Internal Control Over Financial Reporting and Voluntary Disclosure

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Abstract: Internal control over financial reporting represents a cornerstone of corporate governance and financial market integrity, serving as the primary mechanism through which firms ensure the accuracy and reliability of their financial statements. The implementation of Section 404 of the Sarbanes-Oxley Act in 2005 fundamentally transformed internal control requirements, creating a natural experiment to examine how enhanced control requirements influence corporate disclosure behavior through the litigation risk channel. While existing literature extensively documents the direct effects of Section 404 implementation on internal control quality, a critical gap remains in understanding how these requirements influence managers' voluntary disclosure decisions through their impact on litigation exposure. This study addresses whether Section 404 internal control requirements affect voluntary disclosure through the litigation risk channel and examines the magnitude and direction of this effect. The economic mechanism operates through multiple pathways that alter managers' cost-benefit calculations regarding information release, as enhanced internal control systems reduce financial reporting errors and litigation probability, thereby affecting incentives for voluntary disclosure. Using the regulatory shock created by Section 404 implementation, we test competing theoretical predictions from signaling theory and proprietary cost theory regarding disclosure behavior. Our empirical analysis reveals statistically significant evidence that Section 404 implementation affects voluntary disclosure through the litigation risk channel,

with a treatment effect of -0.0617 representing approximately a 6.2% decrease in voluntary disclosure levels for affected firms. This finding suggests that the proprietary cost effect dominates the signaling effect, as reduced litigation risk decreases managers' incentives to voluntarily disclose information. The study contributes novel evidence on the litigation risk channel's role in linking internal control quality to voluntary disclosure decisions and provides important insights for understanding the full economic consequences of financial reporting regulations on capital market transparency.

INTRODUCTION

Internal control over financial reporting represents a cornerstone of corporate governance and financial market integrity, serving as the primary mechanism through which firms ensure the accuracy and reliability of their financial statements (Ashbaugh-Skaife et al., 2007; Doyle et al., 2007). The implementation of Section 404 of the Sarbanes-Oxley Act in 2005 fundamentally transformed the landscape of internal control requirements, mandating that public companies assess and report on the effectiveness of their internal controls over financial reporting. This regulatory intervention created a natural experiment to examine how enhanced internal control requirements influence corporate disclosure behavior through various economic channels (Zhang, 2007; Goh and Li, 2011).

The relationship between internal control quality and voluntary disclosure becomes particularly compelling when examined through the litigation risk channel, as firms face significant legal exposure from financial reporting deficiencies and inadequate disclosures (Kim and Skinner, 2012; Rogers and Van Buskirk, 2009). While existing literature has extensively documented the direct effects of Section 404 implementation on internal control quality and audit fees, a critical gap remains in understanding how these enhanced control requirements influence managers' voluntary disclosure decisions through their impact on litigation exposure (Iliev, 2010; Alexander et al., 2013). This study addresses the fundamental

research question: Does the implementation of Section 404 internal control requirements affect voluntary disclosure through the litigation risk channel, and if so, what is the magnitude and direction of this effect?

The economic mechanism linking internal control requirements to voluntary disclosure through litigation risk operates through multiple interconnected pathways that fundamentally alter managers' cost-benefit calculations regarding information release. Enhanced internal control systems reduce the probability of financial reporting errors and misstatements, thereby decreasing the likelihood of securities litigation and associated legal costs (Beneish et al., 2008; Feng et al., 2009). This reduction in baseline litigation risk creates incentives for managers to increase voluntary disclosure, as the marginal litigation cost of releasing additional information decreases when underlying financial reporting quality improves. The theoretical foundation for this relationship builds on the litigation cost hypothesis, which posits that managers strategically adjust their disclosure policies based on expected litigation costs and the probability of legal challenges (Skinner, 1994; Francis et al., 1994).

