Pontifícia Universidade Católica
do Rio de Janeiro

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Legal requirements for disclosure of material facts in Brazil: Noisy announcements or relevant information?

Dissertação de Mestrado

Thesis presented to the Programa de Pós–graduação em Economia, do Departamento de Economia of PUC-Rio in partial fulfillment of the requirements for the degree of Mestre em Economia.

Advisor: Prof. Walter Novaes

Rio de Janeiro
April 2026

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B.A. in Economics, PUC-RIO, 2022.

Bibliographic data

Godinho, Maria Manoella

Legal requirements for disclosure of material facts in Brazil: Noisy announcements or relevant information? / Maria Manoella Pestana de Aguiar Godinho; advisor: Walter Novaes. – 2026.

36 f: il. color. ; 30 cm

Dissertação (mestrado) - Pontifícia Universidade Católica do Rio de Janeiro, Departamento de Economia, 2026.

Inclui bibliografia

1. Economia – Teses. 2. Finanças – Teses. 3. Intensidade de divulgação. 4. Ibovespa. 5. Preços das ações. 6. Regressão descontínua. 7. Estudo de eventos. 8. Retornos anormais. 9. Divulgação corporativa. 10. Fatos Relevantes. I. Novaes, Walter. II. Pontifícia Universidade Católica do Rio de Janeiro. Departamento de Economia. III. Título.

CDD: 332

Acknowledgments

I would like to express my sincere gratitude to the professors who generously supported my return to academic life. I am especially thankful to Rogério Werneck, Renata Narita, Lucas Lima, Leonardo Rezende, and Nathalie Gimenes, who believed in my potential and helped me reconnect with my studies despite the many challenges along the way.

I am particularly grateful to my advisor, Walter Novaes, who, despite his demanding schedule, devoted countless afternoons and evenings not only to helping me develop and trust my research, but also to shaping the way I think about finance. His guidance turned the learning process into something I genuinely came to enjoy.

I am deeply thankful to my partner, Lucca Scarpa, who has been by my side from the very beginning and never let go of my hand. His support was fundamental throughout this journey. I also thank my family for their continuous encouragement, especially my mother, my grandparents, and my father.

Finally, I would like to thank my classmates, especially Bernardo, Tito, Igor, and Giornni, who patiently helped me work through my doubts and, at times, acted as both tutors and therapists along the way.

Abstract

Godinho, Maria Manoella; Novaes, Walter (Advisor). **Legal requirements for disclosure of material facts in Brazil: Noisy announcements or relevant information?**. Rio de Janeiro, 2026. 36p. Dissertação de Mestrado – Departamento de Economia, Pontifícia Universidade Católica do Rio de Janeiro.

Disclosure requirements in stock markets facilitate the timely dissemination of corporate news. Accordingly, I find that in Brazil, cumulative abnormal returns upon the disclosure of positive and negative news are 1.01% and −1.88%, respectively, with p-values below 1%. More interestingly, abnormal returns do not differ when Fuzzy RDD regressions compare firms just inside the threshold for inclusion in the stock index with those nearly excluded. Given that index firms are more closely followed by investors, these results suggest that abnormal returns in Brazil are not primarily driven by firm visibility or monitoring; rather, the information content of the announcement itself is the main causal determinant. This result is somewhat surprising in a civil-law country such as Brazil, given its relatively weak minority shareholder protections.

Keywords

Disclosure intensity; Ibovespa; Stock prices; Regression discontinuity; Event study; Abnormal returns; Corporate disclosure; Material Facts.

Resumo

Godinho, Maria Manoella; Novaes, Walter. **Exigências legais para a divulgação de fatos relevantes no Brasil: comunicados ruidosos ou informações relevantes?**. Rio de Janeiro, 2026. 36p. Dissertação de Mestrado – Departamento de Economia, Pontifícia Universidade Católica do Rio de Janeiro.

As exigências de divulgação nos mercados de capitais facilitam a disseminação tempestiva de notícias corporativas. Nesse sentido, observo que, no Brasil, os retornos anormais acumulados após a divulgação de notícias positivas e negativas são de 1,01% e $-1,88\%$, respectivamente, com p-valores inferiores a 1%. Adicionalmente, os retornos anormais não diferem quando regressões de RDD Fuzzy comparam empresas logo abaixo do limite de inclusão no índice de ações com aquelas quase excluídas. Dado que as empresas do índice são acompanhadas mais de perto por investidores, esses resultados sugerem que os retornos anormais no Brasil não são primariamente impulsionados pela visibilidade ou monitoramento das empresas; em vez disso, o conteúdo informativo do anúncio em si é o principal determinante causal. Esse resultado é, portanto, algo surpreendente no contexto brasileiro, dado que o país segue a tradição de civil law e apresenta proteção relativamente fraca aos acionistas minoritários.

Palavras-chave

Intensidade de divulgação; Ibovespa; Preços das ações; Regressão descontínua; Estudo de eventos; Retornos anormais; Divulgação corporativa; Fatos Relevantes.

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List of Abreviations

AR – Abnormal Return

B3 – Brasil, Bolsa, Balcão

CAR – Cumulative Abnormal Return

CVM – Comissão de Valores Mobiliários

DiD – Difference-in-Differences

ETF – Exchange-Traded Fund

Ibovespa – Índice Bovespa

LLM – Large Language Model

RDD – Regression Discontinuity Design

S&P 500 – Standard & Poor's 500

1
Introduction

Capital market regulators require listed firms to disclose material information so that investors can make informed trading decisions. Accordingly, formal disclosure requirements are a common feature of capital markets worldwide. These systems ensure that firm-specific news is released publicly and in a timely manner, reducing information asymmetries and improving market efficiency.

Yet, it is not obvious that such requirements fully achieve their intended purpose. Hirshleifer and Teoh (2003) develop a model in which managers retain discretion over framing and salience even under mandatory disclosure regimes. In turn, Carlin and Manso (2011) show that firms introduce complexity when complying with disclosure requirements, making it harder for investors to process information, particularly when they have incentives to obscure unfavorable news. Together, these theoretical contributions raise questions about the effectiveness of disclosure rules.

Despite these concerns, empirical evidence suggests that markets do respond to mandatory disclosure events. Zhao (2017) documents average abnormal returns of about 5.5% around disclosure dates, indicating that these announcements convey value-relevant information. The paper also shows that firms with higher disclosure frequency exhibit lower future returns and volatility, consistent with investors learning from repeated information releases. However, this interpretation does not identify the underlying mechanism. Firms that disclose more frequently are typically larger, more closely followed by analysts and investors, and may experience a higher underlying rate of material events, which is not fully controlled for. Disentangling the effects of these structural characteristics from the positive abnormal returns associated with mandatory disclosure events is a central theme of this dissertation.

Brazil provides a natural setting to study abnormal returns around mandatory disclosures. First, Brazil's stock exchange, B3, is the largest in Latin America by trading volume, with nearly 400 listed firms. In addition, the Brazilian Securities and Exchange Commission (CVM) actively monitors and enforces rules against potential stock price manipulation. In 2024 alone, the CVM sanctioned 176 individuals, levying total fines exceeding US$ 200 million (CVM, 2025). Mandatory disclosure requirements play a major role in Brazil's capital markets in general and in its stock market in particular. In contrast, its civil law institutional environment may amplify the mechanisms highlighted by Hirshleifer and Teoh (2003) and Carlin and Manso (2011). In particular, firms' strategic manipulation of disclosure may weaken the effectiveness of mandatory disclosure rules, reducing the prominence of information content relative to market monitoring. **Hence, it is not obvious that the evidence in Zhao (2017) overcomes the negative effects on opaqueness in countries with governance weak.**

To empirically determine whether mandatory disclosure rules increase transparency in country's with poor protection to minority shareholders, I build on Shleifer (1986), Harris and Gurel (1986), and Wurgler

(2009) to argue that firms that nearly missed inclusion in Brazil's stock market index are less visible and are under a weak scrutiny than firms that barely made it to the index.[1] Conceivably, index membership around the inclusion cutoff in Brazil yields a source of exogenous variation in monitoring intensity and market visibility across comparable firms. This source of exogenous variation across, in turn, allows me to estimate the average effect of disclosure events while controlling for firm characteristics.

Indeed, I show that firms included in the index are on average larger, more liquid and systematically disclose different types of information. These differences may well explain Zhao (2017)'s abnormal returns in disclosure events. These differences vanish, nonetheless, when we restrict attention to firms near the threshold the inclusion of Brazil's index. In this restricted sample, discontinuous regressions show that, unlike Zhao (2017), there is no statistically significant differences between the abnormal returns of information releases of firms around the threshold of inclusion in the index. This evidence supports the hypothesis that mandatory information disclosure in Brazil increases transparency in the stock market in the sense that the market responds equally to the information disclosure of firms near the index inclusion whether they are closely monitored (i.e., they belong to the index) or not.

My analysis uses stock prices and the flow of *Material Facts (Fatos Relevantes)* disclosures for firms listed on B3 from 2021 through 2025. The sample starts in 2021, when CVM Resolution No. 44 introduced the current disclosure requirements, and ends in 2025 due to data availability.[2] In my sample period, I collect an average of one filing of Material Facts per firm per quarter. My final sample comprises around 300 firms and 3,222 firm–quadrimester observations, including both firms that are included in the Ibovespa and those that are not. As my empirical strategy exploits variation in index membership, I align the analysis with the index rebalancing frequency. Accordingly, I define each observation at the firm–quadrimester level and compare firms across index status within each rebalancing window, forming a treatment group of firms included in the index and a control group of firms outside it.

To characterize the informational content of disclosures, I classify news into positive and negative using a text-based approach supported by a machine learning model. Positive disclosures are associated with cumulative abnormal returns of about 1.1% over a three-day window around the filing date, while negative disclosures generate returns of approximately -1.3% over the same period. Although smaller than the 5.5% documented by Zhao (2017), these effects are economically meaningful and statistically significant, indicating that material fact disclosures convey relevant information.

To address this issue, I implement a regression discontinuity design (RDD) that exploits the institutional rules governing index inclusion. In particular, membership in the Ibovespa depends on financial volume share, which creates a threshold for inclusion. This measure serves as the running variable in the RDD, with the cutoff defined as the median financial volume

[1] Procianoy and Verdi (2006) and Salazar (2007) documented this difference in the visibility of Brazilian firms around the inclusion in the index.

[2] Requirement to disclose material information dates back to the *Lei das Sociedades por Ações* (Law No. 6,404/1976), which establishes the obligation to disclose relevant facts to the market. See Art. 157, §4º of Law No. 6,404/1976.

share of firms entering and exiting the index, approximately 0.3%. Importantly, the index composition does not depend solely on financial volume. It also depends on other criteria that are not fully observable, so the design is implemented as a fuzzy RDD.[3] In this setting, I find a discontinuity in the probability of entering or exiting the Ibovespa, making RDD a suitable estimation strategy.

