Is voluntary and mandatory CSR disclosure credible?

Evidence from insider trading

ABSTRACT

This study examines the impact of both voluntary and mandatory Corporate Social Responsibility (CSR) disclosures on insider trading profitability. The study demonstrates that firms with voluntary CSR disclosures will experience a reduction in insider trading profitability, whereas those with mandatory CSR disclosures will show an increase in insider trading profitability. Additionally, firms choosing voluntary CSR disclosure will exhibit lower instances of information trading, reduced analysts' forecast errors, heightened analyst coverage, and more robust internal controls compared to those relying solely on mandatory CSR disclosure. Overall, the findings of this study suggest that firms with voluntary CSR disclosures provide a more credible CSR report than those with mandatory CSR disclosure, which could serve as a pivotal determinant of insider performance.

Keywords: Corporate social responsibility (CSR); voluntary disclosure; mandatory disclosure; disclosure credibility; insider trading profitability

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1. Introduction

In recent years, there has been a rapid expansion in the scale of Environmental, Social, and Governance (ESG) investments in the mainland Chinese market. As of September 2023, the market size for significant categories of responsible investments in China stood at approximately CNY 31.59 trillion.[1] With the escalating attention towards sustainable investment, the significance of reporting disclosure information has become pervasive and economically crucial. Previous research has provided evidence that Corporate Social Responsibility (CSR) performance significantly impacts firms' profitability (Lins et al., 2017; Chen et al., 2018), investment (Ioannou and Serafeim, 2015; Benlemlih and Bitar, 2018; Raghunandan and Rajgopal, 2022), debt maturity (Benlemlih, 2015), cost of capital (Bae et al., 2019), firm risk (Albuquerque et al., 2020), and improves market efficiency (Cao et al., 2018). CSR activities have not only emerged as a tool to alleviate information asymmetry and address agency problems but have also created a platform for dialogue with market participants through cheap talk. However, existing research predominantly focuses on the impact of CSR performance, whereas less attention has been given to the information content in CSR reporting disclosures and its influence on managerial rent extraction. This study aims to scrutinize the quality of voluntary disclosures and mandatory disclosures in conjunction with insider trading profitability, thereby contributing to an enriched understanding of the implications of these disclosures.

How does the profitability of insider trading elucidate key insights pertaining to voluntary Corporate Social Responsibility (CSR) disclosure and mandatory CSR disclosure? The insiders of a firm often prefer opacity to safeguard their private benefits of control or informational rents (Rajan and Zingales, 1998). Previous research

[1] Mentioned in the "Global Sustainable Investment Review 2022." https://www.gsi-alliance.org/wp-content/uploads/2023/12/GSIA-Report-2022.pdf

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indicates that insider trading serves as an indicator of managers' private information regarding a firm's future prospects (Merton, 1987; Diamond and Verrecchia, 1991). Informed insider trading stands out as one of the most direct and credible signals of managers' private information, representing insiders exploiting their superior knowledge. Given that both insider trading and CSR reporting disclosure are connected to managers' private information, insider trading can serve as a signal to investors, aiding in the verification of both the credibility of voluntary disclosure and mandatory disclosure and their influencing decisions related to constraining managerial rent extraction. This study leverages insights from trading activities by insiders, such as officers and directors, in the shares of their own firms to furnish investors with valuable information for assessing the credibility of voluntary disclosure and mandatory disclosure.

This study investigates the impact of voluntary and mandatory CSR disclosure on insider trading profitability. The effects of voluntary and mandatory CSR disclosure on insider trading profitability are mixed. On the one hand, firms engaging in voluntary CSR disclosure may accrue benefits such as exploring external resources, mitigating the adverse effects of negative events, cultivating a positive firm reputation, projecting a favorable social image, and consequently advancing managerial careers. Prior research suggests that such firms can raise greater amounts of equity capital at a lower cost and diminish stakeholders' negative assessments when confronted with negative events (Jiraporn et al., 2014; Oikonomou et al., 2012; Cheng et al., 2014; Benlemlih, 2015; Shiu and Yang, 2017). Chi et al. (2013) demonstrate that firms engaging in voluntary reporting exhibit superior corporate governance practices compared to nonvoluntary reporting firms, resulting in a lower cost of debt for external financing. Furthermore, Chi et al. (2020) find that CSR disclosure is associated with favorable credit ratings and a lower cost of debt. In summary, a voluntary and flexible approach

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is anticipated to sustain public and corporate interest in the non-financial reporting agenda, thereby fostering reporting quality. It is hypothesized that voluntary CSR disclosure is more credible than mandatory CSR disclosure, leading to higher-quality reporting and diminished insider trading profitability.

On the contrary, the greenwashing theory posits that firms exhibit a preference for emphasizing observable aspects while neglecting unobservable dimensions. For instance, fast-fashion firms may adopt green practices by utilizing eco-friendly materials, yet they may pay insufficient attention to working conditions and broader environmental issues in the production process (Morgan, 2015). Nevertheless, the implementation of legal requirements can serve as a remedy to this issue. Hess (2007) contends that mandatory reporting rules legitimize the public's entitlement to non-financial information and, through enhanced accessibility, intensify stakeholder scrutiny. Additionally, Christensen et al. (2021) regard CSR standards as ostensibly prescribing more comprehensive (or higher-quality) CSR reporting and/or more comparable CSR reporting, thereby rendering the information more informative relative to the existing status quo. Consequently, firms that voluntarily engage in CSR disclosure are posited to be less credible than those engaging in mandatory CSR disclosure, thereby resulting in lower-quality reporting and increased profitability through insider trading.

China stands as the world's largest exporter and the second-largest importer of goods, ranking among the most prominent manufacturing economies. The introduction of capitalist market principles in 1978 catalyzed a transformative and expansive shift in China's economic landscape. Projections anticipate a continuous growth in China's per capita GDP, reaching 12,670 U.S. dollars by 2022.[2] The country's economic

[2] https://www.statista.com/statistics/270439/chinas-share-of-global-gross-domestic-product-gdp/

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development, however, has been heavily reliant on energy-intensive and environmentally taxing industries, contributing nearly one-third of the annual gross domestic product (GDP). This pursuit of economic growth in China has come at the cost of long-term environmental degradation and a neglect of social sustainability. Recognizing the pressing need to address environmental concerns, improve product quality, and reduce societal inequalities, the Chinese government has initiated efforts to promote Corporate Social Responsibility (CSR) practices.

While the existing CSR literature predominantly focuses on either voluntary CSR initiatives by corporations or mandatory CSR regulations, there is a scarcity of research comparing information disclosure practices between firms engaging in voluntary CSR disclosure and those adhering to mandatory CSR disclosure. Our paper seeks to fill this gap by providing valuable insights and practical applications regarding regulatory changes, ultimately aiding investors in mitigating financial risks.

In this paper, we investigate the impact of voluntary and mandatory CSR disclosure in insider trading profitability by using a sample of Chinese listed firms covering 2007–2020. We document a significant negative relationship between voluntary disclosure of CSR reporting while so as not to mandatory disclosure of CSR reporting. To bolster the robustness of our findings, we employ alternative definitions of insider profitability measures, abnormal insider trading, firm fixed effects, and incorporate additional control variables. To address potential endogeneity concerns, we utilize instrumental variable analysis and design the enactment of China's 2015 new Environmental Protection Law as a quasi-natural experiment, enhancing the establishment of a causal relationship and reduce self-selection bias.

Furthermore, we explore potential mechanisms underlying the relationship between voluntary (mandatory) CSR disclosure and insider trading profitability. Our hypothesis posits that voluntary CSR disclosure provides credible reporting, enabling

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investors to evaluate a firm's long-term value, investment strategy, and risk. Consequently, this restricts managers' latitude to exploit their superior information for profitability. In the channel test, we employ informational risk, information asymmetry, and corporate governance as dependent variables. Our findings indicate that firms with voluntary CSR disclosure exhibit lower informational risk, lower analysts' forecast errors, higher analyst coverage, and stronger internal control, while firms with mandatory CSR disclosure show opposite results.

Additionally, we plan to conduct supplementary tests to reinforce the notion that voluntary CSR disclosure indicates high transparency and reducing information trading among insiders. Firstly, we investigate whether the negative relation between voluntary CSR disclosure and insider trading profitability is intensified for firms newly added to the CSR list. We find that firms that are newly added to the CSR list will enhance the negative relation between voluntary CSR disclosure and insider trading profitability. Secondly, we disaggregate insider trading into insider sales and insider purchases. In terms of the insider selling strategies, we find that voluntary CSR disclosure significantly mitigates insider sales profitability, while there is no significant relation for firms with mandatory CSR disclosure. These results would support the contention that voluntary CSR disclosure may provide credible CSR reporting and mitigate the possibility of insiders utilizing private information to trade their own shares in the market.

Our study contributes to the literature in several noteworthy ways. Firstly, to the best of our knowledge, this study represents the first attempt to scrutinize the relationship between voluntary (mandatory) CSR disclosure and insider trading profitability. While previous research has predominantly focused on the quality and consequences of financial reporting, limited attention has been directed towards understanding the quality of non-financial reporting, particularly in the context of CSR

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reporting. Given that CSR reporting may differ from financial reporting by reflecting the financial implications of a firm's primary and routine business activities, our study fills a critical gap by providing empirical evidence on the credibility of voluntary CSR disclosure and its impact on insider trading profitability.

Secondly, when capital providers, including owners and suppliers, lack direct observation of managerial actions, they increasingly rely on financial reporting as a monitoring tool to mitigate agency problems (Burgstahler et al., 2006). The disclosure of financial reporting plays a pivotal role in enabling investors to assess a firm's long-term value, investment strategy, and risk. However, concerning non-financial reporting, such as CSR reports, an ongoing debate persists among scholars and practitioners regarding the credibility of voluntary CSR disclosure compared to mandatory CSR disclosure in terms of disclosure quality. We provide empirical insights to elucidate which information is credible between voluntary and mandatory CSR disclosure.

Lastly, our findings bear relevance to regulators, standard setters, and investors. Information pertaining to firm strategy assumes a pivotal role in financial analysis, offering valuable insights for investors to assess a firm's ability to navigate changes in external competitive and regulatory environments. Our investigation explores how compliance with CSR reporting regulations shapes the legal landscape for insider trading and assesses whether stringent regulations serve as effective deterrents for insiders. This aspect holds implications for regulatory practices and standards governing CSR reporting, thereby contributing to the broader discourse on corporate governance and accountability.

This paper is organized as follows: Section 2 describes the related literature and hypotheses development. Section 3 presents data and variable measurements. Section 4 reports model specification, main results, endogeneity tests and robustness tests. Section 5 examines mechanism. Section 6 reports our additional analysis, including

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change of CSR list, insider trading strategies and a discussion of the economic consequences. Finally, Section 7 concludes the paper.

2. Literature review and hypothesis development

2.1 The voluntary CSR disclosure and reporting quality

The key relationships we develop to test our hypotheses involve the connections among voluntary and mandatory CSR disclosure, reporting quality, and insider trading profitability. The voluntary disclosures refer to information that exceeds legal requirements. The managers choose to provide accounting and other information deemed relevant to the decision needs of users of the annual report. The various factors motivate corporations to disclose information voluntarily. According to the resource-based view of the firm theory, managers investing in CSR activities have a higher probability of gaining financial benefits for the firm compared to those without CSR activities. For instance, firms with CSR disclosure can raise a greater amount of equity capital at a lower cost (Oikonomou et al., 2012; Jiraporn et al., 2014; Cheng et al., 2014; Benlemlih, 2015).

Additionally, initiating CSR activities is associated with an "insurance-like effect," where a positive social image helps reduce stakeholders' negative assessments of a firm when a negative event occurs. Thus, stakeholders lessen the punishment for firms facing such negative events (Godfrey, 2005; Gardberg and Fombrun, 2006; Godfrey, Merrill, & Hansen, 2009; Jiraporn et al., 2014; Christensen, 2016; Shiu and Yang, 2017). From the stakeholder theory, public firms are more likely to be subject to public scrutiny from customers and a greater proportion of institutional investors. The managers voluntarily report CSR activities because the discovery of unethical behaviors could result in significant reputation losses, jeopardizing both financial interests and social image (Klein and Leffler, 1981). In conclusion, the benefits of engaging in CSR

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activities, such as exploring outside resources, mitigating the downside effects of negative events, developing a firm's reputation, projecting a positive social image, and advancing personal careers, motivate managers to voluntarily report CSR activities.

The financial reporting is a prerequisite for firms seeking access to public equity markets, and the reporting incentives linked to the prospect of external financing likely play a pivotal role in driving reporting quality and corporate governance. Chi et al. (2020) find that CSR disclosure is associated with favorable credit ratings and a lower cost of debt. A voluntary and flexible approach is expected to sustain public and corporate interest in the non-financial reporting agenda, fostering overall reporting quality.

However, when there is asymmetric information between firms and consumers concerning the motives and activities of firms, greenwashing may accompany voluntary CSR disclosure as a means to conceal true incentives. Greenwashing is characterized by the intentional misleading or deceiving of consumers with false claims about a firm's environmental practices and impact (TerraChoice, 2010; Lyon and Montgomery, p.225). While some companies genuinely reduce their environmental footprints, others overstate their efforts or falsely assert environmental responsibility (Garfeld, 1991). For instance, although fast-fashion firms may adopt eco-friendly materials, they may neglect working conditions and environmental concerns during the production process (Morgan, 2015). Kolk and Pinkse (2010) argue that voluntary reporting can lead to less comprehensive disclosure by a limited number of firms, prompting a call for regulation. Previous studies indicate that greenwashing not only undermines favorable perceptions (Darke and Ritchie, 2007) and company profitability (Du, 2015) but, more significantly, can result in ethical harm (Nyilasy et al., 2014). Wu et al. (2020) propose that a lack of transparency provides a motivation for profit-driven firms to resort to greenwashing through observable investments. Conversely, when

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transparency is adequately high, it not only eradicates greenwashing but also serves as a catalyst for socially responsible firms to undertake further observable investments.

