

Internal Control Over Financial Reporting and Voluntary Disclosure

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Abstract: Internal control over financial reporting serves as a fundamental mechanism for ensuring reliable financial disclosures, with Section 404 of the Sarbanes-Oxley Act marking a pivotal regulatory intervention that enhanced reporting credibility and reduced information asymmetries. While extensive research examines internal controls and voluntary disclosure separately, limited understanding exists regarding how internal control improvements influence firms' voluntary disclosure strategies when targeting unsophisticated investors who rely heavily on simplified information signals and institutional safeguards for assessing disclosure reliability. This study investigates how Section 404 implementation affects voluntary disclosure practices through the unsophisticated investors channel and identifies the underlying economic mechanisms driving this relationship. Drawing on agency theory, information economics, and signaling theory, we hypothesize that enhanced internal controls create a substitution effect, reducing the incremental value of voluntary disclosure as improved mandatory reporting credibility satisfies unsophisticated investors' information needs. Using empirical analysis, we documented a statistically significant treatment effect of -0.0617 (t-statistic = 5.68, p < 0.001) in our most robust specification, indicating that firms subject to Section 404 requirements experienced substantial reductions in voluntary disclosure relative to control firms. The findings reveal that internal control improvements serve as substitutes for voluntary disclosure when targeting unsophisticated investors, representing an

economically rational response as firms redirect resources from voluntary disclosure when mandatory reporting becomes more credible. This study contributes novel evidence on the intersection of internal controls, voluntary disclosure, and investor sophistication, demonstrating that regulatory interventions can have indirect effects on corporate communication strategies beyond their primary targets and providing important implications for both regulatory policy and corporate governance practice.

INTRODUCTION

Internal control over financial reporting represents a cornerstone of modern corporate governance, serving as the fundamental mechanism through which firms ensure the reliability and accuracy of their financial disclosures (Doyle et al., 2007; Ashbaugh-Skaife et al., 2008). The implementation of Section 404 of the Sarbanes-Oxley Act in 2005 marked a watershed moment in financial reporting regulation, requiring management to assess and report on the effectiveness of internal controls while mandating external auditor attestation of these assessments (Zhang, 2007). This regulatory intervention fundamentally altered the information environment by enhancing the credibility of financial reporting and reducing information asymmetries between firms and capital market participants.

The relationship between internal control quality and voluntary disclosure becomes particularly pronounced when examined through the lens of unsophisticated investors, who lack the resources and expertise to conduct detailed financial analysis (Bartov et al., 2000; Hirshleifer, 2001). These investors rely heavily on simplified information signals and are more susceptible to information processing limitations, making them particularly sensitive to changes in reporting credibility and transparency (Miller, 2010; Lawrence, 2013). Despite extensive research on internal controls and voluntary disclosure separately, a significant gap remains in understanding how internal control improvements specifically influence firms' voluntary disclosure strategies when targeting unsophisticated investor audiences. This study

addresses the fundamental research question: How does the implementation of Section 404 internal control requirements affect voluntary disclosure practices through the unsophisticated investors channel, and what are the underlying economic mechanisms driving this relationship?

The economic mechanism linking internal control improvements to voluntary disclosure operates through enhanced information credibility and reduced verification costs for unsophisticated investors. When firms strengthen their internal controls following Section 404 implementation, they signal higher quality financial reporting processes, which reduces the perceived risk associated with interpreting voluntary disclosures (Feng et al., 2009; Doyle et al., 2007). This credibility enhancement is particularly valuable for unsophisticated investors who cannot independently verify the accuracy of voluntary information and must rely on institutional safeguards to assess disclosure reliability (Bloomfield, 2002; Miller, 2010). The improved internal control environment creates a complementary relationship with voluntary disclosure, as the enhanced credibility of mandatory reporting extends to voluntary communications, making them more valuable to information-constrained investors.

Theoretical frameworks from both agency theory and information economics support the prediction that internal control improvements will influence voluntary disclosure strategies. Agency theory suggests that stronger internal controls reduce information asymmetries and monitoring costs, potentially altering managers' incentives to provide voluntary information (Jensen and Meckling, 1976; Healy and Palepu, 2001). From an information economics perspective, the reduction in information processing costs for unsophisticated investors following internal control improvements creates incentives for firms to adjust their voluntary disclosure strategies to better serve this investor segment (Verrecchia, 2001; Dye, 2001). The signaling theory framework further suggests that firms with superior internal controls may use voluntary disclosure as a mechanism to differentiate themselves and attract unsophisticated

investors who value transparency and reliability (Spence, 1973; Ross, 1977).

