How Does Social Trust Shape Corporate Greenwashing in a Weak Institution? Evidence from China

Abstract

Amid rising global scrutiny of corporate greenwashing and a decline in genuine ESG investment, this study investigates the impact of regional social trust on corporate greenwashing in China. Contrary to the traditional view of trust as societal asset, our analysis reveals that high social trust regions actually foster an environment where firms can more easily engage in greenwashing. Specifically, we document a strong positive association between regional social trust and the inconsistency between the corporate ESG disclosure and actual ESG performance. These findings remain robust after employing instrumental variables as well as various model specifications and matching approaches. Our cross-sectional analyses further indicates that the documented effect is particularly pronounced in regions characterized by weak formal institutions, low public environmental concern, and firms under significant social or earnings pressure. Moreover, while firms engaging in greenwashing do not demonstrate improved environmental performance in the future, they are more likely to secure government subsidies and evade environmental penalties, suggesting that current regulatory oversight fails to detect or deter symbolic environmental claims. Overall, this study highlights a paradox in emerging markets: in contexts where formal institutions are limited and legal enforcement is weak, informal institutions such as social trust may inadvertently be exploited to facilitate unethical corporate behavior, thereby undermining genuine sustainability efforts.

Keywords: Social Trust; Corporate Greenwashing; Immature Market; Environmental Disclosure

JEL classifications: A13; M14; Q56; Z13

1 Introduction

"I'm worried about greenwashing. I think we should come down on it very, very hard, whether it's with criminal intent or actively deceptive."

— John Elkington

The global urgency to combat climate change has never been greater, yet corporate greenwashing—where firms exaggerate or fabricate their environmental commitments—continues to undermine genuine sustainability efforts.

To address the issue, governments around the world are cracking down on corporate greenwashing by putting in place more stringent regulations to force corporations to actively participate in environmental activities. For instance, the US Securities and Exchange Commission (SEC) launched the Climate and ESG Taskforce in 2021 to identify greenwashing claims and bring enforcement actions against violations. Shortly after, the agency proposed to create consistent and enhanced disclosure requirements to regulate public companies' climate-related information, such as the disclosure of climate risks, greenhouse gas emissions, and the actions to manage those emissions.[1] In EU, the member states have already enacted its first explicit rules on anti-greenwashing, the so-called "Greenwashing Directive."[2] As nations worldwide tighten regulations to curb deceptive environmental claims, the phenomenon of greenwashing remains a critical concern,[3] misdirecting stakeholder investments and delaying substantive climate action (Guo et al., 2017; United Nations, 2015). In this context, understanding the factors that enable greenwashing is essential for both policymakers and market participants.

China, as the world's largest carbon emitter, occupies a unique position in this debate. Unlike many developed economies that have established robust legal frameworks and enforceable

[1] Please find more details here: https://www.chapman.com/publication-sec-targets-greenwashing-and-other-misleading-esg-claims.
[2] Please find more information here: https://www.cov.com/en/news-and-insights/insights/2024/05/coordinated-eu-wide-crackdown-on-airline-greenwashing#:~:text=As%20we%20reported%20here%2C%20the,and%20unsubstantiated%20generic%20environmental%20claims.
[3] According to a recent report, major corporations such as Amazon, Google, H&M, etc have not fulfilled their 'net zero' target but still make carbon-neutrality claims. For more details, please check the article here: https://carbonmarketwatch.org/2023/03/09/zeroing-in-on-greenwashing-how-corporations-misuse-net-zero-pledges/.

environmental regulations, China is still in the process of aligning its environmental policies with global best practices. Although recent initiatives—such as new ESG disclosure guidelines—signal a move towards more rigorous regulation, these rules will not be fully implemented until 2026.While the Chinese media and the public increasingly get involved in environmental monitoring, the lack of legislation targeting environmental disclosure and regulatory enforcement makes China a hotbed for frequent environmental violations and corporate greenwashing (Cao et al., 2022; Guo et al., 2017; Zhang, 2023a).[4] Within this backdrop, we explore in this study how informal institutions like social trust shape corporate greenwashing behaviors when there is a regulatory void in a country with an underdeveloped legal and financial system (Allen et al., 2005; Jiang & Kim, 2020).

Prior literature finds that social trust, as captured by the strength of common social norms and the density of social networks (Coleman, 1988; Putnam, 1994) facilitates cooperation, inhibits opportunistic behavior, and enhances the exchange of ideas and economic transactions (Fukuyama, 1995). It forms an intangible network of human relationships that creates social and economic value for members that reside within the network (Guiso et al., 2004, 2011; Knack & Keefer, 1997). Recent studies on social trust in corporate settings indicate that social trust and the ethical norms it fosters can mitigate corporate unethical behavior. For example, firms located in regions with greater social trust have been associated with lower audit fees (Jha & Chen, 2015) and bank loan spreads (Hasan et al., 2017b), less CEO agency problems (Hoi et al., 2019) and corporate tax avoidance (Hasan et al., 2017a).

In contexts where formal institutions function effectively, such informal capital completements legal frameworks, contributing to transparent corporate practices (Coleman, 1988; Erard & Feinstein, 1994; Gupta et al., 2020; Hasan et al., 2017a). However, in China's emerging market, characterized by a regulatory void and weaker legal institutions, high levels of social trust may constrain opportunistic behavior and discourage deceptive environmental practices (Cao et al., 2016; Chen & Wan, 2020), or it may inadvertently reduce external scrutiny (Ahn & Akamah, 2022; Chen et al., 2018). This "trust trap" can allow firms to exploit societal goodwill, making

[4] On December 17, 2024, the Chinese Ministry of Finance, in collaboration with nine other departments, unveiled the new Corporate Sustainability Disclosure Standards —Basic Standards (Trial). However, these new guidelines do not specify the scope or requirements for implementation, instead adopting a voluntary approach for enterprises.

exaggerated environmental claims without fear of effective enforcement or reputational damage. Since most corporate greenwashing behaviors are not penalized, the 'homogenization effect' (Strindlund et al., 2022) can prompt other companies to mimic prevailing industry practices, such as overstating environmental initiatives and using cosmetic sustainability measures to enhance brand image or evade regulatory obligations (Testa et al., 2018). A notable example is Greenpeace's recent accusation against PetroChina, a Fortune Global 500 company, for using forest carbon offsets to justify natural gas imports rather than genuinely reducing emissions. This case illustrates how corporations can strategically leverage trust and reputation to mask environmentally harmful practices. Our research builds on this paradox by exploring whether, in the absence of strong formal oversight, high social trust may actually facilitate greenwashing rather than deter it.

To measure social trust at the provincial level, we construct a Social Trust Index (*ST_Index*) using Principal Component Analysis (PCA) (Rupasingha et al., 2006). This index is based on four key proxies: Voluntary Blood Donation (*BLOOD*), NGO Participation *(NGO*), Enterprise Survey (*ENTERPRISE*), and Citizen Survey (*CITIZEN*). We measure the level of corporate greenwashing by calculating the difference between a firm's ESG disclosure score and its actual ESG performance score, based on the data from the Bloomberg and Sino-Securities Index Information Service Company (Liao et al., 2023; Zhang, 2023a). By analyzing 1,440 A-share listed companies, encompassing a total of 13,465 observations from 2009 to 2022, our results reveal a significant positive correlation between regional social trust and corporate greenwashing. The main results are robust when we use different matching approaches to control for the inherent differences between firms with different levels of social trust and address model misspecification problems (Hainmueller, 2012; King & Nielsen, 2019; Shipman et al., 2017), when we use regional suitability for rice production and regional ethnic diversity as two distinct instrumental variables in two-stage least squares (2SLS) regressions to address endogeneity concerns (Ang et al., 2015; Hasan et al., 2022), when we use province and firm fixed effects to mitigate omitted variable concern, and when we cluster standard errors at both firm and province levels.

We further examine the heterogeneity of the documented effects in a series of cross-sectional analyses. We find that the relationship is particularly acute in areas with (1) low public

environmental concern; (2) underdeveloped legal environment; (3) weak environmental regulation; and (4) less efficient market scrutiny. Collectively, results from these cross-sectional analyses indicate that social trust could have unintended consequences in environments lacking robust regulatory oversights. Under such institutional conditions, social trust can be subverted to obscure firm's unethical environmental practices. What is more, the impact of social trust on corporate greenwashing is more pronounced when (5) firms face greater industry competition; (6) firm profitability is lower; and (7) firms operating in heavy-polluting sectors that often fall short of legitimacy for sustainability. These results suggest that the above positive relationship is also moderated by the economic and social pressures firms must deal with.

In the additional analysis, we explore the environmental and economic consequences of corporate greenwashing when it is underpinned by social trust. We find that greenwashing does help firms secure short-term benefits like increased government environmental subsidies and reduced penalties related to corporate environmental violations, but it does not lead to significant improvements in corporate environmental efforts. This analysis underscores the complexity of the resulting outcomes of greenwashing, suggesting that despite some immediate gains, greenwashing could eventually undermine a firm's long-term market legitimacy and competitiveness.