Using this design, I examine how market reactions to disclosures change around the index inclusion threshold. I find no statistically significant discontinuity in abnormal returns at the cutoff, indicating that marginal differences in investor attention do not affect how markets react to disclosed information. This suggests that the variation in abnormal returns observed in simple comparisons is not driven by differences in monitoring, but rather reflects the informational content of disclosures themselves. In other words, material fact announcements convey new information to the market even for more closely monitored firms, rather than merely formalizing information that has already been anticipated.

To support the interpretation of this result, I examine whether firms exhibit similar disclosure intensity around the cutoff. Using the RDD framework, I find no statistically significant discontinuity in disclosure intensity at the cutoff, indicating that firms close to the threshold exhibit similar disclosure behavior. As a result, differences in abnormal returns cannot be attributed to systematic variation in disclosure strategies, reinforcing the interpretation that market reactions reflect the informational content of announcements rather than differences in anticipation or firm characteristics.

In summary, market reactions to mandatory disclosures are primarily driven by the arrival of new information, rather than by differences in anticipation across firms. Consistent with the local nature of the RDD, this result applies to firms in a narrow window around the index inclusion threshold. This evidence points to the effectiveness of mandatory disclosure requirements in conveying value-relevant information, even in a civil law environment with weaker investor protection.

The remainder of this dissertation is organized as follows. Chapter 2 presents the regulatory framework governing Material Facts and the construction of the Ibovespa. Chapter 3 describes the data sources and sample construction. Chapter 4 outlines the empirical strategy, and Chapter 5 reports the main findings.

[3]The financial volume share is the ratio of a firm's traded financial volume, defined as price times quantity, to the total volume of all eligible firms over a given period, and serves as a proxy for trading activity.

2
Institutional Context

Emerging markets with relatively weaker investor protection should assign a prominent role to visibility and analyst coverage in shaping how information is processed. For example, Brazil is an ideal laboratory to test whether disclosure plays a relevant role in increasing market efficiency or whether it is dominated by manipulable tactics discussed by Hirshleifer and Teoh (2003) and Carlin and Manso (2011).

In the analyzed institutional environment, it is necessary to focus on a standardized and value-relevant type of disclosure that is immediately observed by investors, allowing for a clean measurement of market reactions. *Material Facts* (*Fatos Relevantes*) provide such a setting, as they constitute the main formal channel through which firms disclose value-relevant information to the market. I combine the relevance of Material Facts with a source of variation in investor attention that is not mechanically driven by differences in firm characteristics such as size or profitability. Participation in the Ibovespa, the main stock market index in Brazil, provides such variation: inclusion in the index is associated with greater visibility and analyst coverage, while firms close to the inclusion threshold remain comparable along both observable and unobservable dimensions.

This chapter describes the institutional foundations of these two elements of my analysis. Section 2.1 presents the regulatory framework governing Material Facts, while Section 2.2 describes the construction of the Ibovespa and its role in shaping market visibility.

2.1
Material Facts

The concept of Material Facts in the Brazilian market is not new, being formally established in 1976 under the "*Lei das Sociedades por Ações*".[1] Currently, this disclosure requirement is regulated and enforced by the CVM. publicly traded firms are required to disclose Material Facts when a material event related to the company occurs. These disclosures must be made promptly through official channels, including the electronic system maintained on the CVM website. This system ensures that information becomes publicly available to all market participants simultaneously. The current regulatory framework is defined by CVM Resolution No. 44, which came into force on September 1, 2021.

Even though the disclosure requirement has long existed, the concept of a material fact involves a degree of subjectivity. Resolution No. 44 defines a material fact as any decision or event that may materially affect the price of the company's securities, investors' trading decisions, or the exercise of rights associated with those securities. At the time of disclosure, the impact of an event cannot be known with certainty. As a result, determining whether a

[1] See Art. 157, §4º of Law No. 6,404/1976.

particular development qualifies as a material fact often requires managerial judgment.

This potential ambiguity has also been acknowledged by the CVM. In 2025, the regulator opened Public Consultation SDM No. 01/25 proposing changes to the disclosure framework, including the formal recognition of *Comunicados ao Mercado* (Market Announcements). In the consultation documents, the CVM notes that Market Announcements and Material Facts have increasingly coexisted and now rely on similar dissemination procedures. The proposal aims to formalize this secondary communication channel while preserving the distinction between materially relevant information and information of general interest to investors.

Despite this ambiguity, responsibility for complying with disclosure rules lies not only with the company but also with its Investor Relations Officer. Resolution No. 44 establishes that violations of these obligations constitute serious infractions under Law No. 6,385. As a result, failures to properly disclose relevant information may lead to administrative sanctions, including warnings, monetary fines, and temporary disqualification from serving as an officer in publicly traded firms.

These sanctions have been applied in practice. In 2020, the Investor Relations Officer of Recrusul was sanctioned for failing to disclose a capital increase approved by the company. In another case, in 2023, a significant shareholder of PetroRio was harshly fined approximately US$ 70,000 for not publicly disclosing coordinated actions to acquire a stake in the company, information that should have been communicated to the market as a material fact. While these cases illustrate the enforcement of disclosure rules, available information on enforcement actions is partial, with limited coverage for cases in early stages of investigation or judicial review. Moreover, fines are reported only in aggregate form on an annual basis, without a breakdown by type of violation.

2.2 The Ibovespa Index

A key question in my analysis is what drives market reactions to corporate disclosures. To isolate the role of investor attention in shaping these reactions, I require a source of variation in how closely firms are followed by the market. As the main equity index in Brazil, the Ibovespa provides such variation.

Ibovespa is administered by the Brazilian stock exchange, B3, and serves as the principal benchmark for the performance of the domestic equity market. The index was created in 1968 and aims to represent the performance of the most traded securities listed on the exchange. As defined by B3, the Ibovespa tracks the average performance of assets that concentrate a large share of trading activity in the Brazilian equity market. As a result, index membership is closely associated with differences in visibility and market monitoring across firms.

The institutional design of the Ibovespa makes it particularly suitable for analyzing how firms within and outside the index differ in terms of market visibility. Unlike the S&P 500, whose composition depends on discretionary de-

cisions of an index committee, the Ibovespa follows a set of publicly disclosed quantitative criteria. The index is revised three times per year, and each revision follows a pre-announced schedule. Prior to each rebalancing, B3 publishes preliminary portfolio compositions that indicate the likely constituents of the next index portfolio. These preview lists allow market participants to anticipate potential inclusions and exclusions before the official revision takes effect.

Accordingly, inclusion and exclusion in the Ibovespa are guided by rules established by B3, although some elements of the selection process are not fully observable. To be part of the index, a security must satisfy several trading activity requirements. First, it must belong to the group of assets that together represent 85% of the total negotiability index (IN), a measure that ranks stocks according to their trading activity by combining trading frequency and financial volume. Second, the asset must have trading presence in at least 95% of the trading sessions during the reference period, ensuring that the stock is consistently traded. Third, it must account for at least 0.1% of the total financial trading volume in the spot market. Finally, securities classified as *penny stocks* are excluded. In the Brazilian market, this term refers to shares whose price is below US$0.20. Firms in special situations, such as those experiencing financial distress, are also excluded from the index according to B3's eligibility criteria.

Beyond these institutional features, index membership is associated with economically meaningful changes in market attention. The Ibovespa is the most widely used benchmark for Brazilian equity ETFs, so revisions in its composition generate mechanical portfolio adjustments by passive investors. In addition, a large share of institutional portfolios and performance evaluations in Brazil use the Ibovespa as their primary benchmark. The Brazilian empirical literature further documents abnormal returns and changes in trading activity around index revisions. For example, Procianoy and Verdi (2006) and Salazar (2007) show that index inclusions and exclusions are accompanied by shifts in demand. Moreover, Wurgler (2009) argues that the growing importance of stock indices in the US has been accompanied by increased media coverage and investor attention to index constituents, further reinforcing their visibility in financial markets. Taken together, these mechanisms suggest that membership in the Ibovespa is associated with greater visibility and investor scrutiny, making index participation a useful proxy for differences in market monitoring across firms.

3
Data and Sample

In this chapter, I construct the dataset used in the empirical analysis and describe the main features of firms' disclosure activity. By combining information on Material Facts, index membership, and market data, I build a panel that captures variation across firms and index revision periods. Each observation corresponds to a firm–event pair, where the event refers to a quadrimestral revision of the Ibovespa index, and disclosure outcomes are measured over the three months that follow. Section 3.1 describes the data sources, Section 3.2 details the sample construction, Section 3.3 presents descriptive patterns, and Section 3.4 examines the informational content of disclosures.

3.1
Data Sources

My main dataset is comprised of all Material Facts disclosed by publicly traded firms in Brazil between September 2021 and August 2025, a period selected to coincide with the implementation of the current regulatory framework (CVM Resolution No. 44) and the data collection window of this study. The sample initially consists of 10,932 Material Fact filings from 708 firms. These disclosures are obtained from a public database maintained by CVM. For each Material Fact, the database reports the submission date and time, the issuing firm, and the original document in PDF format. Using the regulator's platform allows events to be observed at their first official release, avoiding delays associated with news-based sources.

Information on the composition of the Ibovespa and its rebalancing events is obtained from B3. These data include the theoretical portfolios of the index and the official inclusion and exclusion announcements, allowing firms to be classified according to their index membership status over time. Daily data on stock prices, returns, and trading volumes are obtained from the Refinitiv (Reuter's) database.

Firm identifiers in the CVM database are matched to traded securities using external data from Quantum Axis, which provides mappings between firm-level identifiers, such as CNPJ, and securities traded on the exchange. Finally, the textual content of Material Facts is classified according to the direction of the news (positive, negative, or neutral) using automated natural language processing techniques.

3.2
Sample Construction

The sample is constructed to ensure a consistent interpretation around index revisions. First, the analysis is restricted to firms with trading data available in Refinitiv, which is required to compute returns and construct the running variable. This filter reduces the sample to 6,714 Material Fact filings

from 293 firms and increases the average number of disclosures per firm from approximately 15 to 23, consistent with more actively traded firms disclosing more frequently.

Second, to avoid multiple observations for the same disclosure, only one security per firm is retained, selecting the most actively traded instrument when multiple securities exist. The dataset is then organized at the firm–rebalancing level. For each such pair, disclosure outcomes are measured over the three months following the rebalancing date. Index membership is treated as a time-varying indicator based on official Ibovespa revisions, allowing firms to appear both inside and outside the index over time.

Figure A.1 plots the total number of Material Facts disclosed by each firm over the sample period, with firms ordered along the horizontal axis according to their average trading activity. The figure shows that firms with higher trading activity tend to disclose more frequently, while also highlighting a small number of firms with unusually high disclosure intensity. Notably, firms such as Oi and Americanas appear as outliers, both of which filed for judicial reorganization during the sample period. Because such episodes are associated with atypical disclosure patterns, and firms in special situations are not considered eligible for inclusion in the Ibovespa, I exclude firm–rebalancing observations with negative price-to-book ratios or market values in the preceding twelve months.[1] This filter is applied at the firm–rebalancing level, so that firms remain in the sample outside distress periods.

