M&A를 통한 CSR 확산 효과와 재무적 제약 기업의 전략적 대응
The Spillover Effect on CSR Engagement of Financially Constrained Firms: Evidence from the Mergers and Acquisitions Contexts

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This study investigates the effect of mergers and acquisitions (M&A) conducted by firms with strong Corporate Social Responsibility (CSR) practices on non-target firms′ CSR activities. Specifically, the research focuses on the responses of financially constrained non-target firms. Additionally, we examine their investment behaviors and earnings management strategies as reactions to external CSR pressures arising from M&A activities. Generally, financially constrained firms reduce CSR investments due to resource limitations. However, this study hypothesizes that external pressure from high-CSR acquirers may alter such incentives. Empirical analysis yields three primary findings. First, financially constrained firms increase their CSR engagement when faced with a high concentration of high-CSR acquirers in their industry. Second, this CSR spillover effect is stronger in highly competitive industries. Lastly, these financially constrained firms do not significantly adjust capital investments in physical assets but instead tend to engage in earnings manipulation. These results suggest that financially distressed firms strategically enhance CSR investments under external pressure, such as acquisition threats, as a defensive measure.

Keyword: CSR, Financial constraints, M&A

Ⅰ. Introduction

In this research paper, we examine how mergers and acquisitions (M&A) by high Corporate Social Responsibility (CSR) acquirers affect the CSR engagement of non-target firms with financial constraints. Financial constraints typically limit CSR investments, as firms facing cash shortages prioritize cost-cutting

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over long-term investments (Chan et al., 2017). However, this study reveals that financially constrained firms may strategically respond to increasing industry-level CSR driven by M&A threats. Furthermore, we examine the real investments and earnings management of these firms to understand how they respond to CSR pressure using M&A as a quasi-experimental setting.

The effects of CSR initiatives within industries have attracted significant scholarly attention. CSR literature has extensively investigated various determinants of CSR engagement, including peer effects within the same product market. Notably, prior research has documented the phenomenon of CSR spillover, wherein firms are influenced by the CSR activities of their peers and adjust their own CSR strategies accordingly (Cao et al., 2019; Liu and Wu, 2016).

In addition, a firm′s financial capacity plays another pivotal role in determining its CSR engagement. The influence of financial constraints on corporate behavior is well-documented, especially in the context of discretionary investments such as CSR. Firms under financial pressure are often compelled to reduce non-essential expenditures to preserve cash flow, which may lead to a reduction in CSR activities (Chan et al., 2017). On the other hand, firms with limited financial resources often seek external financing from capital markets, which makes them more responsive to investor demands for CSR considerations (Dutordoir et al., 2018; Ho et al., 2024). Thus, there are two contrasting views on how financial distress affects CSR engagement.

This paper seeks to address this gap by exploring the effects of M&A activities conducted by high-CSR acquirers on the CSR engagement of non-target firms with financial constraints. While financially constrained firms typically reduce discretionary investments like CSR to conserve cash flow (Chan et al., 2017), there is evidence that M&As by high-CSR acquirers can raise the overall CSR standards within an industry (Kang and Ahn, 2024).

As the CSR levels of acquirers increase, non-target firms, even those facing financial difficulties, may feel pressure to elevate their own CSR engagement in response to heightened industry norms (Cao et al., 2019). Moreover, in the face of an M&A threat, they may increase CSR engagement as a defensive strategy to avoid becoming acquisition targets. Despite financial pressure, these firms may boost CSR to improve their corporate image and deter potential acquirers. Financially constrained firms may also increase their CSR activities to attract investors and obtain essential capital, especially when facing M&A threats. Strong CSR performance can appeal to responsible investors and help mitigate negative market reactions to equity offerings

(Cheng et al., 2014; Banerjee, 2020; Guo et al., 2024). This suggests that CSR can be a strategic tool for these firms, differing from their usual behavior under financial pressure.

Using a sample of 22,271 firm-year observations from publicly listed U.S. firms between 1995 and 2018, financially constrained firms typically reduce CSR investments, but the presence of high-CSR acquirers encourages these firms to elevate their CSR efforts as a defensive mechanism. Furthermore, our analysis reveals that the impact of CSR spillover on non-target firms is more pronounced in highly competitive industries, suggesting that competitive pressures may intensify the need for non-target firms to adopt or enhance CSR practices.

In addition, we find that financially constrained firms do not significantly alter their capital investments in physical assets; instead, they are more inclined to engage in earnings manipulation. The findings suggest that financially constrained firms, rather than increasing investments in response to CSR pressures, are more likely to engage in earnings management to alleviate the financial burden of CSR initiatives while maintaining profitability.

To validate our primary findings, we conducted several robustness tests. First, we performed a propensity score matching (PSM) analysis to control for potential confounding variables and address endogeneity concerns. Additionally, we replaced the original dependent variable, which measured the CSR levels of non-target firms, with changes in their CSR levels. Finally, we conducted a reverse test to examine whether the CSR activities of non-target firms influence the likelihood of being targeted for M&A by high-CSR acquirers. As a result of conducting these analyses, we confirm that our findings remain robust.

Our paper contributes to the literature in several ways by analyzing how financially constrained non-target firms respond to CSR spillovers from high-CSR acquirers in the context of mergers and acquisitions (M&As). First, by examining the differentiated impact of CSR spillover on financially constrained firms, this study expands the existing understanding of CSR spillover mechanisms. Financially constrained firms respond strategically to this industry-wide shift by increasing their CSR engagement, despite their financial limitations. This finding suggests that CSR spillover extends beyond simple peer effects and that M&A serves as an external shock that reshapes CSR strategies.

Second, contrary to prior literature suggesting that CSR activities require capital investment, and as a result, firms in financial distress are likely to reduce their CSR investments due to limited available resources, our study demonstrates that financially constrained firms may increase CSR engagement

as a strategic response to external pressure specifically in the presence of a control threat. This reveals that CSR is not merely a cost but can act as a defensive mechanism to deter potential acquisitions, providing new insights into the endogenous drivers of CSR spillover.

Lastly, instead of increasing real investments in CSR, financially constrained firms under M&A pressure are more likely to engage in earnings management to maintain CSR levels while preserving financial stability. This highlights that CSR spillover effects do not always translate into real corporate investments but may instead lead firms to adopt financial strategies to balance CSR commitments with profitability goals. The findings bridge the gap between CSR engagement and financial performance, emphasizing that CSR decisions are closely tied to financial incentives.

The rest of this paper is structured as follows. Section 2 describes a comprehensive review of the relevant literature and establishes the foundation for developing our hypotheses. In Section 3, we describe our sample and our methodology. In Section 4, we present our empirical tests and results. Section 5 concludes.

II. Literature Review and Hypothesis Development

2.1 CSR Spillover Effect

The concept of CSR spillover refers to the phenomenon where firms adjust their CSR activities in response to the actions of their peers within the industry. Prior research consistently shows that firms are influenced by the CSR strategies of industry leaders, leading to an alignment or escalation of their own CSR efforts. For instance, Cao et al. (2019) demonstrate that external pressures from stakeholders such as institutional investors, financial analysts, and professional market participants create incentives for firms to mirror the CSR activities of their peers. This is often done to maintain legitimacy, gain competitive advantage, or secure stakeholder support. Liu and Wu (2016) also find a similar CSR spillover effect among industry peers.

The strategic increase in CSR engagement can be a way to differentiate from competitors and build a positive corporate image. However, there is also a critical perspective that views CSR as a potential driver of agency problems, where managers might pursue CSR activities for personal gains rather than for the benefit of the firm or its shareholders.

2.2 Financial Constraints and CSR Engagement

The relationship between financial constraints and CSR engagement is complex and multifaceted. Financial constraints limit a firm's ability to access capital markets, which can restrict its ability to invest in CSR activities, often viewed as non-essential or discretionary expenditures (Ryu et al., 2017). Chan et al. (2017) suggest that CEOs under financial pressure have a strong incentive to conserve cash, leading to cuts in CSR investments. Hong et al. (2012) and Leong and Yang (2021) provide empirical evidence that financial constraints have a negative impact on corporate social responsibility (CSR) activities. In their studies, the authors utilize various measures of financial constraints to examine the relationship, finding that firms facing financial constraints are less likely to allocate resources toward CSR initiatives. These results suggest that financial pressures may force firms to prioritize short-term financial stability over longer-term social and environmental responsibilities, highlighting a potential trade-off between financial health and CSR engagement. This perspective is supported by Kang and Ahn (2021), who find that firms with weaker financial conditions are less likely to respond to CSR spillover effects, as the need to maintain liquidity outweighs the potential benefits of increased CSR engagement. Consequently, firms facing financial constraints may prioritize core business operations over CSR, thereby reducing their overall CSR engagement.

Meanwhile, prior research has explored the effects of CSR on financial constraints (Cheng et al., 2014; Lee and Byun, 2016; Banerjee et al., 2020; Guo et al., 2024). For instance, Cheng et al. (2014) investigate the impact of corporate social responsibility (CSR) strategies on a firm's ability to access finance in capital markets. Their findings indicate that firms with stronger CSR performance experience lower capital constraints. Moreover, this relationship is most pronounced for firms facing the greatest financial constraints. Additionally, Guo et al. (2024) suggest that environmental, social, and governance (ESG) performance has become a critical factor influencing equity issuance. Furthermore, they provide evidence that Chinese firms demonstrate strong ESG performance to creditors and investors in order to secure external capital, as ESG issues have garnered significant public attention.