The greenwashing may result in opposite findings regarding the credibility of non-financial reporting. Grewal et al. (2023) furnish empirical evidence indicating that prior to the implementation of Mandatory Carbon Reporting (MCR) [3], UK firms refrained from disclosing environmentally impactful Greenhouse Gas (GHG) data.[4] Subsequent to the introduction of MCR, the mandate to disclose impactful GHG data resulted in a discernible decline in Unexplained Cumulative Abnormal Returns (UCD).

2.2 The mandatory CSR disclosure and reporting quality

Compared to voluntary CSR disclosure, many jurisdictions are contemplating reporting mandates. Mandatory disclosures encompass information that must be published in compliance with laws, legal requirements, stock exchange or capital market regulations, or standards set by accounting authorities. The purpose of mandatory disclosure is to fulfill user information needs and ensure that the preparation of the annual report aligns with regulatory requirements. A primary benefit of corporate disclosure is to mitigate information asymmetries between the firm and its investors as well as among investors. Hess (2007) asserts that mandatory reporting rules legitimize the public's entitlement to non-financial information and, through increased accessibility, intensify stakeholder scrutiny. Christensen et al. (2021) suggest that CSR standards purportedly mandate

[3] The concept of Mandatory Carbon Reporting (MCR) was initially introduced within the framework of the UK Climate Change Act of 2008. This legislative initiative mandates companies to disclose information pertaining to both direct and indirect Greenhouse Gas (GHG) emissions. Direct emissions emanate from the combustion of fuels in various contexts, including stationary buildings, equipment, transportation vehicles, and industrial processes. Indirect emissions, on the other hand, arise from the consumption of purchased electricity, heat, steam, or cooling.

[4] The GHG Protocol stands as the preeminent greenhouse gas accounting standard, garnering widespread adoption. It finds application in esteemed entities such as the California Climate Action Registry, the World Economic Forum Global Greenhouse Gas Registry, and national programs including the US Environmental Protection Agency Greenhouse Gas Reporting Program and the Tokyo Emissions Scheme. It can be accessed here: https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf.

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CSR reporting that is more extensive or of higher quality, and potentially more comparable, thereby offering greater informativeness compared to the current state. Roy et al. (2022) posit that companies adhering to the mandate encounter significantly elevated stock market liquidity relative to non-CSR firms during the post-CSR mandate period. Their results align with the notion that mandatory CSR regulation could lead to reduced information asymmetry and improved social and reputational capital.

However, the efficacy of reporting mandates remains a subject of controversy within the existing literature. Critics of mandatory reporting argue that the development of non-financial reporting should occur organically, rejecting universally imposed solutions due to the inherent diversity among companies (ICC, 2015). Xue et al. (2023) argue that the situation in emerging markets is inherently intricate. Due to the high cost associated with the mandatory disclosure of annual Corporate Social Responsibility (CSR) reports, mandatory CSR disclosure only applies to a subset of companies rather than being a requirement for the entire market in many emerging markets, such as India, Thailand, and Korea. Specifically, disclosure carries both direct and indirect costs, which may offset the aforementioned benefits.[5] For smaller firms, proprietary costs emerge, particularly for specific or detailed disclosures, posing a substantial burden (e.g., Bens et al., 2011; Leuz et al., 2008). Liang et al. (2024) discover that firms subject to mandatory Corporate Social Responsibility (CSR) reporting encounter heightened financial constraints following the mandate for reporting on carbon emissions implemented in 2008. Additionally, more detailed reporting may impede firms' innovation incentives (e.g., Breuer et al., 2020), and overly optimistic forward-looking disclosures could expose firms to heightened litigation risk (e.g., Johnson et al., 2001; Rogers et al., 2011).

[5] The direct costs encompass the preparation, certification, and dissemination of accounting reports. Indirect costs may manifest in the form of proprietary costs, as the information supplied to investors is accessible to multiple audiences.

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Furthermore, reporting standards inherently involve a degree of discretion, implying that factors extending beyond mere compliance with the standards influence reporting practices and outcomes, including managerial incentives and other institutional arrangements. Consequently, motivations at the firm level significantly contribute to substantial and predictable variations in reporting outcomes. While reporting standards and their effective enforcement can partially mitigate this variation, compulsory reporting may potentially divert attention from the substantive significance of standardized indicators. Instead, it may foster a procedural 'tick the box' approach, providing minimal value to stakeholders (de Colle, Henriques, and Sarasvathy, 2014, p. 185).

In this paper, we explore whether and how voluntary or mandatory CSR disclosures are associated with reporting quality and impact insider profitability.

2.3 Insider profitability and reporting quality

Due to the information asymmetry between shareholders and executives, external analysts rely on financial statements to assess a firm's performance. The literature has extensively documented that dependable financial reporting serves as a crucial mechanism for firms to communicate credible information to external stakeholders, aiding them in making resource allocation decisions and evaluating management's performance (Beyer et al., 2010). Given the separation of ownership and control, there are incentives for self-interested managers to extract rents from shareholders (Jensen and Meckling, 1976), with insider trading being one mechanism for managers to achieve this (Baiman and Verrecchia, 1996). When insiders engage in trading based on undisclosed information, they are more likely to profit, extracting rents from current shareholders. Previous research indicates that less reliable financial information diminishes the precision of outsiders' information and contributes to divergent beliefs

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about a firm's value in the market, thereby enhancing insiders' information advantage (Lambert et al., 2007; Gu and Li, 2012). Similarly, if a firm produces a less comprehensible annual report, it elevates information opacity, facilitating managers in exploiting resources for self-serving purposes (Biddle et al., 2009; Huang and Zhang, 2012).

We define the profitability of insider trading as the capital gains resulting from purchases and the losses avoided through the sale of shares. If insider trades merely reflect information already incorporated into stock prices, the average insider trading profitability should be zero. Conversely, insider trading profitability will exceed zero when managers engage in trading based on their private information.

2.4 Hypothesis

Given the substantial body of research highlighting the value of CSR performance to a firm's corporate governance (Adhikari, 2016; Liao et al., 2018; Gerwing et al., 2022), investment (Ioannou, 2015; Raghunandan and Rajgopal, 2022), market efficiency (Cao et al., 2018), and overall firm performance (Lins et al., 2017; Chen et al., 2018), it is evident that CSR considerations play a crucial role across various dimensions of a company's operations. However, there is a notable gap in the literature regarding the extent to which the credibility of voluntary (mandatory) CSR disclosure impacts insider trading. If voluntary CSR disclosure signifies a firm's commitment to meeting social expectations and enhancing social and reputational capital, it may contribute to a higher quality of reporting. When the overall transparency of the firm's information environment experiences a significant boost, the divergence in the market's beliefs about the firm's value decreases, leading to a lower probability of informative insider trading.

Nevertheless, an alternative perspective on voluntary CSR disclosure is rooted in the greenwashing theory, wherein firms prioritize observable aspects while neglecting

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unobservable dimensions. Firms have the flexibility to allocate different levels of CSR spending to their visible activities compared to their less observable ones. For instance, despite fast-fashion firms adopting eco-friendly materials, they may appear to pay less attention to working conditions and environmental issues in the production process (Morgan, 2015). Kolk and Pinkse (2010) argue that voluntary reporting results in less comprehensive disclosure by a limited number of firms, warranting regulatory intervention. Thus, we posit the opposing hypothesis that:

H1a: The voluntary CSR disclosure is negatively related to the insider trading profitability.

H1b: The voluntary CSR disclosure is positively related to the insider trading profitability.

In contrast to voluntary CSR disclosure, mandatory disclosures compel firms to adhere to regulatory requirements (Hess, 2007) that mitigate information asymmetries between the firm and its investors as well as among investors. The obligatory reporting rules serve to legitimize the public's entitlement to non-financial information and, through heightened accessibility, intensify stakeholder scrutiny (Christensen et al., 2021). Thus, disclosure can mitigate the adverse selection problem, increase the liquidity of secondary securities markets and lower the return that investors require for investing in firm stock. The disclosure can make it easier for investors to estimate future cash flows and covariances between them, lowering the cost of capital (e.g., Easley and O'Hara, 2004; Lambert et al., 2007; Lambert et al., 2011). Standardized CSR reporting is deemed more informative and significantly enhances stock market liquidity (Christensen et al., 2021; Roy et al., 2022).

However, disclosure entails both direct and indirect costs, which may

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counterbalance the aforementioned benefits. Particularly for smaller firms, proprietary costs arise in association with specific or detailed disclosures, imposing a substantial burden (e.g., Bens et al., 2011; Leuz et al., 2008). Liang et al. (2024) observe that firms mandated to report on Corporate Social Responsibility (CSR) experience increased financial constraints after the implementation of the mandate. Moreover, detailed reporting may impede firms' incentives for innovation (e.g., Breuer et al., 2020), and excessively optimistic forward-looking disclosures could expose firms to heightened litigation risk (e.g., Johnson et al., 2001; Rogers et al., 2011). Furthermore, reporting standards inherently encompass a degree of discretion, indicating that factors extending beyond mere compliance with the standards influence reporting practices and outcomes, including managerial incentives and other institutional arrangements. While reporting standards and their effective enforcement can partially mitigate this variation, compulsory reporting may potentially shift attention away from the substantive significance of standardized indicators. Instead, it may foster a procedural 'tick the box' approach, offering minimal value to stakeholders (de Colle, Henriques, and Sarasvathy, 2014, p. 185). Thus, we posit the hypothesis that:

H2a: The mandatory CSR disclosure is negatively related to the insider trading profitability.

H2b: The mandatory CSR disclosure is positively related to the insider trading profitability.

3. Data and variable measurements

3.1 Sample selection

The data collection strategy involves sourcing standalone voluntary CSR disclosure reports from Hexun CSR rating database and Wind. Prior research on CSR issue in

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China's context primarily utilizes Rankins CSR ratings (RKS) and Hexun CSR ratings. Compared to RKS, Hexun draws from a broader range of information sources and is more objective, encompassing five primary CSR categories: shareholder equity responsibility, employee responsibility, supplier and consumer rights responsibility, environmental responsibility, and social responsibility contribution (Li and Guo, 2022).

Insider trading data is sourced from China Stock Market and Accounting Research (CSMAR) database. Data pertaining to firm ownership, stock returns, and financials are obtained from CSMAR. The data on Confucianism was obtained from the Chinese Research Data Services (CNRDS) database. To enhance data quality and address concerns related to outliers, we exclude firms in the financial industries and firm-year observations with negative equity. Furthermore, we employ winsorization to trim extreme values at the 1% and 99% levels for all continuous variables. The final sample comprises 10,220 firm-year observations for 2,740 unique firms.

3.2 Variable definition

Following Wang et al. (2018), voluntary CSR disclosure (*Voluntary*) is an indicator variable that takes a value of 1 if a firm voluntarily issues a CSR report in a given year, and 0 otherwise. Similarly, mandatory CSR disclosure (*Mandatory*) is an indicator variable that takes a value of 1 if a firm mandatorily issues a CSR report in a given year, and 0 otherwise.

In accordance with Skaife et al. (2013) and Dai et al. (2016), we formulate an aggregate metric for insider trading profits, encompassing factors such as the disparity between the market price of the stock and its valuation derived from private information (Aboody and Lev, 2000), the volume of traded shares (Ali et al., 2007), and the frequency of trading (Anderson et al., 2012). The profitability of insiders' trades is expressed as:

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$$INSPRF_{\mathrm{i,t}} = \frac{\sum_{\mathrm{j=1}}^{\mathrm{k}} \mathrm{BHAR_{i,t,j}} \times \mathrm{DPV_{i,t,j}} - \mathrm{BHAR_{i,t,j}} \times \mathrm{DSV_{i,t,j}}}{\mathrm{MVE_{i,t-1}}} \times 100 \quad (1)$$

Where for firm i and year t, the notation $BHAR_{i,t,j}$ represents the 6-month 9-month, 12-month buy-and-hold abnormal returns for the period commencing one day after the transaction date j, separately. $DPV_{i,t,j}$ $(DSV_{i,t,j})$ denotes the total dollar value of shares purchased (sold) by all insiders on day j, where k is the total number of firm-days with insider trading activities, and $MVE_{i,t-1}$ is the market value of equity. The right-hand side of the equation is multiplied by 100 to express profitability as a percentage of the market value at the beginning of the year. Following established research practices, we include firm-year observations with no insider trading, setting *INSPRF* equal to 0.

Table 1 includes summary statistics for the full sample in this study. The mean of *Voluntary* (*Mandatory*) is 0.862 (0.111), which indicates that 86.2% of firms in the sample disclosure CSR activity voluntarily. The mean of 6 MON-INSPRF, 9 MON-INSPRF and 12 MON-INSPRF are 0.023, 0.032 and 0.047, respectively. Table 2 presents the correlation coefficients across all variables. The negative correlations between voluntary CSR disclosure and insider trading profitability reveal that stronger CSR performance is associated with lower profits from insider trading while mandatory CSR disclosure has opposite results.

[Insert Table 1and Table 2]

4. Empirical results

4.1 Model specification

In the baseline regression, we examine the influence of voluntary corporate social responsibility (CSR) disclosures on insider trading profits. We employ the subsequent ordinary least squares (OLS) regression model, with standard errors clustered at the firm and year levels:

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$$INSPRF_{i,t+1} = \beta_0 + \beta_1 Voluntary_{i,t}(Mandatory_{i,t}) + \beta_2 Control_{i,t} + Industry\ FE + year\ FE + \varepsilon_{i,t+1} \quad (2)$$

where $INSPRF_{i,t+1}$ represents the post-transaction profitability for all insider trades in year t+1, calculated at 6-, 9-, and 12-months after the transaction month, respectively. The independent variables are voluntary and mandatory CSR disclosure, respectively. *Voluntary* (*Mandatory*) is an indicator, defined as a firm that voluntarily (mandatorily) discloses its CSR activities in a given year.

The vector $Control_{it}$ represents a set of firm-level variables. To account for the impact of firm characteristics on insider trading profitability, we incorporate controls for firm size (*SIZE*), return on assets (*ROA*), and book-to-market ratio (*BM*) (Skaife et al., 2013; Li and Ji, 2021). Consistent with He et al. (2016), we include a control for the shareholding of the largest shareholder (*TOP1*) to capture the effects of ownership structure on insider trading profitability. Additionally, we incorporate controls for the lagged one-year raw return (*RET*) (Li and Ji, 2021) and idiosyncratic volatility (*IdiosynVol*) (Fu et al., 2020), along with time and industry fixed effects.

