

Article

The Effect of Intermediate Environmental Courts on Corporate Climate-Related Disclosure: Evidence from China

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Abstract

Climate-related corporate disclosure is increasingly important for investors and other stakeholders when assessing firms' exposure to climate risks. This study examines whether the establishment of intermediate environmental courts affects corporate climate-related disclosure in China. Using a staggered difference-in-differences design and a sample of Chinese listed firms from 2010 to 2022, we find that the establishment of environmental courts is associated with a significant increase in the intensity of climate-related disclosure in firms' Management Discussion and Analysis (MD&A) sections. The effect is more pronounced among firms with lower levels of analyst coverage and research-report attention. In contrast, firms with stronger internal governance confidence and a stronger environmental orientation exhibit a more pronounced increase in disclosure. Further analysis suggests that environmental court establishment is associated with improvements in internal control quality, which helps explain the observed changes in disclosure. Overall, the findings suggest that specialized environmental adjudication constitutes an important institutional driver of firms' climate-related reporting behavior, although the magnitude of this effect varies with firms' external monitoring conditions and internal governance characteristics.

Keywords: environmental courts; climate-related disclosure; environmental judicial specialization; internal control quality; staggered difference-in-differences



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1. Introduction

Climate change creates substantial physical, transition, and regulatory risks for firms and has prompted governments around the world to strengthen environmental regulation and corporate climate governance [1,2]. Existing research suggests that firms' responses to climate-related challenges depend on both their exposure to climate risks and the institutional environment in which they operate [3]. As key economic actors, firms influence climate mitigation through their production, investment, and strategic decisions.

At the same time, stakeholders increasingly rely on climate-related disclosure to assess firms' exposure to climate risks and their strategies for mitigation and adaptation. As a result, climate-related disclosure has become an important way for firms to communicate environmental information to investors, regulators, creditors, and the broader public.

The effectiveness of climate-related disclosure depends not only on reporting standards but also on the institutional environment that shapes firms' incentives and account-

ability. Climate change has created growing economic and social challenges, affecting corporate operations, agricultural production, public welfare, and long-term economic development [4–7]. Extreme weather events can impose substantial direct and indirect losses on firms and communities [6], while changes in temperature and precipitation may affect production decisions, adaptation behavior, and income stability [4,7]. These developments have increased the demand for credible information about firms' climate risks and environmental responses. Understanding how institutional factors influence climate-related disclosure has become an important research question.

Against this backdrop, growing attention has been paid to environmental regulation and specialized environmental courts [8,9]. Environmental courts, also known as environmental protection, ecological, or land and environment courts, are specialized judicial institutions responsible for adjudicating disputes related to environmental protection, natural-resource management, land use, and ecological conservation [10]. By concentrating environmental cases within specialized judicial institutions, these courts aim to improve the efficiency, consistency, and professionalism of environmental adjudication, particularly in cases involving scientific complexity and cross-regional environmental externalities [11].

Environmental courts and tribunals have been established in a wide range of jurisdictions, including Australia, New Zealand, Sweden, and several developing economies. Although their institutional arrangements differ, these specialized judicial bodies share a common objective of strengthening environmental enforcement and improving the resolution of environmental disputes [11,12]. International experience suggests that judicial specialization can enhance environmental governance by improving expertise, procedural consistency, and access to environmental justice [13]. In China, experimentation with specialized environmental adjudication began in 2007 and gradually expanded across cities as part of the broader ecological-civilization strategy [14]. The development of environmental courts reflects both the global trend toward judicial specialization and China's effort to strengthen environmental governance through institutional reform.

Existing studies have examined the consequences of environmental judicial specialization. Existing studies show that environmental courts contribute to pollution control [15], encourage public participation in environmental governance [16], and promote corporate environmental investment [9]. Compared with conventional court structures organized around administrative boundaries, environmental courts may also improve the consistency and fairness of environmental adjudication, particularly in cases involving regional environmental spillovers [17]. Together, these findings suggest that environmental courts can influence both environmental governance and corporate behavior by strengthening enforcement and improving regulatory credibility.

Despite these findings, little is known about whether environmental judicial institutions influence firms' climate-related disclosure. Existing studies mainly focus on environmental outcomes, such as pollution reduction, environmental investment, and public participation [9,15,16]. Much less attention has been paid to disclosure behavior, especially climate-related disclosure, which is an important channel through which firms communicate environmental risks and strategies to external stakeholders. Examining whether environmental courts affect such reporting behavior can provide new evidence on the broader governance effects of environmental judicial reform [18].

To fill this research gap, this study exploits the staggered establishment of intermediate environmental courts across Chinese cities as a quasi-natural experiment and employs a staggered difference-in-differences approach to examine their effect on corporate climate-related disclosure. We manually collect city-level information on environmental court establishment and analyze climate-related expressions in the annual reports of Chinese A-share listed firms from 2010 to 2022. The results show that the establishment

of environmental courts significantly increases firms' climate-related disclosure. Further analyses show that this effect is stronger for firms with lower levels of analyst coverage and research-report attention and for firms with female board chairs. The results also suggest that improvements in internal control quality may be one channel through which environmental courts affect disclosure behavior [18].

This study makes three main contributions. First, it extends research on environmental courts by examining climate-related disclosure as an important but understudied organizational response to environmental judicial reform. Unlike previous studies focusing on environmental performance, pollution control, public participation, and environmental investment [9,15,16], we examine how environmental judicial institutions influence firms' disclosure behavior. Second, this study contributes to the climate-related disclosure literature by identifying judicial enforcement as an institutional factor affecting corporate climate reporting in an emerging economy. Using the climate-related dictionary developed by Sautner et al. [19], we measure climate-related disclosure in the MD&A sections of annual reports and show how local environmental governance shapes firms' climate-related communication. Third, by exploiting the staggered establishment of environmental courts as a quasi-natural experiment, we provide new evidence on the governance effects of environmental judicial reform. We further examine heterogeneity across firms and employ heterogeneity-robust staggered difference-in-differences (DID) estimators to address potential biases arising from staggered treatment timing [20–22].