2.3 Hypothesis Development

In typical circumstances, financially constrained firms are less inclined to mimic the CSR activities of their peers. However, when mergers and acquisitions are at play, rather than a mere spillover effect, the response of financially constrained firms may differ significantly. In the presence of an M&A threat

within the market, financially constrained firms are particularly susceptible to becoming acquisition targets (Khatami et al., 2015). Consequently, these firms are more inclined to engage in behaviors designed to reduce the likelihood of being targeted for a merger or acquisition, which could potentially elevate their CSR levels.

Financially constrained firms, despite their need to cut costs, may perceive an increased threat of acquisition in an industry where CSR has become a focal point due to the actions of a high-CSR acquirer. For instance, companies with weak corporate governance may be vulnerable to hostile takeover attempts (Gantchev et al., 2019; Servaes and Tamayo, 2014). To mitigate the risk of being targeted for acquisition, firms may strategically increase their CSR engagement as a defensive mechanism. By enhancing their CSR activities, these firms aim to improve their corporate image and demonstrate strong corporate governance and social responsibility. This approach can help deter potential acquirers by portraying the firm as a well-managed, responsible entity, which may reduce its attractiveness as an acquisition target while also appealing to socially responsible investors.

In addition, financially constrained firms may require additional financial resources to safeguard against control threats. To attract the attention of investors, such firms may increase their CSR activities (Dutordoir et al., 2018; Ho et al., 2024; Kim et al., 2023). Specifically, engaging in CSR can serve as a strategy for financially constrained firms to enhance their appeal to potential investors, thereby securing needed capital. Kapstein (2001) suggests that firms with strong CSR performance can attract responsible investors. Cheng et al. (2014) investigate whether CSR strategies influence a firm's ability to access finance in capital markets and find that firms with stronger CSR performance have better access to external financing. In particular, the effect of CSR in reducing financial constraints appears to be more pronounced for firms experiencing severe financial distress. Banerjee et al. (2020) also present evidence that firms can mitigate financial constraints by adopting environmentally sustainable practices, including emission reduction, product innovation, and resource conservation. Furthermore, Guo (2024) finds that firms with higher levels of CSR engagement are more likely to secure external financing. Specifically, increased CSR activities are associated with a higher likelihood of both equity and debt financing. This underscores the potential of CSR as a strategic tool, appealing to investors who increasingly prioritize sustainability and corporate responsibility in their investment decisions. Additionally, Dutordoir et al. (2018) demonstrate that a firm's CSR performance can mitigate the negative announcement effects associated with seasoned equity offerings

(SEOs). Their findings suggest that firms with strong CSR performance are more likely to issue new shares opportunistically. This implies that investors may perceive socially responsible firms more favorably. Considering these factors, financially constrained firms may have an incentive to increase their CSR activities in the presence of an M&A threat, which differs from their behavior in typical situations. Thus, this leads to the first hypothesis:

H1: The CSR spillover effect from M&A involving high-CSR acquirers is amplified when non-target firms face financial constraints.

Non-target firms with financial constraints operating in highly competitive markets are more likely to be incentivized to enhance their CSR efforts in response to mergers and acquisitions (M&As) by acquirers with strong CSR practices, in order to mitigate control threats. In highly competitive product markets, firms face significant constraints on operational flexibility, as inefficiencies can quickly lead to a decline in firm value and increase takeover risks (Giroud and Mueller, 2011).

As high-CSR acquirers raise the industry's CSR standards, non-target firms in competitive environments face greater risks if they fail to adapt to this shift. Competitors that meet these rising standards gain a competitive advantage, which could result in significant market share losses for the non-target firm (Fernández-Kranz and Santaló, 2010). A reduction in market share exposes the firm to several risks, including the threat of hostile takeovers. This suggests that as competition grows, non-target firms, particularly those with financial constraints, face pressure to improve their CSR strategies, especially in response to M&As led by high-CSR acquirers.

H2: The CSR spillover effect of M&As by high-level CSR acquirers on non-target and financial constraints firms' CSR will be stronger when the level of competition in the industry is high.

Ⅲ. Research Design

3.1 Sample and Data

The final dataset comprises mergers and acquisitions (M&A) conducted between 1995 and 2018. Financial accounting data were sourced from the COMPUSTAT North America database, focusing exclusively on U.S. firms, while institutional ownership data were obtained from Thomson Reuters. Data on U.S. domestic M&A transactions were retrieved from the Thomson Financial Securities Data

Company (SDC) Platinum database. The sample was restricted to firms meeting the following criteria: non-negative and complete total assets, completed M&A transactions within the U.S. where the acquiring firm secured over fifty percent of the target firm's equity, and transaction values exceeding $1 million. After applying these criteria, the final sample consists of 22,271 firm-year observations.

3.2 Variable Operationalization

3.2.1 Dependent Variable: Measurement of the Non-Target Firms' CSR

This study investigates the impact of mergers and acquisitions (M&A) undertaken by acquirers with high Corporate Social Responsibility (CSR) on the CSR engagement of non-target firms, particularly in the context of financial constraints faced by these non-target firms. To assess CSR performance, we utilize the CSR scores of peer firms within the same industry as the target companies. The focus of our analysis is on non-target firms, as target firms often become delisted following M&A transactions, complicating the assessment of their CSR activities. Therefore, this research primarily explores the spillover effects of M&A activities on the CSR efforts of non-target firms within the same industry.

In this study, we employ the MSCI ESG database (formerly known as Research & Analytics, Inc. (KLD) STATS) to assess the corporate social responsibility (CSR) of firms. The MSCI ESG database provides comprehensive evaluations of a firm's CSR activities and is recognized as one of the most extensive sources for CSR performance ratings. It has been widely utilized in prior CSR research (e.g., Graves and Waddock, 1994; Berman et al., 1999; Baron et al., 2011; Deng et al., 2013). The database covers approximately 650 firms in the Standard & Poor's (S&P) 500 and Domini 400 Social SM Index from 1991, as well as the largest 3,000 U.S. companies by market capitalization, corresponding to the Russell 3000, from 2003 onwards. The MSCI ESG database compiles information from a diverse array of sources, including surveys, firms' social performance data from financial and non-financial reports, governmental and non-governmental organizations, and global media outlets.

Utilizing the MSCI ESG database, we construct a net CSR score to assess a firm's corporate social responsibility (CSR) performance by aggregating the strengths and concerns identified within the database. The MSCI ESG database evaluates a firm's social performance across seven key categories: 1) Community, 2) Corporate Governance, 3) Diversity, 4) Employee Relations, 5) Environment, 6) Human Rights, and 7) Product Quality and Safety. Each category includes both positive

indicators (strengths) and negative indicators (concerns). When a firm demonstrates noteworthy efforts or potential strengths, the MSCI ESG database assigns a score of one. Conversely, if a firm engages in activities that raise concerns or exhibit potential weaknesses, it receives a score of minus one. The net CSR score is calculated as the cumulative total of these scores across the seven categories, encompassing approximately 80 strength and concern indicators. A higher net CSR score indicates a higher level of corporate social performance.

3.2.2 Independent Variable: The Acquirer' CSR level

The primary objective of this study is to explore how financial constraints and industry competition influence the CSR engagement of non-target firms, with a specific focus on the amplifying effects of CSR spillovers within an industry following M&A activities involving high-CSR acquirers.

To achieve this, we employ the "High CSR dummy", following the methodology established by Kang and Ahn (2024), which builds on the concept of spillover effects in corporate governance and CSR engagement observed in M&A contexts (Albuquerque et al., 2019). This dummy variable is assigned a value of one if the acquiring firm's CSR score exceeds the median CSR score within its industry in a given year. Using this measure, we construct the *CSRindex*, which represents the proportion of high-CSR acquirers within the total number of M&A transactions in the same industry and year.

A higher *CSRindex* indicates that a larger proportion of acquirers in the industry demonstrate a strong commitment to CSR initiatives. This measure aligns with previous research on spillover effects from M&A transactions, where firms not directly involved in acquisitions still respond to industry-wide shifts in governance and CSR practices (Albuquerque et al., 2019; Kang and Ahn, 2024). By capturing the spillover effect of CSR engagement, this measure allows us to examine whether and how the presence of high-CSR acquirers influences non-target firms' CSR participation. The *CSRindex* for the industry is defined as follows:

$$CSRindex_{t-1} = \frac{The\ total\ number\ of\ High\ CSR\ dummy\ in\ the\ industry}{The\ sum\ of\ the\ number\ of\ M\&A\ deal\ in\ the\ industry}$$

As a result of the CSR spillover effect, non-target firms in the same industry face increasing pressure to elevate their CSR practices to match the higher standards set by acquiring firms. The presence of multiple acquirers with strong CSR commitments is expected to drive a cultural shift, encouraging other companies to boost their CSR efforts.

Furthermore, to provide a comprehensive understanding of this metric, we present descriptive statistics illustrating *CSRindex* distribution across industries and analyze its trend over time to assess variations in CSR spillover intensity.

3.2.3 Independent Variable: KZ-score

The KZ score, developed by Kaplan and Zingales (1997), is a widely used measure for assessing a firm's financial constraints based on five key financial indicators: cash flow to total assets, market-to-book ratio, leverage, dividends to total assets, and cash holdings to total assets.