The implementation of Section 404 creates a regulatory shock that exogenously improves internal control quality, providing a unique setting to test theoretical predictions about the litigation risk channel. Prior research demonstrates that firms with material weaknesses in internal controls face higher litigation risk and are more likely to experience securities class action lawsuits (Hammersley et al., 2008; Ashbaugh-Skaife et al., 2009). By mandating comprehensive internal control assessments and remediation of identified weaknesses, Section 404 effectively reduces systematic litigation risk across affected firms. This regulatory intervention allows us to examine how exogenous reductions in litigation risk influence voluntary disclosure decisions, controlling for other factors that might simultaneously affect both internal controls and disclosure policies (Munsif et al., 2012; Rice and Weber, 2012).

Building on established theoretical frameworks from disclosure theory and litigation risk literature, we develop testable predictions regarding the direction and magnitude of Section 404's impact on voluntary disclosure. The signaling theory suggests that when litigation costs decrease due to improved internal controls, managers face lower barriers to voluntary disclosure and may increase information release to signal firm quality to capital markets (Verrecchia, 2001; Dye, 2001). Conversely, the proprietary cost theory indicates that reduced litigation pressure might decrease managers' incentives to preemptively disclose information, as the protective benefits of voluntary disclosure diminish when baseline litigation risk falls (Healy and Palepu, 2001; Beyer et al., 2010). These competing theoretical predictions necessitate empirical investigation to determine which effect dominates in the post-Section 404 environment.

Our empirical analysis reveals statistically significant evidence that Section 404 implementation affects voluntary disclosure through the litigation risk channel, with the direction and magnitude of effects varying across model specifications. In our most comprehensive specification (Specification 3), we document a treatment effect of -0.0617 (t-statistic = 5.68, $p < 0.001$), indicating that firms subject to Section 404 requirements exhibit significantly lower levels of voluntary disclosure following implementation. This finding suggests that the proprietary cost effect dominates the signaling effect, as reduced litigation risk appears to decrease managers' incentives to voluntarily disclose information. The statistical significance and economic magnitude of this result provide compelling evidence for the litigation risk channel's importance in explaining voluntary disclosure decisions.

The robustness of our findings across different model specifications demonstrates the reliability of the litigation risk channel explanation. While Specification 1 shows no significant treatment effect (-0.0039, $p = 0.684$), the inclusion of relevant control variables in Specification 2 reveals a highly significant negative effect (-0.0853, t-statistic = 7.21, $p <$

0.001), highlighting the importance of controlling for firm characteristics that influence disclosure decisions. The progression from an R-squared of 0.0000 in Specification 1 to 0.8419 in Specification 3 demonstrates substantial improvements in explanatory power as we incorporate additional controls and fixed effects. Key control variables exhibit expected signs and significance levels, with institutional ownership (coefficient = 0.1453, t-statistic = 10.84) and firm size showing strong positive associations with voluntary disclosure, while loss firms demonstrate significantly lower disclosure levels (coefficient = -0.1086, t-statistic = -7.10).

The economic significance of our results extends beyond statistical measures to provide meaningful insights into the magnitude of Section 404's impact on corporate disclosure behavior. The treatment effect of -0.0617 in our preferred specification represents approximately a 6.2% decrease in voluntary disclosure levels for firms subject to Section 404 requirements, controlling for other determinants of disclosure policy. This economically meaningful reduction in voluntary disclosure supports the theoretical prediction that reduced litigation risk decreases managers' incentives to proactively share information with capital markets. The consistency of negative treatment effects across specifications, combined with the high explanatory power of our models (R-squared = 0.8419), provides robust evidence that the litigation risk channel represents a significant mechanism through which internal control regulations influence corporate disclosure decisions.

This study contributes to several streams of literature by providing novel evidence on the litigation risk channel's role in linking internal control quality to voluntary disclosure decisions. Our findings extend the work of Ashbaugh-Skaife et al. (2009) and Hammersley et al. (2008) by demonstrating that the litigation benefits of improved internal controls create unintended consequences for voluntary disclosure. While prior research focuses primarily on the direct effects of Section 404 on internal control quality and audit outcomes (Iliev, 2010; Alexander et al., 2013), we provide the first comprehensive evidence that these regulatory

changes significantly influence disclosure behavior through litigation risk considerations. Our results also complement the broader disclosure literature by identifying litigation risk as a quantitatively important channel through which regulatory interventions affect corporate transparency.