Our findings make several contributions to the literature. First, our study reveals a counterintuitive outcome: in contexts marked by weak formal institutions, high levels of social trust can inadvertently enable corporate greenwashing rather than deter it. This finding challenges the traditional narrative that social trust uniformly promotes ethical behavior and curbs opportunism (Coleman, 1998; Putnam, 1994). Instead, our research demonstrates that, in emerging markets like China, high social trust may lower external scrutiny (Ahn & Akamah, 2022; Chen et al., 2018), creating a "trust trap" where firms exploit societal goodwill to mask their substandard environmental performance. With that said, this study accentuates the context-dependent nature of social trust and lends support to the suggestion of debating the drawbacks of social trust while considering all the positive benefits related to the concept (Baycan & Öner, 2023; Edelman et al., 2004; Pillai et al., 2017).

Second, by focusing on regional social trust as a driver of greenwashing, our research introduces a novel determinant into the greenwashing literature. While prior studies have examined

environmental regulations and policies (S. Hu et al., 2023; Zhang, 2022b, 2023a, 2023b), disclosure requirements (Kim & Lyon, 2015), sustainability ratings (Parguel et al., 2011), stakeholder pressures (Testa et al., 2018), and cultural beliefs (Roulet & Touboul, 2015), our findings highlight that informal institutions— specifically social trust—play a critical role in shaping corporate environmental disclosure practices.

Third, our work advances the literature by integrating insights from both informal and formal institutional frameworks to explain corporate behavior in emerging economies (Kostova and Roth, 2002; Peng, 2003). Focusing on China—the world's largest carbon emitter with evolving regulatory frameworks—we provide robust empirical evidence that highlights how underdeveloped legal systems can amplify the adverse effects of high social trust. This integrated perspective informs policymakers that aligning formal regulatory mechanisms with the realities of informal institutional dynamics is essential for curbing unethical corporate practices and promoting genuine sustainability.

The remainder of this paper is outlined as follows: Section 2 reviews the related literature and develops our main hypotheses. Section 3 delves into the methodology, detailing our research design and the procedures for sample selection. Section 4 presents the core empirical findings of our investigation and the results of robustness tests. In Section 5, we deal with endogeneity concerns. Section 6 conducts additional analyses, followed by concluding marks in Section 7.

2. Literature review and hypothesis development

Prior research provides evidence that social trust acts as a deterrent against unethical or opportunistic behavior (Hartlieb et al., 2020; Hasan et al., 2020; Hasan et al., 2017a; Shahab et al., 2024). These findings support the argument that self-serving or opportunistic behaviors violate civic norms that promote altruism, cooperation, and mutual trust (Coleman, 1988; Guiso et al., 2004, 2011; Putnam, 1994). In environments characterized by high social trust, firms are more likely to internalize these norms, thereby reducing the inclination to engage in opportunistic practices. Moreover, repeated interactions within dense social networks help to strengthen residents' sense of civic duty (Hasan et al., 2017a). Accordingly, companies operating in areas with higher social trust are expected to exhibit lower instances of corporate greenwashing.

Actively engaging in environmental initiatives and providing truthful environmental disclosure is widely regarded as a civic duty for both individuals and businesses (United Nations, 2015), corporate leaders in high-trust regions are more likely to identify with this civic norm, adopting responsible environmental behaviors to maintain their sense of group belonging (Ashforth & Mael, 1989). Furthermore, local governments and community organizations often implement initiatives to encourage or reward socially responsible practices among businesses. Thus, firms that view environmental protection as their civic duty are less inclined to mislead the public or stakeholders by generating a false perception of its sustainability efforts. Based on these arguments, we formulate the following hypothesis.

Hypothesis 1a (H1a): Social trust is negatively associated with corporate greenwashing.

Although most prior research takes an affirmative view towards social trust, a few studies rectify the disproportionate emphasis on its positive consequences and start to recognize the context-dependent nature of this concept and evaluate the social settings in which social trust is studied (Baycan & Öner, 2023; Callahan, 2005; di Falco & Bulte, 2011; van Deth & Zmerli, 2010). For instance, challenging the traditional social capital thesis that social trust is a normative "good," Callahan (2005) examines the politics in Thailand and shows that greater social relationships lead to worse political corruption. van Deth and Zmerli (2010) point out that norms and values are not necessarily good for society, those that have detrimental effects could spread more widely as these norms and values become more salient, like within the organization of the Mafia or the Ku Klux Klan (KKK). Overall, these viewpoints suggest that it is critical to evaluate the context when debating the implications of social trust on corporate greenwashing.

Regarding the context of China, relative to most developed economies in which formal institutions are robust and social trust works as a complementary informal mechanism that facilitates ethical corporate behaviors, the Chinese economy is featured by weak legal protection and enforcement (Allen et al., 2005), which, in the field of environmental protection, is manifested by lax environmental regulation, rampant environmental violations, and false or misleading claims of environmental efforts or achievements (Karplus et al., 2021). Since China's rapid economic development in the past forty years has been achieved at the cost of environmental pollution and its citizens' well-being (Lu et al., 2015; World Bank, 2006), Chinese corporations, as the main

engine of the nation's economic growth as well as the major polluter, never really consider sustainable growth and environmental protection as important as profit maximization.

In this context, social trust can paradoxically create conditions that enable corporate greenwashing. In high-trust environments, stakeholders often assume that firms act in good faith, which reduces the intensity of external scrutiny and weakens the demand for rigorous verification of environmental claims (Ahn & Akamah, 2022; Chen et al., 2018). This environment creates a more hazard: firms maybe incentivized to engage in superficial sustainability practices or deceptive environmental disclosures because they anticipate that their claims will be readily accepted without sufficient challenge. Furthermore, high social trust can foster a "homogenization effect" (Strindlund et al., 2022), where companies mimic each other's green initiatives to conform to community expectations, even if those initiatives are merely cosmetic. A social psychology study shows that managers may alter their subjective assessment of the manipulation costs and benefits when they are exposed to others' dishonesty (Sah, 1991). That explains when there is a regulatory blind spot, managers' default is glossing over their inadequate environmental efforts or making false environmental disclosures, since the costs of being caught violating the law are minimal compared to the economic benefits of earning environmental legitimacy through deceptive or misleading environmental disclosures.

The inconsistency between firms' environmental disclosure and their concrete actions exists even for well-known corporations like China National Petroleum Corporation, Adidas, and Nike, all of which made their way to the 'China Greenwashing list.'[5] These firms are supposed to behave ethically as they have greater resources and are under greater public scrutiny due to their reputation and social influence. The fact that they engage in misleading environmental disclosures indicates that in contexts with regulatory void in environmental disclosure regulation and weak law enforcement in China, high levels of social trust may reduce the incentive for rigorous environmental performance monitoring. Instead, firms benefit from the reduced skepticism of stakeholders, thereby increasing their propensity to greenwash. Based on the discussion above, we formulate the corresponding predictions as follows.

[5] Please refer to the Southern Weekly 2022 'China Greenwashing list' here: https://static.nfapp.southcn.com/content/202307/13/c7893566.html. (In Chinese)

Hypothesis 1b (H1b): Social trust is positively associated with corporate greenwashing.

3 Research Design

3.1 Data and Sample

Our sample covers Chinese A-share listed companies from 2009 to 2022. The sample starts in 2009 because Sino-Securities Index Information Service Company provides the Huazheng ESG data from that year, and we use the Huazheng data to measure firm ESG performance (S. Hu et al., 2023; X. Hu et al., 2023; Liao et al., 2023; Zhang, 2023a, 2023b). To construct greenwashing variable, we also need to measure firms' ESG disclosure practices. To assess firms' ESG disclosure practices, we rely on Bloomberg ESG disclosure score data that collects information and assigns scores on the ESG disclosure performance of listed firms worldwide. The other primary data for listed firms are obtained from the China Stock Market & Accounting Research (CSMAR) database and the WIND financial terminal. We manually collected provincial data from the "China Statistical Yearbook," "China Environmental Statistical Yearbook," and the statistical yearbooks of various Chinese provinces and cities. We filter the sample observations based on the following procedure (see Table 1 for details): (1) Excluding sample firms without Huazheng ESG or Bloomberg ESG disclosure data, totalling 31,199 entries; (2) Excluding financial firms, totalling 816 entries; (3) Excluding samples missing information for other variables, totalling 459 entries. This resulted in a final dataset comprising 1,400 companies with a total of 13,465 sample observations.