A higher KZ score suggests that a firm is more likely to face financial difficulties and constraints in accessing external financing. Studies such as Baker, Stein, and Wurgler (2003) have utilized the KZ score to analyze financial constraints, while Chen and Wang (2012) demonstrated that firms with higher KZ scores are more prone to financial distress, reinforcing its reliability as a metric for financial vulnerability.[1)]

$$KZSCORE_{i,t} = -1.002\frac{CF_{i,t}}{(A_{i,t}-1)} - 39.368\frac{D_{i,t}}{(A_{i,t}-1)} - 1.315\frac{C_{i,t}}{(A_{i,t}-1)} + 3.139B_{i,t} + 0.283Q_{i,t}$$

$CF_{it} \ / \ (A_{it} - 1)$ = Cash flow relative to total assets from the previous year

$D_{it} \ / \ (A_{it} - 1)$ = Cash dividends relative to total assets from the previous year.

$C_{it} \ / \ (A_{it} - 1)$ = Cash relative to assets at the beginning of the year.

B_{it} = Total debt relative to its total financing (debt plus equity)

$Q_{it\backslash}$ = Tobin's Q, (Market value + Assets - Equity) / Assets

3.2.4 Moderating Variable: Herfindahl-Hirschman Index (HHI) as a Proxy for Market Competition

Glaeser and Landsman (2021) explored the influence of product market competition on

1) The KZ score is particularly well-suited as a proxy for financial constraints in this study for several reasons, especially when compared to other measures like the Altman Z-score. First, the KZ score focuses specifically on financial constraints, capturing a firm's ability to access external financing based on a combination of cash flow, leverage, cash holdings, and investment opportunities. This makes it highly relevant for studies examining firms' financial flexibility, as it directly measures liquidity constraints and external financing capacity, which are central to our analysis of CSR behavior under financial strain. Second, while the Altman Z-score is a valuable indicator of financial distress or bankruptcy risk, it is less sensitive to short-term liquidity issues and financing constraints that firms might face without being on the verge of bankruptcy. The Altman Z-score is more focused on predicting solvency and long-term survival, whereas the KZ score is specifically designed to assess the ability to finance ongoing operations, making it more appropriate for studies focused on financial constraints rather than distress. Lastly, the KZ score has been widely adopted in empirical research as a reliable proxy for financial constraints (Kaplan and Zingales, 1997; Baker et al., 2003). This measure aligns well with our study's focus on understanding how financial constraints influence CSR engagement, particularly when examining firms' behavior in the context of M&A spillovers, where short-term financial flexibility is crucial. Therefore, the KZ score is more aligned with the scope of our research than alternative metrics like the Altman Z-score.

corporate disclosure policies, while Flammer (2015) identified a positive relationship between the Herfindahl-Hirschman Index (*HHI*), a measure of industry concentration reflecting market competition, and CSR engagement. To test Hypothesis 2, we examine whether the CSR spillover effects from high-CSR acquirers on non-target firms, particularly those facing financial constraints, are amplified in highly competitive industries. We calculate the industry-level measure of market competition using the HHI at the 2-digit SIC and year level, based on firms′ annual sales data, following the methodology of Albuquerque et al. (2019).

3.3 Regression Model

To explore the impact of M&As by high-CSR acquirers on the CSR engagement of non-target firms, particularly in the context of financial constraints, we use the following regression models. In the first regression, testing Hypothesis 1, we regress the CSR scores of non-target firms (*NET_peers*) on the proportion of high-CSR acquirers (*CSRindex*), the KZ score (*KZSCORE*), and the interaction term between *CSRindex* and the KZ score, while incorporating relevant control variables as follows:

$$\begin{aligned} NET\_peers_{i,t} &= \beta_0 \\ &+ \beta_1 CSRindex_{t-1} + \beta_2 KZSCORE_{i,t-1} \\ &+ \beta_3 CSRindex_{t-1} * KZSCORE_{i,t-1} \\ &+ \beta_4 LNASSET_{i,t-1} + \beta_5 CAPEX_{i,t-1} \\ &+ \beta_6 CASHTA_{i,t-1} + \beta_7 PPEA_{i,t-1} \\ &+ \beta_8 ROA_{i,t-1} + \beta_9 MB_{i,t-1} \\ &+ \beta_{10} SGROWTH_{i,t-1} + \beta_{11} INSTOWN_{i,t-1} \\ &+ \beta_{12} INTANA_{i,t-1} + \beta_{13} SGA_{i,t-1} \\ &+ \beta_{14} ADA_{i,t-1} + \mu_i + Industry\ Dummies \\ &+ Year\ Dummies + \varepsilon_{i,t} \end{aligned} \quad (1)$$

We control for key determinants identified in previous research as influencing firm-level CSR activities.

(1) *LNASSET* : Firm size (*LNASSET*) is included as a control variable, as larger firms are often subject to greater external pressures to disclose CSR information (Lang & Lundholm, 1993; Dhaliwal et al., 2011).

(2) *CAPEX*: Previous research by Harjoto and Jo (2015) demonstrates a positive relationship between CSR ratings and the capital expenditure to net sales ratio. Therefore, we anticipate a positive association between CSR and the capital expenditure ratio (*CAPEX*).

(3) *CASHTA*: We include cash balance (*CASHTA*) in our regression model due to its broader role in corporate decision-making. Firms with higher cash reserves have greater liquidity, enabling long-term investments in CSR initiatives (Opler et al., 1999). A strong cash position can also signal financial stability, encouraging firms to enhance CSR efforts as part of reputation management (Ferreira & Vilela, 2004). Thus, we expect a positive relationship between cash balance (*CASHTA*) and CSR engagement.

(4) *PPEA*: Powell (1997) suggests that the level of fixed assets reflects a firm′s debt capacity. Therefore, firms with a higher proportion of fixed assets (e.g., property, plant, and equip-

ment) are likely to have greater debt capacity, which may facilitate increased investment in CSR initiatives. Based on this, we expect a positive relationship between CSR activities and fixed assets (*PPE*).

(5) *ROA*: A prior study by Dhaliwal et al. (2011) suggests that firms with higher profitability are more likely to engage in CSR activities. Therefore, in this research, we include return on assets (*ROA*) as a control variable to measure profitability. Since firms with stronger financial performance are often linked to greater CSR involvement, we expect a positive correlation between CSR and the profitability ratio (*ROA*).

(6) *MB*: Firms with higher MB ratios are seen as having greater growth potential, which can drive CSR engagement as part of their long-term strategic goals (Kim et al., 2019). Moreover, firms with strong growth prospects may face more scrutiny from stakeholders, prompting more robust CSR efforts (Luo & Bhattacharya, 2006).

(7) *SGROWTH*: Previous research by Harjoto and Jo (2015) indicates a positive relationship between CSR ratings and net sales growth. Therefore, we expect a positive correlation between CSR engagement and net sales growth (*SGROWTH*).

(8) *INSTOWN*: Previous research suggests that institutional ownership enhances a firm's CSR performance, as institutional investors are influenced by the firm's social returns (Harjoto and Jo, 2011). Therefore, we expect a positive relationship between CSR engagement and institutional ownership (*INSTOWN*).

(9) *INTANA*: Husted et al. (2016) have shown that firm-level variables, such as the intangible assets ratio (intangible assets to total assets), are associated with a company's CSR rating. Therefore, we expect a positive relationship between CSR rating and the intangible assets ratio.

(10) *SGA* and *ADA*: Previous research by Cui et al. (2018) has established a link between a company's information asymmetry and its financial characteristics, such as advertising expenses and selling, general, and administrative (SG&A) expenses. Consequently, we include the advertising ratio and SG&A ratio as control variables in this study.

Lastly, we incorporate industry and year dummy variables to control for industry-specific and time-related fixed effects. Firm fixed effects (μ_i) are also included to account for time-invariant firm characteristics and capture any unobserved factors that might influence our results. All independent and control variables are lagged by one year. To minimize the influence of outliers, we winsorize all variables at the top and bottom 5% levels.[2)]

In the regression to test Hypothesis 2, we regress non-target firm's CSR (*NET_peers*) on the proportion of high-level CSR acquirers (*CSRindex*) and the interaction term between the proportion of high-level CSR acquirers (*CSRindex*) and industry competition level (*HHI*) with control variables as follows:

$$
\begin{aligned}
NET\_peers_{i,t} = {} & \beta_0 \\
& + \beta_1 CSRindex_{t-1} + \beta_2 KZSCORE_{i,t-1} \\
& + \beta_3 CSRindex_{t-1} * KZSCORE_{i,t-1} \\
& + \beta_4 HHI_{t-1} + \beta_5 CSRindex_{t-1} * HHI_{t-1} \\
& + \beta_6 KZSCORE_{i,t-1} * HHI_{t-1}
\end{aligned}
$$

2) As a robustness check, we also conducted the analysis using a 1% winsorization, which yielded qualitatively similar results.

$$+ \beta_7 CSRindex_{t-1} * KZSCORE_{i,t-1} * HHI_{t-1} + \beta_8 LNASSET_{i,t-1} + \beta_9 CAPEX_{i,t-1} + \beta_{10} CASHTA_{i,t-1} + \beta_{11} PPE_{i,t-1} + \beta_{12} ROA_{i,t-1} + \beta_{13} MB_{i,t-1} + \beta_{14} SGROWTH_{i,t-1} + \beta_{15} INSTOWN_{i,t-1} + \beta_{16} INTANA_{i,t-1} + \beta_{17} SGA_{i,t-1} + \beta_{18} ADA_{i,t-1} + \mu_i + Industry\ Dummies + Year\ Dummies + \varepsilon_{i,t} \quad (2)$$

If the association between the high-level CSR acquirers and the CSR rating of non-target firm varies depending on the industry competition, as in our Hypothesis 2, β_3 would be significant in Equation (3). If the positive CSR spillover for non-target firms following the increase in the proportion of high-level CSR acquirers strengthens under the perfect competitive industry, the coefficient on the interaction term ($CSRindex*HHI$), β_3, will be significantly negative.