The remainder of this paper is organized as follows. Section 2 reviews the literature and develops our hypotheses, while Section 3 presents the empirical design, including data sources, variable definitions, and model specifications. Section 4 reports the empirical results, covering the baseline regression, robustness tests, heterogeneity analysis, and mechanism analysis. Finally, Section 5 concludes the paper and offers policy implications.

2. Literature Review and Hypothesis Development

2.1. Environmental Judicial Specialization and Corporate Behavior

Climate change has made effective environmental institutions increasingly important for guiding firms' environmental behavior. Within this institutional framework, environmental courts are expected to influence firms by strengthening the credibility, consistency, and expected consequences of environmental enforcement [23]. Existing studies have examined the effects of environmental judicial specialization on pollution control [14], public participation in environmental governance [16], and corporate environmental-protection expenditure [9].

These studies show that specialized courts can influence firms' environmental decisions. However, they mainly focus on operational, investment, innovation, or overall environmental-performance outcomes, while paying much less attention to corporate disclosure. Disclosure represents a different dimension of corporate response. Firms may improve their environmental performance without providing more public information, or they may disclose more environmental information without making comparable operational changes. Whether environmental courts also affect climate-related disclosure remains an open question and deserves further investigation.

2.2. Climate and Sustainability Disclosure in China

During most of the sample period, climate-related disclosure in China remained largely voluntary and was reported through multiple channels, including annual reports, corporate social responsibility (CSR) reports, ESG reports, and sustainability reports. Unlike financial reporting, climate-related disclosure was not subject to a unified mandatory framework, leading to substantial variation in the scope and depth of disclosure across

firms. This institutional setting provides an appropriate context for examining how external governance mechanisms influence firms' disclosure decisions.

This study focuses on climate-related disclosure in the Management Discussion and Analysis (MD&A) section of annual reports. According to China's disclosure requirements, the MD&A discusses firms' operating performance, major risks, business strategies, and future development plans [24,25]. It also allows managers to communicate information on environmental protection, energy conservation, low-carbon technologies, environmental compliance, and responses to climate-related policies.

The MD&A section is well suited to measuring climate-related disclosure because it reflects management's assessment of business risks and strategic responses to external challenges [26]. Compared with standalone CSR or ESG reports, MD&A disclosures are more closely linked to firms' operating activities and strategic decisions. Recent studies also show that textual information disclosed in annual reports provides useful evidence on firms' climate-risk exposure and climate-related strategies [19].

2.3. Climate Risks, Disclosure, and Institutional Enforcement

Firms are exposed to physical, transition, supply-chain, market, and regulatory risks arising from climate change. These risks can affect production continuity, input costs, supply networks, investment decisions, and market access [27]. Climate-related disclosure enables investors and other stakeholders to assess how firms identify, manage, and respond to these risks [28,29]. It can therefore reduce information asymmetry and support the evaluation of corporate climate strategies.

Environmental courts may affect climate-related disclosure by changing firms' incentives to comply with environmental regulations and improve transparency. More credible legal sanctions can encourage firms to strengthen compliance and provide more climate-related information on environmental risk management and regulatory preparedness [30]. At the same time, stronger judicial enforcement may increase litigation exposure, making managers more cautious about disclosing information that could reveal non-compliance, create legal commitments, or be used in future proceedings. The overall effect therefore depends on whether the incentives to disclose outweigh the potential litigation-related costs.

From a regulatory enforcement perspective, firms respond to changes in the expected probability and cost of legal enforcement. By improving judicial specialization and making environmental adjudication more visible and predictable, intermediate environmental courts increase the expected consequences of environmental non-compliance [28,30]. Firms therefore have stronger incentives to improve environmental risk management, strengthen compliance procedures, and enhance climate-related disclosure.

Environmental courts also reshape the institutional environment in which firms operate. Institutional theory suggests that organizations adjust their practices and reporting behavior in response to evolving institutional expectations. This view is consistent with legitimacy and stakeholder theories, which argue that firms seek to maintain support from regulators, investors, communities, and other stakeholders by responding to their expectations [28,29,31]. As environmental governance becomes more prominent, firms face greater pressure to demonstrate environmental responsibility and are therefore more likely to communicate climate-related risks, strategies, and responses through corporate disclosure.

Nevertheless, litigation-risk considerations generate a competing prediction. Detailed disclosure may reveal environmental vulnerabilities, inconsistencies, or unmet commitments. Firms anticipating stronger judicial scrutiny may therefore reduce specific disclosure or rely on more cautious language. The overall effect remains an empirical question.

Overall, stronger environmental judicial enforcement is expected to increase firms' incentives to disclose climate-related information. Although litigation concerns may dis-

courage some forms of detailed disclosure, the establishment of an intermediate environmental court signals a sustained strengthening of environmental governance. We therefore expect the positive effects of stronger regulatory enforcement and institutional pressure to outweigh the potential costs associated with litigation risk.

H1. *The establishment of an intermediate environmental court increases corporate climate-related disclosure.*

2.4. The Moderating Role of External Information-Intermediary Attention

Analysts and research reports act as external information intermediaries. When analyst and research-report coverage is high, firms already face substantial information demand and external monitoring. Their annual-report disclosure is therefore more likely to reflect these external expectations before the establishment of an intermediate environmental court, leaving less room for additional changes after environmental judicial reform.

By contrast, firms receiving limited external attention are subject to weaker external monitoring. For these firms, the establishment of an intermediate environmental court represents a larger change in the institutional environment. Environmental courts may therefore play a stronger monitoring role when analyst and research-report attention is low, leading to a stronger disclosure response. Although external pressure may also generate short-term managerial responses or managerial myopia [23], the present study does not examine this possibility. Instead, we focus on the substitution effect between environmental judicial enforcement and external information-intermediary monitoring.

H2. *The positive effect of establishing an intermediate environmental court on corporate climate-related disclosure is stronger for firms with lower analyst and research-report attention.*

2.5. The Moderating Role of Female Board Chairs

Board leadership may also influence how firms respond to environmental judicial reform. Upper echelons theory suggests that senior leaders' values, experiences, and cognitive orientations shape corporate strategy and reporting decisions [27,28,32,33]. Prior studies also find that female executives and directors tend to place greater emphasis on stakeholder welfare, environmental responsibility, and ethical considerations [34–36].