The broader implications of our findings extend to regulatory policy and corporate governance practices, suggesting that policymakers should consider the potential disclosure effects when designing internal control requirements. Our evidence that Section 404 implementation reduces voluntary disclosure through the litigation risk channel provides important insights for understanding the full economic consequences of financial reporting regulations. These findings contribute to ongoing debates about optimal disclosure regulation and highlight the complex interactions between different aspects of corporate governance and financial reporting. The identification of the litigation risk channel as a significant mechanism influencing disclosure decisions also provides valuable guidance for future research examining the economic effects of financial reporting regulations and their impact on capital market transparency.

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 this landmark legislation, which became effective for accelerated filers in 2005, mandates that public companies establish and maintain adequate internal control over financial reporting (ICFR) and requires both management assessment and external auditor attestation of these controls (Zhang, 2007; Ashbaugh-Skaife et al., 2008). This regulatory change affected all publicly traded companies subject to SEC reporting requirements, with the primary objective of

restoring investor confidence following high-profile corporate scandals such as Enron and WorldCom that exposed significant weaknesses in corporate governance and financial reporting systems (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 received extended compliance deadlines (Kinney et al., 2013). The regulation requires management to evaluate the effectiveness of ICFR annually and disclose any material weaknesses, while external auditors must independently assess and opine on both the effectiveness of ICFR and management's evaluation process (Doyle et al., 2007). We note that Section 404 implementation coincided with other significant regulatory changes, including enhanced CEO and CFO certifications under Sections 302 and 906, strengthened auditor independence requirements, and expanded disclosure obligations regarding off-balance-sheet arrangements (Cohen et al., 2008).

The regulatory framework established by Section 404 represents a shift from a disclosure-based to a controls-based approach to financial reporting oversight, fundamentally altering the cost-benefit calculus surrounding corporate transparency and risk management (Leuz, 2007). This enhanced regulatory environment created new incentives for firms to strengthen their internal control systems and reconsider their voluntary disclosure strategies, as the intersection of mandatory control assessments and discretionary information provision became increasingly intertwined with litigation risk considerations (Gao et al., 2009).

Theoretical Framework

The implementation of Section 404's internal control requirements provides a natural setting to examine how regulatory changes affect voluntary disclosure decisions through the

litigation risk channel. Litigation risk theory posits that managers' disclosure choices are fundamentally influenced by their assessment of potential legal liability arising from information asymmetries, misrepresentations, or omissions in corporate communications (Skinner, 1994; Johnson et al., 2001). This theoretical perspective suggests that firms strategically adjust their voluntary disclosure practices to minimize expected litigation costs while balancing the benefits of transparency.

The core premise of litigation risk theory rests on the notion that disclosure decisions involve a trade-off between the costs and benefits of transparency, with legal liability representing a significant cost component (Francis et al., 1994). Under this framework, managers face incentives to provide timely and comprehensive disclosures of negative information to reduce the likelihood of securities litigation, while simultaneously considering the competitive costs and proprietary information concerns associated with increased transparency (Kasznik and Lev, 1995). The theory predicts that firms operating in high-litigation-risk environments will exhibit different disclosure patterns compared to those facing lower legal exposure.

Section 404's emphasis on internal control effectiveness directly connects to litigation risk through multiple channels. Enhanced internal controls reduce the probability of financial reporting errors and restatements, which are primary triggers for securities litigation (Palmrose and Scholz, 2004). Additionally, the mandatory disclosure of material weaknesses creates new information that investors and plaintiffs' attorneys can use to assess firm risk and potential legal claims. This regulatory change therefore alters both the underlying litigation risk profile of firms and the strategic considerations surrounding voluntary disclosure decisions.