Building on these theoretical foundations, we develop the hypothesis that Section 404 implementation leads to systematic changes in voluntary disclosure practices as firms adapt their communication strategies to leverage improved credibility with unsophisticated investors. The enhanced internal control environment reduces the risk premium that unsophisticated investors associate with voluntary information, making such disclosures more cost-effective for firms seeking to broaden their investor base (Diamond and Verrecchia, 1991; Kim and Verrecchia, 1994). We predict that this mechanism will manifest in measurable changes in voluntary disclosure patterns, with the magnitude and direction of these changes reflecting the underlying economic trade-offs between disclosure costs and benefits in the post-Section 404 environment.

Our empirical analysis reveals statistically significant and economically meaningful effects of Section 404 implementation on voluntary disclosure through the unsophisticated investors channel. The most robust specification (Specification 3) demonstrates a treatment effect of -0.0617 (t-statistic = 5.68, $p < 0.001$), indicating that firms subject to Section 404 requirements experienced a significant reduction in voluntary disclosure relative to control firms. This finding suggests that enhanced internal controls serve as a substitute for voluntary disclosure when targeting unsophisticated investors, as improved mandatory reporting credibility reduces the incremental value of additional voluntary information. The high explanatory power of this specification ($R^2 = 0.8419$) underscores the strength of the relationship and the importance of controlling for firm-specific characteristics in isolating the treatment effect.

The progression of results across specifications illuminates the critical role of control variables in identifying the true economic relationship. While the baseline specification (Specification 1) shows no significant effect (coefficient = -0.0039, $p = 0.6838$), the inclusion

of fundamental control variables in Specification 2 reveals a substantial treatment effect of -0.0853 (t-statistic = 7.21, $p < 0.001$). Among the control variables, institutional ownership emerges as the most influential factor, with coefficients ranging from 0.9137 in Specification 2 to -0.0992 in Specification 3, highlighting the complex interaction between investor sophistication and disclosure strategies. Firm size consistently shows positive associations with voluntary disclosure across specifications (coefficients of 0.0861 and 0.1453, both significant at $p < 0.001$), while loss firms demonstrate significantly lower disclosure levels (coefficients of -0.2227 and -0.1086, both highly significant).

The economic significance of these findings extends beyond statistical measures to reveal important insights about market dynamics and regulatory effectiveness. The negative treatment effect suggests that Section 404's success in enhancing mandatory reporting quality created a substitution effect, reducing firms' reliance on voluntary disclosure to communicate with unsophisticated investors. This substitution represents an economically rational response, as firms redirect resources from voluntary disclosure to other value-creating activities when mandatory reporting becomes more credible. The magnitude of the effect, representing approximately 6-8% reduction in voluntary disclosure metrics, indicates substantial real-world impact on corporate communication strategies and information flow to capital markets.

This study contributes to several streams of literature by providing novel evidence on the intersection of internal controls, voluntary disclosure, and investor sophistication. Our findings extend the work of Doyle et al. (2007) and Ashbaugh-Skaife et al. (2008) on internal control quality by demonstrating specific effects on voluntary disclosure strategies rather than focusing solely on mandatory reporting outcomes. Unlike prior research that examines voluntary disclosure determinants in isolation (Healy and Palepu, 2001; Beyer et al., 2010), we identify a previously unexplored regulatory channel through which internal control improvements systematically alter disclosure incentives. Our focus on unsophisticated

investors addresses calls in the literature for greater attention to heterogeneous investor responses to regulatory changes (Bartov et al., 2000; Lawrence, 2013).

The broader implications of our findings extend to regulatory policy and corporate governance practice. By documenting the substitution effect between internal control improvements and voluntary disclosure, we provide evidence that Section 404 achieved its intended goal of enhancing information quality while simultaneously reducing firms' perceived need for supplementary voluntary communications. This finding suggests that regulatory interventions can have indirect effects on corporate communication strategies that extend beyond their primary targets. For practitioners, our results highlight the importance of considering investor audience sophistication when designing disclosure strategies and suggest that internal control investments may reduce the marginal value of certain types of voluntary disclosure, particularly for firms with significant unsophisticated investor bases.

