Internal Control Over Financial Reporting and Voluntary Disclosure

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Abstract: Internal control over financial reporting represents a cornerstone of corporate transparency and investor protection, with the implementation of Section 404 of the Sarbanes-Oxley Act in 2005 creating one of the most significant regulatory changes in modern financial reporting history. While existing research extensively documents the direct effects of Section 404 on financial reporting quality and audit fees, limited attention has been paid to how reputation concerns stemming from internal control assessments influence managers' voluntary disclosure strategies through reputation risk channels. This study addresses this gap by examining whether firms subject to internal control regulations alter their voluntary disclosure practices in response to heightened reputation concerns, specifically investigating how the threat of internal control deficiency disclosure affects managerial incentives to provide additional information to the market. Building on signal jamming theory, reputation theory, and proprietary cost theory, we hypothesize that internal control regulations create a substitution effect whereby firms subject to enhanced scrutiny reduce voluntary disclosure as managers become more cautious about revealing information that might highlight operational weaknesses. Our empirical analysis provides compelling evidence of a significant negative relationship between internal control regulation and voluntary disclosure, with treatment effects ranging from -6.2 to -8.5 percentage points across specifications. These findings contribute to the literature by providing the first comprehensive evidence of spillover effects

on voluntary disclosure through reputation risk channels, demonstrating that regulatory interventions can create unintended consequences that reduce overall information flow to capital markets and informing ongoing debates about optimal regulatory design.

INTRODUCTION

Internal control over financial reporting represents a cornerstone of corporate transparency and investor protection, fundamentally shaping how firms communicate with capital markets. 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 changes in modern financial reporting history (Ashbaugh-Skaife et al., 2007; Doyle et al., 2007). This regulatory intervention established new standards for management's evaluation and auditor attestation of internal control effectiveness, fundamentally altering the risk-reward calculus surrounding corporate disclosure decisions. The enhanced scrutiny and potential reputational consequences associated with internal control deficiencies have created powerful incentives that extend far beyond mandatory reporting requirements.

The relationship between internal control regulation and voluntary disclosure operates primarily through reputation risk channels, yet this mechanism remains underexplored in the literature. While existing research extensively documents the direct effects of Section 404 on financial reporting quality and audit fees (Iliev, 2010; Kinney and Shepardson, 2011), limited attention has been paid to how reputation concerns stemming from internal control assessments influence managers' voluntary disclosure strategies. This gap is particularly puzzling given that reputation risk represents one of the most potent drivers of corporate behavior, potentially creating spillover effects that extend to discretionary communication with investors. Our study addresses this void by examining whether firms subject to internal control regulations alter their voluntary disclosure practices in response to heightened reputation concerns, and specifically investigates how the threat of internal control deficiency disclosure affects managerial incentives to provide additional information to the market.

The economic mechanism linking internal control regulation to voluntary disclosure through reputation risk operates via several interconnected pathways that fundamentally alter managerial incentives. Signal jamming theory suggests that when firms face potential negative signals from mandatory disclosures, they may strategically adjust their voluntary disclosure to influence market perceptions (Dye, 1985; Jung and Kwon, 1988). In the context of Section 404, managers anticipating potential internal control deficiencies face reputational costs that extend beyond the immediate regulatory compliance burden. These anticipated costs create incentives to either increase voluntary disclosure to demonstrate transparency and competence, or alternatively, to reduce disclosure to avoid drawing additional scrutiny to potentially problematic areas of operations.

Reputation theory provides additional insight into this relationship, suggesting that firms with higher reputation stakes respond more dramatically to regulatory changes that threaten their standing with stakeholders (Fombrun and Shanley, 1990; Roberts and Dowling, 2002). The internal control assessment process creates a formal mechanism through which control deficiencies become public information, potentially damaging management credibility and firm reputation. This reputational threat may prompt managers to recalibrate their entire disclosure strategy, not merely their compliance with the specific regulation. The anticipation of reputational damage from control deficiencies may lead to strategic disclosure decisions that attempt to preemptively manage investor perceptions and maintain information asymmetry at optimal levels.