After applying this restriction, the sample decreases from 3,824 to 3,222 firm–rebalancing observations and from 4,884 to 3,832 Material Facts. This reduction reflects both the exclusion of distressed observations and the requirement that disclosures fall within the three-month window following each rebalancing. Overall, the final sample includes 295 unique firms.

3.3 Disclosure Activity as a Source of Heterogeneity

Disclosure activity provides useful context for interpreting the abnormal return evidence developed in this study. If firms differ systematically in the frequency with which they communicate material information to the market, observed differences in market reactions may reflect not only how investors process disclosures but also differences in firms' underlying reporting behavior. Accordingly, this section characterizes disclosure patterns across firms and over time, examining whether reporting activity varies with market visibility, trading activity, and firm size. These descriptive patterns help motivate the empirical strategy and provide a benchmark for interpreting the abnormal return results presented in the following section.

Figure A.2 reports the weekly evolution of Material Fact filings over the sample period, before the application of sample filters. The figure shows a persistently high aggregate volume of disclosures, averaging slightly above fifty events per week and exhibiting no clear structural breaks. Although short-term fluctuations are present, the smoothed trend indicates that the overall intensity

[1] Under B3's eligibility rules, companies in special situations, such as judicial reorganization, bankruptcy, or liquidation, must be excluded from the Ibovespa index universe.

of communication remains relatively stable over time. Nevertheless, when scaled by the number of firms in the sample, disclosure activity appears more limited. On average, this corresponds to approximately 0.07 filings per firm per week in the unrestricted sample, and about 0.11 filings when restricting the sample to firms with actively traded securities over the period. These suggest that, despite the high aggregate volume, disclosure frequency at the firm level remains relatively modest.

Consistent with this evidence, Table A.1 shows limited variation in disclosure activity across weekdays and only modest seasonal patterns at the monthly level. Disclosure activity is somewhat lower in January and higher toward the end of the year, particularly in December, but overall these effects are small. Taken together, these results suggest that disclosure activity is not strongly driven by calendar effects and does not display pronounced temporal clustering.

Given the absence of strong time patterns, variation in disclosure activity appears to be primarily driven by differences across firms. This is evident when exploring variation around Ibovespa rebalancing events after applying the financial distress filter described above. Considering the resulting set of firm–rebalancing observations, firms included in the index exhibit higher disclosure intensity in the three months following the rebalancing. On average, these firms issue approximately 1.9 Material Facts in the post-rebalancing window, compared to 0.9 for firms outside the index. This pattern is consistent with the view that greater market visibility and monitoring, proxied by index inclusion, are associated with more active use of formal disclosure channels.

Finally, Table A.2 examines cross-sectional differences in disclosure activity using the same filtered sample, organizing firm–rebalancing observations into market-capitalization quartiles defined at each rebalancing date. Disclosure intensity increases monotonically across quartiles, with average 3 months filings rising from 0.67 in the lowest quartile to 1.85 in the highest, driven primarily by positive disclosures. Larger firms are also substantially more likely to belong to the Ibovespa and exhibit higher trading volumes and asset levels, while smaller firms display lower visibility and reporting activity. Taken together, these patterns suggest that disclosure behavior varies systematically with firm size, trading activity, and market prominence. These differences imply that simple comparisons of market reactions across firms may capture not only differences in how investors process information, but also differences in the underlying flow of disclosures, motivating the identification strategy developed in the following chapters.

3.4
Information Content of Disclosures

The central outcome of this dissertation is the market reaction to Material Fact disclosures. Accordingly, this section examines whether these announcements convey information that is incorporated into asset prices and generate abnormal returns around disclosure dates. Addressing this issue requires examining the informational content of Material Facts and how market participants react when this information is disclosed. Given the large number of documents in the dataset, an automated LLM procedure is employed to classify

disclosures according to their main topic and the direction of the economic signal embedded in the communication, distinguishing between favorable, unfavorable, and neutral content from the market's perspective.

Figure A.3 presents the distribution of disclosures across categories and directions using the set of filings matched to firms with listed securities, prior to the exclusion of financially distressed observations. Positive and neutral communications are more frequent than negative ones across most categories. For instance, positive disclosures typically include announcements such as dividend payments, new contracts, or improved earnings guidance, while negative disclosures often involve events such as financial losses, legal disputes, or operational disruptions. Neutral communications generally refer to procedural or informational updates, such as changes in governance, clarifications, or corporate reorganizations without a clear immediate economic impact. In aggregate terms, 14.5% of disclosures are classified as negative, 28.1% as neutral, and 57.4% as positive. This pattern is consistent with the notion that firms tend to emphasize favorable communications when interacting with the market. Because the classification evaluates each document in isolation and does not incorporate its broader informational context, neutral classifications may be relatively overrepresented.

To evaluate whether disclosures are associated with information that is incorporated into asset prices, abnormal return analyses are conducted around disclosure dates following the event-study framework introduced by Fama et al. (1969). Expected returns are estimated using a market model over a pre-event estimation window, and abnormal returns are defined as deviations from this benchmark, using the Ibovespa index as the market proxy. The estimation window spans from -360 to -90 trading days prior to the disclosure date, while the event window covers the period from -3 to $+3$ trading days around the announcement.

Table A.3 reports the estimated AR and CAR around disclosure dates, while Figure A.4 provides a graphical representation of their dynamics over the event window. These results are based on the full sample of firms with available return data and are not additionally filtered to exclude financially distressed observations. The results indicate economically meaningful and statistically significant price adjustments concentrated around the disclosure date. For negative disclosures, AR reaches -0.42% on the day prior to the event and -0.49% on the event day, both statistically significant. For positive disclosures, AR equals 0.39% on day 0 and 0.62% on day +1, also statistically significant.

To further assess heterogeneity in market reactions, I compare abnormal returns between firms included in the Ibovespa and those outside the index, focusing on the immediate response at day 0 and day +1. In this comparison, the sample is restricted to non-distressed firms, excluding observations associated with negative market value, negative price-to-book ratios, or indicators of financial distress in firm disclosures. This ensures that the comparison is not driven by extreme or non-standard firm conditions. Untabulated results show that the patterns are qualitatively similar when using alternative sample definitions.

The results reveal substantial heterogeneity in the magnitude of abnormal returns across firms inside and outside the Ibovespa, particularly for pos-

itive disclosures. For positive news, firms outside the index exhibit markedly stronger reactions, with average abnormal returns of 0.41% on day 0 and 0.94% on day +1, compared to 0.21% and 0.19% for firms included in the index. This corresponds to differences of -0.20 percentage points on the event day and -0.76 percentage points on the following day. In contrast, for negative disclosures, the pattern is less pronounced and not fully consistent across days. While firms outside the index experience slightly larger reactions on the event day (-0.07% versus -0.03%), firms within the Ibovespa exhibit stronger adjustments on day +1 (-0.22% versus -0.06%), indicating that differences in reaction magnitude are more heterogeneous for negative news.

These findings indicate that firms outside the Ibovespa experience substantially stronger price reactions to disclosure events. One interpretation is that firms with greater market visibility and more frequent disclosure activity, such as those included in the index, generate smaller informational surprises, leading to more muted price adjustments. Conversely, firms outside the index, which may disclose less frequently or receive less continuous market attention, tend to produce announcements that are less anticipated and therefore trigger larger revisions in investor beliefs, consistent with the evidence in (Zhao, 2017).

Overall, the results show that market reactions are immediate and continue to unfold shortly after the announcement. Positive Material Facts are associated with positive abnormal returns, whereas negative disclosures generate negative price reactions. These findings indicate that Material Facts convey information that is incorporated into asset prices and generate economically meaningful abnormal returns around disclosure dates. The evidence also reveals substantial heterogeneity in market reactions across firms, motivating the subsequent analysis of whether these differences reflect monitoring intensity or underlying differences in firm characteristics and disclosure environments.

4
Empirical Strategy

Firms that are more closely monitored by the market are less likely to generate large surprises upon disclosure, as a higher level of investor attention reduces informational frictions. However, monitoring is inherently difficult to observe and measure directly. To address this challenge, I rely on variation in index membership as a proxy for differences in market monitoring. There is substantial evidence, both in the United States and in Brazil, that firms included in major stock indices receive greater attention from investors, analysts, and the media. Building on this insight, my empirical strategy exploits the institutional rules governing index inclusion to isolate variation in monitoring that is plausibly exogenous to firms' underlying characteristics.

This chapter is organized as follows. Section **??** presents the identification strategy. Section 4.1 describes the construction of the running variable and the definition of the empirical cutoff. Section 4.2 outlines the econometric specification used to estimate the effects on disclosure intensity and market reactions. Finally, Section 4.3 discusses the identification assumptions and presents the corresponding validity tests.

4.1
Regression Discontinuity: Running Variable and Cutoff

Given that Ibovespa membership is largely determined by trading activity–based criteria, the empirical strategy focuses on the share of financial trading volume, a metric defined in B3's index methodology. This measure captures the relative trading activity of each stock in the market and plays a central role in determining which securities enter the index. In the empirical analysis, this measure therefore serves as the running variable.

Crossing the corresponding threshold does not mechanically determine whether a firm belongs to the Ibovespa. Index eligibility also depends on additional criteria, such as minimum trading presence and the exclusion of penny stocks. Because these conditions may also affect inclusion, the financial volume share alone does not perfectly determine index membership. Instead, firms located above the cutoff become substantially more likely to belong to the index than firms located below it.

Figure A.5, illustrates the relationship between financial volume share and index membership around the empirical cutoff. Although crossing the threshold does not mechanically determine inclusion in the Ibovespa, it generates a clear increase in the probability of index membership. Consequently, firms located just above and just below the cutoff remain highly comparable in terms of trading activity while facing different probabilities of treatment. The analysis therefore implements a fuzzy regression discontinuity design.

The official methodology relies on the negotiability index, which combines trading frequency and financial volume, this measure cannot be directly reconstructed due to data limitations. Moreover, other eligibility criteria, such as the exclusion of penny stocks and minimum trading presence, are

satisfied by a large majority of observations in the sample, accounting for approximately 90% of firms. As a result, these criteria display little dispersion and have weak explanatory power with respect to index inclusion, especially when compared to financial trading volume. Consequently, trading activity provides the primary source of identifying variation around the cutoff.

For this reason, the empirical implementation relies on the share of financial trading volume as the running variable. This measure captures a firm's relative trading importance in the market. For each asset i and trading day d, daily financial trading volume is defined as

$$\text{Financial Volume}_{i,d} = P_{i,d} \times Q_{i,d},$$

where $P_{i,d}$ is the closing price and $Q_{i,d}$ is the number of shares traded on day d.

Financial volume is then aggregated over the reference window used in the index methodology, corresponding to the twelve months preceding each rebalancing date t:

$$\text{Financial Volume}_{i,t} = \sum_{d \in \mathcal{T}_t} P_{i,d} \times Q_{i,d},$$

where $\mathcal{T}_t$ denotes the set of trading days in the twelve-month period preceding rebalancing t.