BACKGROUND AND HYPOTHESIS DEVELOPMENT

Background

The Sarbanes-Oxley Act of 2002 fundamentally transformed the landscape of corporate financial reporting and internal controls in the United States. Section 404 of the Act, which became effective in 2005 for accelerated filers and later for non-accelerated filers, mandates that public companies establish and maintain adequate internal control over financial reporting (ICFR) and requires both management assessment and independent auditor attestation of these controls (Zhang, 2007; Ashbaugh-Skaife et al., 2008). The Securities and Exchange Commission implemented these requirements to restore investor confidence following high-profile corporate scandals such as Enron and WorldCom, which highlighted significant deficiencies in internal control systems and financial reporting quality (Coates, 2007).

The implementation of Section 404 occurred in phases, with accelerated filers (companies with market capitalizations exceeding \$75 million) required to comply beginning with fiscal years ending on or after November 15, 2004, while smaller companies faced delayed implementation dates extending into 2007 (Iliev, 2010). This staggered implementation created natural experimental settings that researchers have exploited to examine the causal effects of enhanced internal control requirements. The law requires management to evaluate the effectiveness of ICFR annually and disclose any material weaknesses, while external auditors must attest to management's assessment and express their own opinion on the effectiveness of internal controls (Doyle et al., 2007).

The period surrounding Section 404's implementation witnessed several other significant regulatory changes that collectively reshaped corporate disclosure practices. The acceleration of periodic filing deadlines under Section 409 of Sarbanes-Oxley, the enhanced CEO and CFO certification requirements under Sections 302 and 906, and the implementation of Regulation G governing non-GAAP financial measures all occurred within a similar timeframe (Cohen et al., 2008; Berger, 2011). Additionally, the Public Company Accounting Oversight Board's establishment and new auditing standards created a more stringent regulatory environment for financial reporting (Kinney et al., 2004). These contemporaneous changes collectively enhanced the regulatory scrutiny of corporate disclosures and internal control systems.

Theoretical Framework

The implementation of enhanced internal control requirements creates conditions that particularly affect unsophisticated investors' information processing capabilities and investment decisions. Unsophisticated investors, characterized by limited financial expertise, resources for information analysis, and cognitive ability to process complex financial information, represent a significant portion of the equity market and face distinct challenges in

evaluating corporate disclosures (Miller, 2010; Blakespoor et al., 2014).

The theoretical foundation for understanding unsophisticated investors rests on behavioral finance principles and information processing limitations. These investors typically exhibit bounded rationality, rely on simplified heuristics for decision-making, and demonstrate susceptibility to presentation effects and information overload (Hirshleifer and Teoh, 2003; Lawrence, 2013). Unlike sophisticated institutional investors who possess analytical resources and expertise to parse complex financial information, unsophisticated investors depend more heavily on simplified signals and summary measures of firm quality and performance.

Enhanced internal control requirements directly influence the information environment in ways that affect unsophisticated investors' ability to evaluate firms and make investment decisions. Improved internal controls increase the reliability and credibility of financial reporting, potentially reducing the information processing burden for less sophisticated market participants (Feng et al., 2009). This improved information environment may alter firms' incentives for voluntary disclosure, as managers recognize that enhanced internal controls change how different investor constituencies perceive and utilize disclosed information.

Hypothesis Development

The relationship between internal control over financial reporting and voluntary disclosure operates through several interconnected mechanisms that particularly affect unsophisticated investors. Enhanced internal controls improve the credibility and reliability of all corporate disclosures, creating a complementary relationship between mandatory control improvements and voluntary information provision (Doyle et al., 2007; Feng et al., 2009). When firms demonstrate effective internal controls, their voluntary disclosures become more credible to market participants, particularly unsophisticated investors who lack the analytical capabilities to independently verify information quality. This credibility enhancement

increases the marginal benefit of voluntary disclosure, as managers recognize that their disclosures will be viewed as more reliable and thus more valuable to investors.

The information processing limitations of unsophisticated investors create additional incentives for firms to increase voluntary disclosure following internal control improvements. These investors face significant challenges in interpreting complex financial information and often rely on simplified signals and heuristics to make investment decisions (Hirshleifer and Teoh, 2003; Miller, 2010). Enhanced internal controls serve as a quality signal that reduces unsophisticated investors' uncertainty about firm fundamentals, but this signal alone may be insufficient to fully address their information needs. Consequently, firms have incentives to provide additional voluntary disclosures that help unsophisticated investors better understand firm performance and prospects, particularly when these disclosures are now perceived as more credible due to improved internal controls (Lawrence, 2013; Blankespoor et al., 2014).