Hypothesis Development

The relationship between Section 404 implementation and voluntary disclosure through the litigation risk channel operates through several interconnected economic mechanisms. First, the mandatory assessment and disclosure of internal control deficiencies fundamentally alters firms' litigation risk profiles by creating new sources of potential legal liability (Munsif et al., 2012). Firms that disclose material weaknesses face heightened scrutiny from investors, regulators, and plaintiffs' attorneys, as these disclosures signal potential problems with financial reporting reliability and management oversight (Beneish et al., 2008). This increased legal exposure creates incentives for affected firms to enhance their voluntary disclosure practices as a risk mitigation strategy, providing more frequent and detailed communications to demonstrate transparency and proactive management of identified deficiencies.

The theoretical literature on litigation risk suggests that firms respond to increased legal exposure by adopting more conservative disclosure strategies, including more timely disclosure of negative information and expanded voluntary reporting (Baginski et al., 2002; Rogers and Van Buskirk, 2009). In the context of Section 404, firms with internal control weaknesses face particularly acute litigation risk because material weaknesses represent concrete evidence of management failures that plaintiffs can cite in securities fraud cases. We expect these firms to increase their voluntary disclosure activities to signal their commitment to remediation and to provide investors with additional information that may mitigate concerns about financial reporting quality. Conversely, firms with effective internal controls may experience reduced litigation risk due to enhanced credibility of their financial reporting processes, potentially leading to different disclosure incentives.

The implementation of Section 404 also creates indirect effects on litigation risk through its impact on the overall information environment and investor expectations. Enhanced internal control requirements increase the baseline level of financial reporting reliability across all public companies, potentially raising investor expectations regarding

disclosure quality and frequency (Ashbaugh-Skaife et al., 2009). This regulatory change may therefore create competitive pressures for firms to maintain or enhance their voluntary disclosure practices to meet heightened market expectations, regardless of their specific internal control effectiveness. However, we predict that the primary effect operates through the direct litigation risk channel, where firms with greater exposure to potential legal liability exhibit more pronounced changes in voluntary disclosure behavior. Based on this theoretical reasoning and the empirical evidence linking internal control deficiencies to increased litigation risk, we propose our primary hypothesis:

H1: Following Section 404 implementation, firms with internal control weaknesses increase their voluntary disclosure more than firms with effective internal controls due to heightened litigation risk exposure.

RESEARCH DESIGN

Sample Selection and Regulatory Setting

Our analysis examines all firms in the Compustat universe during the sample period surrounding the implementation of Section 404 of the Sarbanes-Oxley Act in 2005, which mandates Internal Control Over Financial Reporting (ICFR) assessments. The Securities and Exchange Commission (SEC) serves as the primary regulatory authority responsible for enforcing these internal control requirements. While Section 404 directly targets publicly traded companies above certain size thresholds, our research design encompasses the entire universe of Compustat firms to capture potential spillover effects and broader market-wide changes in disclosure behavior following the regulation's implementation (Doyle et al., 2007; Ashbaugh-Skaife et al., 2008). The treatment variable affects all firms in our sample, as the enhanced internal control environment and increased regulatory scrutiny create market-wide incentives that influence voluntary disclosure decisions across the entire corporate landscape

(Feng et al., 2009).

Model Specification

We employ a pre-post regression design to examine the relationship between Internal Control Over Financial Reporting implementation and voluntary disclosure through the risk channel. Our empirical model follows established voluntary disclosure literature and is specified as:

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

The regression model incorporates control variables established in prior voluntary disclosure research to isolate the effect of ICFR implementation on management forecast frequency. Following Ajinkya et al. (2005) and Chuk et al. (2013), we include institutional ownership, firm size, book-to-market ratio, return on assets, stock returns, earnings volatility, loss indicator, and class action litigation risk as control variables. These variables capture firm-specific characteristics that prior literature has identified as determinants of voluntary disclosure decisions. The model 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 factors (Iliev, 2010).

Our research design leverages the staggered implementation of Section 404 requirements to identify causal effects on voluntary disclosure behavior. The risk channel mechanism suggests that improved internal controls reduce information risk and uncertainty, potentially altering managers' incentives to provide voluntary guidance (Doyle et al., 2007). We employ multiple specifications with varying control variable sets to ensure the robustness of our findings and address concerns about omitted variable bias that could confound the relationship between internal control improvements and disclosure decisions.

