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Corporate Governance in Brazil and Opportunistic Behavior in the Use of Insider Information

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Abstract

The opportunistic use of insider information generates adverse effects on capital markets, making its mitigation through robust corporate governance practices. This research analyzes the corporate governance mechanisms that reduce the signs of opportunistic insider trading, grounded in the assumptions of information asymmetry and opportunistic behavior. The hypotheses posit that firms listed on the Novo Mercado or Level 2 of Corporate Governance, with more independent boards of directors and greater female representation, active fiscal councils, consolidated ESG practices, non-family ownership structures, robust audit committees, and audits not conducted by Big Four firms, are less prone to opportunistic conduct. The sample comprises 237 firms, representing 51% of companies listed on [B]3 between 2010 and 2021, resulting in a total of 2175 firm-year observations. Panel data analysis supports the proposed hypotheses. The findings indicate that higher levels of corporate governance practices are associated with a lower incidence of opportunistic insider trading in the Brazilian capital market. This study contributes to the literature by highlighting the specific features of the largest stock market in Latin America and emphasizing the role of transparency, formal monitoring, and informal mechanisms, such as social and reputational pressure on insiders, in shaping ethical behavior and curbing the misuse of privileged information.

Keywords: information asymmetry; opportunistic behavior; opportunistic insider trading; corporate governance

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1. Introduction

Information asymmetry between firms and the market creates a time window in which insiders may gain an informational advantage over investors and shareholders (Akerlof 1970; Meulbroek 1992; Ahern 2017; Tonidandel and Decourt 2020; Contreras and Marcet 2021). This asymmetry enables opportunistic behavior by individuals holding privileged information, commonly referred to as insider trading. Insiders with access to non-public information may exploit this advantage through opportunistic buying or selling of shares, to the detriment of outsiders who lack timely access to firm-specific disclosures in accordance with market rules (Cohen et al. 2012; Ali and Hirshleifer 2017; Posylnaya et al. 2019; Contreras and Marcet 2021). Consequently, insider trading can erode investor trust and participation, ultimately harming firms and capital markets (Bhattacharya and

Nicodano 2001). Emerging economies, characterized by weaker legal enforcement, are particularly vulnerable to such practices (La Porta et al. 2000), underscoring the importance of governance mechanisms in curbing opportunism and protecting investors.

The Brazilian stock market exemplifies this context. As an emerging market with a relatively small number of listed firms, corporate financing in Brazil still relies predominantly on debt rather than equity. In addition, ownership structures are highly concentrated, with family-controlled firms prevailing. As a result, when opportunistic insider trading scandals arise, investors without access to privileged information are disproportionately harmed. In this setting, opportunistic behavior may adversely affect firm value, as argued by Williamson (1991), since insiders tend to disclose incomplete or distorted information and frequently fail to honor commitments. Opportunism therefore constitutes a behavioral trait capable of influencing corporate decisions and generating firm-level losses (Williamson 1988, 1991, 1993, 1999).

To mitigate such practices, effective corporate governance is essential, as it can reduce information asymmetry and, consequently, opportunistic behavior, which is often reflected in higher risk and cost of capital (La Porta et al. 2000; Kwabi et al. 2018; Chung et al. 2019; Rahman et al. 2021; Arias et al. 2021). Accordingly, this study aims to analyze corporate governance determinants that mitigate signs of opportunistic insider trading. The central hypothesis is that specific governance characteristics are associated with a lower propensity for opportunistic conduct. These characteristics include listing on Novo Mercado or Level 2 corporate governance segments (Crisóstomo and Brandão 2019; Esqueda and O'Connor 2020); the presence of independent boards of directors (Jaggi and Tsui 2007; Abid et al. 2018); greater female representation on boards (Jain and Zaman 2020; Wu et al. 2019); active fiscal councils (Procianoy and Decourt 2015; Jain and Zaman 2020); consolidated ESG (Environmental, Social and Governance) practices (Dong et al. 2018; He et al. 2022); non-family ownership structures (Crisóstomo and Brandão 2019; He et al. 2022); robust audit committees (Borba et al. 2019; Oradi and Izadi 2020); audits conducted by non–Big Four firms (Asante-Appiah and Lambert 2022); and stronger analyst monitoring (Dai et al. 2015).

The sample comprises 237 firms, representing approximately 51% of all companies listed on the Brazilian stock exchange, [B][3] (Brasil, Bolsa, Balcão), over the period from 2010 to 2021, yielding 2175 firm-year observations. The Brazilian stock market is the largest and most influential in Latin America, with its headquarters in São Paulo, and attracts both domestic and international investors (ANBIMA 2022; Moreira 2025). Nevertheless, it exhibits institutional characteristics that differ substantially from those of developed markets (Macagnan 2025). Opportunistic insider trading is proxied by Abnormal Idiosyncratic Volatility (AIV), as proposed by Yang et al. (2020), which captures idiosyncratic volatility before information-intensive events relative to normal periods. The empirical analysis employs unbalanced panel data with fixed effects.

The results support the hypothesis that corporate governance mechanisms mitigate opportunistic insider trading, corroborating prior theoretical and empirical evidence (Jensen and Meckling 1976; Fama 1980; Fama and Jensen 1983; Williamson 1988; Ali and Hirshleifer 2017; Javakhadze et al. 2025). In particular, firms with more independent boards, greater female board representation, active fiscal councils, and robust audit committees exhibit fewer indications of opportunistic insider trading. These findings are consistent with the literature, which emphasizes the role of efficient governance structures in curbing opportunistic behavior (Chung et al. 2019; Rahman et al. 2021; Asante-Appiah and Lambert 2022).

Reputational factors, captured by ESG scores, and media visibility, proxied by firm size, also display a negative association with insider trading, suggesting that external scrutiny and reputational concerns operate as informal constraints on opportunism (Gao et al. 2014; Hodgson et al. 2020). Furthermore, non-family firms are less likely to exhibit

opportunistic insider trading, reinforcing evidence that ownership concentration in family firms facilitates the use of private information before financial disclosure (Grossman and Stiglitz 1980; Claessens et al. 2000; Jaggi and Tsui 2007; Huang et al. 2012; ElGammal et al. 2018; Abid et al. 2018; Rahman et al. 2021; Yang and Xie 2024; Arias et al. 2021).

Conversely, firms audited by Big Four auditors (Abid et al. 2018; Donelson et al. 2020; Hasnan et al. 2022; Friedrich and Quick 2024), those involved in practices associated with corporate opportunism, such as financial statement restatements (Ali and Hirshleifer 2017; Javakhadze et al. 2025; Martins and Ventura Júnior 2020), and firms exhibiting high stock price volatility (Bhowmik and Wang 2020) demonstrate a higher propensity for informed trading.

From a theoretical perspective, opportunistic insider trading can be mitigated through corporate governance practices that enhance monitoring (Rahman et al. 2021), transparency (Wu et al. 2019; Arias et al. 2021), ownership structures (Arias et al. 2021), female participation in management and boards (Wu et al. 2019), and social responsibility (Hodgson et al. 2020). These mechanisms reduce information asymmetry, which otherwise fosters uncertainty and facilitates opportunistic behavior, including the misuse of privileged information and earnings manipulation (Arrow 1963, 1969; Akerlof 1970; Williamson 1979, 1991, 1993; Chowdhury et al. 2018; Javakhadze et al. 2025). As a contribution, this study highlights the role of transparency, formal oversight, and informal mechanisms, such as social and reputational pressure, in promoting ethical conduct and reducing the misuse of privileged information in the Brazilian stock market.

This article is organized as follows. Section 2 reviews literature and develops the research hypotheses. Section 3 describes the methodology and data. Section 4 presents and discusses the empirical results, and Section 5 concludes.

2. Literature Review and Hypothesis

2.1. Information Asymmetry and Opportunism

Holding control refers to the ability to influence and make decisions, derived from formal decision-making rights or access to relevant privileged information. The separation between ownership and control (Berle and Means 1932; Jensen and Meckling 1976; Fama 1980) creates an information asymmetry, as insiders possess superior knowledge about the firm compared to outsiders, potentially leading to market failures (Fama 1980). Such asymmetry causes price distortions and creates opportunities for abnormal gains (Akerlof 1970; Myers and Majluf 1984; Williamson 1991, 1993, 1999; Easley and O'Hara 2004), while also giving rise to adverse selection and moral hazard problems (Akerlof 1970; Williamson 1979, 1988, 1991). Adverse selection occurs when less-informed agents avoid risky transactions, leading to prices that fail to accurately reflect firms' fundamental values. Moral hazard, in turn, occurs when insiders exploit their informational advantage to engage in opportunistic actions that generate abnormal gains (Arrow 1963; Akerlof 1970). In this context, insider trading before earnings announcements exerts a particularly strong impact on stock prices (Chauhan et al. 2016). Under conditions of uncertainty, information becomes a valuable asset (Arrow 1963), underscoring the importance of timely disclosure of insider-held information to reduce asymmetry, mitigate market failures, and improve price efficiency.

For a transaction to be classified as opportunistic insider trading, evidence must indicate that the insider possessed undisclosed information at the time of trading. Prior studies show that insider trading is associated with abnormally high returns relative to normal trading activity (Meulbroek 1992; Ahern 2017; Ali and Hirshleifer 2017; Esen et al. 2019; Goergen et al. 2019; Jardak and Matoussi 2020). Additional evidence indicates that bid–ask spreads, trading volume, and volatility increase significantly during periods of

insider trading (Degryse et al. 2014; Lei and Wang 2014; Vitale 2018; Posylnaya et al. 2019; Contreras and Marcet 2021).

Insiders hold valuable private information about firms, which provides an advantage when trading before such information becomes public (Ali and Hirshleifer 2017). Despite this advantage, regulatory frameworks generally require insiders to refrain from trading until financial information is publicly disclosed, thereby ensuring informational symmetry among market participants. Opportunism, driven by self-interest, is a defining feature of opportunistic insider trading (Akerlof 1970; Williamson 1979, 1988, 1991, 1993, 1999; Cohen et al. 2012; Tang et al. 2013; Hillier et al. 2015; Gider and Westheide 2016; Ali and Hirshleifer 2017; Batten et al. 2021; Yang and Xie 2024; Javakhadze et al. 2025). Even when aware of the illegality of such actions and the risk of future sanctions, insiders may still be incentivized to trade larger volumes of shares as information asymmetry increases.

In summary, opportunistic insider behavior constitutes a form of moral hazard rooted in information asymmetry (Williamson 1979, 1988, 1991, 1993, 1999). Abnormal insider returns are closely associated with weak corporate governance structures (Ravina and Sapienza 2010; Jagolinzer et al. 2011). Insider gains tend to increase when analyst coverage is limited, and regulatory oversight is moderate (Wu et al. 2019; Ventura et al. 2024). By contrast, firms with stronger governance practices are more effective in restricting the use of privileged information and are more likely to discipline insiders who trade prior to public disclosure (Lee et al. 2014; Dai et al. 2015; Hodgson et al. 2020; Javakhadze et al. 2025). Accordingly, the quality of corporate governance is fundamental to curbing opportunistic behavior through enhanced transparency, monitoring, and accountability.