The running variable is defined as the asset's share of total eligible financial volume:

$$\text{Volume Share}_{i,t} = \frac{\text{Financial Volume}_{i,t}}{\sum_{j \in \mathcal{U}_t} \text{Financial Volume}_{j,t}},$$

where $\mathcal{U}_t$ denotes the set of eligible securities at rebalancing t. In the empirical implementation, $\mathcal{U}_t$ corresponds to the subset of securities observed in my dataset after excluding firms with extreme leverage levels. Consistent with the sample construction, only one security per firm is retained, corresponding to the most liquid instrument. Because the dataset does not cover the full universe of traded assets, this set represents a restricted version of the eligible universe considered in the official index methodology.

Nevertheless, some limitations imply that the empirical measure does not exactly reproduce the official methodology used by B3. First, the running variable is computed using only the share of financial trading volume, while the official methodology also relies on the negotiability index. Second, not all assets in the market are observed in the sample. Because the denominator of the volume share is therefore smaller than the true market universe, the effective threshold observed in the sample becomes higher than the 0.1% minimum share defined by B3.

For this reason, using the official financial volume 0.1% threshold would not accurately reflect the boundary observed in the data. Instead, the empirical cutoff is recovered from the distribution of financial volume shares of firms entering and exiting the index. Table A.4 shows that entering firms display mean and median volume shares of 0.38% and 0.34%, respectively, with a standard deviation of 0.15 percentage points, while exiting firms cluster around 0.15% and 0.18%, with a standard deviation of 0.05 percentage points. When

these two groups are pooled, representing firms located at the margin of index participation, both the mean and median financial volume shares converge to approximately 0.3%. These patterns indicate that observations are relatively tightly distributed around the cutoff, supporting its use as a natural empirical approximation for the boundary and motivating its adoption in the regression discontinuity design.

These patterns indicate that observations are relatively tightly distributed around the cutoff, supporting its use as a natural empirical approximation for the boundary and motivating its adoption in the regression discontinuity design. Additional evidence is provided in Table A.5, which compares firms located immediately above and below the empirical threshold under progressively narrower bandwidths. The results show that firms near the cutoff are broadly similar in terms of observable characteristics, including market capitalization, stock returns, and disclosure activity, with differences becoming smaller as the bandwidth narrows. This evidence reinforces the interpretation that firms around the threshold are highly comparable, supporting the validity of the local comparisons underlying the regression discontinuity design.

4.2 Econometric Specification

As discussed, firms close to the liquidity threshold face very similar trading conditions. Even so, firms located just above the threshold are more likely to belong to the Ibovespa than firms located just below it. The empirical strategy exploits this discontinuous change in the probability of index membership to identify the effect of monitoring on disclosure outcomes. Because crossing the cutoff increases the probability of belonging to the index but does not guarantee inclusion, the analysis adopts a fuzzy regression discontinuity design.

Let $X_{i,t}$ denote the share of financial trading volume of firm i at rebalancing date t, computed over the twelve months preceding that revision. Let c denote the empirical cutoff defined in the previous section. Firms with $X_{i,t}$ values above c are located on the treated side of the threshold, while firms with values below c are located on the control side. This running variable therefore determines firms' proximity to the boundary where the probability of index membership changes discontinuously. For this reason, a standard instrumental variables approach is not suitable in this context. Financial trading volume directly affects both disclosure behavior and market reactions, so it cannot be used to isolate variation in index membership. The regression discontinuity design addresses this issue by shifting the identification strategy from global to local variation.

To formalize this idea, define the cutoff indicator as

$$D_{i,t} = \mathbb{1}(X_{i,t} \geq c)$$

where $D_{i,t}$ is equal to one when the firm is located above the empirical cutoff and zero otherwise. This variable does not measure actual treatment. Instead, it indicates whether the firm is on the treated side of the threshold.

The first regression is therefore the first-stage relationship between the cutoff indicator and actual index membership:

$$Ibov_{i,t} = \alpha + \pi D_{i,t} + m(X_{i,t} - c) + u_{i,t},$$

where $Ibov_{i,t}$ is an indicator equal to one if firm i belongs to the Ibovespa at rebalancing date t, and zero otherwise. The function $m(X_{i,t} - c)$ captures the smooth relationship between index membership and the running variable on both sides of the cutoff. The coefficient of interest is π. It measures the jump in the probability of belonging to the index at the threshold. Intuitively, this is the first-stage effect of crossing the liquidity boundary.

Because the design is fuzzy, the treatment effect is not obtained directly from the discontinuity in the outcome. Instead, it is computed as the ratio between the discontinuity in the outcome and the discontinuity in actual index membership at the cutoff. Intuitively, this scaling accounts for the fact that crossing the threshold changes the probability of treatment rather than determining it with certainty. This corresponds to a local Wald estimator that identifies the causal effect of index membership for firms whose status is affected by the cutoff. Estimation is conducted using local polynomial regressions with data-driven bandwidth selection that optimally balances bias and variance, together with bias-corrected inference that yields robust standard errors and confidence intervals.[1]

The main outcome of interest is the market reaction to disclosures. For each *Material Fact*, abnormal returns are first estimated using a market model and then accumulated over event windows of 3 and 1 trading days, generating cumulative abnormal returns. To align the measurement of market reactions with the index status defined at rebalancing date t, the analysis considers only disclosures released in the three months following each revision. This window is chosen to avoid contamination from subsequent index rebalancing cycles. Because the Ibovespa is rebalanced three times per year and preliminary portfolio compositions are released prior to each revision, using a longer horizon could capture disclosures affected by changes in index expectations or by a new rebalancing cycle. Restricting the analysis to this three-month window ensures that the measured market reactions reflect firms' behavior under the index status prevailing at date t.

For each firm and each rebalancing date, the analysis computes the average CAR of the positive disclosures and the average CAR of the negative disclosures released within this window. Denoting these outcomes generically by $CAR_{i,t}$, the fuzzy regression discontinuity estimand is

$$\tau^{CAR} = \frac{\lim_{x \downarrow c} E[CAR_{i,t} \mid X_{i,t} = x] - \lim_{x \uparrow c} E[CAR_{i,t} \mid X_{i,t} = x]}{\lim_{x \downarrow c} E[Ibov_{i,t} \mid X_{i,t} = x] - \lim_{x \uparrow c} E[Ibov_{i,t} \mid X_{i,t} = x]}.$$

The numerator measures the discontinuity in market reactions at the cutoff, while the denominator captures the corresponding change in the probability of index membership. Their ratio therefore identifies the local effect of index membership on how disclosures are priced by the market.

To assess whether differences in market reactions could be driven by changes in the underlying disclosure environment, the analysis also examines disclosure intensity around the cutoff. Let $FR3_{i,t}$ denote the number of

[1] All estimates are implemented using the `rdrobust` package of Calonico et al. (2014).

Material Facts disclosed by firm i between rebalancing date t and the following three months. The corresponding local treatment effect is

$$\tau^{FR3} = \frac{\lim_{x\downarrow c} E[FR3_{i,t} \mid X_{i,t} = x] - \lim_{x\uparrow c} E[FR3_{i,t} \mid X_{i,t} = x]}{\lim_{x\downarrow c} E[Ibov_{i,t} \mid X_{i,t} = x] - \lim_{x\uparrow c} E[Ibov_{i,t} \mid X_{i,t} = x]}.$$

The numerator captures the discontinuity in the number of disclosures at the cutoff, while the denominator captures the discontinuity in actual index membership. Their ratio identifies the local effect of belonging to the Ibovespa on disclosure intensity for firms near the threshold. Rather than representing a primary outcome, this specification serves to evaluate whether firms adjust their disclosure behavior at the cutoff, which could in turn affect the composition of observed events and confound the interpretation of market reactions.

In practice, estimation focuses on local polynomial regressions around the cutoff, with an emphasis on local linear specifications and triangular kernel weighting. Inference follows a robust bias-corrected procedure, and bandwidths are selected using a data-driven method. This approach ensures that identification is driven by firms in a narrow neighborhood around the threshold, allowing the analysis to isolate the effect of marginal differences in monitoring on market reactions, while ruling out alternative explanations related to changes in disclosure behavior.

4.3 Identification Assumptions and Validity Tests

4.3.1 First Stage: Discontinuity in Index Membership

The first requirement for the fuzzy regression discontinuity design is that crossing the trading-activity threshold produces a discrete change in the probability of belonging to the Ibovespa. If firms located just above the cutoff are significantly more likely to be included in the index than firms located just below it, the threshold provides a valid source of variation in monitoring intensity.

Figures A.5 and A.6 illustrate this relationship by plotting the probability of belonging to the Ibovespa as a function of the share of financial trading volume around the empirical cutoff. Each point corresponds to the average value of the index membership indicator within quantile-spaced bins. In Figure A.5, the solid lines represent linear (first-order) fits estimated separately on each side of the threshold, consistent with the local specification used in the estimation. Figure A.6 presents a more flexible fourth-order polynomial fit. Both figures indicate a clear increase in the probability of index membership at the cutoff.

4.3.2
Continuity of Covariates

Another key assumption of the regression discontinuity design is that observable firm characteristics evolve smoothly around the cutoff. If firms on both sides of the threshold are comparable in their underlying characteristics, differences in outcomes can be attributed to changes in index membership rather than to preexisting differences between firms.

I implement formal continuity tests based on the same local specifications used in the main estimation. Specifically, I replace the outcome variable with predetermined firm characteristics and estimate local regressions at the cutoff (Table A.6). The covariates include the logarithm of market capitalization, the logarithm of total assets, the logarithm of revenue, and the average price-to-book ratio measured prior to the rebalancing date. None of the estimated discontinuities is statistically significant, providing evidence that firms on either side of the threshold are locally comparable and supporting the validity of the regression discontinuity design.

4.3.3
Density Test

A further identification concern in regression discontinuity designs is the possibility that firms manipulate the running variable in order to sort themselves on one side of the cutoff. If such manipulation occurs, the density of the running variable may exhibit a discontinuity at the threshold.

To evaluate this possibility, the analysis implements the density test proposed by McCrary (2008), using local polynomial density estimation. The test examines whether the density of the running variable is continuous around the cutoff by estimating the density function separately on each side of the threshold.

Figure A.7 plots the estimated density of the share of financial trading volume around the empirical cutoff. The results do not indicate evidence of a discontinuity in the density at the threshold. Consistent with the formal test results, the null hypothesis of continuity cannot be rejected (p-value = 0.833), suggesting no evidence of sorting or manipulation around the cutoff.

4.3.4
Monotonicity

The interpretation of the fuzzy regression discontinuity design also relies on a monotonicity assumption regarding treatment assignment. In this context, monotonicity requires that crossing the trading-activity threshold does not reduce a firm's probability of belonging to the Ibovespa.

The institutional structure of the index supports this assumption. The Ibovespa follows inclusion rules primarily based on trading activity measures, and higher trading activity increases the likelihood of index participation. As a result, firms located above the threshold should not be less likely to belong to the index than firms located below it.

Although index membership depends on additional criteria, such as minimum trading presence and the exclusion of penny stocks, these rules

operate as eligibility filters rather than reversing the positive relationship between trading activity and index participation. This institutional structure makes violations of the monotonicity assumption unlikely.

