Stock Exchanges as Governance Institutions: Evidence from the Tokyo Stock Exchange*

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Abstract

In March 2023, the Tokyo Stock Exchange requested, without formal enforcement, that listed firms disclose action plans to improve their cost of capital and profitability. We evaluate the effects of this disclosure request using a staggered difference-in-differences design. Our estimates show that disclosed firms experience modest short-run increases in valuation, higher profitability, and more shareholder-friendly payout and capital policies. These effects are stronger and more persistent among higher-valuation and higher-tier firms. Exploiting the exchange's emphasis on firms with price-to-book ratios below one, we also conduct a regression discontinuity analysis. Contrary to expectations, firms just below the threshold are initially less likely to disclose than those just above it, and that marginal disclosers just above the cutoff subsequently trade at lower price-to-book ratios. Collectively, our findings suggest that exchange-driven governance initiatives without formal enforcement can be effective on average, but can also depress valuations for firms induced to comply at the margin.

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1 Introduction

Stock exchanges play two fundamental roles in the economy. First, they provide liquidity infrastructure for trading that facilitates price discovery and lowers the cost of capital (O'Hara, 2003; Easley and O'Hara, 2004; Fang et al., 2009; Bessembinder et al., 2020). Second, they enforce governance standards through listing rules, disclosure requirements, and monitoring functions (Huddart et al., 1999; Frost et al., 2006; Cumming et al., 2011; De Carvalho and Pennacchi, 2012; Gerakos et al., 2013). While there is a large literature on the liquidity role they play, the governance role is often underappreciated. Exchanges are typically viewed as neutral market operators rather than as active agents shaping corporate behavior (Fleckner, 2005; Gadinis and Jackson, 2006; Petry, 2025). This conventional view understates the influence exchanges can have on corporate decision-making. As a result, we know little about whether and how exchange-initiated governance affects firm behavior and valuation.

We address this gap in the literature by examining the recent governance rule changes implemented by the Tokyo Stock Exchange (TSE). In March 2023, the TSE took the unprecedented step of directly intervening in the governance of listed firms. Through its request titled *Action to Implement Management that is Conscious of Cost of Capital and Stock Price* (hereinafter, the CCSP request), the TSE urged all firms on the Prime and Standard markets to disclose concrete plans to enhance capital efficiency and corporate value. While the initiative applies broadly across these market segments, the TSE explicitly highlighted firms with a market value trading below book value, i.e., those with a price to book ratio less than one. The CCSP request represents a new form of disclosure-based governance intervention initiated by the exchange.

In this paper, we address three main research questions. First, we examine how firms adjust their disclosure practices in response to the TSE's CCSP request. Although the request is formally nonbinding, the TSE's communication explicitly drew attention to the large number of firms trading at price-to-book (P/B) ratios below one and urged these firms to set out credible plans for improving capital efficiency. This emphasis increased scrutiny of

undervalued firms and heightened expectations that they demonstrate strategic intent. Such pressure may prompt more informative disclosure and signal managerial commitment, but it may also expose weaknesses in firms with limited governance capacity. How firms navigate these incentives, and how this shapes the substance and quality of their disclosures, remains an empirical question. Understanding the overall effect on disclosure is crucial for assessing the role of exchange-led governance interventions.

Second, we investigate how CCSP disclosure affects firm valuation. Investors may view these disclosures as credible commitments to better governance or more efficient capital use, which could lead to sustained improvements in market value. However, disclosure can also backfire if it reveals negative information or signals limited strategic capacity, in which case valuations may decline. In addition, observed valuation changes may reflect short-lived actions such as buybacks or temporary dividend increases rather than genuine improvements in fundamentals. Distinguishing among these possibilities is essential for determining whether valuation gains reflect lasting enhancements in firm performance or are instead driven by superficial adjustments aimed at meeting investor expectations. Clarifying this issue is critical for evaluating the economic impact of the TSE's intervention.

Lastly, we explore the real effects of the CCSP request on firms' profitability and capital allocation. If the initiative encourages firms to deploy capital more effectively, strengthen internal governance, or improve operational efficiency, it would indicate that the intervention has substantive consequences for firm behavior. These effects may differ across firms with varying characteristics, particularly between those in the Prime segment with stronger governance frameworks and those in the Standard segment with weaker monitoring environments. Exploring this heterogeneity helps illuminate the mechanisms through which the CCSP request operates and provides guidance for designing more effective governance reforms going forward.

The CCSP request is practically relevant because it targets one of the most persistent frictions in Japan's equity market: chronically low valuations associated with weak capital

efficiency and opaque capital allocation practices. By pushing firms to articulate capital allocation strategies and disclose improvement plans, the reform provides investors with new, comparable information about managerial intent and governance quality that was previously unavailable. The initiative also creates a clear separation between firms that credibly commit to capital efficiency improvements and those that respond minimally, sharpening the information environment for domestic and foreign investors. Studying the TSE's intervention offers insights into how market institutions can improve corporate behavior and capital allocation. As investors and policymakers around the world search for ways to address low valuations and capital inefficiency, understanding whether and how a stock exchange can shape firm incentives is relevant. Our study clarifies whether exchange-led approaches can complement traditional regulation and investor activism in promoting efficient markets. By examining a rare case in which a major exchange actively intervened in firm governance, this study sheds light on the broader potential of market operators to serve as catalysts for corporate reform.

To study the consequences of the CCSP request, we employ two empirical strategies. First, we exploit the staggered timing of firms' compliance with the CCSP request. We estimate the average treatment effects of the CCSP disclosure on firm fundamentals and financial policies using an event-study difference-in-differences (DiD) framework. The key identifying assumption underlying this approach is that the treatment and control groups would have followed parallel trends in the absence of the disclosure. We corroborate this assumption by showing that the two groups' pre-disclosure trends are similar.

Second, we exploit the TSE's emphasis on firms with P/B ratios below one, a condition indicating that these firms were undervalued. Since firms below the P/B ratio threshold of one are likely to face different levels of pressure than those just above it, we hypothesize that this setting provides an opportunity to leverage a regression discontinuity (RD) design. This approach enables us to identify the causal effect of the TSE's request on subsequent disclosure and economic outcomes, while holding constant unobserved firm characteristics.

We examine whether firms just below the cutoff were more likely to disclose in response to the request and whether such disclosures led to changes in valuation, payout policy, and other corporate outcomes.

These two empirical approaches are complementary. The RD analysis complements the DiD estimates by capturing the local average treatment effects and providing a sharper causal interpretation around the policy threshold. Together, they allow us to examine both the average and local effects of the CCSP request, offering a comprehensive view of its impact on firm economic outcomes and financial policies. Moreover, the RD framework helps illustrate how targeting functions in a soft intervention without immediate or direct penalties, providing insight into how social norm pressure can affect firm behavior.

Our findings are threefold. First, the DiD estimates indicate that firms experience higher P/B and P/S ratios for four months after complying with the disclosure request, although the effects dissipate after. We also document significant increases in ROE, dividend payouts, and share repurchases six quarters after the disclosure, with modest reductions in cash holdings right after compliance. These patterns remain robust after controlling for firm fundamentals, capital structure, and industry- or segment-specific pre-trends. Using alternative event-study estimators that properly address staggered treatment timing and heterogeneous treatment effects does not alter the qualitative conclusions. Taken together, this result suggests that the TSE's intervention successfully encouraged governance-related and capital structure improvements and increased investor confidence, showing that exchange-induced governance measures can be effective even in the absence of formal enforcement when it is well designed and framed.

In addition, the subsample analysis shows that the effects on P/B ratio are stronger and more persistent among high-valuation firms and firms listed on the Prime Market, compared with low-valuation firms and those on the Standard Market, respectively. This pattern suggests that the request was particularly effective for higher-tier firms already viewed more favorably by investors, whereas lower-tier and less valued firms exhibit only moderate im-

provements.

Second, our first-stage RD estimates show that, contrary to expectations, firms just below the P/B ratio threshold of one right before the request were less likely to disclose than those just above it, despite the TSE's emphasis on low-valuation firms. This pattern may be because targeted firms may have faced stigma, disclosure costs, or strategic concerns that delayed compliance, whereas firms just above the threshold could disclose more readily as a signal of financial strength. This RD evidence reinforces the idea that the exchange's ability to induce governance-oriented behavior is more limited among low-valuation firms, even when they are the primary targets of the intervention.

Third, our second-stage RD estimates reveal that among marginally disclosing firms just above the threshold, the P/B ratio declined following the disclosure—again, contrary to expectations. We also find that disclosure led to a reduction in bid-ask spreads, indicating improved market liquidity despite lower valuations. Together, these results suggest that the CCSP disclosure made firms' financial constraints and growth prospects more transparent to investors, prompting downward revisions in valuations. The subsample analysis shows that the negative disclosure effect on the P/B ratio is concentrated among Standard Market firms, where weaker governance and lower investor scrutiny may have heightened concerns about firm quality. The first- and second-stage RD estimates together indicate that stock exchange interventions can enhance transparency but may simultaneously dampen valuations among firms disclosing at the margin.

Our empirical findings together suggest that while stock exchange-led initiatives can promote transparency and governance awareness, their ability to induce substantive valuation improvements depends on firms' initial conditions and market environments. In particular, while exchanges can enhance transparency through disclosure requirements, they may struggle to generate positive market responses or to induce genuine governance improvements among the firms most in need of reform.

This study contributes to at least three strands of literature. First, we add to the dis-

closure literature by examining how a disclosure requirement works in the absence of formal enforcement mechanisms. Prior literature emphasizes that strong public or private enforcement mechanisms are key to effective disclosure regimes (Ball et al., 2000; Daske et al., 2008; Leuz, 2010; Christensen et al., 2013; Leuz and Wysocki, 2016). In contrast, our findings suggest that even a soft disclosure requirement without formal enforcement can enhance firm valuation when it is carefully designed and framed. Moreover, our nuanced evidence from the RD analysis, showing null average effects on valuation among marginally disclosing and marginally non-disclosing firms, indicates that these interventions do not operate uniformly, but instead have highly heterogeneous effects across firms. Our evidence enriches our understanding of how disclosure requirements by stock exchanges function.

Second, by highlighting the role of the stock exchange itself as a governance institution, our analysis contributes to the literature on stock exchanges' role in corporate governance. Prior research has largely emphasized the disciplining role of investors (e.g., Gillan and Starks, 1998, 2009; Goranova and Ryan, 2014; Denes et al., 2017; Chuah et al., 2024) and regulators (e.g., Chhaochharia and Grinstein, 2007; Christensen et al., 2013, 2016). While a few studies have examined the role of stock exchanges in corporate governance (e.g., Bonetti and Ormazabal, 2023; Bourveau et al., 2025), evidence remains scarce. In this paper, we demonstrate that an exchange's active intervention can shape corporate governance, providing new evidence on the role of stock exchanges as governance institutions and offering a richer understanding of their functions.

Lastly, we contribute to the literature on Japan's capital market reforms and corporate governance. Chattopadhyay et al. (2020) examines the 2014 introduction of the JPX–Nikkei 400 and shows that managers sought index inclusion by raising ROE, in part driven by reputational and status concerns. Recent studies have examined the consequences of the CCSP request. Morikawa et al. (2024) show that firms making CCSP disclosures experienced higher abnormal returns. Okada et al. (2025) find that disclosure rates were higher among firms with greater foreign ownership. D'Ercole et al. (2025) document that investors favored

low P/B firms with high return on equity and reacted strongly to the TSE's publication of non-compliant firms. These studies primarily focus on market reactions and participation patterns, and we still lack causal evidence on how the CCSP request affects firms' underlying fundamentals and financial policies. Our study fills this gap by using a rigorous research design to identify the causal effects of the CCSP request on firm fundamentals and behavior, offering a broad assessment of the economic implications of this exchange-led governance measure.

The remainder of the paper is organized as follows. Section 2 reviews the institutional background of Japan's capital market, the TSE's recent reforms, and the 2023 request. Section 3 explains our data. Section 4 outlines our empirical strategy for obtaining causal estimates. Section 5 presents and discusses the estimation results. Section 6 concludes.

2 Institutional Background

In this section, we provide a detailed account of the institutional background of the Japanese capital market and the recent efforts of the TSE to enhance market functioning. Readers less interested in institutional details may proceed directly to Section 2.3, which discusses the CCSP request.

Japan's equity market has long been characterized by persistently low valuations across a large segment of companies. Many established Japanese firms trade at prices below book value, a condition uncommon in other major markets. This pattern of undervaluation has persisted for decades despite multiple rounds of corporate governance reform.

2.1 Japan's Valuation Discount

Since the collapse of Japan's asset price bubble in the 1990s, many listed firms have traded at persistently low valuations by global standards. P/B ratios below one, indicating that a company's market value is lower than the book value of its net assets, are common among

Japanese firms but much less prevalent among their Western counterparts.

Figure 1 plots the average P/B ratios across major economies. The comparison shows that Japanese equities have persistently traded at lower valuations than their global peers. While the average P/B ratio in the United States has exceeded five in recent years, Japan's ratio has remained below two, indicating that investors continue to assign lower market values to Japanese firms relative to their book equity. This persistent valuation gap reflects long-standing concerns over capital efficiency, profitability, and governance quality among Japanese listed companies, which have motivated the TSE's ongoing reform initiatives.

Figure 2 further illustrates the prevalence of low valuations by showing the monthly share of index constituents with P/B ratios below one across major equity indices for 2000–2025. The figure shows that the proportion of under-book firms in Japan's TOPIX index is persistently high, frequently exceeding 50% of all constituents, underscoring how widespread low-valuations are in the Japanese market. By contrast, the corresponding share in the S&P 1500 hovers only around 10%, while broader U.S. benchmarks such as the Russell 3000 and NASDAQ Composite, as well as European and U.K. indices like the STOXX 600 and FTSE All-Share, typically exhibit about 20–30% of firms trading below book value.

These patterns confirm that Japan is an outlier in the extent of persistent low valuations, but they also reveal that the phenomenon is not unique to Japan. Consequently, understanding whether and how an exchange-led initiative can materially raise firm valuations is not only central to the functioning of Japan's domestic capital market, but also of broader relevance for global equity markets with chronically undervalued firms.

This aggregate comparison is reflected at the firm level within Japan. Figure 3 shows the number and share of TSE-listed firms with a P/B ratio below one since 2022. Throughout the period, roughly half of all listed companies, or about 45 to 52 percent, have traded below book value. Although the share has declined modestly by about 7.7 percentage points since 2022, the persistence of low valuations highlights the structural nature of Japan's capital efficiency problem and the ongoing challenge for the TSE in raising corporate value.

Such low valuations of Japanese listed firms suggest that investors see limited growth prospects and inefficient use of assets. In theory, when many firms trade below book value, it implies that the market believes they would be worth more if liquidated than as going concerns. This "Japan discount" is also visible in firms' return on equity (ROE), which has consistently lagged behind that of U.S. and European companies. Over the past three decades, the average ROE of mid- and large-cap Japanese firms has remained significantly lower than in those markets. In 2022–2023, for instance, Japanese companies' ROE hovered around 8 to 9 percent.

Japanese firms' relatively low valuations reflect several structural factors. One is modest profitability, as many companies operate with narrow margins and moderate returns on assets, which constrain ROE. Another is large cash holdings. As of 2022, firms in the MSCI Japan Index held cash equivalent to about 17 percent of their market capitalization, compared with around 5 percent for U.S. firms (Wong, 2022). These reserves can reduce asset efficiency and suggest that some capital is not being actively deployed.

Japan's stakeholder-oriented management culture also plays a role. Managers have traditionally emphasized stable growth and long-term relationships with employees and business partners rather than shareholder value. In addition, cross-shareholding, where firms hold shares in one another, has been used to maintain business ties and stability, but it can lessen external pressure on management. As a result, corporate restructuring and takeovers have been relatively uncommon. Taken together, moderate profitability, substantial cash reserves, and a stakeholder-focused governance system have contributed to Japan's lower equity valuations compared with Western markets.

2.2 TSE's Concern and Past Relevant Reforms

The TSE has long been concerned with the persistent reputation that listed companies on the TSE market underperform in terms of capital efficiency, governance standards, and investor accountability when compared to their global peers, such as the U.S market. Addressing

these concerns became especially pressing in the 2010s, as international investors increasingly demanded higher returns and more transparent governance practices during the "Abenomics" boom. In response, the TSE, under the guidance of the Financial Services Agency (FSA), implemented a series of reforms. For ease of presentation, we group these reforms into three categories: *norm-setting*, *index reforms*, and *market segment reform*. These initiatives reflect a gradual tightening of standards for listed firms, designed to encourage more disciplined capital management and stronger governance practices.