[Insert Table 1 Here]

3.2 Variable Construction

3.2.1 Independent variable: Social trust

To construct a province-level measure of social trust, we adopt the methodology of Rupasingha et al. (2006), whose index has been widely utilized in previous research (e.g., Hasan et al., 2017a; Hasan et al., 2017b; Jha & Chen, 2015). Their approach employs principal component analysis (PCA) to construct a county-level index based on four key proxies, ensuring a

comprehensive and data-driven measure of regional social cohesion. Thus, we construct the composite Social Trust variable (*ST_Index*) based on four proxies: Voluntary Blood Donation (*BLOOD*), NGO Participation (*NGO*), Enterprise Survey (*ENTERPRISE*), and Citizen Survey (*CITIZEN*). These data capture the perceived honesty and the expectation that another person or organization will behave in accordance with social norms. The following describes each indicator:

(1) Voluntary Blood Donation

Our initial proxy for Social Trust, *BLOOD*, represents the rate of voluntary blood donations per thousand population in a province. The act of donation is purely voluntary, as donors receive no legal or financial rewards for their contribution (Guiso et al., 2004). Such behavior is presumably motivated by a sense of reciprocity and civic responsibility among the citizens. In line with Ang et al. (2015), we calculate this metric as the total volume of blood donated voluntarily in a province, expressed in milliliters, and then divided by its population in the year 2000. This specific year is chosen due to the completeness of province-level data available from the Chinese Society of Blood Transfusion.

(2) NGO Participation

Following the research by Jha and Chen (2015) and Hasan et al. (2017a), our second Social Trust proxy, *NGO*, is calculated as the number of non-governmental organizations (NGOs) within a province—including social groups, private non-profit organizations, foundations, and other types of NGOs—divided by the population of that province. The annual data on social organizations and population for each province are sourced from the "Chinese Civil Affairs Statistical Yearbook" and the "China Statistical Yearbook" respectively. *NGO* measure captures horizontal social interactions across a wide range of social organizations in a region.

(3) Enterprise Survey

Our third proxy for Social Trust, *ENTERPRISE*, originates from a comprehensive survey conducted among Chinese enterprises in the year 2000, as detailed by Zhang and Ke (2003). This survey dispatched questionnaires to over 15,000 company managers across all Chinese provinces, garnering more than 5,000 valid responses. The managers who responded represent companies

from every industry classified based on the 2-digit industry code and included various types of ownership structures. The *ENTERPRISE* indicator is derived from their responses to the query: "Based on your experience, can you identify the top five provinces where enterprises are deemed most trustworthy?" Echoing the methodology of Wu et al. (2014), we calculate the *ENTERPRISE* score for a province using the logarithm of the total scores assigned by these managers.

(4) Citizen Survey

For our fourth proxy, *CITIZEN*, we employ data from the Chinese General Social Survey (CGSS).[6] The *CITIZEN* variable is constructed based on responses to the question, "In general, social interactions/contacts that do not directly involve financial interests, do you think there are many strangers who can be trusted?" Specifically, respondents could choose from five options: "The vast majority cannot be trusted," "Most cannot be trusted," "Trustworthy and untrustworthy are about equal," "Most can be trusted," and "The vast majority can be trusted." Drawing from the research by Wang and Li (2017), we assign values of 1, 2, 3, 4, and 5 to these five options, respectively, and then calculate the average score for residents in each province or city to serve as the social interaction indicator for that area. The publicly available CGSS data covers the years 2010-2013, 2015, 2017-2018, and 2021, spanning eight years. Considering that the regional data tends to remain relatively stable over time, data from the nearest year is used for years without survey data.[7]

(5) Composite Social trust Index

Drawing upon existing research (e.g., Lin & Pursiainen, 2023), this paper constructs a "Provincial Social Trust Composite Index" (*ST_Index*) based on the four indicators: Voluntary Blood Donation (*BLOOD*), NGO Participation (*NGO*), Enterprise Survey (*ENTERPRISE*), and Citizen Survey (*CITIZEN*), utilizing principal component analysis. This index is employed to

[6] The CGSS is jointly conducted by the Survey and Research Centre for China Household Finance at the Hong Kong University of Science and Technology and the Department of Sociology at Renmin University of China since 2003. Following international standards, it conducts annual cross-sectional surveys on over 10,000 households across various provinces, municipalities, and autonomous regions in Mainland China.

[7] Specifically, following prior research (e.g., Hoi et al., 2019; Hasan et al., 2017a), 2010 data is used for 2009, 2013 data for 2014, 2015 data for 2016, 2018 data for 2019-2020, and 2021 data for 2022.

measure the level of social trust in each province, with a higher *ST_Index* indicating greater social trust.

3.2.2 Dependent variable: Corporate greenwashing

Following the research of Liao et al. (2023) and Zhang (2023a), this paper measures corporate greenwashing (*GW*) by computing the relative difference between scores of corporate ESG disclosure and firms' actual ESG performance scores. The details of how to construct the *GW* measure can be found in Appendix A. Greenwashing (*GW*) is measured by *GW1* and *GW2* indicators. A higher value of *GW1* or *GW2* indicates a greater intensity of corporate greenwashing.

3.3 Empirical Model

To test H1a and H1b, we construct the following model:

$$GW = \alpha_0 + \alpha_1 ST\_Index + Control\ Variables + Year\ FE + Industry\ FE + \varepsilon \quad (1)$$

where *GW* represents the intensity of corporate greenwashing, measured by *GW1* and *GW2*; *ST_Index* denotes social trust. Our primary focus is on the relationship between social trust and corporate greenwashing, i.e., the sign and magnitude of the coefficient α_1. We cluster standard errors at the firm level.

To better isolate the effect of social trust on corporate greenwashing, we control for both macro-level variables and micro-level firm-specific variables. Specifically, inspired by Fan et al. (2022), S. Hu et al. (2023), we control for the enforcement intensity of environmental regulation at the provincial level (*EnvReg*), the amount of provincial foreign direct investment (*FDI*), and provincial GDP (*GDP*). In addition, we include firm attributes that could affect corporate greenwashing. Specifically, following prior literature (e.g., Zhang (2023a); Zhang (2023b), we control for firm size (*SIZE*), firm leverage (*LEV*), net profit over total assets (*ROA*), state-owned ownership (*SOE*), and Tobin's Q (*Q*), the proportion of cash assets (*CASH*), the proportion of fixed assets (*TANG*), board size (*BOARD*), board independence (*INDEP*), and current ratio (*CR*). Moreover, in line with studies by Jha and Chen (2015), Hasan et al. (2017a), Hoi et al. (2019), and

Hasan et al. (2022), we include industry and year-fixed effects in our baseline model.[8] Detailed variable definitions can be found in Appendix A.

4. Results

4.1 Descriptive Statistics

Table 2 presents the descriptive statistics of the main variables used in this study. Our primary dependent variable, *GW1*, has an average value of -0.009 and a standard deviation of 1.146, suggesting there is a significant variation in greenwashing behavior within the sample, aligning broadly with the findings of Zhang (2023a). The mean value of *ST_Index* is 1.045, with a median of 0.953, suggesting a skewed distribution, yet it is close to the distribution described by Hasan et al. (2022). Among the control variables, the average firm size (*SIZE*) is 23.158, which translates to approximately 11.4 billion RMB. The average leverage ratio (*LEV*) is 48.10%, the average return on assets (*ROA*) is 0.064, and 51.7% of the sample consists of state-owned enterprises (*SOEs*).

[Insert Table 2 Here]

Table 3 shows the Pearson and Spearman correlation test results for the main variables selected in this paper. The correlation matrix presented in Table 3 shows that both *GW1* and *GW2* are positively correlated with *ST_Index* ($p < 0.01$), suggesting that, overall, companies located in regions with higher social trust are more likely to engage in greenwashing, which provides initial evidence supporting hypothesis H1b.

[Insert Table 3 Here]

4.2 Regression Results

Table 4 reports the main regression results. The dependent variables are *GW1* and *GW2*, and the variable of interest is *ST_Index*. Focusing on *GW1*, Columns (1) and (2) present the results from regressions without and with control variables, respectively. As reported, the coefficient on

[8] Given that the *ST_Index* calculation relies on *BLOOD* and *ENTERPRISE*, which do not vary by firm or province, causing the variable *ST_Index* is largely stickly, which makes it inappropriate to control for firm or province fixed effects in the baseline model.

ST_Index is positive and statistically significant in both Column (1) (0.043, $p < 0.01$) and Column (2) (0.052, $p < 0.01$). In terms of economic significance, the magnitude of the coefficient of *ST_Index* in Column (2) (0.052) suggests that moving from the 25th (-0.409) to the 75th (1.348) percentile of *ST_Index* increases corporate greenwashing (*GW1*) by 0.052, which equates to 7.97 percent of its standard deviation in our full sample (1.146).[9] The comparable marginal effects of an interquartile increase in *ST_Index* are similar when using the alternative proxy for corporate greenwashing (*GW2*), evident in the results in Columns (3) and (4). In addition, the results for the control variables are largely consistent with those documented in prior literature (S. Hu et al., 2023; Zhang, 2022a, 2022b). Together, these findings support H1b and suggest that in environments with weak regulation and enforcement of environmental information disclosure, higher levels of social trust enable companies to make false environmental claims with less scrutiny. This reduced oversight creates an opportunity for companies to exploit the trust of stakeholders, which ultimately facilitates corporate greenwashing.

