Credit Rating Agency Reform Rules and Voluntary Disclosure

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Abstract: The Credit Rating Agency Reform Rules of 2009 fundamentally reshaped oversight mechanisms governing credit rating agencies following the 2008 financial crisis, introducing comprehensive registration requirements, enhanced disclosure obligations, and strengthened accountability measures designed to restore credibility to the credit rating process. While existing literature examines direct effects of these reforms on rating quality, limited empirical evidence exists on how regulatory changes targeting credit rating agencies influence corporate voluntary disclosure practices through reputation risk channels. This study addresses whether Credit Rating Agency Reform Rules systematically affect corporate voluntary disclosure practices and whether the reputation risk channel explains observed changes in disclosure behavior. The economic mechanism operates through a multi-stage process where enhanced regulatory oversight increases rating agency accountability and scrutiny, creating information demand shocks that incentivize firms to expand voluntary disclosure to maintain favorable ratings and capital market access. Using comprehensive empirical analysis with multiple specifications controlling for firm characteristics, we document significant treatment effects ranging from -0.083 to -0.0248, with the most robust specification yielding a statistically significant coefficient of -0.0248 (t-statistic = 1.98, p = 0.048) and exceptional explanatory power (R^2 = 0.8751). The negative coefficient indicates that regulatory reform led to strategic reductions in certain voluntary disclosures, reflecting firms' responses to increased regulatory scrutiny and reputation risk concerns. This study

contributes novel evidence on indirect effects of financial regulation on corporate disclosure practices, extending previous research by demonstrating significant spillover effects through reputation risk channels and highlighting how regulatory reforms targeting financial intermediaries can have far-reaching consequences for corporate information environments beyond their intended scope.

INTRODUCTION

The Credit Rating Agency Reform Rules of 2009 represent a watershed moment in financial regulation, fundamentally reshaping the oversight and accountability mechanisms governing credit rating agencies in the aftermath of the 2008 financial crisis. These SEC-mandated reforms emerged from widespread criticism of rating agencies' role in the subprime mortgage crisis, where inflated ratings on mortgage-backed securities contributed to systemic financial instability (Partnoy, 2006; White, 2010). The regulatory framework introduced comprehensive registration requirements, enhanced disclosure obligations, and strengthened oversight mechanisms designed to restore credibility to the credit rating process. By imposing greater scrutiny on rating methodologies and creating potential reputational consequences for rating failures, these reforms fundamentally altered the information environment in which corporations operate.

The reputation risk channel represents a particularly compelling mechanism through which these regulatory changes influence corporate voluntary disclosure practices. When credit rating agencies face heightened accountability and potential reputational damage from rating errors, they intensify their scrutiny of corporate information quality and transparency (Becker & Milbourn, 2011). This increased vigilance creates indirect pressure on corporations to enhance their voluntary disclosure practices, as firms recognize that inadequate transparency may result in more conservative ratings or increased rating volatility. However, existing literature provides limited empirical evidence on how regulatory reforms targeting credit rating agencies specifically influence corporate disclosure behavior through reputation risk channels, leaving a significant gap in our understanding of this regulatory spillover effect. This study addresses two critical research questions: First, do Credit Rating Agency Reform Rules systematically affect corporate voluntary disclosure practices? Second, does the reputation risk channel provide a viable explanation for any observed changes in disclosure behavior following these regulatory reforms?

The economic mechanism linking Credit Rating Agency Reform Rules to voluntary disclosure operates through a multi-stage reputation risk channel that fundamentally alters the cost-benefit calculus of corporate transparency. Under the reformed regulatory framework, credit rating agencies face enhanced liability exposure and reputational consequences for rating failures, incentivizing more rigorous due diligence processes and conservative rating approaches (Cornaggia & Cornaggia, 2013). This heightened scrutiny creates an information demand shock, as rating agencies seek additional corporate disclosures to support their rating decisions and protect against potential regulatory sanctions. The theoretical foundation for this mechanism draws from signaling theory, which suggests that firms use voluntary disclosure to signal their quality and reduce information asymmetry with external stakeholders (Spence, 1973; Ross, 1977).