Building on proprietary cost theory and strategic disclosure models, we hypothesize that the implementation of internal control regulations creates a substitution effect in voluntary disclosure practices (Verrecchia, 1983; Dye, 1986). Specifically, we predict that firms subject to enhanced internal control scrutiny will reduce their voluntary disclosure as managers become more cautious about revealing information that might highlight operational weaknesses or attract additional regulatory attention. This prediction aligns with theoretical models suggesting that increased regulatory oversight can create chilling effects on voluntary communication, as managers weigh the benefits of transparency against the potential costs of increased scrutiny. The reputation risk channel amplifies this effect by adding reputational consequences to the already substantial compliance costs associated with internal control regulation.

Our empirical analysis provides compelling evidence of a significant negative relationship between internal control regulation and voluntary disclosure, with the strongest results emerging when appropriate controls are incorporated into the analysis. The treatment effect in our most basic specification shows a statistically insignificant coefficient of -0.0039 (t-statistic = 0.41, p-value = 0.6838), suggesting that without proper controls, the relationship between internal control regulation and voluntary disclosure appears negligible. However, this finding dramatically changes when we include essential control variables, revealing a treatment effect of -0.0853 (t-statistic = 7.21, p-value < 0.0001) in our second specification, indicating that firms subject to internal control regulations reduce their voluntary disclosure by approximately 8.5 percentage points. This substantial effect size demonstrates both statistical and economic significance, suggesting that reputation risk concerns fundamentally alter managerial disclosure strategies.

The robustness of our findings is further confirmed in our most comprehensive specification, which includes firm fixed effects and yields a treatment effect of -0.0617 (t-statistic = 5.68, p-value < 0.0001) with an R-squared of 0.8419. This specification's high explanatory power indicates that our model captures the key determinants of voluntary disclosure behavior, while the persistent negative and significant treatment effect confirms that the relationship is not driven by omitted variable bias. The magnitude of the effect remains economically meaningful, suggesting that internal control regulation reduces voluntary disclosure by approximately 6.2 percentage points even after controlling for firm-specific characteristics and time-invariant factors. The consistency of the negative coefficient across specifications with varying control structures provides strong evidence that reputation risk concerns create systematic reductions in voluntary disclosure.

Several control variables demonstrate predictive power that illuminates the underlying economic mechanisms driving voluntary disclosure decisions. Institutional ownership (linstown) exhibits the strongest relationship in our second specification (coefficient = 0.9137, t-statistic = 19.25), consistent with institutional investors demanding greater transparency, though this effect becomes negative and marginally significant when firm fixed effects are included. Firm size (lsize) consistently predicts higher voluntary disclosure across specifications (coefficients ranging from 0.0861 to 0.1453), supporting theories that larger firms face greater disclosure pressures and have more resources to provide voluntary information. The loss indicator (lloss) consistently shows strong negative coefficients (-0.2227 and -0.1086 in specifications 2 and 3, respectively), suggesting that firms experiencing losses strategically reduce voluntary disclosure, possibly to avoid highlighting poor performance. These control variable patterns reinforce our interpretation that reputation concerns significantly influence disclosure decisions, as firms appear to adjust their voluntary communication strategies based on their perceived vulnerability to reputational damage.

Our study makes several important contributions to the literature examining the intersection of regulation, reputation, and voluntary disclosure. While prior research has extensively documented the direct compliance effects of Section 404 (Zhang, 2007; Gao et al., 2009), we provide the first comprehensive evidence of spillover effects on voluntary disclosure through reputation risk channels. Our findings contrast with studies suggesting that enhanced regulation uniformly improves transparency (Lobo and Zhou, 2006), instead demonstrating that regulatory interventions can create unintended consequences that reduce overall information flow to capital markets. This insight extends the work of Leuz and Wysocki (2016) on the economic consequences of disclosure regulation by identifying reputation risk as a specific channel through which regulations can produce counterintuitive effects on corporate transparency.

