Modernization Of Oil And Gas Reporting and Voluntary Disclosure

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Abstract: This study examines how the SEC's 2008 Modernization of Oil and Gas Reporting requirements affects firms' voluntary disclosure practices through the reputation risk channel. While prior research documents the direct effects of mandatory disclosure requirements on reporting quality, the interaction between mandatory requirements and voluntary disclosure decisions through reputation risk remains underexplored. Using difference-in-differences analysis of oil and gas companies before and after the regulation's implementation, we investigate how enhanced mandatory disclosure requirements influence firms' voluntary disclosure strategies. Results show that affected firms significantly reduced their voluntary disclosure following the regulation's implementation, with a treatment effect of -0.1004. This reduction is particularly pronounced for firms with higher calculated risk measures, supporting the reputation risk channel hypothesis. The relationship remains robust when controlling for firm characteristics, institutional ownership, and firm size. These findings demonstrate that firms manage their information environment more conservatively when mandatory requirements increase reputation risk exposure. The study contributes to disclosure literature by identifying reputation risk as a key channel through which mandatory requirements influence voluntary disclosure decisions and provides insights for policymakers regarding potential unintended consequences of enhanced disclosure regulations in reputation-sensitive industries.

INTRODUCTION

The Securities and Exchange Commission's 2008 Modernization of Oil and Gas Reporting requirements represents a significant shift in energy sector disclosure regulation, fundamentally altering how firms communicate their reserves and production metrics to market participants. This regulatory change aimed to enhance transparency and standardization of oil and gas companies' reporting practices, particularly regarding proved reserves estimation and valuation methodologies (Dhaliwal et al., 2011; Armstrong et al., 2010). The regulation's implementation coincided with increasing scrutiny of energy companies' environmental impacts and operational risks, making it particularly relevant for understanding how mandatory disclosure requirements influence firms' reputation management strategies.

A critical yet underexplored aspect of this regulation is its impact on voluntary disclosure through the reputation risk channel. While prior research documents the direct effects of mandatory disclosure requirements on reporting quality (Leuz and Verrecchia, 2000), less is known about how such regulations influence firms' voluntary disclosure decisions when reputation concerns are paramount. We address this gap by examining how the Modernization of Oil and Gas Reporting requirements affected firms' voluntary disclosure practices through reputation risk considerations.

The theoretical link between mandatory disclosure requirements and voluntary disclosure decisions operates through several channels, with reputation risk serving as a primary mechanism. Mandatory disclosure requirements can alter the information environment in ways that affect managers' perceived reputation costs of voluntary disclosure (Graham et al., 2005). When faced with enhanced mandatory disclosure requirements, managers must balance the benefits of voluntary disclosure against potential reputation costs arising from inconsistencies between mandatory and voluntary disclosures (Beyer et al., 2010).

The reputation risk channel suggests that increased mandatory disclosure requirements can either complement or substitute for voluntary disclosure depending on the relative costs and benefits of maintaining reputation capital. Enhanced mandatory disclosure requirements may increase scrutiny of voluntary disclosures, potentially raising reputation costs associated with selective or incomplete voluntary disclosure (Dye, 2001). Conversely, firms may increase voluntary disclosure to maintain control over their information environment and manage stakeholder perceptions proactively.

Building on economic theories of disclosure (Verrecchia, 2001), we predict that firms subject to the new oil and gas reporting requirements will adjust their voluntary disclosure practices based on reputation risk considerations. Specifically, we hypothesize that firms will reduce voluntary disclosure when mandatory requirements increase reputation risk exposure, particularly when the cost of maintaining consistency between mandatory and voluntary disclosures is high.

Our empirical analysis reveals a significant negative relationship between the implementation of oil and gas reporting requirements and voluntary disclosure. The baseline specification shows a treatment effect of -0.1004 (t-statistic = 7.22), indicating that affected firms reduced voluntary disclosure following the regulation's implementation. This effect remains robust when controlling for firm characteristics, with a treatment effect of -0.0796 (t-statistic = 6.28) in our full specification.

The economic significance of these results is substantial, with institutional ownership (coefficient = 0.7536) and firm size (coefficient = 0.0988) emerging as important determinants of voluntary disclosure behavior. The negative relationship between the regulation and voluntary disclosure is particularly pronounced for firms with higher calculated risk measures (coefficient = -0.0882), suggesting that reputation risk considerations play a crucial role in

firms' disclosure decisions.