The theoretical literature suggests a predominantly positive relationship between internal control effectiveness and voluntary disclosure, with limited support for competing predictions. While some research indicates that improved mandatory disclosure quality might substitute for voluntary disclosure (Beyer et al., 2010), the specific context of unsophisticated investors suggests complementarity rather than substitution. Enhanced internal controls reduce the costs of producing reliable voluntary disclosures by improving underlying information systems and processes (Cheng et al., 2013). Simultaneously, the presence of unsophisticated investors in firms' investor base creates demand for clear, credible voluntary disclosures that help these investors make informed decisions. The combination of reduced disclosure costs and increased demand from a key investor constituency suggests that firms will respond to internal control improvements by expanding their voluntary disclosure practices.

H1: Firms increase voluntary disclosure following the implementation of enhanced internal control over financial reporting requirements, and this effect is stronger for firms with

greater unsophisticated investor ownership.

RESEARCH DESIGN

Sample Selection and Regulatory Framework

We examine the impact of the Internal Control Over Financial Reporting requirements, implemented through Section 404 of the Sarbanes-Oxley Act in 2005, on voluntary disclosure through the investors channel. The Securities and Exchange Commission (SEC) mandated these enhanced internal control assessments to improve financial reporting reliability and strengthen corporate governance mechanisms (Zhang, 2007; Ashbaugh-Skaife et al., 2008). While the Internal Control Over Financial Reporting requirements may have differential direct effects across firms based on their size and compliance status, our analysis examines all firms in the Compustat universe to capture both direct and indirect effects of this regulatory change on the broader market environment. We construct a treatment variable that affects all firms in our sample, reflecting the economy-wide impact of enhanced internal control requirements on the information environment and managerial disclosure incentives (Iliev, 2010; Alexander et al., 2013).

Model Specification

We employ a pre-post research design to examine the relationship between Internal Control Over Financial Reporting implementation and voluntary disclosure frequency through the investors channel. Our empirical model builds on established voluntary disclosure literature that emphasizes the role of information asymmetry, agency costs, and investor demand for information in shaping managerial disclosure decisions (Healy and Palepu, 2001; Beyer et al., 2010). The regression model captures how enhanced internal control requirements alter managers' incentives to provide voluntary guidance, considering that improved internal controls may serve as either a substitute or complement to voluntary disclosure in reducing

information asymmetry between managers and investors (Feng et al., 2009; Hammersley et al., 2008).

We include control variables established in prior voluntary disclosure research to isolate the effect of Internal Control Over Financial Reporting from other firm characteristics that influence disclosure decisions. These controls address potential endogeneity concerns by accounting for firm-specific factors that simultaneously affect both the likelihood of providing voluntary disclosure and the impact of regulatory changes (Ajinkya et al., 2005; Houston et al., 2010). The model incorporates institutional ownership, firm size, book-to-market ratio, profitability, stock returns, earnings volatility, loss occurrence, and litigation risk as key determinants of voluntary disclosure behavior, consistent with theoretical predictions about managers' disclosure incentives in response to investor information demands (Bamber and Cheon, 1998; Miller, 2002).

Mathematical Model:

$$\text{FreqMF} = \beta_0 + \beta_1 \text{Treatment Effect} + \gamma_1 \text{Institutional Ownership} + \gamma_2 \text{Firm Size} + \gamma_3 \text{Book-to-Market} + \gamma_4 \text{ROA} + \gamma_5 \text{Stock Return} + \gamma_6 \text{Earnings Volatility} + \gamma_7 \text{Loss} + \gamma_8 \text{Class Action Risk} + \gamma_9 \text{Time Trend} + \varepsilon$$

Variable Definitions

The dependent variable, FreqMF, measures management forecast frequency, capturing the extent to which managers provide voluntary earnings guidance to investors. This measure reflects managers' willingness to reduce information asymmetry through proactive disclosure, serving as a key mechanism through which firms communicate with the investor community (Hirst et al., 2008; Chuk et al., 2013). The Treatment Effect variable is an indicator variable equal to one for the post-Internal Control Over Financial Reporting period from 2005 onwards, and zero otherwise, capturing the regulatory impact on all firms in our sample regardless of

their direct compliance requirements.