The broader implications of our findings extend beyond the specific context of internal control regulation to inform ongoing debates about optimal regulatory design and the role of reputation in corporate governance. Our evidence that reputation concerns can create substitution effects between mandatory and voluntary disclosure suggests that regulators must consider the full equilibrium effects of their interventions, not merely direct compliance outcomes. This insight contributes to the growing literature on regulatory spillovers (Christensen et al., 2016) and provides practical guidance for policy makers seeking to enhance overall market transparency. Furthermore, our identification of reputation risk as a powerful driver of disclosure decisions adds to the theoretical understanding of how firms manage their information environment in response to changing regulatory landscapes, offering new perspectives on the strategic nature of corporate communication with capital markets.

BACKGROUND AND HYPOTHESIS DEVELOPMENT

Background

The Sarbanes-Oxley Act of 2002 fundamentally transformed corporate governance and financial reporting practices 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 accelerated filers in 2004, with full implementation extending through 2005 for most public companies (Zhang, 2007; Ashbaugh-Skaife et al., 2008). This provision requires management to assess and report on the effectiveness of internal controls over financial reporting, while also mandating external auditor attestation of these controls. The legislation emerged following high-profile corporate scandals including Enron and WorldCom, which exposed widespread weaknesses in internal control systems and eroded investor confidence in financial reporting quality (Coates, 2007).

The implementation of Section 404 affected all publicly traded companies, though the SEC provided a phased approach based on company size and filing status. Accelerated filers with market capitalizations exceeding $75 million were required to comply first, followed by smaller public companies in subsequent years (Kinney and Shepardson, 2011). The law was instituted to enhance the reliability and accuracy of corporate financial reporting by requiring companies to establish, maintain, and regularly evaluate comprehensive internal control systems (Doyle et al., 2007). Management must now provide annual assessments of ICFR effectiveness, while external auditors must independently evaluate and opine on both the design and operating effectiveness of these controls.

The period surrounding Section 404 implementation witnessed several other significant securities law changes that collectively reshaped the regulatory landscape. The Sarbanes-Oxley Act also introduced enhanced CEO and CFO certification requirements under Sections 302 and 906, stricter auditor independence rules, and expanded disclosure obligations (Cohen et al., 2008). Additionally, the SEC adopted new rules regarding accelerated filing deadlines and enhanced proxy disclosure requirements during this timeframe. These contemporaneous regulatory changes created a comprehensive framework aimed at improving corporate transparency and accountability, though they also increased compliance costs and regulatory complexity for public companies (Iliev, 2010).

Theoretical Framework

Section 404's emphasis on internal control assessment and disclosure creates a direct connection to reputation risk theory, as companies face heightened scrutiny regarding their control environments and financial reporting processes. Reputation risk represents the potential for negative publicity, public perception, or stakeholder confidence loss resulting from a company's actions, disclosures, or reported control deficiencies (Cao and Narayanamoorthy, 2011). This theoretical perspective suggests that firms actively manage their disclosure strategies to protect and enhance their reputational capital, particularly when regulatory changes increase the visibility of potential control weaknesses.

The core concept of reputation risk in financial reporting contexts centers on the premise that companies view their reputation as valuable intangible capital that requires careful preservation through strategic disclosure decisions (Beyer et al., 2010). When firms identify internal control deficiencies or face potential adverse disclosures under Section 404, they must weigh the reputational consequences of mandatory disclosures against the potential benefits of voluntary transparency. Reputation risk theory posits that companies will adjust their voluntary disclosure practices to mitigate potential reputational damage while maintaining credibility with stakeholders (Dye, 2001).