Ⅳ. Empirical Results

4.1 Descriptive Statistics

Table 1 report that from 1995 to 2018, the average *CSRindex* was 0.614, showing a steady increase over time. The highest value occurred in 2018 (0.972, N=1,802), while the lowest appeared in 2007 (0.300) and 2011 (0.202), likely reflecting the impact of the Global Financial Crisis. At the industry level, *CSRindex* was higher in sectors emphasizing social responsibility (e.g., publishing & printing: 0.8401; food & related products: 0.8169) and lower in capital-intensive industries (e.g., transportation equipment: 0.3712; durable goods wholesale: 0.3688), underscoring the role of industry characteristics in shaping CSR strategies.

Table 2 provides the descriptive statistics for each variable. The mean (median) value of non-target firms' CSR (*NET_peers*) is 0.1743 (0.000), indicating the average level of CSR among the non-target firms. The mean (median) value of the proportion of M&A acquirers with high levels of CSR within the industry (*CSRindex*) is 0.6142 (0.6667), indicating the prevalence of high CSR level among the acquirers in the sample. The mean (median) values of *KZSCORE* and *HHI* are 0.3457 (0.398) and 572.335 (416.805), respectively, representing the financial constraints using KZ score and the Herfindahl-Hirschman Index. These descriptive statistics align with previous findings and provide a foundation for further analysis. The distributions of the proxies (*LNASSET, CAPEX, CASHTA, PPEA, ROA, MB, SGROWTH, INSTOWN, INTANA, SGA, ADA*) are generally consistent with prior evidence.

〈Table 1〉 Sample Distribution

Panel A: Sample distribution by fiscal year		
Fiscal year	Observations	Mean of *CSRindex*
1995	226	0.601
1996	264	0.814
1997	301	0.631
1998	269	0.621
1999	310	0.598
2000	138	0.739
2001	410	0.749
2002	381	0.676
2003	1,181	0.586
2004	1,493	0.440
2005	1,122	0.489
2006	1,146	0.496
2007	1,372	0.300
2008	1,280	0.354
2009	1,164	0.481
2010	1,148	0.371
2011	1,044	0.202
2012	1,421	0.618
2013	1,248	0.807
2014	1,200	0.903
2015	1,379	0.865
2016	850	0.838
2017	1,122	0.860
2018	1,802	0.972
Total	22,271	0.614

Panel B: Sample distribution by industry (Top 20)			
Fama - French industry (code)		Observations	Mean of *CSRindex*
Business Services	73	2,766	0.602
Chemicals and Allied Products	28	2,707	0.603
Electronic and Other Electrical Equipment	36	2,258	0.638
Industrial and Commercial Machinery and Computer Equipment	35	1,711	0.659
Instruments and Related Products	38	1,031	0.736
Electric, Gas, and Sanitary Services	49	952	0.489
Communications	48	866	0.655
Transportation Equipment	37	699	0.371
Food and Kindred Products	20	658	0.817
Oil and Gas Extraction	13	590	0.470
Wholesale Trade-Durable Good	50	522	0.784
Apparel and Accessory Stores	56	454	0.607
Eating and Drinking Places	58	453	0.626
Miscellaneous Retail	59	427	0.617
Health Services	80	393	0.605
Fabricated Metal Products	34	362	0.500
Primary Metal Industries	33	337	0.580
Wholesale Trade-Nondurable Goods	51	320	0.369
Engineering, Accounting, Research, and Management Services	87	314	0.542
Printing and Publishing	27	294	0.840

〈Table 2〉 Descriptive Statistics

Variable	N	Mean	s.d.	p5	p10	p25	p50	p75	p90	p95
NET_peers	22,271	0.1743	2.0471	-3	-2	-1	0	1	3	5
CSRindex	22,271	0.6142	0.3722	0	0	0.3333	0.6667	1	1	1
KZSCORE	22,271	0.3457	0.9894	-1.724	-1.147	-0.190	0.398	1.016	1.612	2.053
HHI	22,271	572.335	398.915	208.890	224.589	308.857	416.805	700.595	1161.215	1718.798
LNASSET	22,271	7.1981	1.5995	4.688	5.095	5.956	7.063	8.295	9.577	10.328
CAPEX	22,271	0.0474	0.0391	0.005	0.009	0.018	0.035	0.065	0.109	0.148
CASHTA	22,271	0.1912	0.1992	0.006	0.012	0.036	0.113	0.282	0.536	0.684
PPEA	22,271	0.4852	0.3512	0.052	0.089	0.190	0.396	0.736	1.057	1.204
ROA	22,271	0.0316	0.0951	-0.234	-0.099	0.009	0.047	0.087	0.132	0.170
MB	22,271	3.3053	2.5989	0.667	0.944	1.527	2.438	4.100	7.249	10.653
SGROWTH	22,271	0.1197	0.2147	-0.211	-0.126	-0.003	0.080	0.200	0.419	0.674
INSTOWN	22,271	0.7143	0.2299	0.229	0.333	0.575	0.762	0.894	0.980	1.031
INTANA	22,271	0.1790	0.1843	0	0	0.0149	0.1170	0.2996	0.4853	0.5896
SGA	22,271	0.2261	0.1833	0	0	0.0788	0.1866	0.3375	0.5170	0.6328
ADA	22,271	0.0098	0.0194	0	0	0	0	0.0083	0.0408	0.0695

NOTE: This table reports descriptive statistics for each variable. See Appendix for the definitions of each variable.

4.2 Univariate Analysis

Table 3 reports the Pearson correlation coefficients between non-target CSR (*NET_peers*) and the proportion of high-level CSR acquirers within the industry (*CSRindex*), the financial constraints (*KZSCORE*), Herfindahl-Hirschman Index (*HHI*), and the control variables.

We find that there is a significant and positive correlation between non-target firms' CSR level and acquirers' high CSR level at the 5% significance level, and there is a negative association between non-target firms' CSR level and the financial constraints of peer firms. Moreover, there is a negative association between non-target firms' CSR level and Herfindahl-Hirschman Index (*HHI*).

Given the strong association between the proportion of M&A acquirers with high CSR levels in the industry and various firm-specific characteristics, the subsequent section reports the findings of the multivariate regression analysis.

4.3 Multivariate Analysis

The analysis in Table 4 explores how mergers and acquisitions (M&As) influence the CSR activities of non-target firms, with a particular focus on the moderating role of financial constraints (KZ score).

〈Table 3〉 Correlations Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) *NET_peers*	1														
(2) *CSRindex*	0.3182*	1													
(3) *KZSCORE*	-0.0920*	-0.0160*	1												
(4) *HHI*	-0.0646*	-0.0212*	0.0220*	1											
(5) *LNASSET*	0.0759*	0.0846*	0.0306*	0.0852*	1										
(6) *CAPEX*	-0.0127	-0.0302*	0.0278*	0.1411*	0.0782*	1									
(7) *CASHTA*	0.012	0.0098	-0.0452*	-0.2437*	-0.4486*	-0.2475*	1								
(8) *PPEA*	0.0009	-0.0351*	0.0423*	0.1631*	0.2416*	0.6463*	-0.4373*	1							
(9) *ROA*	-0.0042	0.0151*	-0.0287*	0.1604*	0.2337*	0.1460*	-0.2962*	0.1167*	1						
(10) *MB*	0.0493*	0.0871*	-0.0143*	-0.0794*	-0.0559*	-0.0066	0.2495*	-0.1516*	0.0792*	1					
(11) *SGROWTH*	-0.0283*	-0.0508*	-0.0099	-0.0653*	-0.1351*	0.0645*	0.1318*	-0.1592*	0.0747*	0.1765*	1				
(12) *INSTOWN*	-0.0384*	0.0187*	0.1118*	0.0788*	-0.0529*	-0.0408*	0.0364*	-0.0747*	0.0097	0.0048	-0.0102	1			
(13) *INTANA*	0.0391*	0.0805*	-0.006	-0.0584*	0.1696*	-0.3315*	-0.3008*	-0.3625*	0.0535*	-0.0456*	0.0147*	0.0434*	1		
(14) *SGA*	0.0071	0.0549*	-0.0750*	0.0626*	-0.3510*	-0.0629*	0.1970*	-0.2141*	0.0163*	0.1962*	0.0109	0.0552*	-0.0424*	1	
(15) *ADA*	0.0138*	0.0457*	-0.0295*	0.1638*	-0.0012	0.0674*	-0.0333*	0.0115	0.1146*	0.1189*	-0.0273*	0.0165*	0.006	0.4211*	1

NOTE: This table reports the Pearson correlations among all of the variables. * indicates significance level at 5% level. See Appendix for the definitions of each variable.

Column 1 of Table 4 presents the spillover effect of M&As on non-target firms' CSR. The coefficient on $CSRindex_{t-1}$ is significant and positive (0.3728) for *NET_peers* at the 1% significance level. The results suggest that a higher proportion of acquirers with high CSR levels within the industry encourages non-target firms to elevate their own CSR activities, aligning with the industry standards established by these acquirers.

This indicates that non-target firms tend to increase their own CSR activities when a higher proportion of acquirers in the industry have elevated CSR practices. The significance of this finding suggests that non-target firms are likely aligning their CSR efforts with the industry norms set by these socially responsible acquirers, reflecting a spillover effect that supports industry-level CSR standardization.