Norm-setting The reform process began in 2014 when the FSA introduced the Stewardship Code, encouraging institutional investors to engage more actively with investee companies to enhance shareholder oversight and support better governance and capital policies (Financial Services Agency, 2014). This movement was followed by the Corporate Governance Code, jointly introduced by the FSA and the TSE in 2015. The Code urges listed firms to appoint independent directors, safeguard shareholder rights, and enhance disclosure practices under a "comply or explain" framework (Financial Services Agency, 2015). These Codes marked the emergence of a soft-law regime that sought to establish governance norms encouraging listed companies to undertake reforms under pressure from institutional and other investors.

Index reforms The TSE also introduced market-based discipline through new stock indexes. In 2014, it launched the JPX–Nikkei Index 400 in cooperation with Nikkei Inc. The index marked a shift toward rewarding companies with higher return on equity (ROE) and stronger governance practices. Unlike traditional indexes based mainly on size or liquidity, the JPX–Nikkei 400 selects firms that demonstrate profitability, transparent disclosure, and the appointment of independent directors. Inclusion in the index served as a signal of corporate quality, motivating firms to improve capital efficiency and governance to attract investment. Indeed, Chattopadhyay et al. (2020) find that firms closest to the JPX–Nikkei 400 inclusion cutoff increased ROE by about 2.4 percentage points after the index's intro-

duction. Building on this approach, the Tokyo Stock Price Index (TOPIX) reforms initiated in 2022 aimed to gradually exclude firms that failed to meet liquidity and governance standards, thereby enhancing TOPIX's investability and ensuring it more accurately reflected the TSE market. In 2023, the TSE introduced the JPX Prime 150 Index to highlight companies expected to create long-term value. The index selects firms with a strong equity spread, defined as ROE less cost of equity, and a P/B ratio above one. It aims to promote value-creating management and attract medium- to long-term investment from both domestic and global investors.

Market segment reform In 2022, the TSE consolidated its four-tier market structure into three segments: Prime, Standard, and Growth. The Prime Market introduced stricter requirements for free-float ratios, governance practices, and mandatory English disclosure to better align Japan's capital markets with global investor expectations. These initiatives encouraged listed companies to move beyond formal compliance with governance principles and to focus on capital efficiency and long-term corporate value. The reform also showed a shift in the TSE's role from indirectly promoting corporate transformation through investors and index-based incentives to directly influencing firms' reputations through market classification and possible exclusion from major indexes.

Taken together, these reforms illustrate the TSE's gradual shift from relying on voluntary compliance and investor engagement to embedding market-based and structural mechanisms that promote corporate discipline. By strengthening governance expectations and linking market status to performance and transparency, the TSE aimed to raise the overall quality and global competitiveness of Japan's listed companies. However, the effectiveness of these measures proved limited, prompting the TSE to introduce a new initiative in March 2023 to address these shortcomings. Our findings should be interpreted in this broader context, with the CCSP request extending earlier reform efforts.

2.3 TSE's CCSP Request in March 2023

On March 31, 2023, the TSE released guidelines entitled *Action to Implement Management that is Conscious of Cost of Capital and Stock Price*, requesting companies listed on the Prime Market and the Standard Market to take necessary actions to improve their cost of capital and stock prices (Tokyo Stock Exchange, Inc., 2023a).[1] We confirm that the original Japanese version was published on March 31, 2023. In the guidelines, the TSE stresses that sustaining growth and enhancing long-term corporate value requires attention to capital costs and profitability. Yet many listed firms, about half on the Prime Market and 60 percent on the Standard Market, show low ROE and trade below book value, prompting the TSE to call for greater managerial awareness of capital efficiency and market valuation.

The CCSP request seeks to shift firms from a narrow focus on accounting profits to management based on capital costs and returns. The TSE states in the request that they expect executives to lead in reallocating resources, including investments in R&D, intangibles, and human capital, while emphasizing that surpassing the cost of capital requires ongoing, comprehensive measures and active engagement with investors. Although the CCSP request was not mandatory, the TSE's intention was to "strongly request firms to provide disclosures," as indicated in the minutes and related references from the TSE's meeting prior to the release of the request. (See Appendix C.)

The CCSP request sets the following three action items for targeted firms to comply:

1. *Analysis of Current Situation*: Gain a proper understanding of the firm's cost of capital and profitability, and evaluate the current situation together with market valuation at board meetings.

2. *Planning & Disclosure*: Have the board of directors develop policies, targets, planning periods, and initiatives for improvement, and disclose this information to investors

[1] Although the English version we cite here has the date March 31, 2023 on its title page, one of the TSE's web pages indicate that the English document was made publicly available by April 14, 2023. (See `https://www.jpx.co.jp/english/news/1020/e20230414-01.html`.)

along with an assessment of the current situation.

3. *Implementation of Initiatives*: Push forward with management practices that are conscious of cost of capital and stock price, and engage in proactive dialogue with investors based on the disclosed plans.

In addition, companies are expected to conduct a progress analysis and update disclosures at least once a year.

The CCSP request offers a general guideline on how to address the three action items. First, regarding *Analysis of Current Situation*, firms are instructed to assess whether their profitability exceeds their cost of capital, and if not, to explain why. Even if it does, they are asked to account for why market valuation may remain low, for example when the P/B ratio is below one. The TSE suggests using weighted average cost of capital (WACC) and cost of equity to capture capital costs, return on invested capital (ROIC) and ROE to capture profitability, and market indicators such as P/B and price-to-equity (P/E) ratios, with analysis carried out at both the firm-wide and business-segment level.

Second, in the *Planning & Disclosure* stage, the TSE expects firms to communicate their assessment of profitability and valuation in a form that is easy for investors to understand. This includes explaining how capital costs are calculated and presenting multi-year assessments rather than relying only on a single year. Firms are expected to set clear policies and targets for improvement, which may take the form of levels, ranges, or growth rates of indicators such as ROE, earnings per share (EPS), or P/B ratios, and to justify why further improvement may or may not be necessary. They are also asked to disclose specific initiatives and timelines to enhance profitability and valuation, covering measures such as resource allocation, business portfolio review, and investment in human capital and R&D. In addition, firms are encouraged to report on sustainability and intangible asset strategies that strengthen growth potential, and to use executive remuneration schemes as incentives aligned with profitability and corporate value enhancement. Specific content and forms of the CCSP disclosure are left up to companies, but the TSE asks firms to make clear where

and how investors can access the information.

Lastly, in the *Implementation of Initiatives and Updates* stage, the TSE expects firms to follow through with the management practices and disclosure plans they have announced, while engaging in active dialogue with investors, including overseas investors, in line with the Corporate Governance Code. Prime Market firms are further asked to disclose their ongoing status of dialogues with shareholders. After implementation, companies are also required to update their disclosures at least annually, reporting on the progress of initiatives, changes in targets, and results to date in a way that investors can easily understand. Although no strict timeframe is set for interim updates, the TSE emphasizes that firms should promptly revise their disclosures when major changes occur, ensuring that the information remains current and relevant for investors.

It is important to note that the TSE did not formally specify the P/B ratio of one as a disclosure criterion. The request applied to all firms listed on the Prime Market and the Standard Market, with an emphasis on low-valuation firms. Nevertheless, media coverage and investor commentary widely framed the request as applying to firms trading below book value. This interpretation rendered the P/B ratio of one a salient threshold for market participants, providing a natural setting for causal estimation with a regression discontinuity design. We return to this point in Section 4.2.1 and discuss it in detail in Appendix D.

3 Data

Our data comes from two sources. First, we obtain the valuation multiples and fundamentals of companies listed on the Prime Market and the Standard Market from the NEEDS FinancialQUEST 2.0 database. This database, widely used in research on Japanese firms, is compiled by Nikkei, Inc., and provides standardized financial statement information, market valuation metrics, and firm attributes at both annual and monthly frequencies. It covers effectively almost all listed firms in Japan, ensuring comprehensive coverage of our sample.

Second, we collect information on whether firms made CCSP disclosures from the TSE's official disclosure list (List of Companies That Have Disclosed Information Regarding "Action to Implement Management That Is Conscious of Cost of Capital and Stock Price"), which records the names of companies that announced action plans in response to the request for each year-month.[2] One caveat of the list is that it only provides disclosure status starting in December 2023, and information on disclosure status prior to that date is not available. This data limitation forces us to focus on the effects on and of the CCSP disclosure only after December 2023.

The TSE's list of disclosing firms contains two types of entries. The first consists of firms that have actually disclosed information in response to the CCSP request ("Disclosed"). The second consists of firms that state they are considering disclosure ("Under consideration"). Because the distinction between firms categorized as under consideration and those not listed at all is ambiguous, we focus on whether firms explicitly listed as having disclosed.

We merge these two sources to construct a panel dataset of listed firms that covers both their financial outcomes and disclosure behavior. Our sample period spans the 22 months from December 2023 to September 2025. All variables are measured at the end of each month or quarter, depending on their reporting frequency. Over this period, the raw sample includes 1,543 Prime Market firms and 1,542 Standard Market firms, corresponding to 33,071 and 34,107 firm-month observations and 12,004 and 12,325 firm-quarter observations, respectively.

We exclude firms in the financial and utility industries, as well as firms with negative book equity, because these firms operate under distinct regulatory and accounting regimes, and negative book equity typically indicates severe financial distress. For the econometric analysis, we further restrict the sample to firms with at least one year of trading history prior to the request and at least one observation after December 2023, to limit the influence of initial public offerings and mitigate survival bias. We also exclude a small set of 24 firms that

[2]The list of disclosing firms is available at the following page on Japan Exchange Group's website: `https://www.jpx.co.jp/english/equities/follow-up/02.html`.

switch from disclosing to not disclosing, i.e., those removed from the TSE's list of disclosing firms after having been included.

After applying these restrictions, we end up with the final sample that contains 1,467 Prime Market firms and 1,490 Standard Market firms, generating 31,676 and 31,748 firm-month observations and 11,293 and 11,224 firm-quarter observations, respectively.

Table 1 reports summary statistics for the main variables over the period from December 2023 to September 2025. The average firm in our sample trades at moderate valuation multiples, with a mean P/B of about 1.6, P/S of 1.1, and P/E of roughly 22.7, and offers an average dividend yield of 2.4%. Market liquidity is relatively high: the average relative bid–ask spread is 0.7%, and the typical monthly stock return is about 0.9%, with a standard deviation of 8 percentage points, indicating substantial return volatility. Profitability is moderate, with mean ROE and ROA of 7.4% and 6.3%, respectively. On the balance sheet, firms hold on average about 23% of assets in cash and cash equivalents, 0.75% of assets in R&D, and 3.9% in intangible assets, all expressed as percentages of total assets. The mean dividend payout ratio is approximately 41%, and share repurchases, proxied by treasury stock growth, display a high mean and very large dispersion, consistent with buyback activity being concentrated among a subset of firms. The distribution of firm size is wide, with a mean log of total assets of 10.9 and substantial spread between the 10th and 90th percentiles.

4 Empirical Strategy

Our empirical strategy is twofold. First, we estimate the effect of the CCSP disclosure on firm valuation by using the difference-in-differences (DiD) approach. To capture the dynamics of the treatment effects, we estimate event-study models (Miller, 2023). Since the CCSP disclosure was made by firms in different points in time, we employ the modern toolkit from the vibrant literature on dynamic DiD designs (De Chaisemartin and d'Haultfoeuille, 2023; Baker et al., 2025). We estimate the parameters of interest by using three different

event-study DiD estimators and show that our estimates are robust.

Second, we estimate the effect of the CCSP disclosure by using a regression discontinuity (RD) design. We document that the TSE's communication of the CCSP request specifically highlighted such firms as the primary targets. Accordingly, we treat a P/B ratio of one as a fuzzy cutoff for the CCSP disclosure propensity, exploiting the differential emphasis. By doing this RD exercise, we can also estimate the effect of being marginally emphasized as a target on the likelihood of disclosure. This exercise complements our DiD estimates of the average treatment effect by focusing on a different subset of the population and identifying the local average treatment effect. We follow the standard workflow of RD design proposed by Cattaneo et al. (2024a).

4.1 Difference-in-Differences Design

We estimate the effect of CCSP disclosure on firms' valuations using a staggered difference-in-differences framework. To capture the dynamics of the treatment effect, we employ the event-study specification (Miller, 2023). We address the potential bias coming from the two-way fixed effects (TWFE) specification by using the estimators proposed in the recent dynamic DiD literature (Sun and Abraham, 2021; Callaway and Sant'Anna, 2021; De Chaisemartin and d'Haultfoeuille, 2020, 2023; Borusyak et al., 2024; Baker et al., 2025).

Let $D_{i,t}$ denote a dummy variable indicating that firm i makes the CCSP disclosure in year-month t. We identify 24 firms that switch back from disclosure to non-disclosure status.[3] It seems that the TSE regarded their disclosures as insufficient, and we therefore exclude these firms from the sample as anomalous cases throughout our empirical analysis.[4]

To fix ideas, let us begin by considering the following stylized regression model with

[3]We rely on the monthly TSE list identifying firms that comply with the CCSP request. Once a firm discloses, it rarely switches back to non-disclosure status (i.e., firms rarely get removed from the list). Those 24 switching firms only account for less than 1 percent of all firm-year observations in our sample.

[4]In both the DiD and RD analyses, our empirical results remain robust to the inclusion of these 24 firms by defining the treatment variable as an ever-treated indicator that remains equal to one after the first disclosure, i.e., we define and use $D_{i,t}^{\text{ever}}$ such that $D_{i,t}^{\text{ever}} = \max_{t' \leq t} D_{i,t'}$. In the DiD framework, our estimates are also robust to allowing for switching treatment status, following the approach of De Chaisemartin and d'Haultfoeuille (2023).

TWFE:

$$y_{i,t} = \sum_{k \in W} \beta_k D_{i,t-k} + \alpha_i + \tau_t + X'_{i,t}\gamma + \varepsilon_{i,t}, \tag{1}$$

where $y_{i,t}$ is the outcome of interest (e.g., the P/B ratio), α_i denotes a firm fixed effect, τ_t is a year-month effect, $X_{i,t}$ is a vector of time-variant firm characteristics, and $W = \{-6, -5, \ldots, 9, 10\}$. Our parameters of interest are $\{\beta_k\}$, each of which represents the effect of the CCSP disclosure k months after adoption.

The important identifying assumption of DiD designs is the parallel trends assumption (De Chaisemartin and d'Haultfoeuille, 2023; Baker et al., 2025). While we cannot directly verify this assumption, we provide indirect evidence by examining whether pre-disclosure trends differ between the treatment and control groups. The absence of systematic pre-trend differences would strengthen confidence in the causal interpretation of our estimates, and we do so by showing event-study plots (Miller, 2023).

It is now well understood that estimating equation (1) using ordinary least squares (OLS) can be problematic when treatment effects are heterogeneous and treatment timing varies across units (De Chaisemartin and d'Haultfoeuille, 2023; Baker et al., 2025). To address this, we use the estimator proposed by De Chaisemartin and d'Haultfoeuille (2023). In this specification, we use not-yet-treated firms as the control group. At each point in time, the control group consists of firms that have not yet complied with the request. This choice avoids relying on firms that remain untreated at the end of the sample (September 2025), which are disproportionately drawn from the Standard Market and could therefore introduce selection concerns related to market segment composition.

As robustness checks, we also use the estimators proposed by Sun and Abraham (2021), Callaway and Sant'Anna (2021), and Borusyak et al. (2024) and switched the control group to never-treated firms. The results remain qualitatively unchanged across these alternative event-study estimators and control groups.

4.2 Regression Discontinuity Design

As a complementary empirical strategy, we estimate the effect of the CCSP disclosure through a regression discontinuity (RD) design. We use the P/B ratio in March 2023 as the running variable because it is the exact benchmark highlighted by the Tokyo Stock Exchange (TSE) in its request made public in March 2023 for improved disclosure and performance. In particular, the TSE emphasized its concern with firms trading below book value, i.e., firms whose P/B ratio falls below 1.00, publicly labeling them as undervalued and urging corrective measures. The threshold of 1.00 thus represents the natural and policy-relevant cutoff, separating firms explicitly targeted by the intervention from those outside its immediate scope. Using this cutoff in our regression discontinuity design allows us to align our empirical strategy directly with the operator's stated priorities and to capture the differential response induced by the disclosure request.

First, we focus on how being an emphasized target of the TSE's request affects disclosure, and estimate the following regression equation separately for each year–month sample:

$$\begin{aligned} D_{i,t} = \beta_0 &+ \gamma\, \mathbb{1}\{\mathrm{PBR}_{i,2023/03} \geq 1.00\} \\ &+ f_{\mathrm{L}}(\mathrm{PBR}_{i,2023/03} - 1.00) \\ &+ f_{\mathrm{R}}(\mathrm{PBR}_{i,2023/03} - 1.00) \times \mathbb{1}\{\mathrm{PBR}_{i,2023/03} \geq 1.00\} + \varepsilon_{i,t}, \end{aligned} \tag{2}$$

where $\mathrm{PBR}_{i,t}$ denotes the P/B ratio of firm i in year-month t, and $f_L(\cdot)$ and $f_R(\cdot)$ are polynomial functions. The parameter of interest is γ, which is the local average treatment effect of the TSE's emphasis (on less-than-one P/B ratio firms) around the cutoff. Following Cattaneo et al. (2024a), we employ the local linear regression discontinuity approach with bandwidths selected in a data-driven, nonparametric way for each year–month sample. We use the bias-corrected estimator of Calonico et al. (2014), which adjusts both point estimates and standard errors to account for the boundary bias inherent in local polynomial RD designs.