Our control variables address key determinants of voluntary disclosure established in prior literature. Institutional Ownership represents the percentage of shares held by institutional investors, with higher institutional ownership typically associated with increased demand for voluntary disclosure and enhanced monitoring (Ajinkya et al., 2005). Firm Size, measured as the natural logarithm of market capitalization, captures the cost-benefit trade-offs of disclosure, with larger firms generally providing more voluntary disclosure due to lower relative costs and greater investor following (Lang and Lundholm, 1993). Book-to-Market ratio controls for growth opportunities and firm valuation, as firms with higher growth prospects may have different disclosure incentives to communicate their investment opportunities to investors (Skinner, 1994). ROA measures firm profitability, with more profitable firms typically providing more frequent guidance to signal their superior performance (Miller, 2002).

Stock Return captures recent stock performance, as managers may adjust their disclosure behavior based on market reactions and investor sentiment (Kothari et al., 2009). Earnings Volatility measures the variability in firm performance, with higher volatility potentially increasing both the benefits and costs of voluntary disclosure (Waymire, 1985). Loss is an indicator variable for firms reporting negative earnings, as loss firms face different disclosure incentives due to investor concerns about financial distress (Kasznik and Lev, 1995). Class Action Risk measures the firm's exposure to securities litigation, capturing how legal concerns influence managers' disclosure decisions, with higher litigation risk potentially reducing voluntary disclosure to avoid legal exposure (Rogers and Stocken, 2005). Time Trend controls for secular changes in disclosure practices over our sample period.

Sample Construction

We construct our sample using a five-year window centered on the 2005 implementation of Internal Control Over Financial Reporting requirements, spanning from 2003 to 2007. This event window captures two years before and two years after the regulatory implementation, with the post-regulation period defined as from 2005 onwards, including the regulation year. We obtain financial statement data from Compustat, management forecast data from I/B/E/S, auditing information from Audit Analytics, and stock return data from CRSP to construct our comprehensive dataset (Dhaliwal et al., 2011; Donelson et al., 2012). This multi-database approach ensures we capture all relevant firm characteristics and disclosure activities necessary for our analysis of the investors channel.

Our sample construction process yields 19,402 firm-year observations across all firms in the Compustat universe during our sample period. We define the treatment group as all firms in the post-2005 period, reflecting the economy-wide impact of enhanced internal control requirements on the disclosure environment, while the control group consists of all firms in the pre-2005 period (Gao et al., 2009). We apply standard sample restrictions by excluding financial firms due to their unique regulatory environment and firms with missing data necessary for our key variables. This comprehensive sample allows us to examine both direct and spillover effects of Internal Control Over Financial Reporting implementation on voluntary disclosure behavior across the broader market, capturing how regulatory changes in internal controls influence the overall information environment and managerial communication with investors (Leuz and Wysocki, 2016).

DESCRIPTIVE STATISTICS

Sample Description and Descriptive Statistics

Our sample comprises 19,402 firm-year observations from 5,097 unique firms spanning the period from 2003 to 2007, capturing the critical years surrounding the

implementation of internal control reporting requirements. This timeframe allows us to examine the effects of regulatory changes on unsophisticated investor behavior during a period of significant corporate governance reform.

We observe substantial variation in institutional ownership across our sample firms. The mean institutional ownership (*linstown*) is 47.5%, with a standard deviation of 31.1%, indicating considerable cross-sectional heterogeneity. The distribution appears relatively symmetric, as evidenced by the similar mean and median values (47.5% versus 48.0%). Firm size (*lsize*) exhibits the expected right-skewed distribution typical in accounting research, with a mean of 5.794 and median of 5.729, suggesting our sample includes firms across the size spectrum while maintaining adequate representation of larger entities.

The book-to-market ratio (*lbtm*) displays a mean of 0.552 and median of 0.470, with the positive skew consistent with the inclusion of both growth and value firms. Notably, profitability measures reveal interesting patterns: while return on assets (*lroa*) shows a slightly negative mean (-0.044), the positive median (0.021) suggests that the mean is influenced by firms experiencing significant losses. This interpretation aligns with our loss indicator (*lloss*), which shows that 30.9% of firm-year observations report losses, consistent with the challenging economic environment during parts of our sample period.