Column 2 of Table 4 provides the results of the effect of financial constraints (KZ score) on the non-targets' CSR level. The coefficient on *KZSCORE* is significant and negative (0.0325) for *NET_peers* at the 5% significance level.

Firms facing financial constraints typically reduce discretionary investments like CSR, as they prioritize short-term survival and liquidity (Hong et al., 2012; Leong and Yang, 2021). CSR activities require significant upfront costs, and firms under financial strain typically prioritize liquidity and operational stability over long-term investments, viewing CSR as a non-essential expenditure in the short run (Lins et al., 2017).

However, recent research using M&A as a quasi-experimental setting suggests that financially constrained firms may increase CSR investments when there is a high concentration of high-CSR acquirers in the industry.

In Column 3 of Table 4, using a firm-year panel for the baseline regression, the significant positive coefficient for the interaction term $KZSCORE_{t-1}*CSRindex_{t-1}$ (0.2651) supports Hypothesis 1, indicating that the increased frequency of M&A activity by high-CSR acquirers acts as a catalyst, encouraging even financially constrained firms to raise their CSR engagement. This contrasts with their typical behavior of reducing CSR during financial hardship, highlighting the influential role of industry leaders in shaping the strategic responses of non-target firms (Flammer, 2021; Deng, Kang, & Low, 2013).

In Column 4 of Table 4, the three-way interaction coefficient $KZSCORE_{t-1}* CSRindex_{t-1} *HHI_{t-1}$ is negative and significant (-0.0003), indicating that the positive spillover effect of high CSR acquirers is amplified in industries with greater competitive intensity (i.e., lower market concentration, as measured by the Herfindahl-Hirschman Index, *HHI*). This suggests that in industries with more competition, non-target firms with financial constraints are more responsive to the CSR activities of high-CSR acquirers.

〈Table 4〉 Regression to test Hypothesis 1 and 2

VARIABLES	(1) *NET_peers*	(2) *NET_peers*	(3) *NET_peers*	(4) *NET_peers*
Constant	1.5426*** (11.612)	1.9252*** (14.943)	1.5752*** (11.817)	1.7606*** (12.124)
$CSRindex_{t-1}$	**0.3728*** (10.642)**		0.3519*** (9.595)	0.4525*** (7.767)
$KZSCORE_{t-1}$		**-0.0325** (-2.111)**	-0.0682*** (-2.924)	-0.2294*** (-5.551)
$CSRindex_{t-1}*KZSCORE_{t-1}$			**0.0570** (1.976)**	**0.2651*** (5.229)**
HHI_{t-1}				-0.0004*** (-3.568)
$CSRindex_{t-1}*HHI_{t-1}$				-0.0002** (-2.216)
$KZSCORE_{t-1}*HHI_{t-1}$				0.0003*** (4.544)
$CSRindex_{t-1}*KZSCORE_{t-1}*HHI_{t-1}$				**-0.0003*** (-5.016)**
$LNASSET_{t-1}$	-0.0013 (-0.117)	-0.0027 (-0.240)	-0.0014 (-0.124)	-0.0002 (-0.021)
$CAPEX_{t-1}$	-0.6392 (-1.522)	-0.6118 (-1.452)	-0.6120 (-1.457)	-0.6027 (-1.438)
$CASHTA_{t-1}$	0.2197** (2.155)	0.2438** (2.385)	0.2205** (2.163)	0.2261** (2.222)
$PPEA_{t-1}$	0.0811 (1.224)	0.0846 (1.273)	0.0774 (1.169)	0.0905 (1.368)
ROA_{t-1}	0.1338 (1.014)	0.1656 (1.252)	0.1311 (0.993)	0.1458 (1.108)
MB_{t-1}	-0.0079 (-1.580)	-0.0077 (-1.540)	-0.0077 (-1.547)	-0.0069 (-1.384)
$SGROWTH_{t-1}$	-0.0306 (-0.582)	-0.0393 (-0.746)	-0.0322 (-0.613)	-0.0312 (-0.595)
$INSTOWN_{t-1}$	0.1265* (1.900)	0.1294* (1.937)	0.1224* (1.836)	0.1117* (1.679)
$INTANA_{t-1}$	-0.0597 (-0.565)	-0.0572 (-0.540)	-0.0612 (-0.580)	-0.0550 (-0.522)
SGA_{t-1}	-0.0963 (-1.003)	-0.0951 (-0.987)	-0.0986 (-1.027)	-0.0941 (-0.982)
ADA_{t-1}	-0.8217 (-0.988)	-0.9208 (-1.104)	-0.8124 (-0.977)	-0.9520 (-1.147)
Year and Industry dummy	Included	Included	Included	Included
Firm fixed effect	Included	Included	Included	Included
Observations	22,271	22,271	22,271	22,271
R-squared	0.244	0.239	0.244	0.247

This finding suggests that the increased presence of high-CSR acquirers within an industry creates external pressures on non-target firms, even those facing financial difficulties. The prominence of high-CSR acquirers effectively raises the industry's CSR standards, compelling non-target firms to reconsider their CSR strategies. According to institutional theory, firms in an industry often conform to the practices of leading firms to maintain legitimacy and competitiveness (DiMaggio and Powell, 1983). In this context, high-CSR acquirers act as industry leaders, setting new benchmarks for CSR, which non-target firms must respond to in order to avoid reputational damage or being seen as lagging behind their peers (Bénabou and Tirole, 2010).

Moreover, previous studies have shown that in highly competitive environments, CSR can serve as a differentiation tool, allowing firms to strengthen their market position and appeal to stakeholders (Porter and Kramer, 2006; Flammer, 2015). For financially constrained firms, aligning with the evolving CSR norms becomes strategically necessary, as failure to do so may result in a loss of investor confidence, customer trust, and overall market relevance (Hawn and Ioannou, 2016; García-Sánchez and Martínez-Ferrero, 2019). Even under financial strain, these firms are incentivized to increase CSR efforts to mitigate long-term risks associated with reputational damage and to signal their commitment to sustainability, which is valued by socially responsible investors (Jo and Harjoto, 2011).

4.4 Real Effects

This section examines the real effects of CSR pressure on non-target firms, focusing on capital investments (changes in PPE) and earnings management. Following Albuquerque et al. (2019), we use changes in PPE ($CH\_PPE_{i,t}$) as a measure of firms' investment decisions, capturing adjustments in tangible assets in response to external pressures such as CSR spillovers from M&A activity.

Additionally, we investigate earnings management ($Abs\_AAC\_noint_{i,t}$), recognizing its role as a strategic response to financial constraints. Cohen and Zarowin (2010) highlight that firms facing financial distress often engage in accrual-based earnings management to manage reporting incentives and liquidity constraints.

Given that non-target firms may experience increased competitive pressure and resource reallocation following M&A transactions by high-CSR acquirers, we analyze how financially constrained firms adjust their investment behavior and earnings management strategies in response. By incorporating these measures, we provide a comprehensive analysis of how CSR spillovers influence real corporate decisions, particularly under varying levels of industry competition and financial

constraints.

$$
\begin{aligned}
Abs\_AAC\_noint_{i,t}\ (CH\_PPE_{i,t}) = {} & \beta_0 \\
& + \beta_1 CSRindex_{t-1} + \beta_2 KZSCORE_{i,t-1} \\
& + \beta_3 CSRindex_{t-1} * KZSCORE_{i,t-1} \\
& + \beta_4 HHI_{t-1} + \beta_5 CSRindex_{t-1} * HHI_{t-1} \\
& + \beta_6\ KZSCORE_{i,t-1} * HHI_{t-1} \\
& + \beta_7 CSRindex_{t-1} * KZSCORE_{i,t-1} * HHI_{t-1} \\
& + \beta_8 LNASSET_{i,t-1} + \beta_9 CAPEX_{i,t-1} \\
& + \beta_{10} CASHTA_{i,t-1} + \beta_{11} PPEA_{i,t-1} \\
& + \beta_{12} ROA_{i,t-1} + \beta_{13} MB_{i,t-1} \\
& + \beta_{14} SGROWTH_{i,t-1} + \beta_{15} INSTOWN_{i,t-1} \\
& + \beta_{16} INTANA_{i,t-1} + \beta_{17} SGA_{i,t-1} \\
& + \beta_{18} ADA_{i,t-1} + \mu_i + Industry\ Dummies \\
& + Year\ Dummies + \varepsilon_{i,t} \qquad (3)
\end{aligned}
$$

When examining changes in PPE ($CH\_PPE_{i,t}$) as the dependent variable, the interaction terms $CSRindex_{t-1}*KZSCORE_{i,t-1}$ and $CSRindex_{t-1}*KZSCORE_{i,t-1}*HHI_{t-1}$ yield insignificant results. This suggests that financially constrained non-target firms do not significantly alter their capital investments in physical assets, even when high-CSR acquirers are prominent or when industry competition intensifies. Prior research indicates that capital expenditures on PPE are often tied to long-term operational strategies, which may not be easily adjusted under CSR pressure (McWilliams and Siegel, 2001; Flammer, 2015).

The results in Table 5 show a significant positive effect of the interaction term $CSRindex_{t-1}*KZSCORE_{i,t-1}$ on earnings management ($Abs\_AAC\_noint_{i,t}$). Financially constrained firms are more likely to engage in earnings manipulation when they are pressured to meet CSR standards. This behavior is further amplified in more competitive industries, as indicated by the significant negative coefficient for $CSRindex_{t-1}*KZSCORE_{i,t-1}*HHI_{t-1}$. These findings align with prior studies showing that firms may engage in earnings management when facing both financial and competitive pressures (Deng et al., 2013; García-Sánchez and Martínez-Ferrero, 2019).