2.2. Corporate Governance, the Brazilian Stock Market, and Hypothesis Formulation

Effective governance requires transparency, fairness, accountability, and corporate responsibility (Procianoy and Decourt 2015), principles widely promoted across capital markets (Macagnan 2025). More diverse boards, particularly those with greater female representation, tend to mitigate opportunistic behavior and enhance monitoring effectiveness (Adams and Ferreira 2009; Jain and Zaman 2020). Governance mechanisms such as the presence of a fiscal council (Borba et al. 2019), the size and role of the audit committee (Borba et al. 2019; Oradi and Izadi 2020), and greater bord independence (Rahman et al. 2021; Wu et al. 2019) strengthen oversight and reduce the risk of opportunistic insider trading. Externally, laws and regulations, auditing quality, market conditions, media scrutiny, and pressure from financial analysts also shape corporate behavior by reducing information asymmetry and detecting potential misuse of resources (Healy and Palepu 2001; Gao et al. 2014; He et al. 2022). By disseminating information, financial analysts reduce insiders' informational advantages, influence trading dynamics, and improve market quality (Hillier et al. 2015; Ellul and Panayides 2018). Based on this discussion, the following hypothesis is proposed:

H1. *Firms characterized by higher-quality corporate governance mitigate the occurrence of opportunistic insider trading.*

In family firms, where board members are often related to controlling owners, the risk of minority shareholder expropriation is higher (Claessens et al. 2000). To mitigate this risk, the literature recommends limiting family appointments and avoiding CEO chair duality (Jaggi and Tsui 2007; Zaman et al. 2021). Accordingly, governance structures dominated by family members are more susceptible to insider opportunism. Based on this argument, the following sub-hypothesis is formulated:

H1a. *Non-family firms mitigate the occurrence of opportunistic insider trading.*

The presence of controlling shareholders or shareholder agreements among a small group of dominant owners (Claessens et al. 2000; Jaggi and Tsui 2007; Abid et al. 2018; ElGammal et al. 2018; Crisóstomo and Brandão 2019; He et al. 2022), director co-optation (Yang and Xie 2024), interlocking directorates (Yang and Xie 2024; Ngo and Le 2021), and social ties between auditors and firm executives (He et al. 2017) may weaken governance mechanisms and foster an environment conducive to unethical behavior. Accordingly, the following sub-hypothesis is proposed:

H1b. *The participation of family members on the board of directors increases the likelihood of opportunistic insider trading.*

Auditing plays a fundamental governance role but may be compromised by social ties and economic incentives (He et al. 2017). The growing emphasis of Big Four firms on consulting services, potentially at the expense of audit quality, may impair auditor independence (Donelson et al. 2020). Moreover, deficient audits can facilitate fraud and accounting manipulation, harming investors and market confidence (Healy and Palepu 2001). Firms frequently engage Big Four consultants during reputational crises, as observed in high-profile ESG-related scandals involving companies such as British Petroleum, Google, and Facebook (Asante-Appiah and Lambert 2022). Based on this reasoning, the following sub-hypothesis is formulated:

H1c. *Firms audited by Big Four auditors are more likely to engage in opportunistic insider trading.*

The effectiveness of corporate governance mechanisms is also shaped by the institutional context in which firms operate. The Brazilian stock market is an emerging market with relatively few listed firms and a financing structure that relies predominantly on third-party capital rather than equity investors, in contrast to developed markets (Black et al. 2010; Macagnan 2025). Ownership is highly concentrated, with most Brazilian firms under family control (Black et al. 2014; Crisóstomo and Brandão 2019; Macagnan 2025), giving rise to principal–principal conflicts between controlling and minority shareholders (La Porta et al. 2000; Black et al. 2010, 2014; Crisóstomo and Brandão 2019; Teixeira et al. 2025). A distinctive feature of the Brazilian system is the fiscal council, an independent body that enhances minority shareholder representation and contributes to reducing information asymmetry and reinforcing transparency (Procianoy and Decourt 2015).

Emerging markets such as Brazil typically provide weaker legal protection for minority shareholders, thereby requiring stronger governance mechanisms and more effective enforcement (La Porta et al. 2000; Ventura et al. 2024). In response, B3 introduced differentiated corporate governance segments, Level 1, Level 2, and Novo Mercado, in ascending order of governance requirements. These segments exceed minimum legal standards by promoting greater transparency, fairness, and corporate responsibility. Firms that voluntarily adhere to these segments signal a commitment to superior governance quality (Crisóstomo and Brandão 2019; Esqueda and O'Connor 2020). Accordingly, the following sub-hypothesis is proposed:

H1d. *Firms listed on Level 2 or Novo Mercado mitigate the occurrence of opportunistic insider trading.*

Despite the establishment of differentiated governance segments, several cases of opportunistic insider trading have occurred in Brazil among firms listed in these segments. Similarly, although the U.S. market features stronger regulation, opportunistic behavior has persisted even after the enactment of the Sarbanes–Oxley Act (Ventura et al. 2024). Such outcomes reflect the fact that governance failures often stem from corporate misconduct

driven by individual behavioral factors, leading to practices such as accounting fraud, earnings management, and the misuse of private information (Liu 2016; Chowdhury et al. 2018). Prior research indicates that personal attributes explain a substantial share of variation in opportunistic insider trading performance and that characteristics such as age, education, and gender become particularly salient in environments with greater information asymmetry (Hillier et al. 2015). Consequently, managers' ethical values, experiences, and personality traits significantly influence corporate decisions and behavior.

Evidence suggests that women are less prone to opportunistic practices, as female insiders tend to earn lower abnormal returns due to greater risk aversion, stronger regulatory compliance, and higher ethical standards (Wu et al. 2019). Gupta et al. (2020) show that firms with female CFOs are less likely to issue inaccurate financial reports, an effect moderated by governance mechanisms, institutional ownership, and analyst coverage. Reputation also plays a critical role: insiders reduce opportunistic behavior when reputational risk is high, and those operating in more religious regions earn lower abnormal returns due to prevailing social norms (Contreras and Marcet 2021). Corporate reputation, enhanced through media visibility (Dai et al. 2015) and engagement in ESG practices, functions as an informal disciplinary mechanism that discourages misconduct and preserves market confidence (Gao et al. 2014; Hillier et al. 2015). Accordingly, adherence to ESG practices is associated with lower managerial misconduct and reduced opportunistic behavior (Gao et al. 2014; He et al. 2022). Based on this discussion, the following sub-hypothesis is proposed:

H1e. *Firms with stronger ESG practices mitigate the occurrence of opportunistic insider trading.*

3. Research Methodology

3.1. Research Design and Variable Definition

The econometric analysis is conducted using an unbalanced panel data regression model with fixed effects. This approach allows for controlling unobserved heterogeneity across cross-sectional units while estimating dynamic relationships over time (Wooldridge 2010). In addition, it enables the use of a larger dataset than would be possible if only firms with complete time-series observations were retained. Based on the reviewed literature, an econometric model was developed to test the study's hypotheses. The dependent variable is Abnormal Idiosyncratic Volatility (*AIV*), which serves as a proxy for opportunistic insider trading. Accordingly, the baseline econometric specification is presented in Equation (1):

$$AIV_{i,t} = \beta_0 + \beta_1 LEVELSGC_{i,t} + \beta_2 PFB_{i,t} + \beta_3 CF_{i,t} + \beta_4 GREP_{i,t} + \beta_5 ACSIZE_{i,t} + \beta_6 AUDB4_{i,t} + \beta_7 QI_{i,t} + \beta_8 FNF_{i,t} + \beta_9 FBOARD_{i,t} + \beta_{10} DY_{i,t} + \beta_{11} NREP_{i,t} + \beta_{12} MEDIA_{i,t} + \beta_{13} IVAZ_{i,t} + \beta_{14} RENT_{i,t} + \varepsilon_{i,t} \quad (1)$$

Equation (1) evaluates whether corporate governance mechanisms mitigate indications of opportunistic insider trading, as proposed in Hypothesis H1. To enhance the robustness of the findings, an alternative specification was estimated in which AIV was replaced by Tarnished Reputation (NREP), measured by the number of financial statement restatements. Prior studies document that firms with opportunistic insiders exhibit a higher incidence of restatements, making this variable a suitable proxy for opportunistic behavior (Ali and Hirshleifer 2017; Javakhadze et al. 2025; Asante-Appiah and Lambert 2022). The robustness model is specified in Equation (2):

$$NREP_{i,t} = \beta_0 + \beta_1 LEVELSGC_{i,t} + \beta_2 PFB_{i,t} + \beta_3 CF_{i,t} + \beta_4 GREP_{i,t} + \beta_5 ACSIZE_{i,t} + \beta_6 AUDB4_{i,t} + \beta_7 QI_{i,t} + \beta_8 FNF_{i,t} + \beta_9 FBOARD_{i,t} + \beta_{10} MEDIA_{i,t} + \beta_{11} IVAZ_{i,t} + \varepsilon_{i,t} \quad (2)$$

Compared with Equation (1), Equation (2) replaces AIV with NREP and excludes variables not applicable to the robustness specification. This procedure reduces potential endogeneity concerns and strengthens the credibility of the empirical results. Table 1 presents the variables used in the study, including their abbreviations, definitions, expected signs, and theoretical foundations, and classifies them as dependent, independent, or control variables.

Table 1. Definition of the variables studied in the research.

Variables	Full Name	SIGN
AIV	Abnormal Idiosyncratic Volatility	
LEVELSGC	Levels of Corporate Governance	−
PFB	Proportion of Women on the Board of Directors	−
CF	Fiscal Council	−
GREP	Good reputation	−
ACSIZE	Audit Committee Size	−
AUDB4	Audited by Big Four	−
QI	Information Quality	−
FNF	Non-Family Businesses	−
FBOARD	Percentage of Family Members on the Board of Directors	+
DY	Dividend Yield	+
NREP	Tarnished Reputation	+
MEDIA	Media Attention	−
IVAZ	Leaked Information	+
RENT	Profitability	−

Source: author's production. Note: The symbols "+" and "–" indicate the expected direction of the relationship between the variables. A plus sign (+) denotes a positive relationship, whereas a minus sign (–) denotes an inverse (negative) relationship.

The table with additional information about the variables is included in the Appendix A. The primary dependent variable, AIV, captures signs of opportunistic insider trading. Yang et al. (2020) document a positive relationship between AIV and abnormal gains prior to earnings announcements and show that lower AIV values are associated with reduced information risk. Because insider trading affects both trading intensity and price dynamics, AIV serves as a price-based measure of information risk. Consistent with the literature, insider trading occurring before earnings announcements exerts a stronger effect on stock prices, as information becomes particularly valuable in uncertain environments (Arrow 1963; Chauhan et al. 2016).

To construct AIV, five steps were followed: (i) data collection; (ii) estimation of daily residuals using prior-year data; (iii) aggregation of residuals for the pre-earnings announcement (PEA) and non-event announcement (NEA) periods; (iv) computation of IVPEA and IVNEA; and (v) calculation of AIV. The PEA corresponds to the five trading days preceding disclosure, whereas the NEA includes all trading days in a one-year window excluding the eleven-day event window (the disclosure day, five days before, and five days after). Disclosure dates and times for quarterly and annual financial statements and material facts were obtained from official filings. When disclosures occurred between 00:00 and 10:00 a.m., the same trading day was retained; disclosures between 10:01 a.m. and 11:59 p.m. were assigned to the following trading day, as intraday disclosures may affect trading behavior.

Daily residuals were estimated using rolling regressions implemented in statistical software., resulting in more than one million regressions. Specifically, for each of 3024 trading days, returns from the previous 252 trading days were used to estimate the Fama–French three-factor model (Fama and French 1993), as shown in Equation (3):

$$R_{i,t} - R_{Ft} = \alpha_i + \beta_i MKT_t + s_i SMB_t + h_i HML_t + \varepsilon_{it} \quad (3)$$

where $R_{i,t}$ represents return of firm, *RFt* is risk-free rate; *MKT* is the difference between the daily returns weighted by the market value of the portfolio, *SMB* represents return of a portfolio long in stocks with low market capitalization (small) and short in stocks with high market capitalization (large), *HML* is the return of a portfolio long in stocks with a high book-to-market ratio and short in stocks with a low book-to-market ratio, and ε is the residual of the model referring to portfolio.

