

# The Relationship Between Government Sustainable Investment and Corporate Finance: Findings from Three Industries in China

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## **Abstract:**

This study examines the impact of Government Sustainable Investment (GSI) on corporate financial performance. Using the Environmental Ratio (ER) as a proxy to measure the intensity of regional policies, we perform linear regression analysis on financial data of 15 firms spanning three sectors: technology, finance, and automotive. Key findings reveal: the finance sector demonstrates a positive effect on efficiency first, though revenue and profit trends remain unstable; the technology sector exhibits overall neutrality in the short term, largely influenced by its globalized revenue structure and the time lag between R&D and commercialization; Automotive manufacturing, which is undergoing compliance-related investments and production line transformation, shows no significant improvement. Overall, GSI influences finance through structural channels such as governance, asset allocation, and operational efficiency, exhibiting distinct time lags and industry-specific heterogeneity. We recommend shifting evaluation metrics from short-window profits to efficiency and risk exposure indicators, while extending observation periods. Limitations include sample size, proxy variables, and window length; future research should expand multinational samples and incorporate sustainability performance metrics such as carbon efficiency indices.

**Keywords:** Government Sustainable Investment; Corporate Finance; Industry Heterogeneity; ROA; Asset Allocation; R&D Lags; Automotive Manufacturing; Financial Sector

## 1. Introduction

Globalization amplifies operational complexity, compelling firms to pursue profitability while simultaneously addressing environmental and social objectives. Government Sustainable Investment is transforming environmental management from voluntary initiatives into binding regulatory requirements, making transformation depend on governance, finance, and technology. Although green innovation is costly and slow to pay back, it can translate into brand value and competitive advantages and align with regulation. Investors and supply chains increasingly reward sustainability, driving the cumulative growth of corporate value over time. This paper treats GSI as an exogenous institutional force and compares how firms across different industries—with varying capital intensity and regulatory exposure—translate the same GSI environment into financial performance. This paper will explore the following three questions:

RO1 Explore the characteristics of the relationship between GSI and corporate performance;

RO2 Analyze the pathways through which regional policy elements and mechanisms exert an impact on corporate outcomes;

RO3 Compare financial impacts across industries under unified regulation.

## 2. Literature Review

From an institutional perspective, GSI exerts influence through coercive, normative, and mimetic pressures—pressures that reshape firms’ organizational structures and operational routines to maintain organizational legitimacy and financial performance [1]. This chapter synthesizes existing research findings and clarifies controversies regarding sample selection, measurement indicator design, observation window settings, and causal identification that complicate inference on GSI–ESG–performance links.

### 2.1 Environment Becomes a Strategic Driver for Business

Environmental governance has evolved from resource control to safeguarding ecosystems and biodiversity and is now integrated into macroeconomic policies and local policy toolkits—including public investment, infrastructure development, and incentive mechanisms [2]. Within

this architecture, GSI shifts the cost–benefit frontier, reshapes technological options, and signals regulatory expectations that firms must incorporate into their strategic decision-making [3]. Empirical results diverge because research perspectives vary: some studies find rising compliance costs suppress margins and R&D, while others show medium-to-long-run “innovation compensation,” where incentives and spillovers enhance productivity and competitiveness [4]. Effect direction is sensitive to measurement choices: short windows and narrow financial metrics tend to register costs but miss lagged innovation gains, whereas samples limited to listed firms may overstate policy benefits during favorable economic cycles. Beyond coercion, mimetic and normative forces propagate sustainability expectations: leading MNCs codify standards, peers imitate under uncertainty, and rating, audit, and consulting intermediaries stabilize norms that influence corporate disclosure practices, reputation, and capital pricing [3].

### 2.2 ESG as a Tool for Policy Alignment and Competitive Positioning

Firms deploy ESG to align with regulation, investors, and stakeholders, using strategic planning and transparent disclosure to manage policy risks, access green finance, and build reputational advantages; adoption depth rises with scale and governance capacity. Yet informational and reputational gains can outpace tangible environmental improvements: high-quality disclosure and third-party assurance often lift comparability and trust, but governance narratives may have a greater impact on reputation than actual environmental performance [5]. A critical strand warns of performative ESG, superficial image projects or risk masking—that diverts attention from operational environmental problems, where ratings rise without parallel abatement or efficiency gains. These patterns raise endogeneity concerns: good governance can spur disclosure, lower financing costs, and improve results, which then feed back into higher ESG scores; conversely, weak performance may induce a pivot to ESG narratives, biasing estimates unless researchers separate the effects of ESG communication from actual production improvements [6].