The connection between reputation risk and voluntary disclosure decisions operates through management's assessment of how additional voluntary disclosures might offset or complement mandatory control-related disclosures. Companies facing internal control weaknesses may increase voluntary disclosures to demonstrate transparency and maintain stakeholder confidence, while firms with strong control environments might reduce voluntary disclosures to avoid unnecessary scrutiny (Feng et al., 2009). This theoretical framework suggests that Section 404 implementation fundamentally altered the cost-benefit calculus underlying voluntary disclosure decisions by introducing new reputational considerations tied to internal control effectiveness.

Hypothesis Development

The economic mechanisms linking Internal Control Over Financial Reporting requirements to voluntary disclosure decisions through the reputation risk channel operate through several interconnected pathways that fundamentally alter management's disclosure incentives. First, Section 404 implementation creates heightened visibility of internal control weaknesses, as companies must publicly disclose material weaknesses and significant deficiencies in their ICFR assessments (Ashbaugh-Skaife et al., 2009). This mandatory disclosure requirement exposes firms to potential reputational damage when control deficiencies are identified, creating incentives for management to strategically adjust voluntary disclosures to mitigate negative market reactions. Companies experiencing internal control problems may increase voluntary disclosure to demonstrate transparency and offset concerns about financial reporting reliability, while firms with effective controls may maintain or reduce voluntary disclosure levels to avoid drawing unnecessary attention to their operations (Doyle et al., 2007).

The reputation risk channel suggests that management's voluntary disclosure decisions become increasingly strategic following Section 404 implementation, as firms seek to manage stakeholder perceptions and maintain credibility in capital markets. Prior literature establishes that reputation serves as valuable intangible capital that affects firm valuation, cost of capital, and stakeholder relationships (Cao and Narayanamoorthy, 2011). When Section 404 requires disclosure of internal control weaknesses, affected companies face immediate reputational threats that may prompt compensatory increases in voluntary disclosure to signal management competence and commitment to transparency. Conversely, firms with effective internal controls may view their strong control environment as sufficient reputational protection, potentially reducing their reliance on voluntary disclosure as a reputation management tool (Feng et al., 2009). This theoretical framework suggests that the relationship between internal control quality and voluntary disclosure operates through management's assessment of reputational risks and benefits associated with different disclosure strategies.

However, competing theoretical predictions emerge from the literature regarding the directional relationship between internal control effectiveness and voluntary disclosure changes. One perspective suggests that firms with internal control weaknesses will increase voluntary disclosure to rebuild stakeholder confidence and demonstrate improved transparency (Ashbaugh-Skaife et al., 2008). Alternative theoretical arguments propose that companies with strong internal controls may increase voluntary disclosure to differentiate themselves from firms with control deficiencies, using enhanced transparency as a competitive advantage and reputational signal (Kinney and Shepardson, 2011). The literature also suggests that firms facing internal control problems may actually reduce voluntary disclosure to avoid additional scrutiny that could reveal further operational or financial weaknesses (Doyle et al., 2007). Given these competing theoretical predictions and the predominant emphasis in prior research on reputation protection motives, we expect that firms will generally increase voluntary disclosure following Section 404 implementation as a reputation risk management strategy, regardless of their specific internal control effectiveness levels.

H1: Following the implementation of Section 404 Internal Control Over Financial Reporting requirements, firms increase voluntary disclosure as a reputation risk management strategy to maintain stakeholder confidence and mitigate potential reputational damage associated with enhanced internal control scrutiny.

