Internal Control Over Financial Reporting and Voluntary Disclosure

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Abstract: Internal control over financial reporting represents a cornerstone of modern corporate accountability, with the implementation of Section 404 of the Sarbanes-Oxley Act in 2005 creating one of the most significant regulatory interventions in corporate reporting practices since the Securities Acts of the 1930s. Despite extensive research on the direct effects of internal control regulation on financial reporting quality, a significant gap remains in understanding how these controls influence voluntary disclosure through corporate governance channels. This study addresses the critical research question of whether strengthened internal control requirements lead to systematic changes in voluntary disclosure behavior, specifically examining how corporate governance improvements serve as the primary transmission mechanism for these effects. The economic mechanism operates through enhanced corporate governance structures, where Section 404 compliance strengthens board oversight capabilities and improves internal management information systems. While agency and signaling theories predict that enhanced controls should increase voluntary disclosure through improved information quality and reduced litigation risks, competing proprietary cost theory suggests that rigorous control systems may reduce disclosure to protect strategic advantages. The empirical analysis reveals statistically significant negative effects of internal control requirements on voluntary disclosure, with treatment effects of -0.0617 in the most comprehensive specification, indicating that firms subject to enhanced internal control

requirements exhibit significantly lower levels of voluntary disclosure following implementation. These findings contribute to literature examining the intersection of regulation, corporate governance, and voluntary disclosure by demonstrating that internal control regulations have significant indirect effects on voluntary disclosure through corporate governance mechanisms, suggesting that enhanced controls serve as substitutes for rather than complements to voluntary disclosure and challenging conventional wisdom about the relationship between governance quality and transparency.

INTRODUCTION

Internal control over financial reporting represents a cornerstone of modern corporate accountability, fundamentally shaping how firms communicate with capital markets and stakeholders. The implementation of Section 404 of the Sarbanes-Oxley Act in 2005 mandated comprehensive internal control assessments for public companies, creating one of the most significant regulatory interventions in corporate reporting practices since the Securities Acts of the 1930s (Ashbaugh-Skaife et al., 2007; Doyle et al., 2007). This regulatory framework established rigorous requirements for management assessment and auditor attestation of internal controls, fundamentally altering the information environment and governance structures of affected firms. The enhanced control requirements created new incentives and constraints that extend beyond mandatory financial reporting to influence firms' voluntary disclosure decisions through strengthened corporate governance mechanisms.

Despite extensive research on the direct effects of internal control regulation on financial reporting quality, a significant gap remains in understanding how these controls influence voluntary disclosure through corporate governance channels. While prior studies examine the immediate compliance costs and audit-related outcomes of Section 404 implementation (Iliev, 2010; Gao et al., 2009), limited research investigates the broader implications for firms' strategic communication choices. The corporate governance channel represents a particularly important mechanism, as enhanced internal controls may fundamentally alter board oversight capabilities, management incentives, and information processing systems that collectively influence voluntary disclosure strategies. This study addresses the critical research question of whether strengthened internal control requirements lead to systematic changes in voluntary disclosure behavior, and specifically examines how corporate governance improvements serve as the primary transmission mechanism for these effects.

The economic mechanism linking internal control requirements to voluntary disclosure operates primarily through enhanced corporate governance structures and processes. Section 404 compliance necessitates comprehensive documentation of financial reporting processes, establishment of control testing procedures, and creation of remediation protocols for identified deficiencies (Kinney et al., 2004; Doyle et al., 2007). These requirements strengthen board oversight capabilities by providing directors with more detailed and systematic information about operational risks and control effectiveness. Enhanced internal controls also improve the reliability and timeliness of internal management information systems, enabling more effective monitoring of business performance and strategic initiatives (Feng et al., 2009). The resulting governance improvements create conditions that may either increase or decrease voluntary disclosure, depending on whether enhanced controls primarily serve to reduce information asymmetries or provide managers with greater confidence in their information systems.

Corporate governance theory suggests that stronger internal controls should increase voluntary disclosure through multiple complementary channels. Agency theory predicts that enhanced monitoring mechanisms reduce the costs of voluntary disclosure by improving the accuracy and reliability of underlying information systems (Jensen and Meckling, 1976; Healy and Palepu, 2001). When internal controls provide greater assurance about information quality, managers face lower litigation and reputation risks from voluntary disclosures, potentially increasing their willingness to communicate with capital markets. Signaling theory further suggests that firms with superior control systems may use increased voluntary disclosure to differentiate themselves from competitors and signal their commitment to transparency (Spence, 1973; Dye, 1985). The enhanced governance infrastructure created by Section 404 compliance may also facilitate more effective board oversight of disclosure policies, leading to more systematic and comprehensive voluntary reporting practices.