Next, we also estimate the effect of the CCSP disclosure on firm valuation and behavior.

Since not all firms just above the cutoff disclose and some firms just below do disclose the CCSP plan, we use the fuzzy RD design to identify the local treatment effect of the CCSP disclosure. We estimate the following regression equation using two-stage least-square:

$$Y_{i,t} = \alpha + \rho \widehat{D}_{i,t} + g_{\mathrm{L}}(\mathrm{PBR}_{i,2023/03} - 1.00) + g_{\mathrm{R}}(\mathrm{PBR}_{i,2023/03} - 1.00) \times \mathbb{1}\{\mathrm{PBR}_{i,2023/03} \geq 1.00\} + \delta_t + \eta_{i,t}, \quad (3)$$

with Equation (2) being the first-stage equation, $Y_{i,t}$ denotes the outcome of interest (P/B, P/S, P/E, yield, spread, volumn per share, and return), δ_t denotes year-month fixed effects, and $g_L(\cdot)$ and $g_R(\cdot)$ are polynomial functions. The parameter of interest is ρ, which is the local average treatment effect of the CCSP disclosure on compliers around the cutoff. We use the bias-corrected estimator of Calonico et al. (2014), which adjusts both point estimates and standard errors to account for the boundary bias inherent in local polynomial RD designs. Since the fuzzy design requires more power to gain accurate estimates, we pool the month-year samples and estimate a single regression equation. We control for year-month dummies and cluster our standard errors at the firm level.

The estimands of interest in our RD analysis are the local treatment effect among the compliers around the threshold. Note that the compliers in Equation 2 are constituted by all firms near the threshold, since the TSE's emphasis is deterministic with respect to the threshold and, by construction, does not allow for non-compliers. The compliers in Equation 3 are constituted by firms whose P/B ratio was less than 1.00 in March 2023 and have not made the CCSP disclosure and firms whose P/B ratio was greater than or equal to 1.00 in March 2023 and have made the CCSP disclosure, and our estimates are local to these compliers.

4.2.1 The Effectiveness of the Threshold

It is important to note that the TSE did not intend the P/B ratio of one to serve as a formal criterion for disclosure. The request was addressed broadly to all companies listed on the Prime Market and the Standard Market, regardless of whether their price-to-book ratio was above or below one. Nonetheless, media coverage and investor commentary predominantly framed the request as targeting firms trading below book value. For example, an article published in the *Nihon Keizai Shimbun*, Japan's leading financial newspaper, on March 31, 2023 carried the headline, "1,800 companies trading below P/B ratio of 1, TSE requests disclosure of improvement measures" (translation by the authors) (Nikkei, Inc., 2023b).

Given that the leading financial newspaper reported the request in this way, it is likely that market participants also interpreted the CCSP request accordingly. We provide more detailed qualitative evidence in Appendix D, drawing on news articles, TSE meeting archives, and analyst commentaries, to illustrate how the market likely understood the CCSP request, which shows that our view is consistent with a wide range of qualitative sources. The widespread understanding of the request as targeting firms below book value renders the P/B ratio of one a salient threshold for identifying the causal effects of the intervention in RD designs.

A typical concern in regression discontinuity designs is the possibility of manipulation or sorting around the cutoff, which could undermine the local randomization assumption. In our setting, this concern is limited because the P/B ratio is mechanically determined by market prices and book values, leaving little scope for firms to fine-tune their position. Moreover, the Tokyo Stock Exchange's disclosure request was difficult to anticipate, making it unlikely that firms could have adjusted their financials or market valuation in advance to avoid falling below the 1.00 threshold. Together, these features make precise manipulation around the cutoff implausible and support the credibility of our RDD design.

4.2.2 Manipulation Tests

To quantitatively demonstrate the sanity of our running variable, we conduct a manipulation test around the cutoff. We apply Cattaneo et al. (2020)'s density test to examine whether there is any discontinuity in the distribution of the P/B ratio at the 1.00 threshold. A significant jump in the density would suggest potential sorting or strategic behavior by firms to avoid being classified as undervalued, thereby threatening the credibility of our design. In contrast, the absence of such discontinuity supports the assumption that firms could not precisely manipulate their P/B ratios around the cutoff, reinforcing the plausibility of our identification strategy.

Table 2 reports the results of the manipulation test based on local polynomial density estimation (Cattaneo et al., 2020). The robust T-statistic is close to zero and the p-value is around 0.9, indicating no statistically significant discontinuity in the density of the P/B ratio at the 1.00 cutoff. This suggests that firms did not bunch just above or below the threshold, supporting the credibility of the running variable.

Figure 4 visualizes the estimated density of the P/B ratio around the cutoff, following Cattaneo et al. (2022, 2024b). The fitted local polynomial curves to the left and right of the threshold overlap smoothly without a visible jump, providing further visual evidence against manipulation or sorting at the cutoff.

We also conduct a manipulation test based on finite sample exact binomial testing following Calonico et al. (2015); Cattaneo et al. (2017), which, again, generates no evidence of manipulation at the cutoff as shown in Table 3. Taken together, the statistical tests and graphical evidence indicate that the identifying assumption of no precise manipulation around the threshold is plausible in our setting.

5 Results

5.1 Difference-in-Differences Estimates

Figure 5 presents the event-study estimates of the CCSP disclosure's effect on the P/B ratio, P/S ratio, ROE, cash holdings, dividend payout ratio, and treasury stock growth obtained using De Chaisemartin and d'Haultfoeuille's (2023) estimator. Note that the time period is quarterly for ROE, cash holdings, dividend payout ratios, and treasury stock growth because these variables are observed at that frequency. We do not observe any significant differences in pre-trends between the treatment and control groups, which is reassuring and supports the validity of the parallel trends assumption. The estimates show that firms' P/B ratio increases after the CCSP disclosure.

Panels (a) and (b) of Figure 5 show that firms' P/B and P/S ratios exhibit a modest increase during the first four months following the CCSP disclosure. The effect subsequently fades, with no persistent changes in later months. Four months after the disclosure, firms experience an average increase of roughly 0.05 and 0.03 points in their P/B and P/S ratios, respectively.

Panels (c) and (d) report the dynamic effects on ROE and cash holdings. For ROE, the estimates fluctuate around zero for most of the event window, indicating little systematic change in profitability. However, a noticeable increase about 2 points emerges six quarters (eighteen months) after the disclosure, though with significance only marginal at conventional levels. Cash holdings show a mild but consistent downward trajectory after disclosure, with a marginal decrease amounting to roughly 5 percent of total assets by the fourth to fifth quarter. This decline aligns with firms reallocating liquidity toward investment or payouts.

Panels (e) and (f) illustrate effects on dividend payout ratios and treasury stock growth. Dividend payouts exhibit a gradual and steady rise beginning immediately after the disclosure. Nine months after the event, disclosing firms' payout ratios are about 5 percentage points higher than those of non-disclosers, with confidence intervals indicating a meaningful

shift toward returning cash to shareholders. Treasury stock growth, the measure of share repurchases, shows a striking pattern. Estimated effects turn positive shortly after disclosure and rise sharply over subsequent quarters. By the fifth quarter, the effect becomes statistically significant and reaches economically large magnitudes: treasury stock growth is approximately 20 percent higher for disclosers relative to non-disclosers. The shape of the event-study curve suggests that repurchases become an increasingly important channel of firms' post-disclosure capital policy response.

Taken together, the event-study results reveal that the CCSP disclosure is followed by modest short-run valuation gains, emerging improvements in profitability, a gradual reduction in cash balances, and sizable increases in both dividends and share repurchases. Because the valuation effects dissipate relatively quickly while the effects on firm fundamental and financial policies are more persistent, it is difficult to isolate the dominant channel with precision. The evidence is consistent with two possibilities: the disclosure may have facilitated incremental improvements in firms' underlying fundamentals, or it may have prompted a sustained reallocation of internal capital, or some combination of both.

The improvement in P/B and P/S ratios among disclosing firms during the first four months may predominantly reflect increased share repurchases, higher dividend payouts, or other short-term financial policies. If so, the efficiency implication of the CCSP disclosure's positive effect would be more nuanced. To investigate this possibility, we estimate the effects of the CCSP disclosure on P/B and P/S ratios while controlling for assets, intangibles, R&D, CAPEX, ROA, cash holdings, dividend payout ratio, and treasury stock growth. We also control for assets, intangibles, R&D, and CAPEX when estimating the effects on ROE, cash holdings, dividend payout ratios, and treasury stock growth. This specification allows us to assess whether the CCSP request merely induced temporary stock price adjustments or enhanced information transparency and investor expectations through disclosure.

Figure 6 shows the effects of the CCSP disclosure on firms' financial outcomes with controls. The results are almost unchanged from the estimation without controls, suggesting

that the earlier increase in firm valuation and fundamental is not solely driven by changes in financial policies. Note that we also control for ROA, which is mechanically related to the P/B ratio through standard valuation identities (Ohlson, 1995).

Overall, the DiD results show that the CCSP disclosure led to a modest short-term increase in firms' P/B and P/S ratios, alongside gradual improvements in ROE and more shareholder-friendly payout and capital policies. Disclosing firms raise dividends and repurchases and reduce cash holdings.

The persistence of valuation gains after controlling for changes in profitability and payout behavior suggests that the CCSP disclosure operates through both improved information transparency and shifts in investor expectations, as well as incremental adjustments in firm policies. Taken together, the DiD evidence is consistent with the view that the exchange's disclosure request modestly enhanced market valuation, strengthened profitability, and encouraged more shareholder-oriented financial policies.

5.1.1 Subsample DiD Analysis

To explore potential heterogeneity in the effects of the CCSP disclosure, we conduct a series of subsample analyses. Specifically, we examine whether the disclosure's impact varies across market segments and firm valuation levels.

First, we split the sample into firms listed on the Prime Market and those on the Standard Market to examine whether market sophistication or investor attention moderates the treatment effect. Firms on the Prime Market represent the higher-tier segment with stricter listing requirements and greater investor scrutiny, whereas those on the Standard Market are typically smaller and subject to less stringent standards.

Second, we divide firms based on whether their P/B ratios are below or above one, distinguishing between firms potentially undervalued and those already priced above book value. This subsample analysis allows us to assess whether the CCSP disclosure differentially affected firms depending on their market position and pre-existing valuation. In particular,

it helps evaluate whether the TSE successfully encouraged improvements among the lower-valued firms that the CCSP initiative primarily targeted.

Figure 7 plots the dynamic effects of the CCSP disclosure on P/B ratios separately by market segment. The positive effects of disclosure are largely concentrated among Prime Market firms, which show a gradual and increasingly pronounced rise in P/B ratios over time. In contrast, Standard Market firms display much smaller and noisier responses, and the estimates remainly largerly insignificant.

Figure 8 presents analogous estimates separately for firms whose P/B ratio in March 2023 was below one and larger than 1. For firms with P/B ratios of one or above, the estimated effects remain significantly positive and relatively persistent over the post-disclosure window. By contrast, firms with P/B ratios below one exhibit positive effects concentrated in the first few months after disclosure. The effects quickly faded out, with later coefficients becoming insignificant and in some cases turning negative.

The subsample evidence indicates substantial heterogeneity in the impact of the CCSP disclosure. The effects are stronger and more persistent among high-valuation firms and firms listed on the Prime Market, compared with low-valuation firms and those on the Standard Market. This pattern suggests that the request was particularly effective for higher-tier firms already viewed more favorably by investors, whereas lower-tier and less valued firms exhibit only moderate and short-term improvements.

5.2 Regression Discontinuity Estimates

5.2.1 The Effect on the CCSP Disclosure

Figure 9 shows the regression discontinuity (RD) estimates of the effect of crossing the P/B ratio cutoff at 1.00 in March 2023 on the probability of making the CCSP disclosure.[5] Each point corresponds to the robust RD estimate for a given year–month, with vertical bars indicating 95% confidence intervals. The effect is small and statistically indistinguishable

[5]Figure B.1 reports RD plots for each year-month sample.

from zero in the months immediately following December 2023, when disclosure information first becomes available, but it turns positive and statistically significant in mid to late 2024. The magnitude of the RD estimates peaks at around 25 percentage points, indicating that firms just below the threshold, which were emphasized and targeted by the TSE's request, were in fact less likely to disclose than firms just above it. Toward late 2024 and early 2025, the estimates taper off and lose statistical significance, suggesting that firms with P/B ratios just below 1.00 eventually caught up in their disclosure behavior. Overall, despite the TSE's emphasis on encouraging disclosure among firms with low P/B ratios, the evidence indicates that targeted firms were initially less responsive to the request, although this negative effect was temporary.

One possible explanation is that firms with P/B ratios below one, which were singled out by the TSE, faced greater reputational concerns or stigma that made them reluctant to disclose sensitive information, leading to a short-run decline in disclosure relative to firms just above the threshold. Another explanation is that disclosure requires preparation costs and organizational capacity, which may be more constrained in poorly valued firms, which could have delayed their response. It is also possible that strategic considerations, such as concerns that disclosure would confirm weak fundamentals, discouraged early compliance. Over time, these constraints appear to have eased, and firms below the threshold eventually aligned with the broader disclosure trend, consistent with the disappearance of the negative effect by early 2025.

5.2.2 The Effects of the CCSP Disclosure

Table 4 shows the Effect of the CCSP Disclosure on Firm Financial Indices.[6] The first column indicates that CCSP disclosure lowers the P/B ratio by 0.811 points for firms near the cutoff. Interpreted as a fuzzy RD local average treatment effect, this implies that for firms whose disclosure was induced by being just above the threshold of 1.00, markets marked

[6] We also present separate fuzzy RD estimates for each year-month subsample in Figures B.2 through B.5. Although the estimates are less precise, overall patterns are broadly consistent with the pooled results.

down market-to-book multiples.

The second and third columns of Table 4 present the estimates for P/E and P/S ratios. The estimates are both negative but not statistically distinguishable from zero. This may be due to the inherently higher variation in P/E and P/S ratios relative to P/B, as these metrics are more sensitive to short-term fluctuations in earnings and sales rather than balance sheet fundamentals.

The fourth column of Table 4 shows that CCSP disclosure increases the dividend yield by 5.875 points. This suggests that marginally disclosing firms exhibit higher dividend yields, which may reflect either lower valuations following disclosure or adjustments in payout policy in response to market reactions.

The fifth column of Table 4 shows that CCSP disclosure reduces the bid-ask spread by 0.017 points. This suggests that marginally disclosing firms experience improved stock market liquidity. This is may be because disclosure reduces information asymmetry between investors and firms.

The sixth column of Table 4 reports the effect on trading volume per share. The estimate is negative but statistically indistinguishable from zero. This suggests that the CCSP disclosure did not affect trading activity.

The seventh column of Table 4 presents the estimates for stock returns. The coefficient is negative and statistically significant, suggesting that marginally disclosing firms experienced lower subsequent returns. This may indicate that the additional information revealed through disclosure led investors to revise expectations downward or that the market had already priced in optimistic valuations prior to the disclosure.

Across outcomes, the CCSP disclosure appears to lower valuation multiples and raise dividend yields for marginally disclosing firms near the cutoff. These results are consistent with an information-revelation effect: disclosure made firm fundamentals more transparent, prompting investors to revise growth expectations or price in compliance costs, which reduced valuations.

At the same time, higher yields may reflect prices adjusting more quickly than payouts or modest increases in dividends to reassure investors. The narrower bid-ask spreads point to improved liquidity and reduced information asymmetry, while the effects on trading volume are limited and returns decline modestly following disclosure.

5.2.3 Subsample RD Analysis

To explore potential heterogeneity in the effects of the CCSP disclosure, we conduct a subsample analysis by market segment. This allows us to examine whether the impact of the disclosure differs between firms listed on the Prime Market and the Standard Market, which may be characterized by different investor bases and business profiles. By comparing these groups, we assess whether the exchange's intervention operates similarly across different tiers of the market or whether its effectiveness depends on firms' baseline governance environments.

Tables 5 and 6 present the estimates of equation (2), using firms in the Prime Market and the Standard Market, respectively.

The first columns of Tables 5 and 6 show that the effect of the CCSP disclosure on the P/B ratio differs across market segments. For firms listed on the Standard Market, the disclosure lowers the P/B ratio by about 2.29 points. In contrast, the estimate for Prime Market firms is positive, though statistically indistinguishable from zero. This difference may suggest that investors revised valuations downward more sharply where baseline transparency was lower.