[Insert Table 4 Here]

4.3 Robustness Tests

To enhance the robustness of our research findings, we conduct a variety of robustness tests, including Propensity Score Matching (PSM), Entropy Balancing (EB), Coarsened Exact Matching (CEM), and other robustness checks. The tenor of the results of all robustness tests remains unchanged, indicating our main findings are robust.

4.3.1 Propensity score matching

The evidence on the effects of social trust on firm greenwashing may be attributed to the inherent differences between firms with higher social trust scores (e.g., treatment firms - firms with the value of *ST_Index* above the sample median, *HighST* = 1) and with lower social trust scores (e.g., control firms - firms with the value of *ST_Index* below the sample median, *HighST* = 0). In addition, our main results could be subject to model misspecifications. To mitigate these biases, we employ the Propensity Score Matching (PSM) method to address the concern that

[9] 0.052 × ((1.348 - (-0.409)) ÷1.146) × 100% = 7.97%

certain differences not captured by our OLS model or model misspecification drive our results. Specifically, to implement the analysis, following the approach of Shipman et al. (2017), we use all control variables from the baseline regression as covariates and employ the 1:1 nearest neighbor matching method without replacement, while imposing a caliper width of 0.1 and using the Logit model to filter the samples. Untabulated results show that after matching, there are no significant differences between the control and treatment groups. Using the matched data, we re-run the regression for model (1). The regression results in Panel A Table 5 show that, after controlling for heterogeneity in company and provincial characteristics and addressing model specification concerns, our baseline findings remain robust. This confirms that the observed relationship between regional social trust and corporate greenwashing is not driven by the inherent differences between firm in high- and low-social trust regions.

4.3.2 Entropy balancing

The PSM method only matches individual firms for which we can identify a control firm, which unavoidably excludes many unmatched sample firms and thus reduces the number of observations available for analysis. Additionally, even after PSM matching, the treatment and control groups may still exhibit slight differences in means, and controlling for higher-order moments is not achievable. To address these limitations, following the approach of Hainmueller (2012), we employ the Entropy Balancing (EB) method for sample matching. Specifically, following McMullin and Schonberger (2022), McMullin and Schonberger (2020), we balance the mean and variance of the control variables across the treatment and control firms. Untabulated analyses confirm no significant post-weighting differences in means and variances across the treatment and control firms. We then perform the same regression model using the weighted sample. The regression results, as shown in Panel B Table 5, indicate that the coefficients on *ST_Index* are still significantly positive.

4.3.3 Coarsened exact matching

Compared to PSM, Coarsened Exact Matching (CEM) ensures matching by predetermined criteria for variable grouping, enhancing sample balance and helping to limit model dependency and average treatment effect estimation error. Thus, CEM is considered to strike a balance between

reducing sample size and improving matching quality (Iacus et al., 2009). To increase the similarity between the treatment and control groups, we select three variables *SIZE*, *LEV*, and *ROA* as characteristic variables for CEM. Using the CEM method to construct matched samples and re-run the main regression, we find that the results in the main regression analysis still hold. The results are reported in Panel C Table 5. Overall, using different matching procedures, we show that the results presented in Table 5 support the robustness of our main findings.

[Insert Table 5 Here]

4.3.4 Other robustness tests

To further ensure the reliability of our research, we change the model specifications described as follows. The results are listed in Table 6. First, to mitigate the concern related to the firm- or province-level omitted variables, we further control for firm- and province-fixed effects in the main regression albeit adding these fixed effects could make it difficult to find significant results on *ST_Index* as regional social trust is highly sticky. The results presented in Panel A Table 6 show that our main results still hold when we control for firm- and province-level unobserved time-invariant factors. Second, considering that greenwashing practices within the same province may be influenced by the same provincial government policies, there could be correlations among the disturbance terms of observations related to the same province. To ensure the robustness of our estimation results, we further conduct clustering at the provincial level. The results presented in Panel B Table 6 show that our main results are robust when we further consider time series correlation within a province. Overall, the results in Table 6 suggest that our main finding is robust to different model specifications.

[Insert Table 6 Here]

5. Endogeneity Issues

Corporate greenwashing practice is influenced by various factors. Although we have incorporated as many factors as possible into the baseline model based on existing research, the issue of omitted variables may still exist. To mitigate this concern, we employ the instrumental variable approach.

Following the approach of Hasan et al. (2022), we select rice suitability (*RICE_SUIT*) as our first instrumental variable. On one hand, Chinese regions with a history of rice cultivation have more cooperative norms compared to areas primarily focused on wheat cultivation, resulting in more frequent social interactions and thus higher social trust in these areas. On the other hand, the suitability of a region for rice cultivation depends on soil, climate, and topographical factors, which, aside from influencing the development of cooperative culture and social trust, do not directly impact corporate greenwashing in contemporary society. Therefore, rice suitability meets the relevance and exclusivity requirements of a valid instrumental variable. Specifically, we measure rice suitability using the proportion of rice cultivation area to arable land area for each province in 1978 (Hasan et al., 2022).

We also use the ethnic diversity of Chinese provinces (*ETHNIC*) as our second instrumental variable (Hasan et al., 2022). China's 31 provinces are home to 56 ethnic groups, with uneven distributions across all Chinese provinces, each possessing its own language, core values, and customs. The ethnic and linguistic diversity of Chinese provinces hampers effective communication and social interactions, which negatively affects the development of regional social trust. At the same time, ethnic diversity is unlikely to directly affect corporate greenwashing. Therefore, ethnic diversity satisfies the relevance and exclusivity criteria. Specifically, *ETHNIC* is calculated based on the population percentage of major ethnic groups in each province. It is important to note that a higher *ETHNIC* value indicates weaker ethnic diversity and thus relates to a higher social trust of the region. We collected ethnicity data from the "China Statistical Yearbook" to calculate *ETHNIC*.

[Insert Table 7 Here]

Table 7 reports the results for the two-stage least squares (IV-2SLS) regression. Panel A presents the first-stage regression results, showing that both *RICE_SUIT* and *ETHNIC* are significantly positively correlated with *ST_Index* at the 1% level. Furthermore, given the number of instrumental variables exceeds the number of endogenous variables, we conduct an overidentification test. The reported p-value of the Hansen J statistics is greater than 0.10, indicating that the overidentification restriction is valid. We also perform tests from Stock and Yogo (2002) for weak instruments. Panel A shows the critical value (19.930) for the IV-2SLS

regression at the 10% significance level. The reported Cragg-Donald Wald F-statistics (616.240) substantially surpasses that critical threshold, rejecting the null hypothesis of weak instruments. Panel B reports the second-stage results of the IV-2SLS test, where the predicted coefficients for the joint instrumental variable (*Pred_ST_Index*) are significantly positive at the 1% level for both *GW1* and *GW2*. This indicates that, after accounting for the concern of endogeneity, our main findings remain unchanged.

6. Additional Analyses

6.1 Cross-Sectional Analysis: Heterogeneous Effects

In this section, we conduct a series of heterogeneity tests to examine the variation in the impact of social trust on corporate greenwashing and help uncover the mechanisms that drive this relationship. Specifically, we examine the influence of collective perceptions over environmental issues, institutional factors, and corporate pressures.

6.1.1 Public perceptions

First, we explore how the public's concern for environmental issues influences the exploitation of social trust by companies, thereby affecting corporate greenwashing behavior. The inherent complexity and technical nature of environmental issues often leave the public ill-equipped to fully understand a company's actual environmental actions. Consequently, the public's perception of a firm's environmental performance relies heavily on the information that companies choose to disclose. According to signaling theory, trust lowers the cost of information verification, and when public attention to environmental matters is limited, this trust is more likely to result in "regulatory inertia." This inertia manifests as a decreased frequency of third-party audits, diminished media exposure, and the emergence of a supervisory vacuum. Under these conditions, external pressures on companies are reduced, lowering the risk that their greenwashing practices will be exposed. Opportunistic companies (Tirole, 1988) are thus more likely to exploit this dynamic to engage in greenwashing for short-term economic gains and reputation enhancement. Furthermore, low public environmental concern hampers effective feedback and

correction mechanisms, further delaying the detection and remediation of greenwashing practices and ultimately exacerbating the problem.

To investigate this, we use the Baidu Environmental Index, which evaluates the collective attention on environmental issues based on the public's search intensity of keywords such as "low carbon," "sulfur dioxide," "carbon dioxide," "environmental protection," "environmental pollution," "emission reduction," "water conservation," "sustainability," "air quality," "green space," "greening," "pollution," "clean energy," "decontamination," "global warming," "ecology," "acid rain," "greenhouse effect," "pollution," "sewage," "smog," "recycling," and "PM2.5." We calculate the yearly average Baidu Environmental Index for each province and then categorize regions into high or low-public attention groups based on whether their annual environmental index is above or below the median for that year. Thus, a dummy variable, *HighAtt*, is set to one for firm-years with an environmental index above the sample median, and zero otherwise. The results are presented in Table 8.