A female board chair can influence board agendas, oversight priorities, and communication with management. When the establishment of an intermediate environmental court increases the expected consequences of environmental non-compliance, firms with a female board chair may pay greater attention to climate-related issues and provide more climate-related disclosure. This argument focuses on the gender of the board chair rather than the number or proportion of female executives in the management team.

H3. *The positive effect of establishing an intermediate environmental court on corporate climate-related disclosure is stronger in firms with a female board chair.*

2.6. The Moderating Role of Internal Governance Capacity

Firms differ in their ability to respond to external institutional pressure. Even under the same regulatory environment, differences in internal governance and strategic orientation may lead to different disclosure responses.

Firms with stronger internal governance are generally better able to respond to changes in the external environment. Prior studies also show that firms with a stronger environmental orientation are more likely to incorporate sustainability considerations into business decisions and respond more actively to environmental pressure [37,38]. These firms are

therefore more likely to strengthen climate-related disclosure following environmental judicial reform.

In this study, governance confidence and environmental orientation capture firms' internal governance capacity. Firms with stronger internal governance capacity are expected to respond more strongly to environmental judicial reform and show a larger increase in climate-related disclosure.

H4. *The positive effect of establishing an intermediate environmental court on corporate climate-related disclosure is stronger for firms with greater internal governance capacity.*

3. Empirical Design

3.1. Data

Data on intermediate people's courts with environmental adjudication functions are hand-collected from the official websites of intermediate people's courts, government documents, and contemporaneous media reports. Corporate climate-related disclosure is measured using textual analysis of listed firms' annual reports. Following Sautner et al. [19], we develop a climate-related dictionary adapted to the Chinese context and apply it to the MD&A sections of annual reports. Financial and governance data for Chinese A-share firms listed on the Shanghai and Shenzhen stock exchanges from 2010 to 2022 are obtained from the China Stock Market & Accounting Research Database.

The initial sample consists of all eligible A-share firm-year observations during the sample period. We exclude (1) firms designated as ST or *ST; (2) firms in the financial sector; (3) firms that were not listed throughout the sample period; and (4) observations with missing values for the dependent variable, treatment variable, or control variables. The final baseline sample comprises 28,312 firm-year observations. Appendix A Table A1 reports the sample construction process, including the initial sample size and the number of observations excluded at each step.

3.2. Variable Definition

3.2.1. Dependent Variable

The dependent variable in this study is corporate climate-related disclosure (*Exposure*). Exposure captures the intensity of climate-related textual disclosure in the Management Discussion and Analysis (MD&A) section of firms' annual reports. Following Sautner et al. [19], we construct this measure using a dictionary-based textual analysis approach and adapt the original dictionary to the Chinese context. While Sautner et al. [19] measure firms' climate exposure using earnings-call transcripts, this study relies on MD&A disclosures in Chinese annual reports, which provide a standardized source of managerial narrative information for listed firms.

Dictionary-based textual analysis is widely used in accounting and finance research to measure corporate disclosure and analyze textual information [39]. Recent studies have also applied this approach to climate-related disclosure and climate-risk research using large samples [19]. Based on this approach, we manually review and modify the original dictionary to better capture climate-related expressions used by Chinese listed firms while maintaining consistency with the original framework.

The climate-related dictionary is adapted from Sautner et al. [19] and supplemented with terms frequently used in China's climate policies and low-carbon transition. The final dictionary includes 156 terms covering key dimensions such as energy transition, greenhouse gas emissions, environmental regulation, climate risks, low-carbon technologies, renewable energy, and corporate climate strategies. Representative terms include carbon emissions, carbon neutrality, carbon peaking, renewable energy, and low-carbon development.

For each firm-year observation, *Exposure* is measured as the ratio of climate-related word occurrences to the total number of words in the MD&A section. A higher value indicates greater attention to climate-related issues in corporate disclosure. Consistent with prior studies, this measure captures the extent of climate-related disclosure rather than the quality of disclosed information. Accordingly, *Exposure* should be interpreted as an indicator of firms' climate-related reporting attention rather than a comprehensive evaluation of disclosure quality. This distinction is important because dictionary-based textual analysis is designed to capture variation in the salience of specific topics in corporate narrative disclosures rather than to assess the credibility or completeness of reported information. Therefore, the empirical findings should be interpreted within the scope of disclosure intensity measured from firms' MD&A narratives.

We focus on the MD&A section for three reasons. First, MD&A disclosures are widely available for Chinese listed firms, reducing potential sample selection bias. Second, the MD&A section is a standardized part of annual reports where managers discuss risks, regulatory changes, investment decisions, and strategic outlook. Third, using a consistent reporting section improves comparability across firms and over time. Compared with standalone sustainability or ESG reports, MD&A disclosures are mandatory for listed firms in China and therefore provide a more consistent basis for large-sample analysis.

3.2.2. Independent Variable

The treatment variable *Court* equals one for firms located in a city after the establishment of an intermediate environmental court, and zero otherwise. The establishment dates of intermediate environmental courts are manually collected from official court websites, government documents, and contemporaneous media reports.

3.2.3. Control Variables

To account for firm characteristics that may influence climate-related disclosure, we include a set of control variables related to profitability, leverage, governance structure, firm size, executive characteristics, employment scale, and board structure.

ROA, measured as net income divided by total assets, captures profitability and internal financial capacity. *Lev* is defined as total liabilities divided by total assets and proxies for financial risk and external monitoring pressure. *Dual* is a dummy variable equal to one when the CEO and board chair are the same individual. *Mkt* is measured as the natural logarithm of firm market value. *Female* is defined as the proportion of female executives in the executive team. *Employee* is measured as the natural logarithm of one plus the number of employees. *Board* is measured as the natural logarithm of one plus the number of board members.

The selection of control variables follows prior studies on corporate environmental and climate-related disclosure, which emphasize profitability, capital structure, governance, and managerial characteristics [24,37,40].

3.2.4. Descriptive Statistics

Table 1 reports descriptive statistics. The mean of *Exposure* is 1.593%, with a standard deviation of 0.607, indicating substantial variation in firms' climate-related disclosure across firms and over time. The mean of *Court* is 0.244, suggesting that 24.4% of firm-year observations are located in cities after the establishment of intermediate environmental courts.