The second columns of Tables 5 and 6 report the effects on the P/S ratio. For Prime Market firms, the coefficient is negative and statistically significant, indicating that disclosure. In contrast, the estimate for Standard Market firms is statistically insignificant. This pattern is consistent with the interpretation that, for Prime Market firms, the decline in the P/S ratio may reflect stronger sales performance, given that we see a small effect on the P/B ratio, whereas for Standard Market firms, the reduction in P/B coupled with a stable P/S ratio points to weaker sales.

The third columns of Tables 5 and 6 report the effects on the P/E ratio. The estimate for Prime Market firms is small and statistically insignificant. In contrast, the P/E ratio declines sharply for Standard Market firms, indicating that prices fell relative to earnings, consistent with investors revising expectations downward or perceiving weaker profitability following disclosure.

The fourth columns of Tables 5 and 6 report the effects on dividend yield. In both market segments, the estimates are positive and statistically significant, indicating that the CCSP disclosure is associated with higher dividend yields among firms near the cutoff. For Prime Market firms, this increase may reflect modest dividend adjustments aimed at reassuring investors, whereas for Standard Market firms, it likely arises from lower stock prices following disclosure.

The fifth columns of Tables 5 and 6 present the results for the bid-ask spread. In both market segments, the coefficients are negative and statistically significant, indicating that CCSP disclosure reduces trading frictions and improves market liquidity. The effect is somewhat larger for Standard Market firms, suggesting that the benefits of enhanced transparency are more pronounced where baseline information asymmetry is higher. This pattern supports the interpretation that the exchange's disclosure request improved the information environment, making it easier for investors to trade and price securities more efficiently.

The sixth columns of Tables 5 and 6 report the effects on trading volume per share. For Prime Market firms, the coefficient is positive and statistically significant, indicating that CCSP disclosure increased trading activity, possibly because improved transparency attracted greater investor attention and participation. In contrast, for Standard Market firms, the estimate is negative and only marginally significant, suggesting a modest decline in trading volume.

The seventh columns of Tables 5 and 6 present the results for stock returns. In both market segments, the coefficients are negative and statistically significant, indicating that firms induced to disclose experienced lower subsequent returns. The effect is larger for

Standard Market firms, suggesting that investors in this segment reacted more strongly to the additional information revealed through disclosure. These results are consistent with a downward revision of expectations or a correction of previously overvalued prices following the exchange's intervention.

The subsample analysis reveals that the effects of CCSP disclosure differ notably across market segments. Among Prime Market firms, the disclosure had limited impact on valuation multiples but is associated with higher dividend yields, narrower bid-ask spreads, and increased trading volume, indicating modest price adjustments and improved liquidity in a more transparent environment.

In contrast, Standard Market firms experienced significant declines in valuation ratios and returns, along with higher dividend yields and tighter spreads, suggesting stronger market repricing and a more pronounced information revelation effect. Overall, the results imply that the exchange's intervention had a greater disciplining and informational impact in the less prestigious Standard Market, while it primarily enhanced liquidity and market functioning among Prime firms.

5.3 Discussions

Our DiD estimates suggest that firm valuations improved following CCSP disclosure. The subsample analysis further shows that these gains are stronger and more persistent among high-valuation firms and firms listed on the Prime Market, whereas low-valuation and Standard Market firms exhibit more modest and short-term improvements. These results are robust to alternative choices of DiD estimators. Overall, the DiD analysis reveals that CCSP disclosure had, on average, a moderate effect for firms that disclosed.

The RD estimates show that, contrary to expectations, the TSE's emphasis on firms just below the threshold induced additional disclosure among firms just above the threshold. Several mechanisms can explain this pattern. The "below one" label may carry stigma and raise perceived scrutiny, deterring disclosure among financially constrained firms that face

higher costs of preparing and releasing reports. These firms may also bear greater downside risk from revealing adverse information. By contrast, firms just above the threshold face lower perceived downside risk and may view disclosure as a way to send a positive signal.

The twist here is that, however, firms just above the cutoff that did disclose subsequently traded at lower valuation multiples. One way to interpret this negative impact is that the CCSP disclosure revealed information that tempered beliefs about growth or profitability, or brought expected compliance costs into focus, so prices adjusted downward even though disclosure uptake was higher on that side of the threshold. Our subsample analysis shows that the negative effect of the CCSP disclosure on the P/B ratio is driven by firms in the Standard Market, suggesting that the effectiveness of may depend on differences in investor base, regulatory environment, listing standards, and business characteristics across market segments.

The somewhat surprising directions of the RD estimates offer a nuanced perspective on the effectiveness of exchange-induced governance measures. They suggest that such interventions can influence disclosure behavior, but in ways that are not always predictable, reflecting the strategic responses of firms to soft governance pressure. The positive first-stage estimates indicate that an exchange's ability to steer governance improvements toward low-valuation firms is limited, as firms' strategic considerations can offset the intended targeting effect in the absence of strict enforcement. Meanwhile, the negative second-stage effect on the P/B ratio suggests that exchange-led governance disclosure may dampen firm valuations for some firms by revealing less favorable information to the market.

One way to reconcile the opposite effects on the P/B ratio from the DiD and RD designs is to recognize that they estimate different parameters. The DiD design captures the average treatment effect across all disclosing firms, reflecting the overall impact of the CCSP disclosure on the firms that chose to disclose. In the language of potential outcomes model (Imbens and Rubin, 2015), the estimand of the DiD estimator is the average treatment effect

on the treated (ATT), i.e.,

$$\text{ATT} = \mathsf{E}[\, Y_{i,t}(1) - Y_{i,t}(0) \mid D_{i,t} = 1 \,], \tag{4}$$

where $Y_{i,t}(1)$ and $Y_{i,t}(0)$ denote the potential outcomes if firm i disclosed in period t and if firm i did not disclose in period t, respectively.

In contrast, the RD design identifies a local average treatment effect around the cutoff, focusing on firms whose disclosure decisions were marginally induced by the exchange's request. The estimand of the RD estimator is the local average treatment effect (LATE) for compliers in the neighborhood of the threshold, i.e.,

$$\text{LATE} = \mathsf{E}[\, Y_{i,t}(1) - Y_{i,t}(0) \mid D_{i,t}(0) = 0, D_{i,t}(1) = 1, \text{PBR}_{i,2023/03} \simeq 1 \,], \tag{5}$$

where $D_{i,t}(1)$ and $D_{i,t}(0)$ denote the potential disclosure status if firm i were above the threshold in period t and if firm i fell below the threshold in period t, respectively.

Because these firms may differ systematically, their market responses can differ from the average effect estimated on the treatment group by the DiD. In particular, note that the RD estimator captures only the effect for compliers—firms that would choose to disclose if they were just above the threshold and would choose not to disclose if they were just below it, whereas the DiD estimator captures all firms that chose to disclose. The comparison underlying the RD estimate therefore focuses on a subset of firms whose disclosure decisions are marginal and potentially more opportunistic, which may explain why the market reacted negatively to additional information about these firms.

In sum, the DiD and RD results together show that the CCSP disclosure had positive average effects but more mixed impacts among marginally disclosing firms. While disclosure generally improved valuations for firms that chose to comply, the RD evidence indicates that firms induced to disclose near the threshold experienced weaker or even negative valuation responses, reflecting their distinct characteristics and strategic motivations. These patterns

provide a nuanced insight—namely, while soft interventions may raise average valuations, their effects can be less predictable for firms that disclose at the margin.

6 Conclusion

This paper examines the Tokyo Stock Exchange's 2023 initiative encouraging listed firms to adopt management practices that take into account their cost of capital and stock price, and to disclose related action plans. Although the request formally applied to all firms listed on the Prime Market and the Standard Market, market commentary highlighted low-valuation firms—particularly those trading below book value—as the primary targets, creating a salient but non-binding threshold at a P/B ratio of one. Leveraging both DiD and RD designs, we offer several findings that shed light on the effectiveness and limitations of this form of exchange-led governance.

Our DiD results indicate that firms that chose to disclose experienced modest but statistically meaningful short-run increases in P/B and P/S ratios after disclosure, accompanied by higher ROE, larger dividend payouts and share repurchases, and lower cash holdings. These effects are not driven by confounding pre-trends and remain robust to controlling for firm fundamentals, capital structure, and industry- or segment-specific trends. Subsample analyses further show that these valuation gains are stronger and more persistent among high-valuation firms and firms listed on the Prime Market, whereas low-valuation and Standard Market firms exhibit smaller and more short-lived improvements, implying that the request was most effective for higher-tier firms already viewed more favorably by investors. Taken together, the evidence suggests that the valuation response reflects a combination of improved transparency and active capital reallocation, rather than merely a temporary market reaction.

By contrast, the RD results show that firms just above the implicit P/B threshold—those marginally induced to disclose—saw declines in valuation multiples following disclosure. This

suggests that disclosure revealed information that tempered investor beliefs or highlighted constraints, producing adverse reactions even as disclosure rates increased among these firms.

It is also worth emphasizing that the TSE's emphasis on low-valuation firms did not succeed in inducing additional disclosure among firms just below the threshold, contrary to expectations. Instead, disclosure rose among firms for whom the perceived downside risk was lower. Together, these patterns provide a nuanced insight, that is, while soft exchange-led interventions may improve average valuations, their effects can be more unpredictable among firms disclosing at the margin.

Our findings suggest that soft governance mechanisms can improve transparency or investor expectations and, on average, raise valuations for firms that disclose, even without formal enforcement. However, their effects can be negative and more nuanced for firms comply on the margin. Such interventions may reveal underlying weaknesses of firms rather than correct them, and strategic firm responses can dilute the targeting that these initiatives are meant to achieve. In this sense, the TSE's experience illustrates both the promise and the limits of stock exchanges operating as governance agents through moral suasion and public visibility rather than formal regulation.

The study also faces limitations that point to avenues for future research. Our analysis covers only the short-run period of one to two years following the CCSP request, so it remains an open question whether these patterns persist, reverse, or intensify over time. Future work could examine longer-run outcomes related to governance practices, disclosure quality, and firms' cost of capital, and could distinguish substantive action plans from more symbolic forms of compliance. Comparative evidence from other exchange-led initiatives would also help clarify the conditions under which soft enforcement complements formal regulation.

Tables

Table 1: Summary Statistics

	Mean	SD	P10	Median	P90	N
P/B	1.591	1.590	0.482	1.060	3.260	63,424
P/S	1.084	1.329	0.208	0.662	2.280	63,424
P/E	22.665	40.979	7.220	14.539	37.547	57,346
Dividend yield	2.436	1.416	0.456	2.436	4.271	63,424
Spread	0.007	0.007	0.002	0.005	0.014	63,424
Volume per share	0.089	0.153	0.011	0.047	0.174	63,424
Return	0.009	0.080	-0.075	0.003	0.099	63,424
ROE	7.409	11.154	-1.540	7.460	18.640	22,517
ROA	6.252	6.626	0.000	5.530	14.260	22,517
Cash holding	22.563	15.362	6.393	18.850	44.721	22,517
R&D	0.750	1.277	0.000	0.174	2.235	22,517
Intangible	3.872	6.935	0.175	1.313	10.055	22,517
Dividend payout ratio	40.629	40.834	7.000	32.100	72.140	22,517
Share repurchase	34.300	234.598	-3.276	0.000	21.519	22,517
Ln assets	10.920	1.747	8.812	10.712	13.279	22,517

Notes: Table 1 reports descriptive statistics for firm-level variables from December 2023 to September 2025. P/B is the price-to-book ratio; P/S is the price-to-sales ratio; P/E is the price-to-earnings ratio; dividend yield is dividends per share divided by price per share. Spread is the relative bid–ask spread, $(\text{ask} - \text{bid})/(\text{ask} + \text{bid}) \times 2$. Volume per share is trading volume per share, and return is the stock return. ROE and ROA are return on equity and return on assets. Cash holding, R&D, and intangible are cash and cash equivalents, R&D, and intangible assets, each scaled by total assets and and expressed in percent (multiplied by 100). The dividend payout ratio is dividends per share divided by earnings per share, and share repurchase is proxied by the treasury stock growth, both expressed in percent. Ln assets is the natural logarithm of total assets. Variables based on quarterly accounting information (ROE, ROA, cash holding, R&D, intangible, dividend payout ratio, share repurchase, and Ln assets) are observed at the quarterly frequency. All variables are winsorized at the 1st and 99th percentiles.

Table 2: Manipulation Testing at the P/B Cutoff ($c = 1.00$) — Full Sample

	Left of c	Right of c
Number of observations	1,484	1,467
Effective number of obs.	1,120	583
Order est. (p)	2	2
Order bias (q)	3	3
Bandwidth est. (h)	0.524	0.540
Robust t-statistic	-0.0732	
p-value	0.9416	

Notes: This table reports results of the density discontinuity test at cutoff $c = 1.00$. Effective sample sizes, polynomial orders, and bandwidths are shown for each side of the cutoff. The robust t-statistic and p-value correspond to the null hypothesis of no manipulation at the cutoff. Standard errors are jackknife-adjusted.

Table 3: Binomial Tests of Equal Mass around the Cutoff — Full Sample

Window Length /2	$< c$	$\geq c$	p-value
0.010	22	20	0.8776
0.019	40	36	0.7310
0.029	57	48	0.4351
0.038	70	69	1.0000
0.048	89	81	0.5915
0.057	100	95	0.7746
0.067	113	108	0.7879
0.076	130	122	0.6593
0.086	146	132	0.4356
0.095	161	142	0.3011

Notes: This table reports binomial tests of the null hypothesis that the probability of observations falling on either side of the cutoff $c = 1$ is equal ($p = 0.5$). For each symmetric window length, the counts of observations below ($< c$) and above ($\geq c$) the cutoff are shown, along with the associated p-value.

Table 4: The Effect of the CCSP Disclosure on Firm Financial Indices (Full Sample)

	P/B	P/S	P/E	Yield	Spread	Volume per Share	Return
Second-Stage Estimate	-0.811^{***}	-0.333	-38.812	5.875^{***}	-0.017^{***}	-0.033	-0.027^{**}
(Effect on Outcome)	(0.181)	(0.264)	(24.988)	(1.718)	(0.003)	(0.051)	(0.012)
First-Stage Estimate	0.109^{***}	0.110^{***}	0.093^{***}	0.109^{***}	0.109^{***}	0.117^{***}	0.168^{***}
(Effect on Disclosure)	(0.030)	(0.028)	(0.025)	(0.031)	(0.030)	(0.027)	(0.038)
Total Observations	54,975	54,975	49,679	54,975	54,901	54,975	54,975
Effective Observations	10,302	11,175	10,684	9,818	10,379	11,080	6,445
MSE-Optimal Bandwidth	0.171	0.184	0.188	0.163	0.173	0.182	0.109
Year-Month FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Second-stage rows report the pooled fuzzy RD effect of disclosure on each outcome; first-stage rows report the discontinuity in treatment at the cutoff $c = 1.00$. Standard errors are adjusted for robust bias-corrected inference, clustered at the firm level, and shown in parentheses. Estimates use covariate-adjusted local polynomial RD with triangular kernel and MSE-optimal bandwidth selection. Effective observations sum left and right effective counts within h: P/B = 5,911 + 4,391 = 10,302; P/S = 6,465 + 4,710 = 11,175; P/E = 6,192 + 4,492 = 10,684; Yield = 5,569 + 4,249 = 9,818; Spread = 5,961 + 4,418 = 10,379; Volume per Share = 6,408 + 4,672 = 11,080; Return = 3,450 + 2,995 = 6,445. Significance: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 5: The Effect of the CCSP Disclosure on Firm Financial Indices (Prime Market)

	P/B	P/S	P/E	Yield	Spread	Volume per Share	Return
Second-Stage Estimate	0.069	-1.588^{***}	-1.179	2.278^{***}	-0.009^{***}	0.145^{***}	-0.009^{***}
(Effect on Outcome)	(0.063)	(0.161)	(5.337)	(0.308)	(0.001)	(0.018)	(0.003)
First-Stage Estimate	0.146^{***}	0.139^{***}	0.132^{***}	0.140^{***}	0.142^{***}	0.132^{***}	0.145^{***}
(Effect on Disclosure)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.004)	(0.003)
Total Observations	27,382	27,382	25,928	27,382	27,367	27,382	27,382
Effective Observations	4,032	4,317	5,062	4,336	4,203	5,076	4,127
MSE-Optimal Bandwidth	0.133	0.146	0.174	0.148	0.141	0.169	0.136
Year-Month FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Second-stage rows report the pooled fuzzy RD effect of disclosure on each outcome; first-stage rows report the discontinuity in treatment at the cutoff $c = 1.00$. Standard errors are adjusted for robust bias-corrected inference, clustered at the firm level, and shown in parentheses. Estimates use covariate-adjusted local polynomial RD with triangular kernel and MSE-optimal bandwidth selection. Effective observations sum left and right effective counts within h: P/B = 2,128 + 1,904 = 4,032; P/S = 2,280 + 2,037 = 4,317; P/E = 2,773 + 2,289 = 5,062; Yield = 2,299+2,037 = 4,336; Spread = 2,223+1,980 = 4,203; Volume per Share = 2,773+2,303 = 5,076; Return = 2,166 + 1,961 = 4,127. Significance: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 6: The Effect of the CCSP Disclosure on Firm Financial Indices (Standard Market)