### 2.3 Assessing the Impact of ESG on Corporate

## Performance

Meta-evidence across thousands of studies finds predominantly positive associations between sustainability and financial outcomes, but the boundary between correlation and causation remains unclear [7]. Results vary by industry and cycle: for instance, high-ESG firms appeared to outperform during recoveries, but effects are entangled with sector composition and macroeconomic rebound effects [8]. Innovation and productivity payoffs are typically lagged, so short-horizon metrics such as profitability or revenue understate structural gains [9]. Capability thresholds matter: when policy triggers innovation, early benefits accrue to firms with absorptive capacity and access to financing, whereas resource-constrained firms can be burdened by near-term compliance costs [10]. Geography also conditions outcomes: multi-region operators face heterogeneous rules and supply-chain adjustments, and firms in pro-environmental regions tend to adopt ESG earlier and translate it more effectively into financial performance [11]. Based on this evidence, rigorous designs should broaden samples beyond large disclosers, avoid substituting ESG ratings for tangible environmental performance, lengthen observation windows to capture technology diffusion and capital formation, and prioritize financial-statement indicators tied to efficiency and risk [7].

## 2.4 Research Gaps

Four gaps persist in advanced research. First, exogeneity is under-identified: many studies use firm-level ESG as a proxy for policy pressure, obscuring the independent role of GSI as an institutional force. Second, cross-industry heterogeneity is under-tested: comparisons rarely span technology, finance, and high-emission manufacturing within the same regime, despite clear differences in their resource endowments and regulatory exposure levels. Third, indicator mismatch is common: disclosure and ratings often stand in for physical performance, and short-window profit metrics stand in for long-run efficiency—both of which obscure the underlying mechanisms. Fourth, implementation heterogeneity is insufficiently characterized: capability, financing, and regional policy differences shape which firms benefit and when, but are frequently treated uniformly. In response, this paper explicitly models GSI as an exogenous institutional environment, conducts cross-industry tests under a single institu-

tional setting, emphasizes efficiency and risk metrics from financial statements (with ESG disclosure as a complement), and distinguishes between short-term effects and structural changes.

## 3. Methodologies

### 3.1 Research Design and Variable Characterization

The study adopts a deductive approach, it first establishes a theoretical framework via a systematic literature review and subsequently validates it through empirical analysis. The research design constructs a model based on the methodological framework proposed by Zhou et al. [12] adapting it to the specific context of this study. It employs SPSS linear regression to conduct [13,14,15]. Identify the marginal impact of GSI on corporate financial performance [16,17]. To quantify policy intensity and enable regional comparison, this paper uses the environmental expenditure ratio (ER) as a proxy for the intensity of government sustainable investment; its data are sourced from the World Bank Database and assigned to specific provinces to reflect the local policy environment in which enterprises are located.

$$ER = \frac{\text{Investment in regional pollution control}}{GDP} \quad (1)[12]$$

### 3.2 Data Collection and Metrics

Financial data are sourced from corporate annual reports and investor relations materials; the core indicators are operating revenue (Turnover), net profit (Net Income), and return on assets (ROA), among which ROA measures asset efficiency [18]. The sample includes three industries, technology, finance, and automobile manufacturing, with a total of 15 enterprises (representatives: Huawei, ICBC, GAC; the other 12 are used as comparators). The technology industry covers Tencent, Alibaba, Baidu, and Lenovo; the automobile industry covers Geely, Dongfeng, China Automotive Systems, and Kandi; the financial industry includes Agricultural Bank of China, Bank of China, Bank of Communications, and China Construction Bank, selected to reflect differences in financial performance and policy exposure across firms of varying sizes and market positions (Macrotrends data). The advantage of this sample design is that core enterprises can be analyzed in conjunction with their specific organizational strategies and

operational contexts.

$$ROA = \frac{NetIncome}{TotalAssets} \times 100\% \quad (2)$$

variables (Turnover, Net Income, ROA, ER), yielding a Measure of Sampling Adequacy (MSA) of 0.688. This result meets the prerequisite for multivariate analysis and provides methodological validity for subsequent regression analyses[19].