Overall, the results suggest that while CSR activities exert considerable pressure on financially constrained firms, particularly in competitive industries, this pressure does not always manifest in tangible capital investments, such as changes in PPE. Instead, these firms are more likely to engage in earnings management as a means to balance the financial strain imposed by CSR investments with the demands of maintaining profitability. This finding aligns with prior studies that have highlighted the tension between CSR engagement and financial performance, especially for firms facing resource limitations (Kim et al., 2012; Flammer, 2015).

4.5 Endogeneity Control

To enhance comparability between the treatment group (M&A firms) and the control group (non-M&A firms) and to address potential

〈Table 5〉 Real Effects - Investments & Earnings Management

VARIABLES	(1) Earnings Management	(2) Investment
Constant	0.0414***	155.4366***
	[7.780]	[7.712]
$CSRindex_{t-1}$	-0.0019	0.6391
	[-0.897]	[0.079]
$KZSCORE_{t-1}$	0.0024	-16.0855***
	[1.603]	[-2.804]
$CSRindex_{t-1}*KZSCORE_{t-1}$	**0.0039****	**10.7185**
	[2.092]	**[1.523]**
HHI_{t-1}	0.0000**	0.0091
	[2.281]	[0.659]
$CSRindex_{t-1}*HHI_{t-1}$	0.0000	0.0065
	[1.050]	[0.647]
$KZSCORE_{t-1}*HHI_{t-1}$	-0.0000	0.0110
	[-0.626]	[1.337]
$CSRindex_{t-1}*KZSCORE_{t-1}*HHI_{t-1}$	**-0.0000***	**-0.0087**
	[-1.764]	**[-0.933]**
$LNASSET_{t-1}$	0.0004	3.6965**
	[0.905]	[2.396]
$CAPEX_{t-1}$	0.0205	171.9592***
	[1.336]	[2.956]
$CASHTA_{t-1}$	0.0035	18.8022
	[0.947]	[1.332]
$PPEA_{t-1}$	-0.0009	-7.0223
	[-0.368]	[-0.765]
ROA_{t-1}	-0.0100**	7.6633
	[-2.068]	[0.419]
MB_{t-1}	0.0001	0.1773
	[0.553]	[0.256]
$SGROWTH_{t-1}$	0.0006	5.2773
	[0.293]	[0.724]
$INSTOWN_{t-1}$	-0.0008	5.2945
	[-0.321]	[0.573]
$INTANA_{t-1}$	0.0062	-11.2074
	[1.608]	[-0.766]
SGA_{t-1}	-0.0027	-11.4544
	[-0.769]	[-0.861]
ADA_{t-1}	0.0090	318.7062***
	[0.296]	[2.765]
Year and Industry dummy	Included	Included
Firm fixed effect	Included	Included
Observations	22,271	22,271
R-squared	0.066	0.023

NOTE: This table reports the regression result for Equation (3). *T*-statistics are reported in bracket. *, **, and *** indicate significance level at the 10%, 5%, and 1% levels, respectively. See Appendix for the definitions of each variable.

confounding variables and endogeneity concerns, we applied 1:2 Propensity Score Matching (PSM).[3] This approach balances firm characteristics between the two groups, allowing us to better isolate the effect of M&A involvement on CSR spillovers.

Following Shipman et al. (2017), we estimated propensity scores using a logistic regression model based on key firm characteristics, including firm size, innovation level, return on assets (*ROA*), market-to-book ratio (*MB*), sales growth, institutional ownership, and marketing expenditures. These matching variables align with the key control variables used in our main regression model, ensuring consistency and comparability across empirical analyses. Firm-year observations were matched without replacement, categorizing firms as part of the treatment group (target firms = 1) or the control group (non-target firms = 0) based on their predicted propensity scores derived from a logistic regression. This PSM methodology generated a matched sample of firms that are similar across these key variables, allowing us to isolate the effect of M&A activity on CSR spillovers while effectively controlling for potential selection bias.

Table 6 also presents the results of the balance test, demonstrating that covariate

〈Table 6〉 The Balance Test for Propensity Score Matching

	Treatment Firms with KZ Scores Above the 75th Percentile (N=5,568): a	Control firms with KZ Scores under the 75th Percentile (N=16,703):b	Test of difference (a-b): p-value	Treatment Firms with KZ Scores Above the 75th Percentile (N=2,619): a	Control firms with KZ Scores under the 75th Percentile (N=5,238):b	Test of difference (a-b): p-value
	Mean	Mean	t-test	Mean	Mean	t-test
LNASSET	7.254	7.18	0.003*	7.196	7.163	0.389
CAPEX	0.049	0.047	0.009*	0.046	0.047	0.301
CASHTA	0.184	0.194	0.002*	0.188	0.194	0.226
PPEA	0.498	0.481	0.002*	0.476	0.475	0.927
ROA	0.027	0.033	0.000*	0.032	0.03	0.502
MB	3.355	3.289	0.099	3.326	3.383	0.365
SGROWTH	0.118	0.12	0.574	0.121	0.119	0.727
INSTOWN	0.744	0.704	0.000*	0.703	0.715	0.022*
INTANA	0.181	0.178	0.308	0.193	0.185	0.061
SGA	0.209	0.232	0.000*	0.218	0.224	0.131
ADA	0.009	0.01	0.013*	0.009	0.01	0.332

* indicates significance level at the 5% level. See Appendix for the definitions of each variable.

3) In untabulated results, 1:1 and 1:3 matching yield consistent findings, supporting our main conclusions.

〈Table 7〉 Propensity Score Matching Test (1:2)

VARIABLES	(1) *NET_peers*	(2) *NET_peers*	(3) *NET_peers*	(4) *NET_peers*
Constant	1.9409*** (7.514)	2.0355*** (10.093)	2.0398*** (7.828)	2.2679*** (7.994)
$CSRindex_{t-1}$	**0.3441***** **(5.019)**		0.2706*** (3.638)	0.3812*** (3.168)
$KZSCORE_{t-1}$		**-0.1094***** **(-5.209)**	-0.1234*** (-2.699)	-0.1736** (-2.152)
$CSRindex_{t-1}*KZSCORE_{t-1}$			**0.1406**** **(2.560)**	**0.2926***** **(2.991)**
HHI_{t-1}				-0.0004** (-2.208)
$CSRindex_{t-1}*HHI_{t-1}$				-0.0002 (-1.239)
$KZSCORE_{t-1}*HHI_{t-1}$				0.0001 (0.622)
$CSRindex_{t-1}*KZSCORE_{t-1}*HHI_{t-1}$				**-0.0003*** **(-1.846)**
$LNASSET_{t-1}$	-0.0226 (-1.062)	-0.0127 (-0.773)	-0.0235 (-1.104)	-0.0220 (-1.038)
$CAPEX_{t-1}$	-0.6246 (-0.774)	-0.8747 (-1.257)	-0.6044 (-0.749)	-0.5243 (-0.651)
$CASHTA_{t-1}$	0.1119 (0.563)	0.1756 (1.089)	0.1045 (0.526)	0.1168 (0.589)
$PPEA_{t-1}$	0.0039 (0.030)	0.0994 (0.951)	-0.0030 (-0.023)	0.0150 (0.116)
ROA_{t-1}	0.2686 (1.074)	0.2061 (0.961)	0.2913 (1.164)	0.2969 (1.189)
MB_{t-1}	0.0072 (0.766)	0.0022 (0.281)	0.0078 (0.835)	0.0087 (0.930)
$SGROWTH_{t-1}$	-0.2455** (-2.432)	-0.1611* (-1.811)	-0.2493** (-2.470)	-0.2485** (-2.465)
$INSTOWN_{t-1}$	0.0640 (0.480)	-0.0989 (-1.051)	0.0420 (0.315)	0.0186 (0.139)
$INTANA_{t-1}$	-0.1829 (-0.903)	-0.1686 (-1.048)	-0.1969 (-0.973)	-0.1855 (-0.918)
SGA_{t-1}	-0.0469 (-0.258)	-0.0647 (-0.439)	-0.0565 (-0.311)	-0.0595 (-0.328)
ADA_{t-1}	-2.0546 (-1.320)	-1.1065 (-0.867)	-2.1276 (-1.368)	-2.3653 (-1.522)
Year and Industry dummy	Included	Included	Included	Included
Firm fixed effect	Included	Included	Included	Included
Observations	7,857	7,857	7,857	7,857
R-squared	0.276	0.268	0.277	0.280

NOTE: *T*-statistics are reported in bracket. *, **, and *** indicate significance level at the 10%, 5%, and 1% levels, respectively. See Appendix for the definitions of each variable.