	P/B	P/S	P/E	Yield	Spread	Volume per Share	Return
Second-Stage Estimate	-2.292^{***}	0.517	-155.878^{**}	4.031^{***}	-0.032^{***}	-0.186^{**}	-0.019^{***}
(Effect on Outcome)	(0.506)	(0.607)	(70.385)	(0.829)	(0.006)	(0.082)	(0.002)
First-Stage Estimate	0.114^{***}	0.100^{***}	0.065^{**}	0.166^{***}	0.107^{***}	0.116^{***}	0.426^{***}
(Effect on Disclosure)	(0.028)	(0.027)	(0.028)	(0.028)	(0.027)	(0.028)	(0.026)
Total Observations	24,362	24,362	21,080	24,362	24,308	24,362	24,362
Effective Observations	3,703	3,984	2,725	2,802	3,725	3,646	1,680
MSE-Optimal Bandwidth	0.141	0.152	0.125	0.116	0.144	0.138	0.064
Year-Month FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Second-stage rows report the pooled fuzzy RD effect of disclosure on each outcome; first-stage rows report the discontinuity in treatment at the cutoff $c = 1.00$. Standard errors are adjusted for robust bias-corrected inference, clustered at the firm level, and shown in parentheses. Estimates use covariate-adjusted local polynomial RD with triangular kernel and MSE-optimal bandwidth selection. Effective observations sum left and right effective counts within h: P/B = 2,080 + 1,623 = 3,703; P/S = 2,304 + 1,680 = 3,984; P/E = 1,452 + 1,273 = 2,725; Yield = 1,559+1,243 = 2,802; Spread = 2,107+1,618 = 3,725; Volume per Share = 2,042+1,604 = 3,646; Return = 969 + 711 = 1,680. Significance: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Figures

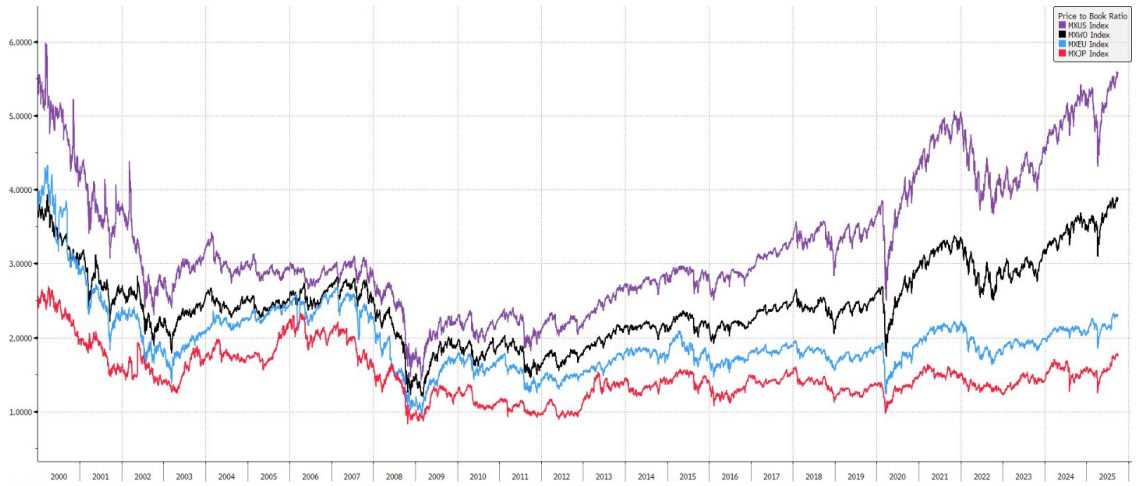


Figure 1: Trends in Average Price-to-Book Ratios Across Major Economies, 2000–2025

Notes: This figure plots the average price-to-book (P/B) ratios for broad equity indexes across major economies. The series include the United States (MXUS), World (MXWO), Europe (MXEU), and Japan (MXJP), which are represented by purple, black, blue, and red lines, respectively. Higher values indicate that listed firms are, on average, priced further above their book value, reflecting stronger market valuation. Data are sourced from Bloomberg and are shown from 2000 to 2025.

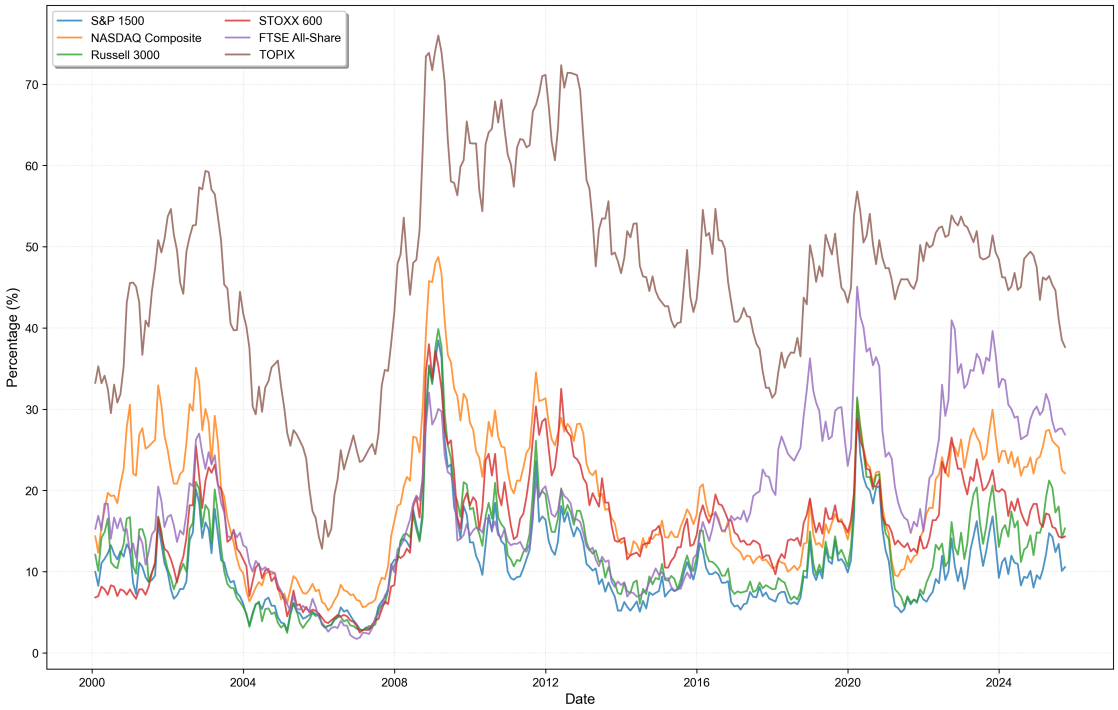


Figure 2: Share of Index Constituents with Price-to-Book Ratios Below One

Notes: The figure plots the monthly percentage of constituents with price-to-book (P/B) ratios below one for six broad equity indices, 2000–2025. Indices and line colors: S&P 1500 (blue), NASDAQ Composite (orange), Russell 3000 (green), STOXX 600 (red), FTSE All-Share (purple), and TOPIX (brown). Data on constituents and P/B ratios are from Bloomberg.

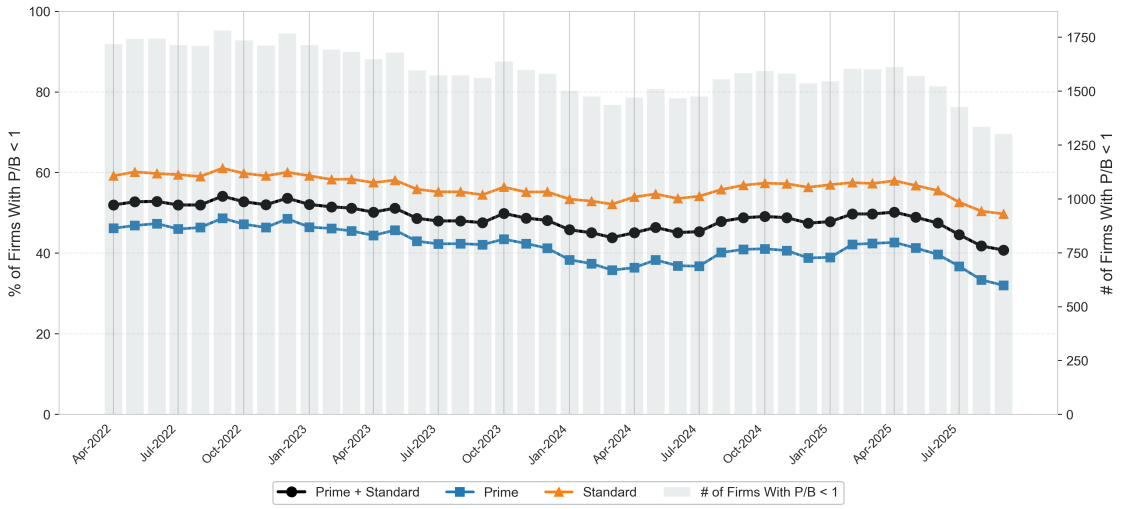


Figure 3: Share of TSE-Listed Firms with Price-to-Book Ratios Below One, 2022–2025

Notes: This figure shows the number and share of firms listed on the Tokyo Stock Exchange (TSE) with price-to-book (P/B) ratios below one between April 2022 and July 2025. The bars represent the number of firms (left axis), and the lines represent the percentage share (right axis). Results are shown separately for the Prime Market (blue), the Standard Market (orange), and all listed firms combined (black). Data are sourced from NEEDS FinancialQuest monthly statistics.

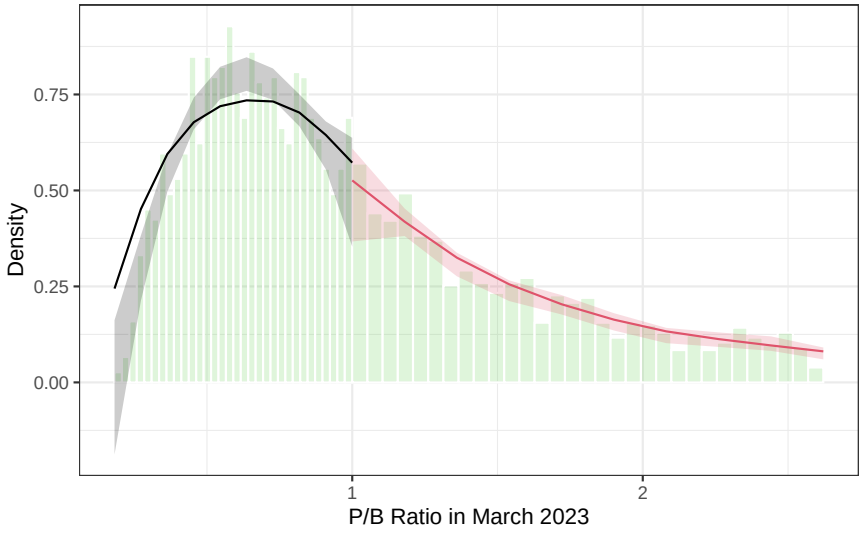
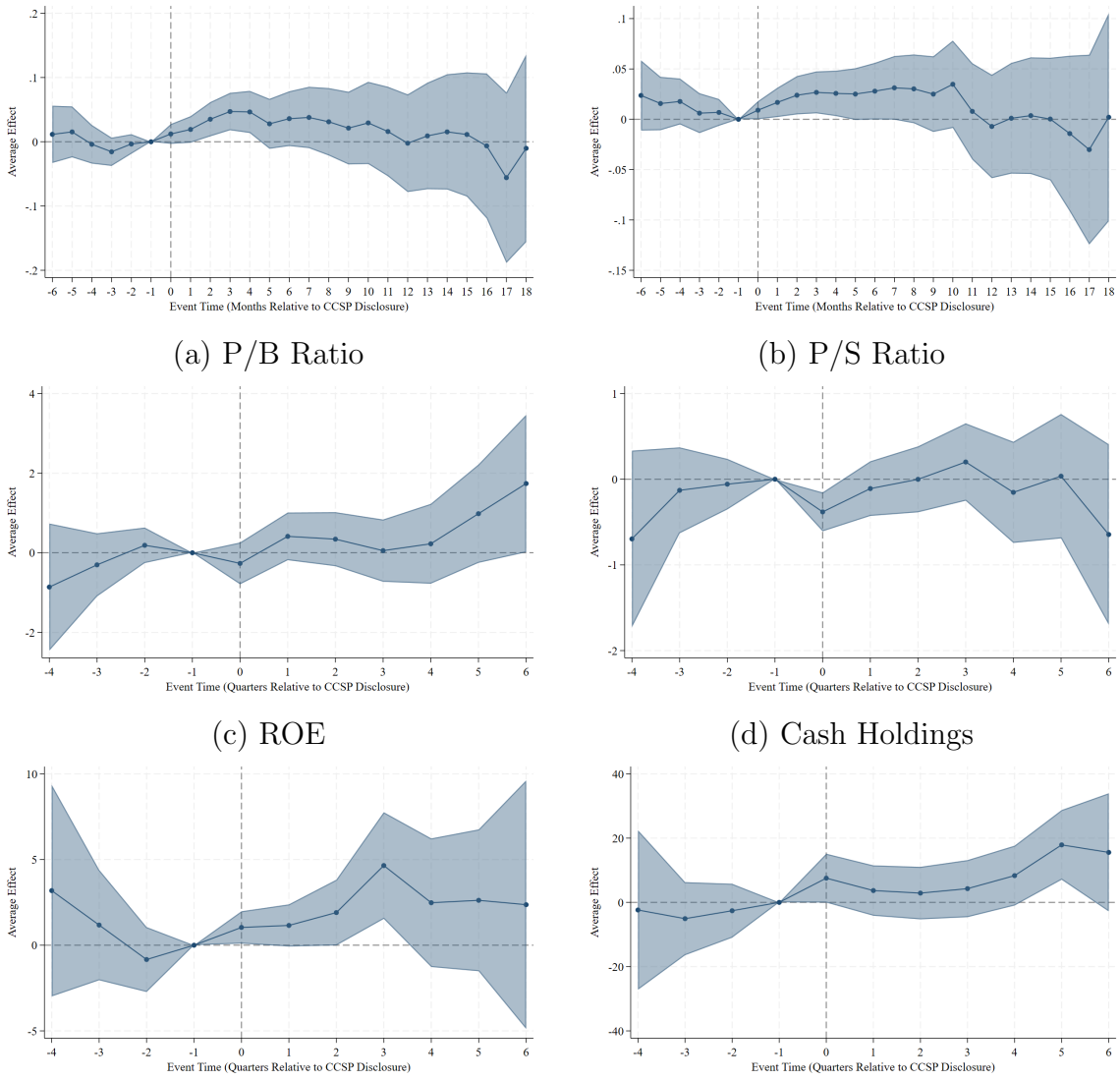


Figure 4: Density of Price-to-Book Ratio around the Threshold

Notes: This figure plots the estimated density of the running variable (price-to-book ratio in March 2023) around the cutoff at $c = 1.00$. The local polynomial density estimates are shown separately on either side of the cutoff, with triangular kernels and bandwidths selected by the `rddensity` procedure. The plot is used to assess possible manipulation of the running variable near the threshold. A smooth density without a visible discontinuity provides visual evidence against sorting or bunching at the cutoff.



