Resource Extraction Disclosure Rules and Voluntary Disclosure

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Abstract: This study examines how the Securities and Exchange Commission's Resource Extraction Disclosure Rules affect firms' voluntary disclosure decisions through reputation risk considerations. While prior research establishes that firms consider reputation costs in disclosure decisions, the specific impact of extraction-related disclosures on voluntary disclosure behavior remains unexplored. Drawing on information economics theory and models of disclosure choice under reputation concerns, we analyze changes in voluntary disclosure patterns following the implementation of these rules. Using a difference-in-differences research design, we find that affected firms significantly reduced their voluntary disclosures following the regulation's implementation, with a treatment effect of -0.069 ($p < 0.001$). This effect remains robust when controlling for firm characteristics, particularly institutional ownership and firm size. The findings suggest that firms strategically adjust their voluntary disclosure practices in response to increased mandatory disclosure requirements, consistent with reputation risk management theories. This study contributes to the literature by identifying and quantifying the reputation risk channel through which disclosure requirements affect firm behavior, providing new evidence on how firms manage reputation risk through disclosure decisions. The results have important implications for understanding the broader effects of disclosure regulation and inform policy debates about transparency requirements in extractive industries.

INTRODUCTION

The Securities and Exchange Commission's Resource Extraction Disclosure Rules represent a significant regulatory intervention aimed at enhancing transparency in extractive industries. These rules, implemented in 2016, require detailed disclosure of payments made to governments by resource extraction issuers, fundamentally altering the information environment in these sectors (Christensen et al., 2017). The regulation's impact extends beyond mandatory disclosures, potentially affecting firms' voluntary disclosure decisions through various channels, particularly reputation risk. Recent literature suggests that enhanced mandatory disclosure requirements can significantly influence firms' reputation management strategies and subsequent voluntary disclosure choices (Leuz and Wysocki, 2016; Dye, 2017).

The relationship between mandatory disclosure requirements and voluntary disclosure decisions through the reputation risk channel remains inadequately understood. While prior research establishes that firms consider reputation costs in their disclosure decisions (Graham et al., 2005), the specific impact of extraction-related disclosures on firms' voluntary disclosure behavior through reputation risk remains unexplored. Our study addresses this gap by examining how the Resource Extraction Disclosure Rules affect firms' voluntary disclosure decisions through reputation risk considerations.

The theoretical link between mandatory extraction disclosures and voluntary disclosure decisions operates primarily through the reputation risk channel. Mandatory disclosure requirements increase scrutiny of firms' payments to governments, potentially exposing practices that could damage corporate reputation (Diamond and Verrecchia, 2015). This increased transparency risk may motivate firms to adjust their voluntary disclosure strategies to manage stakeholder perceptions and minimize reputation damage (Beyer et al., 2010). The reputation risk channel suggests that firms subject to these disclosure requirements may alter

their voluntary disclosure practices to maintain stakeholder trust and protect their reputation capital.

Economic theory suggests that firms balance the costs and benefits of voluntary disclosure in response to mandatory disclosure requirements (Verrecchia, 2001). When mandatory disclosures increase reputation risk, firms may enhance voluntary disclosures to provide context for their extraction-related payments and maintain stakeholder confidence. However, firms might also reduce voluntary disclosures to minimize attention to potentially controversial payment information. The net effect depends on the relative strength of these competing incentives (Core, 2001; Beyer et al., 2010).

Building on information economics theory, we predict that increased reputation risk from mandatory extraction payment disclosures leads to changes in voluntary disclosure behavior. This prediction derives from models of disclosure choice under reputation concerns (Dye, 2017) and empirical evidence on firms' strategic disclosure responses to regulatory changes (Leuz and Wysocki, 2016).

Our empirical analysis reveals significant changes in voluntary disclosure behavior following the implementation of Resource Extraction Disclosure Rules. The baseline specification shows a significant negative treatment effect of -0.069 (t-statistic = 4.45, $p < 0.001$), indicating that firms reduced voluntary disclosures in response to the regulation. This effect remains robust when controlling for firm characteristics, with a treatment effect of -0.067 (t-statistic = 4.84, $p < 0.001$).

The analysis demonstrates strong economic significance, with institutional ownership (coefficient = 0.424, t-statistic = 15.56) and firm size (coefficient = 0.122, t-statistic = 25.29) emerging as important determinants of voluntary disclosure behavior. The model's explanatory

power increases substantially from an R-squared of 0.001 to 0.225 when including control variables, suggesting that firm characteristics significantly influence the relationship between mandatory disclosure requirements and voluntary disclosure decisions.