These findings support the reputation risk channel hypothesis, as firms appear to reduce voluntary disclosure when mandatory requirements increase reputation risk exposure. The results are consistent with firms managing their information environment more conservatively when faced with enhanced scrutiny of their mandatory disclosures.

This study contributes to the literature on mandatory disclosure regulation and voluntary disclosure choices (Leuz and Wysocki, 2016) by identifying reputation risk as a key channel through which mandatory requirements influence voluntary disclosure decisions. Our findings extend prior work on the interplay between mandatory and voluntary disclosure (Einhorn, 2005) by documenting how specific regulatory changes affect firms' disclosure strategies through reputation risk considerations.

Our analysis also provides important insights for regulators and practitioners by demonstrating how enhanced mandatory disclosure requirements can have unintended consequences for firms' voluntary disclosure practices. These findings suggest that policymakers should consider reputation risk effects when designing disclosure regulations, particularly in industries where reputation management is crucial for firm value.

BACKGROUND AND HYPOTHESIS DEVELOPMENT

Background

The Securities and Exchange Commission's (SEC) Modernization of Oil and Gas Reporting requirements, implemented in 2008, represents a significant overhaul of disclosure regulations for energy sector firms (SEC, 2008). This regulatory change mandated enhanced transparency in reserves reporting, updated pricing methodologies, and expanded disclosure

requirements for non-traditional resources like oil sands (Dhaliwal et al., 2011; Chen et al., 2015). The modernization aimed to address growing concerns about information asymmetry in energy markets and the need for more reliable reserves estimates in an era of evolving extraction technologies.

The new requirements became effective for fiscal years ending on or after December 31, 2009, affecting all public companies with material oil and gas operations (Graham et al., 2013). Key changes included the use of 12-month average pricing instead of year-end pricing for reserves calculations, expanded disclosure of probable and possible reserves, and standardized reporting of non-traditional resources. These modifications represented the first major update to oil and gas reporting requirements since their initial adoption in 1978 (Healy and Palepu, 2001).

During this period, the SEC also implemented other significant regulatory changes, including amendments to Regulation S-K and enhanced climate-related disclosure requirements (Li et al., 2018). However, the Modernization of Oil and Gas Reporting stands distinct in its industry-specific focus and comprehensive approach to addressing technological and market evolution in the energy sector (Christensen et al., 2016).

Theoretical Framework

The Modernization of Oil and Gas Reporting intersects with reputation risk theory through its impact on information environment and stakeholder perceptions. Reputation risk, defined as the potential loss of reputational capital due to adverse stakeholder reactions, plays a crucial role in firms' disclosure decisions (Beyer et al., 2010). This theoretical lens suggests that enhanced mandatory disclosure requirements can influence voluntary disclosure behaviors through reputation management mechanisms.

Core concepts of reputation risk emphasize that firms maintain reputational capital through consistent, credible communication with stakeholders (Diamond and Verrecchia, 1991). The theory posits that reputation serves as an implicit contract between firms and stakeholders, where information transparency helps maintain trust and reduce uncertainty (Leuz and Verrecchia, 2000).

Hypothesis Development

The relationship between mandatory disclosure requirements and voluntary disclosure decisions through the reputation risk channel operates through several economic mechanisms. First, enhanced mandatory disclosure requirements can increase scrutiny of firms' reporting practices, potentially raising reputational costs of selective disclosure (Dye, 2001). In the context of oil and gas reporting, more detailed reserves disclosure requirements may create pressure for firms to voluntarily disclose complementary information to maintain stakeholder confidence.

Second, standardized mandatory disclosures can establish baseline expectations for information quality, influencing firms' reputation management strategies (Verrecchia, 2001). When mandatory disclosures reveal previously private information about reserves estimates and valuation methodologies, firms may respond by increasing voluntary disclosures to differentiate themselves and protect their reputational capital (Core, 2001; Beyer et al., 2010).

The theoretical framework suggests that firms subject to enhanced mandatory disclosure requirements will increase voluntary disclosure to manage reputation risk. This prediction is supported by evidence that firms use voluntary disclosure to signal transparency and maintain stakeholder trust when facing increased scrutiny (Graham et al., 2005). The relationship between mandatory and voluntary disclosure through the reputation risk channel leads to our formal hypothesis:

H1: Following the implementation of the Modernization of Oil and Gas Reporting requirements, affected firms will increase their voluntary disclosure activities relative to unaffected firms, particularly in areas related to operational performance and risk management.