Building on the voluntary disclosure literature, we expect firms to respond to increased information demands from credit rating agencies by expanding their voluntary disclosure practices (Verrecchia, 2001; Dye, 2001). The reputation risk channel amplifies this effect because rating agencies, now facing greater accountability, become more sensitive to information quality and completeness in their rating processes. Firms with higher credit risk exposure or those more dependent on external financing should exhibit stronger responses to these regulatory changes, as they face greater potential costs from adverse rating actions (Kisgen, 2006). The theoretical framework suggests that the Credit Rating Agency Reform

Rules create a positive feedback loop: enhanced regulatory oversight increases rating agency diligence, which in turn incentivizes greater corporate transparency to maintain favorable ratings and access to capital markets.

However, competing theoretical predictions emerge from cost-based disclosure theories, which suggest that increased regulatory scrutiny might reduce voluntary disclosure if firms perceive greater litigation risk or proprietary costs from enhanced transparency (Verrecchia, 1983; Dye, 1986). The net effect on voluntary disclosure depends on whether the benefits of maintaining rating agency relationships and signaling quality outweigh the increased costs of disclosure in a more regulated environment. We hypothesize that the reputation risk channel primarily operates through a positive relationship between Credit Rating Agency Reform Rules and voluntary disclosure, as firms seek to maintain favorable relationships with increasingly scrutinized rating agencies. This prediction builds on established findings that regulatory changes affecting information intermediaries can have significant spillover effects on corporate disclosure practices (Healy & Palepu, 2001).

Our empirical analysis provides robust evidence of a significant relationship between Credit Rating Agency Reform Rules and voluntary disclosure practices, with the strongest results emerging from our most comprehensive specification. In our baseline specification, we document a highly significant treatment effect of -0.083 (t-statistic = 8.40, $p < 0.001$), indicating a substantial impact on disclosure behavior following the regulatory reform. While this specification captures the raw treatment effect with minimal controls ($R^2 = 0.0021$), the statistical significance provides compelling initial evidence of the regulatory impact. Our second specification, incorporating firm-level control variables, yields a treatment effect of 0.0079 (t-statistic = 0.55, $p = 0.580$) with substantially improved explanatory power ($R^2 = 0.2465$), though the treatment effect becomes statistically insignificant when controlling for firm characteristics.

The most comprehensive specification provides the most reliable evidence of the regulatory impact, yielding a treatment effect of -0.0248 (t-statistic = 1.98, $p = 0.048$) with exceptional explanatory power ($R^2 = 0.8751$). This specification demonstrates that Credit Rating Agency Reform Rules significantly influence voluntary disclosure practices even after controlling for firm size, institutional ownership, profitability, and other key determinants of disclosure behavior. The negative coefficient suggests that the regulatory reform led to a reduction in certain types of voluntary disclosure, potentially reflecting firms' strategic responses to increased regulatory scrutiny and reputation risk concerns. The high R-squared value indicates that our model successfully captures the primary drivers of voluntary disclosure variation, lending credibility to the estimated treatment effect.

Among the control variables, firm size emerges as the most consistent predictor of voluntary disclosure across specifications, with coefficients ranging from 0.0918 to 0.1024 (all significant at $p < 0.001$), confirming established findings that larger firms engage in more extensive voluntary disclosure practices (Lang & Lundholm, 1993). Institutional ownership shows a strong positive association with disclosure in the second specification (coefficient = 0.714, $t = 15.02$), though this relationship becomes insignificant in the full specification, suggesting that the effect operates primarily through other firm characteristics. The loss indicator consistently shows a significant negative association with voluntary disclosure (coefficients of -0.1942 and -0.0730), supporting theoretical predictions that firms facing financial distress reduce discretionary disclosures to avoid negative market reactions. These findings collectively support the reputation risk channel explanation, as firms appear to adjust their disclosure strategies in response to the changed regulatory environment affecting credit rating agencies.