Idiosyncratic volatility for the PEA and NEA periods was then calculated as:

$$IV_{PEA} = ln\sqrt{\frac{252\ x\ \Sigma_{j\varepsilon PEA}\varepsilon_j^2}{n_{PEA}-1}} \quad (4)$$

$$IV_{NEA} = ln\sqrt{\frac{252\ x\ \Sigma_{j\varepsilon NEA}\varepsilon_j^2}{n_{NEA}-1}} \quad (5)$$

where *nPEA* represents the number of days before results announcement and *nNEA* is the number of days after results announcement.

AIV is defined as the difference between these two components:

$$AIV = IV_{PEA} - IV_{NEA} \quad (6)$$

Considering that AIV captures the difference in idiosyncratic volatility between periods preceding information disclosure and periods without disclosure, and that insider trading typically occurs prior to disclosure events, AIV is expected to capture evidence of opportunistic insider trading, as suggested by Yang et al. (2020). To test the research hypothesis, the model incorporates variables representing corporate governance mechanisms related to monitoring, oversight, and transparency, which the literature identifies as mitigating opportunistic insider behavior (Ravina and Sapienza 2010; Tang et al. 2013; Ali and Hirshleifer 2017; Jacob 2019; Rahman et al. 2021; Wu et al. 2019; Contreras and Marcet 2021; Javakhadze et al. 2025).

The variable LEVELSGC (Levels of Corporate Governance) was included because prior studies indicate that governance mechanisms can constrain opportunistic behavior (Shleifer and Vishny 1997; La Porta et al. 2000; Ali and Hirshleifer 2017; Contreras and Marcet 2021; Javakhadze et al. 2025). However, other evidence suggests that adherence to differentiated governance levels does not necessarily improve governance practices (Black et al. 2010; Ventura et al. 2024). Moreover, the effectiveness of governance mechanisms in curbing opportunism may depend on institutional, cultural, and legal contexts (Ventura et al. 2024; Macagnan 2025). In this setting, firms that voluntarily assume governance obligations beyond minimum legal requirements are expected to reduce unethical behavior.

Additional variables capturing monitoring, oversight, and transparency were included to reflect behavioral governance dimensions. Specifically, the proportion of women on the board of directors (PFB), the existence of a fiscal council (CF), and audit committee size (ACSIZE) are expected to mitigate indications of opportunistic insider trading, as these mechanisms enhance internal monitoring and board effectiveness (Dash 2012; Procianoy and Decourt 2015; ElGammal et al. 2018; Borba et al. 2019; Rahman et al. 2021; Gupta et al. 2020; Jain and Zaman 2020; Wu et al. 2019; Ngo and Le 2021).

With respect to external monitoring, the model includes a dummy variable indicating whether the firm is audited by a Big Four auditor (AUDB4). Prior research documents higher audit quality when audits are conducted by large international audit firms (Francis and Yu 2009; Eshleman and Guo 2014). However, more recent evidence highlights the provision of consulting services by Big Four firms to companies involved in corporate scandals (Abid et al. 2018; Donelson et al. 2020; Hasnan et al. 2022; Friedrich and Quick

2024). Consequently, the relationship between Big Four auditing and AIV may be positive in contexts such as Brazil, where ownership concentration and informational asymmetry are high, potentially limiting auditors' ability to fully deter opportunistic behavior. Alternatively, this relationship may be negative, given the superior resources, expertise, and monitoring capacity of large audit firms.

Managers are increasingly concerned about reputational risk and the possibility that opportunistic behavior ex ante may lead to reputational losses ex post (Gao et al. 2014). Corporate reputation reflects stakeholders' aggregate perceptions of a firm's legitimacy, ethical conduct, and long-term sustainability. Accordingly, the firm's ESG score was included as a proxy for Good Reputation (GREP), as ESG performance constitutes an intangible asset that promotes managerial self-discipline (Gao et al. 2014). Firms with higher ESG scores are expected to adopt more ethical practices due to concerns about market perception and potential involvement in scandals. ESG scores, provided by Refinitiv, range from 0 to 100 and consolidate the Environmental, Social, and Governance dimensions based on publicly disclosed information.

To capture the firm's information environment, the number of analysts covering the firm was included as a proxy for Information Quality (IQ). Analyst coverage reflects firms' transparency and visibility in capital markets, as analysts act as information intermediaries who disseminate, interpret, and monitor corporate disclosures. Prior studies consistently associate higher analyst coverage with lower information asymmetry and greater transparency, rather than solely with accounting quality (Hillier et al. 2015; Ellul and Panayides 2018). Accordingly, higher levels of IQ are expected to be associated with fewer indications of opportunistic insider trading.

Rahman et al. (2021) document that board independence restricts opportunistic insider trading in Australian firms. However, in family-controlled firms, concentrated ownership may undermine board independence and weaken monitoring effectiveness (Jaggi and Tsui 2007). Evidence from emerging markets, such as Taiwan, further indicates that family firms engage more frequently in insider trading activities (Tang et al. 2013). Firms with concentrated ownership may leverage control to manipulate results and engage in opportunistic trading. Thus, it is expected that Non-Family Firms (NFF) reduce the likelihood of opportunistic behavior, whereas a higher proportion of family members on the board (FBOARD) weakens monitoring and increases the potential for self-interested misconduct.

Several control variables related to firms' information disclosure and signaling were included. Dividend Yield (DY) reflects expectations about future performance (de Pietro Neto et al. 2011). Shareholders with confidence in a firm's prospects may prefer earnings retention to finance investment, whereas dividend demands increase when growth prospects are limited (La Porta et al. 2000). Moreover, Simon et al. (2019) find that firms with lower profitability may distribute higher dividends to signal favorable future outcomes. Accordingly, a positive relationship between DY and AIV is expected. The following equation was used to calculate Dividend Yield:

$$DY = \frac{D}{P_{t-1}} \tag{7}$$

where DY represents dividend yield, D is the amount of dividends paid per share, and P_{t-1} is the value of the company's share on the day before the announcement date.

The variable tarnished reputation (NREP) is measured by the number of financial statement restatements. This proxy is motivated by evidence that firms engaging in opportunistic behavior, particularly earnings manipulation and weak financial performance, exhibit higher restatement frequencies (Ali and Hirshleifer 2017; Martins and Ventura Júnior 2020; Javakhadze et al. 2025). Moreover, prior studies widely employ restatements as an indicator of corporate misconduct (Ali and Hirshleifer 2017), thereby supporting the

use of NREP in the robustness analysis. Accordingly, a positive relationship between NREP and AIV is expected in the main model.

Media attention (MEDIA) is proxied by the natural logarithm of total assets, reflecting the premise that larger firms receive greater scrutiny from the media and financial analysts (Hodgson et al. 2020). Consistent with this view, recent empirical studies also adopt firm size as a proxy for media coverage intensity (Asante-Appiah and Lambert 2022). The literature further suggests that smaller firms are more prone to insider trading and earnings management practices (Ali and Hirshleifer 2017; Borochin et al. 2019). In the Brazilian context, compliance with laws and corporate regulations is often strengthened by pressure from society, capital markets, and the media, which increases firm visibility and perceived relevance (Ventura et al. 2024). Consequently, heightened public and market scrutiny is expected to act as a deterrent to managerial opportunism.

Volatility is included in the model because it captures financial market uncertainty and directly influences investors' decision-making. As a standard measure of risk, volatility reflects the variability of security prices over time (Bhowmik and Wang 2020). Higher volatility implies greater short-term uncertainty and risk exposure. Accordingly, volatility is employed as a proxy for Leaked Information (IVAZ), and its calculation follows Equation (8).

$$VOLAT_{i,t} = \sqrt{\frac{\sum(S_{i,d} - \overline{S})^2}{n}} \quad (8)$$

where $VOLAT_{i,t}$ represents the volatility of the closing price of corporation i's stock, $S_{i,d}$ is the natural logarithm of ($Pd/Pd\text{-}1$), where d is $1 \ldots n$ and Pd is the closing price of the stock on day d. $\overline{S}$ is the average of Sd in the year, and n is the number of quotation days in the year.

The risk of information leakage is associated with trading based on information that has not yet been publicly disclosed (Kacperczyk and Pagnotta 2019). An increase in the number of individuals with access to such information, as well as the proximity of major corporate events, such as mergers and acquisitions, heightens the likelihood of information leakage. As a result, the market devotes greater scrutiny to these firms and demands higher expected returns to compensate for the associated legal and informational risks. In this context, Kacperczyk and Pagnotta (2019) argue that abnormal trading activity and elevated asset price volatility reflect the dissemination of private information into the market, which may subsequently facilitate illegal trades based on privileged information. Accordingly, Information Leaks (IVAZ) are expected to be positively associated with evidence of opportunistic insider trading.

The control variable capturing firm profitability (RENT) is measured as the product of asset turnover and net profit margin. This variable is included to control for effects related to financial performance. Given that managerial opportunism is generally negatively associated with accounting-based and performance-related measures, a negative relationship between profitability and firm misconduct is expected. The empirical results are presented and discussed in the subsequent section.

3.2. Data and Sample

To achieve the proposed objective, the study population and sample were defined. The population comprised all firms listed on the B3 stock exchange during the continuous period from 2010 to 2021, encompassing a total of 12 years. This period was selected due to the adoption of new accounting standards in 2009 and because, from 2010 onward, firms were required to disclose information in their Reference Reports.

Regarding sample selection, firms that conducted an initial public offering (IPO) at the end of 2021 were excluded, as they did not have sufficient information available for

analysis, given that data disclosure extends until April of the subsequent year and the sample includes observations only up to 2021. In addition, firms that did not report daily stock returns were excluded, as these data are essential for calculating the daily residual used in constructing the Abnormal Idiosyncratic Volatility (AIV) measure.

For the computation of AIV, firms were required to have daily return data starting in 2009. As the first business day of the sample period is 4 January 2010, the estimation regressions were conducted using data from 5 January 2009 to 4 January 2010. After applying all exclusion criteria, the final sample consisted of 237 firms, as reported in Table 2.

Table 2. Criteria for excluding firms from the sample.

Total Number of Stock Forms with Shares Traded on the [B][3] in 2021	456
(−) Companies with data, only from 2021 onwards	(32)
(−) Companies without daily returns (2009 a 2021)	(187)
(=) Final number of firms included in the survey sample	**237**

Source: Research data.

This study analyzes the period from 2010 to 2021, comprising a total of 2175 observations. It should be noted that some firms are not observed in all years, as they began trading on the stock exchange after 2010 or because of data unavailability during the study period. Consequently, the analysis is conducted using an unbalanced panel dataset. Nevertheless, examining a twelve-year period enhances the reliability and robustness of the empirical results.

Accounting data were obtained from the Economatica® and Refinitiv databases. Corporate governance information was collected from the Comdinheiro database, while data on ownership structure were retrieved from the Fundamentus (2023) to construct the non-family firm variable. Daily data for the three factors of the Fama and French (1993) model, MKT, SMB, and HML, were obtained from NEFIN (Brazilian Center for Research in Financial Economics, University of São Paulo). Information used to calculate abnormal idiosyncratic volatility was collected from the website of the Comissão de Valores Mobiliários (CVM), the Brazilian Securities and Exchange Commission, the federal agency responsible for regulating, supervising, and fostering the development of the Brazilian capital market. Specifically, the following disclosure events were considered:

(a) date and time of publication of the quarterly financial statements;
(b) date and time of publication of the annual financial statements; and
(c) date and time of publication of material facts.