(a) P/B Ratio

(b) P/S Ratio

(c) ROE

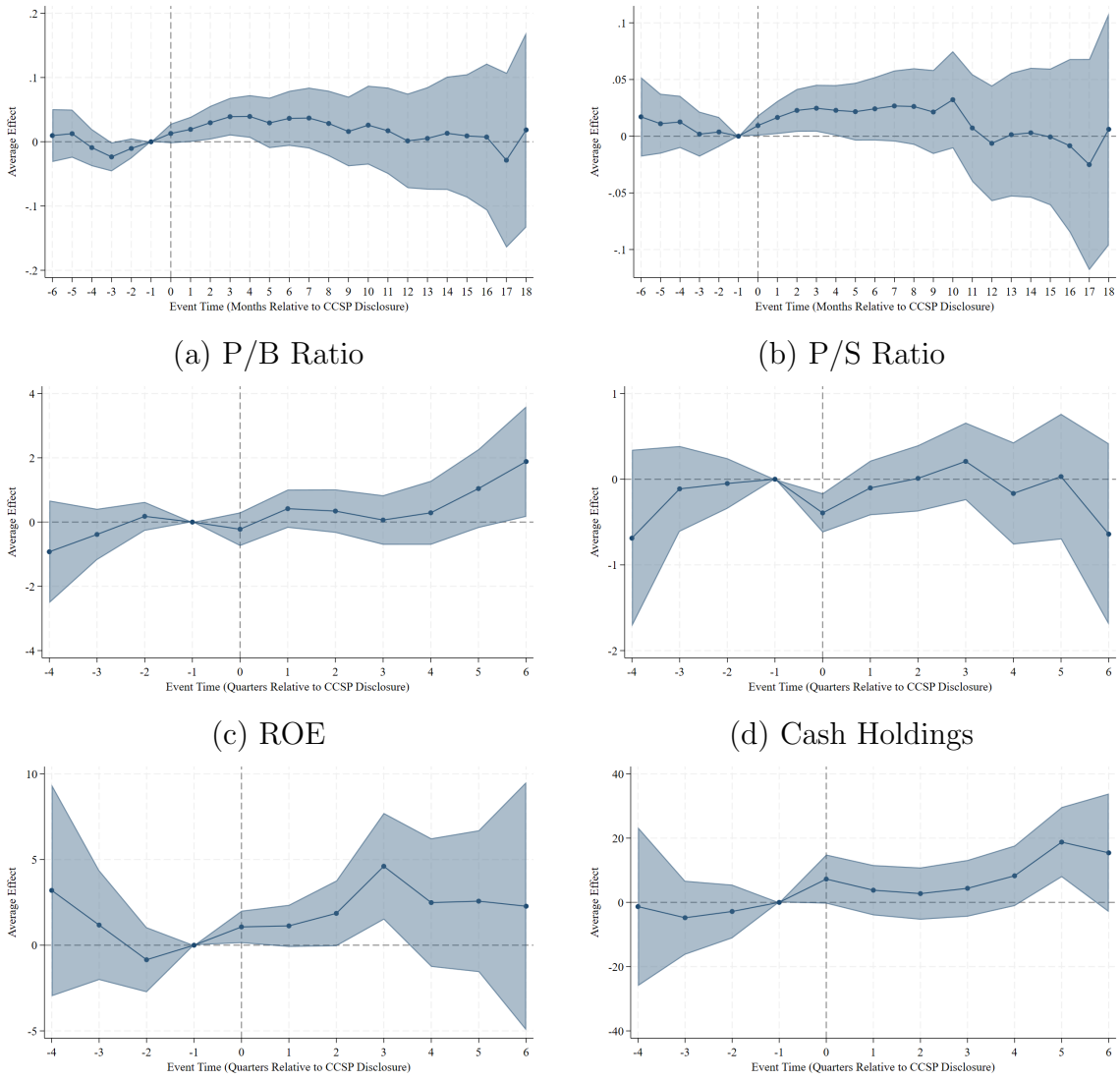
(d) Cash Holdings

(e) Dividend Payout Ratio

(f) Share Repurchase

Figure 5: Effects of the CCSP Disclosure on Firms' Financial Outcomes

Notes: Each panel presents the dynamic effects of the CCSP disclosure on a different firm-level outcome using an event-study specification. The estimator proposed by De Chaisemartin and d'Haultfoeuille (2023) is used. The outcomes are price-to-book (P/B) ratio, price-to-sales (P/S) ratio, return on equity (ROE), cash holding, dividend payout ratio, and share repurchase for panels (a), (b), (c), (d), (e) , and (f) respectively. Solid lines represent coefficient estimates for each event time relative to the disclosure, and shaded areas show 95% confidence intervals. The vertical dashed line marks the disclosure event ($t = 0$). Standard errors are clustered at the firm level. Note that time periods are monthly for panels (a) and (b) and quarterly for panels (c), (d), (e), and (f).



(a) P/B Ratio

(b) P/S Ratio

(c) ROE

(d) Cash Holdings

(e) Dividend Payout Ratio

(f) Share Repurchase

Figure 6: Effects of the CCSP Disclosure on Firms' Financial Outcomes With Controls

Notes: Each panel presents the dynamic effects of the CCSP disclosure on a different firm-level outcome using an event-study specification. The estimator proposed by De Chaisemartin and d'Haultfoeuille (2023) is used. The outcomes are price-to-book (P/B) ratio, price-to-sales (P/S) ratio, return on equity (ROE), cash holding, dividend payout ratio, and treasury stock growth for panels (a), (b), (c), (d), (e) , and (f) respectively. Solid lines represent coefficient estimates for each event time relative to the disclosure, and shaded areas show 95% confidence intervals. The set of control variables for panel (a), (b) includes assets, intangibles, R&D, CAPEX, ROA, cash holdings, dividend payouts, and share repurchase. The set of control variables for panel (c), (d), (e), and (f) includes assets, intangibles, R&D, and CAPEX. The vertical dashed line marks the disclosure event ($t = 0$). Standard errors are clustered at the firm level. Note that time periods are monthly for panels (a) and (b) and quarterly for panels (c), (d), (e), and (f).

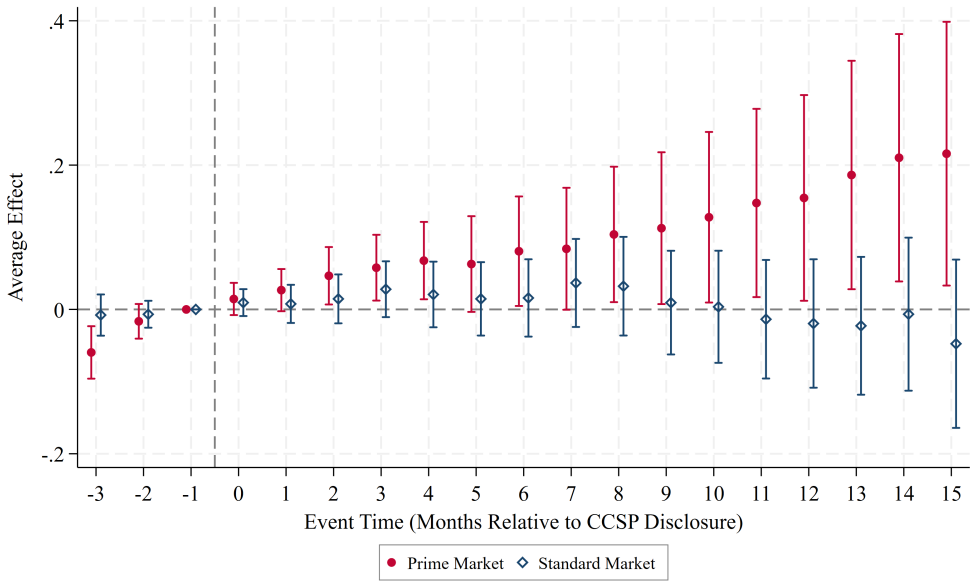


Figure 7: Effects of CCSP Disclosure on Firms' Price-to-Book Ratio by Market Segments

Notes: This figure plots the dynamic effects of the CCSP disclosure on firms' price-to-book ratios using an event-study specification for firms listed on the Prime Market (red cirbles) and the Standard Market (blue diamonds). The effects for each market segment are estimated separately in two regressions. The estimator proposed by De Chaisemartin and d'Haultfoeuille (2023) is used. The solid line represents point estimates of the coefficients for each event time relative to the disclosure, and the shaded area shows 95% confidence intervals. The set of control variables includes assets, intangibles, R&D, CAPEX, ROA, cash holdings, dividend payouts, and treasury stock growth. The vertical dashed line marks the disclosure event ($t = 0$). Standard errors are clustered at the firm level.

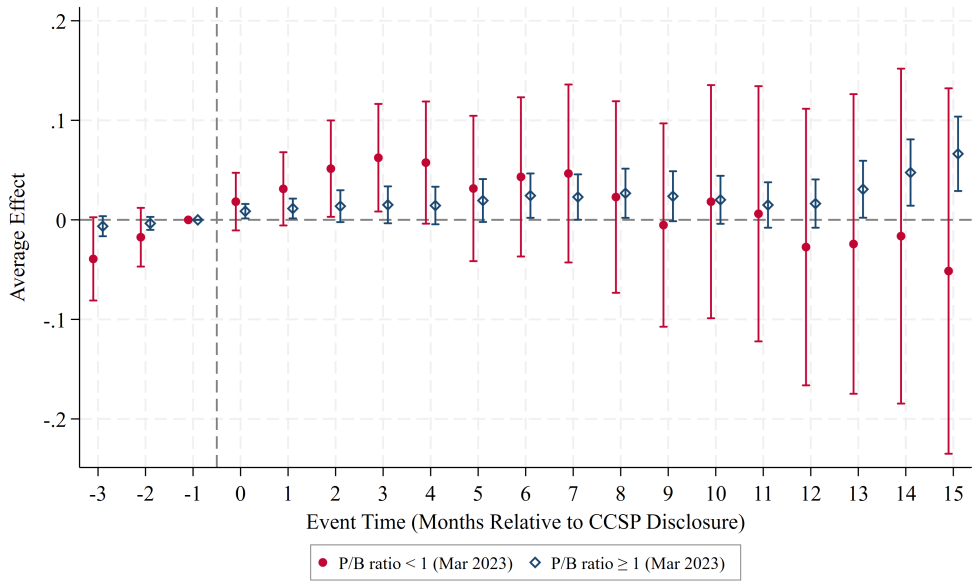


Figure 8: Effects of CCSP Disclosure on Firms' Price-to-Book Ratio by P/B Groups

Notes: This figure plots the dynamic effects of the CCSP disclosure on firms' price-to-book ratios using an event-study specification for firms with a P/B ratio below one in March 2023 (red circles) and those with a P/B ratio of at least one in March 2023 (blue diamonds). The effects for each P/B group are estimated separately in two regressions. The estimator proposed by De Chaisemartin and d'Haultfoeuille (2023) is used. The markers represent point estimates of the coefficients for each event time relative to the disclosure, and the vertical bars show 95% confidence intervals. The set of control variables includes assets, intangibles, R&D, CAPEX, ROA, cash holdings, dividend payouts, and treasury stock growth. The vertical dashed line marks the disclosure event ($t = 0$). Standard errors are clustered at the firm level.

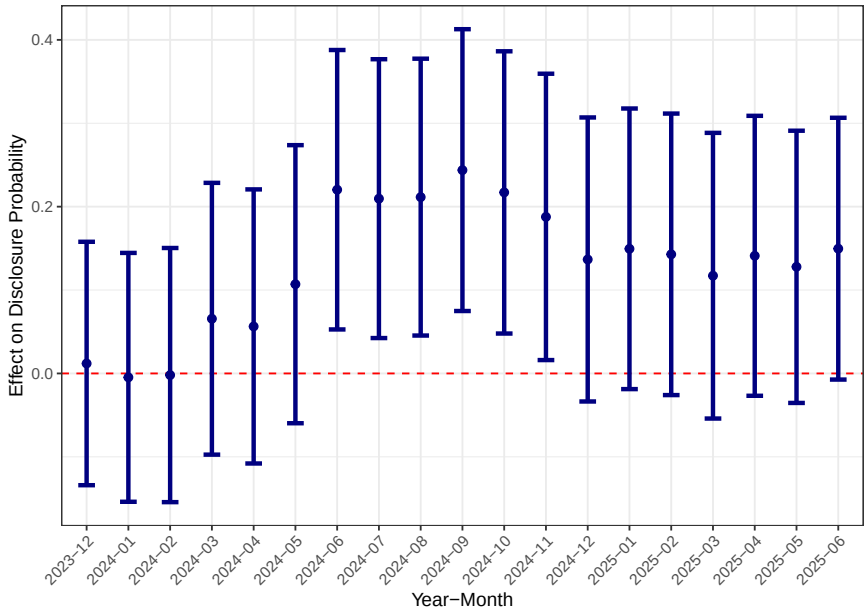


Figure 9: RD Estimates of the Effect on the CCSP Disclosure

Notes: This figure reports the estimated regression discontinuity (RD) effects of crossing the price-to-book (in March 2023) cutoff at $c = 1.00$ on the probability of the CCSP disclosure. Each point corresponds to the robust RD estimate for a given month, with vertical bars showing the associated 95% confidence intervals. The dashed horizontal line at zero marks the null hypothesis of no discontinuity. Estimates are based on local polynomial methods with triangular kernels and bandwidths selected by the `rdrobust` procedure. The plot illustrates the evolution of disclosure responses over time relative to the threshold. The estimates are obtained from separate RD exercises conducted for each year-month.

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Appendix A Robustness Checks for DiD

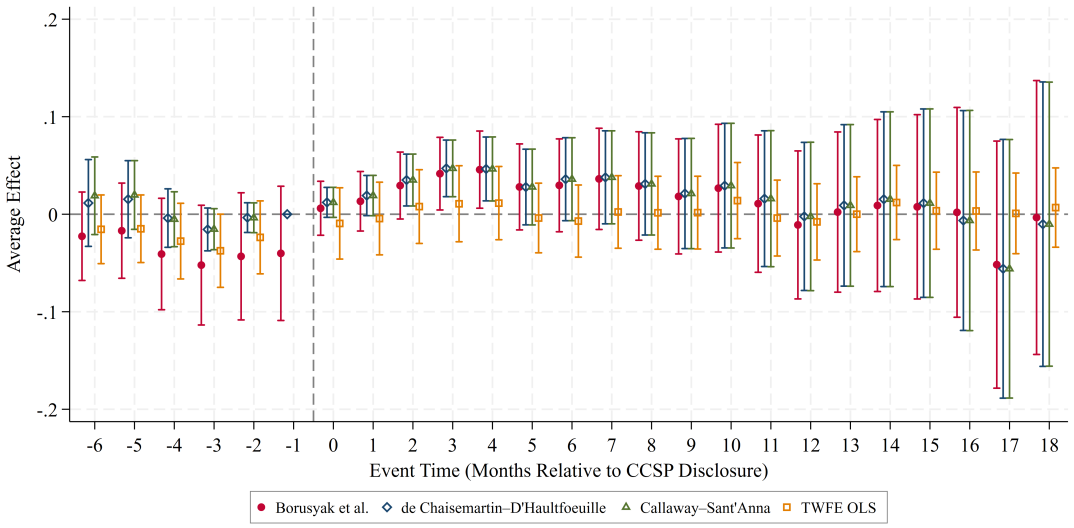


Figure A.1: Effects of the CCSP Disclosure on Firms' P/B Ratios

Notes: This figure compares the estimated dynamic effects of the CCSP disclosure on firms' price-to-book ratios using four different event-study estimators: Borusyak et al. (2024) (red circles), De Chaisemartin and d'Haultfoeuille (2023) (blue diamonds), Callaway and Sant'Anna (2021) (green triangles), and the conventional two-way fixed effects (TWFE) OLS estimator (orange squares). The solid markers represent the estimated coefficients for each event month relative to the disclosure, and the vertical bars denote 95% confidence intervals. The vertical dashed line marks the disclosure event ($t = 0$). Standard errors are clustered at the firm level. The set of control variables includes assets, intangibles, R&D, CAPEX, ROA, cash holdings, dividend payouts, and treasury stock growth.

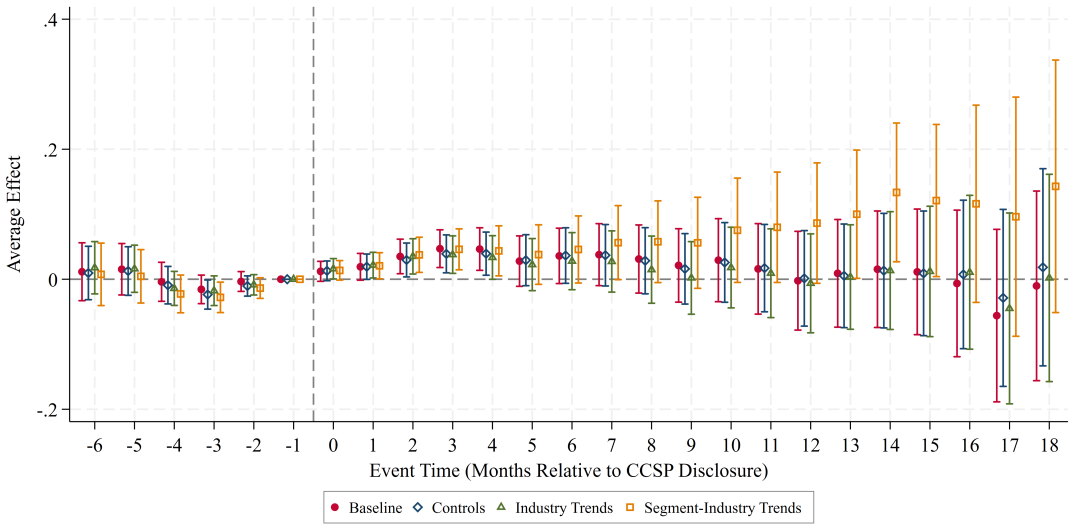


Figure A.2: Effects of the CCSP Disclosure on Firms' P/B Ratios with Different Trends

Notes: This figure presents robustness checks for the estimated dynamic effects of the CCSP disclosure on firms' P/B ratios under alternative model specifications. The baseline estimation (red circles) is compared with specifications that include firm-level controls (blue diamonds), industry-specific time trends (green triangles), and segment-by-industry time trends (orange squares). Solid markers represent coefficient estimates for each event month relative to the disclosure, and vertical bars denote 95% confidence intervals. The vertical dashed line marks the disclosure event ($t = 0$). Standard errors are clustered at the firm level. The set of control variables includes assets, intangibles, R&D, CAPEX, ROA, cash holdings, dividend payouts, and treasury stock growth.