Appendix A Table A2 presents the Pearson correlation matrix. The correlation between *Court* and *Exposure* is 0.130, indicating a positive but moderate association. Among control variables, the highest pairwise correlation is 0.663, suggesting no severe multicollinearity concerns in the baseline specification.

Table 1. Summary Statistics.

Variable	N	Min	Max	Mean	SD
<i>Exposure</i>	28,312	0.000	5.814	1.593	0.607
<i>Court</i>	28,312	0.000	1.000	0.244	0.430
<i>ROA</i>	28,312	−1.128	0.821	0.060	0.075
<i>Lev</i>	28,312	0.007	2.529	0.451	0.207
<i>Dual</i>	28,312	0.000	1.000	0.015	0.121
<i>Mkt</i>	28,312	1.436	10.306	4.449	1.183
<i>Female</i>	28,312	0.000	0.800	0.141	0.128
<i>Employee</i>	28,312	1.946	13.223	7.800	1.316
<i>Board</i>	28,312	0.693	2.890	2.149	0.200

Note: Italicized terms denote variable names and statistical symbols.

3.3. Model Construction

To estimate the effect of intermediate environmental court establishment on corporate climate-related disclosure, we exploit the staggered timing of court establishment across cities and estimate the following difference-in-differences specification:

$$Exposure_{i,j,t} = \alpha_0 + \beta Court_{j,t} + \gamma X_{i,j,t} + Firm + Year + Ind + City + \varepsilon_{i,j,t}$$

In the model, i , j , and t denote firms, cities, and years, respectively. $Exposure_{i,j,t}$ is the climate-related term-frequency measure, while $Court_{j,t}$ equals one from the year when the intermediate environmental court becomes operational in city j and zero otherwise. The vector of controls contains the firm characteristics described above. Firm fixed effects absorb time-invariant firm characteristics, and year fixed effects capture nationwide shocks.

We acknowledge that conventional two-way fixed-effects (TWFE) estimators may be biased in the presence of staggered adoption and heterogeneous treatment effects across cohorts or over time. Therefore, we conduct additional analyses using heterogeneity-robust estimators proposed by Callaway and Sant’Anna (2021) and Sun and Abraham (2021) [20–22].

Following recent studies on staggered policy evaluation [20–22], we assess the robustness of our identification strategy using several complementary approaches, including event-study estimation, placebo tests, propensity score matching (PSM-DID), and heterogeneity-robust estimators. The consistency of results across these complementary approaches increases confidence that the documented findings are not driven by a particular estimation strategy. Nevertheless, as with other quasi-experimental studies, these approaches cannot completely eliminate concerns arising from unobserved time-varying factors or policy selection.

4. Empirical Result

4.1. Baseline Result

Table 2 reports the baseline results. We control for firm and year fixed effects in Column (1), with industry and city fixed effects further included in Columns (2) and (3). The coefficients on *Court* are positive and statistically significant across all baseline specifications, indicating that firms increase the relative frequency of climate-related expressions in their MD&A sections following the establishment of an intermediate environmental court.

In Column (3), the estimated coefficient on *Court* is 0.020. Relative to the sample mean of 1.593%, this estimate implies a relative increase of approximately 1.27% in climate-related disclosure. Although the estimated effect is modest in magnitude, climate-related disclosure generally changes gradually and remained largely voluntary during much of the

sample period. Given this gradual evolution, the observed increase suggests a meaningful change in firms' attention to climate-related issues after environmental judicial reform.

Table 2. Baseline Results.

Variable	(1) <i>Exposure</i>	(2) <i>Exposure</i>	(3) <i>Exposure</i>
<i>Court</i>	0.020 * (1.781)	0.024 ** (2.113)	0.023 ** (2.052)
<i>ROA</i>	0.035 (0.750)	0.045 (0.996)	0.033 (0.702)
<i>Lev</i>	−0.018 (−0.659)	−0.003 (−0.119)	0.001 (0.036)
<i>Dual</i>	−0.001 (−0.019)	0.001 (0.060)	0.002 (0.090)
<i>Mkt</i>	0.046 *** (5.158)	0.036 *** (4.363)	0.035 *** (4.262)
<i>Female</i>	−0.002 (−0.087)	−0.006 (−0.200)	−0.001 (−0.017)
<i>Employee</i>	−0.010 (−1.375)	−0.007 (−1.012)	−0.009 (−1.230)
<i>Board</i>	−0.025 (−1.057)	−0.032 (−1.352)	−0.030 (−1.272)
<i>Constant</i>	1.523 *** (21.844)	1.552 *** (22.1840)	1.563 *** (22.147)
<i>Observations</i>	28,312	28,312	28,312
<i>R-squared</i>	0.667	0.675	0.6780
<i>Firm</i>	YES	YES	YES
<i>Year</i>	YES	YES	YES
<i>Ind</i>	NO	YES	YES
<i>City</i>	NO	NO	YES

Note: Italicized terms denote variable names and statistical symbols. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

These findings suggest that environmental courts may shape firms' incentives to communicate climate-related information beyond their traditional judicial functions. By increasing the expected consequences of environmental non-compliance, environmental courts provide firms with stronger incentives to pay attention to climate-related risks and disclose related information.

Overall, the empirical evidence is consistent with H1 and suggests that environmental judicial institutions constitute an important institutional driver of corporate climate-related disclosure.

4.2. Robustness Test

4.2.1. Dynamic Effects and Parallel-Trend Tests

Figure 1 presents the event-study estimates around the establishment of intermediate environmental courts. The coefficients in the pre-treatment periods are generally close to zero and statistically insignificant, indicating that treated and control firms did not exhibit significantly different trends in climate-related disclosure before court establishment. Following court establishment, the estimated coefficients become positive and increase gradually over time. The effects are relatively small in the early years but become stronger in later periods, suggesting that the impact of environmental courts develops gradually after implementation.