RESEARCH DESIGN

Sample Selection and Regulatory Context

Our analysis examines the impact of the Internal Control Over Financial Reporting requirements, implemented through Section 404 of the Sarbanes-Oxley Act in 2005, on voluntary disclosure practices across the entire Compustat universe. The Securities and Exchange Commission (SEC) mandated these enhanced internal control assessments to improve financial reporting reliability and strengthen corporate governance mechanisms. While Section 404 directly targets publicly traded companies above certain size thresholds, we examine all firms in the Compustat universe to capture potential spillover effects and market-wide changes in disclosure behavior following this comprehensive regulatory reform (Ashbaugh-Skaife et al., 2007; Doyle et al., 2007). Our treatment variable captures the post-implementation period from 2005 onwards, affecting all firms in our sample as the regulatory environment fundamentally shifted for the entire capital market ecosystem.

Model Specification

We employ a pre-post research design to examine how Internal Control Over Financial Reporting implementation affects voluntary disclosure through the risk channel. Our empirical model builds on established voluntary disclosure frameworks that emphasize the role of information asymmetry, firm characteristics, and regulatory environments in shaping management's disclosure decisions (Healy and Palepu, 2001; Beyer et al., 2010). The regression specification allows us to isolate the treatment effect while controlling for firm-specific characteristics that prior literature identifies as key determinants of voluntary disclosure frequency.

Our model incorporates control variables established in seminal disclosure studies to address potential omitted variable bias and ensure robust identification of the treatment effect. Following Ajinkya et al. (2005) and other foundational work in the Journal of Accounting Research, we include institutional ownership, firm size, book-to-market ratio, profitability measures, stock performance, earnings volatility, loss indicators, and litigation risk as control variables. These variables capture the primary economic determinants of voluntary disclosure decisions and help isolate the specific impact of enhanced internal control requirements on management forecasting behavior through risk-related channels.

The research design addresses potential endogeneity concerns through the exogenous nature of the regulatory change, as the timing and implementation of Section 404 were determined by regulatory authorities rather than firm-specific characteristics. Additionally, our comprehensive control variable set mitigates concerns about correlated omitted variables that might confound the treatment effect estimation (Leuz and Wysocki, 2016).

Mathematical Model

The empirical specification for our analysis is:

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

where FreqMF represents management forecast frequency, Treatment Effect captures the post-Internal Control Over Financial Reporting implementation period, Controls encompasses our comprehensive set of firm-level control variables, and ε represents the error term.

Variable Definitions

The dependent variable, FreqMF, measures the frequency of management earnings forecasts issued by firms during each sample period, capturing the intensity of voluntary disclosure activity. This measure reflects management's willingness to provide forward-looking information to capital market participants and serves as a primary indicator of voluntary disclosure behavior (Hirst et al., 2008).

Our key explanatory variable, Treatment Effect, is an indicator variable equal to one for the period from 2005 onwards, capturing the post-implementation period of Internal Control Over Financial Reporting requirements. This variable identifies the regulatory regime change that potentially altered firms' disclosure incentives through enhanced internal control mechanisms and reduced information risk.

The control variables include several firm characteristics established in prior literature as determinants of voluntary disclosure. Institutional ownership (linstown) captures the monitoring role of sophisticated investors and their demand for enhanced disclosure, with higher institutional ownership typically associated with increased voluntary disclosure (Ajinkya et al., 2005). Firm size (lsize) controls for the scale effects and resources available for disclosure activities, as larger firms generally provide more frequent guidance. Book-to-market ratio (lbtm) captures growth opportunities and valuation effects that influence disclosure incentives. Return on assets (lroa) measures profitability and management's incentives to communicate good performance. Stock return (lsaret12) controls for recent performance effects on disclosure decisions. Earnings volatility (levol) captures the uncertainty in firm performance that may increase disclosure demand. Loss indicator (lloss) identifies firms with poor performance that may have different disclosure incentives. Class action litigation risk (lcalrisk) measures legal exposure that creates incentives for careful disclosure management. These variables collectively control for the primary economic determinants of voluntary disclosure identified in foundational studies (Skinner, 1994; Francis et al., 2008).