## 4. Data Analysis

### 4.1 Validity Test

As shown in table 1, using the KMO test on the four core

**Table 1. Testing for consistency of data collection results**

Items	Factor Loadings		Communalities
	Factor 1	Factor 2	
Turnover	0.960	-0.042	0.924
Net Income	0.889	-0.067	0.795
ROA	0.933	0.069	0.876
Environmental Ratio	-0.031	0.998	0.998
Eigenvalues (Initial)	2.587	1.005	-
% of Variance (Initial)	64.672%	25.123%	-
% of Cum. Variance (Initial)	64.672%	89.795%	-
Eigenvalues (Rotated)	2.584	1.008	-
% of Variance (Rotated)	64.604%	25.191%	-
% of Cum. Variance (Rotated)	64.604%	89.795%	-
KMO	0.688	-	-
Bartlett's Test of Sphericity (Chi-Square)	67.416	-	-
df	6	-	-
p value	0.000	-	-

### 4.2 Regression Results

#### 4.2.1 Technology Industry

Huawei: The immediate financial response to GSI is overall neutral. Operating revenue is largely unaffected by fluctuations in local GSI intensity during the observation period; net profit shows some sensitivity but with unstable

direction, indicating that the globalized revenue structure and diversified product lines dilute the impact of policy fluctuations. Asset efficiency (ROA) does not show a stable upward trend; time lags between R&D and commercialization, along with market hedging between domestic and overseas markets, weaken the financial manifestations of GSI within the short window(as shown in table2).

**Table 2. Regression Analysis of Regional Environmental Investment and Performance in the Technology Sector**

	non-standardised coefficient		standardisation coefficient	t	p	Collinearity diagnosis	
	B	standard error	Beta			VIF	tolerance
constant	9.157	0.195	-	47.039	0.000**	-	-
Turnover	0	0	-0.378	-1.742	0.09	2.388	0.419
Net Income	0	0	-0.189	-0.8	0.429	2.827	0.354
ROA	1.595	1.751	0.183	0.911	0.369	2.041	0.49
R 2	0.291						

ajust R 2	0.232
F	F (3,36)=4.927,p=0.006
D-W	1.36
DV = Environmental Ratio	
* p<0.05 ** p<0.01	

The other four (Tencent, Alibaba, Baidu, Lenovo): The overall picture is consistent with Huawei: operating revenue is mostly weakly associated/close to zero; net profit shows weak negatives in some models but is not significant; ROA is mostly weakly positive and not significant. To clarify the magnitude of these effects, the four comparators have seen ROA coefficients around +1.6 (not significant) and revenue coefficients close to 0; overall, it remains difficult to conclude that short-term financial improvements are directly driven by GSI.

**4.2.2 Financial Industry**

Core enterprise (Industrial and Commercial Bank of China): GSI is first reflected in the structural optimization of asset allocation and risk weighting; revenue measures are neutral to GSI or slightly contracted; net profit remains resilient but with unstable direction; ROA improvement is more consistent, manifested as a combined effect of expanded green credit, growth in non-interest businesses, and rebalanced risk exposure (results shown in the Appendix)(as shown in table 3).

**Table 3. Regression Analysis of Regional Environmental Investment and Performance in the Financial industry**

	non-standardised coefficient		standardisation coefficient	t	p	Collinearity diagnosis	
	B	standard error	Beta			VIF	tolerance
constant	8.246	0.464	-	17.753	0.000**	-	-
Turnover	-0.004	0.007	-0.103	-0.654	0.517	1.355	0.738
Net Income	-0.023	0.006	-0.553	-3.599	0.001**	1.3	0.769
ROA	141.946	44.294	0.49	3.205	0.003**	1.286	0.778
R 2	0.346						
ajust R 2	0.292						
F	F (3,36)=6.358,p=0.001						
D-W	1.731						
DV = Environmental Ratio							
* p<0.05 ** p<0.01							

The other four (Agricultural Bank of China/Bank of China/China Construction Bank/Bank of Communications): The pooled model shows an operating revenue coefficient of about -0.004 and a net profit coefficient of about -0.023 (both slight contractions), while the ROA coefficient is about +141.946 and significantly positive. This indicates that industry-level efficiency improvements precede the stable manifestation of revenue and profit growth; differences in strength among banks are mainly influenced by capital constraints, governance quality, and the regional client structures of each bank.

**4.2.3 Automobile Manufacturing**

Core enterprise (GAC): In the short term, GSI is more reflected in fixed investments for compliance and production line retrofitting—investments that are difficult to directly translate into financial growth on the statements. Revenue is dominated by industry variables such as product cycles and channel destocking; the directionality of net profit is even weaker; ROA shows no stable improvement, as the investment cycles and scale effects of electrification and intelligitization require more time to materialize

**Table 4. Regression Analysis of Regional Environmental Investment and Performance in the Automobile industry**

	non-standardised coefficient		standardisation coefficient	t	p	Collinearity diagnosis	
	B	standard error	Beta			VIF	tolerance
constant	8.974	0.112	-	80.236	0.000**	-	-
Turnover	0	0	-0.328	-1.494	0.144	1.874	0.533
Net Income	0	0	0.275	1.023	0.313	2.807	0.356
ROA	0.853	2.22	0.083	0.384	0.703	1.827	0.547
R 2	0.075						
ajust R 2	-0.002						
F	F (3,36)=0.972,p=0.416						
D-W	1.312						
DV = Environmental Ratio							
* p<0.05 ** p<0.01							