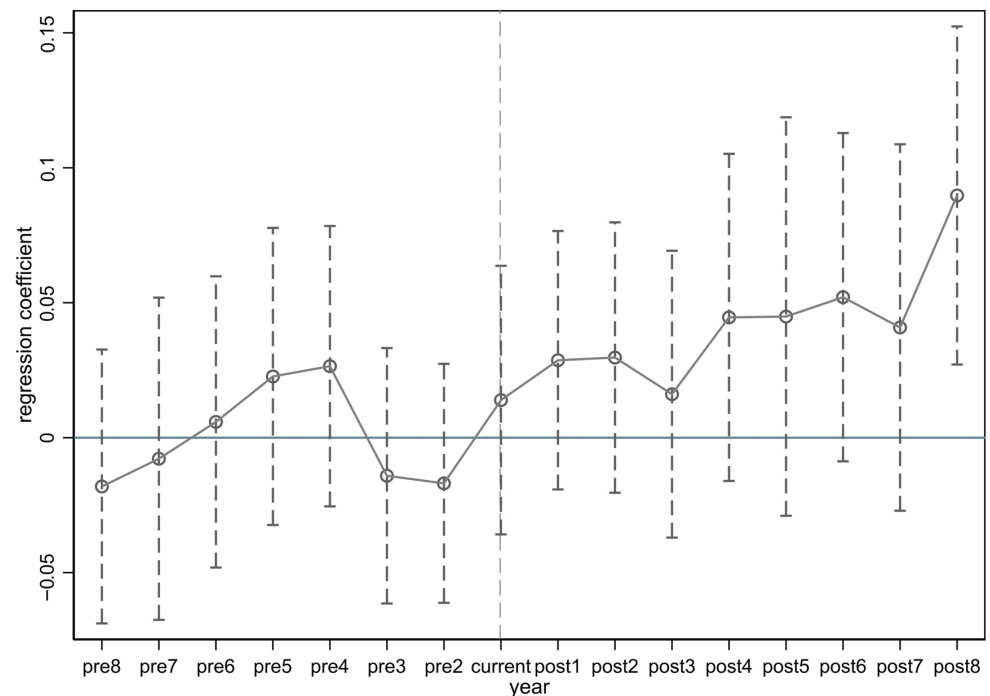


Figure 1. Parallel Trend of Environmental Court Establishment.

To address concerns related to staggered treatment timing [20–22,41], Figure 2 reports the dynamic ATT estimates based on the Callaway and Sant’Anna (2021) estimator [20,21]. Similar to Figure 1, the pre-treatment coefficients remain statistically insignificant, and the joint pre-treatment test supports the parallel-trend assumption. After treatment, the ATT estimates are generally positive and increase over time, with larger effects observed in later years. The similar patterns across the two approaches suggest that the baseline results are robust to alternative estimation methods designed for staggered policy adoption.

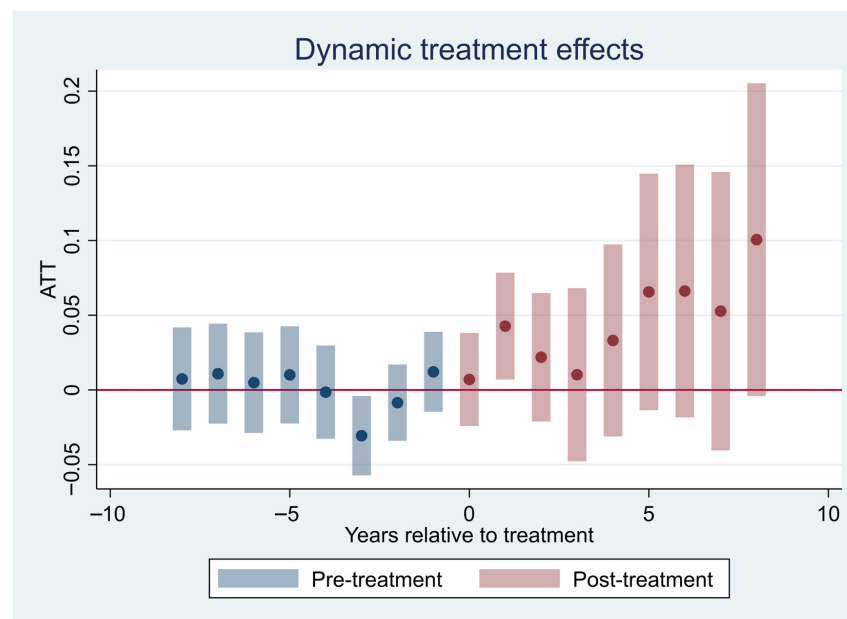


Figure 2. Dynamic Average Treatment Effects of Environmental Court Establishment.

Overall, the results provide additional support for the causal interpretation of the baseline findings and suggest that the effect of environmental courts on corporate climate-related disclosure strengthens over time.

4.2.2. Placebo Test

We conduct placebo tests to assess whether the baseline results could be explained by random treatment assignment. Specifically, we randomly assign treatment locations and policy timing, re-estimate the baseline model, and repeat this procedure 500 times. Figures 3 and 4 report the distributions of the placebo coefficients and corresponding t-statistics. The placebo estimates are concentrated around zero and are generally smaller than the actual estimate, indicating that the baseline findings are unlikely to be driven by random factors unrelated to environmental court establishment. These results provide additional evidence that the observed relationship is unlikely to be explained by arbitrary treatment timing.

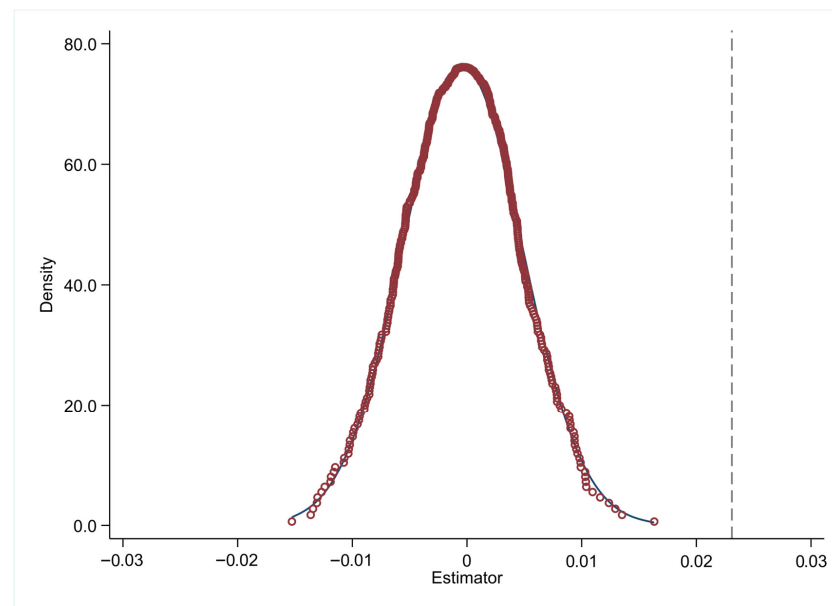


Figure 3. Placebo test for coefficient.