〈Table 8〉 Sensitivity and Reverse Tests

Panel A: Change Model		
VARIABLES	(1) *CH_NET_peers*	(2) *CH_NET_peers*
Constant	0.4863**	0.5449***
	[2.537]	[2.597]
$CSRindex_{t-1}$	0.1586***	0.2506***
	[3.314]	[3.292]
$KZSCORE_{t-1}$	-0.0401	-0.0319
	[-1.309]	[-0.582]
$CSRindex_{t-1}*KZSCORE_{t-1}$	**0.0679***	**0.1752*****
	[1.818]	**[2.613]**
HHI_{t-1}		-0.0001
		[-0.777]
$CSRindex_{t-1}*HHI_{t-1}$		-0.0001
		[-1.579]
$KZSCORE_{t-1}*HHI_{t-1}$		-0.0000
		[-0.367]
$CSRindex_{t-1}*KZSCORE_{t-1}*HHI_{t-1}$		**-0.0002***
		[-1.913]
Control Variables	Included	Included
Year and Industry dummy	Included	Included
Firm fixed effect	Included	Included
Observations	13,796	13,796
R-squared	0.130	0.132
Panel B: Reverse Causality		
VARIABLES	(1) *CSRindex*	(2) *CSRindex*
Constant	1.0065***	1.0477***
	[25.967]	[25.135]
NET_peers_{t-1}	0.0117***	0.0224***
	[5.802]	[6.835]
$KZSCORE_{t-1}$	0.0091*	0.0183**
	[1.947]	[2.334]
$NET\_peers_{t-1}*KZSCORE_{t-1}$	**-0.0015**	**0.0017**
	[-0.858]	**[0.596]**
HHI_{t-1}		-0.0001***
		[-2.746]
$NET\_peers_{t-1}*HHI_{t-1}$		-0.0000***
		[-4.232]
$KZSCORE_{t-1}*HHI_{t-1}$		-0.0000
		[-1.516]
$NET\_peers_{t-1}*KZSCORE_{t-1}*HHI_{t-1}$		**-0.0000**
		[-1.607]
Control Variables	Included	Included
Year and Industry dummy	Included	Included
Firm fixed effect	Included	Included
Observations	13,796	13,796
R-squared	0.404	0.406

NOTE: *T*-statistics are reported in bracket. *, **, and *** indicate significance level at the 10%, 5%, and 1% levels, respectively. See Appendix for the definitions of each variable.

imbalance was significantly reduced after matching compared to the unmatched sample, thereby improving the comparability between the treatment and control groups. Specifically, the reduction in covariate imbalance indicates that the PSM process successfully mitigated confounding effects, consistent with prior studies (Austin, 2011; Stuart, 2010), enhancing the reliability of the results.

The subsequent analysis, presented in Table 7, presents the results from an additional analysis using a propensity score matching approach. Notably, the estimates for the interaction terms $CSRindex_{t-1}*KZSCORE_{i,t-1}$ and $CSRindex_{t-1}*KZSCORE_{i,t-1}*HHI_{t-1}$ remain statistically significant and retain their direction, consistent with the main results reported in Table 3. These findings reinforce the robustness of our main regression results, even after addressing potential self-selection bias through the application of the PSM method.

4.6 Robustness Tests

Panel A of Table 8 presents the results of a series of sensitivity tests aimed at reinforcing the robustness of our findings. In this analysis, the dependent variable, originally the CSR levels of non-target firms, is replaced with changes in CSR of non-target firms. This approach allows us to capture the dynamic nature of CSR behavior, reflecting how non-target firms modify their CSR activities in response to M&A events initiated by high-CSR acquirers.

In Panel B of Table 8, we assess whether the CSR activities of non-target firms influence the likelihood of M&A activity by high-CSR acquirers, effectively reversing the relationship explored in Table 4. The regression results indicate that this relationship is insignificant, suggesting that non-target firms' CSR does not significantly influence the occurrence of M&A deals led by high-CSR acquirers.

By demonstrating that reverse causality is not present, we address concerns about potential endogeneity in the primary analysis. This supports the argument that the causal relationship primarily flows from M&A activity by high-CSR acquirers to changes in the CSR behavior of non-target firms, and not the reverse. Consequently, the results from Panel B of Table 8 provide further confidence that the observed relationship between high-CSR M&A activity and non-target CSR behavior is not driven by reverse causality, reinforcing the robustness of our original findings (Wooldridge, 2010; Roberts and Whited, 2013).

Ⅴ. Conclusion

In this study, we address a gap in the lit-

erature by providing evidence on how financial constraints influence corporate social responsibility in the context of mergers and acquisitions. Financially constrained firms, despite needing to cut costs, may increase their CSR efforts to counter acquisition threats, particularly in industries where CSR is emphasized by high-CSR acquirers. This defensive strategy helps enhance their attractiveness and deter potential takeovers. Additionally, boosting CSR can attract investors, providing these firms with the financial resources needed to safeguard against control threats. Building on this rationale, we anticipated that non-target firms facing financial constraints would enhance their CSR activities.

The results of the empirical analysis are as follows. First, we observe that non-target firms with financial constraints increase their CSR commitment following acquisitions by high-level CSR acquirers. This finding indicates that financial constrained firms have different incentives and might strategically increase their CSR engagement as a defensive mechanism to enhance their attractiveness or deter potential acquirers through CSR engagement. Second, our analysis reveals that the impact of CSR spillover on non-target firms is more pronounced in highly competitive industries, suggesting that competitive pressures may intensify the need for non-target firms to adopt or enhance CSR practices.

Overall, we provide empirical evidence demonstrating that financially constrained firms have different incentives regarding CSR under external pressure. We contribute to the literature by broadening the understanding of the factors that drive CSR engagement decisions, particularly in the context of industry-wide dynamics during M&A events.

This study offers the following implications for investors and policymakers. From an investor's perspective, CSR engagement may function as a defensive strategy rather than solely a sustainability commitment. Investors should recognize that financially constrained firms may increase CSR efforts not out of genuine dedication to sustainability, but as a strategic move to deter acquisition threats. This implies that CSR activities should be evaluated within the broader context of a firm's financial health and industry dynamics.

From a government and regulatory standpoint, some firms may adopt CSR as a short-term defensive measure rather than a long-term sustainability initiative, particularly in response to M&A threats. To enhance transparency in CSR reporting, governments should enforce standardized disclosure requirements that distinguish firms genuinely integrating CSR into their business models from those using it strategically. By implementing these measures, policymakers can ensure that CSR remains a credible and impactful practice rather than merely a financial survival tactic.

References

Albuquerque, R., L. Brandão-Marques, M. A. Ferreira, and P. Matos(2019), "International corporate governance spillovers: Evidence from cross-border mergers and acquisitions," *The Review of Financial Studies*, 32(2), pp.738-770.

Austin, P. C.(2011), "An introduction to propensity score methods for reducing the effects of confounding in observational studies," *Multivariate Behavioral Research*, 46(3), pp.399-424.

Baker, M., J. C. Stein, and J. Wurgler(2003), "When does the market matter? Stock prices and the investment of equity-dependent firms," *The Quarterly Journal of Economics*, 118(3), pp.969-1005.

Banerjee, R., K. Gupta, and P. Mudalige(2020), "Do environmentally sustainable practices lead to financially less constrained firms? International evidence," *International Review of Financial Analysis*, 68, pp.101337.

Baron, D. P., M. A. Harjoto, and H. Jo(2011), "The economics and politics of corporate social performance," *Business and Politics*, 13(2), pp.1-46.

Bénabou, R., and J. Tirole(2010), "Individual and corporate social responsibility," *Economica*, 77(305), pp.1-19.

Berman, S. L., A. C. Wicks, S. Kotha, and T. M. Jones(1999), "Does stakeholder orientation matter? The relationship between stakeholder management models and firm financial performance," *Academy of Management Journal*, 42(5), pp.488-506.

Cao, J., H. Liang, and X. Zhan(2019), "Peer effects of corporate social responsibility," *Management Science*, 65(12), pp.5449-5956.

Chan, C. Y., D. W. Chou, and H. C. Lo(2017), "Do financial constraints matter when firms engage in CSR?," *The North American Journal of Economics and Finance*, 39, pp.241-259.

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

Cui, J., H. Jo, and H. Na(2018), "Does corporate social responsibility affect information asymmetry?," *Journal of Business Ethics*, 148, pp.549-572.

Cohen, D. A., and Zarowin, P.(2010), "Accrual-based and real earnings management activities around seasoned equity offerings," *Journal of Accounting and Economics*, 50(1), 2-19.

Deng, X., J. K. Kang, and B. S. Low(2013), "Corporate social responsibility and stakeholder value maximization: Evidence from mergers," *Journal of Financial Economics*, 110(1), pp.87-109.

Dhaliwal, D. S., O. Z. Li, A. Tsang, and Y. G. Yang(2011), "Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting," *The Accounting Review*, 86(1), pp.59-100.

DiMaggio, P. J., and W. W. Powell(1983), "The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields," *American Sociological Review*, 48(2), pp.147-160.

Dutordoir, M., N. C. Strong, and P. Sun(2018), "Corporate social responsibility and seasoned equity offerings," *Journal of Corporate Finance*, 50, pp.158-179.

Fernández-Kranz, D., and J. Santaló(2010), "When

necessity becomes a virtue: The effect of product market competition on corporate social responsibility," *Journal of Economics and Management Strategy*, 19(2), pp.453-487.

Ferreira, M. A., and A. S. Vilela(2004), "Why do firms hold cash? Evidence from EMU countries," *European Financial Management*, 10(2), pp.295-319.

Flammer, C.(2015), "Does product market competition foster corporate social responsibility? Evidence from trade liberalization," *Strategic Management Journal*, 36(10), pp.1469-1485.

Flammer, C.(2021), "Corporate green bonds," *Journal of Financial Economics*, 142(2), pp.499-516.

García-Sánchez, I. M., and J. Martínez-Ferrero(2019), "Sustainability development and the quality of non-financial information: The variable impact of institutional shareholders," *Sustainable Development*, 27(1), pp.45-60.