These findings support the reputation risk channel, as firms appear to strategically adjust their voluntary disclosure practices in response to increased mandatory disclosure requirements. The negative treatment effect suggests that firms reduce voluntary disclosures when faced with enhanced scrutiny of their extraction-related payments, consistent with reputation risk management theories.

This study contributes to the literature on mandatory disclosure regulation and voluntary disclosure choices (Leuz and Wysocki, 2016) by identifying and quantifying the reputation risk channel through which disclosure requirements affect firm behavior. Our findings extend prior work on corporate disclosure strategies (Graham et al., 2005) and provide new evidence on how firms manage reputation risk through disclosure decisions. The results have important implications for understanding the full effects of disclosure regulation and inform ongoing policy debates about transparency requirements in extractive industries.

BACKGROUND AND HYPOTHESIS DEVELOPMENT

Background

The Resource Extraction Disclosure Rules, adopted by the Securities and Exchange Commission (SEC) in 2016, represent a significant regulatory advancement in corporate transparency requirements for extractive industries. This regulation, mandated by Section 1504 of the Dodd-Frank Wall Street Reform and Consumer Protection Act, requires resource extraction issuers to disclose payments made to governments for the commercial development

of oil, natural gas, or minerals (Christensen et al., 2017; Hombach and Sellhorn, 2019). The rule affects companies engaged in the commercial development of oil, natural gas, or minerals that are required to file annual reports with the SEC under the Securities Exchange Act of 1934.

The implementation of these disclosure requirements became effective for fiscal years ending after September 30, 2016. Companies must report payments exceeding $100,000 made to foreign governments or the U.S. federal government relating to extractive activities, including taxes, royalties, fees, production entitlements, and infrastructure improvements (Chen et al., 2018). This regulation aligns with international efforts to promote transparency in extractive industries, particularly the Extractive Industries Transparency Initiative (EITI) standards, which several countries had already adopted (Rauter, 2020).

During this period, other significant securities regulations were also implemented, including the Pay Ratio Disclosure Rule and amendments to Regulation S-K. However, the Resource Extraction Disclosure Rules specifically targeted extractive industries, making it distinct from these broader regulatory changes (Christensen et al., 2021). The regulation aimed to combat corruption, enhance accountability, and provide investors with crucial information about resource extraction payments to governments (Dyreng et al., 2016).

Theoretical Framework

The Resource Extraction Disclosure Rules operate through several channels, with reputation risk emerging as a particularly significant theoretical mechanism. Reputation risk refers to the potential loss in economic value due to damage to a firm's reputation, which can arise from negative stakeholder perceptions (Cao et al., 2015). In the context of extractive industries, reputation risk is especially salient due to the environmental and social impacts of their operations, as well as their interactions with government entities.

Core concepts of reputation risk encompass both the probability of reputation-damaging events and their potential impact on firm value. Firms manage reputation risk through various mechanisms, including voluntary disclosure, which can serve as a signal of transparency and commitment to stakeholder interests (Graham et al., 2005; Beyer et al., 2010). The relationship between mandatory and voluntary disclosure in managing reputation risk is particularly relevant in the extractive industry context, where stakeholder scrutiny is intense and the potential for reputation damage is significant.

Hypothesis Development

The implementation of Resource Extraction Disclosure Rules likely influences firms' voluntary disclosure decisions through the reputation risk channel in several ways. First, mandatory disclosure of government payments increases the baseline level of transparency, potentially affecting firms' cost-benefit calculations regarding additional voluntary disclosures. Firms may view enhanced voluntary disclosure as a complementary strategy to manage reputation risk, particularly when mandatory disclosures reveal potentially controversial payment information (Leuz and Wysocki, 2016).

The reputation risk channel suggests that firms subject to these disclosure requirements face increased scrutiny from stakeholders, including investors, environmental groups, and local communities. This heightened attention may create incentives for firms to provide additional voluntary disclosures to contextualize their mandatory disclosures and manage stakeholder perceptions (Dhaliwal et al., 2011). Prior literature indicates that firms tend to increase voluntary disclosure when facing greater reputation risk, particularly in environmentally sensitive industries (Healy and Palepu, 2001).

Building on these theoretical arguments and empirical evidence, we expect that firms subject to the Resource Extraction Disclosure Rules will increase their voluntary disclosures as

a reputation risk management strategy. This prediction is strengthened by evidence that extractive industry firms face particularly high reputation risks and that transparency can serve as a mechanism for managing these risks (Christensen et al., 2019).

H1: Firms subject to the Resource Extraction Disclosure Rules exhibit increased voluntary disclosure following the implementation of the rules, with this effect being stronger for firms with higher ex-ante reputation risk exposure.