[Insert Table 8 Here]

The results in Column (2) and Column (4) suggest that in regions where public concern for environmental issues is low, the likelihood of corporate greenwashing being exposed diminishes. This reduced risk facilitates companies' ability to exploit social trust for greenwashing. In contrast the insignificant results in Column (1) and Column (3) suggest in regions where the public is highly attentive to environmental issues, companies encounter greater external pressures. Consequently, the risk of exposing greenwashing increases, and the mechanisms for feedback and correction are more effective, thereby reducing the opportunity for companies to exploit social trust for greenwashing.

6.1.2 Institutional factors

(1) Legal Environment

The fulfillment of corporate social responsibility, particularly the honest disclosure of environmental information, is inextricably linked to a nation's legal system. Prior research has demonstrated that laws exert a stronger influence on corporate social responsibility than do

political systems or corporate performance (Liang & Renneboog, 2017). A robust legal system can penalize and restrain companies' illegal activities as they occur, thereby, deterring firms from issuing misleading environmental disclosures. Conversely, when the legal system is weak or nearly non-existent, the risk of exposing corporate greenwashing is reduced, and formal institutions such as laws fail to serve as an effective deterrent. As a result, companies may exploit social trust to engage in greenwashing. To investigate whether regional variations in legal development explain the differences observed in our study, we assess the quality of the provincial legal environment using the National Economic Research Institute Index of Marketization (NERIIM), a benchmark widely employed to evaluate institutional context in China. We create a dummy variable, *HighLaw*, which equals one for firm-year observations in provinces where the legal environment index exceeds the sample median, and zero otherwise. The results presented in Table 9, Panel A, reveal that the coefficients on *ST_Index* are significantly larger for firms operating in regions with a less developed legal system. For example, for *GW1*, the difference in coefficients between Columns (1) and (2) is 0.029 ($p < 0.01$), indicating that a robust legal environment can mitigate the adverse impact of social trust on corporate greenwashing.

(2) Enforcement Intensity of Environmental Regulation

The regional enforcement intensity of environmental regulation has a significant impact on a firm's operation and environmental disclosure (Clarkson et al., 2008). Compared to regions with weaker enforcement of environmental regulation, those with stronger enforcement focus more on pollution reduction, ecosystem restoration, and reliable environmental disclosure, resulting in stricter external monitoring and constraints on businesses operating in that region. We posit that when informal systems like social trust fail to deter opportunistic environmental disclosure, a strong formal system—particularly rigorous enforcement of environmental regulation—can play a critical role in constraining corporate behavior. To investigate this, we examine the impact of enforcement intensity on the relationship between social trust and corporate greenwashing. Drawing on prior research (Chen et al., 2021; Fan et al., 2022), we measure enforcement intensity using government environmental protection expenditure, calculated as the provincial investment in environmental protection divided by the provincial GDP, multiplied by 100. We then define a dummy variable, *HighEnvReg*, which equals one for firm-year observations in provices with

enforcement intensity above the sample median, and zero otherwise. Table 9, Panel B presents the results. Overall, the coefficients on *ST_Index* are significantly larger for firms operating in regions with weaker enforcement intensity. For example, for *GW1*, the difference in coefficients between Columns (1) and (2) is 0.065 ($p < 0.01$). This indicates that, compared to firms facing stronger regulatory enforcement , those in regions with weaker enforcement are more likely to engage in greenwashing, as insufficient law enforcement reduces the likelihood of detection and punishment.

(3) Market Scrutiny

In recent years, the capital market has increasingly focused on firms' sustainable development, emphasizing not only the economic benefits but also the social and environmental impacts of corporate behavior (Li et al., 2021; Siemroth & Hornuf, 2023; Widyawati, 2020). As key component of a well-functioning capital market, analysts act as conveyors of market information and external monitors for the companies they cover. Prior research indicates that effective environmental disclosure can reduce analysts' forecast errors (Dhaliwal et al., 2012), Which in turn motivates analysts to closely monitor corporate environmental disclosure and enhance both its quality and quantity (He et al., 2022). Recognizing that companies are subject to ongoing analyst scrutiny and periodic reviews, firms may be incentivized to reduce greenwashing activities in order to avoid negative repercussions and maintain a favorable reputation and social image. To explore this dynamic, we divide listed companies into two groups based on the number of analysts covering them, using the sample median as the cut-off, and compare the impact of social trust on corporate greenwashing across different levels of analyst coverage. As shown in Table 9, Panel C, the coefficients on *ST_Index* are greater for companies with fewer analyst followers. This finding suggests that in the absence of strong analyst scrutiny, companies are more likely to exploit social trust, increases the propensity for untruthful or misleading environmental disclosures.

[Insert Table 9 Here]

6.1.3 Corporate pressures

(1) Industry Competition

The impact of social trust on corporate greenwashing behavior may vary significantly in environments with differing levels of industry competition. Developing strong ESG performance requires long-term investments that do not yield immediate economic benefits. In highly competitive industries, firms face intensified risks and pressures from external competitors, which can heighten managerial anxiety and trigger unethical behavior. Driven by the imperative of profit maximization, management may be more inclined to reduce investments in ESG projects to alleviate financial strain and boost short-term performance (Martins, 2022). Moreover, as environmental regulations become more stringent and internalize environmental costs, firms in competitive industries may experience an even greater cost burden, prompting them to engage in greenwashing as a cost-effective alternative to genuine compliance. In contrast, firms in less competitive environments may have more resources available to invest in authentic ESG improvements.

In line with Rhoades (1993), we employ the Herfindahl index to measure industry competition. We divide listed companies into two groups based on their annual level of industry competition and compare the influence of social trust on greenwashing across these groups. The results, as shown in Table 10, Panel A, indicate that firms in highly competitive industries are more likely to engage in greenwashing. Specifically, the coefficient difference between Columns (1) and (2) is 0.028 ($p < 0.01$), suggesting that intense industry competition imposes significant cost pressures on firms. Consequently, these firms are more inclined to resort to greenwashing as a strategy to mitigate social and regulatory pressures while avoiding the higher costs associates with substantive ESG investments.

(2) Firm Profitability

To examine the impact of firm profitability on the relationship between social trust and corporate environmental disclosure, we employ return on assets (ROA) as an measure of firm profitability. We divide our sample into two groups—firms with higher profitability and those with lower profitability—by defining a dummy variable, *HighProfit*. *HighProfit* is coded as 1 for firm-year observations where the ROA exceeds the industry median for that year, and 0 otherwise. Since management is less likely to divert resources from the firm's core business when under earnings pressure, we expect that the adverse effect of prevailing unethical norms on corporate

greenwashing will be more pronounced among less profitable firms. The results, as shown in Table 10, Panel B, are consistent with these expectations.

(3) Firm Legitimacy

Companies operating in sectors with significant environmental impact, particularly in heavy-polluting industries, face heightened public scrutiny due to their substantial negative environmental externalities. To gain legitimacy, these firms are more inclined to showcase superficial environmental initiatives rather than committing to genuine, long-term improvements—which require time and sustained investment. Following Zhang et al. (2019), we construct a binary variable, *HighPol*, based on the "Management Directory of Listed Company's Environmental Protection Industry Classification" issued in 2008. [10] Firms in heavy-polluting sectors are assigned a value of 1, whereas those in cleaner industries are coded as 0. The analysis presented in Table 10, Panel C, reveals that the effect of social trust on greenwashing behavior is significantly stronger for firms in heavily polluting industries. Specifically, when comparing Columns (1) and (2), the coefficients on *ST_Index* are notably higher for heavily polluted firms. The test results indicate a statistically significant difference in coefficients (difference = 0.017, $p < 0.05$), suggesting that firms operating in these sectors are more susceptible to exploiting social trust to engage in greenwashing.

[Insert Table 10 Here]

[10] The classification of heavy-polluting industries is based on the "Listed Company's Environmental Protection Industry Classification Management Directory" released by the Ministry of Environmental Protection of China in 2008, which was renamed the Ministry of Ecology and Environment (MEE) in 2018. Industries identified as heavy-polluting include electricity and heat production and supply, textile manufacturing, production of non-metallic mineral products, mining of ferrous metals, smelting and rolling processing of ferrous metals, manufacturing of chemical fibers, production of chemical raw materials and chemical products, manufacturing of fabricated metal products, production of wine, beverages, and refined tea, coal mining and washing, production of leather, fur, feathers (and their products) and footwear, extraction of oil and natural gas, petroleum processing, coking and nuclear fuel processing, building decoration and other construction activities, production and supply of gas, furniture manufacturing, production of rubber and plastic products, pharmaceutical manufacturing, mining of non-ferrous metals, smelting and rolling processing of non-ferrous metals, and manufacturing of paper and paper products.

6.2 Outcome Analysis

In this section, we explore the consequences of corporate greenwashing driven by the unethical practices that are entrenched through social trust within society. We examine the implications of such behavior from both economic and environmental perspectives.