Taken together, these results support the validity of the regression discontinuity design and provide a credible basis for identifying the causal effect of index membership on disclosure behavior and market reactions. The next section presents the corresponding empirical results.

5
Main Findings

This chapter presents the main empirical findings of the paper, focusing on how index membership affects market response to disclosed information within the regression discontinuity framework.

Section 5.1 reports the first-stage results, documenting the discontinuity in the probability of belonging to the Ibovespa at the cutoff. Section 5.2 presents the main outcome of the analysis, examining whether index membership affects market reactions to *Material Fact* disclosures through cumulative abnormal returns. Section 5.3 then provides complementary evidence on disclosure intensity, assessing whether firms close to the cutoff differ in the number of disclosures released after each rebalancing event. Finally, Section 5.4 evaluates the robustness of the main results across alternative specifications and sample definitions.

5.1
First-Stage Results

As a first stage, I evaluate whether there is a discontinuity in the probability of index inclusion around the empirical cutoff observed for entrants and exits. In line with the graphical evidence, Figures A.5 and A.6 show a clear jump at the 0.3% threshold, with firms located just above the cutoff exhibiting a substantially higher probability of belonging to the Ibovespa than firms located just below it. The results are consistent across specifications using linear fits and higher-order polynomial approximations.

Table A.7 quantifies this discontinuity. The results indicate that crossing the cutoff increases the probability of index inclusion by approximately 26 to 29 percentage points, with all estimates statistically significant at the 1% level.

These findings are robust across alternative kernel specifications, including triangular, uniform, and Epanechnikov kernels. In addition, the estimates rely on data-driven bandwidth selection procedures following Calonico et al. (2014), further supporting the stability of the results.

These results provide strong evidence of a relevant first stage, confirming that the empirical cutoff generates meaningful variation in index membership. This allows us to proceed to the subsequent stages of the analysis.

5.2
Market Reactions

I now turn to the main outcome of the analysis and examine whether index membership affects how disclosures are priced by the market. To do so, I estimate the effect of Ibovespa inclusion on cumulative abnormal returns around *Material Fact* announcements using the fuzzy regression discontinuity design.

The event-study evidence presented earlier documents economically large and statistically significant abnormal returns around disclosure dates, with

clear differences between positive and negative announcements. However, when focusing on variation around the cutoff, Table A.8 shows that the estimated effects of index membership on CAR are statistically indistinguishable from zero across all specifications, with confidence intervals consistently including zero. These results indicate that marginal differences in monitoring or firm characteristics induced by index inclusion have no effect on how disclosures are priced by the market for firms near the threshold.

For negative disclosures, the absence of detectable effects is accompanied by a smaller number of observations around the cutoff, which reduces statistical power. Nonetheless, even abstracting from this limitation, the estimates do not provide evidence of a systematic discontinuity in market reactions.

These findings suggest that market reactions to *Material Facts* primarily reflect the arrival of new information, rather than differences in anticipation driven by marginal changes in monitoring intensity. This is further reinforced by the absence of discontinuities in disclosure behavior, which rules out changes in reporting as a confounding factor.

5.3 Disclosure Activity

As a complementary analysis, I examine whether firms' disclosure behavior changes around the cutoff, which could affect the composition of observed events and confound the interpretation of market reactions. Specifically, I study disclosure intensity, measured by the number of *Material Fact* filings when comparing firms just inside and just outside the Ibovespa around the threshold.

Figure A.8 presents the graphical evidence. In contrast to the first-stage results, the figure does not display a clear discontinuity at the cutoff. The number of filings evolves smoothly around the threshold, with no visible jump for firms that become more likely to be included in the index.

Table A.9 reports the corresponding estimates. Across all kernel specifications, the estimated effects are small in magnitude and statistically indistinguishable from zero. The point estimates are close to zero and imprecisely estimated, with large standard errors and p-values well above conventional significance levels. These results provide no evidence of a causal effect of index membership on disclosure intensity at the cutoff.

Importantly, this result is local and pertains to firms near the threshold, where identification is valid. Within this group of marginal firms, crossing the cutoff and becoming more likely to be included in the index does not generate a discontinuous change in disclosure behavior, despite the increase in monitoring associated with index membership.

This finding plays a key role in the interpretation of the main results. In particular, the absence of discontinuities in disclosure intensity indicates that firms do not systematically adjust their reporting behavior around the cutoff. As a result, differences in market reactions cannot be attributed to changes in the frequency or composition of disclosed events.

Consistent with this interpretation, the regression discontinuity design shows that unconditional differences in disclosure frequency between index

and non-index firms reflect underlying firm characteristics, such as size and trading activity, rather than a causal effect of monitoring.

Overall, these results indicate that disclosure intensity is not a margin through which firms respond to marginal changes in monitoring around the cutoff, reinforcing that market reactions are not confounded by changes in reporting behavior.

5.4 Robustness Checks

To assess the robustness of the main findings, I evaluate whether the estimated effects remain stable across alternative specifications and sample definitions.

In particular, I examine whether the results differ across firms with distinct governance characteristics by splitting the sample according to *Novo Mercado* listing status.[1] Specifically, I replicate the analysis for firms that are either included in the Ibovespa or belong to the Novo Mercado (Table A.10), and for firms that are either included in the Ibovespa or do not belong to this segment (Table A.11).

Across both subsamples, the results remain consistent with the baseline findings, indicating that differences in governance standards do not materially affect the conclusions. Due to the limited number of observations around the cutoff, it is not possible to obtain reliable estimates for negative disclosures in the subsample restricted to Novo Mercado firms.

Overall, the results remain robust across alternative event windows, kernel choices, bandwidth selections, and sample definitions. Moreover, the validity tests presented in Section 4.3 provide no evidence of discontinuities in predetermined firm characteristics or manipulation of the running variable around the cutoff. These results reinforce the credibility of the identification strategy and support the conclusion that marginal differences in monitoring intensity associated with index membership do not causally affect either firms' disclosure behavior or the market's response to disclosed information.

[1] The Novo Mercado is a special listing segment of B3 in which firms voluntarily adopt corporate governance practices that go beyond those required by Brazilian law, including enhanced disclosure requirements and stronger protections for minority shareholders (B3, 2025).

6
Conclusion

Event studies are widely used to analyze market responses to corporate disclosures, in part because narrow event windows allow for precise measurement of price reactions. However, abnormal returns typically reflect a combination of informational content and the extent to which news is anticipated, making causal interpretation challenging.

This paper addresses this issue by exploiting discontinuities in index membership to isolate variation in market monitoring. Using a regression discontinuity design, we show that material fact disclosures generate economically and statistically significant abnormal returns, indicating that these announcements convey value-relevant information to the market.

At the same time, we find no evidence that marginal differences in abnormal returns due to visibility, proxied by index inclusion, affect either disclosure intensity or the magnitude of abnormal returns. For firms located near the index inclusion threshold, increased visibility has no effect on how disclosures are issued or how they are priced.

These findings indicate that market reactions to material facts primarily reflect the arrival of new information, rather than differences in anticipation driven by monitoring. The absence of discontinuities in disclosure intensity further rules out changes in reporting behavior as a confounding factor.

My results have implications for regulatory policy. In particular, they suggest that the current disclosure framework is effective in ensuring that material information is incorporated into prices. Market reactions appear to be driven by the informational content of disclosures rather than by differences in monitoring intensity across firms. As such, recent initiatives by the CVM to refine disclosure practices, including the formalization of Market Announcements, should be approached with caution, as changes to the structure of communication channels may affect a mechanism that already appears to function effectively.

7
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A
Appendix

A.1
Figures

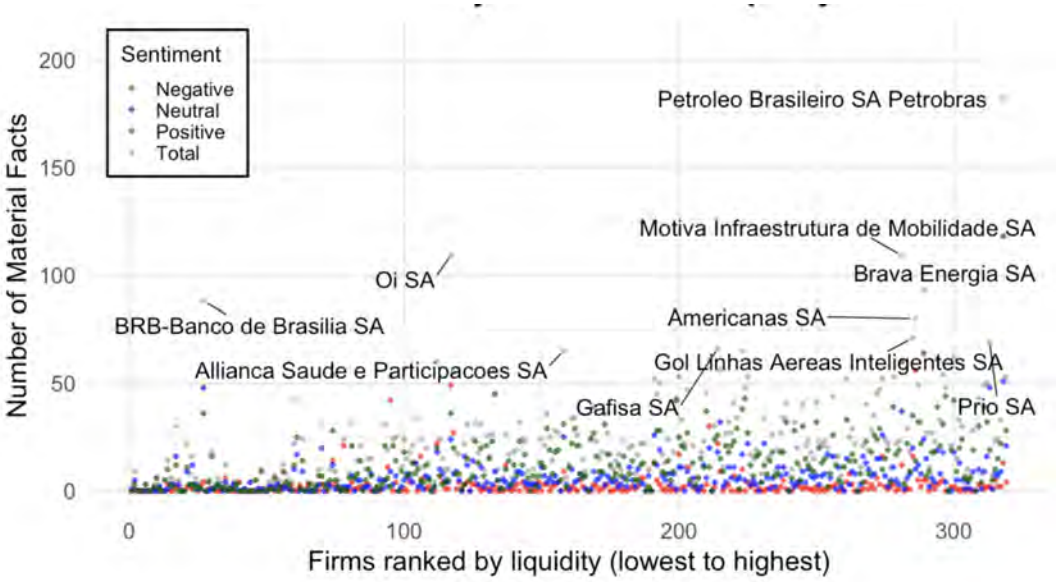


Figure A.1: Material Fact Disclosures by Sentiment and Liquidity

Notes: Each point represents a firm in the matched sample of firms with available trading data, ordered along the horizontal axis according to average trading activity (from lowest to highest). The horizontal spacing between firms is uniform and does not reflect differences in the level of trading activity. The vertical axis reports the total number of Material Facts disclosed by each firm over the sample period. Colored points indicate the number of disclosures by sentiment (positive in green, neutral in blue, and negative in red), while gray points represent the total number of disclosures per firm. Selected high-disclosure firms are labeled for reference.