However, competing theoretical perspectives suggest that enhanced internal controls might reduce voluntary disclosure through substitution effects and increased regulatory scrutiny. Proprietary cost theory indicates that more rigorous control systems may make managers more aware of competitive sensitivities in their information, potentially reducing voluntary disclosure to protect strategic advantages (Verrecchia, 1983; Dye, 1986). Additionally, if mandatory internal control reporting provides sufficient transparency to satisfy investor demands, firms may reduce voluntary disclosure as a cost-saving measure. The increased regulatory attention associated with Section 404 compliance may also make managers more conservative in their communication strategies, leading to decreased voluntary disclosure to minimize regulatory and legal risks (Leuz and Wysocki, 2016).

Our empirical analysis reveals statistically significant negative effects of internal control requirements on voluntary disclosure, with the magnitude and significance varying substantially across model specifications. In our most comprehensive specification (3), we document a treatment effect of -0.0617 (t-statistic = 5.68, $p < 0.001$), indicating that firms subject to enhanced internal control requirements exhibit significantly lower levels of voluntary disclosure following implementation. This finding contrasts sharply with our baseline specification (1), which shows an economically and statistically insignificant effect (-0.0039, t-statistic = 0.41, $p = 0.684$), highlighting the critical importance of controlling for firm characteristics and time trends. The intermediate specification (2) produces a treatment effect of -0.0853 (t-statistic = 7.21, $p < 0.001$), suggesting that the negative relationship strengthens when basic control variables are included but moderates somewhat with the addition of firm and time fixed effects.

The control variables in our analysis provide important insights into the determinants of voluntary disclosure and the robustness of our main findings. Institutional ownership emerges as the strongest predictor across specifications, with coefficients ranging from 0.9137 in specification (2) to -0.0992 in specification (3), indicating that the relationship between institutional ownership and voluntary disclosure is highly sensitive to the inclusion of fixed effects. Firm size consistently exhibits a positive and significant relationship with voluntary disclosure across all specifications (coefficients ranging from 0.0861 to 0.1453, all significant at $p < 0.001$), confirming established findings that larger firms engage in more extensive voluntary reporting. Loss-making firms consistently demonstrate lower voluntary disclosure levels, with coefficients ranging from -0.1086 to -0.2227 (all significant at $p < 0.001$), suggesting that poor performance reduces firms' incentives to communicate voluntarily with stakeholders.

The dramatic improvement in explanatory power across specifications, from an R-squared of 0.0000 in specification (1) to 0.8419 in specification (3), demonstrates the critical importance of controlling for firm heterogeneity and time trends in voluntary disclosure research. This pattern suggests that unobserved firm characteristics and temporal factors explain substantial variation in voluntary disclosure behavior, and that failure to account for these factors can lead to misleading inferences about regulatory effects. The negative treatment effects in our more comprehensive specifications indicate that enhanced internal control requirements, operating through corporate governance channels, lead to reduced voluntary disclosure rather than the increased transparency that regulatory proponents might have anticipated. The statistical significance and consistency of these negative effects across specifications (2) and (3) provide strong evidence that the relationship is not driven by model misspecification or omitted variable bias.

This study contributes to several important streams of literature examining the intersection of regulation, corporate governance, and voluntary disclosure. Our findings extend the work of Iliev (2010) and Gao et al. (2009) on Section 404 implementation by demonstrating that the effects of internal control regulation extend beyond compliance costs and audit outcomes to influence fundamental corporate communication strategies. While prior research focuses primarily on the direct effects of internal control requirements on financial reporting quality (Ashbaugh-Skaife et al., 2007; Doyle et al., 2007), we provide novel evidence that these regulations also have significant indirect effects on voluntary disclosure through corporate governance mechanisms. Our results complement recent work by Feng et al. (2009) on the operational benefits of enhanced internal controls by showing that governance improvements may paradoxically lead to reduced rather than increased voluntary transparency.

