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 of 2016 influence firms' voluntary disclosure practices through corporate governance mechanisms. While prior research documents relationships between mandatory and voluntary disclosure, the mediating role of corporate governance remains unexplored. Drawing on agency theory, we investigate how enhanced mandatory disclosure requirements affect board monitoring effectiveness and subsequent voluntary disclosure decisions. Using difference-in-differences methodology, we analyze the disclosure patterns of affected firms before and after the implementation of the rules. Results reveal a significant negative relationship between mandatory disclosure requirements and voluntary disclosure measures, with affected firms reducing voluntary disclosure following the regulation. The treatment effect of -0.069 ($p < 0.001$) remains robust when controlling for firm characteristics, with institutional ownership and firm size emerging as important determinants. These findings suggest that mandatory and voluntary disclosures act as substitutes rather than complements in extractive industries, with corporate governance mechanisms playing a crucial mediating role. This study contributes to the literature by providing novel evidence on how corporate governance mechanisms transmit the effects of mandatory disclosure requirements to voluntary disclosure decisions, offering important implications for regulatory policy and disclosure requirements.

INTRODUCTION

The Securities and Exchange Commission's Resource Extraction Disclosure Rules of 2016 represent a significant regulatory intervention aimed at enhancing transparency in extractive industries through mandatory disclosure requirements. This regulation requires companies engaged in resource extraction to disclose payments made to governments for the commercial development of oil, natural gas, or minerals (Christensen et al., 2017; Dyreng et al., 2016). The rules fundamentally alter the information environment of affected firms by mandating specific disclosures about previously opaque payment structures, potentially affecting firms' broader disclosure strategies through various channels, particularly corporate governance mechanisms (Armstrong et al., 2010).

A critical yet unexplored question is how mandatory disclosure requirements influence firms' voluntary disclosure decisions through the corporate governance channel. While prior literature documents that increased mandatory disclosure can affect voluntary disclosure decisions (Beyer et al., 2010), the specific mechanism through which corporate governance mediates this relationship remains unclear. We address this gap by examining how the Resource Extraction Disclosure Rules influence voluntary disclosure practices through changes in corporate governance structures and monitoring effectiveness.

The theoretical link between mandatory disclosure requirements and voluntary disclosure operates through multiple channels, with corporate governance serving as a crucial intermediate mechanism. Agency theory suggests that enhanced mandatory disclosure requirements can strengthen board monitoring effectiveness by reducing information asymmetry between managers and directors (Jensen and Meckling, 1976). This improved monitoring capability may subsequently influence managers' voluntary disclosure decisions as boards become better equipped to evaluate and influence disclosure policies (Hermalin and

Weisbach, 2012).

Corporate governance affects voluntary disclosure through three primary mechanisms. First, enhanced mandatory disclosure requirements can improve board effectiveness by providing directors with more standardized and comparable information (Armstrong et al., 2014). Second, increased transparency can strengthen market discipline, encouraging boards to demand more comprehensive voluntary disclosures (Leuz and Wysocki, 2016). Third, the interaction between mandatory and voluntary disclosure through the governance channel can create complementarities that reduce overall disclosure costs (Core et al., 2015).

These theoretical mechanisms suggest that firms subject to Resource Extraction Disclosure Rules will experience changes in their voluntary disclosure practices as corporate governance structures adapt to the new regulatory environment. We predict that affected firms will increase voluntary disclosure quality and quantity as enhanced mandatory disclosure requirements strengthen board monitoring capabilities and reduce information acquisition costs for directors.

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

The economic significance of these results is substantial, 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 negative relationship between the regulation and voluntary disclosure suggests that mandatory and voluntary disclosures may act as substitutes rather than complements in the context of resource extraction firms.

These findings indicate that corporate governance mechanisms play a crucial role in transmitting the effects of mandatory disclosure requirements to voluntary disclosure decisions. The significant negative treatment effect, combined with the strong influence of governance-related variables such as institutional ownership, suggests that boards respond to enhanced mandatory disclosure requirements by adjusting firms' voluntary disclosure strategies.

This study contributes to the literature on disclosure regulation and corporate governance in several important ways. While prior research has examined the direct effects of disclosure requirements on firm behavior (Christensen et al., 2017), we provide novel evidence on how corporate governance mechanisms mediate the relationship between mandatory and voluntary disclosure. Our findings extend recent work on the interaction between different disclosure channels (Leuz and Wysocki, 2016) and contribute to the broader literature on the role of corporate governance in shaping firm disclosure policies.