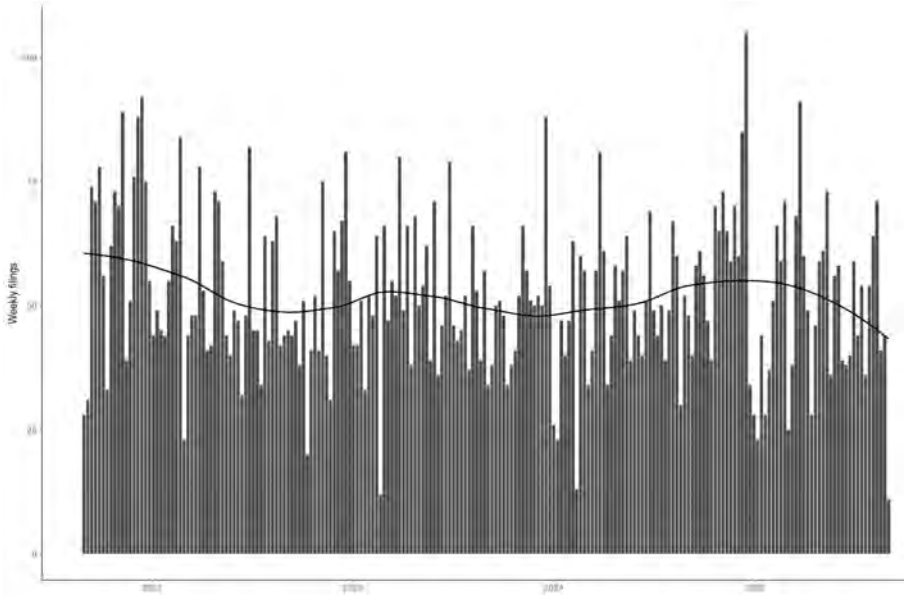


Figure A.2: Weekly Frequency of Material Fact Filings

Notes: The figure reports the weekly count of Material Fact filings disclosed by publicly listed firms in Brazil over the sample period, based on the full disclosure database prior to the application of sample filters. Weeks are defined using ISO calendar conventions (Monday–Sunday), and weeks with no filings are recorded as zero. The smoothed line corresponds to a LOESS fit.

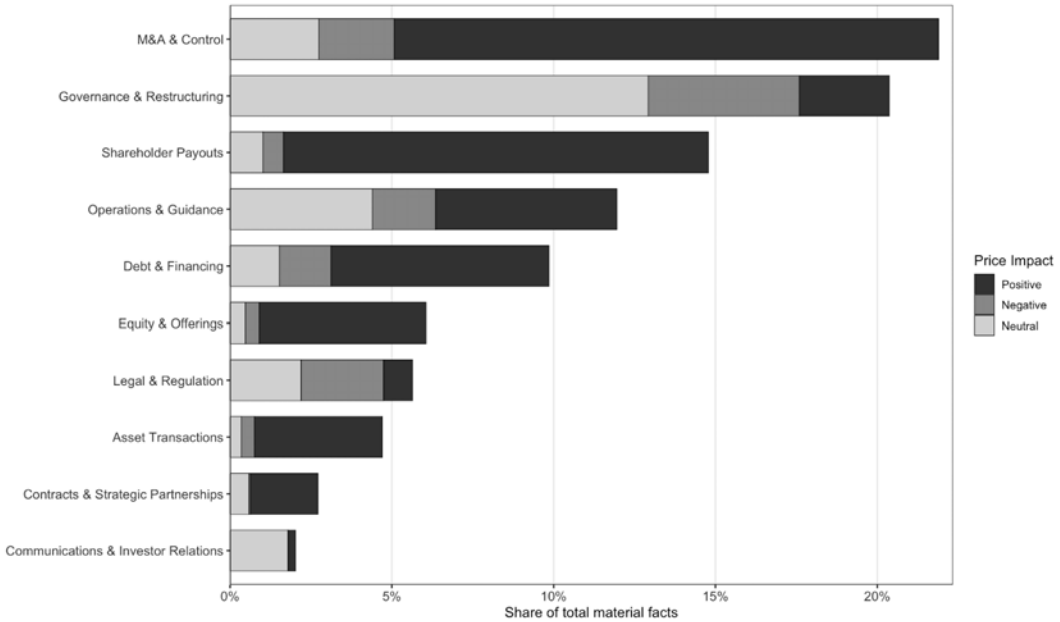
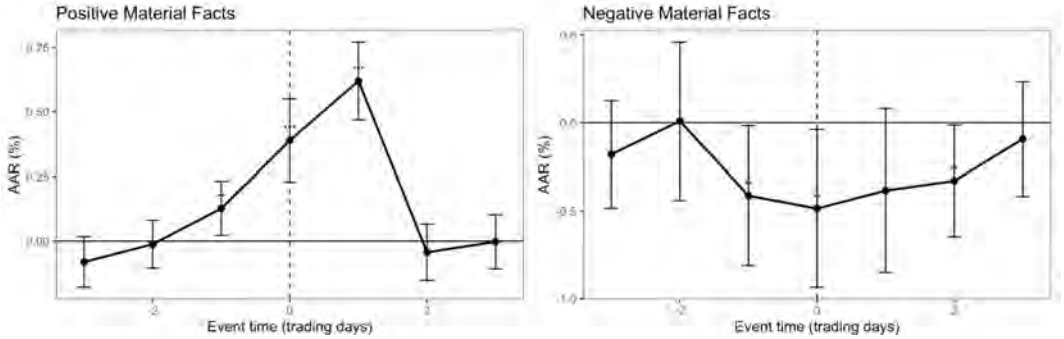


Figure A.3: Material Facts by Category and Price Impact

Notes: This figure shows the distribution of Material Fact filings across disclosure categories for all disclosures in the reference period related to firms with listed securities. Each horizontal bar reports the category's share of total filings in the sample (x-axis, in %). Bars are stacked by the direction of the associated price impact: *Positive*, *Negative*, or *Neutral*.

(a) Average Abnormal Returns (AR)



(b) Cumulative Average Abnormal Returns (CAR)

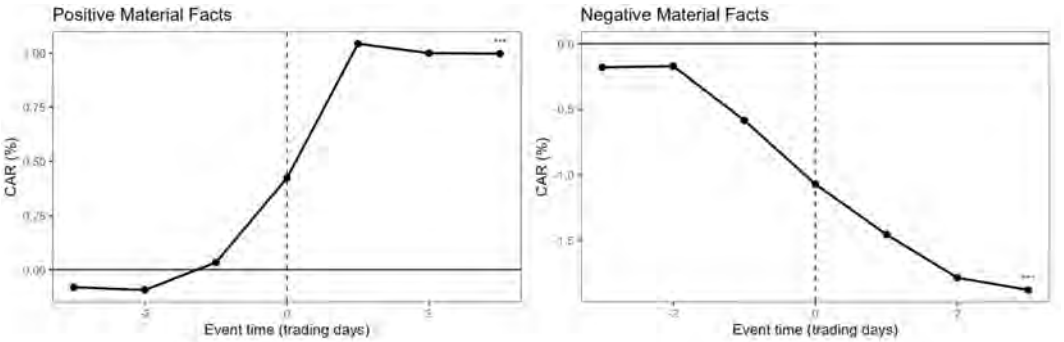


Figure A.4: Market Reaction Around Material Fact Filings

Notes: Panel (a) reports the average abnormal return (AR) at each trading day relative to the disclosure date, so each point represents the mean price reaction on that specific event day. Panel (b) reports the cumulative average abnormal return (CAR), obtained by cumulatively aggregating AR over the event window; the final point therefore reflects the total average abnormal return over the full window. Statistical significance in panel (a) is assessed at each event day, while in panel (b) it is evaluated for the full event window, corresponding to a joint test that the sum of abnormal returns over the window is equal to zero. Abnormal returns are estimated using a market model as in Fama et al. (1969), with expected returns computed relative to the Ibovespa index, which serves as the market benchmark. The estimation window spans from -360 to -90 trading days prior to the disclosure date, and the event window covers the interval from -3 to $+3$ trading days around the announcement (day 0). Event time is measured in trading days based on the Ibovespa trading calendar. The sample used in this figure is not additionally filtered to exclude financially distressed observations.

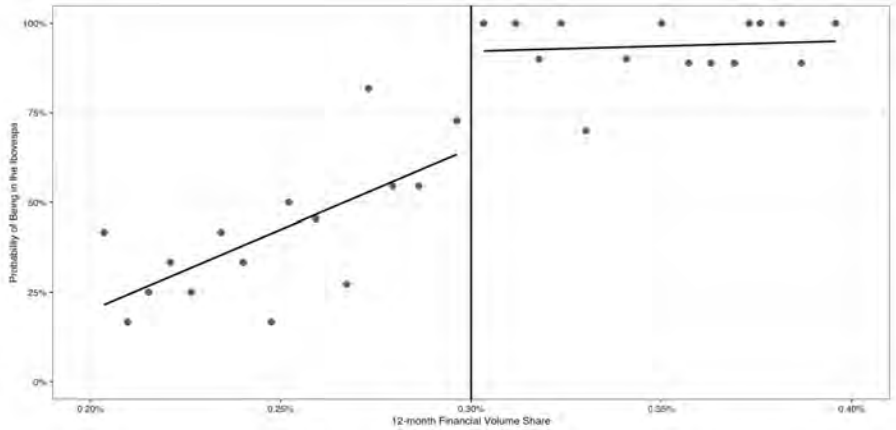


Figure A.5: First-Stage Discontinuity in Ibovespa Membership (Linear Fit)

Notes: This figure plots the probability of belonging to the Ibovespa as a function of the 12-month financial volume share. The sample is restricted to firm–rebalancing observations within a window of ± 0.001 around the cutoff of 0.003, focusing on the local neighborhood of the threshold. Each point represents the average value of the Ibovespa membership indicator within a quantile-spaced bin (15 bins per side of the cutoff), chosen to balance smoothness and visual clarity. The solid lines correspond to linear (first-order) fits estimated separately on each side of the threshold. The vertical line marks the cutoff used in the analysis. This specification is consistent with the local polynomial approach used in the estimation. The graphical choices do not affect the estimation results, which are obtained separately using data-driven bandwidth selection procedures.

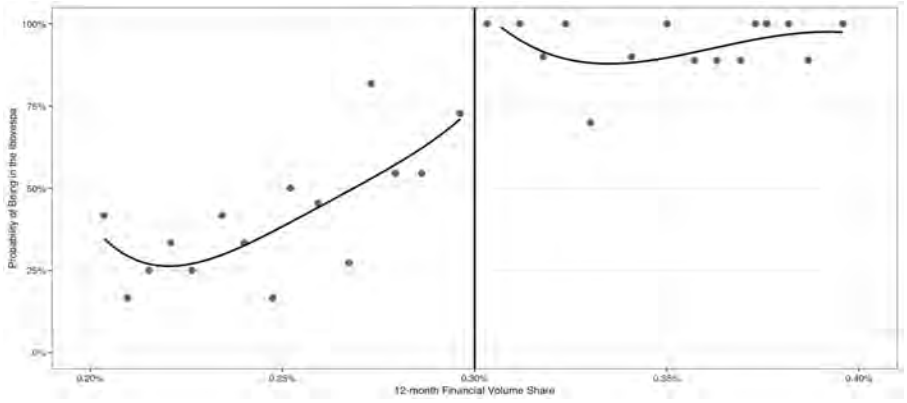


Figure A.6: First-Stage Discontinuity in Ibovespa Membership (Fourth-Order Polynomial Fit)

Notes: This figure plots the probability of belonging to the Ibovespa as a function of the 12-month financial volume share. The sample is restricted to firm–rebalancing observations within a window of ± 0.001 around the cutoff of 0.003, focusing on the local neighborhood of the threshold. Each point represents the average value of the Ibovespa membership indicator within a quantile-spaced bin (15 bins per side of the cutoff). The solid lines correspond to fourth-order polynomial fits estimated separately on each side of the threshold, providing a more flexible representation of the relationship between the running variable and the outcome. The vertical line marks the cutoff used in the analysis. These higher-order fits are used for visualization purposes only and do not affect the estimation results, which are obtained using local polynomial methods with data-driven bandwidth selection.