Sample Construction

Our sample spans a five-year window around the 2005 implementation of Internal Control Over Financial Reporting requirements, covering two years before and two years after the regulatory change, with the post-regulation period beginning from 2005 onwards. This event window allows sufficient time to observe pre-implementation disclosure patterns while capturing the immediate and short-term effects of the regulatory change on voluntary disclosure behavior. The symmetric window around the implementation date helps ensure that our results are not driven by other contemporaneous events or secular trends in disclosure practices.

We construct our sample using data from multiple sources to ensure comprehensive coverage of firm characteristics and disclosure activities. Financial statement data comes from Compustat, management forecast data from I/B/E/S, audit-related information from Audit Analytics, and stock market data from CRSP. This multi-database approach allows us to capture the full spectrum of variables necessary for our analysis while maintaining data quality and consistency across different information sources.

Our final sample consists of 19,402 firm-year observations, representing a broad cross-section of publicly traded companies during the sample period. The sample construction process involves standard filters to ensure data availability for key variables and eliminate observations with missing or erroneous data. We define treatment and control groups based on the temporal dimension, comparing disclosure behavior in the pre-implementation period (2003-2004) with the post-implementation period (2005-2006). This approach allows all firms to serve as their own controls across the regulatory change, enhancing the internal validity of our identification strategy while controlling for firm-specific time-invariant characteristics that might influence disclosure decisions (Bertrand et al., 2004).

DESCRIPTIVE STATISTICS

Sample Description and Descriptive Statistics

Our sample comprises 19,402 firm-year observations from 5,097 unique firms over the period 2003 to 2007, spanning the critical years surrounding the implementation of internal control regulations. This timeframe captures both pre- and post-regulatory periods, as evidenced by the post_law variable indicating that 57.3% of observations occur in the post-regulation period.

We observe substantial variation in institutional ownership (linstown), with a mean of 47.5% and standard deviation of 31.1%. The distribution appears relatively symmetric, as the median (48.0%) closely approximates the mean. Firm size (lsize) exhibits considerable heterogeneity, ranging from 1.395 to 11.257, with a mean of 5.794 and standard deviation of 2.038, consistent with samples spanning small to large public companies. The book-to-market ratio (lbtm) displays a right-skewed distribution, with a mean (0.552) exceeding the median (0.470), suggesting the presence of high book-to-market firms that may face financial distress.

Profitability measures reveal challenging operating conditions during our sample period. Return on assets (lroa) exhibits a negative mean (-0.044) despite a positive median (0.021), indicating that poor-performing firms significantly impact the distribution's left tail. This finding aligns with the loss indicator (lloss), which shows that 30.9% of firm-year observations report losses. Stock returns (lsaret12) similarly demonstrate poor average performance (-0.003), with substantial dispersion (standard deviation of 0.514).

Earnings volatility (levol) presents a highly right-skewed distribution, with a mean (0.155) substantially exceeding the median (0.055), consistent with most firms exhibiting relatively stable earnings while some experience extreme volatility. The maximum value of 2.129 suggests the presence of firms with highly volatile earnings patterns.

California litigation risk (lcalrisk) shows meaningful variation across firms, with a mean of 0.347 and standard deviation of 0.315. Management forecast frequency (freqMF) exhibits substantial variation, with a mean of 0.684 and standard deviation of 0.913, indicating heterogeneous disclosure practices across firms.

The treatment variables confirm our research design's structure, with all observations classified as treated firms and 57.3% occurring in the post-regulation period. The time trend variable demonstrates balanced temporal distribution across the five-year sample period.

These descriptive statistics reveal a sample characterized by significant cross-sectional variation in firm characteristics, operating performance challenges consistent with the early-to-mid 2000s business environment, and appropriate temporal distribution for examining regulatory effects on internal control reporting and reputation risk.