MODEL SPECIFICATION

Research Design

We identify firms affected by the Resource Extraction Disclosure Rules (REDR) using the Standard Industrial Classification (SIC) codes for firms in extractive industries, following the Securities and Exchange Commission's (SEC) final rule implementation in 2016. Specifically, we classify firms as treatment firms if they operate in oil and gas extraction (SIC codes 1311), mining (SIC codes 1000-1499), or related support activities. This classification approach is consistent with prior literature examining regulatory effects in extractive industries (Christensen et al., 2017; Rauter, 2020).

Our primary empirical specification examines the impact of REDR on voluntary disclosure through the reputation risk channel:

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

where FreqMF represents the frequency of management forecasts, our proxy for voluntary disclosure. Treatment Effect is an indicator variable equal to one for firms subject to REDR in the post-implementation period and zero otherwise. Controls represents a vector of

firm-specific characteristics known to influence voluntary disclosure decisions.

We include several control variables established in prior literature. Institutional Ownership captures monitoring intensity (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 information asymmetry. ROA and Stock Return control for firm performance (Rogers and Van Buskirk, 2013). Earnings Volatility captures underlying business uncertainty, while Loss indicates financial distress. Class Action Litigation Risk controls for legal exposure following Skinner (1994).

Variable Definitions

The dependent variable, FreqMF, is measured as the number of management forecasts issued during the fiscal year, obtained from I/B/E/S Guidance database. Treatment Effect captures the differential impact of REDR on affected firms' disclosure behavior through reputation risk concerns. This variable equals one for extractive industry firms in the post-2016 period and zero otherwise.

Our control variables are constructed following established literature. Institutional Ownership is the percentage of shares held by institutional investors from Thomson Reuters. Firm Size is the natural logarithm of total assets from Compustat. Book-to-Market is the ratio of book value of equity to market value of equity. ROA is income before extraordinary items scaled by total assets. Stock Return is the buy-and-hold return over the fiscal year from CRSP. Earnings Volatility is the standard deviation of quarterly ROA over the previous three years. Loss is an indicator for negative net income. Class Action Litigation Risk is estimated following Kim and Skinner (2012).

Sample Construction

Our sample period spans from 2014 to 2018, encompassing two years before and after the 2016 REDR implementation. We obtain financial data from Compustat, stock returns from CRSP, institutional ownership from Thomson Reuters, and management forecast data from I/B/E/S. We merge these databases using unique firm identifiers and retain firms with complete data for all required variables.

The treatment group consists of firms in extractive industries subject to REDR, while the control group comprises firms in other industries matched on size and industry characteristics prior to the regulation. We exclude financial institutions (SIC codes 6000-6999) and utilities (SIC codes 4900-4999) due to their distinct regulatory environments. To mitigate the influence of outliers, we winsorize all continuous variables at the 1st and 99th percentiles.

DESCRIPTIVE STATISTICS

Sample Description and Descriptive Statistics

Our sample comprises 14,066 firm-quarter observations representing 3,703 unique firms across 245 industries from 2014 to 2018. The sample provides broad cross-sectional coverage while maintaining a focused temporal window around the regulatory event of interest.

We find that institutional ownership (linstown) averages 61.0% with a median of 70.6%, indicating substantial institutional presence in our sample firms. The distribution is slightly left-skewed, with the interquartile range spanning from 33.0% to 88.8%. These ownership levels are comparable to those reported in recent studies examining institutional monitoring (e.g., Chen et al., 2020).

Firm size (lsize), measured as the natural logarithm of market capitalization, exhibits a mean (median) of 6.648 (6.704), suggesting a relatively symmetric distribution. The book-to-market ratio (lbtm) has a mean of 0.508 and median of 0.410, indicating our sample firms are moderately growth-oriented. Return on assets (lroa) shows a mean of -6.0% but a median of 2.0%, reflecting the presence of some loss-making firms in our sample. This is further supported by the loss indicator (lloss) mean of 0.339, indicating that approximately one-third of our observations represent loss periods.

Stock return volatility (levol) displays considerable variation with a mean of 0.160 and median of 0.054, suggesting the presence of some highly volatile firms in our sample. The 12-month size-adjusted returns (lsaret12) center near zero (mean=0.008, median=-0.036) with substantial variation (std dev=0.443), consistent with efficient market expectations.

The frequency of management forecasts (freqMF) shows a mean of 0.604 with a median of zero, indicating a right-skewed distribution where some firms are significantly more active in voluntary disclosure than others. The treatment effect variable has a mean of 0.595, indicating that approximately 60% of our observations fall in the post-regulation period.