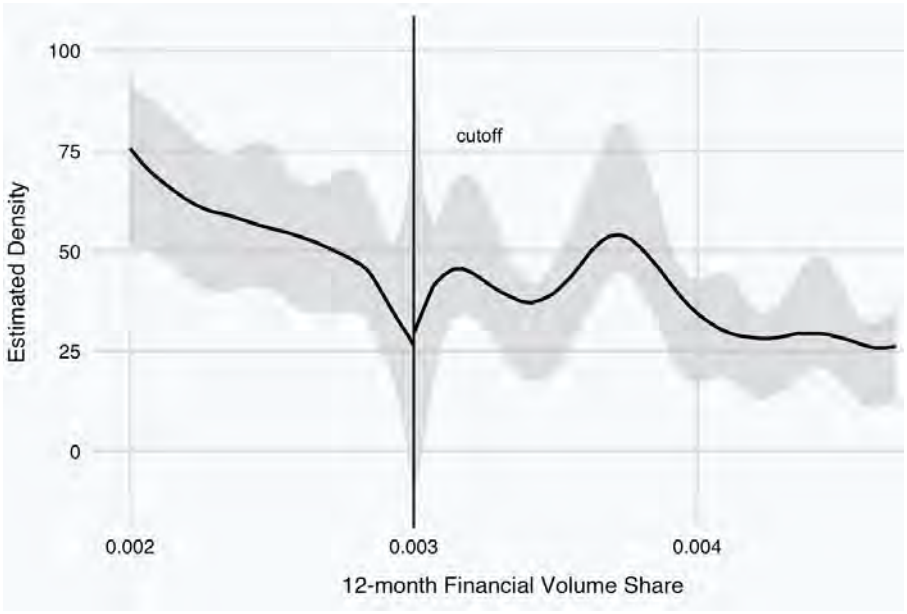


Figure A.7: Density of the Running Variable Around the Ibovespa Cutoff

Notes: This figure plots the estimated density of the 12-month financial volume share around the empirical cutoff adopted in the analysis. The vertical solid black line identifies the cutoff at 0.003. Local polynomial density estimates are computed separately on each side of the cutoff and displayed together with 95% confidence intervals, represented by the gray shaded area. The formal manipulation test is based on the estimated discontinuity in the density at the cutoff. The results do not reject the null hypothesis of continuity (p-value $= 0.833$), providing no evidence of sorting or manipulation around the threshold. Additional binomial tests across multiple windows yield similarly high p-values, reinforcing this conclusion.

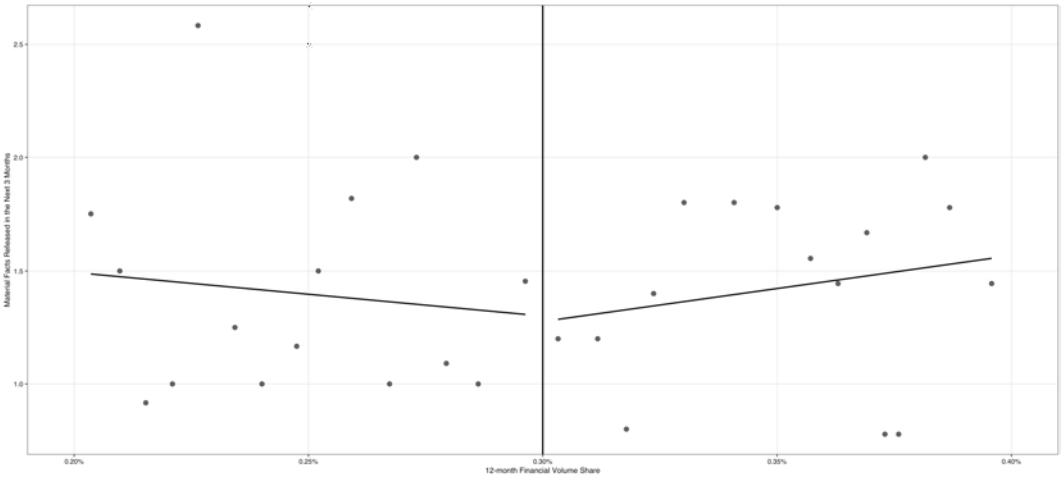


Figure A.8: Discontinuity in Disclosure Activity

Notes: This figure plots the number of Material Fact filings in the three months following each rebalancing event as a function of the 12-month financial trading volume share. The sample is restricted to firm–rebalancing observations within a window of ± 0.001 around the cutoff of 0.003. Each point represents the average value of the outcome within a quantile-spaced bin (15 bins per side of the cutoff). The solid lines correspond to local linear (first-order) fits estimated separately on each side of the threshold. The vertical line marks the cutoff used in the analysis.

A.2
Tables

Table A.1: Seasonality in Disclosure Activity

	Coefficient (SE)	IRR
Day of week (ref: Wed)		
Monday	0.058 (0.047)	1.060
Tuesday	-0.072 (0.048)	0.930
Thursday	0.053 (0.047)	1.054
Friday	-0.034 (0.048)	0.967
Month (ref: Jun)		
January	-0.236** (0.080)	0.790
February	0.086 (0.075)	1.090
March	0.077 (0.074)	1.080
April	0.032 (0.075)	1.033
May	0.043 (0.074)	1.044
July	-0.047 (0.076)	0.954
August	0.055 (0.074)	1.056
September	-0.031 (0.076)	0.970
October	-0.007 (0.075)	0.993
November	0.155* (0.073)	1.167
December	0.286*** (0.070)	1.331
Intercept	2.286*** (0.061)	9.833
Business-day observations		1,043
Total filings		10,921

Notes: The unit of observation is a business day. The dependent variable is the daily number of Material Fact filings. The sample includes all available filings over the period, without applying any firm-level filters. Coefficients $\hat{\beta}$ correspond to the estimated parameters from a quasi-Poisson regression of daily filings on day-of-week and month indicator variables, with Wednesday and June as the omitted categories. IRR (incidence rate ratio), given by $\exp(\hat{\beta})$, measures the proportional change in the expected number of filings relative to the reference category. Standard errors are reported in parentheses. Significance levels: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

Table A.2: Observation-Level Characteristics and Post-Rebalancing Disclosure Activity by Market-Cap Quartile

	Market-cap quartile at rebalancing date			
Statistic	Q1	Q2	Q3	Q4
Total observations	811	807	804	800
Total filings (next 3m)	545	830	978	1,479
Avg. filings in next 3m	0.672	1.029	1.216	1.849
Avg. positive filings in next 3m	0.365	0.627	0.733	1.173
Avg. negative filings in next 3m	0.123	0.113	0.097	0.131
% in Ibovespa at rebalance	0.000	2.230	25.995	81.750
Median trading volume (prev. 12m)	49,504	2,620,047	15,337,848	100,014,202
Median absolute return (prev. 12m)	0.018	0.015	0.014	0.011
Avg. Total Assets (prev. 12m)	595	2,552	9,851	37,748
Avg. Leverage (prev. 12m)	0.340	0.272	0.336	0.332
Avg. Price-to-Book (prev. 12m)	0.963	1.083	1.651	2.353

Notes: This table reports summary statistics by quartiles of market capitalization at the rebalancing date. The unit of observation is a firm–rebalancing pair. The sample includes all firms in the analysis, without excluding financially distressed observations.
Columns Q1 to Q4 correspond to quartiles of market capitalization, with Q1 representing the smallest firms and Q4 the largest. Variables measured over the previous 12 months (prev. 12m) are computed using firm-level data prior to the rebalancing date, while variables referring to the next 3 months (next 3m) are computed using disclosures occurring after the rebalancing date.
Trading volume is measured in monetary units (financial volume). Returns are expressed in daily decimal form, and leverage and price-to-book are unit-free ratios. Percentages refer to the share of firms in the Ibovespa within each quartile at the rebalancing date.

Table A.3: Average and Cumulative Abnormal Returns Around Material Fact Filings

	Negative News				Positive News			
Day	AR (%)		CAR (%)		AR (%)		CAR (%)	
-3	-0.18		-0.18		-0.08		-0.08	
-2	0.01		-0.17		-0.01		-0.09	
-1	-0.42	**	-0.59		0.13	**	0.04	
0	-0.49	**	-1.08		0.39	***	0.43	
1	-0.38		-1.46		0.62	***	1.05	
2	-0.33	**	-1.79		-0.04		1.01	
3	-0.09		-1.88	***	0.00		1.01	***

Notes: This table reports average abnormal returns (AR) and cumulative average abnormal returns (CAR) around Material Fact disclosures. AR corresponds to the cross-sectional mean of abnormal returns across firms at each event day, while CAR is constructed as the cumulative sum of AR over the event window.
Abnormal returns are estimated using a market model as in Fama et al. (1969), with expected returns computed relative to the Ibovespa index. The estimation window spans from -360 to -90 trading days prior to the disclosure date, and the event window covers the interval from -3 to $+3$ trading days around the announcement (day 0). Event time is measured in trading days using the Ibovespa trading calendar. The sample is not additionally filtered to remove financially distressed firms.
Significance markers for AR refer to cross-sectional t-tests of the null hypothesis that the mean abnormal return is equal to zero at each event day (df $= N - 1$): $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$. For CAR, significance is reported only for the final day of the event window and corresponds to an F-test of the joint hypothesis that the sum of abnormal returns over the window is equal to zero.

Table A.4: Financial Volume Share of Ibovespa Entrants and Exits

Year	Entrants Obs.	Mean	Median	Exits Obs.	Mean	Median
2021	6	0.0049	0.0043	–	–	–
2022	6	0.0033	0.0032	2	0.0011	0.0011
2023	3	0.0030	0.0030	6	0.0015	0.0015
2024	5	0.0037	0.0033	2	0.0018	0.0018
2025	6	0.0034	0.0035	6	0.0016	0.0019
Total	26	0.0038	0.0034	16	0.0015	0.0018

Notes: This table reports the 12-month financial volume share of firms entering and exiting the Ibovespa over the sample period. Observations are defined at the firm–rebalancing level, allowing the same firm to appear multiple times across different rebalancing events. For each entry and exit event, the financial volume share is measured at the corresponding rebalancing date using the closest available observation. The sample is restricted to firms that satisfy the eligibility criteria and excludes financially distressed observations.