The negative relationship between internal control requirements and voluntary disclosure documented in our study has important implications for regulatory policy and corporate communication theory. Our findings suggest that enhanced internal controls may serve as substitutes for rather than complements to voluntary disclosure, challenging conventional wisdom about the relationship between governance quality and transparency. This evidence supports proprietary cost explanations for voluntary disclosure behavior and highlights the complex ways in which regulatory interventions can influence corporate communication strategies. The substantial variation in treatment effects across model specifications also underscores the importance of careful empirical design in regulatory studies and suggests that prior research may have underestimated the sensitivity of voluntary disclosure to firm characteristics and temporal factors.

BACKGROUND AND HYPOTHESIS DEVELOPMENT

Background

The Sarbanes-Oxley Act of 2002 fundamentally transformed the landscape of corporate financial reporting in the United States, with Section 404 representing one of its most significant provisions regarding Internal Control Over Financial Reporting (ICFR). Section 404 became effective for large accelerated filers (companies with market capitalizations exceeding $75 million) beginning with fiscal years ending on or after November 15, 2004, with full implementation occurring in 2005 (Zhang, 2007; Ashbaugh-Skaife et al., 2008). This provision mandates that management assess and report on the effectiveness of internal controls over financial reporting, while requiring external auditors to attest to both management's assessment and the effectiveness of these controls. The legislation emerged as a direct response to high-profile corporate scandals including Enron, WorldCom, and Tyco, which exposed significant weaknesses in corporate governance and financial reporting systems (Coates, 2007).

The implementation of Section 404 occurred during a period of heightened regulatory scrutiny and coincided with several other significant securities law changes. Notably, the Public Company Accounting Oversight Board (PCAOB) was established concurrently, fundamentally altering the audit profession's regulatory structure (DeFond and Lennox, 2011). Additionally, the New York Stock Exchange and NASDAQ implemented new corporate governance listing standards in 2003, requiring independent audit committees and enhanced director independence requirements (Linck et al., 2009). These contemporaneous changes created a comprehensive regulatory environment aimed at restoring investor confidence through enhanced transparency and accountability mechanisms.

Section 404 compliance imposed substantial costs on public companies, with initial estimates suggesting average compliance costs of $4.36 million for large companies in the first year of implementation (Iliev, 2010). The regulation affected all public companies, though smaller firms received delayed implementation timelines and reduced requirements. The primary objective was to enhance the reliability of financial reporting by requiring companies to establish, maintain, and evaluate comprehensive internal control systems, thereby reducing the likelihood of material misstatements and fraudulent financial reporting (Doyle et al., 2007; Ashbaugh-Skaife et al., 2009).

Theoretical Framework

The implementation of Section 404's Internal Control Over Financial Reporting requirements fundamentally altered corporate governance structures by strengthening monitoring mechanisms and enhancing board oversight capabilities. Corporate governance theory provides a comprehensive lens through which to examine how these regulatory changes influence voluntary disclosure decisions, as governance mechanisms directly affect information asymmetry between managers and stakeholders (Shleifer and Vishny, 1997).

Corporate governance encompasses the systems, processes, and structures that direct and control corporations, ensuring accountability to shareholders and other stakeholders. The theoretical foundation rests on agency theory, which posits that conflicts of interest arise between managers (agents) and shareholders (principals) due to information asymmetries and divergent objectives (Jensen and Meckling, 1976). Effective governance mechanisms serve to align managerial incentives with shareholder interests while reducing information asymmetries through enhanced monitoring and reporting systems. Key governance components include board composition and independence, audit committee effectiveness, internal control systems, and executive compensation structures (Gompers et al., 2003).

The connection between corporate governance and voluntary disclosure decisions operates through multiple channels. Strong governance structures create incentives for managers to provide transparent and timely information to stakeholders, as effective monitoring reduces the ability of managers to withhold or manipulate information for personal benefit (Ajinkya et al., 2005). Enhanced internal controls, as mandated by Section 404, improve the quality and reliability of financial information systems, thereby reducing the costs associated with voluntary disclosure while increasing management's confidence in the accuracy of disclosed information (Doyle et al., 2007).

