. *Ecological Indicators*, 145, 109744. <https://doi.org/10.1016/j.ecolind.2022.109744>
- [2] Cheng, Z., & Kong, S. (2022). The effect of environmental regulation on green total-factor productivity in China's industry. *Environmental Impact Assessment Review*, 94, 106757. <https://doi.org/10.1016/j.eiar.2022.106757>
- [3] Ouyang, X., Liao, J., Sun, C., et al. (2023). Measure is treasure: Revisiting the role of environmental regulation in Chinese industrial green productivity. *Environmental Impact Assessment Review*, 98, 106968. <https://doi.org/10.1016/j.eiar.2022.106968>
- [4] Chen, X., Ou, J., Tang, X., et al. (2023). The impact of officials' off-office accountability audit of natural resource assets on firms' green innovation strategies: A quasi-natural experiment in China. *Sustainability*, 15(3), 2640. <https://doi.org/10.3390/su15032640>
- [5] Wu, X., Cao, Q., Tan, X., et al. (2020). The effect of audit of outgoing leading officials' natural resource accountability on environmental governance: Evidence from China. *Managerial Auditing Journal*, 35(9), 1213-1241. <https://doi.org/10.1108/MAJ-08-2019-2378>
- [6] Li, Q., He, Z., Ruan, W., et al. (2025). Reformation of government officials' performance evaluation and corporate environmental investment: The moderating effect of corporate bargaining power. *Economic Analysis and Policy*, 85, 150-168. <https://doi.org/10.1016/j.eap.2024.11.019>
- [7] Zhang, G., Wang, J., & Liu, Y. (2024). How does auditing outgoing officials' natural resource asset management policies affect carbon emission efficiency? Evidence from a debiased machine learning model. *Journal of Cleaner Production*, 478, 143932. <https://doi.org/10.1016/j.jclepro.2024.143932>
- [8] Huang, R., & Zou, X. (2025). Accountability audits of natural resources and industrial green total factor productivity: Evidence from China. *Humanities and Social Sciences Communications*, 12(1), 147. <https://doi.org/10.1057/s41599-025-04451-5>
- [9] Zhang, H., & Lai, J. (2024). Auditing leading officials: Unintended consequences of government audit reform on corporate green innovation. *Economic Modelling*, 139, 106820. <https://doi.org/10.1016/j.econmod.2024.106820>
- [10] Huang, X., & Li, S. (2024). Accountability audit of natural resources and total factor productivity—Evidence based on Chinese listed companies. *Heliyon*, 10(3), e25082. <https://doi.org/10.1016/j.heliyon.2024.e25082>
- [11] Tan, J., Hua, M., & Chan, K. C. (2024). Do anticipated government environmental audits improve firm productivity? Evidence from China. *Finance Research Letters*, 61, 104985. <https://doi.org/10.1016/j.frl.2024.104985>
- [12] Xie, X., & Huang, R. (2023). Leading officials' audits of natural-resource assets and local environmental attention: Evidence of word frequency analysis from Chinese local government work reports. *Environmental Science and Pollution Research*, 31(46), 56961-56982. <https://doi.org/10.1007/s11356-023-30930-w>
- [13] Zeng, H., Li, X., Zhou, Q., et al. (2022). Local government environmental regulatory pressures and corporate environmental strategies: Evidence from natural resource accountability audits in China. *Business Strategy and the Environment*, 31(7), 3060-3082. <https://doi.org/10.1002/bse.3064>
- [14] Zhang, Z., Ling, D., Tian, W., et al. (2023). Public participation and outgoing audit of natural resources: Evidence from tripartite evolutionary game in China. *Environmental Research*, 236, 116734. <https://doi.org/10.1016/j.envres.2023.116734>
- [15] Zeng, H., Huang, Z., Zhou, Q., et al. (2022). Corporate environmental governance strategies under the dual supervision of the government and the public. *Business & Society*, 62(4), 860-907. <https://doi.org/10.1177/00076503221114792>
- [16] Huang, R. (2023). Auditing the environmental accountability of local officials and the corporate green response: evidence from China. *Applied Economics*, 55(34), 3950-3970. <https://doi.org/10.1080/00036846.2022.2120958>
- [17] Yan, K., Chen, Z., Wang, J., et al. (2023). The power from folk monitoring: Leading Officials' Natural Resources Accountability Audit (NRAA) and corporate ESG performance. *Finance Research Letters*, 58, 104575. <https://doi.org/10.1016/j.frl.2023.104575>
- [18] Zhang, X., Liu, Y., Zhu, J., et al. (2025). The outgoing audit of natural resources assets and green governance: New

- evidence from causal inference based on double machine learning. *Economic Analysis and Policy*, 87, 1113-1129. <https://doi.org/10.1016/j.eap.2025.06.024>
- [19] Yu, D., Hu, K., & Hao, Y. (2024). Can China's leading officials' accountability audit of natural resources policy promote corporate emissions reduction? *Carbon Management*, 15(1), 2317282. <https://doi.org/10.1080/17583004.2024.2317282>
- [20] Peng, L., & Li, H. (2024). Environmental governance and firm's environmental investment: Evidence from the natural resources and assets accountability audit of outgoing officials. *Finance Research Letters*, 65, 105545. <https://doi.org/10.1016/j.frl.2024.105545>
- [21] Yan, Y., Cheng, Q., Huang, M., et al. (2022). Government Environmental Regulation and Corporate ESG Performance: Evidence from Natural Resource Accountability Audits in China. *International Journal of Environmental Research and Public Health*, 20(1), 447. <https://doi.org/10.3390/ijerph20010447>
- [22] Cheng, Z., & Yu, X. (2023). Can central environmental protection inspection induce corporate green technology innovation? *Journal of Cleaner Production*, 387, 135902. <https://doi.org/10.1016/j.jclepro.2023.135902>
- [23] Ding, J., Lu, Z., & Yu, C. H. (2022). Environmental information disclosure and firms' green innovation: Evidence from China. *International Review of Economics & Finance*, 81, 147-159. <https://doi.org/10.1016/j.iref.2022.05.007>
- [24] Zhang, S., Zhang, M. A., Qiao, Y., et al. (2022). Does improvement of environmental information transparency boost firms' green innovation? Evidence from the air quality monitoring and disclosure program in China. *Journal of Cleaner Production*, 357, 131921. <https://doi.org/10.1016/j.jclepro.2022.131921>
- [25] Tan, J., Zhou, X., Hua, M., et al. (2025). Can government environmental audit improve green innovation? *International Review of Financial Analysis*, 104, 104334. <https://doi.org/10.1016/j.irfa.2025.104334>