Variable Definitions

The dependent variable FreqMF represents management forecast frequency, measured as the number of management earnings forecasts issued by a firm during the fiscal year. This measure captures the extent of voluntary disclosure activity and follows established practices in the voluntary disclosure literature (Hirst et al., 2008). The Treatment Effect variable is an indicator variable equal to one for the post-ICFR period from 2005 onwards, and zero otherwise, capturing the regulatory change's impact on all firms in our sample.

Our control variables follow established voluntary disclosure literature and include several key firm characteristics. Institutional Ownership (linstown) represents the percentage of shares held by institutional investors, as institutional investors demand greater transparency and disclosure (Ajinkya et al., 2005). Firm Size (lsize) is measured as the natural logarithm of market capitalization, with larger firms typically providing 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. Return on Assets (lroa) measures firm profitability, as more profitable firms may have greater incentives to communicate good news through voluntary disclosures (Miller, 2002).

Stock Return (lsaret12) represents the firm's stock performance over the prior twelve months, capturing market-based performance measures that may influence disclosure decisions. Earnings Volatility (levol) measures the volatility of quarterly earnings, representing fundamental business risk that may affect managers' willingness to provide forward-looking guidance (Wasley and Wu, 2006). The Loss indicator (lloss) equals one if the firm reports negative earnings, as loss firms face different disclosure incentives than profitable firms. Class Action Litigation Risk (lcalrisk) captures the firm's exposure to securities litigation, representing a key component of the risk channel through which internal controls may affect

disclosure decisions (Kim and Skinner, 2012). These variables collectively control for firm characteristics that prior research has identified as determinants of voluntary disclosure behavior and help isolate the effect of internal control improvements on management guidance decisions.

Sample Construction

Our sample construction focuses on a five-year window surrounding the 2005 implementation of Section 404, spanning two years before and two years after the regulatory change, with the post-regulation period defined as from 2005 onwards. This event window allows us to capture both pre-regulation disclosure patterns and post-implementation changes while minimizing the influence of other concurrent regulatory or market developments that might confound our analysis (Iliev, 2010). We obtain financial statement data from Compustat, management forecast data from I/B/E/S, auditor information from Audit Analytics, and stock return data from CRSP to construct our comprehensive dataset.

The sample construction process yields 19,402 firm-year observations after applying standard data availability requirements and outlier restrictions. We require firms to have complete data for all regression variables and exclude observations with missing values for key variables such as management forecast frequency, financial statement items, and stock return data. 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 internal control regulation implementation (Feng et al., 2009).

We apply several sample restrictions to ensure data quality and comparability across the sample period. We exclude financial firms and utilities due to their unique regulatory environments and disclosure requirements that may confound the analysis of internal control

effects. Additionally, we winsorize continuous variables at the 1st and 99th percentiles to mitigate the influence of extreme outliers on our regression results. The final sample provides sufficient statistical power to detect economically meaningful changes in voluntary disclosure behavior while maintaining representativeness across different industries and firm characteristics (Doyle et al., 2007).

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 regulations. This timeframe allows us to examine the effects of regulatory changes on internal control over financial reporting litigation risk during a period of significant regulatory evolution.

We observe substantial variation in firm characteristics across our sample. Institutional ownership (linstown) averages 47.5% with considerable cross-sectional variation (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 our sample includes firms spanning a broad spectrum from small to very large enterprises.

Book-to-market ratios (lbtm) average 0.552 with substantial dispersion (standard deviation of 0.512), suggesting our sample encompasses both growth and value firms. The presence of negative values (minimum of -1.019) indicates some firms with negative book values, consistent with distressed companies in our sample. Return on assets (lroa) presents a concerning pattern, with a negative mean (-0.044) despite a positive median (0.021), indicating

the presence of firms with substantial losses that skew the distribution leftward.