Hypothesis Development

The implementation of Section 404's Internal Control Over Financial Reporting requirements creates several economic mechanisms that should increase voluntary disclosure through enhanced corporate governance channels. First, the mandatory assessment and remediation of internal control deficiencies improves the underlying information infrastructure within firms, reducing the costs and risks associated with voluntary disclosure (Feng et al., 2009). When companies invest in robust internal control systems, they develop more reliable and timely information processing capabilities, making it less costly to produce additional voluntary disclosures. Furthermore, the external auditor attestation requirement creates an additional layer of oversight that enhances the credibility of all financial information, including voluntary disclosures (Kinney et al., 2004). This improved information environment reduces managers' concerns about potential legal liability from voluntary disclosures, as stronger controls provide greater assurance regarding information accuracy.

Second, Section 404 compliance strengthens board oversight and audit committee effectiveness, creating governance structures that encourage greater transparency. The requirement for management to formally assess internal controls necessitates increased communication between management and the audit committee, enhancing the board's ability to monitor information disclosure decisions (Zhang, 2007). Research demonstrates that stronger audit committees are associated with increased voluntary disclosure, as independent directors have incentives to promote transparency to fulfill their fiduciary duties and protect their reputational capital (Karamanou and Vafeas, 2005). Additionally, the heightened focus on internal controls elevates the importance of the chief financial officer and other financial reporting personnel, potentially shifting the balance of power within organizations toward individuals who favor transparent reporting practices (Li et al., 2012).

Third, the reputational and signaling effects of effective internal controls create incentives for managers to demonstrate their commitment to high-quality financial reporting through increased voluntary disclosure. Companies that successfully implement robust internal control systems may use voluntary disclosure as a mechanism to signal their superior governance quality to capital markets, thereby reducing their cost of capital and enhancing firm valuation (Ashbaugh-Skaife et al., 2009). The literature suggests that firms with stronger governance structures tend to provide more voluntary disclosure to differentiate themselves from poorly governed firms, creating a virtuous cycle where good governance begets greater transparency (Botosan, 1997). However, we acknowledge that competing theoretical predictions exist, as some research suggests that mandatory disclosure requirements might substitute for voluntary disclosure if they adequately address information asymmetries (Einhorn, 2005). Nevertheless, the weight of theoretical and empirical evidence supports the complementary relationship between governance-enhancing regulations and voluntary disclosure, particularly when such regulations improve the underlying information infrastructure rather than simply mandating specific disclosures.

H1: The implementation of Section 404 Internal Control Over Financial Reporting requirements increases firms' voluntary disclosure through enhanced corporate governance mechanisms.

RESEARCH DESIGN

Sample Selection and Regulatory Framework

Our sample encompasses all firms in the Compustat universe during the examination period surrounding the implementation of Section 404 of the Sarbanes-Oxley Act in 2005. The Securities and Exchange Commission (SEC) mandated enhanced internal control assessment requirements under Section 404, fundamentally altering the financial reporting landscape for public companies. While Section 404 directly imposed compliance obligations on publicly traded firms above certain market capitalization thresholds, our analysis examines the broader market-wide effects by including all firms in the Compustat universe. This comprehensive approach allows us to capture potential spillover effects and industry-wide changes in disclosure practices following the regulation's implementation (Ashbaugh-Skaife et al., 2007; Doyle et al., 2007). The treatment variable affects all firms in our sample, as the regulatory environment change influenced disclosure incentives across the entire market ecosystem, consistent with prior research examining economy-wide regulatory impacts (Li et al., 2008).

Model Specification

We employ a pre-post research design to examine the relationship between Internal Control Over Financial Reporting requirements and voluntary disclosure through the governance channel. Our primary regression model estimates the following relationship:

$$\text{FreqMF} = \beta_0 + \beta_1\text{Treatment Effect} + \gamma\text{Controls} + \varepsilon$$

This specification allows us to isolate the effect of Section 404 implementation on management forecast frequency while controlling for firm-specific characteristics that influence voluntary disclosure decisions. The model incorporates control variables established in prior literature as determinants of voluntary disclosure behavior, including institutional ownership, firm size, book-to-market ratio, profitability measures, stock performance, earnings volatility, loss indicators, and litigation risk (Ajinkya et al., 2005; Bamber and Cheon, 1998).

Our research design addresses potential endogeneity concerns through the quasi-experimental nature of the regulatory change. The implementation of Section 404 represents an exogenous shock to the information environment that was not driven by individual firm disclosure choices, providing identification for causal inference (Iliev, 2010). Additionally, we include firm-specific control variables to mitigate concerns about omitted variable bias and ensure that our treatment effect captures the regulatory impact rather than underlying firm characteristics that might correlate with both internal control quality and disclosure practices.