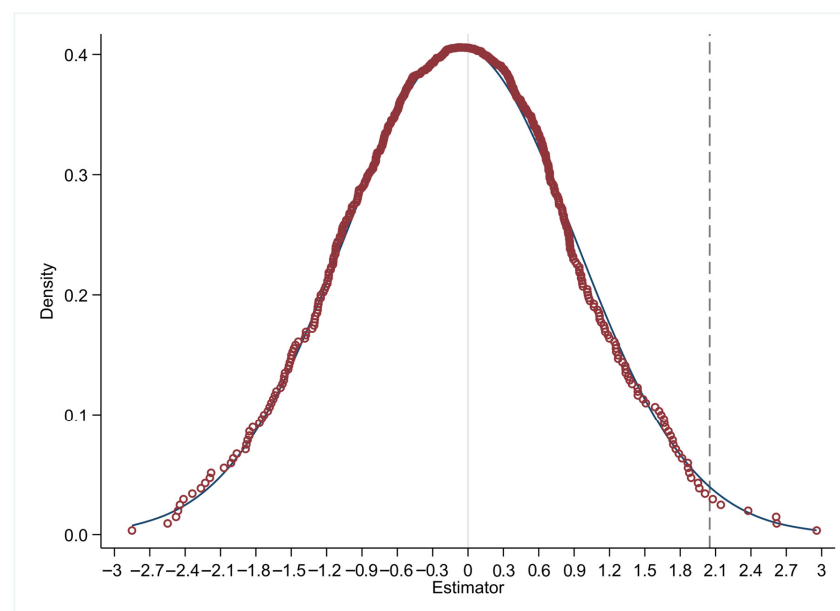


Figure 4. Placebo test for T value.

4.2.3. Other Robustness Tests

Table 3 reports a series of additional robustness checks. The estimated coefficient of Court remains positive and statistically significant after including industry-by-year fixed

effects and clustering standard errors at the firm-year level. Similar results are obtained when the sample is restricted to firms with available climate-related disclosure measures and when continuous variables are winsorized at the 1% level.

Table 3. Robustness tests.

Variable	(1) Fixed Exposure	(2) Cluster Exposure	(3) Variable Exposure	(4) Winsorize Exposure	(5) PSM-DID	(6) City-Level Control
<i>Court</i>	0.022 ** (2.090)	0.023 ** (2.105)	0.001 * (1.913)	0.023 ** (2.048)	0.024 ** (1.981)	0.024 ** (2.166)
<i>ROA</i>	0.024 (0.532)	0.033 (0.738)	0.000 (0.767)	0.019 (0.351)	0.012 (0.206)	0.035 (0.747)
<i>Lev</i>	−0.031 (−1.207)	0.001 (0.038)	0.000 (0.384)	0.006 (0.217)	0.032 (0.994)	0.000 (0.004)
<i>Dual</i>	0.005 (0.190)	0.002 (0.100)	0.000 (0.061)	0.002 (0.074)	0.005 (0.165)	0.002 (0.058)
<i>Mkt</i>	0.035 *** (4.178)	0.035 *** (4.765)	0.000 *** (5.088)	0.035 *** (4.230)	0.025 *** (2.677)	0.035 *** (4.226)
<i>Female</i>	0.015 (0.523)	−0.001 (−0.017)	−0.000 (−0.029)	−0.000 (−0.016)	0.000 (0.004)	−0.002 (−0.073)
<i>Employee</i>	−0.009 (−1.210)	−0.009 (−1.373)	−0.000 (−0.930)	−0.009 (−1.250)	−0.001 (−0.159)	−0.010 (−1.375)
<i>Board</i>	−0.024 (−0.982)	−0.030 (−1.324)	−0.000 (−1.073)	−0.028 (−1.166)	−0.034 (−1.262)	−0.030 (−1.275)
<i>pGDP</i>						0.006 *** (3.6120)
<i>AQR</i>						−0.006 (−0.393)
<i>EI</i>						0.105 * (1.762)
Constant	1.562 *** (22.2871)	1.563 *** (23.965)	0.015 *** (22.554)	1.558 *** (21.880)	1.567 *** (19.210)	1.523 *** (20.730)
<i>Observations</i>	28,234	28,312	28,169	28,312	22,429	28,312
<i>R-squared</i>	0.700	0.678	0.711	0.678	0.693	0.678
<i>Firm</i>	YES	YES	YES	YES	YES	YES
<i>Year</i>	NO	YES	YES	YES	YES	YES
<i>Ind</i>	NO	YES	YES	YES	YES	YES
<i>City</i>	YES	YES	YES	YES	YES	YES
<i>Year × Ind</i>	YES	NO	NO	NO	NO	NO

Note: Italicized terms denote variable names and statistical symbols. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

We further employ a PSM-DID approach based on one-to-five nearest-neighbor matching using a Logit model. The estimated effect remains positive and significant after matching. In addition, the inclusion of city-level controls, including per capita GDP (*pGDP*), air quality (*AQR*), and environmental investment (*EI*), does not materially affect the results.

Across all specifications, the coefficient of *Court* remains stable. These findings indicate that the baseline results are robust to alternative model specifications, sample adjustments, and additional city-level controls.

4.3. Heterogeneity Analysis

Based on the above hypotheses, we further examine whether the effect of environmental court establishment on climate-related disclosure differs across firms with different external monitoring conditions, leadership structures, and internal governance capacity. The results are reported in Table 4.