Table A.5: Balance Around the Effective Ibovespa Cutoff

Metric	**Full Sample**	**0.002 Window**	**0.001 Window**
Below Cutoff (n)	2,907	597	202
Above Cutoff (n)	917	267	156
Δ Financial Volume Share	0.012	0.002	0.001
Δ Market Value	47,101,388,244	10,628,390,229	7,677,333,969
Δ Leverage	0.011	-0.032	-0.004
Δ Daily Return (%)	-0.002	0.012	-0.027
Δ Material Facts Released	0.869	-0.026	0.069
Share in Ibovespa (Below Cutoff)	4.0%	18.8%	40.6%
Share in Ibovespa (Above Cutoff)	94.4%	93.6%	91.0%

Notes: This table reports balance statistics around the effective inclusion threshold in the Ibovespa, defined at a financial volume share of 0.3%. The column *Full Sample* reports statistics for all firm–rebalancing observations in the dataset. The columns *0.002* and *0.001 Window* restrict the sample to observations within ± 0.002 and ± 0.001, respectively, of the cutoff in financial volume share, providing progressively narrower bandwidths around the threshold. *Below Cutoff (n)* and *Above Cutoff (n)* indicate the number of firm–event observations below and above the 0.3% cutoff within each bandwidth. Differences are computed as the mean value above the cutoff minus the mean value below the cutoff. *Share in Ibovespa (Below Cutoff)* and *Share in Ibovespa (Above Cutoff)* report the fraction of firms classified as index members on each side of the cutoff, illustrating the discontinuity in index assignment. The unit of observation is a firm–event pair, since firms may appear multiple times across different rebalancing episodes and their characteristics vary at each event date.

Table A.6: Continuity Tests for Firm Characteristics at the Cutoff

Variable	Est.	S.E.	p-val	95% CI	Bandwidth	Eff. Obs.
Log Market Cap	0.187	0.272	0.492	$[-0.346,\ 0.720]$	0.00107	197 / 146
Log Total Assets	-0.061	0.349	0.860	$[-0.745,\ 0.622]$	0.00098	157 / 130
Log Revenue	0.137	0.197	0.488	$[-0.250,\ 0.523]$	0.00070	111 / 91
Price to Book	0.214	0.349	0.540	$[-0.470,\ 0.898]$	0.00108	182 / 145

Notes: This table reports continuity tests for predetermined firm characteristics at the cutoff of the running variable (12-month financial volume share). Each coefficient corresponds to the estimated discontinuity obtained from local linear regressions with a triangular kernel, data-driven bandwidth selection, and bias-corrected inference. The variables include the logarithm of market capitalization, the logarithm of total assets, the logarithm of revenue, and the average price-to-book ratio over the 12 months preceding the rebalance date. Total assets and revenue are measured using the most recent accounting information available prior to each rebalance date. The absence of statistically significant discontinuities across all covariates supports the validity of the regression discontinuity design, indicating that firms on either side of the cutoff are locally comparable in terms of size, operating scale, and valuation characteristics.

Table A.7: First-Stage Discontinuity in Ibovespa Membership

Kernel	Estimate	Std. Error	p-value	95% CI	Bandwidth	Eff. Obs. (L/R)
Triangular	0.2655	0.0738	0.0003	[0.1209, 0.4101]	0.00130	269 / 167
Uniform	0.2861	0.0789	0.0003	[0.1314, 0.4408]	0.00108	199 / 148
Epanechnikov	0.2669	0.0760	0.0004	[0.1180, 0.4158]	0.00124	247 / 165

Notes: This table reports the first-stage estimates of the fuzzy regression discontinuity design. The dependent variable is an indicator equal to one if the firm belongs to the Ibovespa at the rebalancing date. The running variable is the firm's share of financial trading volume, computed over the twelve months preceding each rebalancing date. The cutoff is set at 0.003. Estimates are obtained using the `rdrobust` procedure with local linear specifications and data-driven bandwidth selection under alternative kernel functions. Effective observations correspond to the number of firms used within the selected bandwidth on each side of the cutoff.

Table A.8: Second-Stage Estimates: Effect of Ibovespa Membership on Cumulative Abnormal Returns

Kernel	Estimate	Std. Error	p-value	95% CI	Bandwidth	Eff. Obs. (L/R)
Panel A: CAR(1), Negative News						
Triangular	-12.3	11.4	0.280	[-34.6341, 10.0343]	0.00150	27 / 12
Uniform	-12.1	10.7	0.261	[-33.1378, 8.9908]	0.00109	19 / 10
Epanechnikov	-13.7	13.6	0.316	[-40.3434, 13.0339]	0.00106	19 / 9
Panel B: CAR(1), Positive News						
Triangular	4.10	6.38	0.520	[-8.3952, 16.6040]	0.000767	62 / 57
Uniform	4.31	9.75	0.659	[-14.8063, 23.4239]	0.000544	42 / 36
Epanechnikov	1.76	5.42	0.746	[-8.8703, 12.3894]	0.00108	92 / 72
Panel C: CAR(3), Negative News						
Triangular	-9.20	13.3	0.490	[-35.2992, 16.8997]	0.00161	30 / 12
Uniform	-10.9	17.0	0.520	[-44.3090, 22.4259]	0.000969	16 / 8
Epanechnikov	-9.41	15.4	0.542	[-39.6703, 20.8496]	0.00119	20 / 11
Panel D: CAR(3), Positive News						
Triangular	-15.1	11.9	0.207	[-38.4421, 8.3181]	0.000896	71 / 65
Uniform	-8.10	8.61	0.347	[-24.9704, 8.7784]	0.00101	84 / 69
Epanechnikov	-17.1	13.6	0.208	[-43.8230, 9.5633]	0.000939	76 / 65

Notes: This table reports second-stage estimates from the fuzzy regression discontinuity design for cumulative abnormal returns around Material Fact disclosures. Panels A and B use a two-day event window, defined as $[-1, 1]$, while Panels C and D use a seven-day event window, defined as $[-3, 3]$. Positive and negative disclosures are analyzed separately. The running variable is the firm's share of financial trading volume over the previous 12 months, with a cutoff at 0.003. Index membership is treated as endogenous and instrumented using the discontinuity at the cutoff. Estimates are obtained using local linear specifications with data-driven bandwidth selection and bias-corrected inference under alternative kernel functions. Effective observations correspond to the number of firms used within the selected bandwidth on each side of the cutoff.

Table A.9: Effect of Ibovespa Membership on Disclosure Activity

Kernel	Estimate	Std. Error	p-value	95% CI	Bandwidth	Eff. Obs. (L/R)
Triangular	-0.1264	1.2368	0.9186	[-2.5504, 2.2976]	0.00114	212 / 158
Uniform	-0.3718	1.0392	0.7205	[-2.4086, 1.6649]	0.00112	208 / 155
Epanechnikov	-0.0442	1.1192	0.9685	[-2.2377, 2.1493]	0.00126	252 / 165

Notes: This table reports second-stage estimates from the fuzzy regression discontinuity design. The dependent variable is the number of Material Fact filings in the three months following each rebalancing event. The running variable is the firm's share of financial trading volume over the previous 12 months, with a cutoff at 0.003. Index membership is treated as an endogenous variable and instrumented using the discontinuity at the cutoff. All specifications include market capitalization as a covariate. Estimates are obtained using local linear specifications with data-driven bandwidth selection and bias-corrected inference under alternative kernel functions. Effective observations correspond to the number of firms used within the selected bandwidth on each side of the cutoff.

Table A.10: Robustness: Ibovespa and Novo Mercado Firms

Kernel	Estimate	Std. Error	p-value	95% CI	Bandwidth	Eff. Obs. (L/R)
Panel A: CAR($[-1,1]$), Positive News						
Triangular	2.46	6.82	0.719	[-10.9172, 15.8333]	0.00109	87 / 72
Uniform	-0.393	9.02	0.965	[-18.0817, 17.2950]	0.000940	71 / 64
Epanechnikov	5.19	9.09	0.568	[-12.6270, 22.9980]	0.000840	63 / 61
Panel B: CAR($[-3,3]$), Positive News						
Triangular	-14.1	12.0	0.240	[-37.5918, 9.4165]	0.00115	91 / 72
Uniform	-6.62	9.78	0.498	[-25.7862, 12.5473]	0.000988	78 / 68
Epanechnikov	-20.8	18.7	0.265	[-57.3897, 15.7846]	0.000870	65 / 62

Notes: This table reports robustness checks for the second-stage fuzzy regression discontinuity design using the same sample restrictions adopted in the baseline specifications, with the additional requirement that firms belong either to the Ibovespa or to the Novo Mercado segment. Panels A and B report results for cumulative abnormal returns over the event windows $[-1,1]$ and $[-3,3]$, respectively, for positive disclosures. Due to the limited number of observations around the cutoff, it was not possible to obtain reliable estimates for negative disclosures under this additional sample restriction. The running variable is the firm's share of financial trading volume over the previous 12 months, with a cutoff at 0.003. Index membership is treated as endogenous and instrumented using the discontinuity at the cutoff. Estimates are obtained using local linear specifications with data-driven bandwidth selection and bias-corrected inference under alternative kernel functions. Effective observations correspond to the number of firms used within the selected bandwidth on each side of the cutoff.

Table A.11: Robustness: Ibovespa and Non–Novo Mercado Firms

Kernel	Estimate	Std. Error	p-value	95% CI	Bandwidth	Eff. Obs. (L/R)
Panel A: CAR($[-1,1]$), Negative News						
Triangular	-7.76	7.44	0.297	[-22.3347, 6.8209]	0.00361	74 / 31
Uniform	-25.6	28.5	0.368	[-81.4814, 30.1979]	0.00186	16 / 13
Epanechnikov	-13.2	11.0	0.229	[-34.7968, 8.3444]	0.00270	25 / 21
Panel B: CAR($[-1,1]$), Positive News						
Triangular	-28.2	39.8	0.479	[-106.2325, 49.9006]	0.00245	108 / 126
Uniform	9.71	37.6	0.796	[-63.9328, 83.3470]	0.000930	35 / 61
Epanechnikov	-19.4	26.5	0.464	[-71.3548, 32.5642]	0.00217	98 / 119
Panel C: CAR($[-3,3]$), Negative News						
Triangular	-13.4	9.66	0.165	[-32.3335, 5.5326]	0.00339	74 / 29
Uniform	-25.0	33.9	0.461	[-91.5193, 41.4936]	0.000933	8 / 8
Epanechnikov	-30.3	22.0	0.169	[-73.3631, 12.8487]	0.00217	21 / 16
Panel D: CAR($[-3,3]$), Positive News						
Triangular	18.8	40.4	0.642	[-60.3297, 97.9227]	0.00256	113 / 128
Uniform	1.64	160.0	0.992	[-311.1208, 314.4053]	0.00125	47 / 72
Epanechnikov	21.2	38.7	0.585	[-54.6729, 96.9800]	0.00217	99 / 119

Notes: This table reports robustness checks for the second-stage fuzzy regression discontinuity design using the same sample restrictions adopted in the baseline specifications, with the additional requirement that firms either belong to the Ibovespa or are not listed in the Novo Mercado segment. Panels A to D report results for cumulative abnormal returns over the event windows $[-1,1]$ and $[-3,3]$, separately for negative and positive disclosures. The running variable is the firm's share of financial trading volume over the previous 12 months, with a cutoff at 0.003. Index membership is treated as endogenous and instrumented using the discontinuity at the cutoff. Estimates are obtained using local linear specifications with data-driven bandwidth selection and bias-corrected inference under alternative kernel functions. Effective observations correspond to the number of firms used within the selected bandwidth on each side of the cutoff.