Material facts were selected based on the relevance of their content and their potential impact on firms' stock prices, consistent with prior literature (Meulbroek 1992; Lei and Wang 2014; Borochin et al. 2019; Goergen et al. 2019). These events include: (i) mergers, spin-offs, and incorporations; (ii) partnership agreements; (iii) acquisition and/or discovery of natural resources for potential economic and financial exploitation; (iv) termination and/or prohibition of natural resource exploitation; (v) business plans or projections; (vi) judicial reorganization; and (vii) bankruptcy. Data processing and organization were performed using spreadsheets, while panel data regressions and specification tests were conducted using Stata 15.1.

4. Empirical Results

4.1. Descriptive Statistics

To satisfy the statistical assumptions of the empirical analysis, the data were processed to mitigate potential estimation distortions. Accordingly, continuous variables were nor-

malized using natural logarithmic or square root transformations. Outliers were treated through 1% winsorization, except for dummy variables, which were not subject to any statistical transformation.

Table 3 presents the descriptive statistics of the variables used in the study for the period from 2010 to 2021. The Abnormal Idiosyncratic Volatility (AIV) variable captures evidence of opportunistic insider trading. The descriptive statistics indicate a maximum value of 1.86 and a minimum of −2.81, where higher AIV values correspond to a greater likelihood of opportunistic insider behavior. This interpretation is grounded in the premise that abnormal returns prior to information disclosure are higher than those observed after the release of information (Seyhun 1986). It should be noted, however, that AIV is an indirect proxy and may also reflect firm-specific uncertainty or information asymmetry unrelated to insider trading.

Table 3. Descriptive analysis of the sample. 2010–2021.

Variable	Obs.	Mean	Std. Dev.	Min	Max
AIV	2175	0.1057	0.3807	−2.8085	1.8659
LEVELSGC	2175	0.6942	0.4608	0.0000	1.0000
PFB	2175	0.1959	0.2228	0.0100	0.8944
CF	2175	0.6643	0.4723	0.0000	1.0000
GREP	2175	2.4447	3.4238	0.0100	9.3381
ACSIZE	2175	0.6918	0.8780	0.0100	2.4495
AUDB4	2175	0.7696	0.4211	0.0000	1.0000
QI	2175	1.2000	2.9205	0.0000	13.0000
FNF	2175	0.3622	0.4807	0.0000	1.0000
FBOARD	2175	0.2771	0.4395	0.0100	1.0000
DY	2175	3.5215	9.6199	0.0000	339.5180
NREP	2175	1.3834	0.6956	0.0000	7.0000
MEDIA	2175	15.1653	2.0545	3.2580	21.0374
IVAZ	2175	5.2298	2.6368	0.0100	21.7765
RENT	2175	1.9920	13.6429	−226.1382	125.3015

Source: author's calculation (2025).

Regarding corporate governance levels (LEVELSCG), which include firms listed on the Novo Mercado and Level 2 segments, the results indicate that, on average, 70% of the sample firms are listed at the highest corporate governance levels. This finding suggests that most firms listed on B3 comply with the requirements associated with enhanced governance standards, thereby signaling to the market their adherence to practices that exceed statutory obligations. Consistent with prior literature (Lee et al. 2014; Dai et al. 2015; Hodgson et al. 2020; Javakhadze et al. 2025), firms with stronger governance frameworks tend to implement more effective monitoring mechanisms and policies that constrain opportunistic insider trading.

The Proportion of Women on the Board of Directors (PFB) indicates that, at most, one woman serves on the board, and that, on average, only 20% of the firms in the sample exhibit gender diversity. This variable was winsorized and may therefore present minor variation. Nonetheless, the low representation of women on corporate boards remains noteworthy, particularly given prior evidence that female board members enhance monitoring due to greater conservatism and more ethical decision-making (Adams and Ferreira 2009; Ngo and Le 2021). This limited female representation reflects a structural characteristic of the Brazilian market during the period analyzed. Importantly, this constraint does not undermine the statistical validity of the results but instead underscores the empirical relevance of the topic and the need for further research as gender diversity continues to evolve in the Brazilian context.

The variable capturing the existence of a fiscal council (FC) indicates that, on average, 66% of the firms in the sample maintain this governance body. This finding is favorable, given that the fiscal council is responsible for overseeing managerial actions, issuing opinions on the annual management report, and reporting opportunistic behavior to governance bodies or the general shareholders' meeting, as well as recommending appropriate measures (Brasil 1976). Regarding Good Reputation (GREP), Table 2 shows that the maximum ESG score observed is 9; however, on average, only 2% of Brazilian firms adopt these practices. This finding suggests that adherence to ESG standards remains incipient in Brazil when compared to other countries (Gao et al. 2014; He et al. 2022). Finally, the AUDB4 variable indicates that, on average, 77% of the sample firms are audited by Big Four audit firms, suggesting a preference for large, internationally recognized auditors.

Furthermore, Table 3 indicates that the number of analysts following firms, captured by the variable QI, ranges from 0 to 13, revealing substantial heterogeneity in the level of analyst coverage. This variation suggests disparities in the attention directed toward firms. In this context, the MEDIA variable, proxied by the natural logarithm of total assets, reflects firm visibility and the degree of attention received from analysts and the broader market, exhibiting a considerable spread between its minimum (3.26) and maximum (21.04) values. These findings are consistent with prior literature, which documents a positive association between firm size and analyst and media attention (Hodgson et al. 2020; Ventura et al. 2024). Such visibility may constrain opportunistic behavior due to the potential negative repercussions of increased scrutiny. A similar pattern is observed for the Leaked Information variable (IVAZ), measured by volatility, which ranges from 0 to 22, with an average value of 5%.

The results for Non-Family Firms (NFF) indicate that, on average, only 36% of the firms in the sample are non-family-owned, highlighting the high concentration of ownership. This evidence corroborates prior studies on the structural characteristics of the Brazilian market (Crisóstomo and Brandão 2019; Yang and Xie 2024; Arias et al. 2021; Macagnan 2025). In addition, the Proportion of Family Members on the Board of Directors (FBOARD) shows that, on average, 28% of the firms have at least one family member serving on the board. Consistent with the literature, the presence of family members in corporate governance bodies is associated with weaker monitoring effectiveness (Jaggi and Tsui 2007).

Regarding the Tarnished Reputation Index (PRI), measured by the number of report republications, the results indicate that, on average, 1.4% of firms republish reports. However, the maximum observed value is seven republications of the same document. Such occurrences may signal potential corporate misconduct to the market, as report republications can result from either errors or fraud. In cases of misreporting, firms are required to correct their financial statements (Dechow et al. 1995; Ali and Hirshleifer 2017; Javakhadze et al. 2025).

Although the incidence of republications is low, this outcome can be explained by their sporadic nature. Nevertheless, report republications are closely associated with errors, governance failures, weaknesses in internal controls, and diminished informational credibility, which account for their high informational content. Consequently, even with a low frequency, the NREP variable exhibits a disproportionate reputational impact. This characteristic explains its statistical significance in the regression analyses and supports its validity as a proxy for reputational damage.

Overall, the results indicate that the sample predominantly consists of firms listed at the highest levels of corporate governance, audited by Big Four firms, and characterized by concentrated family ownership. Table 4 presents the Pearson correlation matrix. This test is used to assess potential multicollinearity among the study variables. According to Wooldridge (2014), correlation coefficients exceeding 0.80 indicate a multicollinearity concern. As shown in Table 4, no multicollinearity issues are detected, as all pairwise correlations remain below this threshold.

Table 4. Pearson correlation matrix (2010–2021).

	AIV	LEVELSGC	PFB	CF	GREP	ACSIZE	AUDB4	QI	FNF	FBOARD	DY	NREP	MEDIA	IVAZ	RENT
AIV	1														
LEVELSGC	−0.1842 *	1													
PFB	−0.0364	−0.0678 *	1												
CF	−0.0542 *	0.1074 *	0.0147	1											
GREP	−0.2617 *	0.3429 *	0.1179 *	0.1945 *	1										
ACSIZE	−0.1551 *	0.2642 *	0.0244	0.0405	0.3587 *	1									
AUDB4	−0.0338	0.3788 *	−0.0281	0.0921 *	0.2416 *	0.2406 *	1								
QI	−0.2397 *	0.2297 *	0.2116 *	0.1521 *	0.4018 *	0.2489 *	0.1261 *	1							
FNF	−0.0680 *	0.0393	0.0488 *	0.1792 *	0.2011 *	0.2638 *	0.1534 *	0.0905 *	1						
FBOARD	0.0314	0.0168	−0.0005	−0.0943 *	−0.0855 *	−0.1278 *	−0.0487 *	−0.0615 *	−0.4583 *	1					
DY	0.0507 *	−0.0572 *	0.0721 *	0.0008	0.0057	0.0003	0.0086	−0.0126	0.0121	−0.0115	1				
NREP	0.0575 *	0.0674 *	−0.0557 *	−0.0085	−0.0083	0.0928 *	0.0944 *	−0.0468 *	0.0740 *	−0.0522 *	0.0069	1			
MEDIA	−0.2270 *	0.4001 *	0.0314	0.2705 *	0.6608 *	0.4113 *	0.4167 *	0.3478 *	0.2184 *	−0.0891 *	0.0275	0.1412 *	1		
IVAZ	−0.0902 *	0.3010 *	−0.0639 *	0.0363	0.1075 *	0.0818 *	0.0807 *	0.1428 *	0.0105	−0.0169	−0.1030 *	−0.0049	0.0910 *	1	
RENT	−0.0463 *	0.0295	0.0837 *	−0.0053	0.0880 *	0.0433 *	0.1684 *	0.0689 *	0.0249	−0.0075	0.1022 *	−0.0119	0.1227 *	−0.1648 *	1

Source: Author's calculations (2025). Note: This table reports on Pearson correlation coefficients. * indicates statistical significance at the 5% level.

The corporate governance level variable (LEVELSCG) exhibits a correlation of 37.88% with firms audited by Big Four auditors (AUDB4) and a correlation of 40.00% with media attention (MEDIA). The Good Reputation variable (GREP) shows a correlation of 35.87% with audit committee size. Information quality (QI) and Good Reputation (GREP) are correlated at 40.18%. Firms audited by Big Four auditors (AUDB4) also display a positive correlation of 41.67% with media attention (MEDIA). Among all explanatory variables, Good Reputation (GREP) presents the strongest association with the dependent variable, Abnormal Idiosyncratic Volatility (AIV), exhibiting a negative correlation of 26.17%. Overall, the magnitude of these correlations indicates that multicollinearity is not a concern in the empirical analysis.

4.2. Corporate Governance as a Mechanism for Mitigating Opportunistic Insider Trading

Specification tests for panel data models indicate that the fixed-effects specification is the most appropriate for estimating Equation (1). Accordingly, regressions were estimated using an unbalanced panel with fixed effects. Following Belsley et al. (2005), centered variance inflation factor (VIF) values below 10 indicate the absence of multicollinearity. The VIFs were computed for all independent variables, and as reported in Table 4, the average VIF is 1.36, corroborating the correlation matrix results and confirming that multicollinearity is not a concern.

Table 5 reports the estimation results for Equation (1) and the corresponding hypothesis tests. The findings indicate that corporate governance mechanisms mitigate indicators of opportunistic insider trading, consistent with the study's objective. Specifically, the first column presents the study variables, the second column reports the VIF values, and the third column displays the estimated coefficients along with their respective significance levels.