Appendix B Detailed Results of RD

Table B.1: The Effect of the CCSP Disclosure on the P/B Ratio around the Cutoff

Year–Month	RD Estimate	Lower CI	Upper CI	h_L	h_R	N_L	N_R	N
2023-12	−9.74	−53.06	33.57	0.24	0.24	465	329	794
2024-01	3.61	−93.15	100.38	0.24	0.24	457	328	785
2024-02	5.99	−23.14	35.12	0.26	0.26	503	356	859
2024-03	−0.93	−3.24	1.38	0.24	0.24	451	324	775
2024-04	−0.27	−2.91	2.37	0.24	0.24	448	324	772
2024-05	−0.65	−2.35	1.05	0.23	0.23	434	311	745
2024-06	−0.20	−1.01	0.61	0.21	0.21	404	293	697
2024-07	−0.06	−0.90	0.78	0.22	0.22	418	304	722
2024-08	−0.17	−1.05	0.71	0.20	0.20	380	275	655
2024-09	0.00	−0.79	0.78	0.20	0.20	379	274	653
2024-10	0.03	−0.98	1.03	0.21	0.21	401	289	690
2024-11	0.02	−1.08	1.13	0.22	0.22	416	298	714
2024-12	0.32	−0.99	1.62	0.28	0.28	538	363	901
2025-01	0.25	−1.05	1.55	0.27	0.27	505	352	857
2025-02	−0.20	−1.53	1.13	0.25	0.25	462	323	785
2025-03	−0.09	−1.41	1.24	0.28	0.28	530	358	888
2025-04	−0.11	−1.26	1.04	0.30	0.30	580	382	962
2025-05	0.14	−1.47	1.74	0.31	0.31	585	388	973
2025-06	0.07	−1.65	1.80	0.27	0.27	514	353	867

Notes: Entries are robust bias-corrected local-polynomial RD estimates at the cutoff $c = 1.00$ with 95% confidence intervals. h_L and h_R are MSE-optimal bandwidths. N_L and N_R are effective sample sizes within bandwidth; $N = N_L + N_R$.

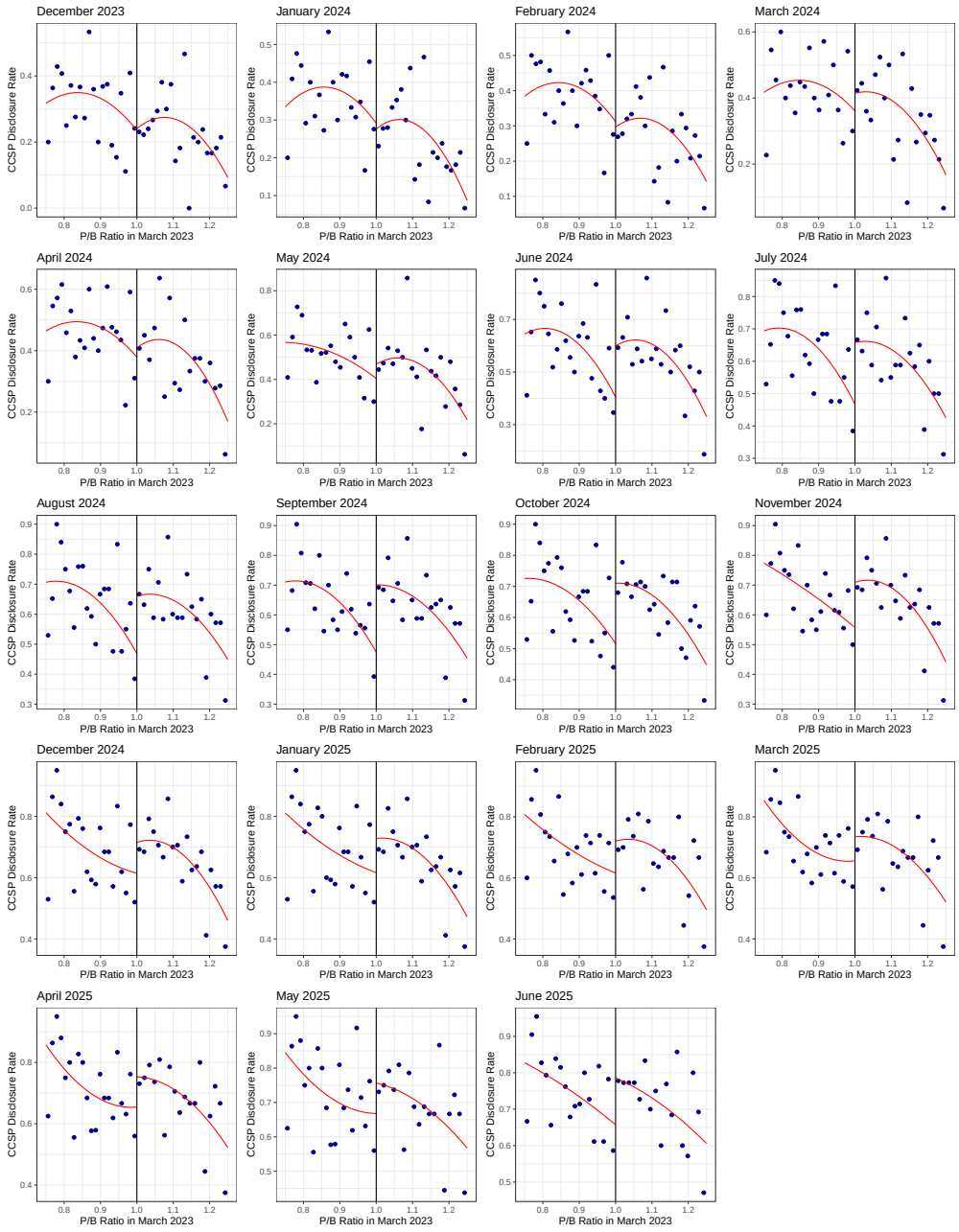


Figure B.1: RD Plots for the Effects on the CCSP Disclosure across Year-Months

Notes: Each panel shows a binned scatter of the CCSP disclosure indicator (vertical axis) against the firm's P/B ratio measured in March 2023 (horizontal axis). The vertical dashed line marks the cutoff ($c = 1.00$). Dots are bin means computed using a data-driven binning rule that balances bias and variance, and the smooth curves are separate local quadratic fits on the left and right of the cutoff. The bandwidth are set at $[0.75, 1.25]$. The figure is for visualization of the RD effect and its evolution over time; formal monthly RD estimates and confidence intervals are reported elsewhere in the paper.

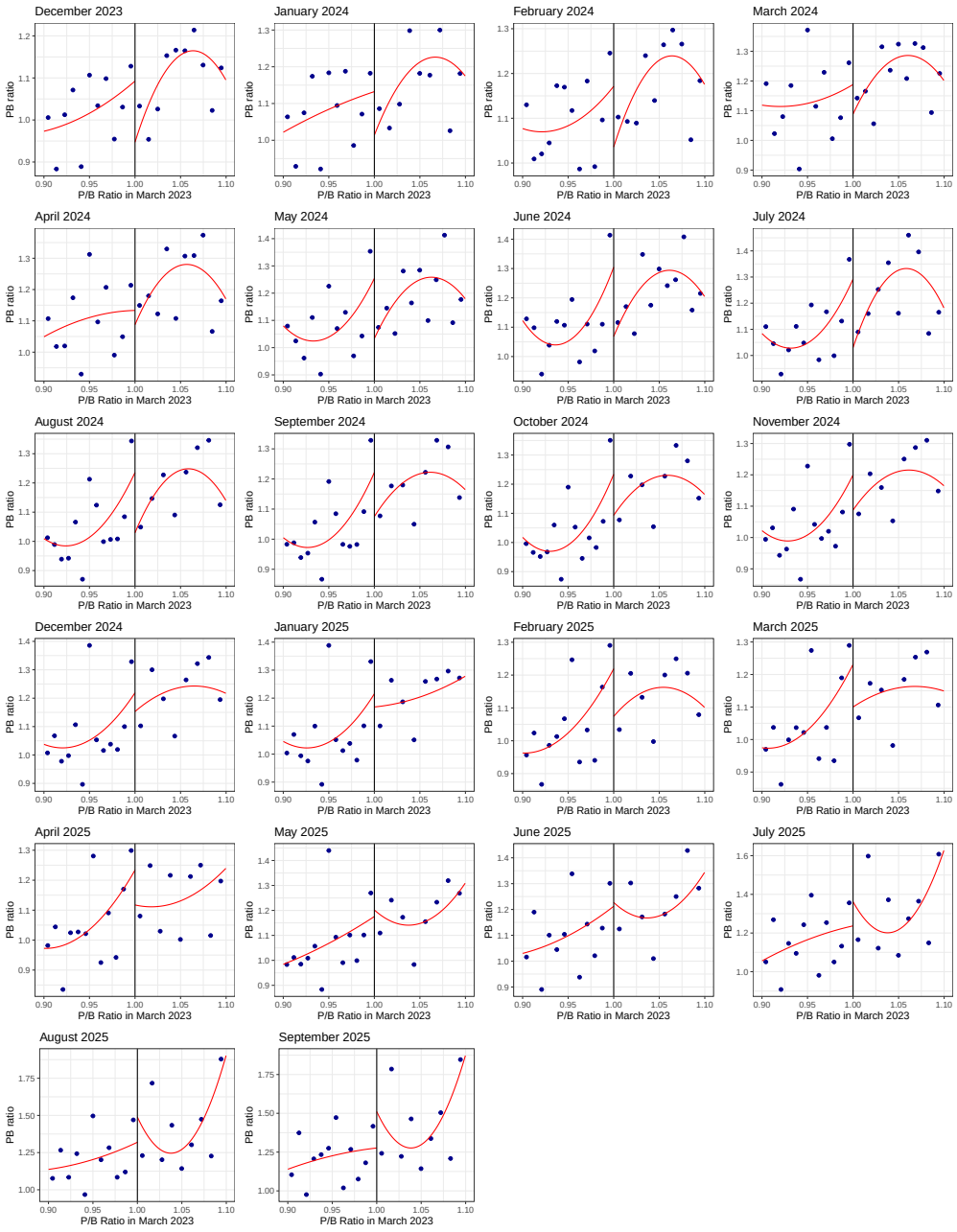


Figure B.2: RD Plots for the Effects on the P/B Ratio across Year-Months

Notes: Each panel shows a binned scatter of the P/B ratio (vertical axis) against the firm's P/B ratio measured in March 2023 (horizontal axis). The vertical dashed line marks the cutoff ($c = 1.00$). Dots are bin means computed using a data-driven binning rule that balances bias and variance, and the smooth curves are separate local quadratic fits on the left and right of the cutoff. The bandwidth are set at $[0.90, 1.10]$. The figure is for visualization of the RD effect and its evolution over time; formal monthly RD estimates and confidence intervals are reported elsewhere in the paper.

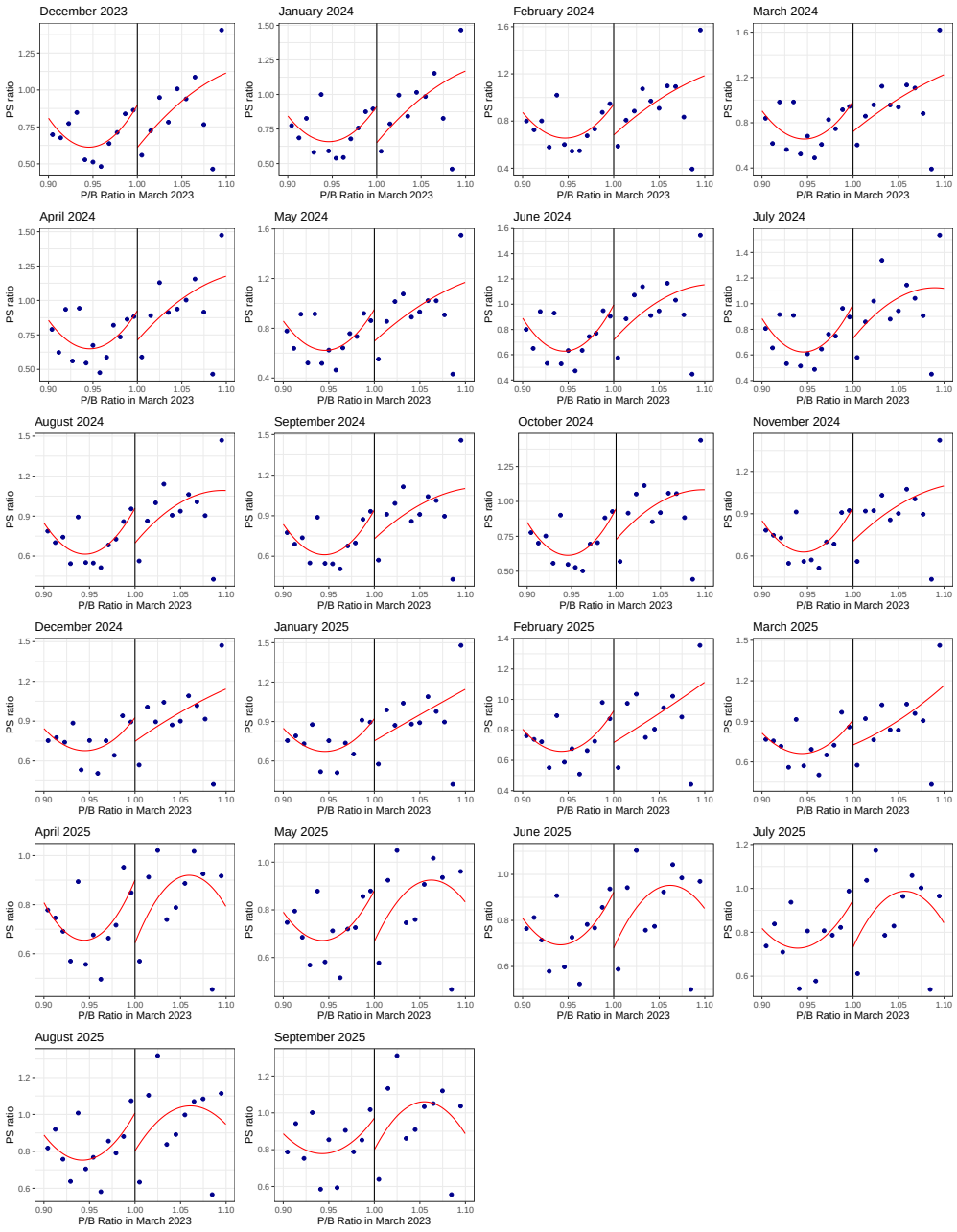


Figure B.3: RD Plots for the Effects on the P/S Ratio across Year-Months

Notes: Each panel shows a binned scatter of the P/S ratio (vertical axis) against the firm's P/B ratio measured in March 2023 (horizontal axis). The vertical dashed line marks the cutoff ($c = 1.00$). Dots are bin means computed using a data-driven binning rule that balances bias and variance, and the smooth curves are separate local quadratic fits on the left and right of the cutoff. The bandwidth are set at $[0.90, 1.10]$. The figure is for visualization of the RD effect and its evolution over time; formal monthly RD estimates and confidence intervals are reported elsewhere in the paper.