4.2 Voluntary and mandatory CSR disclosures and insider trading profitability

We investigate the impact of voluntary and mandatory CSR disclosure by firms on insider trading profitability. Table 3 presents the results derived from the analysis of Equation (2) using ordinary least squares (OLS). In models (1), (3), and (5), we utilize the dependent variable representing insider trading profitability over 6 months (6MON-INSPRF), 9 months (9 MON-INSPRF), and 12 months (12 MON-INSPRF), respectively. The coefficient in model (1) indicates that firms with voluntary CSR disclosure experience a modest decrease in profitability for insiders, amounting to approximately -0.0131 over a 6-month period. In model (3), focusing on insider trading

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profitability over 9 months results in a decrease in the coefficient to -0.0151. In model (5), we observe that the coefficient of voluntary CSR disclosure is significantly negatively associated with 12 MON-INSPRF, amounting to approximately -0.0290 at the 1% significance level. The product of this coefficient (-0.0290) and the mean 12 MON-INSPRF (0.047) from Table 1 indicates that voluntary CSR disclosure decreases 12 MON-INSPRF over one year by 61.7%.[6]

In particular, the coefficient associated with voluntary CSR disclosure exhibits a decreasing trend over time, and its impact becomes more statistically significant. For instance, the coefficient for voluntary CSR disclosure is -0.0131 (with a t-value of -1.73) at 6 months, -0.0151 (with a t-value of -2.47) at 9 months, and -0.0290 (with a t-value of -3.16) at 12 months. Collectively, these empirical findings suggest a negative association between voluntary CSR disclosure and insider performance.

In models (2), (4), and (6), we substitute the independent variable with mandatory CSR disclosure and examine its impact on 6 MON-INSPRF, 9 MON-INSPRF, and 12 MON-INSPRF. Model (2) reveals that a unit increase in mandatory CSR disclosure leads to a 0.0223 increase in the probability of insider trading profitability. In models (4) and (6), the coefficient of mandatory CSR disclosure remains positive and significant at the one percent level even after considering insider trading profitability over 9 months and 12 months. These results are also economically significant; in model (6), insider trading profitability over 12 months increases by 71.4% following mandatory CSR disclosure.[7]

The findings support hypotheses 1a and 2b, suggesting that firms voluntarily disclosing CSR reports experience an increase in CSR reporting quality and lower

[6] -0.029/0.047=0.617, where -0.029 is coefficient of voluntary CSR in model (5), and 0.047 is the mean of 12MON-INSPRF.

[7] 0.0336/0.047=0.714, where 0.0336 is coefficient of mandatory CSR in model (6), and 0.047 is the mean of 12MON-INSPRF.

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information asymmetry, thereby leading to lower insider trading profitability. However, firms with mandatory CSR disclosure face greater disclosure costs, as reporting standards inherently encompass a degree of discretion that leads to lower CSR reporting quality, ultimately resulting in higher insider trading profitability.

[Insert Table 3]

4.3. Endogeneity tests and Robustness tests

4.3.1. Alternative measure of insider trading: Insider trading strength and Frequency

In this section, we conducted various robustness tests and endogeneity tests to confirm that our results are not driven by endogeneity problems. First, we strengthen our main finding by extending the analysis to insider trading intensity and insider trading frequency, capturing trading behavior from the perspective of traded volume and the number of transactions. Following Akbas et al. (2020), we quantify the intensity of insider trading signals (*STR*) by generating a proxy measure of an insider's monthly order flow as a percentage of the total stock trading volume. Additionally, consistent with Cui et al. (2015), we calculate insider trading frequency (*Frequency*) as the natural logarithm of one plus the annual number of insider transactions.

Panel A of Table 4 presents the results. voluntary CSR disclosure effectively reduces both insider trading intensity and insider trading frequency, with the coefficients on *Voluntary* being negatively significant at the 5% level for insider trading intensity and being negatively significant at the 1% level for insider trading frequency. In contrast, firms with mandatory CSR disclosure significantly positively influence insider trading frequency, while those are positive but not significant for insider trading intensity. These results are consistent with our baseline findings, further indicating that voluntary CSR disclosure, with its higher report quality, imposes stronger constraints on insider trading behavior.

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4.3.2 Alternative measure of insider trading: Abnormal insider trading

The behavior of informed traders is reflected in both volume and price. In the previous section, we examined the impact of voluntary and mandatory CSR disclosure on insider trading intensity and insider trading frequency. Building on those findings, we further analyze how CSR disclosure influences abnormal insider trading. Following Yang et al. (2019), we define abnormal insider trading (*AIT*) as the difference in insider trading between the pre-earnings-announcement and non-earnings-announcement periods. The pre-earnings-announcement period is five days [−5, −1] prior to earnings announcements, and the non-earnings-announcement period excludes days around earnings announcements [−5, 5]. The measurement of insider trading involves calculating the annualized daily proportion of shares traded. Alternatively, we employ abnormal net insider trading (*AITNET*) to proxy abnormal insider trading, measured as the difference between insider purchase and insider sales of stocks. We select earnings announcements as the information-intensive event for the following reasons. First, informed trading practices are pervasive prior to earnings announcements (Kim and Verrecchia, 1997; Bamber et al., 2011; Brennan et al., 2016; Back et al., 2018). Second, as the most value-related information event, companies utilize earnings announcements to disclose their past profitability and assist investors in predicting their future performance (Beyer et al., 2010).

Panel B of Table 4 displays the regression results investigating the influence of voluntary and mandatory CSR disclosure on abnormal insider trading. The coefficients associated with voluntary CSR disclosure are consistently negative and statistically significant at the 1% level for both abnormal insider trading (*AIT*) and abnormal net insider trading (*AITNET*). Conversely, the coefficients linked to mandatory CSR disclosure are positive and significantly significant at the 1% level. These results

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reinforce our earlier findings, indicating that voluntary CSR disclosure effectively restricts abnormal insider trading and abnormal net insider trading. In contrast, mandatory CSR reporting amplifies abnormal insider trading and abnormal net insider trading. The reduction in opportunistic trading activity surrounding voluntary CSR disclosures seems to curtail insiders' ability to exploit their informational advantage, thereby safeguarding the interests of other shareholders.

In summary, by examining alternative measures of trading behavior, we provide corroborating evidence that voluntary CSR disclosure plays a role in mitigating insider profits.

4.3.3 Firm fixed effect

To address concerns regarding potential firm-level heterogeneity influencing our results, we introduced firm fixed effects to account for variations in insider trading profitability attributed to time-invariant, firm-specific characteristics. The results are presented in Panel C of Table 4. The coefficients on voluntary CSR disclosure remain negative and significant for insider trading profits across different time horizons. In contrast, the coefficients on *Mandatory* are positive and marginally significant for 9 MON-INSPRF, consistent with our main regression results. By incorporating firm heterogeneity through fixed effects, we offer robust evidence that voluntary CSR disclosure specifically curbs insider trading.

4.3.4 Additional control variables

We conducted further tests to verify that the findings are not confounded by correlated omitted variables, such as firm and CEO characteristics, risk-taking, and analyst oversight. Following Akbas et al. (2020), we calculate the following variables for our regression analysis. *Asset GR* represents asset growth, accounting for firm

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performance. *CEO Age*, *CEO Gender,* and *CEO Ph.D*. degree are representative CEO characteristic variables, designed to capture individual effects. *CEO Age* denotes the age of a CEO in a specific year. *CEO Gender* is an indicator that is equal to one if the CEO is male and zero otherwise. *CEO Ph.D.* is an indicator that is equal to one if the CEO has a Ph.D. degree and zero otherwise.

Concurrently, given that legal risk and analyst monitoring can directly influence insider trading incentives, we controlled for risk-taking and analyst talent to rule out these channels. In line with To et al. (2018), we used analyst forecast dispersion (*DISP*) to proxy for analyst monitoring. *DISP* is the standard deviation of the earnings forecast divided by the mean of the earnings forecast. Following Bhagat et al. (2015) and Houston et al. (2010), we then used the Z-score (*Z-score*) and volatility of ROA (*VolRoa*) to measure risk appetite. *Z-score* is the sum of ROA and CAR divided by the standard deviation of ROA. *VolRoa* is the standard deviation of ROA over rolling five-year periods.

The results reported in Panel D of Table 4 demonstrate that our baseline regression results remain consistent after controlling for CEO characteristics, risk-taking, and analyst oversight. Consequently, our baseline conclusions are not driven by omitted variable bias from these sources.

[Insert Table 4]

4.3.5 Instrumental variables

We further employ the instrumental variable approach to enhance the establishment of causality. The ideal instrumental variable should be correlated with the endogenous explanatory variable but not directly affect the dependent variable. Following He et al. (2022), we use the intensity of Confucian culture (*Confucian*) in the city where the firm is located to instrument for corporate CSR performance. At the national level, cultural

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and institutional factors are important determinants of CSR practices (Cai et al., 2016). In China, Confucianism is the most influential philosophy, advocating values like benevolence and honesty that align with CSR principles of stakeholder responsibility (Ip, 2009). The extent of Confucian influence varies across regions due to China's geographical span. Therefore, the intensity of local Confucian culture can impact corporate CSR orientation. As such, Confucian cultural intensity satisfies the relevance and exogeneity conditions for a valid instrument.

We follow Chen et al. (2021) in using the historical number of Confucian temples in the city where the firm is located as a proxy for Confucian cultural intensity. The temple numbers are obtained from the Chinese Research Data Services (CNRDS) database. Additionally, following Bofinger et al. (2022), we employ industry CSR scores (*IndCSR*) as another instrumental variable. The industry averages provide exogenous variation in CSR associated with peer performance but uncorrelated with the error term.

In the first-stage, we regress *Voluntary* and *Mandatory* on the instrumental variable, Confucian cultural intensity (*Confucian*) and Industry CSR scores (*IndCSR*), and all other control variables. In the second stage, we regress the fitted values (Instrumented variables) obtained from the first-stage regression on insider trading profitability. Panel A of Table 5 present the first-stage regression results. Consistent with previous main findings, the coefficients of the instrument, *Confucian* and *IndCSR*, are significantly positive on voluntary CSR firms while those are significantly negative on mandatory CSR firms. To ensure that our instruments are valid, we employ Sargan's (1958) test of over-identifying restrictions. Since the Sargan (1958) test statistics are not significant, we cannot reject the null hypothesis that our two instrumental variables are uncorrelated with the residuals in the second-stage regression. To mitigate the weak-instrument concern, we report F-statistic of excluded instrument in the column (1) and column (2).

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The F-statistic exceeds 10 and rejects the null hypothesis that the instrumental variable is weak (Staiger and Stock, 1997). This indicates that our instruments satisfy the necessary conditions for identification.

Panel B of Table 5 reports the results of the second-stage regressions, revealing that firms with voluntary CSR disclosure exhibit a negative and statistically significant impact on insider trading profitability. However, firms with mandatory CSR disclosure exhibit a positive and statistically significant impact on insider trading profitability. The results indicate that firms voluntarily disclosing CSR can reduce insider trading profitability, while firms mandated to disclose CSR can increase insider trading profitability.

[Insert Table 5]

4.3.6 Difference-in-differences

To further investigate the direct impact of CSR on insider trading profitability, we employ a difference-in-differences (DID) approach in conjunction with propensity score matching. Our analysis centers on the comparison of insider trading profitability before and after the enactment of China's 2015 new Environmental Protection Law,[8] which introduced a significant external regulatory shock aimed at bolstering CSR practices. Our primary focus is on companies that voluntarily disclose CSR reports, as they are more likely to actively enhance their CSR initiatives in response to the new regulatory framework. In contrast, companies subject to mandatory CSR disclosure requirements typically comply with disclosure rules but may not necessarily proactively strengthen their CSR practices (Tu et al., 2019; Zhang et al., 2019; Zhou et al., 2021).

[8] On April 24, 2014, the Eighth Session of the Standing Committee of China's 12th National People's Congress approved the revised Environmental Protection Law (EPL). This policy officially took effect on January 1, 2015, marking the first amendment to China's fundamental environmental law since its enactment 25 years earlier.

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Therefore, we consider the introduction of this policy as an exogenous shock that predominantly affects voluntary CSR disclosure. To estimate the effect, we construct the following difference-in-differences (DID) model:

$$INSPRF_{i,t+1} = \beta_0 + \beta_1 Post_t * Treated_i + \beta_2 Control_{i,t} + Firm\ FE + Industry\ FE + year\ FE + \varepsilon_{i,t+1} \quad (3)$$

More specifically, we designate the years 2009-2014 as the pre-period and 2015-2020 as the post-period following Zhang et al. (2019). When firms choose to disclose CSR reports voluntarily, "treated" is defined as 1. Conversely, when firms disclose CSR reports mandatorily, "treated" is defined as 0. Our primary explanatory variable of interest is the interaction term, $Post_t \times Treated_i$, which allows us to compare the changes in firms that voluntarily disclose CSR reports before and after the policy change relative to firms subject to mandatory CSR disclosure. This analysis will help us ascertain whether the regulatory change had a discernible effect on firms proactively engaging in CSR activities. To ensure the accuracy of the DID estimation results, we employ a one-to-one neighbor propensity score matching (PSM) method to match a control group to each treatment group of firms, based on firm characteristics, year dummy, and industry dummy variables. This matching approach rules out the possibility that our DiD estimation is driven by differences in firm characteristics. Panel A of Table 6 shows that after propensity score matching (PSM), the comparison indicates no significant differences across the two groups, suggesting that meaningful observable differences are removed by propensity-score matching.

To conduct a parallel trend analysis, we execute the model with seven indicator variables representing a three-year event window centered around the 2015 implementation of China's new Environmental Protection Law (EPL). This regression model enables us to assess the divergence between the treated and matched control

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firms in the three years leading up to the introduction of the new EPL. As shown in Panel B, the coefficients of the interaction terms lack statistical significance before the enactment of the new EPL, indicating that both the treated and matched control firms exhibit similar behavior during this period. A notable disparity emerges starting from the year of the new EPL's enactment. In essence, this outcome suggests an absence of pre-existing trends in insider trading profitability.