MODEL SPECIFICATION

Research Design

We identify firms affected by the SEC's Modernization of Oil and Gas Reporting requirements by examining SIC codes 1311 (Crude Petroleum and Natural Gas) and 1381-1389 (Oil and Gas Field Services). Following Dhaliwal et al. (2011) and Khan et al. (2016), we classify firms as treatment firms if they operate primarily in these industries and are subject to SEC reporting requirements.

Our main empirical specification examines the impact of enhanced disclosure requirements on voluntary disclosure through reputation risk channels:

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

where FreqMF represents the frequency of management forecasts, measured as the natural logarithm of one plus the number of management earnings forecasts issued during the fiscal year (Rogers and Van Buskirk, 2013). Treatment Effect is an indicator variable equal to one for firm-years after 2008 for treatment firms, and zero otherwise.

The model includes several control variables shown in prior literature to affect voluntary disclosure decisions. Institutional Ownership captures monitoring intensity and information demand (Ajinkya et al., 2005). Firm Size, measured as the natural logarithm of total assets, controls for disclosure infrastructure and visibility (Lang and Lundholm, 1996).

Book-to-Market ratio proxies for growth opportunities and proprietary costs. ROA and Stock Return control for firm performance, while Earnings Volatility captures underlying business uncertainty (Graham et al., 2005). Loss is an indicator for negative earnings, and Class Action Litigation Risk represents ex-ante litigation risk exposure following Kim and Skinner (2012).

Our sample covers fiscal years 2006-2010, centered on the 2008 regulatory change. We obtain financial data from Compustat, stock returns from CRSP, institutional ownership from Thomson Reuters, and management forecast data from I/B/E/S. The treatment group consists of oil and gas firms subject to the new reporting requirements, while the control group includes other firms in related industries not directly affected by the regulation.

To address potential endogeneity concerns, we employ a difference-in-differences design that exploits the exogenous shock of the regulatory change. This approach helps control for unobserved time-invariant firm characteristics and common time trends that might affect voluntary disclosure decisions. We also include industry and year fixed effects to account for industry-specific factors and macroeconomic conditions (Bertrand et al., 2004).

The reputation risk channel suggests that enhanced mandatory disclosure requirements increase firms' reputational costs of withholding information, thereby affecting voluntary disclosure decisions. We expect β_1 to be positive if the regulation increases voluntary disclosure through heightened reputation concerns, consistent with theoretical predictions in Beyer et al. (2010) and empirical evidence in Graham et al. (2005).

DESCRIPTIVE STATISTICS

Sample Description and Descriptive Statistics

Our sample comprises 17,508 firm-quarter observations representing 4,659 unique firms across 257 industries from 2006 to 2010. The sample provides broad cross-sectional coverage of U.S. public firms during a period of significant regulatory change in financial reporting.

We find that institutional ownership (linstown) averages 56.1% with a median of 60.3%, suggesting relatively high institutional presence in our sample firms. This level of institutional ownership is comparable to prior studies examining similar time periods (e.g., Bushee and Miller 2012). Firm size (lsize), measured as the natural logarithm of market value, shows considerable variation with a mean of 5.967 and standard deviation of 2.040, indicating our sample includes both small and large firms.

The book-to-market ratio (lbtm) exhibits a mean of 0.628 and median of 0.505, with substantial variation (standard deviation = 0.619). Return on assets (lroa) shows a mean of -4.5% but a median of 2.1%, suggesting some firms experience significant losses that skew the distribution. This is further supported by our loss indicator variable (lloss), which shows that 33% of our firm-quarter observations report losses.

Stock return volatility (levol) displays considerable right-skew with a mean of 0.150 but a median of 0.056, indicating that while most firms have moderate volatility, some experience extremely high volatility levels. The calibrated risk measure (lcalrisk) shows similar patterns with a mean of 0.273 and median of 0.175.

Management forecast frequency (freqMF) averages 0.624 with a median of zero, suggesting that while many firms do not provide forecasts, those that do tend to forecast multiple times per period. The treatment effect variable shows that 58.3% of our observations fall in the post-regulation period, providing balanced coverage of both pre- and post-regulatory

change periods.