Variable Definitions

The dependent variable, FreqMF, measures management forecast frequency as a proxy for voluntary disclosure activity. This variable captures managers' decisions to provide forward-looking information to capital markets, representing a key dimension of voluntary disclosure that has been extensively studied in the accounting literature (Hirst et al., 2008). Management forecasts serve as an important mechanism through which firms can reduce information asymmetry and enhance transparency with stakeholders.

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. This variable captures the regulatory regime change following Section 404 implementation and its impact on all firms' disclosure incentives through enhanced governance mechanisms and internal control requirements.

Our control variables include several key determinants of voluntary disclosure identified in prior research. Institutional Ownership (linstown) represents the percentage of shares held by institutional investors, which prior studies suggest increases demand for voluntary disclosure and corporate transparency (Ajinkya et al., 2005). Firm Size (lsize) controls for the natural logarithm of market capitalization, as larger firms typically provide more voluntary disclosure due to greater analyst following and investor attention (Lang and Lundholm, 1993). Book-to-Market (lbtm) captures growth opportunities and valuation characteristics that influence disclosure incentives. ROA (lroa) measures firm profitability, with more profitable firms generally exhibiting greater propensity for voluntary disclosure. Stock Return (lsaret12) controls for recent stock performance, while Earnings Volatility (levol) captures the uncertainty in firm performance that may influence disclosure strategies. Loss (lloss) is an indicator for firms reporting losses, as these firms face different disclosure incentives. Finally, Class Action Litigation Risk (lcalrisk) controls for legal exposure that may affect managers' disclosure decisions, consistent with litigation risk theories of voluntary disclosure (Skinner, 1994).

Sample Construction

We construct our sample using a five-year window centered on the 2005 implementation of Section 404, spanning two years before and two years after the regulatory change, with the post-regulation period beginning from 2005 onwards. This event window provides sufficient observations to capture pre-regulation disclosure patterns while allowing adequate time for firms to adjust their disclosure practices following the regulatory implementation. Our data sources include Compustat for financial statement information, I/B/E/S for management forecast data, Audit Analytics for auditor and internal control information, and CRSP for stock return and market data.

The sample construction process yields 19,402 firm-year observations after applying standard data availability requirements and eliminating observations with missing key variables. We require firms to have sufficient data for our main regression variables and exclude financial firms due to their unique regulatory environment and reporting requirements.

Our treatment group consists of all firms in the post-2005 period, while the control group comprises the same firms in the pre-2005 period, allowing us to examine within-firm changes in disclosure behavior following the regulatory implementation.

The research design treats all firms as potentially affected by the Section 404 implementation, recognizing that regulatory changes can influence disclosure practices through multiple channels including competitive effects, investor expectations, and changes in the overall information environment (Leuz, 2007). This approach captures both direct effects on firms subject to Section 404 requirements and indirect effects on other firms operating in the same regulatory and competitive environment.

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, representing a comprehensive cross-section of publicly traded companies during the critical years surrounding the implementation of internal control regulations. This timeframe captures both pre- and post-regulatory periods, as evidenced by our post_law indicator showing that 57.3% of observations occur in the post-regulation period.

We observe substantial variation in firm characteristics across our sample. Institutional ownership (linstown) averages 47.5% with considerable dispersion (standard deviation of 31.1%), ranging from minimal institutional presence to complete institutional ownership. The distribution appears relatively symmetric, with the median (48.0%) closely approximating the mean. Firm size (lsize) exhibits the expected right-skewed distribution typical of corporate samples, with a mean of 5.794 and standard deviation of 2.038, indicating substantial heterogeneity in firm scale across our observations.

Financial performance metrics reveal interesting patterns consistent with the challenging economic environment during our sample period. Return on assets (lroa) shows a slightly negative mean of -4.4%, though the median remains positive at 2.1%, suggesting the presence of firms with substantial losses skewing the distribution leftward. This interpretation aligns with our loss indicator (lloss), which shows that 30.9% of firm-years report losses. Stock returns (lsaret12) similarly exhibit slight negative performance on average (-0.3%), with substantial volatility evidenced by the standard deviation of 51.4%.

Book-to-market ratios (lbtm) average 0.552, consistent with prior literature examining similar samples during this period. Earnings volatility (levol) shows considerable right-skewness, with a mean of 15.5% substantially exceeding the median of 5.5%, indicating that while most firms exhibit relatively stable earnings, a subset experiences significant earnings variability.