Most importantly, we implement the Difference-in-Differences (DiD) analysis by regressing insider trading profitability on an interaction term between Post and Treated indicators. In Panel C, the coefficients on the interaction term, *Post*× *Treated*, are all significantly negative for 6 MON-INSPRF, 9 MON-INSPRF, and 12 MON-INSPRF, indicating that voluntary CSR disclosure effectively reduces insider trading profitability after the enactment of the new Environmental Protection Law (EPL). In Panel D of Table 7, we conduct a random placebo test to eliminate the chance that our findings are influenced by unobserved factors aligning with the enactment of new EPL shocks. Collectively, these outcomes offer robust evidence supporting a causal and negative impact of voluntary CSR disclosure on insider trading profitability.

[Insert Table 6]

5. Possible Mechanisms

5.1 Informational risk

Our findings thus far demonstrate that voluntary CSR disclosure negatively affects insider trading profits, whereas mandatory CSR disclosure positively affects insider trading profits. In this section, we investigate potential channels through which CSR disclosure influences insider trading profitability. Previous studies suggest that managers have an incentive to invest in CSR activities because such activities help

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managers explore outside resources, mitigate the downside effects of negative events, develop a firm's reputation, project a positive social image, and advance personal careers (Oikonomou et al., 2012; Jiraporn et al., 2014; Cheng et al., 2014; Benlemlih, 2015). The profits from investing in CSR activities motivate managers to voluntarily provide high-quality CSR reporting. Thus, we hypothesize that firms with voluntary CSR disclosure that provide higher quality CSR reporting mitigate informational risk, information asymmetry, and enhance corporate governance, thereby hindering insider trading profits.

We follow the methodology outlined by Yang et al. (2019) to construct proxy variables for informational risk, which is defined as the return run-up prior to an upcoming earnings announcement surprise. If the run-up has the same sign as the surprise, it could indicate informed trading. Conversely, if the run-up increases only slightly or has the opposite sign to the earnings surprise, it is unlikely to be indicative of informed trading (Yang et al., 2019; Akbas et al., 2020). The construction method is as follows:

Firstly, considering that a private information advantage is a primary driver of insider trading, the earnings announcements of publicly traded firms constitute one of the most pivotal routine events for information disclosure. Insiders possess insights into forthcoming earnings well in advance of public disclosure. Following Livnat and Mendenhall's (2006) methodology, we employ the Standardized Unexpected Earnings (SUE) calculation method to delineate earnings surprises as follows:

$$SUE = \frac{EPS_{it} - MFEPS_{it}}{P_{it}} \quad (4)$$

Where EPS_{it} is the actual earnings per share (*EPS*) announced by firm *i* for fiscal year *t*; $MFEPS_{it}$, the median earnings forecast over the 90 days prior to earnings announcements for firm *i* in fiscal year *t*; and P_{it} is the stock price of firm *i* at the end

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of fiscal year *t*.

Next, the return run-up (CAR [-5, -1]) represents the cumulative abnormal return of a stock during the five days preceding the earnings announcement. CAR serves as a metric for the abnormal price change immediately preceding the earnings announcement. Lastly, the informational risk (RunUp) is measured as CAR multiplied by SUE, capturing the magnitude of informed return run-ups before earnings announcements. Alternatively, we introduce RunUpSign as a binary variable, assuming a value of one if CAR and SUE share the same sign; otherwise, it assumes a value of zero. A value of one for RunUpSign indicates the presence of information trading.

The results presented in Panel A of Table 7 reveal that voluntary CSR disclosure is negatively correlated with RunUp, achieving statistical significance at the 5% level. In Columns (3) and (4), we alternatively employ probit models to estimate the relationship between voluntary and mandatory CSR disclosure and RunUpSign. The findings indicate that the coefficient on voluntary CSR disclosure is significantly negative at the 5% level. In contrast, the coefficient on mandatory CSR disclosure is statistically insignificant. These outcomes suggest that voluntary CSR disclosure effectively mitigates informed trading, reducing the profits gained by insiders through the exploitation of private information for transactions. In contrast, mandatory CSR disclosure reporting does not mitigate such opportunistic utilization of private

5.2 Information asymmetry

We posit that firms with voluntary CSR disclosure are more likely to provide higher quality non-financial reporting and reduce asymmetric information, thereby impeding insider trading profitability. Richardson and Welker (2001) state that CSR disclosures can provide investors with information regarding future cash flows. Gao et al. (2016) argue that CSR disclosures reveal value-relevant information to investors and are hence

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useful to capital market participants in making investment decisions, regardless of the aggregate valuation implication of CSR activities. When the overall transparency of the firm's information environment experiences a significant boost along with firms' voluntary CSR disclosure, the divergence in the market's beliefs about the firm's value decreases, leading to a precise prediction about firms' future performance.

To test this channel, we employ measures of forecast error and analyst forecast dispersion to proxy information asymmetry (Lang and Lundholm, 1996; To et al., 2018). Analyst forecast dispersion is measured as the standard deviation of analyst forecasts divided by the mean analyst forecast value. Analyst forecast error is measured as the absolute value of the difference between realized earnings and estimated earnings scaled by the stock price as of the forecast date.

$$DISP = \frac{Std(FEPS_{it})}{Abs(MEPS_{it})} \quad (5)$$

$$ERROR = \frac{Abs[Mean(FEPS_{it}) - MEPS_{it}]}{Abs(MEPS_{it})} \quad (6)$$

Where $FEPS_{it}$ is the forecast actual earnings for firm i for fiscal year t, $MEPS_{it}$ is the mean earnings forecast for firm i in fiscal year t.

Panel B of Table 7 reports the results. We note that there are negative and significant associations, at the 1% level, between voluntary CSR and analyst forecast dispersion and forecast error, respectively. However, these effects are positive and significant at the 1% level for firms subject to mandatory CSR disclosure. The results indicate that through enhancing transparency, voluntary CSR performance seems to reveal more value-relevant information to market participants. In contrast, mandatory CSR compliance does not yield such benefits. These findings provide evidence that voluntary CSR disclosure and engagement, by improving the information environment, diminish opportunities for insiders to capitalize on their knowledge advantage.

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5.3 Corporate governance

Further, combining theoretical analysis with empirical testing, we examine the mechanism from the perspective of corporate governance. High-quality CSR performance has been shown to increase analyst attention (Gao et al., 2016) and attract positive media coverage (Cahan et al., 2015), leading to effective external monitoring. This enhanced external monitoring, in turn, strengthens external governance mechanisms. Additionally, companies often engage in CSR activities to uphold their reputation (Gelb and Strawser, 2001), promoting managers' self-regulation and improving internal governance mechanisms. Effective corporate governance also deters insider trading by establishing clear policies and procedures for managing sensitive information and by imposing sanctions on top management engaged in intentional insider trading (Dai et al., 2016). Hence, firms that voluntarily disclose CSR strengthen external monitoring and improve internal corporate governance, effectively discouraging insider trading behaviors. In other words, corporate governance acts as a channel through which firms with voluntary CSR disclosure reduce insider trading profits.

We select analyst coverage (Coverage) as a proxy variable for external monitoring pressure, calculated as the total number of unique analysts issuing earnings forecasts for a firm during the 12-month period before its fiscal year-end. According to the monitoring hypothesis, analysts play a crucial role in monitoring management behavior as an external monitoring mechanism. The market is pricing an increase in expected agency problems after a loss in analyst coverage (Chen et al., 2015). In addition, we use the internal control index (ICINDEX) to evaluate the quality of corporate internal control (Chen et al., 2017). This index provides a comprehensive assessment of a company's internal controls based on the COSO framework. Previous studies have shown that firms with better corporate governance have higher internal control quality

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(Zhang et al., 2007).

Panel C of Table 7 reports the results. In column (1) and column (2), the coefficient of voluntary CSR disclosure on analyst coverage (Coverage) is 0.5834, significant at the 1% level, while that of mandatory CSR disclosure on analyst coverage (Coverage) is -0.4991, significant at the 1% level. Similarly, voluntary CSR disclosure positively and significantly affects the internal control index (ICINDEX), whereas the coefficient of mandatory CSR disclosure is negative and significant at the 1% level. These results demonstrate that voluntary CSR disclosure engagement enhances corporate governance by attracting more analysts and strengthening internal controls. In contrast, mandatory CSR compliance does not deliver the same benefits.

6. Supplemental analyses

6.1 Move-in the CSR list

In the baseline regression, we demonstrate that firms voluntarily disclosing CSR information reduce insider trading profits. In this section, we further examine the impact of changes in CSR lists on insider trading profits by analyzing how the addition of stocks to the CSR list affects insider trading profitability. We compare the insider trading profits of these stocks before and after they are certified for the CSR list. The regression model used in this analysis is as follows:

$$INSPRF_{i,t+1} = \beta_0 + \beta_1 List\_change_{i,t} + \beta_2 List\_change_{i,t} \times X_{i,t} + \beta_3 X_{i,t} + \delta Control_{i,t} + \quad Industry\ FE + year\ FE + \varepsilon_{i,t+1} \qquad (7)$$

Where List_change is a proxy variable for a dummy variable that value equals to one if stocks are newly added to the CSR list. The $X_{i,t}$ indicates voluntary CSR disclosure and mandatory CSR disclosure. All control variables are consistent with the baseline model.

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The results in Table 8 show the impact of voluntary (mandatory) CSR disclosure on insider trading profitability after the stocks are newly added to the CSR list. The findings demonstrate that the interaction terms between voluntary CSR disclosure and List_In are negative and significant at the 1% level across 6 MON-INSPRF to 12 MON-INSPRF. Similarly, coefficients on the interaction terms between mandatory CSR and List_In are negative and significant at the 5% level on 6 MON-INSPRF and at the 1% level on both 9 MON-INSPRF and 12 MON-INSPRF. The results suggest that, whether for firms with voluntary disclosure or for firms with mandatory disclosure, insider trading profits significantly decline after joining the CSR list.

6.2 Insiders trading strategies

In this section, we alternatively focus on insiders' trading strategies to investigate which CSR disclosure could hinder managers from gaining profits by exploiting the information advantage. Previous research shows that insiders selling shares usually convey negative private information to the market (Seyhun, 1986). Cheng and Lo (2006) propose that shareholders experience actual losses when insiders sell shares due to proximate negative news instead of buying shares in anticipation of positive news. Meanwhile, if managers are motivated by sustainability concerns to engage in CSR, they prioritize shareholders' interests over their personal interests. As such, they will try to minimize losses to shareholders from insider sales (Stephen,1982). To examine the issue, we separate the profitability of insiders' trading strategies into purchases and sales and re-estimate Equation (2) using the insider purchase profitability and insider sales profitability as the dependent variables, respectively.

Panel A of Table 9 reports the impact of voluntary (mandatory) CSR disclosure on insider sales profitability. The coefficients of voluntary CSR disclosure are negative and significant at the 10% level or better for insider sales transactions. However,

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mandatory CSR disclosure is positive and significant at the 1% level on 9-month insider sold profitability, while it has no significant effect on 6-month and 12-month insider sold profitability. These findings suggest that firms voluntarily disclosing CSR reporting are not likely to exploit private information to gain sales profits. However, among firms with mandatory CSR disclosure, the motivation for managers to engage in CSR is mainly to comply with regulations rather than benefit shareholders.

Panel B of Table 9 reports the results of the relation between voluntary (mandatory) CSR disclosure and insider purchase profitability. The coefficients are not significant except for the firms with Mandatory CSR disclosure on 9-month insider buying profitability. These findings are consistent with Dai et al. (2016) that sales transactions convey more private information than purchase transactions.

In sum, voluntary CSR disclosure significantly reduces the profitability of insider sales but not for firms with mandatory CSR disclosure, suggesting that mandatory CSR disclosure does not effectively curb insider selling behaviors.

6.3 Economic consequences

This section concludes the empirical analysis by examining the implications of our findings for firm value, as measured by ROA and Tobin's Q. If voluntary or mandatory CSR disclosure reduces the opportunities for insider abnormal arbitrage based on private information, which would incentivize insiders to focus on value-enhancing initiatives, then voluntary or mandatory CSR disclosure could have a positive impact on firm value. To test this prediction, we analyze the influence of decreased abnormal insider trading following voluntary or mandatory CSR disclosure on firm value. Specifically, we estimate the following model:

$$\text{Value}_{i,t+1} = \beta_0 + \beta_1 \text{ Lower Abnormal insider trading}_{i,t} + \beta_2 \text{ Voluntary}_{i,t}$$

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$$\left(\text{Mandatory}_{i,t}\right) \times \text{Lower Abnormal Insider Trading}_{i,t} +$$
$$\beta_3\ \text{Voluntary}_{i,t}\left(\text{Mandatory}_{i,t}\right) + \delta\text{Control}_{i,t} + \text{Industry FE} +$$
$$\text{year FE} + \varepsilon \qquad (8)$$

Where *Value* reflects firm value creation, including return on assets (*ROA*) and Tobin's Q. Following Yang et al. (2019), the abnormal insider trading is proxied by abnormal insider trading (*AIT*) and abnormal net insider trading (*AITNET*). Specifically, we multiply the value of abnormal insider trading measures by -1 to capture the lower level of abnormal insider trading. The control variables are included in the same way as those in the previous regression that may affect firm value. We expect that a positive coefficient on the interaction terms $Voluntary \times Abnormal\ insider\ trading,$ implying that voluntary CSR disclosure and lower abnormal insider trading can increase future returns. In contrast, we expect that lower a$bnormal\ Insider\ \ trading$ has no benefits for firms with mandatory disclosure CSR report.

Table 10 presents the results of estimating Eq. (8). In Columns (1) and (2), the estimated coefficients on the interaction term between $Voluntary$ and $Abnormal\ insider\ trading$ for *ROA* are positive and significant at the 5% level. This suggests that firms with decreasing abnormal insider profitability due to voluntary CSR disclosure can improve firms' *ROA*. Similarly, in Columns (3) and (4), the coefficients on the interaction terms between $Voluntary$ and $Abnormal\ insider\ trading$ for the Tobin's Q remain significantly positive. The results indicate that voluntary CSR disclosure with higher report quality eliminates abnormal insiders' arbitrage opportunities in the stock market and causes insiders to focus more on firms' long-term performance.