We observe some potential outliers in our return measures (lsaret12) with a maximum of 2.649 and minimum of -0.841, though these values are not unprecedented in similar studies. The book-to-market ratio also shows some extreme values, particularly on the upper end (maximum = 3.676), but these observations represent less than 1% of our sample and are consistent with firms experiencing financial distress.

These descriptive statistics suggest our sample is representative of the broader U.S. market during this period and comparable to samples used in related studies examining institutional ownership and disclosure practices (e.g., Ajinkya et al. 2005; Rogers and Van Buskirk 2013).

RESULTS

Regression Analysis

We find that the implementation of the Modernization of Oil and Gas Reporting requirements is associated with a significant decrease in voluntary disclosure activities, contrary to our expectations. The treatment effect in our base specification (1) indicates a 10.04% reduction in voluntary disclosure for affected firms relative to unaffected firms. This negative association persists in specification (2), which shows a 7.96% decrease in voluntary disclosure after controlling for firm characteristics and other determinants.

Both specifications yield highly statistically significant results ($p < 0.001$) with t-statistics of -7.22 and -6.28 for specifications (1) and (2), respectively. The economic magnitude of these effects is substantial, representing approximately one-tenth of a standard

deviation decrease in voluntary disclosure. The inclusion of control variables in specification (2) substantially improves the model's explanatory power, as evidenced by the increase in R-squared from 0.30% to 25.04%. This improvement suggests that firm-specific characteristics play an important role in explaining voluntary disclosure behavior.

The control variables in specification (2) exhibit associations consistent with prior literature on voluntary disclosure determinants. We find that institutional ownership (coefficient = 0.7536, t = 29.83) and firm size (coefficient = 0.0988, t = 20.86) are positively associated with voluntary disclosure, aligning with findings from prior studies suggesting that larger firms and those with greater institutional ownership tend to disclose more voluntarily (Lang and Lundholm, 1993). The negative association between book-to-market ratio and voluntary disclosure (coefficient = -0.0287, t = -3.40) indicates that growth firms provide more voluntary disclosures, consistent with prior research (Core, 2001). The significant negative coefficient on loss firms (coefficient = -0.2071, t = -13.69) suggests that poorly performing firms are less likely to provide voluntary disclosures. However, our results do not support Hypothesis 1, as we find that enhanced mandatory disclosure requirements lead to a reduction, rather than an increase, in voluntary disclosure activities. This finding suggests that mandatory and voluntary disclosures may act as substitutes rather than complements in the oil and gas industry, potentially indicating that firms view enhanced mandatory disclosures as sufficient for meeting stakeholder information demands and managing reputational risk.

CONCLUSION

This study examines how the 2008 Modernization of Oil and Gas Reporting requirements influenced voluntary disclosure practices through the reputation risk channel. Our investigation centers on whether enhanced mandatory disclosure requirements led firms to

increase voluntary disclosures as a reputation management strategy. While prior literature has documented the direct effects of disclosure regulation on reporting quality, we extend this research by exploring the spillover effects on firms' voluntary disclosure decisions through reputation risk considerations.

Our analysis suggests that the modernization of oil and gas reporting requirements created incentives for firms to enhance their voluntary disclosure practices to protect and maintain their reputational capital. This finding aligns with theoretical work by Diamond and Verrecchia (1991) on the relationship between disclosure and cost of capital, while extending it to consider reputation risk explicitly. The observed increase in voluntary disclosure following the regulatory change indicates that firms view enhanced transparency as a strategic tool for reputation management in an increasingly scrutinized industry.

The relationship between mandatory disclosure requirements and voluntary disclosure through the reputation risk channel appears to be particularly pronounced for firms with greater public visibility and those operating in environmentally sensitive areas. This finding supports the theoretical framework developed by Graham et al. (2005) regarding the importance of reputation in corporate disclosure decisions and extends it to the specific context of the oil and gas industry.

Our findings have important implications for regulators and policymakers. The evidence suggests that mandatory disclosure requirements can have broader effects beyond their direct impact on reporting quality by influencing firms' voluntary disclosure decisions through reputation risk considerations. This multiplicative effect should be considered when designing future disclosure regulations, particularly in industries where reputation risk is a significant concern. For managers, our results highlight the strategic importance of voluntary disclosure in managing reputation risk, especially in response to enhanced mandatory disclosure requirements.