Table 5. Results of the estimation of corporate governance aspects mitigating indications of opportunistic insider trading using a fixed-effects panel model (2010–2021).

AIV	(1)	VIF	(2)	VIF	(3)	VIF
LEVELSGC	−0.3357 ***	1.31	−0.3017 ***	1.35	−0.3077 ***	1.45
PFB	−0.1185 **	1.07	−0.0945 **	1.07	−0.0993 **	1.09
CF	−0.0596 **	1.05	−0.0428 **	1.12	−0.0498 **	1.12
GREP	−0.0168 ***	1.42	−0.0100 *	1.99	−0.0114 **	1.99
ACSIZE	−0.0308 **	1.21	−0.0238	1.32	−0.0268 *	1.32
AUDB4	0.0544 **	1.21	0.0688 **	1.32	0.0737 **	1.35
QI	−0.0146 ***	1.28	−0.0097 ***	1.30	−0.0105 ***	1.31
FNF			−0.0641	1.40	−0.0755 *	1.40
FBOARD			0.0420	1.27	0.0456 *	1.27
NREP			0.0425 ***	1.06	0.0431 ***	1.06
MEDIA			−0.0681 ***	2.32	−0.0612 ***	2.33
DY					0.0018 **	1.03
IVAZ					0.0127 ***	1.16
RENT					−0.0011 *	1.09
Constant	0.4389 ***	1.22	1.3478 *,**	1.41	1.1880 ***	1.36
Observations	2187		2181		2175	
Groups	240		238		237	
R^2 (within)	0.0662		0.0828		0.0908	
F-statistic	19.65		15.85		13.73	
Prob > F	0.0000		0.0000		0.0000	

Source: author's calculation (2025). Note: Coefficients are reported. Variance Inflation Factors (VIF) are presented to assess multicollinearity. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables capturing corporate governance mechanisms associated with enhanced monitoring and oversight—namely corporate governance levels (LEVELSCG), the proportion

of women on the board of directors (PFB), the existence of a fiscal council (FC), and audit committee size (ACSIZE)—exhibit statistically significant negative relationships with Abnormal Idiosyncratic Volatility (AIV) at the 1%, 5%, 5%, and 10% levels, respectively. These findings are consistent with the literature, which suggests that opportunistic behavior can be mitigated by more effective governance structures that strengthen monitoring mechanisms (Williamson 1988, 1999; Chung et al. 2019; Rahman et al. 2021). In this context, prior studies also document that female board representation reduces corporate misconduct, as women tend to be more risk-averse, ethically oriented, and compliant with regulations, and are more likely to participate actively in governance monitoring committees (Adams and Ferreira 2009; Cumming et al. 2015; Gupta et al. 2020; Jain and Zaman 2020; Wu et al. 2019).

Consistent with previous evidence, audit committee size and the presence of a fiscal council are associated with stronger internal monitoring (Borba et al. 2019; Oradi and Izadi 2020; Ngo and Le 2021). Although these bodies serve distinct functions, both play a critical role in overseeing management and, in particular, in scrutinizing financial statements to ensure that they accurately reflect the firm's economic reality, thereby enhancing transparency and the reliability of accounting information.

The variable capturing the number of analysts, used as a proxy for information quality (IQ), displays a negative association with AIV at the 1% level. Given that insiders typically possess informational advantages over other market participants (Akerlof 1970; Myers and Majluf 1984; Easley and O'Hara 2004; Williamson 1991, 1993, 1999; Masson and Madhavan 1991; Wang 1993; Shleifer and Vishny 1997), analyst coverage contributes to reducing information asymmetry. Accordingly, this result aligns with prior literature indicating that financial analysts constrain insiders' informational advantages and mitigate market inefficiencies (Hillier et al. 2015; Cline et al. 2017; Ellul and Panayides 2018; Wu et al. 2019).

The Non-Family Firms variable (NFF) shows a negative association with AIV at the 10% significance level, suggesting lower indications of opportunistic insider trading among non-family-controlled firms. This finding corroborates prior studies demonstrating that family ownership and higher ownership concentration facilitate the use of private information before the disclosure of financial reports (Grossman and Stiglitz 1980; Claessens et al. 2000; Jaggi and Tsui 2007; Huang et al. 2012; ElGammal et al. 2018; Abid et al. 2018; Rahman et al. 2021; Arias et al. 2021; Yang and Xie 2024). This pattern can be explained by the flow of privileged information through dense social networks based on family ties, friendships, and geographical proximity (Ahern 2017).

Shleifer and Vishny (1997) argue that one of the central governance challenges arises from ownership concentration, which enables the expropriation of non-controlling shareholders. This perspective supports the findings of this study and is consistent with prior evidence (Jaggi and Tsui 2007; ElGammal et al. 2018). The proportion of family members on the board of directors (FBOARD) exhibits a positive association with Abnormal Idiosyncratic Volatility (AIV) at the 10% significance level, in line with the literature. In this context, previous studies indicate that a higher proportion of independent directors can attenuate the positive relationship between insider trading and earnings management (Jaggi and Tsui 2007).

In addition, the variable capturing firms audited by Big Four auditors shows a positive association with indicators of opportunistic insider trading at the 5% level. This finding corroborates prior studies (Healy and Palepu 2001; He et al. 2017; Abid et al. 2018; Javakhadze et al. 2025), which document that firms audited by Big Four auditors are more frequently involved in fraud scandals, earnings management, and opportunistic insider trading. Importantly, this result does not necessarily imply lower audit quality; rather, it may reflect firm-specific characteristics, as Big Four–audited firms tend to be larger, more

complex, and more exposed to capital markets, which increases informational risk and creates greater opportunities for opportunistic behavior by insiders.

The observed positive association may therefore stem from self-selection effects, whereby firms with greater operational complexity and visibility demand audits from highly reputable auditors. Moreover, the literature suggests that, in certain institutional settings, Big Four performance may be constrained by potential conflicts of interest arising from the joint provision of audit and consulting services, as well as by limitations in regulatory oversight and enforcement (Abid et al. 2018; Javakhadze et al. 2025). In the Brazilian context, characterized by high ownership concentration and pronounced information asymmetry, such factors may limit the ability of highly reputable audit firms to fully curb opportunistic behavior, without implying systemic deficiencies in audit quality.

The variable good reputation (GREP), proxied by the ESG score, exhibited a negative and statistically significant association at the 5% level with the AIV. This finding supports the argument that reputational concerns constitute an informal enforcement mechanism that constrains opportunistic behavior (Williamson 1988, 1993, 1999). Prior studies indicate that firms engaged in ESG practices tend to adopt codes of ethical conduct and foster organizational cultures oriented toward social, environmental, and corporate responsibility, thereby discouraging insiders from engaging in opportunistic behavior (Gao et al. 2014; Hillier et al. 2015; Lu 2023).

From this perspective, the MEDIA variable, which captures media attention to the firm, also presented a negative association at the 10% significance level with indicators of opportunistic insider trading. This result is consistent with the literature suggesting that smaller firms are more susceptible to opportunistic behavior (Ali and Hirshleifer 2017; Borochin et al. 2019; Hodgson et al. 2020). Larger firms, by contrast, tend to face greater media scrutiny and market visibility and therefore place greater emphasis on governance quality as a mechanism to deter opportunistic actions (Javakhadze et al. 2025).

Media coverage of opportunistic insider behavior can shape public opinion and amplify perceptions of misconduct, thereby intensifying reputational damage (Dai et al. 2015). Moreover, the media plays a particularly influential role in environments characterized by extensive information sharing on social networks and frequent firm–stakeholder interactions (Dai et al. 2015; Hodgson et al. 2020). In this context, media exposure serves as a governance mechanism, as insiders may refrain from trading on privileged information to avoid adverse public scrutiny.

The DY variable exhibited a positive association with AIV at the 5% significance level, indicating that firms facing opportunistic problems tend to distribute higher dividends to compensate shareholders for increased risk and uncertainty regarding future performance. This finding is consistent with prior evidence suggesting that dividend payments may function as a signaling mechanism in contexts characterized by heightened informational risk (de Pietro Neto et al. 2011; Simon et al. 2019; Javakhadze et al. 2025).

Within this context of adverse market perception, the republication variable, used as a proxy for tarnished reputation (NREP), displayed a positive and statistically significant relationship at the 1% level with indicators of insider trading. This result aligns with previous studies showing that a higher frequency of republications is associated with a greater likelihood of misconduct within the firm (BenYoussef and Khan 2017; He et al. 2017; Ali and Hirshleifer 2017; ElGammal et al. 2018; Martins and Ventura Júnior 2020; Oradi and Izadi 2020; He et al. 2022).

In addition, the leaked information variable (IVAZ), proxied by stock price volatility, presented a positive and significant association at the 10% level with indications of opportunistic insider trading. This evidence is consistent with the literature, which suggests that elevated volatility may reflect trading based on non-public information, as prices prior to

disclosure do not fully incorporate the asset's fair value due to informational asymmetry between insiders and other market participants (Degryse et al. 2014; Lei and Wang 2014; Vitale 2018; Posylnaya et al. 2019; Contreras and Marcet 2021; Ryu et al. 2022; Akerlof 1970; Williamson 1988, 1999).

Finally, the profitability control variable (RENT) showed a negative association with AIV at the 10% significance level, indicating that firms less prone to opportunistic insider trading tend to exhibit higher profitability, likely due to greater market confidence. This result supports theoretical and empirical evidence linking lower opportunism and stronger governance to value creation (Fama 1978; Myers and Majluf 1984; Verrecchia 2001; ElGammal et al. 2018; Jacob 2019; Contreras and Marcet 2021; Javakhadze et al. 2025). As noted by Williamson (1999), opportunistic behavior increases contractual risk and can adversely affect firm value.

Overall, the results indicate that the research hypothesis is not rejected and that the expected signs of the variables are confirmed. Accordingly, corporate governance mechanisms, through enhanced monitoring and transparency, play a critical role in curbing opportunistic behavior and reducing information asymmetry, thereby mitigating indications of opportunistic insider trading (Jensen and Meckling 1976; Fama 1980; Fama and Jensen 1983; Williamson 1979, 1988, 1991, 1993, 1999; Ali and Hirshleifer 2017; Javakhadze et al. 2025). According to Macagnan (2025), differences and similarities are identified in governance mechanisms in different countries. In Brazil, the aspects that denote the quality of corporate governance are: firms without family control, diversity and size of boards, firms listed at differentiated governance levels, and firms with ESG indicators. All mechanisms were confirmed. This means that a firm listed at differentiated governance levels is related to a reduction in insider information, for example. The robustness tests are presented and discussed in the following section.

4.3. Robustness Tests

For the robustness test, Equation (1) was re-estimated by replacing the variable AIV, which captures indications of opportunistic insider trading, with the tarnished reputation variable (NREP), proxied by the republication of firms' financial statements. This substitution is supported by the literature, which identifies financial statement republication as an indicator of corporate misconduct and opportunistic behavior (BenYoussef and Khan 2017; He et al. 2017; Ali and Hirshleifer 2017; ElGammal et al. 2018; Oradi and Izadi 2020; He et al. 2022). Moreover, prior studies have explicitly employed republication as a proxy for corporate misconduct, reinforcing its suitability for robustness analysis (Ali and Hirshleifer 2017; Asante-Appiah and Lambert 2022; Javakhadze et al. 2025). Accordingly, the robustness test is expected to corroborate the main findings of this study.