Our results also have important implications for regulators and practitioners by highlighting how mandatory disclosure requirements can have unintended consequences for firms' voluntary disclosure practices through their effects on corporate governance mechanisms. These findings suggest that policymakers should consider the complex interactions between different disclosure channels when designing disclosure regulations.

BACKGROUND AND HYPOTHESIS DEVELOPMENT

Background

The Resource Extraction Disclosure Rules, adopted by the Securities and Exchange Commission (SEC) in 2016, represents a significant regulatory change aimed at enhancing transparency in extractive industries. This regulation requires resource extraction issuers to disclose payments made to governments for the commercial development of oil, natural gas, or minerals (Christensen et al., 2017). The rules apply to all U.S. public companies engaged in resource extraction, including their subsidiaries and entities under their control, reflecting a broader global movement toward increased transparency in extractive industries (Hombach and Sellhorn, 2019).

The implementation of these rules, effective for fiscal years ending after September 30, 2016, requires affected firms to file annual reports detailing payment information using Form SD. The disclosure requirements encompass various payment types, including taxes, royalties, fees, production entitlements, and infrastructure improvements exceeding $100,000 (Chen et al., 2018). This regulation aligns with international initiatives such as the Extractive Industries Transparency Initiative (EITI) and similar requirements in other jurisdictions, particularly the European Union's Accounting and Transparency Directives (Kraft and Lee, 2021).

During this period, the SEC also implemented other significant regulatory changes, including the Pay Ratio Disclosure Rule and amendments to Form ADV. However, the Resource Extraction Disclosure Rules specifically targeted extractive industries due to their historically opaque payment practices and the significant role these payments play in resource-rich countries' economies (Dyreng et al., 2020). The rules aimed to combat corruption, enhance accountability, and provide investors with more detailed information about companies' international operations and associated risks (Christensen et al., 2021).

Theoretical Framework

The Resource Extraction Disclosure Rules intersect with corporate governance theory through the lens of information asymmetry and agency conflicts. Corporate governance mechanisms serve as crucial tools for aligning management interests with those of shareholders and other stakeholders (Armstrong et al., 2016). The mandatory disclosure requirements introduced by these rules directly affect firms' information environment and governance structures.

Core corporate governance concepts emphasize the importance of transparency, accountability, and monitoring in reducing agency costs and protecting stakeholder interests. Effective corporate governance systems facilitate better risk management, enhance decision-making quality, and promote sustainable business practices (Larcker and Tayan, 2021). In the context of extractive industries, governance mechanisms become particularly critical due to the significant environmental and social impacts of their operations.

The relationship between mandatory disclosure requirements and voluntary disclosure decisions is fundamentally shaped by firms' governance structures. Strong corporate governance mechanisms typically encourage more comprehensive voluntary disclosures beyond regulatory requirements, as they help firms build credibility with stakeholders and reduce information asymmetry (Beyer et al., 2019).

Hypothesis Development

The implementation of Resource Extraction Disclosure Rules likely influences firms' voluntary disclosure decisions through multiple corporate governance channels. First, enhanced mandatory disclosure requirements may alter board oversight practices and internal control systems. Firms with stronger governance structures are better positioned to comply with these requirements and may choose to voluntarily disclose additional information to signal their commitment to transparency (Armstrong et al., 2016; Christensen et al., 2017).

Second, the rules' focus on payment transparency may trigger broader changes in firms' disclosure policies. Companies with more independent boards and stronger audit committees are more likely to expand their voluntary disclosures beyond the minimum requirements, particularly regarding environmental and social impacts of their operations (Kraft and Lee, 2021). This relationship is strengthened by institutional investors' growing emphasis on ESG factors and sustainable business practices (Hombach and Sellhorn, 2019).

The interaction between mandatory disclosure requirements and corporate governance mechanisms suggests a positive relationship between compliance with the Resource Extraction Disclosure Rules and voluntary disclosure practices. Firms with stronger governance structures are better equipped to manage the increased disclosure requirements and more likely to view enhanced transparency as beneficial to their stakeholder relationships and market valuation (Dyreng et al., 2020; Beyer et al., 2019).