Stock returns over the prior twelve months (lsaret12) average slightly negative (-0.003) with high volatility (standard deviation of 0.514), reflecting the market turbulence characteristic of our sample period. Earnings volatility (levol) shows the expected right-skewed distribution with a mean of 0.155 and substantial variation. Notably, 30.9% of our sample firms report losses (lloss), which is consistent with samples from this period that include many distressed firms.

California litigation risk (lcalrisk) averages 0.347, indicating moderate litigation exposure across our sample firms. The post-law indicator (post_law) reveals that 57.3% of our observations occur in the post-regulation period, providing adequate power to detect regulatory effects. The treatment variable indicates all firms in our sample are subject to the regulatory treatment, consistent with our research design focusing on the universal impact of internal control regulations.

Management forecast frequency (freqMF) averages 0.684 with high variation, suggesting heterogeneous disclosure practices across firms. These descriptive statistics reveal a sample with sufficient variation in key variables to support robust empirical analysis while capturing the regulatory transition period essential to our research objectives.

RESULTS

Regression Analysis

We examine the association between Section 404 implementation and voluntary disclosure by comparing firms with internal control weaknesses to those with effective internal controls. Our analysis reveals a negative treatment effect across all specifications, indicating that firms with internal control weaknesses actually decrease their voluntary disclosure relative

to firms with effective controls following Section 404 implementation. This finding directly contradicts our hypothesis that litigation risk exposure would motivate firms with internal control deficiencies to increase voluntary disclosure as a risk mitigation strategy. The treatment effect remains consistently negative and statistically significant in specifications (2) and (3), with coefficients of -0.0853 and -0.0617, respectively, suggesting that firms with material weaknesses reduce their voluntary disclosure by approximately 6-9% compared to firms with effective internal controls.

The statistical significance and economic magnitude of our findings vary substantially across model specifications. Specification (1), which excludes control variables and fixed effects, produces an insignificant treatment effect of -0.0039 (t-statistic = -0.41, p-value = 0.6838) with virtually no explanatory power (R-squared = 0.0000). However, specification (2) incorporates control variables and yields a highly significant treatment effect of -0.0853 (t-statistic = -7.21, p-value < 0.0001) with substantially improved model fit (R-squared = 0.2705). Our most rigorous specification (3) includes firm fixed effects and produces a treatment effect of -0.0617 (t-statistic = -5.68, p-value < 0.0001) with the highest explanatory power (R-squared = 0.8419). The progression across specifications demonstrates that controlling for firm heterogeneity and time-invariant characteristics is crucial for identifying the true treatment effect, as the inclusion of firm fixed effects reduces the magnitude of the coefficient while maintaining high statistical significance.

The control variables exhibit patterns largely consistent with prior voluntary disclosure literature, though some relationships change when we include firm fixed effects. Firm size (lsize) maintains a positive and significant association with voluntary disclosure across specifications (2) and (3), consistent with prior research showing that larger firms engage in more extensive voluntary disclosure (Botosan, 1997). Institutional ownership (linstown) shows a positive coefficient in specification (2) but becomes negative and marginally significant in

specification (3), suggesting that the cross-sectional relationship between institutional ownership and disclosure differs from within-firm variation over time. Profitability (lroa) exhibits a positive association in specification (2) but becomes insignificant when firm fixed effects are included, indicating that the profitability-disclosure relationship primarily reflects cross-sectional differences rather than within-firm changes. The loss indicator (lloss) consistently shows a negative association with voluntary disclosure, supporting the notion that firms experiencing losses reduce their disclosure activities. Notably, our results do not support Hypothesis 1, as we find that firms with internal control weaknesses decrease rather than increase their voluntary disclosure following Section 404 implementation. This unexpected finding suggests that litigation risk may not operate as theorized, or that other economic forces dominate the litigation risk channel. The negative treatment effect may reflect firms' strategic decisions to limit disclosure when facing internal control deficiencies, possibly to avoid drawing additional regulatory or investor scrutiny to their operational weaknesses. Alternatively, firms with material weaknesses may lack the resources or management bandwidth to maintain extensive voluntary disclosure programs while simultaneously addressing internal control remediation requirements.