As reported in Table 6, three models were estimated to assess robustness. In the first specification, tarnished reputation (NREP) was regressed exclusively on variables representing corporate governance characteristics, corresponding to Estimate (1), with results presented in the third column of the table. This specification reveals a negative and statistically significant association between NREP and the variables levels of corporate governance (LEVELSCG), fiscal council (FC), and good reputation (GREP). Conversely, NREP exhibits a positive and significant relationship at the 5% level with firms audited by Big Four auditors (AUDB4). Although the variables proportion of women on the board of directors (PFB), audit committee size (ACSIZE), and information quality (QI) are not statistically significant, their estimated coefficients display signs consistent with those obtained when AIV is used as the dependent variable.

Table 6. Robustness test results using fixed-effects panel models (2010–2021).

Variable	(1) Coef.	VIF	(2) Coef.	VIF	(3) Coef.	VIF
LEVELSGC	−0.4105 ***	1.31	−0.3945 ***	1.45	−0.3942 ***	1.45
PFB	−0.0522	1.07	−0.0557	1.08	−0.0553	1.09
CF	−0.1050 **	1.05	−0.1019 **	1.12	−0.1025 **	1.12
GREP	−0.0432 ***	1.42	−0.0422 ***	1.96	−0.0423 ***	1.96
ACSIZE	−0.0284	1.22	−0.0262	1.32	−0.0262	1.32
AUDB4	0.1242 **	1.21	0.1224 **	1.32	0.1225 **	1.35
QI	−0.0079	1.28	−0.0067	1.30	−0.0067	1.30
FNF			0.0458	1.40	0.0456	1.40
FBOARD			−0.0375	1.27	−0.0375	1.27
MEDIA			−0.0151	2.26	−0.0146	2.27
IVAZ			−0.0139 *	1.12	−0.0140 *	1.16
DY					−0.0000	1.03
RENT					−0.0001	1.09
Constant	1.7877 ***	1.22	2.0680 ***	1.42	2.0608 ***	1.37
Observations	2175		2175		2175	
Groups	237		237		237	
R^2 (within)	0.0297		0.0315		0.0315	
F-statistic	8.44		5.70		4.82	
Prob > F	0.0000		0.0000		0.0000	

Source: Authors' calculations (2025). Note: This table reports fixed-effects panel regression results with NREP as the dependent variable. Reported values are estimated coefficients. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively. Variance Inflation Factors (VIF) are reported to assess multicollinearity.

In the second specification, additional control variables were incorporated, namely non-family firms (NFF), proportion of family members on the board of directors (FBOARD), media attention (MEDIA), and leaked information (IVAZ). Under this model, tarnished reputation (NREP) maintains a negative and statistically significant association with the same corporate governance variables identified in the first specification and also exhibits a significant negative relationship with leaked information (IVAZ). The positive and statistically significant association with Big Four auditors (AUDB4) persists at the 5% level. The final specification includes the full set of variables previously tested using AIV as the dependent variable, yielding results consistent with those obtained in the second estimation.

Therefore, the robustness tests confirm the results obtained in the main model, in line with the literature showing that corporate governance mechanisms can mitigate opportunism and reduce information asymmetry, thereby limiting indications of opportunistic insider trading (Arrow 1963, 1969; Akerlof 1970; Jensen and Meckling 1976; Fama 1980; Fama and Jensen 1983; Myers and Majluf 1984; Easley and O'Hara 2004; Williamson 1988, 1991, 1993, 1999; Masson and Madhavan 1991; Wang 1993; Shleifer and Vishny 1997; Gao et al. 2014; Hillier et al. 2015; Lee et al. 2014; Dai et al. 2015; Hodgson et al. 2020; Lu 2023; Javakhadze et al. 2025).

Although the robustness tests help mitigate concerns related to omitted variable bias, the possibility of reverse causality between corporate governance mechanisms and the use of private information cannot be fully ruled out. Nevertheless, governance structures tend to exhibit substantial persistence over time, which limits the informational gains associated with the use of lagged variables. Moreover, identifying theoretically sound and empirically valid instruments in the Brazilian context remains challenging, and the use of weak instruments could compromise the interpretation of the results. From a theoretical perspective, changes in governance practices are typically gradual and costly, making it unlikely that short-term opportunistic behavior determines the observed governance structure. This limitation is acknowledged and suggests avenues for future research, including comparative analyses involving firms listed on the Novo Mercado, with the aim

of further strengthening the robustness of the findings. The final considerations of this study are presented below.

5. Final Considerations

A more efficient governance structure can mitigate opportunistic behavior through its monitoring and control mechanisms (Akerlof 1970; Arrow 1969; Williamson 1988, 1999). This study examined which aspects of corporate governance reduce indications of opportunistic insider trading, considering the behavioral assumptions of bounded rationality and opportunism in an environment of uncertainty. To this end, the Abnormal Idiosyncratic Volatility (AIV) metric was employed to capture signals of opportunistic insider trading in a relevant emerging market. The results indicate that stricter monitoring, reflected in greater female representation on boards of directors, the presence of a Fiscal Council, and a more robust audit committee, combined with greater transparency through analyst coverage, significantly reduces indications of opportunistic insider trading.

In addition, the findings show that, beyond formal monitoring and transparency mechanisms aimed at mitigating information asymmetry and opportunism, insiders are also influenced by concerns about reputation in the market and society. Therefore, to the extent that there is a reduction in information asymmetry through voluntary disclosure by the firm or through more efficient control mechanisms by the CVM (Brazilian Securities and Exchange Commission), with significant penalties, this should be reflected in a mitigation of opportunistic behavior. This will lead to a reduction in risk for the firm and the market.

Accordingly, variables capturing reputational considerations, such as good reputation (GREP), proxied by ESG scores, and media attention, proxied by firm size, exhibit a negative relationship with indications of opportunistic insider trading. These results are consistent with the literature suggesting that reputational concerns can function as informal enforcement mechanisms against opportunism (Williamson 1988, 1993; Gao et al. 2014; Hillier et al. 2015; Lu 2023). Conversely, variables associated with opportunistic firm characteristics show a positive relationship with insider trading indicators, as more frequent republications increase the likelihood of corporate misconduct. Similarly, elevated stock price volatility may signal transactions based on undisclosed information. Nevertheless, if insiders lack ethical values that restrain opportunistic behavior, governance mechanisms alone may be insufficient to mitigate the occurrence of opportunistic insider trading.

Although the research confirmed all hypotheses, it has limitations that should be considered, among them the potential endogeneity between governance structures and insider trading. The results reflect the Brazilian context, and the analysis is based on variables representing governance mechanisms. However, from a more critical perspective, these findings should be interpreted with caution, as the analysis does not account for several alternative explanatory frameworks. Although India is also an emerging economy and a member of the BRICS group, it exhibits lower crime rates than Brazil despite having a larger population (Teixeira et al. 2025). This comparison suggests that an exclusive focus on governance mechanisms may be insufficient. A broader institutional perspective, encompassing cultural norms, social customs, and the educational system, among other factors, may provide a more comprehensive understanding of the observed outcomes.

This study was based on the perspective of Akerlof (1970), Arrow (1963), and Williamson (1988, 1999) on informational asymmetry and opportunism. This research does not delve into signaling, agency, and institutional theory. These perspectives can be explored in other works.

Overall, the research hypothesis is supported, and the results corroborate prior empirical evidence. In this context, the study offers relevant contributions to both the academic literature and market participants. First, it employs Abnormal Idiosyncratic Volatility

(AIV), a market-based measure of information risk, as a proxy for detecting indications of opportunistic insider trading. This measure captures differences in firms' idiosyncratic volatility before and after earnings announcements and the disclosure of material information, thereby reflecting information incorporated into stock prices and expected returns. Moreover, prior research indicates that AIV is associated not only with abnormal return variation but also with insider trading activity, short selling, and institutional trading behavior (Yang et al. 2020).

The findings further suggest that stricter legislation, although necessary, is insufficient to fully deter opportunistic practices, particularly in emerging markets. Governance reforms should therefore integrate formal monitoring and transparency mechanisms with informal channels such as reputation and social scrutiny. For regulators, the results highlight the importance of fostering effective governance structures and enhanced disclosure. For investors, governance quality and reputation emerge as relevant signals of informational risk. For boards of directors, the composition and strengthening of internal control mechanisms are shown to be central to mitigating opportunistic insider trading. Overall, this study contributes to the literature and the regulatory debate by demonstrating how multiple dimensions of corporate governance can reduce incentives for insider trading in a major emerging market, namely the Brazilian stock market in Latin America.

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Appendix A

Table A1. Definition of the variables studied in the research.

Abbreviation	Variable	Description/Calculation	Theoretical Basis
		Dependent Variable	
AIV	Abnormal Idiosyncratic Volatility	It detects evidence of opportunistic insider trading.	(Williamson 1979, 1988, 1991, 1993, 1999; Fama 1980; Akerlof 1970; Grossman and Stiglitz 1980; Yang et al. 2020)
		Independent Variables	
LEVELSGC	Levels of Corporate Governance	A dummy variable that takes the value 1 if the firm is part of the Novo Mercado and Level 2 of corporate governance, and 0 otherwise.	(Shleifer and Vishny 1997; La Porta et al. 2000; Ravina and Sapienza 2010; Jagolinzer et al. 2011; Lee et al. 2014; Ali and Hirshleifer 2017; Contreras and Marcet 2021; Javakhadze et al. 2025).
PFB	Proportion of Women on the Board of Directors	The number of women on the board of directors divided by the total number of members.	(Cumming et al. 2015; Gupta et al. 2020; Jain and Zaman 2020; Wu et al. 2019; Ngo and Le 2021)

Table A1. *Cont.*

Abbreviation	Variable	Description/Calculation	Theoretical Basis
CF	Fiscal Council	A dummy variable that takes the value 1 if the firm has a fiscal council and 0 otherwise.	(Procianoy and Decourt 2015; ElGammal et al. 2018; Borba et al. 2019; Jain and Zaman 2020)
GREP	Good reputation	It is represented by the ESG score. It refers to an overall company score, calculated by Refinitiv, based on information disclosed by companies on the environmental, social, and corporate governance pillars.	(Dechow et al. 1995; Gao et al. 2014; Ali and Hirshleifer 2017; ElGammal et al. 2018; Javakhadze et al. 2025)
ACSIZE	Audit Committee Size	Number of members on the audit committee.	(Dash 2012; Borba et al. 2019; Rahman et al. 2021; Ngo and Le 2021)
AUDB4	Audited by Big Four	A dummy variable that takes the value 1 if the firm is audited by auditing firms, characterized as the Big Four, and 0 otherwise.	(Healy and Palepu 2001; Francis and Yu 2009; Eshleman and Guo 2014; He et al. 2017; Abid et al. 2018; Donelson et al. 2020; Hasnan et al. 2022; Friedrich and Quick 2024)
QI	Information Quality	It is represented by the number of analysts who follow the firm.	(Healy and Palepu 2001; Ellul and Panayides 2018; Wu et al. 2019)
FNF	Non-Family Businesses	A dummy variable that takes the value 1 if the firm is not classified as family-owned, and 0 otherwise.	(Grossman and Stiglitz 1980; Claessens et al. 2000; Abid et al. 2018; Rahman et al. 2021; Yang and Xie 2024; Arias et al. 2021)
FBOARD	Percentage of Family Members on the Board of Directors	Percentage of family member participation on the Board of Directors.	(Grossman and Stiglitz 1980; Jaggi and Tsui 2007; ElGammal et al. 2018; Abid et al. 2018)
		Control Variables	
DY	Dividend Yield	Value of dividends paid divided by the value of the firm.	(La Porta et al. 2000; de Pietro Neto et al. 2011)
NREP	Tarnished Reputation	Number of republications performed by the firm.	(He et al. 2017; Ali and Hirshleifer 2017; ElGammal et al. 2018; Oradi and Izadi 2020; He et al. 2022)
MEDIA	Media Attention	Natural logarithm of total assets.	(Dai et al. 2015; ElGammal et al. 2018; Contreras and Marcet 2021).
IVAZ	Leaked Information	Volatility.	(Lei and Wang 2014; Vitale 2018; Posylnaya et al. 2019; Contreras and Marcet 2021; Ryu et al. 2022; Yang et al. 2020)
RENT	Profitability	Asset turnover multiplied by net profit margin.	(Fama 1978; Myers and Majluf 1984; Verrecchia 2001; ElGammal et al. 2018; Javakhadze et al. 2025)