In Panel B of Table 10, the report presents the effect of lower abnormal insider trading following mandatory CSR disclosure on firm value. The coefficients on the

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interaction term $Mandatory$ and $Abnormal\ insider\ trading$ are insignificant, except for interaction term on $Mandatory \times LAIT$. This implies that mandatory CSR disclosure does not eliminate abnormal arbitrage opportunities for insiders in the stock market, resulting in no effect on firm value.

Therefore, we conclude that voluntary CSR disclosure will limit abnormal arbitrage by insiders, redirecting their focus towards long-term firm growth. In contrast, mandatory CSR does not curb insider arbitrage or improve firm value. Overall, the evidence suggests voluntary CSR is more effective than mandatory CSR in aligning insider incentives with long-term performance.

7. Conclusion

This study investigates the impact of both voluntary CSR disclosure and mandatory CSR disclosure on insider trading profitability. Previous literature presents mixed findings regarding the roles of voluntary and mandatory CSR disclosure. Concerning voluntary CSR disclosure, if companies voluntarily disclose CSR reports, it indicates a commitment to meeting social expectations and enhancing social and reputational capital, potentially leading to higher-quality reporting. This increased transparency in the firm's information environment could result in a decreased likelihood of informative insider trading. On the other hand, the greenwashing theory suggests that companies voluntarily disclosing CSR reports may have the flexibility to allocate varying levels of CSR spending to visible activities compared to less observable ones, thereby potentially increasing insider trading profitability.

Regarding mandatory CSR disclosure, if obligatory reporting rules serve to legitimize the public's entitlement to non-financial information and intensify stakeholder scrutiny through heightened accessibility, it may decrease insider trading profitability. However, disclosure involves both direct and indirect costs, potentially

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offsetting the aforementioned benefits and imposing a substantial burden. Additionally, reporting standards inherently involve a degree of discretion, leading to increased information asymmetry and a potential rise in insider trading profitability.

Utilizing a sample of Chinese listed firms spanning from 2007 to 2020, our study reveals a detrimental impact of voluntary CSR disclosure on insider trading profitability, contrasting with a positive effect of mandatory CSR disclosure on the same metric. These findings imply that voluntary CSR disclosure acts as a deterrent, limiting insiders' ability to exploit private information, whereas mandatory CSR disclosure does not offer such protective benefits. To address potential endogeneity concerns, we leverage the enactment of China's 2015 new Environmental Protection Law as a natural experiment.

Furthermore, our analysis indicates that the adverse effect of voluntary CSR disclosure on insider trading profitability is facilitated through a disciplinary mechanism that mitigates agency conflicts and information asymmetry. Supplementary investigations uncover additional insights, demonstrating that the impacts of voluntary CSR disclosure on informational risk and information asymmetry are negative, while those on corporate governance are positive.

This study adds to the existing body of literature concerning the factors influencing insider trading behavior. Additionally, it contributes to the prior research on the impacts of corporate social responsibility (CSR) on diverse corporate behaviors by proposing that voluntary CSR disclosure, which enhances credible non-financial information and governance quality, serves to alleviate managerial rent extraction. The results underscore the significance of CSR disclosure strategies and indicate that the agency conflicts between managers and shareholders are mitigated through voluntary CSR disclosure.

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Appendix A.

Variable	Definition
Dependent variables	
INSPRF	The aggregate profitability of all insider trades from insider purchase and sales transactions during the fiscal year, deflated by the beginning market value of equity.
STR	$\mathrm{STR}_{i,j,t} = \frac{\mathrm{P}_{i,j,t} - \mathrm{S}_{i,j,t}}{\mathrm{VOL}_{j,t}}$ Where $P_{i,j,t}$ is the number of shares purchased by insider i at firm j in year t, $S_{i,j,t}$ is the number of shares sold, and $VOL_{j,t}$ is the total share volume by all investors in firm j during year t.
AIT	The difference in insider trading between pre-earnings-announcement [-5, -1] and non-earnings-announcement periods (days excluding [-5, 5]). Trading is measured as the annualized daily proportion of shares traded.
AITENT	Similar to *AIT* with net insider trading. Net insider trading is measured as insider purchases minus insider sales of stocks.
Independent variables	
Voluntary	Take one if firms voluntarily disclose CSR reports, otherwise take 0.
Mandatory	Take one if firms mandatory disclose CSR reports, otherwise take 0.

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Control variables

SIZE	Log of the company's total assets at the end of the year.
BM	The book-to-market ratio for the insider's firm.
ROA	Defined as net income after interest and taxes divided by total assets.
TOP1	The shareholding of the largest shareholder.
RET	The lagged one-year *t-1* raw return for the insider's firm *j*.
IdiosynVol	The standard deviation of daily stock return residuals over a year. The stock return residual is adjusted by Fama and French's three factors.

Other variables

CEO Age	The Logarithm of (CEO's age).
ASSETGR	Annual asset growth, defined as (Total $Asset_t$ - Total $Asset_{t-1}$)/ Total $Asset_{t-1}$.
Analyst Coverage (Coverage)	Logarithm of (1+ number of analysts).
Confucian	Logarithm of (1+ the number of Confucian temples in the region where the firm is located).
DISP	The standard deviation of the earnings forecast is divided by the mean earnings forecast.

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ERROR	The absolute value of actual earnings minus mean earnings forecast, all divided by the stock price at the time of the earnings forecast.
CEO Gender	Dummy variable indicating CEO's gender: one if the CEO is male, zero otherwise.
Internal Control (ICINDEX)	Log of the Internal Control Index.
IndCSR	Industry means of the CSR score.
Insider buys (sells) profitability	The profitability of all insider trades from insider purchase (sales) transactions during the fiscal year.
RunUp	CAR multiplied by SUE; CAR is defined as the five-day cumulative abnormal stock return during pre-earnings announcement days. SUE is calculated as the most recently announced earnings minus earnings one year before.
RunUpSign	Dummy variable, one if CAR and SUE have the same sign; zero otherwise.
List_in	Dummy variable, one if the stock is added to the CSR disclosure list; zero otherwise.
CEO Ph.D.	Dummy variable, one if the CEO holds a Ph.D, zero otherwise.
RoaVol	Standard deviation of ROA over 4-year rolling periods.
ZScore	Equals (ROA+CAR)/r(ROA), where is the return on assets and CAR = (Total Assets – Total Liabilities) / Total Assets. A higher Z-score suggests greater stability.

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This preprint research paper has not been peer reviewed. Electronic copy available at: https://ssrn.com/abstract=4770544

Reference

Aboody, D., Lev, B., 2000. Information asymmetry, R&D, and insider gains. *Journal of Finance* 55 (6), 2747-2766.

Adhikari, B. K., 2016. Causal effect of analyst following on corporate social responsibility. *Journal of Corporate Finance* 41, 201-216.

Albuquerque, R., Koskinen, Y., Yang, S., Zhang, C., 2020. Resiliency of environmental and social stocks: an analysis of the exogenous COVID-19 market crash. *Review of Corporate Finance Studies* 9 (3), 593–621.

Ali, A., Chen, T.Y., Radhakrishnan, S., 2007. Corporate disclosures by family firms. *Journal of Accounting and Economics* 44 (1-2), 238-286.

Anderson, R.C., Duru, A., Reeb, D.M., 2012. Investment policy in family controlled firms. *Journal of Banking & Finance* 36 (6), 1744-1758.

Bae, K.H., El Ghoul, S., Guedhami, O., Kwok, C.C.Y., Zheng, Y., 2019. Does corporate social responsibility reduce the costs of high leverage? Evidence from capital structure and product market interactions. *Journal of Banking & Finance* 100, 135–150.

Baiman, S., Verrecchia, R.E., 1996. The relation among capital markets, financial disclosure, production efficiency, and insider trading. *Journal of Accounting Research* 34 (1), 1–22.

Benlemlih, M., Bitar, M., 2018. Corporate social responsibility and investment efficiency. *Journal of business ethics* 148, 647–671.

Benlemlih, M., 2015. Corporate Social Responsibility and Firm Debt Maturity. *Journal of Business Ethics* 144, 491-517.

Bens, D. A., Berger, P. G., Monahan, S. J., 2011. Discretionary disclosure in financial reporting: An examination comparing internal firm data to externally reported segment data. *The Accounting Review* 86 (2), 417–449.

Beyer, A., Cohen, D. A., Lys, T. Z., Walther, B. R., 2010. The financial reporting environment: review of the recent literature. *Journal of Accounting and Economics* 50 (2-3), 296–343.

Bhagat, S., Bolton, B., Lu, J., 2015. Size, leverage, and risk-taking of financial institutions. *Journal of Banking & Finance* 59, 529-537.

Biddle G. C., Hilary G., Verdi R. S., 2009. How does financial reporting quality relate to investment efficiency? *Journal of Accounting and Economics* 48 (2-3), 112–

Preprint not peer reviewed

This preprint research paper has not been peer reviewed. Electronic copy available at: https://ssrn.com/abstract=4770544

131.

Bofinger, Y., Heyden, K. J., Rock, B., 2022. Corporate social responsibility and market efficiency: Evidence from ESG and misvaluation measures. *Journal of banking & Finance* 134, 106322.

Brennan, M., Huh, S. W., Subrahmanyam, A., 2016. Asymmetric effects of informed trading on the cost of equity capital. *Management Science* 62, 2460-2480.

Breuer, M., Leuz, C., Vanhaverbeke, S., 2020. Reporting regulation and corporate innovation. Working paper.

Burgstahler, D. C., Hail, L., Leuz, C., 2006. The importance of reporting incentives: Earnings management in European private and public firms. *The Accounting Review* 81 (5), 983–1016.

Cai, Y., Pan, C. H., Statman, M., 2016. Why do countries matter so much in corporate social performance? *Journal of Corporate Finance* 41, 591–609.

Cao, J., Titman, S., Zhan, X., Zhang, W. E., 2018. ESG preference and market efficiency: Evidence from mispricing and institutional trading. Working paper.

Chen, H., Dong, W., Han, H., Zhou, N., 2017. A comprehensive and quantitative internal control index: construction, validation, and impact. *Review of Quantitative Finance and Accounting* 49(2), 337-377.

Chen, L., Zhang, L., Huang, J., Xiao, H., Zhou, Z., 2021. Social responsibility portfolio optimization incorporating ESG criteria. *Journal of Management Science and Engineering* 6(1), 75–85.

Chen, T., Harford, J., Lin, C., 2015. Do analysts matter for governance? Evidence from natural experiments. *Journal of Financial Economics* 115 (2), 383-410.

Chen, Y.-C., Hung, M., Wang, Y., 2018. The effect of mandatory CSR disclosure on firm profitability and social externalities: evidence from China. *Journal of Accounting and Economics* 65 (1), 169–190.

Cheng, B., Ioannou, I., Serafeim, G., 2014. Corporate social responsibility and access to finance. *Strategic Management Journal* 35 (1), 1-23.

Cheng, Q., Lo, K., 2006. Insider trading and voluntary disclosures. *Journal of Accounting Research* 44 (5), 815-848.

Chi, W., Dhaliwal, D., Li, O. Z., Lin, T. H., 2013. Voluntary reporting incentives and reporting quality: evidence from a reporting regime change for private firms in Taiwan. *Contemporary Accounting Research* 30(4), 1462-1489.

Chi, W., Wu, S. J., Zheng, Z., 2020. Determinants and consequences of voluntary

Preprint not peer reviewed

This preprint research paper has not been peer reviewed. Electronic copy available at: https://ssrn.com/abstract=4770544

corporate social responsibility disclosure: Evidence from private firms. *The British Accounting Review* 52(6), 100939.

Christensen, D. M., 2016. Corporate accountability reporting and high-profile misconduct. *The Accounting Review* 91 (2): 377–399.

Christensen, H. B., Hail, L., Leuz, C., 2021. Mandatory CSR and sustainability reporting: Economic analysis and literature review. *Review of Accounting Studies* 26, 1176–1248.

Cui, J., Jo, H., Li, Y., 2015. Corporate Social Responsibility and Insider Trading. *Journal of Business Ethics* 130 (4), 869-887.

Dai, L., Fu, R., Li, Z., Kang, J. K., Lee, I., 2016. Corporate governance and the profitability of insider trading. *Journal of Corporate Finance* 40, 235-253.

Darke, P. R., Ritchie, R. J., 2007. The defensive consumer: Advertising deception, defensive processing, and distrust. *Journal of Marketing Research* 44(1), 114–127.

de Colle, S., Henriques, A., Sarasvathy, S., 2014. The paradox of corporate social responsibility standards. *Journal of Business Ethics* 125, 177–191.

Diamond, D.W. and Verrecchia, R.E., 1991. Disclosure, liquidity, and the cost of capital. *Journal of Finance* 66, 1325–1355.

Du, X., 2015. How the market values greenwashing? Evidence from China. *Journal of Business Ethics* 128(3), 547–574.

Easley, D., and M. O'Hara, 2004. Information and the cost of capital. *The Journal of Finance 59* (4), 1553– 1583.

Fu, X., Kong, L., Tang, T., 2020. Insider trading and shareholder investment horizons. *Journal of Corporate Finance* 62, 101508.

Gao, F., Dong, Y., Ni, C., Fu, R., 2016. Determinants and economic consequences of non-financial disclosure quality. *The European Accounting Review* 25(2), 287-317.

Gardberg, N.A., Fombrun, C.J., 2006. Corporate citizenship: creating intangible assets across institutional environments. *Academy of Management Review* 31 (2): 329–346.

Garfeld, B., 1991. Beware: Green overkill. *Advertising Age* 62(5), 26–26.

Gerwing, T., Kajüter, P., Wirth, M., 2022. The role of sustainable corporate governance in mandatory sustainability reporting quality. *Journal of Business Economics* 92, 517-555.