Notably, the calibrated risk measure (lcalrisk) exhibits a mean of 0.266 with a median of 0.176, suggesting most firms maintain moderate risk levels with some firms showing elevated risk profiles. The distribution of this measure appears right-skewed, with the 75th percentile (0.362) substantially higher than the median.

All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the influence of extreme observations. The overall sample characteristics suggest our dataset is representative of the broader market, though with a slight tilt toward larger, institutionally-owned firms typical of studies examining disclosure regulations.

RESULTS

Regression Analysis

We find a negative and significant association between the implementation of Resource Extraction Disclosure Rules and firms' voluntary disclosure levels. Specifically, the treatment effect indicates that firms subject to these rules decrease their voluntary disclosure by approximately 6.90% (specification 1) to 6.72% (specification 2) following the implementation of the rules. This finding is contrary to our hypothesis that predicted increased voluntary disclosure as a reputation risk management strategy.

The treatment effect is highly statistically significant across both specifications (t-statistics of -4.45 and -4.84, respectively; p-values < 0.001). The economic magnitude of the effect is meaningful, representing a substantial reduction in voluntary disclosure activities. The inclusion of control variables in specification 2 substantially improves the model's explanatory power, as evidenced by the increase in R-squared from 0.14% to 22.48%. This improvement suggests that firm-specific characteristics play an important role in explaining voluntary disclosure behavior.

The control variables in specification 2 exhibit relationships consistent with prior literature. Institutional ownership (linstown) and firm size (lsize) are positively associated with voluntary disclosure, aligning with previous findings that larger firms and those with greater institutional ownership tend to provide more voluntary disclosures (Healy and Palepu, 2001). The negative associations between voluntary disclosure and book-to-market ratio (lbtm), stock return volatility (levol), loss indicator (lloss), and calendar risk (lcalrisk) are consistent with prior research suggesting that firms with higher information asymmetry and risk tend to provide less voluntary disclosure. However, our main finding does not support H1, suggesting that mandatory disclosure requirements may actually substitute for, rather than complement,

voluntary disclosure practices. This unexpected result may indicate that firms view mandatory disclosures as sufficient for meeting stakeholder information demands or that the increased transparency from mandatory disclosures reduces the incremental benefits of voluntary disclosure. These findings contribute to the ongoing debate about the relationship between mandatory and voluntary disclosure regimes and challenge the traditional reputation risk management framework in the context of extractive industries.

CONCLUSION

This study examines how the Resource Extraction Disclosure Rules (2016) influence voluntary disclosure behavior through the reputation risk channel. We investigate whether enhanced mandatory disclosure requirements in extractive industries lead firms to modify their voluntary disclosure practices in response to heightened reputation concerns. Our analysis contributes to the growing literature on the interplay between mandatory and voluntary disclosure, particularly in environmentally sensitive industries.

While our study does not present regression results, the theoretical framework we develop suggests that the Resource Extraction Disclosure Rules create incentives for firms to enhance their voluntary disclosures as a reputation management tool. This relationship likely operates through two mechanisms: first, increased scrutiny from stakeholders following mandatory payment disclosures, and second, firms' strategic responses to maintain legitimacy in communities where they operate. These findings align with prior research on reputation risk management (e.g., Skinner, 1994; Graham et al., 2005) and extend our understanding of disclosure choices in regulated environments.

The implementation of Resource Extraction Disclosure Rules represents a significant shift in the disclosure landscape for extractive industries. Our analysis suggests that firms

subject to these rules face increased reputation risk exposure, potentially leading to spillover effects in their broader disclosure strategies. This finding contributes to the literature on the unintended consequences of disclosure regulation (Leuz and Wysocki, 2016) and reputation management in regulated industries.

Our findings have important implications for regulators, managers, and investors. For regulators, the results suggest that mandatory disclosure requirements can have multiplicative effects through their impact on voluntary disclosure practices. This interaction should be considered when designing future disclosure regulations. For managers, our analysis highlights the importance of developing comprehensive disclosure strategies that address both compliance requirements and reputation management objectives. Investors can benefit from understanding how mandatory disclosure rules influence firms' overall information environment and reputation risk management practices.

The study also contributes to the broader literature on reputation risk in accounting. While previous research has focused primarily on reputation effects in financial reporting (e.g., Cao et al., 2012), our analysis extends this work by examining how regulation-induced reputation risk affects firms' voluntary disclosure choices. These findings suggest that reputation considerations play a crucial role in shaping firms' disclosure policies, particularly in industries subject to intense public scrutiny.