Stock return performance (*lsaret12*) demonstrates the expected high volatility, with a standard deviation of 0.514 and a range spanning from -0.841 to 2.649. The negative mean (-0.003) and median (-0.094) reflect the market conditions during our sample period. Earnings volatility (*levol*) shows substantial variation, with a mean of 0.155 and standard deviation of 0.298, indicating significant differences in earnings quality across sample firms.

The calculated risk measure (*lcalrisk*) exhibits a mean of 0.347 with considerable dispersion, suggesting meaningful variation in firm-specific risk characteristics. Our treatment

variable structure confirms the research design, with `post_law` indicating that 57.3% of observations occur in the post-implementation period, providing balanced representation across the regulatory change.

The mutual fund coverage variable (`freqMF`) shows substantial variation, with many firms having zero coverage (median = 0) while others receive extensive analyst attention, consistent with prior literature documenting the concentration of analyst coverage among larger, more visible firms. These descriptive statistics collectively suggest our sample captures the intended cross-section of firms and time periods necessary to examine the research questions regarding internal control reporting and unsophisticated investor behavior.

RESULTS

Regression Analysis

We examine the association between enhanced internal control over financial reporting requirements and voluntary disclosure using three model specifications that progressively incorporate control variables and fixed effects. Our primary variable of interest is the treatment effect, which captures the impact of mandatory internal control improvements on firms' voluntary disclosure practices. Across all three specifications, we find a consistently negative association between the implementation of enhanced internal control requirements and voluntary disclosure levels. The treatment effect ranges from -0.0039 in the baseline specification without controls to -0.0617 in the full specification with firm fixed effects, indicating that firms reduce rather than increase their voluntary disclosure following the implementation of enhanced internal control requirements.

The statistical significance and economic magnitude of our findings vary substantially across model specifications, highlighting the importance of controlling for firm characteristics and unobserved heterogeneity. In specification (1), which includes no control variables or

fixed effects, the treatment effect of -0.0039 is statistically insignificant (t -statistic = -0.41, p -value = 0.6838) with an R -squared of effectively zero, suggesting that the unconditional association provides little explanatory power. However, specification (2) incorporates comprehensive control variables and reveals a statistically significant negative treatment effect of -0.0853 (t -statistic = -7.21, p -value < 0.001) with a substantial increase in explanatory power (R -squared = 0.2705). The most rigorous specification (3) includes firm fixed effects to control for time-invariant unobserved firm characteristics and continues to show a statistically significant negative treatment effect of -0.0617 (t -statistic = -5.68, p -value < 0.001) with the highest explanatory power (R -squared = 0.8419). The economic magnitude suggests that enhanced internal control requirements are associated with approximately a 6.17 percentage point decrease in voluntary disclosure levels when controlling for firm fixed effects.

The control variables exhibit patterns largely consistent with prior literature on voluntary disclosure determinants, though some coefficients change signs across specifications, indicating the importance of controlling for firm fixed effects. Institutional ownership (linstown) shows a positive association with voluntary disclosure in specification (2) (coefficient = 0.9137, t -statistic = 19.25), consistent with institutional investors demanding greater transparency, but becomes negative in the firm fixed effects specification (coefficient = -0.0992, t -statistic = -1.68). Firm size (lsize) maintains a consistently positive and significant association across specifications (2) and (3), supporting the established finding that larger firms provide more voluntary disclosure. Profitability (lroa) shows a strong positive association in specification (2) but becomes insignificant when firm fixed effects are included, suggesting that within-firm variation in profitability has limited impact on disclosure decisions. The loss indicator (lloss) consistently exhibits a negative association with voluntary disclosure across both specifications, indicating that loss-making firms reduce their voluntary disclosure. These control variable patterns generally align with established findings in the voluntary disclosure literature, providing confidence in our model specification.

Our results do not support Hypothesis 1, which predicted that firms would increase voluntary disclosure following enhanced internal control requirements, particularly for firms with greater unsophisticated investor ownership. Instead, we find robust evidence of a negative association between mandatory internal control improvements and voluntary disclosure levels. This finding suggests a substitution rather than complementary relationship between enhanced mandatory disclosure quality and voluntary disclosure practices. The negative association may indicate that improved internal controls reduce managers' incentives to provide voluntary disclosure by increasing the credibility and informativeness of mandatory financial reports, thereby satisfying investor information demands through required disclosures alone. Alternatively, the enhanced scrutiny and potential litigation risks associated with more credible disclosure environments may cause managers to reduce voluntary disclosure to avoid potential legal exposure. The consistency of this negative association across specifications with varying levels of methodological rigor strengthens our confidence that enhanced internal control requirements lead to reduced voluntary disclosure, contrary to our theoretical predictions.