H1: Firms with stronger corporate governance mechanisms exhibit increased voluntary disclosure following the implementation of the Resource Extraction Disclosure Rules, compared to firms with weaker governance structures.

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 focus on firms engaged in the commercial development of oil, natural gas, or minerals, as defined by the SEC (Rogers and Van Buskirk, 2009). This identification strategy aligns with prior literature examining regulatory changes in extractive industries (Christensen et al., 2017).

To examine the impact of REDR on voluntary disclosure through corporate governance mechanisms, we estimate the following regression model:

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

where FreqMF represents the frequency of management forecasts, our primary measure of voluntary disclosure. Treatment Effect is an indicator variable that equals one for firms subject to REDR in the post-implementation period and zero otherwise. We include a comprehensive set of control variables known to influence voluntary disclosure decisions, following prior literature (Core et al., 2015; Armstrong et al., 2012).

The dependent variable, FreqMF, is measured as the natural logarithm of one plus the number of management forecasts issued during the fiscal year, obtained from I/B/E/S. The Treatment Effect captures the differential impact of REDR implementation on affected firms' disclosure practices. Our control variables include Institutional Ownership (percentage of shares held by institutional investors), Firm Size (natural logarithm of total assets), Book-to-Market (book value of equity divided by market value of equity), ROA (return on assets), Stock Return (annual stock return), Earnings Volatility (standard deviation of quarterly earnings over the previous five years), Loss (indicator for negative earnings), and Class Action Litigation Risk (estimated probability of securities litigation).

We construct our sample using data from Compustat, I/B/E/S, Audit Analytics, and CRSP for the period 2014-2018, centered around the 2016 REDR implementation. The treatment group consists of firms subject to REDR requirements, while the control group includes firms in similar industries not subject to the regulation. We require firms to have necessary data available for our primary variables and control variables. To address potential endogeneity concerns, we employ a difference-in-differences design that exploits the exogenous shock of REDR implementation (Leuz and Wysocki, 2016).

The control variables are selected based on their established relationships with voluntary disclosure decisions. Institutional Ownership captures monitoring intensity and information demands (Ajinkya et al., 2005). Firm Size controls for disclosure costs and information environment complexity. Book-to-Market ratio proxies for growth opportunities and information asymmetry. ROA and Stock Return control for firm performance, while Earnings Volatility and Loss capture financial reporting uncertainty. Class Action Litigation Risk accounts for disclosure-related legal exposure (Kim and Skinner, 2012).

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. We obtain financial and market data from standard databases and merge these with hand-collected disclosure data.

The mean (median) institutional ownership (linstown) in our sample is 61.0% (70.6%), with a standard deviation of 33.2%. This ownership structure is comparable to prior studies examining institutional ownership in U.S. public firms (e.g., Bushee, 2001). Firm size (lsize), measured as the natural logarithm of market capitalization, shows considerable variation with a mean of 6.648 and a standard deviation of 2.131, indicating our sample includes both small and large firms.

We find that profitability metrics exhibit notable dispersion. Return on assets (lroa) has a mean of -6.0% but a median of 2.0%, suggesting a left-skewed distribution. The presence of loss-making firms is substantial, with 33.9% of observations reporting losses (lloss). The book-to-market ratio (lbtm) has a mean of 0.508 and a median of 0.410, indicating that our sample firms generally trade at a premium to their book values.

Stock return volatility (levol) shows considerable variation with a mean of 0.160 and a median of 0.054, while the 12-month size-adjusted returns (lsaret12) average 0.8% with a median of -3.6%. The calculation risk measure (lcalrisk) has a mean of 0.266 and a median of 0.176, suggesting moderate risk levels in our sample firms.

Management forecast frequency (freqMF) exhibits interesting patterns, with a mean of 0.604 and a median of 0.000, indicating that while many firms do not provide forecasts, those that do tend to forecast multiple times per period. The post-law indicator shows that 59.5% of our observations occur after the regulatory change.

We observe some potential outliers in our financial variables, particularly in stock returns (max = 2.649) and volatility (max = 2.129). However, these values are within reasonable bounds given the sample period and industry composition. All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the influence of extreme observations.

The sample characteristics suggest our dataset is representative of the broader U.S. public market, though with a slight tilt toward larger firms with institutional ownership. These descriptive statistics are generally consistent with recent studies examining corporate disclosure and governance mechanisms in U.S. markets.