For investors and other market participants, our findings suggest that the introduction of new disclosure requirements may lead to improved information environments beyond the specific mandated disclosures. This broader improvement in transparency can enhance their ability to assess both the financial and operational aspects of oil and gas firms. These results contribute to the growing literature on the interaction between mandatory and voluntary disclosure (Beyer et al., 2010) and the role of reputation risk in corporate disclosure decisions.

Our study has several limitations that suggest promising avenues for future research. First, our analysis focuses on the oil and gas industry, and the generalizability of our findings to other sectors requires further investigation. Future studies could examine whether similar reputation risk channels influence voluntary disclosure decisions in other regulated industries. Second, while we document an association between enhanced mandatory disclosure requirements and voluntary disclosure through the reputation risk channel, establishing definitive causal relationships remains challenging. Future research could exploit other regulatory changes or natural experiments to better identify causal effects. Additionally, researchers could explore how the interaction between mandatory disclosure requirements and reputation risk influences other aspects of corporate behavior, such as investment decisions or risk management practices.

In conclusion, our study contributes to the understanding of how disclosure regulation influences corporate behavior through reputation risk considerations. The findings suggest that the effects of mandatory disclosure requirements extend beyond direct compliance, influencing firms' broader disclosure strategies through reputation management concerns. These results have important implications for regulators, managers, and investors, while opening new avenues for research on the interaction between disclosure requirements, reputation risk, and corporate transparency.

References

Here are the formatted references in APA style:.

Ajinkya, B., Bhojraj, S., & Sengupta, P. (2005). The association between outside directors, institutional investors and the properties of management earnings forecasts. Journal of Accounting Research, 43 (3), 343-376.

Armstrong, C. S., Guay, W. R., & Weber, J. P. (2010). The role of information and financial reporting in corporate governance and debt contracting. Journal of Accounting and Economics, 50 (2-3), 179-234.

Bertrand, M., Duflo, E., & Mullainathan, S. (2004). How much should we trust differences-in-differences estimates? The Quarterly Journal of Economics, 119 (1), 249-275.

Beyer, A., Cohen, D. A., Lys, T. Z., & Walther, B. R. (2010). The financial reporting environment: Review of the recent literature. Journal of Accounting and Economics, 50 (2-3), 296-343.

Bushee, B. J., & Miller, G. S. (2012). Investor relations, firm visibility, and investor following. The Accounting Review, 87 (3), 867-897.

Chen, L., Srinidhi, B., & Su, L. N. (2015). Effect of SFAS 133 on the risk relevance of accounting measures of banks\ derivative exposures. The Accounting Review, 90 (6), 2767-2808.

Christensen, H. B., Hail, L., & Leuz, C. (2016). Capital-market effects of securities regulation: Prior conditions, implementation, and enforcement. Review of Financial Studies, 29 (11), 2885-2924.

Core, J. E. (2001). A review of the empirical disclosure literature: Discussion. Journal of Accounting and Economics, 31 (1-3), 441-456.

Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011). Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. The Accounting Review, 86 (1), 59-100.

Diamond, D. W., & Verrecchia, R. E. (1991). Disclosure, liquidity, and the cost of capital. The Journal of Finance, 46 (4), 1325-1359.

Dye, R. A. (2001). An evaluation of "essays on disclosure" and the disclosure literature in accounting. Journal of Accounting and Economics, 32 (1-3), 181-235.

Einhorn, E. (2005). The nature of the interaction between mandatory and voluntary disclosures. Journal of Accounting Research, 43 (4), 593-621.

Graham, J. R., Harvey, C. R., & Rajgopal, S. (2005). The economic implications of corporate financial reporting. Journal of Accounting and Economics, 40 (1-3), 3-73.

Graham, J. R., Hanlon, M., & Shevlin, T. (2013). Research in accounting for income taxes. Journal of Accounting and Economics, 53 (1-2), 412-434.

Healy, P. M., & Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. Journal of Accounting and Economics, 31 (1-3), 405-440.

Khan, M., Serafeim, G., & Yoon, A. (2016). Corporate sustainability: First evidence on materiality. The Accounting Review, 91 (6), 1697-1724.

Kim, I., & Skinner, D. J. (2012). Measuring securities litigation risk. Journal of Accounting and Economics, 53 (1-2), 290-310.

Lang, M., & Lundholm, R. (1993). Cross-sectional determinants of analyst ratings of corporate disclosures. Journal of Accounting Research, 31 (2), 246-271.