The other four (Geely, Dongfeng, China Automotive Systems, Kandi): The comparator sample is generally insignificant: in the pooled model, operating revenue has a coefficient of about  $-0.000$ , net profit about  $+0.000$ , and ROA about  $+0.853$  (none significant). Firms with higher new-energy vehicle penetration rates have a slight edge in order structure and brand premium, but within the short window this is still insufficient to reshape asset efficiency; enterprises undergoing transformation face pressures mainly from upfront retrofit costs and the need to ramp up production yields (as shown in table 4).

## 5. Discussion

### 5.1 Relationship between GSI and Corporate Performance

Guided by institutional theory, GSI influences corporate financial performance primarily through three channels: governance mechanisms, asset allocation strategies, and production efficiency improvements. Short-term profit and revenue indicators fail to fully capture these structural effects [1]. Consistent with the conclusions in Chapter 2, positive correlations at the long-term level are more common, but correlation does not imply causation—and such correlations are easily influenced by sample selection and indicator choices [7]. Therefore, it is necessary to strictly distinguish between improvements in ESG disclosure and ratings, and improvements in tangible efficiencies (e.g., energy consumption, material utilization, and production

yields), so as to avoid misjudging ESG communication effectiveness as productivity gains [5].

### 5.2 Regional Policy Pathways to Corporate Outcomes

The reason the financial sector first translates GSI into financial performance lies in combinable assets, priceable risk, and direct regulatory transmission. Taking Industrial and Commercial Bank of China as an example, practical moves include reducing high-carbon risk exposure, expanding green credit and green bond underwriting, increasing the share of custody, settlement, and investment-banking services, and improving capital occupation by optimizing risk-weighted assets; the result is that ROA improves first, while revenue and profit directions are unstable, a pattern that aligns with the industry characteristic where efficiency improvements become significant before income indicators. This result also suggests that policy may amplify differences in corporate governance and resource endowments; institutions with strong scale and risk control capabilities are more likely to benefit first, and risks related to asset allocation bias require continuous assessment [10].

### 5.3 Cross-industry Financial Impacts under Unified Regulation

The short-term insignificance in technology and manufacturing does not mean policy ineffectiveness, but rather a mismatch between observation time windows and technological transformation paths. Huawei's approach is to

hedge against local GSI fluctuations using its globalized revenue and diversified product lines, while maintaining multi-jurisdiction compliance and advancing R&D and supply-chain greening; affected by time lags from R&D to commercialization and cross-market hedging, it is difficult for revenue, profit, and ROA to improve steadily within a short window [9]. GAC's approach is to first complete compliance on energy consumption and emissions, conduct green retrofitting of production lines and supply chains, implement certification testing, and introduce platform-based components, and then invest in electrification and intelligentization upgrades; these costs are first reflected as depreciation and expense in accounting, and before scale effects and learning curves are fully realized, ROA struggles to rise [11].

In sum, the four categories of bias raised in Chapter 2 are confirmed here: insufficient identification of exogeneity, underestimated industry heterogeneity, misattribution caused by indicator mismatch, and uneven distribution of benefits due to differences in implementation conditions. Policy and research should shift the focus of evaluation from short-window profits to efficiency and risk-exposure indicators, and extend observation periods; at the same time, adopt differentiated measures and tools across finance, technology, and manufacturing sectors—to prevent mistaking disclosure improvements for productivity gains and to avoid misreading scale and governance advantages as immediate policy effects.

## 6. Conclusion

In conclusion, GSI exerts a significant influence on corporate financial performance, but the effects exhibit industry heterogeneity and lag characteristics. Financial institutions show the strongest positive response in the efficiency dimension (ROA); technology and manufacturing are more neutral/delayed, reflecting structural constraints and strategic considerations specific to each industry. Policy is more likely to influence finance through long-term governance optimization and resource allocation adjustment, rather than as an immediate profit driver.

The study has several limitations. The sample size and observation window are relatively limited; approximating regional policy as homogeneous may overlook intra-provincial differences in policy implementation; regression analysis can only indicate statistical association and does

not imply causality.

It is recommended to expand the sample size, introduce long-term sustainability indicators (e.g., carbon efficiency indices), conduct cross-country comparative studies and industry-specific institutional model analyses, and adopt mixed methods to reveal micro-behavioural mechanisms.

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