Table 4. Heterogeneity analysis.

Variable	(1) <i>Analyst Exposure</i>	(2) <i>Report Exposure</i>	(3) <i>Female Exposure</i>	(4) <i>Confidence Exposure</i>	(5) <i>Environment Exposure</i>
<i>Court</i>	0.058 *** (4.088)	0.057 *** (4.068)	0.018 (1.573)	−0.064 (−1.416)	−0.038 (−1.589)
<i>Court × Analyst</i>	−0.025 *** (−3.982)				
<i>Analyst</i>	0.012 *** (2.795)				
<i>Court × Report</i>		−0.020 *** (−3.964)			
<i>Report</i>		0.012 *** (3.238)			
<i>Court × Female</i>			0.063 * (1.780)		
<i>Female</i>			0.015 (0.782)		
<i>Court × confidence</i>				0.129 ** (2.016)	
<i>confidence</i>				0.027 (0.833)	
<i>Court × environment</i>					0.026 ** (2.203)
<i>environment</i>					0.078 *** (10.716)
<i>ROA</i>	0.017 (0.370)	0.014 (0.302)	0.025 (0.527)	−0.002 (−0.031)	0.041 (0.861)
<i>Lev</i>	0.005 (0.179)	0.006 (0.220)	0.000 (0.004)	0.012 (0.366)	0.019 (0.640)
<i>Dual</i>	0.000 (0.014)	0.000 (0.014)	0.004 (0.139)	0.010 (0.337)	0.010 (0.408)
<i>Mkt</i>	0.033 *** (3.767)	0.031 *** (3.560)	0.035 *** (4.264)	0.033 *** (3.733)	0.029 *** (3.194)
<i>Female</i>	−0.001 (−0.040)	−0.002 (−0.053)	−0.009 (−0.304)	0.028 (0.853)	0.002 (0.076)
<i>Employee</i>	−0.008 (−1.149)	−0.008 (−1.153)	−0.009 (−1.160)	−0.005 (−0.447)	−0.006 (−0.748)
<i>Board</i>	−0.032 (−1.349)	−0.032 (−1.354)	−0.028 (−1.155)	−0.045 (−1.521)	−0.013 (−0.496)
<i>Constant</i>	1.555 *** (21.448)	1.559 *** (21.416)	1.555 *** (21.835)	1.5354 *** (16.486)	1.414 *** (17.515)
Observations	28,312	28,312	28,122	21,647	25,120
R-squared	0.678	0.678	0.679	0.696	0.696
<i>Firm</i>	YES	YES	YES	YES	YES
<i>Year</i>	YES	YES	YES	YES	YES
<i>Ind</i>	YES	YES	YES	YES	YES
<i>City</i>	YES	YES	YES	YES	YES

Note: Italicized terms denote variable names and statistical symbols. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

4.3.1. External Information-Intermediary Attention

Columns (1) and (2) report the results for analyst coverage and research-report coverage. The coefficients of *Court × Analyst* and *Court × Report* are both negative and statistically significant. This indicates that the positive association between environmental court establishment and climate-related disclosure is weaker for firms with higher levels of

external information-intermediary attention. In contrast, firms with lower analyst coverage and fewer research reports show a stronger disclosure response following environmental court establishment.

This finding is consistent with H2 and suggests that capital-market monitoring and judicial supervision may serve similar governance functions. When firms are already subject to stronger external scrutiny, the incremental role of environmental courts may become relatively limited.

4.3.2. Leadership Structure

Column (3) examines whether female board chair characteristics influence firms' responses to environmental court establishment. The coefficient of *Court* $\times$ *Female Chair* is positive and marginally significant at the 10% level.

This result provides suggestive evidence that firms with female board chairs may exhibit a stronger disclosure response following environmental court establishment. However, the statistical significance is relatively weak, so the evidence should be interpreted with caution.

The result is generally consistent with H3 and indicates that leadership characteristics may affect how firms respond to changes in the environmental institutional environment.

4.3.3. Internal Responsiveness

Columns (4) and (5) report the results for internal governance confidence and environmental orientation. Both interaction terms, *Court* $\times$ *confidence* and *Court* $\times$ *environment*, are positive and statistically significant.

These results suggest that firms with stronger internal confidence and environmental orientation may be more responsive to environmental judicial reform. In contrast, firms with weaker internal governance capacity or weaker environmental orientation show a smaller change in climate-related disclosure.

These findings are broadly consistent with H4 and suggest that internal governance capacity may strengthen firms' responsiveness to changes in the external institutional environment.

4.4. Mechanism Analysis

The previous results show that the establishment of intermediate environmental courts increases corporate climate-related disclosure. Environmental judicial reform is likely to affect firms through multiple channels. In the following analysis, we examine whether improvements in internal control quality help explain this increase in disclosure.

Following He [42] and Campbell et al. [43], we use internal control effectiveness and internal control weaknesses to measure changes in firms' internal governance and information systems. Stronger environmental judicial enforcement may increase firms' incentives to strengthen internal control systems. Improved internal control can further enhance firms' ability to collect, organize, and disclose environmental information.

Table 5 presents the results. The coefficient of *Court* is positive in both specifications. In Column (1), the coefficient is 0.006 and significant at the 1% level. In Column (2), the coefficient remains positive at 0.017 and is significant at the 10% level. These results suggest that the establishment of intermediate environmental courts is associated with improvements in internal control quality and provide evidence consistent with internal governance as a potential channel linking environmental judicial reform to climate-related disclosure.

However, these findings should be interpreted with caution. The mechanism analysis provides evidence consistent with the proposed explanation rather than definitive proof of a mediation effect. Other factors, such as regulatory pressure, stakeholder monitoring, and reputational concerns, may also influence firms' climate-related disclosure decisions.

Table 5. Potential-Channel Analysis.