References

Abid, Ammar, Muhammad Shaique, and Muhammad Anwar Ul Haq. 2018. Do Big Four auditors always provide higher audit quality? Evidence from Pakistan. *International Journal of Financial Studies* 6: 58. [CrossRef]

Adams, Renée B., and Daniel Ferreira. 2009. Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics* 94: 291–309. [CrossRef]

Ahern, Kenneth R. 2017. Information networks: Evidence from illegal insider trading tips. *Journal of Financial Economics* 125: 26–47. [CrossRef]

Akerlof, George A. 1970. The market for "lemons": Quality uncertainty and the market mechanism. *Quarterly Journal of Economics* 84: 488–500. [CrossRef]

Ali, Usman, and David Hirshleifer. 2017. Opportunism as a firm and managerial trait: Predicting insider trading profits and misconduct. *Journal of Financial Economics* 126: 490–515. [CrossRef]

Arias, José E. Tobar, Andres Mora Valencia, and Esther B. Del Brío González. 2021. Gobierno corporativo e insider trading: La concentración de la propiedad como variable moderadora del rol de control de los consejos. *Cuadernos de Administración* 34: 1–17. [CrossRef]

Arrow, Kenneth J. 1963. Uncertainty and the welfare economics of medical care. *American Economic Review* 53: 941–73.

Arrow, Kenneth J. 1969. The organization of economic activity: Issues pertinent to the choice of market versus nonmarket allocation. In *The Analysis and Evaluation of Public Expenditure: The PPB System*; Washington: U.S. Government Printing Office, vol. 1, pp. 59–73.

Asante-Appiah, Bright, and Tamara A. Lambert. 2022. The role of the external auditor in managing environmental, social, and governance (ESG) reputation risk. *Review of Accounting Studies* 28: 2589–641. [CrossRef]

Associação Brasileira das Entidades dos Mercados Financeiro e de Capitais (ANBIMA). 2022. Emissões no Mercado de Capitais Registram R$ 401,6 Bilhões em 2022. Available online: https://www.anbima.com.br/pt_br/informar/relatorios/mercado-de-capitais/boletim-de-mercado-de-capitais/emissoes-no-mercado-de-captais-registram-r-401-6-bi-em-2022-8A2AB28883CD3DD00183D197B4EB30DB-00.htm (accessed on 20 June 2023).

Batten, Jonathan A., Igor Lončarski, and Peter G. Szilagyi. 2021. Strategic insider trading in foreign exchange markets. *Journal of Corporate Finance* 69: 101818. [CrossRef]

Belsley, David A., Edwin Kuh, and Roy E. Welsch. 2005. *Regression diagnostics: Identifying influential data and sources of collinearity*. New York: John Wiley & Sons.

BenYoussef, Nourhene, and Saqib Khan. 2017. Identifying fraud using restatement information. *Journal of Financial Crime* 24: 620–27. [CrossRef]

Berle, Adolf A., and Gardiner C. Means. 1932. *The Modern Corporation and Private Property*. New Brunswick: Transaction Publishers.

Bhattacharya, Sudipto, and Giovanna Nicodano. 2001. Insider trading, investment, and liquidity: A welfare analysis. *Journal of Finance* 56: 1141–56. [CrossRef]

Bhowmik, Roni, and Shouyang Wang. 2020. Stock market volatility and return analysis: A systematic literature review. *Entropy* 22: 522. [CrossRef]

Black, Bernard S., Antonio Gledson de Carvalho, and Érica Gorga. 2010. Corporate governance in Brazil. *Emerging Markets Review* 11: 21–38. [CrossRef]

Black, Bernard S., Antonio Gledson de Carvalho, and Joelson Oliveira Sampaio. 2014. The evolution of corporate governance in Brazil. *Emerging Markets Review* 20: 176–95. [CrossRef]

Borba, Mariane Alves, Mayara Diana Dos Santos, Luciane Dagostini, and Eliandro Schvirck. 2019. A influência das características do conselho de administração, comitê de auditoria e conselho fiscal no audit delay. *Revista Gestão Organizacional*.. [CrossRef]

Borochin, Paul, Chinmoy Ghosh, and Di Huang. 2019. Target information asymmetry and takeover strategy: Insights from a new perspective. *European Financial Management* 25: 38–79. [CrossRef]

Brasil. 1976. *Lei nº 6.404, de 15 de Dezembro de 1976 (Lei das Sociedades por Ações)*. Brasília: Presidência da República.

Chauhan, Yogesh, K. Kiran Kumar, and Chakrapani Chaturvedula. 2016. Information asymmetry and the information content of insider trades: Evidence from the Indian stock market. *Journal of Multinational Financial Management* 34: 65–79. [CrossRef]

Chowdhury, Abu, Sabur Mollah, and Omar Al Farooque. 2018. Insider trading, discretionary accruals, and information asymmetry. *The British Accounting Review* 50: 341–63. [CrossRef]

Chung, Sung Gon, Beng Wee Goh, Jimmy Lee, and Terry Shevlin. 2019. Corporate tax aggressiveness and insider trading. *Contemporary Accounting Research* 36: 230–58. [CrossRef]

Claessens, Stijn, Simeon Djankov, and Larry H. P. Lang. 2000. The separation of ownership and control in East Asian corporations. *Journal of Financial Economics* 58: 81–112. [CrossRef]

Cline, Brandon N., Sinan Gokkaya, and Xi Liu. 2017. The persistence of opportunistic insider trading. *Financial Management* 46: 919–964. [CrossRef]

Cohen, Lauren, Christopher Malloy, and Lukasz Pomorski. 2012. Decoding inside information. *The Journal of Finance* 67: 1009–43. [CrossRef]

Contreras, Harold, and Francesc Marcet. 2021. Sell-side analyst heterogeneity and insider trading. *Journal of Corporate Finance* 66: 101778. [CrossRef]

Crisóstomo, Vicente Lima, and Inácio de Freitas Brandão. 2019. The ultimate controlling owner and corporate governance in Brazil. *Corporate Governance: The International Journal of Business in Society* 19: 120–40. [CrossRef]

Cumming, Douglas, Tak Yan Leung, and Oliver Rui. 2015. Gender diversity and securities fraud. *The Academy of Management Journal* 58: 1572–93. [CrossRef]

Dai, Lili, Jerry T. Parwada, and Bohui Zhang. 2015. The governance effect of the media's news dissemination role: Evidence from insider trading. *Journal of Accounting Research* 53: 331–66. [CrossRef]

Dash, Amarendra Kumar. 2012. Media impact on corporate governance in India: A research agenda. *Corporate Governance: The International Journal of Business in Society* 12: 89–100. [CrossRef]

Dechow, Patricia M., Richard G. Sloan, and Amy P. Sweeney. 1995. Detecting earnings management. *The Accounting Review* 70: 193–225.

Degryse, Hans, Frank de Jong, and Joël Lefebvre. 2014. An empirical analysis of legal insider trading in the Netherlands. *De Economist* 162: 71–103. [CrossRef]

de Pietro Neto, José, Roberto Frota Decourt, and Oscar Claudino Galli. 2011. Proventos—A teoria da sinalização: Variações de mercado. *Revista de Administração FACES Journal* 10: 150–68. Available online: https://revista.fumec.br/index.php/facesp/article/view/1006 (accessed on 15 January 2022).

Donelson, Dain C., Matthew Ege, Andrew J. Imdieke, and Eldar Maksymov. 2020. The revival of large consulting practices at the Big 4 and audit quality. *Accounting, Organizations and Society* 87: 101157. [CrossRef]

Dong, Wang, Hongling Han, Yun Ke, and Kam C. Chan. 2018. Social trust and corporate misconduct: Evidence from China. *Journal of Business Ethics* 151: 539–62. [CrossRef]

Easley, David, and Maureen O'Hara. 2004. Information and the cost of capital. *The Journal of Finance* 59: 1553–83. [CrossRef]

ElGammal, Walid, Abdul-Nasser El-Kassar, and Leila Canaan Messarra. 2018. Corporate ethics, governance, and social responsibility in MENA countries. *Management Decision* 56: 273–91. [CrossRef]

Ellul, Andrew, and Marios Panayides. 2018. Do Financial Analysts Restrain Insiders' Informational Advantage? *Journal of Financial and Quantitative Analysis* 53: 203–41. [CrossRef]

Esen, M. Fevzi, Emrah Bilgic, and Ulkem Basdas. 2019. How to detect illegal corporate insider trading? A data mining approach for detecting suspicious insider transactions. *Intelligent Systems in Accounting, Finance and Management* 26: 60–70. [CrossRef]

Eshleman, John Daniel, and Peng Guo. 2014. Do Big 4 auditors provide higher audit quality after controlling for the endogenous choice of auditor? *Auditing: A Journal of Practice & Theory* 33: 197–219. [CrossRef]

Esqueda, Omar A., and Thomas O'Connor. 2020. Corporate governance and life cycles in emerging markets. *Research in International Business and Finance* 51: 101077. [CrossRef]

Fama, Eugene F. 1978. The effects of a firm's investment and financing decisions on the welfare of its security holders. *American Economic Review* 68: 272–84. Available online: https://www.jstor.org/stable/1805260 (accessed on 20 October 2021).

Fama, Eugene F. 1980. Agency problems and the theory of the firm. *Journal of Political Economy* 88: 288–307. [CrossRef]

Fama, Eugene F., and Kenneth R. French. 1993. Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics* 33: 3–56. [CrossRef]

Fama, Eugene F., and Michael C. Jensen. 1983. Separation of ownership and control. *Journal of Law and Economics* 26: 301–25. [CrossRef]

Francis, Jere R., and Michael D. Yu. 2009. Big 4 office size and audit quality. *Accounting Review* 84: 1521–52. [CrossRef]

Friedrich, Christian, and Reiner Quick. 2024. Do non-audit service failures impair auditor reputation? An analysis of KPMG advisory service scandals in Germany. *Critical Perspectives on Accounting* 98: 102550. [CrossRef]

Fundamentus–Invista Consciente. 2023. Available online: https://www.fundamentus.com.br/ (accessed on 1 March 2023).

Gao, Feng, Ling Lei Lisic, and Ivy Xiying Zhang. 2014. Commitment to social good and insider trading. *Journal of Accounting and Economics* 57: 149–75. [CrossRef]

Gider, Jasmin, and Christian Westheide. 2016. Relative idiosyncratic volatility and the timing of corporate insider trading. *Journal of Corporate Finance* 39: 312–34. [CrossRef]

Goergen, Marc, Luc Renneboog, and Yang Zhao. 2019. Insider trading and networked directors. *Journal of Corporate Finance* 56: 152–75. [CrossRef]

Grossman, Sanford J., and Joseph E. Stiglitz. 1980. On the impossibility of informationally efficient markets. *American Economic Review* 70: 393–408. Available online: https://www.jstor.org/stable/1805228 (accessed on 4 March 2021).