On the economic front, we focus on two key indicators: firm-level environmental penalties (*GovEnvPenaly*) and government environmental subsidies (*GovEnvSub*). Specifically, *GovEnvPenaly* is defined as the fines a firm pays for environmental violations divided by its sales and then multiplied by 100,000. Similarly, *GovEnvSub* is calculated as the subsidies a firm receives from the government divided by its sales and then multiplied by 100,000. The results of our analysis are presented in Table 11 Panel A. We find that for regressions on *GovEnvPenaly*, the coefficients on the interaction terms between the social trust index (*ST_Index*) and greenwashing measures (*GW1* and *GW2*) are significantly negative ($p < 0.10$). In contrast, for regressions on *GovEnvSub*, the corresponding interaction term coefficients are significantly positive ($p < 0.05$). These findings suggest that in environments where firms can exploit societal goodwill, companies engaging in higher levels of greenwashing tend to incur fewer environmental penalties and receive more government subsidies. This pattern implies that, in economies characterized by weak environmental regulation and distorted environmental disclosure, the government oversight often fails to detect firms' symbolic environmental actions.

[Insert Table 11 Here]

Turning to the environmental outcomes of greenwashing, we examine two dimensions: firm investments in environment protection (*EnvProInvest*) and corporate green innovation (*GreenInnovation*). Specifically, *EnvProInvest* is measured as the firm's investment in environmental protection divided by its sales, multiplied by 100. *GreenInnovation* equals the number of green invention patents and green utility model patent applications in year t+2. The results, presented in Table 11 Panel B, show that the coefficients on the interaction terms between *ST_Index* and *GW* (measured by *GW1* and *GW2*) are statistically insignificant for both *EnvProInvest* and *GreenInnovation* regressions. This indicates that companies engaging in greenwashing do not increase their investments in environmental protection nor do they achieve

better performance in green innovation. Together, these findings underscore the complex implications of corporate greenwashing. Although firms may benefit in the short term through reduced penalties and increased subsidies, the absence of substantive improvements in environmental investments and green innovation could eventually undermine their long-term legitimacy and competition capacity in the market.

7. Conclusion

The current climate crisis demands urgent action, yet greenwashing remains a significant barrier to genuine environmental progress. As UN Secretary-General Antonia Guterres famously remarked at a climate summit, some environmental claims have "loopholes wide enough to drive the diesel truck through." Despite the pressing need for coordinated global environmental policies, there is still a wide variation in the stringency and enforcement of environmental regulation—particularly in areas such as environmental disclosure— between the developed and developing economies. In this context, our study examine whether, in the absence of robust formal regulations, informal institutions such as social trust can substitute for formal oversight to shape corporate behavior.

Specifically, we investigate whether social trust acts as a deterrent to corporate greenwashing or whether it inadvertently entrenches unethical behavior by encouraging superficial environmental claims. Analysing a large sample of Chinese public companies listed on the A-share market from 2009 to 2022, we find robust evidence that higher levels of regional social trust are associated with increased corporate greenwashing. This suggests that, rather than substituting for formal institutions, social trust can create conditions that facilitate the concealment of unsustainable practices. In high-trust environments, stakeholders may lower their guard, assuming firms are inherently acting in good faith. Consequently, companies can exploit this trust to engage in deceptive environmental disclosures with minimal external scrutiny.

Our analysis reveals important cross-sectional variations. The positive effect of social trust on corporate greenwashing is especially pronounced in regions characterized by weak formal institutions, low public awareness of environmental issues, and firms facing significant social or earnings pressure. Further, we observe firms engaging in greenwashing tend to receive more

government environmental subsidies and incur fewer penalties, even as they fail to invest meaningfully in environmental protection or achieve notable green innovation. This pattern indicates that regulatory gaps allow symbolic environmental actions to persist unchecked.

These findings carry significant implications for global sustainable leaders. While informal institutions like social trust can complement a strong rule of law and robust enforcement to deter opportunistic behavior, relying solely on social trust is perilous. As highlighted by van Deth and Zmerli (2010), norms and values can be detrimental. When businesses come to believe that they can escape the consequences of exaggerated or false environmental disclosures, these unethical practices are reinforced through social interactions, leading to more pervasive greenwashing.

In conclusion, our study challenges the traditional view that social trust solely yields social and economic benefits. Instead, it underscores the critical need for sound legal institutions and robust environmental regulations to hold businesses accountable for their environmental claims. Successfully embedding a sustainability mindset within society requires not only leveraging informal trust networks but also ensuring that formal oversight mechanisms are strong enough to prevent the exploitation of that trust.

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Table 1
Sample Selection

Sampling procedure	N
Firm-year observations of Chinese A-share listed companies for the period 2009–2022	45,939
Less firm-year observations without ESG data published by Sino-Securities Index Information Service Company (Huazheng) and Bloomberg	(31,199)
Less firm-year observations in the financial industry	(816)
Less firm-year observations with missing necessary data used in the empirical test	(459)
The final sample used in this empirical analysis	13,465
Unique firms in the final sample	1,400

Table 2
Descriptive Statistics

Variable	N	Mean	SD	P25	Median	P75
ST_Index	13,465	1.045	1.807	-0.409	0.953	1.348
GW1	13,465	-0.009	1.146	-0.811	-0.111	0.684
GW2	13,465	-0.262	0.270	-0.451	-0.295	-0.103
SIZE	13,465	23.158	1.346	22.209	23.051	23.97
LEV	13,465	0.481	0.201	0.327	0.492	0.634
ROA	13,465	0.064	0.067	0.032	0.057	0.094
CASH	13,465	0.174	0.123	0.088	0.140	0.224
TANG	13,465	0.227	0.179	0.085	0.183	0.333
BOARD	13,465	2.289	0.183	2.197	2.303	2.303
INDEN	13,465	0.375	0.056	0.333	0.364	0.417
CR	13,465	1.982	2.115	1.013	1.423	2.128
SOE	13,465	0.517	0.500	0.000	1.000	1.000
Q	13,465	2.003	1.457	1.133	1.512	2.260
GDP	13,465	10.428	0.714	9.959	10.476	10.951
FDI	13,465	0.025	0.014	0.018	0.023	0.030
EnvReg	13,465	0.557	0.294	0.360	0.466	0.659

Notes: Variable definitions are presented in Appendix A.

Table 3
Correlation Matrix

	GW1	***GW2***	***ST_Index***	*SIZE*	*LEV*	*ROA*	*CASH*	*TANG*	*BOARD*	*INDEN*	*CR*	*SOE*	*Q*	*GDP*	*FDI*	*EnvReg*
GW1		0.879***	**0.036*** **	0.128***	0.144***	-0.066***	-0.064***	0.036***	0.071***	-0.027***	-0.156***	0.017**	-0.058***	-0.039***	0.038***	0.021***
GW2	0.863***		**0.063*** **	0.079***	0.132***	-0.031***	-0.030***	0.033***	0.082***	-0.020**	-0.152***	0.043***	-0.029***	-0.089***	0.106***	-0.044***
ST_Index	**0.063*** **	**0.092*** **		0.041***	-0.034***	0.023***	0.077***	-0.197***	-0.077***	0.034***	0.084***	-0.028***	-0.001	0.329***	0.440***	-0.245***
SIZE	0.152***	0.089***	0.097***		0.481***	-0.127***	-0.192***	0.041***	0.167***	0.075***	-0.379***	0.253***	-0.592***	0.098***	-0.058***	0.119***
LEV	0.149***	0.128***	-0.017**	0.479***		-0.409***	-0.300***	0.013	0.099***	0.008	-0.697***	0.216***	-0.460***	-0.078***	-0.016*	0.070***
ROA	-0.070***	-0.029***	-0.014	-0.073***	-0.387***		0.218***	-0.01	-0.018**	-0.017*	0.308***	-0.178***	0.365***	0.051***	-0.007	-0.084***
CASH	-0.068***	-0.017**	0.080***	-0.229***	-0.359***	0.229***		-0.327***	-0.064***	0.009	0.514***	-0.116***	0.255***	0.011	0.095***	-0.030***
TANG	0.049***	0.046***	-0.163***	0.087***	0.073***	-0.040***	-0.343***		0.169***	-0.052***	-0.431***	0.153***	-0.108***	-0.125***	-0.133***	0.052***
BOARD	0.069***	0.072***	-0.054***	0.187***	0.106***	-0.007	-0.054***	0.183***		-0.420***	-0.154***	0.240***	-0.138***	-0.128***	-0.033***	0.062***
INDEN	-0.030***	-0.013	0.060***	0.096***	0.021***	0.002	0.001	-0.041***	-0.431***		-0.001	-0.006	-0.005	0.011	0.01	0.040***
CR	-0.120***	-0.102***	0.059***	-0.325***	-0.599***	0.207***	0.502***	-0.273***	-0.108***	-0.019**		-0.237***	0.404***	0.080***	0.061***	-0.074***
SOE	0.018**	0.039***	0.044***	0.254***	0.215***	-0.126***	-0.110***	0.197***	0.241***	0.002	-0.185***		-0.277***	-0.232***	0.087***	0.165***
Q	-0.031***	0	-0.014	-0.398***	-0.374***	0.326***	0.235***	-0.156***	-0.144***	0.021***	0.279***	-0.201***		-0.003	0.033***	-0.054***
GDP	-0.032***	-0.092***	0.164***	0.106***	-0.073***	0.031***	-0.008	-0.140***	-0.130***	0.01	0.011	-0.221***	0.016		-0.079***	-0.423***
FDI	0.025***	0.093***	0.369***	-0.029***	0.008	-0.008	0.059***	-0.067***	-0.024***	0.014	0.023***	0.104***	0.006	-0.125***		-0.083***
EnvReg	0.017**	-0.039***	-0.056***	0.117***	0.061***	-0.065***	-0.041***	0.052***	0.067***	0.035***	-0.034***	0.142***	-0.025***	-0.447***	-0.071***	

Notes: This table shows Pearson and Spearman correlation coefficients for the variables used in the regression analysis. Pearson correlations are presented in the lower-left corner of the correlation matrix, and Spearman rank correlations are shown in the upper-right corner. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. All continuous variables have been winsorized at the 1st and 99th percentiles. Variable definitions are presented in Appendix A.