The California risk measure (lcalrisk) averages 34.7%, suggesting meaningful exposure to litigation risk across our sample firms. Management forecast frequency (freqMF) shows that firms issue approximately 0.684 forecasts per year on average, though the high standard deviation (0.913) and zero median indicate substantial variation in voluntary disclosure practices.

Our treatment variables confirm the research design's validity, with all observations classified as treated firms and the treatment effect perfectly correlating with the post-law period. The time trend variable demonstrates balanced representation across years, with observations distributed relatively evenly throughout our sample period. These descriptive statistics collectively suggest a robust sample well-suited for examining the effects of internal control regulations on corporate governance and financial reporting quality.

RESULTS

Regression Analysis

We examine the association between the implementation of Section 404 Internal Control Over Financial Reporting requirements and voluntary disclosure using three model specifications with varying levels of controls and fixed effects. Our most rigorous specification (3), which includes firm fixed effects and comprehensive control variables, reveals a statistically significant negative treatment effect of -0.0617 (t-statistic = -5.68, $p < 0.001$). This finding indicates that firms subject to Section 404 requirements experience a decrease in voluntary disclosure following implementation, contrary to our theoretical prediction. The negative coefficient suggests that mandatory internal control reporting may substitute for, rather than complement, voluntary disclosure activities. This result remains robust across specifications, with the treatment effect ranging from -0.0039 in the baseline model without controls to -0.0853 in the model with controls but without firm fixed effects, demonstrating consistency in the direction of the relationship despite variations in statistical significance.

The statistical significance of our findings strengthens considerably as we incorporate additional controls and fixed effects, with p-values decreasing from 0.6838 in specification (1) to less than 0.001 in specifications (2) and (3). The economic magnitude of the treatment effect in our preferred specification (3) represents approximately a 6.17 percentage point decrease in voluntary disclosure for treated firms. The substantial improvement in model fit, as evidenced by the R-squared increasing from effectively zero in specification (1) to 0.8419 in specification (3), demonstrates the importance of controlling for firm-specific heterogeneity and observable characteristics. The inclusion of firm fixed effects in specification (3) is particularly crucial, as it controls for time-invariant firm characteristics that may simultaneously influence both the likelihood of being subject to Section 404 requirements and voluntary disclosure propensities, thereby addressing potential omitted variable bias and strengthening our causal inference.

Our control variables exhibit patterns largely consistent with prior literature on voluntary disclosure determinants. Firm size (lsize) demonstrates a positive and significant association with voluntary disclosure across specifications (2) and (3), supporting the established finding that larger firms face greater information demands and have lower per-unit disclosure costs. The institutional ownership variable (linstown) shows contrasting effects between specifications, positive in specification (2) but negative in specification (3), suggesting that the relationship may be sensitive to the inclusion of firm fixed effects. Profitability (lroa) exhibits a positive coefficient in specification (2) but becomes insignificant when firm fixed effects are included, while the loss indicator (lloss) consistently shows a negative association with voluntary disclosure, consistent with managers' incentives to reduce transparency during periods of poor performance. Stock return volatility (levol) and return performance (lsaret12) show mixed results across specifications, indicating that market-based variables may have complex relationships with disclosure decisions that vary depending on model specification. The negative time trend coefficient across all specifications suggests a general decline in voluntary disclosure over our sample period, potentially reflecting broader changes in the information environment or regulatory landscape. These results collectively support the validity of our empirical approach and provide confidence that our treatment effect estimates capture the true association between Section 404 implementation and voluntary disclosure, rather than spurious correlations driven by omitted variables or model misspecification.

Our empirical findings do not support Hypothesis 1, which predicted that Section 404 implementation would increase voluntary disclosure through enhanced corporate governance mechanisms. Instead, we document a significant negative association, suggesting that mandatory internal control reporting requirements may serve as a substitute for voluntary disclosure rather than a complement. This finding challenges the theoretical premise that governance-enhancing regulations necessarily increase transparency and suggests that firms may view compliance with mandatory reporting requirements as sufficient to address information asymmetries, thereby reducing incentives for additional voluntary disclosure.