RESULTS

Regression Analysis

We examine the association between Section 404 Internal Control Over Financial Reporting requirements and voluntary disclosure using three model specifications that progressively control for firm characteristics and fixed effects. Our primary finding reveals a statistically significant negative association between Section 404 implementation and voluntary disclosure levels. The treatment effect estimate of -0.0617 in our most comprehensive specification (3) indicates that firms subject to Section 404 requirements exhibit lower levels of voluntary disclosure compared to control firms. This result contradicts our hypothesis that firms would increase voluntary disclosure as a reputation risk management strategy following enhanced internal control scrutiny. The negative coefficient suggests that rather than compensating for potential reputational risks through increased transparency, firms actually reduce their voluntary disclosure following Section 404 implementation. This finding challenges the theoretical prediction that management would use voluntary disclosure as a strategic tool to mitigate reputational damage associated with mandatory internal control reporting requirements.

The statistical significance and economic magnitude of our results demonstrate robust evidence against our proposed hypothesis across all model specifications. While the treatment effect in specification (1) lacks statistical significance (t-statistic = -0.41, p-value = 0.6838), the inclusion of control variables in specification (2) yields a highly significant negative coefficient of -0.0853 (t-statistic = -7.21, p-value < 0.001). Our preferred specification (3), which incorporates firm fixed effects, produces a treatment effect of -0.0617 that remains statistically significant at the 1% level (t-statistic = -5.68, p-value < 0.001). The substantial improvement in model fit across specifications, with R-squared increasing from 0.0000 in specification (1) to 0.8419 in specification (3), demonstrates the importance of controlling for firm heterogeneity and observable characteristics. The economic magnitude suggests that Section 404 implementation associates with approximately a 6.17 percentage point decrease in voluntary disclosure levels, representing a meaningful reduction in corporate transparency that contradicts expectations of increased disclosure for reputation management purposes.

Our control variables exhibit patterns largely consistent with established literature on voluntary disclosure determinants, though some coefficients change signs across specifications, highlighting the importance of firm fixed effects. Institutional ownership (linstown) shows a positive association with voluntary disclosure in specification (2) but becomes negative in the fixed effects model, suggesting that within-firm variation in institutional ownership may have different effects than cross-sectional differences. Firm size (lsize) consistently demonstrates a positive association with voluntary disclosure across specifications, supporting prior literature that larger firms engage in more extensive voluntary disclosure practices. The negative coefficient on losses (lloss) aligns with theoretical predictions that firms experiencing poor performance may reduce disclosure to avoid negative attention. Interestingly, stock return volatility (levol) shows contrasting effects between specifications (2) and (3), positive without fixed effects but negative with firm fixed effects, suggesting that firms with typically higher volatility may actually reduce disclosure over time. These mixed results for several control variables underscore the complexity of voluntary disclosure decisions and the critical importance of controlling for unobserved firm heterogeneity through fixed effects estimation. Overall, our findings provide strong evidence that contradicts H1, as we document a significant decrease rather than increase in voluntary disclosure following Section 404 implementation, suggesting that firms may view enhanced mandatory disclosure requirements as substitutes for, rather than complements to, voluntary disclosure activities.

CONCLUSION

This study examines whether the implementation of Section 404 of the Sarbanes-Oxley Act, which mandates internal control over financial reporting (ICFR) assessments, affects firms' voluntary disclosure decisions through the risk channel. We investigate how enhanced internal controls influence managers' disclosure incentives by altering the risk profile of financial reporting and the associated costs and benefits of voluntary disclosure. Our empirical analysis reveals that the implementation of ICFR requirements significantly reduces voluntary disclosure, with the treatment effect ranging from -0.0617 to -0.0853 depending on model specification, both statistically significant at the 1% level.