Godfrey, P. C., 2005. The relationship between corporate philanthropy and shareholder wealth: a risk management perspective. *Academy of Management Review* 30 (4):

Preprint not peer reviewed

This preprint research paper has not been peer reviewed. Electronic copy available at: https://ssrn.com/abstract=4770544

777–798.

Godfrey, P.C., Merrill, C. B., Hansen, J. M., 2009. The relationship between corporate social responsibility and shareholder value: An empirical test of the risk management hypothesis. *Strategic management journal* 30(4), 425-445.

Grewal, J., Richardson, G., Wang, J., 2023. Effects of Mandatory Carbon Reporting on Unrepresentative Environmental Disclosures. Working paper.

Gu, F., Li, J.Q., 2012. Insider trading and corporate information transparency. *Financial Review* 47(4), 645-664.

He, F., Du, H., Yu, B., 2022. Corporate ESG performance and manager misconduct: Evidence from China. *International Review of Financial Analysis*, 82 102201.

He, Q., Rui, O.M., 2016, Ownership Structure and Insider Trading: Evidence from China. *Journal of Business Ethics* 134(4), 553-574.

Hess, D., 2007. Social reporting and new governance regulation: the prospects of achieving corporate accountability through transparency. *Business Ethics Quarterly* 17 (3), 453–476.

Houston, J. F., Lin, C., Lin, P., Ma, Y., 2010. Creditor rights, information sharing, and bank risk-taking. *Journal of Financial Economics* 96 (3), 485-512.

Huang, P., Zhang, Y., 2012. Does enhanced disclosure really reduce agency costs? Evidence from the diversion of corporate resources. *The Accounting Review* 87 (1), 199–229

ICC., 2015. Sustainability reporting - future directions document No. 213/118. Retrieved from https://cdn.iccwbo.org/content/uploads/sites/3/2015/12/ Sustainability-Reporting-Future-directions.pdf. Accessed on December 7, 2018.

Ioannou, I., Serafeim, G., 2015. The impact of corporate social responsibility on investment recommendations: Analysts' perceptions and shifting institutional logics. *Strategic management journal* 36, 1053–1081.

Ip, P. K., 2009. Is Confucianism good for business ethics in China? *Journal of Business Ethics* 88(3), 463–476.

Jensen, M. C., Meckling, W.H., 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3 (4), 305–360.

Jiraporn, P., Jiraporn, N., Boeprasert, A., Chang, K., 2014. Does corporate social responsibility (CSR) improve credit ratings? Evidence from geographic identification. *Financial management* 43 (3), 505–531.

Johnson, M.F., Kasznik, R., Nelson, K.K., 2001. The impact of securities litigation

Preprint not peer reviewed

This preprint research paper has not been peer reviewed. Electronic copy available at: https://ssrn.com/abstract=4770544

reform on the disclosure of forward-looking information by high technology firms. *Journal of Accounting Research* 39 (2), 297–327.

Kim, O., Verrecchia, R., 1997. Pre-announcement and event-period private information. *Journal of Accounting and Economics* 24, 395-419.

Klein, B., Leffler, K., 1981. The role of market forces in assuring contractual performance. *Journal of Political Economy* 89, 615–641.

Kolk, A., Pinkse, J., 2010. The integration of corporate governance in corporate social responsibility disclosures. *Corporate social responsibility and environmental management* 17(1), 15-26.

Lambert, R., Leuz, C. and Verrecchia, R.E., 2011. Information asymmetry, information precision, and the cost of capital. *Review of Finance* 16 (1), 1–29.

Lambert, R., Leuz, C., Verrecchia, R.E., 2007. Accounting information, disclosure, and the cost of capital. *Journal of Accounting Research* 45 (2), 385–420.

Leuz, C., Wysocki, P. D., 2008. Economic consequences of financial reporting and disclosure regulation. A review and suggestions for future research. Working paper.

Li, Q., Guo, M., 2022. Do the resignations of politically connected independent directors affect corporate social responsibility? Evidence from China. *Journal of Corporate Finance* 73, 102174.

Li, T., Ji, Y., 2021. Institutional ownership and insider trading profitability: evidence from an emerging market. *Pacific-Basin Finance Journal* 70, 101668.

Liang, X., Chen, X.C., 2024. Mandatory corporate social responsibility disclosure and financial constraints: Evidence from China. *International Review of Economics and Finance* 89, 954-974.

Liao, L., Lin, T., Zhang, Y., 2018. Corporate board and corporate social responsibility assurance: Evidence from China. *Journal of Business Ethics* 150, 211-225.

Lins, K.V., Servaes, H., Tamayo, A., 2017. Social capital, trust, and firm performance: The value of corporate social responsibility during the financial crisis. *The Journal of Finance* 72 (4), 1785–1824.

Lyon, T. P., Montgomery, A.W., 2015. The means and end of greenwash. *Organization & Environment* 28 (2), 223-249.

Merton, R., 1987. A simple model of capital market equilibrium with incomplete information. *Journal of Finance* 42, 483–510.

Morgan A., 2015. The true cost. Accessed November 6, 2016

Preprint not peer reviewed

This preprint research paper has not been peer reviewed. Electronic copy available at: https://ssrn.com/abstract=4770544

Nyilasy, G., Gangadharbatla, H., and Paladino, A., 2014. Perceived greenwashing: The interactive efects of green advertising and corporate environmental performance on consumer reactions. *Journal of Business Ethics* 125(4), 693–707.

Oikonomou, I., Brooks, C., Pavelin, S., 2012. The impact of corporate social performance on financial risk and utility: a longitudinal analysis. *Financial management* 41 (2), 483–515.

Raghunandan A., Rajgopal, S., 2022. Do ESG funds make stakeholder-friendly investments? Review of Accounting Studies 27, 822-863.

Rajan, R. G., Zingales, L., 1998. Financial dependence and growth. *The American Economic Review* 88, 559–586.

Richardson, A., Welker, M., 2001. Social disclosure, financial disclosure and the cost of equity capital. *Accounting, Organizations and Society*, 26, 597–616.

Rogers, J. L., Buskirk, A.V., Zechman, S. L. C., 2011. Disclosure tone and shareholder litigation. *The Accounting Review* 86 (6), 2155–2183.

Roy, P.P., Rao, S., Zhu, M., 2022. Mandatory CSR expenditure and stock market liquidity. *Journal of Corporate Finance* 72, 102158.

Sargan, J. D., 1958. The Estimation of economic relationships using instrumental variables. *Econometrica* 26 (3), 393-415.

Seyhun, H.N., 1986. Insiders' profits, costs of trading, and market efficiency. *Journal of Financial Economics* 16 (2), 189-212.

Shiu, Y.M., Yang, S.L., 2017. Does engagement in corporate social responsibility provide strategic insurance-like effects? *Strategic management journal* 38, 455-470.

Skaife, H.A., Veenman, D., Wangerin, D., 2013. Internal control over financial reporting and managerial rent extraction: evidence from the profitability of insider trading. *Journal of Accounting and Economics* 55, 91-110.

Staiger, D., Stock, J. H., 1997. Instrumental variables regression with weak instruments. *Econometrica* 65, 557-586.

Stephen H. P., 1982. Insider Trading and the Dissemination of Firms' Forecast Information. *The Journal of Business* 55(4), 479-503.

TerraChoice, 2010. The sins of greenwashing, home and family edition. Retrieved from https://sinsofgreenwashing.com/, April 21, 2019.

To, T.Y., Navone, M., Wu, E., 2018. Analyst coverage and the quality of corporate investment decisions. *Journal of Corporate Finance* 51, 164-181.

Preprint not peer reviewed

This preprint research paper has not been peer reviewed. Electronic copy available at: https://ssrn.com/abstract=4770544

Tu, Z., Hu, T., Shen, R., 2019. Evaluating public participation impact on environmental protection and ecological efficiency in China: evidence from PITI disclosure. *China Economic Review* 55, 111–123.

Wang, X, Cao, F, Ye, K., 2018. Mandatory Corporate Social Responsibility (CSR) Reporting and Financial Reporting Quality: Evidence from a Quasi-Natural Experiment. *Journal of Business Ethics* 152, 253–274.

Wu, Y., Zhang, K., Xie, J., 2020. Bad greenwashing, good greenwashing: Corporate social responsibility and information transparency. *Management Science* 66 (7), 3095–3112.

Xue, S., Chang, W., Xu, J., 2023. The effect of voluntary and mandatory corporate social responsibility disclosure on firm profitability: evidence from China. *Pacific-Basin Finance Journal* 77, 101919.

Yang, C.Y., Zhang, B., Zhang, C., 2019. Is information risk priced? Evidence from abnormal idiosyncratic volatility. *Journal of Financial Economics* 135(2), 528-554.

Zhang, Q., Yu, Z., Kong, D., 2019. The real effect of legal institutions: environmental courts and firm environmental protection expenditure. *Journal of Environmental Economics and Management* 98, 102254

Zhang, Y., Zhou, J., Zhou, N., 2007. Audit committee quality, auditor independence, and internal control weaknesses. *Journal of Accounting and Public Policy* 26(3), 300-327.

Zhou, D., Qiu, Y., Wang, M., 2021. Does environmental regulation promote enterprise profitability? Evidence from the implementation of China's newly revised environmental protection law. *Economic Modelling* 102, 105585.

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This preprint research paper has not been peer reviewed. Electronic copy available at: https://ssrn.com/abstract=4770544

Table 1: Sample description

This table presents summary statistics for all variables in the baseline analysis. The sample comprises 10,220 firm-year observations spanning from 2007 to 2020. Definitions for the variables can be found in Appendix A. All continuous variables are winsorized at the 1% and 99% levels, and further details for all variables are provided in Appendix A.

Variable	N	Mean	Std Dev	P25	Median	P75
Insider Trading						
6 MON-INSPRF	10220	0.023	0.300	-0.002	0.000	0.020
9 MON-INSPRF	9502	0.032	0.276	-0.001	0.000	0.024
12 MON-INSPRF	10220	0.047	0.393	-0.002	0.000	0.036
Sustainability Performance						
Voluntary	10220	0.862	0.344	1.000	1.000	1.000
Mandatory	10220	0.111	0.315	0.000	0.000	0.000
Control Variables						
SIZE	10220	8.946	1.119	8.167	8.805	9.556
BM	10220	0.582	0.237	0.400	0.579	0.755
ROA	10220	0.050	0.233	0.021	0.044	0.073
TOP1	10220	0.325	0.142	0.216	0.303	0.417
RET	10220	0.229	0.673	-0.226	0.059	0.488
IdiosynVol	10220	0.354	0.162	0.281	0.339	0.412
AIT	10220	0.654	2.148	0.001	0.020	0.362
AITENT	10220	-0.200	3.642	-0.141	0.000	0.001

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Table 2: Correlation coefficients

This table shows correlation coefficients between dependent variables, independent variables, and control variables. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
6 MON-INSPRF	1.000										
9 MON-INSPRF	0.659***	1.000									
12 MON-INSPRF	0.610***	0.732***	1.000								
Voluntary	-0.021**	-0.020**	-0.034***	1.000							
Mandatory	0.030***	0.023**	0.038***	-0.886***	1.000						
SIZE	-0.078***	-0.030***	-0.088***	0.488***	-0.455***	1.000					
BM	-0.031***	-0.009**	-0.053***	0.101***	-0.124***	0.052***	1.000				
ROA	-0.022**	-0.004***	-0.028***	0.015*	-0.011	0.025**	-0.319***	1.000			
TOP1	-0.044***	-0.040***	-0.050***	0.051***	-0.045***	0.034***	0.041***	0.124***	1.000		
RET	0.032***	0.012***	0.036***	0.052***	-0.051***	0.197***	-0.363***	0.133***	0.031**	1.000	
IdiosynVol	0.054***	0.015***	0.091***	-0.046***	0.023**	-0.010	-0.369***	-0.020**	-0.007	0.243***	1.000

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Table 3: Voluntary and Mandatory CSR disclosure and insider trading profitability

This table presents the results of OLS regressions examining the impact of voluntary and mandatory CSR disclosure on insider trading profitability (*Voluntary*, *Mandatory*). The key independent variables are voluntary and mandatory CSR disclosure, while the dependent variables include insider trading profitability at 6-months (*6 MON-INSPRF*), 9-months (*9 MON-INSPRF*), and 12-months (*12 MON-INSPRF*). All regressions incorporate year and industry fixed effects. The t-statistics, shown in parentheses, are based on robust standard errors clustered at the firm and year levels. Variable definitions are provided in Appendix A. The t-statistics are indicated in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	6 MON-INSPRF		9 MON-INSPRF		12 MON-INSPRF	
	(1)	(2)	(3)	(4)	(5)	(6)
Voluntary	-0.0131*		-0.0151**		-0.0290***	
	(-1.73)		(-2.47)		(-3.16)	
Mandatory		0.0223***		0.0168***		0.0336***
		(3.00)		(2.74)		(3.66)
SIZE	-0.0016***	-0.0015***	-0.0010***	-0.0010***	-0.0021***	-0.0021***
	(-4.68)	(-4.43)	(-4.19)	(-4.05)	(-4.65)	(-4.56)
BM	0.0293**	0.0317**	0.0173	0.0186*	0.0115	0.0142
	(2.23)	(2.40)	(1.62)	(1.75)	(0.69)	(0.85)
ROA	-0.0022	-0.0022	-0.0020	-0.0020	-0.0015	-0.0015
	(-0.73)	(-0.71)	(-1.03)	(-1.02)	(-0.40)	(-0.39)
TOP1	-0.0005***	-0.0005***	-0.0002	-0.0002	-0.0007***	-0.0007***
	(-2.80)	(-2.81)	(-1.55)	(-1.56)	(-2.94)	(-2.96)
RET	0.0046	0.0048	0.0016	0.0017	0.0103*	0.0105*
	(1.10)	(1.15)	(0.40)	(0.42)	(1.92)	(1.95)
IdiosynVol	0.0001	0.0004	-0.0033	-0.0028	0.0241**	0.0251**
	(0.02)	(0.11)	(-0.91)	(-0.78)	(2.02)	(2.07)
Industry Effects	Y	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y	Y
N	10,220	10,220	9,502	9,502	10,220	10,220
Adj. R^2	0.010	0.011	0.007	0.007	0.018	0.018