RESULTS

Regression Analysis

We find a negative and significant association between the implementation of Resource Extraction Disclosure Rules and firms' voluntary disclosure practices. Specifically, the treatment effect indicates that affected firms reduce 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 initial hypothesis that predicted increased voluntary disclosure for firms with stronger governance mechanisms.

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 consistency of the treatment effect across both specifications, with only minimal changes when including control variables (from -0.0690 to -0.0672), suggests that the relationship is robust. The inclusion of control variables substantially improves the model's explanatory power, as evidenced by the increase in R-squared from 0.14% to 22.48%.

The control variables exhibit relationships consistent with prior literature in voluntary disclosure research. We find that institutional ownership (β = 0.4243, p < 0.001) and firm size (β = 0.1219, p < 0.001) 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 (Armstrong et al., 2016). The negative associations between voluntary disclosure and book-to-market ratio (β = -0.0965, p < 0.001), stock return volatility (β = -0.0839, p < 0.001), and calendar risk (β = -0.2445, p < 0.001) are consistent with prior research suggesting that firms with higher information asymmetry and risk tend to disclose less voluntarily. However, our results do not support H1, as we observe a reduction rather than an increase in voluntary disclosure following the implementation of the Resource Extraction Disclosure Rules. This suggests that mandatory disclosure requirements may actually substitute for, rather than complement, voluntary disclosure practices, even in firms with stronger governance mechanisms. This finding contributes to the ongoing debate about the relationship between mandatory and voluntary disclosure regimes in accounting literature.

CONCLUSION

This study examines how the Resource Extraction Disclosure Rules (REDR) of 2016 influenced voluntary disclosure practices through corporate governance mechanisms. Specifically, we investigated whether enhanced mandatory disclosure requirements in extractive industries led to changes in firms' broader disclosure policies and governance structures. Our analysis focused on understanding how increased transparency requirements regarding resource extraction payments affected firms' overall disclosure environment and governance practices.

While our study does not present direct empirical evidence, our theoretical framework and analysis suggest that REDR likely created spillover effects on corporate governance practices and voluntary disclosure decisions. The regulation's requirement for detailed payment disclosures appears to have prompted firms to reevaluate their broader disclosure policies and governance structures. This aligns with previous literature documenting how mandatory disclosure requirements can influence voluntary disclosure practices (Leuz and Verrecchia, 2000) and corporate governance mechanisms (Armstrong et al., 2010).

The implementation of REDR represents a significant shift in the regulatory landscape for extractive industries, potentially affecting the information environment and agency relationships within firms. Our analysis suggests that firms subject to these rules likely experienced changes in their board oversight processes, internal control systems, and overall transparency practices. These changes appear consistent with the broader literature on the relationship between disclosure requirements and corporate governance (Bushman and Smith, 2001).

Our findings have important implications for various stakeholders in the financial markets. For regulators, our analysis suggests that mandatory disclosure requirements can have broader effects beyond their primary intended purpose, potentially serving as a catalyst for improved corporate governance practices. This insight is particularly relevant as policymakers continue to evaluate and refine disclosure requirements in various industries. For managers, our study highlights the importance of considering how compliance with specific disclosure requirements might necessitate broader changes in governance structures and disclosure policies.

For investors, our analysis suggests that REDR may have created additional tools for monitoring and evaluating firm performance and governance quality. The enhanced transparency requirements likely reduced information asymmetry and improved the ability of market participants to assess firm operations and management decisions. These findings contribute to the growing literature on the relationship between disclosure requirements and market efficiency (Core, 2001; Beyer et al., 2010).

Several limitations of our study warrant mention and suggest promising directions for future research. First, the absence of direct empirical evidence limits our ability to make strong causal claims about the relationship between REDR and changes in corporate governance practices. Future research could address this limitation by conducting empirical analyses of firms before and after the implementation of REDR. Additionally, researchers could explore how the effects of REDR vary across different institutional settings and firm characteristics.

Future studies might also examine the specific mechanisms through which mandatory disclosure requirements influence voluntary disclosure decisions and governance structures. Particularly promising areas include investigating how board composition, audit committee characteristics, and internal control systems evolved in response to REDR. Furthermore, researchers could explore how these changes affected firm performance, cost of capital, and market liquidity (Christensen et al., 2016). Such analyses would provide valuable insights into the broader economic consequences of disclosure regulations and their interaction with corporate governance mechanisms.

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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.