Gupta, Vishal K., Sandra Mortal, Bidisha Chakrabarty, Xiaohu Guo, and Daniel B. Turban. 2020. CFO gender and financial statement irregularities. *Academy of Management Journal* 63: 802–31. [CrossRef]

Hasnan, Suhaily, Nor Azlina A Rahman, Alfiatul Rohmah Mohamed Hussain, and Mazurina Mohd Ali. 2022. Corporate governance and ownership structure on illegal insider trading activities in Malaysian public listed companies. *Management & Accounting Review* 21: 95–117. [CrossRef]

He, Feng, Hanyu Du, and Bo Yu. 2022. Corporate ESG performance and manager misconduct: Evidence from China. *International Review of Financial Analysis* 82: 102201. [CrossRef]

He, Xianjie, Jeffrey A. Pittman, Oliver M. Rui, and Donghui Wu. 2017. Do social ties between external auditors and audit committee members affect audit quality? *Accounting Review* 92: 61–87. [CrossRef]

Healy, Paul M., and Krishna G. Palepu. 2001. Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics* 31: 405–40. [CrossRef]

Hillier, David, Adriana Korczak, and Piotr Korczak. 2015. The impact of personal attributes on corporate insider trading. *Journal of Corporate Finance* 30: 150–67. [CrossRef]

Hodgson, Allan, Michael Seamer, and Katherine Uylangco. 2020. Does stronger corporate governance constrain insider trading? Asymmetric evidence from Australia. *Accounting Finance* 60: 2665–87. [CrossRef]

Huang, Yu Chuan, Nai Wen Hou, and Yao Jen Cheng. 2012. Illegal insider trading and corporate governance: Evidence from Taiwan. *Emerging Markets Finance Trade* 48: 6–22. [CrossRef]

Jacob, Sajit. 2019. Do Corporate Governance Impact Firm Value? An Indian Perspective. *SSRN Electronic Journal*. Available online: https://ssrn.com/abstract=3491551 (accessed on 22 November 2019).
Jaggi, Bikki, and Judy Tsui. 2007. Insider trading, earnings management, and corporate governance: Empirical evidence based on Hong Kong firms. *Journal of International Financial Management & Accounting* 18: 192–222. [CrossRef]
Jagolinzer, Alan D., David F. Larcker, and Daniel J. Taylor. 2011. Corporate governance and the information content of insider trades. *Journal of Accounting Research* 49: 1249–74. [CrossRef]
Jain, Tanusree, and Rashid Zaman. 2020. When boards matter: The case of corporate social irresponsibility. *British Journal of Management* 31: 365–86. [CrossRef]
Jardak, Maha Khemakhem, and Hamadi Matoussi. 2020. The effectiveness of insider trading disclosure policies: US and EU comparison. *Journal of Financial Reporting and Accounting* 18: 591–614. [CrossRef]
Javakhadze, David, Anita Pennathur, and Brian Silverstein. 2025. Managerial opportunism and corporate investment efficiency. *Journal of Financial Research*. [CrossRef]
Jensen, Michael C., and William H. Meckling. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3: 305–60. [CrossRef]
Kacperczyk, Marcin, and Emiliano S. Pagnotta. 2019. Chasing private information. *Review of Financial Studies* 32: 4997–5047. [CrossRef]
Kwabi, Frank O., Agyenim Boateng, and Emmanuel Adegbite. 2018. The impact of stringent insider trading laws and institutional quality on the cost of capital. *International Review of Financial Analysis* 60: 127–37. [CrossRef]
La Porta, Rafael, Florencio Lopez-De-Silanes, Andrei Shleifer, and Robert Vishny. 2000. Investor protection and corporate governance. *Journal of Financial Economics* 58: 3–27. [CrossRef]
Lee, Inmoo, Michael Lemmon, Yan Li, and John M. Sequeira. 2014. Do voluntary corporate restrictions on insider trading eliminate informed insider trading? *Journal of Corporate Finance* 29: 158–78. [CrossRef]
Lei, Qin, and Xuewu Wang. 2014. Time-varying liquidity trading, private information, and insider trading. *European Financial Management* 20: 321–51. [CrossRef]
Liu, Xiaolan. 2016. Corruption of culture and corporate misconduct. *Journal of Financial Economics* 122: 307–27. [CrossRef]
Lu, Chunyang. 2023. Do Shareholder Networks Influence Insider Trading? Evidence from China. *Emerging Markets Finance and Trade* 59: 772–85. [CrossRef]
Macagnan, Clea Beatriz. 2025. *Corporate Governance in Capital Markets*. Cham: Springer. [CrossRef]
Martins, Orleans S. Silva, and Raul Ventura Júnior. 2020. Influência da governança corporativa na mitigação de relatórios financeiros fraudulentos. *Revista Brasileira de Gestão de Negócios* 22: 65–84. [CrossRef]
Masson, Robert T., and Ananth Madhavan. 1991. Insider Trading and the Value of the Firm. *The Journal of Industrial Economics* 39: 333–53. [CrossRef]
Meulbroek, Lisa K. 1992. An empirical analysis of illegal insider trading. *Journal of Finance* 47: 1661–99. [CrossRef]
Moreira, Felipe. 2025. Alta no mês e volta do estrangeiro: Como mercado vê Ibovespa após alívio em janeiro? *InfoMoney*. Available online: https://www.infomoney.com.br/mercados/alta-no-mes-e-volta-do-estrangeiro-como-mercado-ve-ibovespa-apos-alivio-em-janeiro/ (accessed on 25 February 2025).
Myers, Stewart C., and Nicholas S. Majluf. 1984. Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics* 13: 187–221. [CrossRef]
Ngo, Diem Nhat Phuong, and Anh Thi Hong Le. 2021. Relationship between the audit committee and earnings management in listed companies in Vietnam. *Journal of Asian Finance Economics and Business* 8: 135–42. [CrossRef]
Oradi, Javad, and Javad Izadi. 2020. Audit committee gender diversity and financial reporting: Evidence from restatements. *Managerial Auditing Journal* 35: 67–92. [CrossRef]
Posylnaya, Valeriya V., Brandon N. Cline, and Joshua R. Aaron. 2019. The liquidity impact of insider trading on small and medium-sized enterprises. *Journal of Small Business Strategy* 29: 72–83. Available online: https://libjournals.mtsu.edu/index.php/jsbs/article/view/1388 (accessed on 15 March 2021).
Procianoy, Jairo Laser, and Roberto Frota Decourt. 2015. The Brazilian fiscal council—Protecting minority shareholders in a weak legal system. In *Corporate Governance and Corporate Social Responsibility: Emerging Markets Focus*. Edited by Sabri Boubaker, Bang Dang Nguyen and Duc Khuong Nguyen. Singapore: World Scientific, pp. 159–80. [CrossRef]
Rahman, Dewan, Robert Faff, and Barry Oliver. 2021. Does board independence constrain insider opportunism? *Australian Journal of Management* 46: 499–522. [CrossRef]
Ravina, Enrichetta, and Paola Sapienza. 2010. What do independent directors know? Evidence from their trading. *Review of Financial Studies* 23: 962–1003. [CrossRef]
Ryu, Doojin, Heejin Yang, and Jinyoung Yu. 2022. Insider trading and information asymmetry: Evidence from the Korea Exchange. *Emerging Markets Review* 51: 100847. [CrossRef]
Seyhun, H. Nejat. 1986. Insiders' profits, costs of trading, and market efficiency. *Journal of Financial Economics* 16: 189–212. [CrossRef]
Shleifer, Andrei, and Robert W. Vishny. 1997. A survey of corporate governance. *Journal of Finance* 52: 737–83. [CrossRef]

Simon, Mariana Lanner de Araujo, Jairo Laser Procianoy, and Roberto Frota Decourt. 2019. Fatores determinantes da política de dividendos das instituições financeiras brasileiras. *Revista Brasileira de Finanças* 17: 87–116. [CrossRef]

Tang, Hui-Wen, Anlin Chen, and Chong-Chuo Chang. 2013. Insider trading, accrual abuse, and corporate governance in emerging markets—Evidence from Taiwan. *Pacific-Basin Finance Journal* 24: 132–55. [CrossRef]

Teixeira, Bruno, Ana Flavia Albuquerque Ventura, Arti Chandani, Mohit Pathak, and Prashant Ubarhande. 2025. India. In *Corporate Governance in Capital Markets*. Edited by Cristiane B. Macagnan. Cham: Springer, pp. 1–24. [CrossRef]

Tonidandel, Mauro César, and Roberto F. Decourt. 2020. Insider trading: Um estudo sobre a rentabilidade das operações com ações da própria empresa. Master's thesis, Universidade do Vale do Rio dos Sinos, São Leopoldo, Brazil.

Ventura, Ana Flávia Albuquerque, Roberto Frota Decourt, Raul Ventura Júnior, Lucas Vieira Pereira De Alencar, and Paulo César Barbosa Alves. 2024. Repercussão do insider trading ilegal no mercado de capitais e o grau de penalidade: Um comparativo entre Brasil e EUA. *Enfoque: Reflexão Contábil* 43: 133–50. [CrossRef]

Verrecchia, Robert E. 2001. Essays on disclosure. *Journal of Accounting and Economics* 32: 97–180. [CrossRef]

Vitale, Paolo. 2018. Robust trading for ambiguity-averse insiders. *Journal of Banking & Finance* 90: 113–30. [CrossRef]

Wang, Jiang. 1993. A model of intertemporal asset prices under asymmetric information. *The Review of Economic Studies* 60: 249–282. [CrossRef]

Williamson, Oliver E. 1979. Transaction-cost economics: The governance of contractual relations. *Journal of Law and Economics* 22: 233–61. [CrossRef]

Williamson, Oliver E. 1988. Corporate finance and corporate governance. *Journal of Finance* 43: 567–91. [CrossRef]

Williamson, Oliver E. 1991. *Mercados y jerarquías: Su análisis y sus implicaciones antitrust*. Ciudad de México: Fondo de Cultura Económica.

Williamson, Oliver E. 1993. Calculativeness, trust, and economic organization. *Journal of Law and Economics* 36: 453–86. [CrossRef]

Williamson, Oliver E. 1999. Strategy research: Governance and competence perspectives. *Strategic Management Journal* 20: 1087–108. [CrossRef]

Wooldridge, Jeffrey M. 2010. *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: MIT Press.

Wooldridge, Jeffrey M. 2014. *Introdução à econometria*. São Paulo: Cengage Learning.

Wu, Kean, Susan Sorensen, and Li Sun. 2019. Board independence and information asymmetry: Family firms vs non-family firms. *Asian Review of Accounting* 27: 329–49. [CrossRef]

Yang, Xiaotong, and Rongrong Xie. 2024. The dark side of digital transformation: Evidence from opportunistic insider selling. *Finance Research Letters* 67: 105902. [CrossRef]

Yang, Yung Chiang, Bohui Zhang, and Chu Zhang. 2020. Is information risk priced? Evidence from abnormal idiosyncratic volatility. *Journal of Financial Economics* 135: 528–54. [CrossRef]

Zaman, Rashid, Nader Atawnah, Ghasan A. Baghdadi, and Jia Liu. 2021. Fiduciary duty or loyalty? Evidence from co-opted boards and corporate misconduct. *Journal of Corporate Finance* 70: 102066. [CrossRef]

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