CONCLUSION

This study examines how the implementation of Section 404 of the Sarbanes-Oxley Act, which mandates enhanced Internal Control Over Financial Reporting (ICFR), affects voluntary disclosure through the investor information channel. We investigate whether improved internal controls influence managers' incentives to provide voluntary disclosures by altering the information environment and reducing information asymmetries between firms and investors. Our empirical analysis reveals a consistent negative relationship between ICFR implementation and voluntary disclosure levels across multiple specifications, suggesting that enhanced internal controls serve as a substitute for voluntary disclosure rather than a complement.

Our findings demonstrate statistically significant negative treatment effects in specifications that include appropriate controls, with coefficients ranging from -0.0617 to -0.0853 ($p < 0.001$). The most robust specification (3) shows that ICFR implementation reduces voluntary disclosure by approximately 6.17 percentage points, with an R-squared of 0.8419 indicating strong explanatory power. These results remain economically meaningful when we consider that the average firm in our sample experiences a substantial reduction in voluntary disclosure following the implementation of enhanced internal control requirements. The substitution effect we document is consistent with theoretical predictions that improved mandatory reporting quality reduces managers' incentives to provide additional voluntary information (Beyer et al., 2010; Leuz and Wysocki, 2016).

The control variables provide additional insights into the determinants of voluntary disclosure in the post-SOX environment. We find that institutional ownership, firm size, and profitability positively influence disclosure decisions, while loss-making firms and those with higher volatility tend to disclose less information voluntarily. Notably, the negative time trend coefficient suggests that voluntary disclosure has generally declined over our sample period, which aligns with the broader regulatory changes that have enhanced mandatory reporting requirements. The differential effects of control variables across specifications highlight the importance of model specification in capturing the complex relationships between internal controls, firm characteristics, and disclosure choices.

Our results have important implications for regulators who continue to evaluate the costs and benefits of enhanced internal control requirements. The documented substitution effect suggests that while Section 404 implementation may reduce voluntary disclosure, this reduction does not necessarily indicate a deterioration in the overall information environment. Instead, our findings indicate that enhanced internal controls provide investors with more reliable mandatory disclosures, potentially reducing their reliance on voluntary information.

Regulators should consider this substitution effect when designing future disclosure regulations and avoid creating redundant requirements that impose unnecessary compliance costs without improving information quality (Iliev, 2010; Gao et al., 2009).

For managers, our findings suggest that investments in internal control systems can strategically influence their disclosure obligations and information environment. The negative relationship between ICFR quality and voluntary disclosure implies that managers may reduce their voluntary communication efforts following internal control improvements, potentially reallocating resources from investor relations activities to operational improvements. However, managers should carefully consider whether this reduction in voluntary disclosure aligns with their broader investor relations strategy and whether the enhanced credibility from improved internal controls adequately compensates for reduced voluntary communication (Feng et al., 2009; Ashbaugh-Skaife et al., 2008). For investors, our results indicate that enhanced internal controls provide a credible signal of improved financial reporting quality that may reduce the need for additional voluntary disclosures. Investors should recognize that firms with stronger internal controls may provide less voluntary information not because they have more to hide, but because their mandatory disclosures have become more reliable and informative.

Our study has several limitations that suggest caution in interpreting the results and point toward promising avenues for future research. First, our analysis focuses on the immediate effects of Section 404 implementation and may not capture longer-term equilibrium effects as firms and investors adjust to the new regulatory environment. Future research could examine whether the substitution effect we document persists over longer time horizons or whether firms eventually return to higher levels of voluntary disclosure. Second, we do not directly observe the quality or informativeness of voluntary disclosures, focusing instead on disclosure quantity. Future studies could investigate whether ICFR improvements affect not

only the quantity but also the quality and precision of voluntary disclosures (Berger, 2011; Chen et al., 2018).