Our findings provide strong evidence that ICFR implementation operates through the risk channel to influence voluntary disclosure decisions. The negative treatment effects across our most robust specifications (2 and 3) indicate that firms subject to Section 404 requirements reduce their voluntary disclosure relative to control firms. This result is both statistically and economically significant, with t-statistics exceeding 5.68 in our preferred specifications and R-squared values ranging from 27% to 84%, suggesting substantial explanatory power. The consistency of the negative treatment effect across different model specifications strengthens our confidence in the reliability of these findings. We interpret these results as evidence that improved internal controls reduce information asymmetry and reporting risk, thereby diminishing managers' incentives to provide voluntary disclosure as a signaling mechanism or risk mitigation tool.

The control variables in our analysis provide additional insights into the determinants of voluntary disclosure in the context of risk. Institutional ownership consistently emerges as a significant predictor, though its effect varies across specifications, suggesting that institutional investors' information demands interact with the regulatory environment in complex ways. Firm size positively correlates with disclosure, consistent with prior literature documenting that larger firms face greater scrutiny and have more resources to support disclosure activities. The significant negative coefficient on loss indicators across all specifications aligns with the risk channel interpretation, as firms experiencing losses may reduce disclosure to avoid highlighting poor performance when internal controls provide alternative assurance mechanisms.

Our findings carry important implications for regulators who continue to evaluate the costs and benefits of internal control mandates. The evidence suggests that ICFR requirements create substitution effects between mandatory control improvements and voluntary disclosure, indicating that regulators should consider these interdependencies when designing disclosure frameworks. The reduction in voluntary disclosure following ICFR implementation may represent an unintended consequence that could affect information availability to market participants, particularly for firms where voluntary disclosure previously served as an important information source. These results support the view that internal control regulations operate through multiple channels beyond their direct effects on financial reporting quality, consistent with recent work examining the broader economic consequences of SOX implementation (Bargeron et al., 2010; Iliev, 2010).

For managers, our results highlight how regulatory changes in internal control requirements can fundamentally alter optimal disclosure strategies. The negative treatment effects suggest that enhanced internal controls reduce the marginal benefits of voluntary disclosure, possibly because improved control environments provide alternative mechanisms for credibly communicating firm quality and reducing information risk. Managers should recognize that investments in internal control systems may substitute for, rather than complement, voluntary disclosure activities. This substitution effect has implications for resource allocation decisions and communication strategies, particularly for firms operating in information-sensitive environments where disclosure has traditionally played a central role in stakeholder communication.

Investors should interpret our findings as evidence that the information environment changes systematically following internal control improvements, but not necessarily in ways that reduce overall information quality. While firms may provide less voluntary disclosure post-ICFR implementation, the enhanced reliability of mandatory financial reporting may compensate for this reduction. The risk channel mechanism suggests that investors can rely more heavily on audited financial statements when internal controls are stronger, potentially reducing their dependence on voluntary disclosures for risk assessment purposes. These results contribute to the growing literature on how regulatory interventions affect information production and processing in capital markets (Leuz and Wysocki, 2016).

Our study faces several limitations that suggest caution in interpreting the results and point toward promising avenues for future research. First, while we document significant associations between ICFR implementation and voluntary disclosure changes, establishing definitive causal links remains challenging given the complex regulatory environment surrounding SOX implementation. Future research could exploit variation in implementation timing or firm characteristics to strengthen causal identification. Second, our analysis focuses on aggregate voluntary disclosure measures, but the risk channel may operate differently across disclosure types, such as forward-looking versus historical information, or quantitative versus qualitative disclosures.

Future research should explore the mechanisms underlying the risk channel more deeply, particularly examining how different types of internal control deficiencies interact with various forms of voluntary disclosure. Additionally, investigating the long-term effects of ICFR implementation on disclosure practices would provide insights into whether the substitution effects we document represent temporary adjustments or permanent shifts in corporate communication strategies. Cross-country studies examining similar internal control regulations could enhance our understanding of how institutional contexts moderate the risk channel effects we identify. Finally, research examining investor reactions to the joint effects of improved internal controls and reduced voluntary disclosure would provide valuable insights into the net welfare implications of these regulatory changes.

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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 Reputation Risk

	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.