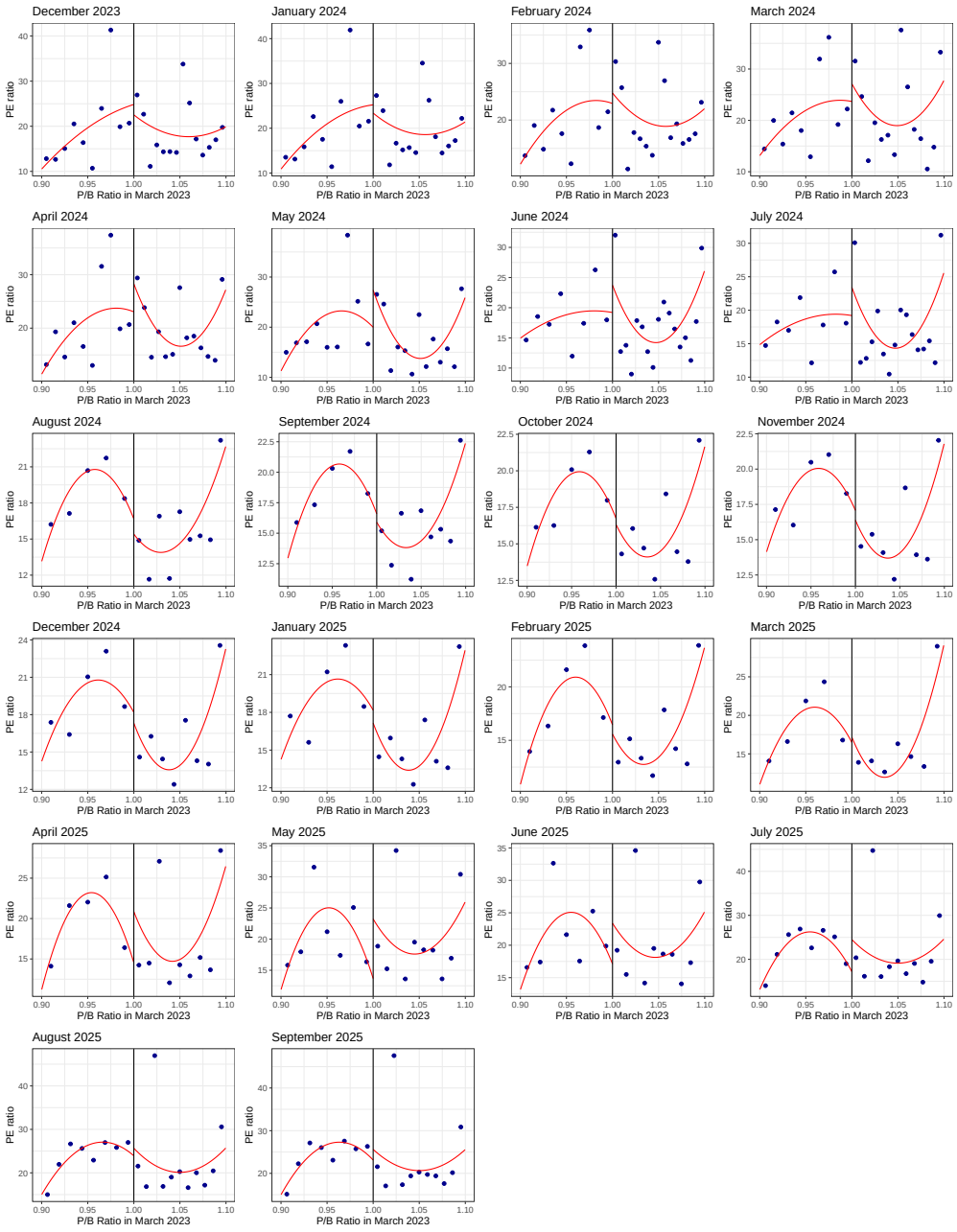


Figure B.4: RD Plots for the Effects on the P/E Ratio across Year-Months

Notes: Each panel shows a binned scatter of the P/E ratio (vertical axis) against the firm's P/B ratio measured in March 2023 (horizontal axis). The vertical dashed line marks the cutoff ($c = 1.00$). Dots are bin means computed using a data-driven binning rule that balances bias and variance, and the smooth curves are separate local quadratic fits on the left and right of the cutoff. The bandwidth are set at $[0.90, 1.10]$. The figure is for visualization of the RD effect and its evolution over time; formal monthly RD estimates and confidence intervals are reported elsewhere in the paper.

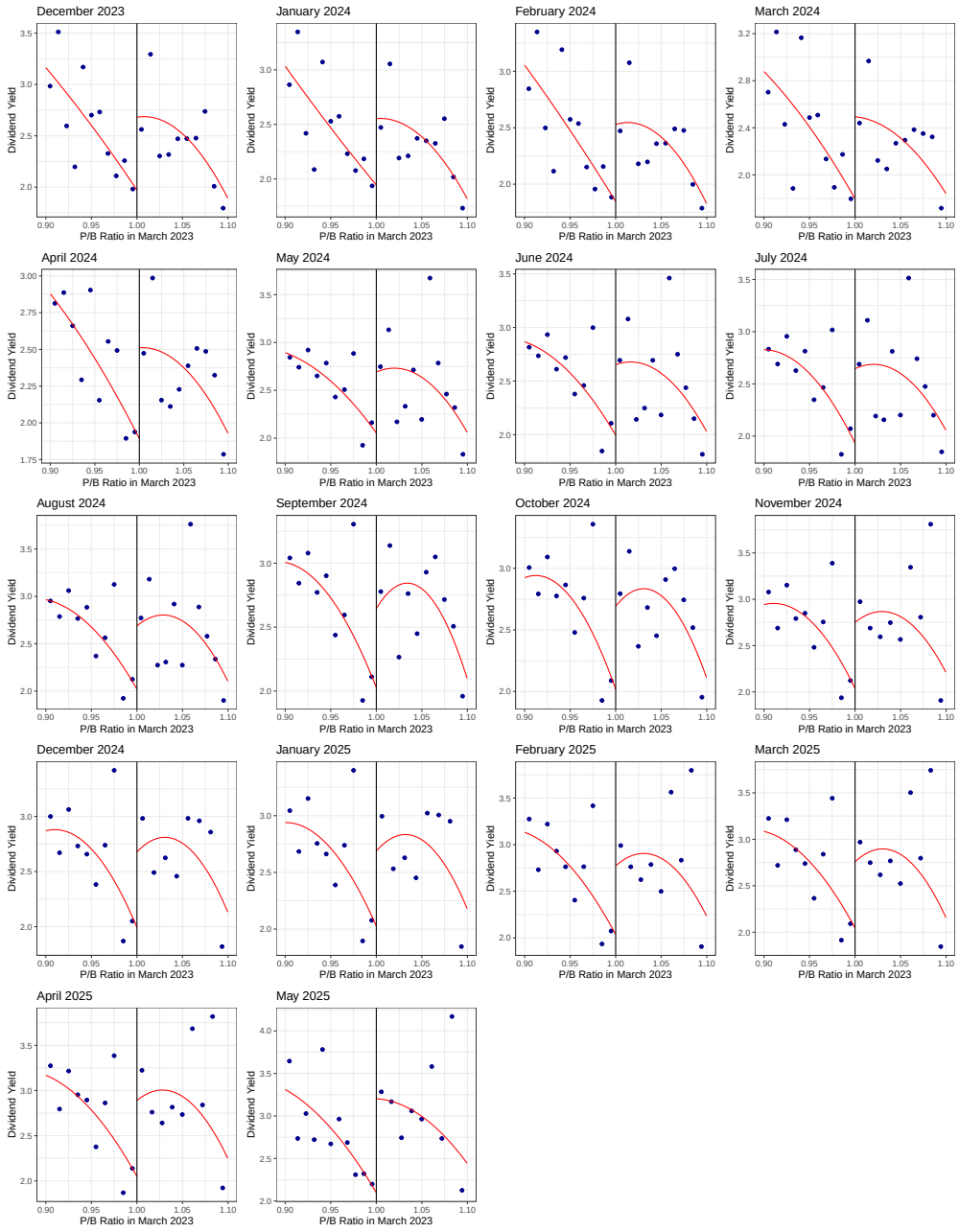


Figure B.5: RD Plots for the Effects on the Dividend Yields across Year-Months

Notes: Each panel shows a binned scatter of the dividend yields (vertical axis) against the firm's P/B ratio measured in March 2023 (horizontal axis). The vertical dashed line marks the cutoff ($c = 1.00$). Dots are bin means computed using a data-driven binning rule that balances bias and variance, and the smooth curves are separate local quadratic fits on the left and right of the cutoff. The bandwidth are set at $[0.90, 1.10]$. The figure is for visualization of the RD effect and its evolution over time; formal monthly RD estimates and confidence intervals are reported elsewhere in the paper.

Appendix C TSE's Framing of the CCSP Request

In this appendix, we document how the TSE framed compliance with the CCSP request. The TSE published both Japanese and English versions of most documents, although some materials were made available only in Japanese. While the two versions mostly coincide in content, there are some slight differences in nuance, and we find that the English version tends to use slightly more modest expressions occasionally. Because companies listed on the Prime Market and the Standard Market are most likely to refer to the original Japanese texts, we base our examination primarily on the Japanese versions and provide translations that are as literal as possible, while also consulting the official English versions.

When the TSE released the CCSP request, it sent letters to listed companies, addressed to their CEOs and signed by the CEO of the TSE. The letter characterizes the CCSP request (and the other two supplemental documents) as follows: "These documents are summarized as items considered important for achieving sustainable growth and enhancing medium- to long-term corporate value. While they are not imposed as obligations under the regulations, we request that listed companies actively implement them in light of investor expectations" (Tokyo Stock Exchange, Inc., 2023e; English translation by the authors). The letter notes that the request is not mandatory, yet still urges listed companies to actively implement it.

The CCSP request states, "In light of these circumstances and discussions, this document summarizes **actions that can be considered important for achieving management that is conscious of cost of capital and stock price**, and **requests that listed companies actively implement them**" (Tokyo Stock Exchange, Inc., 2023b, p. 2; English translation by the authors, emphasis in original). In the request itself, there is no passage that explicitly states that compliance is not mandatory or that there will be no penalty for noncompliance.

In a meeting of the TSE's Council of Experts Concerning the Follow-up of Market Restructuring held on January 15, 2023, the council members discussed the CCSP request. One of the meeting materials states that "For companies whose P/B ratio has continuously fallen

below one, disclosure is strongly requested" (Tokyo Stock Exchange, Inc., 2023c, p. 7, English translation by the authors). According to the minutes of the meeting, one of the council members made the following remark: "Since the implementation period is set as spring 2023, I think that companies with March fiscal year-ends may become uncertain around late April to mid-May, when they face their year-end settlement of accounts, as to whether they need to respond. Of course, I understand that this is not at the level of an obligation, given that it is a 'strong request for disclosure,' but I believe that it is necessary to hold discussions at the next and subsequent follow-up meetings as early as possible and announce how to respond" (Tokyo Stock Exchange, Inc., 2023d, p. 7, English translation by the authors). This remark concerned the timing of disclosure for firms with different fiscal years, but it is suggestive that the TSE intended the CCSP request to be a "strong request."

Taken together, these documents and discussions indicate that, although the CCSP request was not regulatorily binding, the TSE framed it as more than a mere suggestion. The TSE internally described the CCSP request as a "strong request," which suggests the TSE's high expectations of compliance by listed companies. This framing underscores the quasi-regulatory role of the TSE's CCSP request, blurring the line between voluntary guidance and de facto soft obligation.

Appendix D How the CCSP Request was Understood

In this appendix, we document how the market likely understood the CCSP request. First, we show how major newspapers reported on the request. We search archival databases of the six major newspapers in Japan: the *Asahi Shimbun*, the *Tokyo Shimbun*, the *Mainichi Shimbun*, the *Yomiuri Shimbun*, the *Sankei Shimbun*, and the *Nihon Keizai Shimbun*. We retrieve headlines of articles published between March 1st, 2023 and December 31, 2023 using a query for "PBR" (as is) and "Tosho" (in Chinese characters) in the headlines. "PBR" is the standard abbreviation of the P/B ratio in Japan, and "Tosho" is the abbreviation of the Tokyo Stock Exchange that is commonly used in media.

The retrieval results are presented in Table D.1. Because the major newspapers other than the *Nihon Keizai Shimbun*, which is Japan's leading financial daily, are general-interest newspapers, our retrievals disproportionately come from the *Nihon Keizai Shimbun*. Notably, the five general-interest newspapers did not report extensively on the TSE's CCSP request, which highlights that the issue was framed primarily within financial journalism. Nevertheless, Table D.1 shows that the leading financial newspaper, the *Nihon Keizai Shimbun*, consistently presented the CCSP request as directed at companies with P/B ratios below one. In particular, the headlines of the articles published on March 31 and April 1 can be read as stating that the TSE requested companies with P/B ratios below one to take action to improve. The March 31st article begins with the following lead sentences:

> The Tokyo Stock Exchange is calling on listed companies whose price-to-book ratio (PBR) has fallen below one, about 1,800 firms, to present concrete measures to raise it. The aim is to encourage management that is conscious of stock prices and capital costs. (Translated by the authors from the original Japanese.)

This passage directly states that the TSE targets companies with P/B ratios below one. Also, the April 1st article begins with the following lead sentences:

> On the 31st, the Tokyo Stock Exchange (TSE) requested that listed companies

> whose price-to-book ratio (PBR) has fallen below one develop and implement concrete measures to raise it. As an exchange, this represents an unprecedented initiative even by global standards, with the aim of revitalizing Japan's sluggish stock market. (Translated by the authors from the original Japanese.)

This passage also states that the TSE targets companies with P/B ratios below one. These newspaper articles show that the threshold at a P/B ratio of one was salient in how the CCSP request was reported.

Interestingly, in an interview article on September 10, 2023, Hiromi Yamaji, the CEO of the Japan Exchange Group, Inc., stated as follows (Nikkei, Inc., 2023a):

> What we requested was a response aimed at achieving management that is conscious of capital cost and stock value. Meeting a PBR of 1 is not the dividing line between pass and fail. There are industries where business conditions make it difficult to reach that level. Conversely, it is not sufficient to say that simply reaching a PBR of 1.0 is enough. We want firms to think about strategies to aim even higher. (Translated by the authors from the original Japanese.)

He continues:

> We want the disclosure to lead to dialogue with investors. For investors who emphasize capital cost, as opposed to companies that focus on sales growth, there must first be a common ground for dialogue. We will analyze excellent examples of companies and inverstors' evaluation for them and visualize the result. We want to make it well known in order to prevent firms from thinking, "We've exceeded a P/B ratio of 1, so this is enough." (Translated by the authors from the original Japanese.)

Yamaji emphasizes that merely exceeding a P/B ratio of 1.00 is not sufficient, and that this is not the intention of the CCSP request. This statement, in turn, suggests that many market participants understood it in that way.

Indeed, some securities companies noted in their public documents that the CCSP request was directed at listed firms with a P/B ratio less than one. For example, Nomura Asset Management reported as follows (Nomura Asset Management, 2023, p. 2):

> The Tokyo Stock Exchange's request for improvement measures from companies trading below a P/B ratio of one is a novel initiative, and it was expected that firms would make efforts to raise their market valuation, leading to positive effects. (Translated by the authors from the original Japanese.)

Table D.1: Coverage of the CCSP Request by the Major Newspapers

Newspaper	**Date**	**Headline (translation by authors)**
Nikkei	2023-03-31	1,800 companies trading below P/B ratio of 1, TSE requests disclosure of improvement measures
Nikkei	2023-04-01	TSE sounds alarm over sluggish Japanese stocks: P/B ratios below 1 prompt request for improvement measures; Toyota and MUFG among those affected
Nikkei	2023-04-03	"For TSE reform to take root — don't focus only on P/B": Fidelity Investment Vice President and CIO Miyuki Kashima (Multiple Perspectives column)
Nikkei	2023-04-05	One year after TSE restructuring, governance reforms reset: number of firms below P/B ratio of 1 has doubled in eight years; 100 trillion yen in cash reserves, investment stagnates
Nikkei	2023-04-05	One year after TSE restructuring, governance reforms reset — low P/B firms rush to improve; Citizen and others pursue share buybacks
Nikkei	2023-04-11	62% view P/B improvement request as "appropriate," 45% evaluate TSE restructuring positively — QUICK survey
Nikkei	2023-04-18*	Financial Services Agency cooperates with TSE on governance reforms to improve corporate P/B ratios
Nikkei	2023-04-22	Finance Made Easy (Part 4): P/B ratios below 1 signal a warning for growth; over half of TSE-listed firms fall short; JPX urges improvement
Nikkei	2023-05-04	Feature—Understanding the news: 1,800 companies with P/B ratios below 1; TSE expresses concern and calls for improvement
Nikkei	2023-05-18	"Improve below P/B ratio of 1": activist shareholders demand larger dividends and other measures, spurred by TSE request
Nikkei	2023-08-23	TSE selects ETFs promoting resolution of sub–P/B ratio and cross-shareholding reduction as margin-tradable securities
Nikkei	2023-10-11	Firms sell real estate to reach P/B ratio of 1; TSE request prompts change; Mizuho Trust sees eightfold increase in engagements
Yomiuri	2023-04-01	TSE urges share price improvement: 3,300 listed companies targeted, half trading below P/B ratio of 1
Tokyo	2023-05-22	Background to the Nikkei Average surpassing 30,000 yen: P/B ratio improvements welcomed by the market; half of TSE-listed firms below 1.0; calls for strengthening profitability over share buybacks

Notes: "Nikkei" refers to the *Nihon Keizai Shimbun*; "Yomiuri" refers to the *Yomiuri Shimbun*; and "Tokyo" refers to the *Tokyo Shimbun*. All headlines are translated by the authors from the original Japanese. All articles are from the morning edition unless marked by an asterisk (*).