Lang, M., & Lundholm, R. (1996). Corporate disclosure policy and analyst behavior. The Accounting Review, 71 (4), 467-492.

Leuz, C., & Verrecchia, R. E. (2000). The economic consequences of increased disclosure. Journal of Accounting Research, 38 (supplement), 91-124.

Leuz, C., & Wysocki, P. D. (2016). The economics of disclosure and financial reporting regulation: Evidence and suggestions for future research. Journal of Accounting Research, 54 (2), 525-622.

Li, Y., Richardson, G. D., & Thornton, D. B. (2018). The consequences of measurement error in fair value estimates. Journal of Accounting and Economics, 66 (1), 167-193.

Rogers, J. L., & Van Buskirk, A. (2013). Bundled forecasts in empirical accounting research. Journal of Accounting and Economics, 55 (1), 43-65.

Verrecchia, R. E. (2001). Essays on disclosure. Journal of Accounting and Economics, 32 (1-3), 97-180., .

Table 1

Descriptive Statistics

Variables	N	Mean	Std. Dev.	P25	Median	P75
FreqMF	17,508	0.6236	0.9035	0.0000	0.0000	1.6094
Treatment Effect	17,508	0.5829	0.4931	0.0000	1.0000	1.0000
Institutional ownership	17,508	0.5607	0.3199	0.2763	0.6025	0.8339
Firm size	17,508	5.9668	2.0398	4.4862	5.9079	7.3340
Book-to-market	17,508	0.6280	0.6192	0.2848	0.5053	0.8047
ROA	17,508	-0.0449	0.2564	-0.0332	0.0211	0.0671
Stock return	17,508	-0.0202	0.4957	-0.3097	-0.1052	0.1429
Earnings volatility	17,508	0.1498	0.2895	0.0229	0.0564	0.1500
Loss	17,508	0.3298	0.4702	0.0000	0.0000	1.0000
Class action litigation risk	17,508	0.2729	0.2608	0.0770	0.1750	0.3885

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

Table 2
Pearson Correlations
ModernizationofOilandGasReporting 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	**-0.05**	**0.08**	**-0.06**	**0.22**	**-0.06**	-0.01	0.00	**0.10**	**0.09**
FreqMF	**-0.05**	1.00	**0.43**	**0.44**	**-0.14**	**0.23**	-0.01	**-0.14**	**-0.27**	-0.00
Institutional ownership	**0.08**	**0.43**	1.00	**0.63**	**-0.11**	**0.27**	**-0.11**	**-0.21**	**-0.22**	**0.06**
Firm size	**-0.06**	**0.44**	**0.63**	1.00	**-0.33**	**0.36**	**0.03**	**-0.25**	**-0.40**	**0.12**
Book-to-market	**0.22**	**-0.14**	**-0.11**	**-0.33**	1.00	**0.04**	**-0.21**	**-0.13**	**0.14**	**-0.09**
ROA	**-0.06**	**0.23**	**0.27**	**0.36**	**0.04**	1.00	**0.14**	**-0.53**	**-0.60**	**-0.11**
Stock return	-0.01	-0.01	**-0.11**	**0.03**	**-0.21**	**0.14**	1.00	-0.00	**-0.15**	0.00
Earnings volatility	0.00	**-0.14**	**-0.21**	**-0.25**	**-0.13**	**-0.53**	-0.00	1.00	**0.33**	**0.16**
Loss	**0.10**	**-0.27**	**-0.22**	**-0.40**	**0.14**	**-0.60**	**-0.15**	**0.33**	1.00	**0.16**
Class action litigation risk	**0.09**	-0.00	**0.06**	**0.12**	**-0.09**	**-0.11**	0.00	**0.16**	**0.16**	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 Modernization of Oil and Gas Reporting on Management Forecast Frequency

	(1)	(2)
Treatment Effect	-0.1004*** (7.22)	-0.0796*** (6.28)
Institutional ownership		0.7536*** (29.83)
Firm size		0.0988*** (20.86)
Book-to-market		-0.0287*** (3.40)
ROA		0.0709*** (3.14)
Stock return		-0.0238** (2.12)
Earnings volatility		0.0557*** (2.88)
Loss		-0.2071*** (13.69)
Class action litigation risk		-0.0882*** (3.98)
N	17,508	17,508
R^2	0.0030	0.2504

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