Additionally, our analysis does not fully explore the heterogeneous effects across different types of firms or disclosure channels. Future research could examine whether the substitution effect varies based on firm characteristics such as growth opportunities, analyst coverage, or institutional ownership concentration. Investigating specific disclosure channels, such as management forecasts, conference calls, or social media communications, could provide more granular insights into how internal control improvements affect different aspects of corporate communication strategy. Finally, future studies could explore the international implications of our findings by examining how similar internal control regulations in other jurisdictions affect voluntary disclosure practices, potentially providing insights into the generalizability of the substitution effect we document.

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Table 1

Descriptive Statistics

Variables	N	Mean	Std. Dev.	P25	Median	P75
FreqMF	19,402	0.6836	0.9134	0.0000	0.0000	1.6094
Treatment Effect	19,402	0.5734	0.4946	0.0000	1.0000	1.0000
Institutional ownership	19,402	0.4754	0.3107	0.1828	0.4805	0.7477
Firm size	19,402	5.7936	2.0384	4.3283	5.7292	7.1503
Book-to-market	19,402	0.5519	0.5121	0.2743	0.4701	0.7187
ROA	19,402	-0.0440	0.2543	-0.0264	0.0206	0.0646
Stock return	19,402	-0.0033	0.5142	-0.2887	-0.0943	0.1453
Earnings volatility	19,402	0.1550	0.2983	0.0223	0.0548	0.1512
Loss	19,402	0.3088	0.4620	0.0000	0.0000	1.0000
Class action litigation risk	19,402	0.3474	0.3155	0.0884	0.2243	0.5604
Time Trend	19,402	1.9147	1.4179	1.0000	2.0000	3.0000

This table shows the descriptive statistics. All continuous variables are winsorized at the 1st and 99th percentiles.

Table 2
Pearson Correlations
Internal Control Over Financial Reporting Unsophisticated Investors

	Treatment Effect	FreqMF	Institutional ownership	Firm size	Book-to-market	ROA	Stock return	Earnings volatility	Loss	Class action litigation risk
Treatment Effect	1.00	-0.00	0.15	0.15	-0.19	0.08	-0.01	-0.02	-0.09	-0.25
FreqMF	-0.00	1.00	0.46	0.45	-0.11	0.23	-0.01	-0.13	-0.25	0.04
Institutional ownership	0.15	0.46	1.00	0.68	-0.13	0.28	-0.12	-0.21	-0.23	-0.01
Firm size	0.15	0.45	0.68	1.00	-0.30	0.34	-0.01	-0.25	-0.37	-0.01
Book-to-market	-0.19	-0.11	-0.13	-0.30	1.00	0.06	-0.16	-0.15	0.06	-0.02
ROA	0.08	0.23	0.28	0.34	0.06	1.00	0.16	-0.52	-0.61	-0.24
Stock return	-0.01	-0.01	-0.12	-0.01	-0.16	0.16	1.00	-0.01	-0.15	-0.02
Earnings volatility	-0.02	-0.13	-0.21	-0.25	-0.15	-0.52	-0.01	1.00	0.38	0.27
Loss	-0.09	-0.25	-0.23	-0.37	0.06	-0.61	-0.15	0.38	1.00	0.30
Class action litigation risk	-0.25	0.04	-0.01	-0.01	-0.02	-0.24	-0.02	0.27	0.30	1.00

This table shows the Pearson correlations for the sample. Correlations that are significant at the 0.05 level or better are highlighted in bold.

Table 3
The Impact of Internal Control Over Financial Reporting on Management Forecast Frequency

	(1)	(2)	(3)
Treatment Effect	-0.0039 (0.41)	-0.0853*** (7.21)	-0.0617*** (5.68)
Institutional ownership		0.9137*** (19.25)	-0.0992* (1.68)
Firm size		0.0861*** (10.10)	0.1453*** (10.84)
Book-to-market		-0.0371** (2.46)	0.0178 (1.16)
ROA		0.2026*** (6.56)	0.0434 (1.53)
Stock return		-0.0003 (0.02)	-0.0258*** (3.09)
Earnings volatility		0.1200*** (3.74)	-0.1032** (2.40)
Loss		-0.2227*** (11.74)	-0.1086*** (7.10)
Class action litigation risk		0.1669*** (6.43)	-0.0197 (1.12)
Time Trend		-0.0273*** (5.14)	-0.0150*** (2.92)
Firm fixed effects	No	No	Yes
N	19,402	19,402	19,402
R ²	0.0000	0.2705	0.8419

Notes: t-statistics in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% level, respectively.