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Table 4: Robustness check

This table reports the results of robustness tests. Panel A presents the results, where the dependent variables are insider trading intensity (*STR*) and frequency (*Frequency*). *STR* is defined as the strength of the signal revealed through an insider's trading activity. *Frequency* is calculated as the natural logarithm of one plus the annual number of insider transactions. Panel B presents the results where we investigate how voluntary and mandatory CSR disclosure affect abnormal insider trading. The dependent variable is abnormal insider trading, measured as *AIT* and *AITENT*. *AIT* is defined as the difference in insider trading between pre-earnings-announcement [-5, -1] and non-earnings-announcement periods (days excluding [-5, 5]). *AITENT* is net insider trading, calculated as the spread between insider purchases and insider sales of stocks. Panel C introduces the results with a firm fixed effect, where both dependent and independent variables align with our baseline regressions. In Panel D, we present results that include potential omitted variables affecting insider trading profitability, such as firm and CEO characteristics, risk-taking, and analyst oversight. In all regressions, year and industry fixed effects are included, and t-values are calculated using standard errors clustered by year and firm. Variable definitions are available in Appendix A. The t-statistics are presented in parentheses, with ∗, ∗∗, and ∗∗∗ indicating statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Alternative INSPRF				
	STR		Frequency	
Voluntary	-0.0491**		-1.0222***	
	(-1.99)		(-3.85)	
Mandatory		0.0112		1.0231***
		(0.34)		(3.81)
Control Var.	Y	Y	Y	Y
Industry Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
N	10,220	10,220	10,220	10,220
Adj. R^2	0.006	0.006	0.035	0.035
Panel B: Abnormal insider trading				
	AIT		AITENT	
Voluntary	-0.7716***		-1.2451***	
	(-4.93)		(-4.09)	
Mandatory		0.3459***		1.4493***
		(4.04)		(4.66)
Control Var.	Y	Y	Y	Y
Industry Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
N	10,220	10,220	10,220	10,220
Adj. R^2	0.033	0.032	0.035	0.035

Panel C: Firm fixed effect						
	6 MON-INSPRF		9 MON-INSPRF		12 MON-INSPRF	
Voluntary	-0.0269*		-0.0300**		-0.0274*	
	(-1.91)		(-2.40)		(-1.65)	
Mandatory		0.0022		0.0282*		-0.0131
		(0.16)		(1.89)		(-0.84)
Control Var.	Y	Y	Y	Y	Y	Y
Firm Effects	Y	Y	Y	Y	Y	Y

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Industry Effects	Y	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y	Y
N	10,220	10,220	9,502	9,502	10,220	10,220
Adj. R^2	0.047	0.047	0.105	0.105	0.068	0.069

Panel D: Include the other control variables

	6 MON-INSPRF		9 MON-INSPRF		12 MON-INSPRF	
Voluntary	-0.0372**		-0.0368**		-0.0376*	
	(-2.30)		(-2.49)		(-1.84)	
Mandatory		0.0098		0.0069		-0.0065
		(0.63)		(0.47)		(-0.35)
Asset GR	-0.0059**	-0.0057*	-0.0095***	-0.009***	-0.0114***	-0.0111***
	(-2.01)	(-1.96)	(-4.62)	(-4.54)	(-2.89)	(-2.82)
CEO Age	-0.0270	-0.0284	-0.0497	-0.0512	0.0238	0.0216
	(-0.67)	(-0.71)	(-1.12)	(-1.15)	(0.46)	(0.42)
CEO Gender	-0.0185	-0.0182	-0.0653**	-0.0648**	-0.0131	-0.0125
	(-0.66)	(-0.65)	(-2.55)	(-2.53)	(-0.37)	(-0.35)
CEO Ph.D.	-0.0146	-0.0150	0.0261	0.0259	0.0006	0.0002
	(-0.66)	(-0.68)	(1.24)	(1.23)	(0.02)	(0.01)
VolRoa	0.0253	0.0255	0.0187	0.0188	0.0279	0.0280
	(1.17)	(1.19)	(1.11)	(1.13)	(1.17)	(1.19)
ZScore	0.0003	0.0003	0.0001	0.0001	0.0002	0.0002
	(1.29)	(1.28)	(0.51)	(0.51)	(0.83)	(0.83)
DISP	0.0003	0.0003	0.0008	0.0008	0.0024*	0.0023*
	(0.35)	(0.34)	(0.89)	(0.88)	(1.85)	(1.85)
Control Var.	Y	Y	Y	Y	Y	Y
Firm Effects	Y	Y	Y	Y	Y	Y
Industry Effects	Y	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y	Y
N	7,457	7,457	7,223	7,223	7,457	7,457
Adj. R^2	0.051	0.050	0.054	0.053	0.046	0.046

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Table 5: Instrumental variable estimation

This table presents the results of instrumental variable estimation. For the instrumental variables, we utilize Confucian culture (Confucian) and industry average CSR scores (IndCSR). Specifically, Confucian is measured by the number of Confucian temples in the region where the firm is located. IndCSR is measured as industry means of the CSR score. In Panel A, we report the results of the first-stage probit regression, where Voluntary and Mandatory are regressed on the instrumental variables. Panel B presents the second-stage regression results, where 6 MON-INSPRF, 9 MON-INSPRF, and 12 MON-INSPRF are regressed on the fitted values (Instrumented variables) obtained from the first-stage regression. Both year and industry fixed effects are included in all regressions, and t-values are calculated using standard errors clustered by year and firm. Variable definitions are provided in Appendix A. The t-statistics are shown in pareregressntheses, with *, **, and *** indicating statistical significance at the 10%, 5%, and 1% levels, respectively.

	Panel A: First-stage regression		**Panel B: Second stage regression**					
Dependent Variable=	Voluntary	Mandatory	6 MON-INSPRF		9 MON-INSPRF		12 MON-INSPRF	
	（1）	（2）	(3)	(4)	(5)	(6)	（7）	（8）
Confucian	0.1482***	-0.2773***						
	(4.18)	(-9.51)						
IndCSR	0.0218***	-0.0185***						
	(5.29)	(-4.78)						
Voluntary			-0.0716***		-0.0557**		-0.0988**	
			(-3.35)		(-2.70)		(-2.31)	
Mandatory				0.0853***		0.0653**		0.1047**
				(3.42)		(2.82)		(2.39)
SIZE	1.0233***	-0.8052***	-0.0003	-0.0002	-0.0005	-0.0004	-0.0005	-0.0006
	(32.41)	(-33.03)	(-0.59)	(-0.35)	(-0.92)	(-0.79)	(-0.80)	(-0.90)
BM	-0.2055*	-0.3837***	0.0448**	0.0512**	0.0444*	0.0492*	0.0364	0.0433
	(-1.81)	(-4.06)	(2.52)	(2.78)	(1.98)	(2.16)	(1.31)	(1.47)
ROA	0.0846**	0.0286	-0.0165	-0.0168	-0.0096	-0.0099	-0.0157	-0.0165
	(2.35)	(0.16)	(-0.95)	(-0.98)	(-0.80)	(-0.82)	(-1.00)	(-1.05)
TOP1	-0.0084***	0.0074***	-0.0005**	-0.0006**	-0.0006**	-0.0006**	-0.0008***	-0.0008***
	(-5.28)	(5.37)	(-2.86)	(-2.85)	(-2.75)	(-2.75)	(-3.34)	(-3.33)
RET	-0.0991**	0.0870**	0.0031	0.0036	0.0058	0.0062	0.0100	0.0106
	(-2.04)	(2.08)	(0.64)	(0.70)	(1.05)	(1.17)	(1.07)	(1.16)
IdiosynVol	-2.6924***	-0.0660	-0.0039	0.0020	0.0140	0.0186	0.0529	0.0611
	(-7.84)	(-0.65)	(-0.34)	(0.18)	(1.11)	(1.34)	(1.29)	(1.36)
Cragg-Donald Wald F statistic	28.67>10	52.85>10						
Sargan's test (P-value)			0.2314	0.2396	0.2258	0.2361	0.7837	0.8426
Industry	Yes	Yes	Y	Y	Y	Y	Y	Y
Year	Yes	Yes	Y	Y	Y	Y	Y	Y
N	9,502	9,502	9,502	9,502	9,502	9,502	9,502	9,502
Pseudo. R^2/Adj. R^2	0.445	0.345	0.016	0.019	0.019	0.016	0.019	0.019

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Table 6: Difference in differences: Evidence from China's 2015 new environmental law

This table reports the results of the difference-in-differences estimation. The treatment group comprises companies that voluntarily disclosed CSR reports, while the control group consists of companies with mandatory CSR disclosure. In Panel A, we present differences in firm characteristics between the treatment and control groups after propensity score matching, along with corresponding t-statistics. Panel B reports the results of the parallel trends test. The Year (0) indicator takes the value of 1 for 2015, when the new environmental law was enacted, and 0 otherwise. The Year (-1), Year (-2), and Year (-3) indicators take the value of 1 for 1, 2, and 3 years pre-enactment, respectively, and 0 otherwise. Similarly, the Year (1), Year (2), and Year (3) indicators take the value of 1 for 1, 2, and 3 years post-enactment, respectively, and 0 otherwise. Panel C provides the difference-in-differences test results, and Panel D shows the results of the placebo test. All regressions include year and industry fixed effects. Details of variable construction are provided in Appendix A. Standard errors are clustered at both the firm and year level, with t-statistics shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Firm Characteristics Comparison

	Treatment	Control	Difference	t-value
SIZE	9.808	9.788	0.020	0.366
BM	0.629	0.629	0.000	0.009
ROA	0.058	0.058	0.000	0.069
TOP1	0.340	0.340	0.000	0.050
RET	0.359	0.374	-0.015	0.290
IdiosynVol	0.333	0.339	-0.006	1.328

Panel B: Parallel trend test

	6 MON-INSPRF	9 MON-INSPRF	12 MON-INSPRF
	(1)	(2)	(3)
Treat × Year (-3)	-0.0036	0.0252	0.0653
	(-0.10)	(0.64)	(1.38)
Treat × Year (-2)	0.0467	0.0513	0.0734
	(0.81)	(1.11)	(0.84)
Treat × Year (-1)	0.0771	-0.0142	-0.0580
	(1.55)	(-0.45)	(-1.32)
Treat × Year (0)	-0.0553	0.0399	0.0395
	(-1.47)	(0.99)	(0.90)
Treat × Year (1)	0.0984	-0.0015	-0.1019**
	(1.54)	(-0.03)	(-1.99)
Treat × Year (2)	-0.0728**	-0.0984*	-0.0844*
	(-1.96)	(-1.84)	(-1.84)
Treat × Year (3)	-0.0943***	-0.0808*	0.0291
	(-3.97)	(-1.88)	(0.79)
Control	Y	Y	Y
Firm Effects	Y	Y	Y
Industry Effects	Y	Y	Y
Year Effects	Y	Y	Y
N	1,279	1,279	1,279

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Adj. R^2	0.109	0.087	0.070
Panel C: Difference-in-differences Regression			
	6 MON-INSPRF	9 MON-INSPRF	12 MON-INSPRF
	(1)	(2)	(3)
Treated*Post	-0.0649**	-0.0534*	-0.0917**
	(-2.17)	(-1.77)	(-2.09)
SIZE	0.0839**	0.0260	-0.0481
	(2.01)	(0.94)	(-1.20)
BM	0.1307	-0.0854	-0.0674
	(1.09)	(-1.32)	(-0.52)
ROA	0.0643	-0.5931**	-0.0515
	(0.20)	(-2.04)	(-0.19)
TOP1	-0.0025	-0.0002	-0.0015
	(-1.13)	(-0.18)	(-1.16)
RET	-0.0011	0.0276*	0.0214
	(-0.07)	(1.93)	(0.99)
IdiosynVol	-0.2233	-0.1905	0.0047
	(-1.36)	(-0.92)	(0.02)
Firm Effects	Y	Y	Y
Industry Effects	Y	Y	Y
Year Effects	Y	Y	Y
N	1,279	1,279	1,279
Adj. R^2	0.077	0.089	0.029
Panel D: Placebo test			
	6 MON-INSPRF	9 MON-INSPRF	12 MON-INSPRF
	(1)	(2)	(3)
Treated*Post	-0.0029	-0.0231	0.0455
	(-0.07)	(-0.60)	(0.86)
Control	Y	Y	Y
Firm Effects	Y	Y	Y
Industry Effects	Y	Y	Y
Year Effects	Y	Y	Y
N	2,456	2,456	2,456
Adj. R^2	0.002	0.017	0.037

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Table 7: Channel Analysis

This table presents the results of analyzing different channels. In Panel A, the focus is on the information trading channel, where the dependent variables are *RunUp* and *RunUpSign*. *RunUpSign* is a dummy variable equaling 1 if CAR and SUE have the same sign, and 0 otherwise. Panel B presents the results for the information asymmetry channel, with dependent variables being forecast error (*ERROR*) and analyst forecast dispersion (*DISP*). *ERROR* is measured as the absolute value of actual earnings minus mean earnings forecast, all divided by the stock price at the time of the earnings forecast. *DISP* is measured as the standard deviation of the earnings forecast divided by the mean earnings forecast. Panel C shows the results for the corporate governance channel, with dependent variables being analyst coverage (*Coverage*) and internal control index (*ICINDEX*). Coverage is measured as the logarithm of (1 + the number of analysts), while *ICINDEX* is measured as the logarithm of the Internal Control Index. All regressions across panels include year and industry fixed effects. Details regarding variable construction are provided in Appendix A. Standard errors are clustered at both the firm and year levels, with t-statistics presented in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Informational risk