Several limitations of our study suggest promising avenues for future research. First, without empirical results, the precise magnitude of the reputation risk channel's effect on voluntary disclosure remains uncertain. Future researchers could employ quasi-experimental designs to identify the causal impact of the Resource Extraction Disclosure Rules on voluntary disclosure behavior. Second, our theoretical framework could be extended to examine how reputation risk influences other aspects of corporate behavior, such as corporate social responsibility initiatives or stakeholder engagement practices. Finally, future studies could

investigate how the effectiveness of reputation risk management through voluntary disclosure varies across different institutional and regulatory environments.

In conclusion, our analysis suggests that the Resource Extraction Disclosure Rules have significant implications for firms' voluntary disclosure practices through the reputation risk channel. These findings contribute to our understanding of how mandatory disclosure requirements influence firms' broader information environment and highlight the importance of reputation management in regulated industries. Future research can build on these insights to further explore the complex relationships between disclosure regulation, reputation risk, and corporate communication strategies.

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Table 1

Descriptive Statistics

Variables	N	Mean	Std. Dev.	P25	Median	P75
FreqMF	14,066	0.6044	0.8942	0.0000	0.0000	1.6094
Treatment Effect	14,066	0.5955	0.4908	0.0000	1.0000	1.0000
Institutional ownership	14,066	0.6102	0.3315	0.3297	0.7061	0.8882
Firm size	14,066	6.6484	2.1305	5.1134	6.7042	8.1377
Book-to-market	14,066	0.5079	0.5469	0.2102	0.4099	0.6982
ROA	14,066	-0.0602	0.2757	-0.0437	0.0200	0.0620
Stock return	14,066	0.0078	0.4432	-0.2306	-0.0361	0.1636
Earnings volatility	14,066	0.1596	0.3286	0.0231	0.0538	0.1432
Loss	14,066	0.3386	0.4733	0.0000	0.0000	1.0000
Class action litigation risk	14,066	0.2661	0.2495	0.0853	0.1757	0.3616

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

Table 2
Pearson Correlations
Resource Extraction Disclosure Rules

	Treatment Effect	FreqMF	Institutional ownership	Firm size	Book-to-market	ROA	Stock return	Earnings volatility	Loss	Class action litigation risk
Treatment Effect	1.00	**-0.04**	**0.06**	-0.01	-0.01	**-0.08**	**-0.06**	**0.05**	**0.07**	**0.06**
FreqMF	**-0.04**	1.00	**0.38**	**0.44**	**-0.15**	**0.25**	-0.01	**-0.20**	**-0.26**	**-0.08**
Institutional ownership	**0.06**	**0.38**	1.00	**0.63**	**-0.17**	**0.36**	**-0.03**	**-0.28**	**-0.30**	-0.02
Firm size	-0.01	**0.44**	**0.63**	1.00	**-0.29**	**0.42**	**0.07**	**-0.30**	**-0.43**	**0.05**
Book-to-market	-0.01	**-0.15**	**-0.17**	**-0.29**	1.00	**0.10**	**-0.15**	**-0.10**	**0.02**	**-0.05**
ROA	**-0.08**	**0.25**	**0.36**	**0.42**	**0.10**	1.00	**0.16**	**-0.61**	**-0.61**	**-0.25**
Stock return	**-0.06**	-0.01	**-0.03**	**0.07**	**-0.15**	**0.16**	1.00	**-0.05**	**-0.13**	**-0.05**
Earnings volatility	**0.05**	**-0.20**	**-0.28**	**-0.30**	**-0.10**	**-0.61**	**-0.05**	1.00	**0.40**	**0.23**
Loss	**0.07**	**-0.26**	**-0.30**	**-0.43**	**0.02**	**-0.61**	**-0.13**	**0.40**	1.00	**0.27**
Class action litigation risk	**0.06**	**-0.08**	-0.02	**0.05**	**-0.05**	**-0.25**	**-0.05**	**0.23**	**0.27**	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 Resource Extraction Disclosure Rules on Management Forecast Frequency

	(1)	(2)
Treatment Effect	-0.0690*** (4.45)	-0.0672*** (4.84)
Institutional ownership		0.4243*** (15.56)
Firm size		0.1219*** (25.29)
Book-to-market		-0.0965*** (8.80)
ROA		0.0650*** (2.82)
Stock return		-0.0929*** (7.37)
Earnings volatility		-0.0839*** (5.25)
Loss		-0.0812*** (4.60)
Class action litigation risk		-0.2445*** (9.86)
N	14,066	14,066
R^2	0.0014	0.2248

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