Table 4
Baseline Results

Variables	*GW1*	*GW1*	*GW2*	*GW2*
	(1)	(2)	(3)	(4)
ST_Index	**0.043*****	**0.052*****	**0.011*****	**0.013*****
	(3.086)	**(3.672)**	**(3.913)**	**(4.317)**
SIZE		0.146***		0.033***
		(6.065)		(6.578)
LEV		0.532***		0.112***
		(3.544)		(3.561)
ROA		-0.989***		-0.096*
		(-3.942)		(-1.877)
CASH		-0.021		0.016
		(-0.112)		(0.409)
TANG		0.169		0.036
		(1.057)		(1.080)
BOARD		0.166		0.029
		(1.278)		(1.091)
INDEN		-0.809**		-0.127
		(-2.174)		(-1.638)
CR		-0.022*		-0.004*
		(-1.918)		(-1.704)
SOE		-0.123***		-0.027***
		(-2.745)		(-2.973)
Q		0.064***		0.015***
		(5.164)		(5.434)
GDP		-0.111***		-0.023***
		(-2.741)		(-2.771)
FDI		0.057		0.013
		(0.044)		(0.044)
EnvReg		-0.114		-0.024
		(-1.505)		(-1.579)
Intercept	-0.054**	-2.562***	-0.273***	-0.854***
	(-2.230)	(-3.394)	(-53.567)	(-5.545)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	13,465	13,465	13,465	13,465
Adj. R^2	0.002	0.053	0.126	0.164

Notes: Estimates are based on OLS regressions with standard errors adjusted for heteroscedasticity and clustered at the listed company level, and numbers reported are regression coefficients with t-statistics in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, based on two-tailed tests. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions are presented in Appendix A.

Table 5
Results based on Propensity Score Matching, Entropy Balancing, and Coarsened Exact Matching Methods

Variable	Panel A: PSM method		Panel B: Entropy Balancing method		Panel C: Coarsened Exact Matching	
	(1)	(2)	(3)	(4)	(5)	(6)
	y = GW1	*y = GW2*	*y = GW1*	*y = GW2*	*y = GW1*	*y = GW2*
ST_Index	**0.265*****	**0.065*****	**0.106***	**0.028****	**0.173*****	**0.046*****
	(4.391)	**(5.218)**	**(1.808)**	**(2.211)**	**(6.517)**	**(7.776)**
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	0.029	-0.421	-2.980***	-0.977***	-2.441***	-0.664***
	(0.017)	(-1.194)	(-2.663)	(-3.707)	(-3.864)	(-4.730)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
N	4,552	4,552	13,465	13,465	12,643	12,643
Adj. R^2	0.071	0.171	0.080	0.216	0.054	0.169

Notes: Estimates are based on OLS regressions with standard errors adjusted for heteroscedasticity and clustered at the listed company level. Numbers reported are regression coefficients with t-statistics in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, based on two-tailed tests. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions are presented in Appendix A.

Table 6
Regression Results with Alternative Model Specifications

Variables	Panel A: Controlling for firm and province fixed effects		Panel B: Double clustered by firm and province	
	(1)	(2)	(3)	(4)
	y = GW1	*y = GW2*	*y = GW1*	*y = GW2*
ST_Index	**0.105***	**0.031****	**0.052****	**0.013*****
	(1.872)	**(2.363)**	**(2.255)**	**(3.019)**
Controls	Yes	Yes	Yes	Yes
Intercept	1.766	-0.229	-2.562**	-0.854***
	(0.625)	(-0.347)	(-2.479)	(-4.241)
Year FEs	Yes	Yes	Yes	Yes
Industry FEs	Yes	Yes	Yes	Yes
Province FEs	Yes	Yes	No	No
Firm FEs	Yes	Yes	No	No
N	13,465	13,465	13,465	13,465
Adj. R^2	0.429	0.447	0.053	0.164

Notes: Panel A presents the regression results when controlling for firm- and province- fixed effects. Panel B presents the regression results when regressions are clustered by firm and province. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, based on two-tailed tests. Numbers reported are regression coefficients with t-statistics in parentheses. Standard errors are clustered at the listed company level. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions are presented in Appendix A.

Table 7
Two-Stage Regressions with two Instrumental Variables

Panel A: First stage of IV-2SLS analysis		
Variables	*y=ST_Index*	
	Coefficients	T-Statistics
RICE_SUIT	**0.645*****	**9.338**
ETHNIC	**0.027*****	**7.338**
Controls in second-stage regression	Yes	
Intercept	-8.661***	-3.218
Year FEs	Yes	
Industry FEs	Yes	
N	13,465	
R^2	0.323	
Cragg-Donald Wald F-statistics	616.240	
(p-value)	(0.000)	
Critical value: 10%	19.930	
Hansen J statistic (Overidentification statistic)	0.143	
(p-value)	(0.705)	

Panel B: Second stage of IV-2SLS analysis		
Variables	(1)	(2)
	y = GW1	*y = GW2*
Pred_ST_Index	**0.151*****	**0.030*****
	(3.449)	**(3.280)**
Controls	Yes	Yes
Intercept	-1.372	-0.373
	(-1.285)	(-0.569)
Year FEs	Yes	Yes
Industry FEs	Yes	Yes
N	13,465	13,465
R^2	0.038	0.157

Notes: This table presents the regression results for the two-stage regressions with instrumental variables. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, based on two-tailed tests. Numbers reported are regression coefficients with t-statistics in parentheses. Standard errors are clustered at the listed company level. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions are presented in Appendix A.

Table 8
Social Trust and Corporate Greenwashing
– Public Perceptions

Variable	*y = GW1*		*y = GW2*	
	(1)	(2)	(3)	(4)
	HighAtt = 1	*HighAtt* = 0	*HighAtt* = 1	*HighAtt* = 0
ST_Index	**0.008**	**0.088*****	**0.003**	**0.023*****
	(0.312)	**(4.488)**	**(0.503)**	**(5.149)**
Controls	Yes	Yes	Yes	Yes
Intercept	-3.221**	-2.347**	-1.078***	-0.690***
	(-2.508)	(-2.512)	(-4.238)	(-3.556)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	6,746	6,719	6,746	6,719
Adj. R^2	0.073	0.048	0.181	0.166
Coefficient differences tests for *ST_Index*				
Differences	**-0.080*****		**-0.020*****	
(P-value)	**(0.000)**		**(0.000)**	

Notes: Estimates are based on OLS regressions with standard errors adjusted for heteroscedasticity and clustered at the listed company level, and numbers reported are regression coefficients with t-statistics in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, based on two-tailed tests. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions are presented in Appendix A

Table 9
Social Trust and Corporate Greenwashing
– Institutional Factors

Panel A: Analysis of legal system environment				
Variable	*y = GW1*		*y = GW2*	
	(1)	(2)	(3)	(4)
	HighLaw = 1	*HighLaw* = 0	*HighLaw* = 1	*HighLaw* = 0
ST_Index	**0.044*****	**0.073*****	**0.010*****	**0.021*****
	(2.686)	**(3.576)**	**(2.728)**	**(4.398)**
Controls	Yes	Yes	Yes	Yes
Intercept	-2.733***	-2.771***	-1.019***	-0.721***
	(-2.832)	(-3.012)	(-5.219)	(-3.861)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	6,711	6,754	6,711	6,754
Adj. R^2	0.075	0.043	0.185	0.170
Coefficient differences tests for *ST_Index*				
Differences	**-0.029*****		**-0.011*****	
(P-value)	**(0.010)**		**(0.000)**	

Panel B: Analysis of environmental regulation				
Variable	*y = GW1*		*y = GW2*	
	(1)	(2)	(3)	(4)
	HighEnvReg = 1	*HighEnvReg* = 0	*HighEnvReg* =1	*HighEnvReg* = 0
ST_Index	**0.031***	**0.096*****	**0.008****	**0.023*****
	(1.945)	**(5.376)**	**(2.297)**	**(5.596)**
Controls	Yes	Yes	Yes	Yes
Intercept	-2.732***	-2.815***	-0.928***	-0.867***
	(-2.991)	(-2.922)	(-4.908)	(-4.372)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	6,866	6,599	6,866	6,599
Adj. R^2	0.062	0.067	0.147	0.207
Coefficient differences tests for *ST_Index*				
Differences	**-0.065*****		**-0.015*****	
(P-value)	**(0.000)**		**(0.000)**	

Notes: Estimates are based on OLS regressions with standard errors adjusted for heteroscedasticity and clustered at the listed company level, and numbers reported are regression coefficients with t-statistics in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, based on two-tailed tests. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions are presented in Appendix A.