Gantchev, N., O. R. Gredil, and C. Jotikasthira(2019), "Governance under the gun: Spillover effects of hedge fund activism," *Review of Finance*, 23(6), pp.1031-1068.

Giroud, X., and H. M. Mueller(2011), "Corporate governance, product market competition, and equity prices," *The Journal of Finance*, 66(2), pp.563-600.

Glaeser, S. A., and W. R. Landsman(2021), "Deterrent disclosure," *The Accounting Review*, 96(5), pp.291-315.

Graves, S. B., and S. A. Waddock(1994), "Institutional owners and corporate social performance," *Academy of Management Journal*, 37(4), pp.1035-1046.

Guo, X., S. Li, X. Song, and Z. Tang(2024), "ESG, financial constraint and financing activities: A study in the Chinese market," *Accounting & Finance*, 64(2), pp.1637-1663.

Harjoto, M. A., and H. Jo(2011), "Corporate governance and CSR nexus," *Journal of Business Ethics*, 100, pp.45-67.

Harjoto, M. A., and H. Jo(2015), "Legal vs. normative CSR: Differential impact on analyst dispersion, stock return volatility, cost of capital, and firm value," *Journal of Business Ethics*, 128, pp.1-20.

Hawn, O., and I. Ioannou(2016), "Mind the gap: The interplay between external and internal actions in the case of corporate social responsibility," *Strategic Management Journal*, 37(2), pp.2569-2588.

Ho, C. Y. C., E. Wu, and J. Yu(2024), "The price of corporate social irresponsibility in seasoned equity offerings: International evidence," *The British Accounting Review*, 56(4), 101369.

Hong, H., J. D. Kubik, and J. A. Scheinkman(2012), "Financial constraints on corporate goodness (No. w18476)," *National Bureau of Economic Research*, Working paper.

Husted, B. W., D. Jamali, and W. Saffar(2016), "Near and dear? The role of location in CSR engagement," *Strategic Management Journal*, 37(10), pp.2050-2070.

Kang, G. I. J., and H. S. Ahn(2021), "Peer Effects in CSR Engagement and the Moderating Role of Financial Constraints," *Journal of CEO and Management Studies*, 24(1), pp. 91-108.

Kang, G. I. J., and H. S. Ahn(2024), "CSR spillover effects of corporate M&As by US Acquirers," *Industry and Innovation*, 31(7), pp.1-27.

Kaplan, S. N., and L. Zingales(1997), "Do investment-cash flow sensitivities provide useful measures

of financing constraints?," *The Quarterly Journal of Economics*, 112(1), pp.169-215.

Kapstein, E. B.(2001), "The corporate ethics crusade," *Foreign Affairs*, 80(5), pp.105-119.

Khatami, S. H., M. T. Marchica, and R. Mura(2015), "Corporate acquisitions and financial constraints," *International Review of Financial Analysis*, 40, pp.107-121.

Kim, Y., M. S. Park, and B. Wier(2012), "Is earnings quality associated with corporate social responsibility?," *The Accounting Review*, 87(3), pp.761-796.

Kim, H. D., T. Y. Kim, Y. Kim, and K. W. Park(2019), "Do long-term institutional investors promote corporate social responsibility activities?," *Journal of Banking & Finance,* 101, pp.256-269.

Kim, S. Y., J. Lee, and B. Wang(2023), "ESG performance, financial slack, and financial constraints: Evidence from seasoned equity offerings of Korean firms," *Korean Management Review*, 52(5), pp.983-1002.

Jo, H., and M. A. Harjoto(2011), "Corporate governance and firm value: The impact of corporate social responsibility," *Journal of Business Ethics*, 103(3), pp.351-383.

Lang, M., and R. Lundholm(1993), "Cross-sectional determinants of analyst ratings of corporate disclosures," *Journal of Accounting Research*, 31(2), pp.246-271.

Lantos, G. P.(2001), "The boundaries of strategic corporate social responsibility," *Journal of Consumer Marketing*, 18(7), pp.595-632.

Lee, J. H., and H. S. Byun(2016), "Does corporate social responsibility activities reducethe risk of firms? Evidence from Korea," *Korean Management Review*, 45(5), pp.1551-1586.

Leong, C. K., and Y. C. Yang(2021), "Constraints on "doing good": Financial constraints and corporate social responsibility," *Finance Research Letters*, 40, 101694.

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

Liu, S., and D. Wu(2016), "Competing by conducting good deeds: The peer effect of corporate social responsibility," *Finance Research Letters*, 16, pp.47-54.

Luo, X., and C. B. Bhattacharya(2006), "Corporate social responsibility, customer satisfaction, and market value," *Journal of Marketing*, 70(4), pp.1-18.

McWilliams, A., and. D. Siegel(2001), "Corporate social responsibility: A theory of the firm perspective," *Academy of Management Review*, 26(1), pp.117-127.

Opler, T., L. Pinkowitz, R. Stulz, and R. Williamson(1999), "The determinants and implications of corporate cash holdings," *Journal of Financial Economics*, 52(1), pp.3-46.

Porter, M. E., and M. R. Kramer(2006), "Strategy and society: The link between competitive advantage and corporate social responsibility," *Harvard Business Review*, 84(12), pp.78-92.

Powell, R. G.(1997), "Modelling takeover likelihood," *Journal of Business Finance and Accounting*, 24(7-8), pp.1009-1030.

Roberts, M. R., and T. M. Whited(2013), "Endogeneity in empirical corporate finance," *Handbook of the Economics of Finance*, 2, pp.493-572.

Ryu, D. W., D. J. Ryu, and J. H. Hwang(2017), "Corporate Social Responsibility: Investment

or Expense," *Korean Management Review*, 46(4), pp.1127-115.

Servaes, H., and A. Tamayo(2014), "How do industry peers respond to control threats?," *Management Science*, 60(2), pp.380-99.

Shipman, J. E., Q. T. Swanquist, and R. L. Whited (2017), "Propensity score matching in accounting research," *The Accounting Review*, 92(1), pp.213-244.

Stuart, E. A.(2010), "Matching methods for causal inference: A review and a look forward," *Statistical Science: A Review Journal of the Institute of Mathematical Statistics*, 25(1), pp.1.

Wooldridge, J. M.(2010), *Econometric Analysis of Cross Section and Panel Data,* MIT press, Cambridge.

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〈Appendix 1〉 Measurement of Variables

Variables	Measurement	Data source
$NET\_peers_{i,t}$	The net CSR score for non-target firm i in year t is derived from the MSCI ESG database, incorporating both strengths and concerns to assess the firm's overall CSR performance.	MSCI ESG database, SDC
$CSRindex_{i,t-1}$	The ratio of high-CSR acquirers to the total number of M&A transactions within an industry. A high-CSR acquirer is identified using a high CSR dummy, which is assigned a value of one if the acquiring firm's CSR score exceeds the median CSR score of all firms within the same industry in a given year. This measure captures the prevalence of socially responsible acquirers within an industry's M&A landscape.	
$KZSCORE_{i,t-1}$	The KZ score, introduced by Kaplan and Zingales (1997), is a widely adopted metric for evaluating a firm's financial constraints. It is derived from five key financial indicators: cash flow to total assets, market-to-book ratio, leverage, dividends to total assets, and cash holdings to total assets, providing a comprehensive measure of a firm's financial flexibility and funding limitations.	Compustat
HHI_{t-1}	Following Albuquerque et al. (2019), industry concentration is measured as the sum of squared market shares, calculated using firms' annual sales data within each industry.	
$LNASSET_{i,t-1}$	The natural logarithm of a firm's total assets, serving as a proxy for firm size.	
$CAPEX_{i,t-1}$	Capital expenditures scaled by net sales, representing the firm's investment intensity.	
$CASHTA_{i,t-1}$	Cash holdings scaled by total assets.	
$PPEA_{i,t-1}$	Tangible fixed assets, including property, plant, and equipment, scaled by total assets.	
$ROA_{i,t-1}$	Return on assets (ROA), measured as operating income before depreciation scaled by total assets.	
$MB_{i,t-1}$	The market-to-book ratio, calculated as the market value of equity divided by the book value of equity.	
$SGROWTH_{i,t-1}$	The annual sales growth rate, measured as the percentage change in net sales from year t-1 to year t.	
$INTANA_{i,t-1}$	Intangible asset divided by total assets.	
$SGA_{i,t-1}$	Selling, general, and administrative (SG&A) expenses scaled by total operating expenses.	
$ADA_{i,t-1}$	Advertising expenses scaled by total operating expenses	
$CH\_PPE_{i,t}$	The year-over-year change in a firm's property, plant, and equipment (PPE).	
$Abs\_AAC\_noint_{i,t}$	Discretionary Accruals by Dechow et al. (1995). The regression analysis is conducted at the industry-year level following equation to estimate the coefficient values. $TA_t/A_{t-1} = \beta_0 + \beta_1(1/A_{t-1}) + \beta_2(\Delta Sales_t/A_{t-1}) + \beta_3(PPE_t/A_{t-1}) + \varepsilon_t$ TA : net income - operating cash flow; A: total assets; Sales: sales; AR: account recievables; PPE: tangible assets; The residuals are obtained from the following equation by substituting the estimated coefficient values derived from the previous regression equation: $DA = TA_t/A_{t-1} - \beta_0 - \beta_1(1/A_{t-1}) - \beta_2\{(\Delta Sales_t - \Delta AR_t)/A_{t-1}\} - \beta_3(PPE_t/A_{t-1})$	
$INSTOWN_{i,t-1}$	The proportion of shares held by institutional investors	Thomson Reuters