<i>Variable</i>	(1) <i>Valid</i>	(2) <i>Mistake</i>
<i>Court</i>	0.006 *** (2.673)	0.017 * (1.904)
<i>ROA</i>	−0.169 *** (−7.180)	0.174 *** (4.125)
<i>Lev</i>	0.015 * (1.668)	−0.032 (−1.243)
<i>Dual</i>	−0.009 ** (−2.002)	0.035 * (1.662)
<i>Mkt</i>	0.005 *** (2.747)	0.028 *** (4.213)
<i>Female</i>	−0.014 * (−1.942)	0.033 (1.227)
<i>Employee</i>	−0.005 ** (−2.436)	0.004 (0.640)
<i>Board</i>	−0.002 (−0.385)	0.044 * (1.860)
<i>Constant</i>	1.034 *** (52.369)	1.422 *** (22.239)
<i>Observations</i>	24,835	24,836
<i>R-squared</i>	0.234	0.591
<i>Firm</i>	YES	YES
<i>Year</i>	YES	YES
<i>Ind</i>	YES	YES
<i>City</i>	YES	YES

Note: Italicized terms denote variable names and statistical symbols. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

5. Conclusions and Policy Recommendations

This study examines whether specialized environmental adjudication affects corporate climate-related disclosure. Using the staggered establishment of intermediate environmental courts across Chinese cities and annual-report data for A-share listed firms from 2010 to 2022, we find that the establishment of environmental courts increases the relative frequency of climate-related expressions in firms' MD&A sections.

The main effect is economically moderate but statistically significant, indicating that firms adjust their disclosure behavior in response to changes in environmental judicial institutions. These findings suggest that judicial enforcement can influence corporate reporting practices beyond traditional compliance-related activities.

The heterogeneity analysis shows that the effect is weaker for firms with higher analyst coverage and research-report attention. This pattern is consistent with a substitution effect between environmental judicial enforcement and external monitoring. Firms with female board chairs exhibit a slightly stronger response, although the evidence is limited. In contrast, firms with stronger internal governance capacity and environmental orientation respond more strongly to environmental courts. These results highlight the importance of both external monitoring conditions and internal firm characteristics in shaping corporate disclosure responses.

The mechanism analysis further shows that the establishment of environmental courts is associated with improvements in internal control quality. This evidence is consistent with the view that environmental judicial reform may affect climate-related disclosure partly through internal governance improvements.

Overall, the findings suggest that environmental courts can influence corporate climate-related disclosure and that the effect depends on both external institutional conditions and firm-level characteristics.

Based on our finding, we propose several policy recommendations.

First, the evidence indicates that the establishment of environmental courts is associated with improved corporate climate-related disclosure. This suggests that specialized environmental adjudication can complement existing environmental governance mechanisms by strengthening corporate transparency. Second, firms with weaker external information monitoring respond more strongly to environmental courts. This implies that environmental judicial enforcement may help reduce differences in disclosure incentives across firms. Policymakers could enhance coordination between environmental judicial institutions and disclosure regulation to improve the consistency of corporate climate-related reporting. Third, the effectiveness of environmental judicial reform depends partly on firms' internal capabilities. Firms with stronger internal governance capacity and environmental orientation show stronger disclosure responses. Improving internal governance systems and environmental management practices may therefore strengthen the effectiveness of external enforcement. Finally, the mechanism analysis suggests that environmental courts may operate partly through internal control systems. Strengthening internal control and compliance systems can therefore serve as an important complement to environmental judicial enforcement.

This study has several limitations. First, the sample consists of Chinese A-share listed firms. The effects of environmental judicial specialization may differ in jurisdictions with different litigation systems, disclosure regimes, or levels of judicial capacity. Future research could examine whether similar effects exist in other institutional contexts.

Second, the dependent variable is based on the frequency of climate-related terms in MD&A texts. While this approach provides a consistent measure of climate-related disclosure intensity across firms, it does not directly distinguish differences in disclosure quality. Future research may further validate and enrich this measure by integrating dictionary-based textual analysis with manual coding, framework-based disclosure indices, emissions data, external assurance information, and more advanced text analysis techniques.

Third, the internal-control analysis provides suggestive evidence regarding the underlying mechanisms. Future studies could further examine alternative channels, such as environmental litigation exposure, regulatory penalties, reputational pressure, stakeholder monitoring, board-level climate oversight, and environmental management systems, while employing additional quasi-natural experiments to strengthen causal identification.

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Abbreviations

The following abbreviations are used in this manuscript:

DID	Difference-in-Differences
ROA	Return on Assets
Lev	Leverage
Mkt	Market value
CEO	Chief Executive Officer
Dual	Duality (CEO and board chair are the same person)
Female	Female executive ratio

Appendix A

Table A1. Sample Selection Procedure.

Process	Obs. Excluded	Obs. Remaining
Initial sample	-	37,814
Exclude: listed firms with less than one year of listing history	3055	34,759
Exclude: firms with missing data	5270	29,489
Exclude: financial firms	139	29,350
Exclude: ST and *ST firms	1038	28,312

Table A2. Pairwise correlations.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) <i>Exposure</i>	1.000								
(2) <i>Court</i>	0.130 *	1.000							
	(0.000)								
(3) <i>ROA</i>	−0.043 *	−0.021 *	1.000						
	(0.000)	(0.000)							
(4) <i>lev</i>	0.019 *	0.021 *	−0.303 *	1.000					
	(0.003)	(0.000)	(0.000)						
(5) <i>Dual</i>	0.026 *	0.025 *	−0.019 *	0.034 *	1.000				
	(0.000)	(0.000)	(0.002)	(0.000)					
(6) <i>Mkt</i>	0.107 *	0.156 *	0.095 *	0.377 *	0.092 *	1.000			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)				
(7) <i>Female</i>	0.011 *	0.023 *	0.015 *	−0.098 *	0.010 *	−0.116 *	1.000		
	(0.093)	(0.000)	(0.012)	(0.000)	(0.092)	(0.000)			
(8) <i>employee</i>	0.031 *	0.082 *	0.080 *	0.279 *	0.076 *	0.663 *	−0.116 *	1.000	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		
(9) <i>board</i>	−0.026 *	−0.029 *	0.025 *	0.136 *	−0.002	0.199 *	−0.107 *	0.226 *	1.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.687)	(0.000)	(0.000)	(0.000)	

Note: Italicized terms denote variable names and statistical symbols. * indicates statistical significance at the 10% level.

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