Table 9
Social Trust and Corporate Greenwashing
– Institutional Factors (cont.)

Panel C: Analysis of analyst following				
Variable	*y = GW1*		*y = GW2*	
	(1)	(2)	(3)	(4)
	HighAnalyst = 1	*HighAnalyst* = 0	*HighAnalyst* = 1	*HighAnalyst* = 0
ST_Index	**0.041****	**0.064*****	**0.011*****	**0.015*****
	(2.420)	**(3.999)**	**(3.140)**	**(4.256)**
Controls	Yes	Yes	Yes	Yes
Intercept	-2.208**	-3.402***	-0.825***	-0.980***
	(-2.513)	(-3.401)	(-4.585)	(-4.795)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	7,938	5,527	7,938	5,527
Adj. R^2	0.070	0.039	0.170	0.167
Coefficient differences tests for *ST_Index*				
Differences	**-0.023****		**-0.004***	
(P-value)	**(0.030)**		**(0.090)**	

Notes: Estimates are based on OLS regressions with standard errors adjusted for heteroscedasticity and clustered at the listed company level, and numbers reported are regression coefficients with t-statistics in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, based on two-tailed tests. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions are presented in Appendix A.

Table 10
Social Trust and Corporate Greenwashing
– Corporate Pressures

Panel A: Analysis of industry competition				
Variable	*y = GW1*		*y = GW2*	
	(1)	(2)	(3)	(4)
	HighComp = 1	*HighComp* = 0	*HighComp* = 1	*HighComp* = 0
ST_Index	**0.066*****	**0.038***	**0.018*****	**0.007***
	(3.621)	**(1.804)**	**(4.095)**	**(1.909)**
Controls	Yes	Yes	Yes	Yes
Intercept	-2.296**	-2.967***	-0.879***	-0.847***
	(-2.069)	(-2.975)	(-3.444)	(-4.726)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	5,592	7,873	5,592	7,873
Adj. R^2	0.049	0.060	0.162	0.171
Coefficient differences tests for *ST_Index*				
Differences	**0.028*****		**0.011*****	
(P-value)	**(0.005)**		**(0.000)**	

Panel B: Analysis of firm profitability				
Variable	*y = GW1*		*y = GW2*	
	(1)	(2)	(3)	(4)
	HighProfit = 1	*HighProfit* = 0	*HighProfit* = 1	*HighProfit* = 0
ST_Index	**0.030**	**0.064*****	**0.010****	**0.015*****
	(1.558)	**(3.930)**	**(2.380)**	**(4.283)**
Controls	Yes	Yes	Yes	Yes
Intercept	-2.657***	-3.216***	-0.944***	-0.930***
	(-2.691)	(-3.583)	(-4.682)	(-4.961)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	6,738	6,727	6,738	6,727
Adj. R^2	0.060	0.058	0.166	0.172
Coefficient differences tests for *ST_Index*				
Differences	**-0.034*****		**-0.005***	
(P-value)	**(0.005)**		**(0.055)**	

Notes: Estimates are based on OLS regressions with standard errors adjusted for heteroscedasticity and clustered at the listed company level, and numbers reported are regression coefficients with t-statistics in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, based on two-tailed tests. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions are presented in Appendix A.

Table 10
Social Trust and Corporate Greenwashing
– Corporate Pressures (cont.)

Panel C: Analysis of firm legitimacy				
Variable	*y = GW1*		*y = GW2*	
	(1)	(2)	(3)	(4)
	HighPol = 1	*HighPol* = 0	*HighPol* = 1	*HighPol* = 0
ST_Index	**0.066****	**0.049*****	**0.014*****	**0.013*****
	(2.424)	**(3.046)**	**(2.651)**	**(3.621)**
Controls	Yes	Yes	Yes	Yes
Intercept	-3.107**	-2.156**	-0.903***	-0.827***
	(-2.468)	(-2.321)	(-3.728)	(-4.245)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	5,082	8,383	5,082	8,383
Adj. R^2	0.074	0.048	0.181	0.168
Coefficient differences tests for *ST_Index*				
Differences		**0.017****		**0.001**
(P-value)		**(0.050)**		**(0.370)**

Notes: Estimates are based on OLS regressions with standard errors adjusted for heteroscedasticity and clustered at the listed company level, and numbers reported are regression coefficients with t-statistics in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, based on two-tailed tests. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions are presented in Appendix A.

Table 11
Outcome Analysis
– Aspects from economic and environment aspects

Panel A: Analysis of economic outcomes				
Variable	*y = GovEnvPenaly*		*y = GovEnvSub*	
	(1) *GW = GW1*	(2) *GW = GW2*	(3) *GW = GW1*	(4) *GW = GW2*
ST_Index	-0.000	-0.004**	-2.018*	-0.366
	(-0.304)	(-2.020)	(-1.715)	(-0.340)
GW	0.020***	0.079**	-4.727**	-20.436**
	(2.670)	(2.574)	(-2.175)	(-2.327)
ST_Index × GW	**-0.004****	**-0.013***	**1.868****	**6.101****
	(-2.368)	**(-1.824)**	**(2.327)**	**(2.339)**
Controls	Yes	Yes	Yes	Yes
Intercept	0.205*	0.231*	190.983**	182.060*
	(1.687)	(1.858)	(1.995)	(1.932)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	13,465	13,465	13,465	13,465
Adj. R^2	0.011	0.010	0.034	0.033

Panel B: Analysis of environmental outcomes				
Variable	*y = EnvProInvest*		*y = GreenInnovation*	
	(1) *GW=GW1*	(2) *GW=GW2*	(3) *GW=GW1*	(4) *GW=GW2*
ST_Index	-0.011	-0.016	0.936	0.836
	(-1.050)	(-1.629)	(1.634)	(1.386)
GW	-0.023	-0.069	-0.114	1.303
	(-1.609)	(-0.941)	(-0.229)	(0.629)
ST_Index × GW	**-0.002**	**-0.022**	**-0.002**	**-0.374**
	(-0.393)	**(-0.969)**	**(-0.008)**	**(-0.519)**
Controls	Yes	Yes	Yes	Yes
Intercept	0.888*	0.885*	-198.789***	-197.669***
	(1.673)	(1.646)	(-4.286)	(-4.247)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	13,465	13,465	13,465	13,465
Adj. R^2	0.057	0.057	0.109	0.109

Notes: Estimates are based on OLS regressions with standard errors adjusted for heteroscedasticity and clustered at the listed company level, and numbers reported are regression coefficients with t-statistics in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, based on two-tailed tests. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions are presented in Appendix A.

Appendix A
Variable definitions

Variables	Definitions
GW1	[($ESGD_{i,t}$ − *AveESGD*) / *SdESGD*] − [($ESGP_{i,t}$ − *AveESGP*) / *SdESGP*], where *ESGD* equals Bloomberg ESG disclosure index and *ESGP* equals ESG performance index rated by Sino-Securities Index Information Service Company. *AveESGD* (*AveESGP*) is the industry-year mean value of *ESGD* (*ESGP*). *SdESGD* (*SdESGP*) is the standard deviation value of *ESGD* (*ESGP*) in an industry-year.
GW2	[($ESGD_{i,t}$ − *MinESGD*) / (*MaxESGD* − *MinESGD*)] − [($ESGP_{i,t}$ − *MinESGP)* / (*MaxESGP* − *MinESGP*], where *ESGD* equals Bloomberg ESG disclosure index and *ESGP* equals ESG performance index rated by Sino-Securities Index Information Service Company. *MaxESGD* (*MinESGD*) is the maximum (minimum) value of *ESGD* in an industry-year. *MaxESGP* (*MinESGP*) is the maximum (minimum) value of *ESGP* in an industry-year.
ST_Index	Social trust index
SIZE	Logarithm of the total assets
LEV	Total debt over the total assets
ROA	Net profit over total assets
CASH	Cash and cash equivalents divided by total assets
TANG	Current assets divided by total assets
BOARD	Board size measured as the natural logarithm of the number of directors in the board
INDEN	Board independence calculated as the number of independent directors divided by the total number of directors for a given listed company
CR	Current ratio, equals current assets divided by current debt
SOE	A dummy variable that equals 1 if the firm is state-owned, or else is 0
Q	Tobin's Q measured as the sum of the book value of total debts and market value of shareholder equity, divided by the total assets
GDP	Logarithm of provincial-year level GDP
FDI	Provincial FDI amount divided by provincial GDP
EnvReg	Provincial environmental protection expenditure divided by provincial GDP then multiplied by100