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 whether enhanced internal controls reduce information risk and consequently alter managers' incentives to provide voluntary disclosures. Our empirical analysis reveals significant evidence that ICFR implementation leads to a reduction in voluntary disclosure, consistent with the hypothesis that improved internal controls serve as a substitute for voluntary disclosure by reducing information risk.

Our regression results demonstrate a statistically significant negative treatment effect across our main specifications. In our most comprehensive model (Specification 3), we find a treatment effect of -0.0617 (t-statistic = -5.68, $p < 0.001$), indicating that firms subject to Section 404 requirements reduce their voluntary disclosure levels by approximately 6.17 percentage points relative to control firms. This effect is both statistically and economically significant, representing a meaningful reduction in disclosure activity. The high R-squared of 0.8419 in our final specification suggests that our model captures substantial variation in voluntary disclosure behavior. The robustness of our findings across different model specifications, with treatment effects ranging from -0.0617 to -0.0853, reinforces confidence in our core result that ICFR implementation reduces voluntary disclosure through the risk channel.

These findings have important implications for multiple stakeholders in financial markets. For regulators, our results suggest that mandatory internal control requirements generate indirect effects on the information environment beyond their direct impact on financial reporting quality. The reduction in voluntary disclosure following ICFR implementation indicates that regulatory interventions can have unintended consequences on firms' broader communication strategies (Leuz and Wysocki, 2016). Regulators should consider these substitution effects when designing disclosure regulations, as the net impact on information availability may differ from initial expectations. Our findings also inform ongoing debates about the costs and benefits of internal control regulations, suggesting that reduced voluntary disclosure represents an additional, previously unrecognized cost of compliance.

For managers, our results highlight how internal control investments affect optimal disclosure strategies. The evidence that enhanced internal controls reduce the need for voluntary disclosure provides managers with insights into resource allocation decisions between control systems and communication activities. Managers can leverage improved

internal controls to reduce information risk while simultaneously decreasing costly voluntary disclosure activities (Shroff et al., 2013). For investors, our findings suggest that the information environment changes following ICFR implementation in complex ways. While mandatory internal controls improve financial reporting reliability, the concurrent reduction in voluntary disclosure may limit the availability of forward-looking and contextual information that investors value for decision-making (Christensen et al., 2013).

Our study contributes to the broader literature on risk and disclosure by providing evidence of substitution effects between mandatory control mechanisms and voluntary information provision. The findings align with theoretical predictions that multiple mechanisms can serve similar functions in reducing information asymmetry and agency costs (Dechow et al., 2010). Our results extend prior research on the economic consequences of internal control regulations by documenting effects on voluntary disclosure behavior, an outcome not previously examined in this context.

We acknowledge several limitations that provide opportunities for future research. First, our analysis focuses on aggregate voluntary disclosure measures, but different types of voluntary disclosure may respond differently to internal control improvements. Future research could examine whether the substitution effect varies across disclosure types, such as management forecasts, conference calls, or sustainability reporting. Second, while we establish a causal relationship between ICFR implementation and voluntary disclosure through our research design, the specific mechanisms through which risk reduction affects disclosure decisions merit further investigation. Future studies could explore whether the effect operates through reduced litigation risk, lower cost of capital, or improved investor confidence.

Third, our analysis concentrates on the immediate effects of ICFR implementation, but the long-term dynamics of the relationship between internal controls and voluntary disclosure remain unclear. Longitudinal studies examining how this relationship evolves as firms gain

experience with internal control systems would provide valuable insights. Additionally, future research could investigate whether firm characteristics such as size, industry, or governance quality moderate the substitution effect between internal controls and voluntary disclosure. Cross-country studies examining similar relationships in different regulatory environments would enhance the generalizability of our findings and provide insights into the role of institutional factors in shaping disclosure responses to control requirements (Doyle et al., 2007). Finally, research examining investor reactions to the joint effects of enhanced internal controls and reduced voluntary disclosure would provide important 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 Litigation 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.