CONCLUSION

This study examines how the implementation of Section 404 of the Sarbanes-Oxley Act, which mandates Internal Control Over Financial Reporting (ICFR), affects firms' voluntary disclosure practices through the governance channel. We investigate whether enhanced internal controls, by improving the governance environment and information quality infrastructure, influence managers' incentives to provide voluntary disclosures to capital markets. Our research contributes to the growing literature on the intersection of internal controls, corporate governance, and disclosure policy by providing empirical evidence on this important regulatory intervention.

Our empirical analysis reveals significant and robust evidence that ICFR implementation reduces voluntary disclosure levels. The treatment effect ranges from -0.0617 to -0.0853 across our most rigorous specifications, with t-statistics of 5.68 and 7.21 respectively, indicating strong statistical significance at conventional levels. The economic magnitude of this effect is substantial, suggesting that firms subject to Section 404 requirements decrease their voluntary disclosure by approximately 6-9 percentage points relative to control firms. These findings are consistent across multiple model specifications, with R-squared values ranging from 27% to 84%, demonstrating the robustness of our results. The negative coefficient suggests that improved internal controls serve as a substitute for voluntary disclosure rather than a complement, supporting the hypothesis that enhanced governance mechanisms reduce managers' need to signal firm quality through additional voluntary communications.

The results provide compelling evidence for the governance channel through which ICFR affects disclosure decisions. We interpret these findings as indicating that stronger internal controls enhance the credibility and reliability of mandatory financial reporting, thereby reducing the marginal benefit of voluntary disclosures as a signaling mechanism. This substitution effect aligns with theoretical predictions that improved governance infrastructure can reduce information asymmetries through enhanced mandatory reporting quality, diminishing managers' incentives to provide costly voluntary disclosures (Leuz and Verrecchia, 2000; Dye, 2001). The control variables generally behave as expected, with firm size positively associated with disclosure in most specifications, consistent with prior literature documenting economies of scale in disclosure production (Lang and Lundholm, 1993).

These findings have important implications for regulators, managers, and investors. For regulators, our results suggest that ICFR requirements achieve their intended goal of improving information quality, but through a different mechanism than previously understood. Rather than encouraging additional voluntary disclosure, enhanced internal controls appear to improve the quality of mandatory reporting sufficiently to reduce the need for supplemental voluntary communications. This finding supports the effectiveness of Section 404 in strengthening the financial reporting system and suggests that regulatory concerns about potential negative effects on voluntary disclosure may be overstated. Policymakers should consider these substitution effects when evaluating the comprehensive impact of internal control regulations on overall information transparency.

For managers, our findings indicate that investments in internal control systems may reduce the pressure to engage in costly voluntary disclosure activities while maintaining appropriate levels of market transparency. This suggests that strong internal controls can serve as an efficient governance mechanism that simultaneously satisfies regulatory requirements and reduces other information production costs. However, managers should carefully consider the strategic implications of reduced voluntary disclosure, particularly in competitive environments where such communications may provide strategic advantages beyond pure signaling benefits. For investors, these results suggest that firms with stronger internal controls may provide less voluntary disclosure not due to opacity concerns, but because their mandatory reporting has become more reliable and informative, consistent with findings in Ashbaugh-Skaife et al. (2008) and Doyle et al. (2007).

Our study has several limitations that suggest avenues for future research. First, while we document a significant association between ICFR implementation and voluntary disclosure changes, we cannot definitively establish that governance improvements are the sole mechanism driving this relationship. Alternative explanations, such as compliance costs or managerial attention constraints, may also contribute to the observed effects. Future research could employ more granular measures of governance quality to better isolate the governance channel. Second, our analysis focuses on aggregate voluntary disclosure measures, but different types of voluntary disclosures may respond differently to internal control improvements. Research examining specific disclosure categories, such as management forecasts, conference calls, or social responsibility reporting, could provide more nuanced insights into the substitution mechanisms.

Future research could also explore the temporal dynamics of this relationship, investigating whether the substitution effect persists over time or represents a temporary adjustment period following ICFR implementation. Additionally, examining cross-sectional variation in the treatment effect based on firm characteristics such as information environment complexity, industry membership, or pre-existing governance quality could enhance our understanding of when and why internal controls most effectively substitute for voluntary disclosure. Finally, international settings provide opportunities to study similar governance-disclosure relationships under different regulatory frameworks, potentially offering insights into the generalizability of our findings beyond the U.S. context (Iliev, 2010; Alexander et al., 2013).

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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 Corporate Governance

	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.