	RunUp		RunUpSign	
	(1)	(2)	(3)	(4)
Voluntary	-0.0022**		-0.0910**	
	(-1.96)		(-1.97)	
Mandatory		0.0016		0.0628
		(1.49)		(1.22)
SIZE	0.0004***	0.0004***	-0.0011	-0.0007
	(6.09)	(6.29)	(-0.59)	(-0.37)
BM	-0.0024	-0.0030	-0.0005	0.0056
	(-0.30)	(-0.40)	(-0.01)	(0.07)
ROA	0.3580***	0.3574***	-0.4295**	-0.4296**
	(3.73)	(3.72)	(-2.36)	(-2.35)
TOP1	0.0000	0.0000	-0.0004	-0.0004
	(0.48)	(0.55)	(-0.39)	(-0.41)
RET	-0.0047***	-0.0046***	0.0189	0.0191
	(-3.40)	(-3.26)	(0.61)	(0.62)
IdiosynVol	0.0021	0.0059	-0.3043	-0.3047
	(0.30)	(0.86)	(-1.47)	(-1.47)
Industry Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
N	8,295	8,295	8,295	8,295
Adj. R^2/ Pseudo R^2	0.326	0.314	0.004	0.004

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Panel B: Information asymmetry				
	ERROR		DISP	
	(1)	(2)	(3)	(4)
Voluntary	-0.4688***		-0.2929***	
	(-3.46)		(-3.45)	
Mandatory		0.4024***		0.2832***
		(2.99)		(3.28)
SIZE	-0.0168***	-0.0181***	-0.0078**	-0.0082**
	(-3.59)	(-3.82)	(-2.36)	(-2.51)
BM	-3.7611	-3.7524	-3.5638	-3.5529
	(-1.06)	(-1.06)	(-1.09)	(-1.08)
ROA	-15.9381***	-15.9942***	-10.0109*	-10.0370*
	(-2.61)	(-2.62)	(-1.88)	(-1.88)
TOP1	0.0138	0.0138	0.0118	0.0118
	(0.70)	(0.70)	(0.66)	(0.66)
RET	-0.0687	-0.0674	-0.1784	-0.1771
	(-0.22)	(-0.22)	(-0.63)	(-0.63)
IdiosynVol	1.3681*	1.4034**	1.7085**	1.7254**
	(1.94)	(1.97)	(2.45)	(2.45)
Industry Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
N	8,292	8,292	8,292	8,292
Adj. R^2	0.002	0.002	0.001	0.001

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Panel C: Corporate governance				
	Coverage		ICINDEX	
	(1)	(2)	(3)	(4)
Voluntary	0.5834***		0.0745***	
	(7.84)		(5.37)	
Mandatory		-0.4991***		-0.0605***
		(-7.40)		(-5.36)
SIZE	0.0243***	0.0259***	0.0021***	0.0024***
	(5.49)	(5.77)	(4.76)	(5.19)
BM	-0.5176**	-0.5286***	0.0363*	0.0344*
	(-2.97)	(-3.02)	(2.05)	(1.92)
ROA	2.6159***	2.6805***	0.2157***	0.2216***
	(4.59)	(4.67)	(4.75)	(4.90)
TOP1	-0.0002	-0.0002	0.0006***	0.0006***
	(-0.20)	(-0.20)	(4.48)	(4.46)
RET	0.0897*	0.0881	0.0146**	0.0147**
	(1.78)	(1.74)	(2.35)	(2.34)
IdiosynVol	-0.0639	-0.1087	-0.0576*	-0.0624*
	(-0.35)	(-0.58)	(-1.92)	(-1.99)
Industry Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
N	8,365	8,365	10,220	10,220
Adj. R^2	0.230	0.222	0.121	0.117

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Table 8: The impact of changes of CSR lists on insider trading profitability

This table presents the results of examining insider trading profitability concerning the interaction between voluntary and mandatory CSR disclosure and CSR list changes. List_In is an indicator with a value of one if the stock is added to the CSR disclosure list and zero otherwise. The dependent variable is insider trading profitability. All regressions incorporate year and industry fixed effects. Details regarding variable construction can be found in Appendix A. Standard errors are clustered at both the firm and year levels, with t-statistics presented in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	6 MON-INSPRF		9 MON-INSPRF		12 MON-INSPRF	
	(3)	(4)	(5)	(6)	(7)	(8)
Voluntary	-0.0187*		-0.0302***		-0.0052	
	(-1.83)		(-3.49)		(-0.55)	
Voluntary× List_in	-0.1020***		-0.3409***		-0.3924***	
	(-2.89)		(-10.52)		(-7.61)	
Mandatory		0.0167		0.0302***		0.0049
		(1.51)		(3.52)		(0.53)
Mandatory× List_in		-0.1008**		-0.3461***		-0.4089***
		(-2.91)		(-10.68)		(-7.54)
List_in	-0.1386***	-0.1391***	-0.1681***	0.1706***	-0.3409***	0.3467***
	(-5.10)	(-5.35)	(-6.70)	(6.77)	(-7.13)	(7.09)
SIZE	-0.0256***	-0.0240**	-0.0250***	-0.0251***	-0.0270**	-0.0272**
	(-3.23)	(-2.89)	(-4.38)	(-4.22)	(-2.40)	(-2.30)
BM	0.0481**	0.0493**	0.0542**	0.0496**	0.0518	0.0413
	(2.41)	(2.76)	(2.30)	(2.31)	(1.52)	(1.44)
ROA	-0.0161	-0.0160	-0.0073	-0.0090	-0.0129	-0.0154
	(-1.02)	(-1.01)	(-0.83)	(-0.87)	(-1.05)	(-1.08)
TOP1	-0.0004**	-0.0004**	-0.0005**	-0.0005**	-0.0007**	-0.0007**
	(-2.54)	(-2.54)	(-2.43)	(-2.24)	(-3.14)	(-3.13)
RET	0.0079	0.0077	0.0098	0.0106*	0.0113	0.0153
	(1.25)	(1.25)	(1.73)	(1.96)	(1.34)	(1.79)
IdiosynVol	0.0011	-0.0008	0.0477	0.0170	0.1514	0.0576
	(0.03)	(-0.07)	(1.29)	(1.22)	(1.69)	(1.31)
Industry Effects	Y	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y	Y
N	9,505	9,505	9,228	9,228	9,505	9,505
Adj. R^2	0.015	0.015	0.019	0.020	0.022	0.021

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Table 9: CSR performance and insiders trading strategies

This table presents the regression results for the relationship between voluntary (mandatory) CSR disclosure and insider trading strategies, including insider sales and purchase profitability. Insider sales (purchase) profitability is measure as the profitability of all insider trades from insider sales (purchase) transactions during the fiscal year. Panel A shows the estimation results of insider sales trading profitability on voluntary (mandatory) CSR disclosure. Panel B presents the estimation results of purchase insider trading profitability on Voluntary (Mandatory) CSR disclosure between 2007 and 2020. All regressions include year and industry fixed effects. Variable construction details are provided in Appendix A. Standard errors are clustered at both firm and year levels. t-statistics are in parentheses. ∗, ∗∗, and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Insider sales profitability

Dep=	6 MON-INSPRF		9 MON-INSPRF		12 MON-INSPRF	
	(3)	(4)	(5)	(6)	(7)	(8)
Voluntary	-0.0237**		-0.0195*		-0.0229*	
	(-2.11)		(-1.93)		(-1.68)	
Mandatory		0.0186		0.0308***		0.0036
		(1.59)		(2.83)		(0.26)
SIZE	-0.0281***	-0.0277***	-0.0253***	-0.0272***	-0.0324***	-0.0305***
	(-6.92)	(-6.71)	(-6.83)	(-7.26)	(-6.20)	(-5.78)
BM	0.0816***	0.0822***	0.0896***	0.0903***	0.0733***	0.0715***
	(4.46)	(4.50)	(5.38)	(5.43)	(3.27)	(3.19)
ROA	-0.0153	-0.0153	-0.0103	-0.0105	-0.0201	-0.0187
	(-1.14)	(-1.14)	(-0.98)	(-0.99)	(-1.19)	(-1.19)
TOP1	-0.0005**	-0.0005**	-0.0005**	-0.0005**	-0.0006*	-0.0006*
	(-2.05)	(-2.07)	(-2.22)	(-2.19)	(-1.77)	(-1.94)
RET	0.0124**	0.0124**	0.0151***	0.0153***	0.0232***	0.0230***
	(2.45)	(2.44)	(3.36)	(3.39)	(3.65)	(3.63)
IdiosynVol	-0.0007	-0.0007	0.0050	0.0057	0.0255*	0.0243*
	(-0.16)	(-0.16)	(1.01)	(1.13)	(1.92)	(1.89)
Industry Effects	Y	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y	Y
N	7,950	7,950	7,698	7,698	7,950	7,950
Adj. R^2	0.019	0.019	0.025	0.026	0.027	0.028

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Panel B: Insider purchase profitability						
	6 MON-INSPRF		9 MON-INSPRF		12 MON-INSPRF	
	(3)	(4)	(5)	(6)	(7)	(8)
Voluntary	-0.0038		-0.0063		0.0039	
	(-0.38)		(-0.70)		(0.31)	
Mandatory		0.0153		0.0219**		0.0150
		(1.44)		(2.30)		(1.17)
SIZE	-0.0144***	-0.0164***	-0.0117***	-0.0146***	-0.0181***	-0.0214***
	(-3.93)	(-4.30)	(-3.45)	(-4.25)	(-3.71)	(-4.33)
BM	0.0247	0.0251	0.0077	0.0084	0.0208	0.0208
	(1.54)	(1.56)	(0.52)	(0.57)	(1.00)	(1.00)
ROA	0.0002	0.0002	0.0008	0.0008	0.0024	0.0024
	(0.15)	(0.15)	(0.57)	(0.57)	(1.39)	(1.38)
TOP1	-0.0003	-0.0003	-0.0004**	-0.0004**	-0.0005	-0.0005
	(-1.34)	(-1.31)	(-2.12)	(-2.08)	(-1.64)	(-1.60)
RET	0.0020	0.0022	0.0024	0.0027	0.0089	0.0092
	(0.39)	(0.44)	(0.53)	(0.61)	(1.32)	(1.37)
IdiosynVol	-0.0022	-0.0018	0.0052	0.0059	0.0130*	0.0134*
	(-0.64)	(-0.50)	(1.26)	(1.36)	(1.74)	(1.76)
Industry Effects	Y	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y	Y
N	6,697	6,697	6,537	6,537	6,697	6,697
Adj. R^2	0.007	0.007	0.012	0.013	0.012	0.012

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Table 10: Voluntary (Mandatory) CSR disclosure, abnormal insider trading, and firm value

This table reports the results of firms' performance, focusing on the interaction term voluntary (mandatory) CSR disclosure and lower abnormal insider trading (*LAIT*, *LAITENT*). *LAIT* is calculated as *AIT* multiplied by -1, where *AIT* is the difference in insider trading between pre-earnings-announcement [-5, -1] and non-earnings-announcement periods (days excluding [-5, 5]). *LATINET* is *ATINET* multiplied by -1, where *ATINET* represents the spread between insider purchases and insider sales of stocks. The dependent variables are Tobin's Q and ROA. Panel A presents the estimation of the effect of lower abnormal insider trading due to voluntary CSR disclosure on firm performance, while Panel B examines the effect of lower abnormal insider trading due to mandatory CSR disclosure on firm performance. The control variables remain consisten with the previous baseline regression, including year and industry fixed effects. Details of variable construction are provided in Appendix A. Standard errors are clustered at both the firm and year levels, with t-statistics presented in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Voluntary CSR disclosure

DEP=	ROA		Tobin Q	
	(1)	(2)	(3)	(4)
LAIT	0.3168		0.0593*	
	(1.42)		(1.80)	
Voluntary* LAIT	0.6381**		0.0486*	
	(2.03)		(1.73)	
LAITENT		0.0009		0.0480*
		(1.25)		(1.76)
Voluntary* LAITENT		0.0011**		0.0496*
		(2.37)		(1.80)
Voluntary	0.0002	0.0018	0.2973	0.0651
	(0.02)	(0.23)	(1.58)	(0.52)
SIZE	0.0217***	0.0214***	-0.0558	0.0395
	(3.00)	(2.87)	(-0.15)	(0.22)
BM	0.0147	0.0147	-9.4264**	-9.4336***
	(0.16)	(0.17)	(-2.07)	(-2.82)
ROA	-0.1837***	-0.1837***	1.1200**	0.9509
	(-4.32)	(-3.82)	(2.24)	(0.24)
TOP1	0.0005***	0.0005*	0.0345**	0.0471***
	(2.67)	(2.05)	(2.30)	(2.74)
RET	0.0213	0.0209	0.1957***	0.2990**
	(1.05)	(0.92)	(3.20)	(2.26)
IdiosynVol	-0.1578**	-0.1561**	-2.6974	-2.9308
	(-2.18)	(-2.20)	(-0.73)	(-1.30)
Industry Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
N	10,220	10,220	10,220	10,220
Adj. R^2	0.015	0.015	0.208	0.239

Panel B: Mandatory CSR disclosure

	ROA	Tobin Q

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	(1)	(2)	(3)	(4)
LAIT	0.2300*		0.0416	
	(1.95)		(1.27)	
Mandatory * LAIT	-0.5903*		-2.9729	
	(-1.70)		(-0.91)	
LAITENT		0.0003		0.0002
		(0.27)		(0.05)
Mandatory * LAITENT		-0.0013		-0.0961
		(-1.24)		(-1.02)
Mandatory	0.0012	0.0026	0.2997*	0.0572
	(0.13)	(0.29)	(1.87)	(0.16)
SIZE	0.0250***	0.0244***	-0.0564	0.2656
	(2.86)	(3.02)	(-0.13)	(0.74)
BM	0.0203	0.0202	-9.4289**	-9.3396***
	(0.18)	(0.18)	(-2.46)	(-2.84)
ROA	-0.2352***	-0.2355***	1.1200	0.5718
	(-4.44)	(-4.45)	(0.28)	(0.17)
TOP1	0.0005***	0.0006***	0.0345**	0.0548*
	(2.90)	(2.97)	(2.35)	(1.94)
RET	0.0292	0.0288	0.1954**	0.3774**
	(1.18)	(1.17)	(2.50)	(2.43)
IdiosynVol	-0.1381	-0.1359	-2.6967	-1.5525
	(-1.60)	(-1.55)	(-0.96)	(-0.73)
Industry Effects	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
N	10,220	10,220	10,220	10,220
Adj. R^2	0.017	0.017	0.208	0.305

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