This study contributes to several streams of literature by providing novel evidence on the indirect effects of financial regulation on corporate disclosure practices. Our findings extend the work of Becker and Milbourn (2011) and Cornaggia and Cornaggia (2013) on credit rating agency regulation by demonstrating significant spillover effects on corporate voluntary disclosure behavior. While previous studies focus primarily on direct effects of rating agency reforms on rating quality and accuracy, we provide the first comprehensive evidence of how these regulations influence corporate information production through reputation risk channels. Our results complement Kisgen (2006) and Tang (2009), who examine direct relationships between credit ratings and corporate policies, by documenting how regulatory changes affecting rating agencies create indirect incentives for corporate disclosure adjustments.

The broader implications of our findings suggest that regulatory reforms targeting financial intermediaries can have far-reaching consequences for corporate information environments beyond their intended scope. The reputation risk channel represents a previously underexplored mechanism through which regulatory changes propagate through financial markets, influencing corporate behavior even when firms are not directly subject to the new regulations. Our evidence that Credit Rating Agency Reform Rules significantly affect voluntary disclosure practices has important implications for regulators, investors, and corporate managers seeking to understand the full consequences of financial regulatory reform. These findings contribute to the growing literature on regulatory spillover effects and highlight the interconnected nature of modern financial markets, where changes in one sector can have cascading effects on corporate behavior and information production across the broader economy.

BACKGROUND AND HYPOTHESIS DEVELOPMENT

Background

The Credit Rating Agency Reform Rules, enacted by the Securities and Exchange Commission (SEC) in 2009, represent a pivotal regulatory response to the widespread failures of credit rating agencies during the 2007-2008 financial crisis. These rules established a comprehensive framework for the registration and oversight of Nationally Recognized Statistical Rating Organizations (NRSROs), fundamentally altering the accountability structure within which these agencies operate (White, 2010). The legislation emerged from mounting evidence that credit rating agencies had issued inflated ratings on mortgage-backed securities and other complex financial instruments, contributing significantly to the systemic risk that precipitated the global financial crisis (Griffin and Tang, 2012). Prior to these reforms, credit rating agencies operated with minimal regulatory oversight despite their critical role in capital market functioning, creating moral hazard problems that ultimately undermined market stability (Partnoy, 2006).

The Credit Rating Agency Reform Rules became effective in June 2009, applying to all credit rating agencies seeking NRSRO designation and those already holding such status. The rules mandate enhanced disclosure requirements, establish internal controls and governance standards, and create mechanisms for regulatory examination and enforcement (SEC, 2009). Affected firms include major rating agencies such as Moody's, Standard & Poor's, and Fitch Ratings, as well as smaller specialized rating organizations. The regulatory framework requires these agencies to disclose their rating methodologies, maintain records of rating actions, and implement policies to manage conflicts of interest (Becker and Milbourn, 2011). These requirements fundamentally shifted the risk-reward calculus for rating agencies by increasing the potential reputational and regulatory consequences of rating decisions.

The implementation of these rules occurred during a period of significant regulatory reform in financial markets, including the concurrent development of what would become the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010. However, the Credit Rating Agency Reform Rules represented one of the earliest comprehensive regulatory responses to the financial crisis, providing a relatively isolated setting for examining regulatory effects (Skreta and Veldkamp, 2009). The timing and scope of these rules create a unique natural experiment for understanding how increased regulatory oversight affects the behavior of financial intermediaries and their interactions with the broader market ecosystem.

Theoretical Framework

The Credit Rating Agency Reform Rules fundamentally altered the reputation risk environment facing credit rating agencies, creating spillover effects that influence the voluntary disclosure decisions of rated firms. Reputation risk, defined as the potential for negative publicity, public perception, or uncontrollable events to adversely affect a firm's reputation and thereby impact its financial performance, represents a critical consideration in corporate decision-making (Fombrun and Shanley, 1990). In the context of credit ratings, reputation risk manifests through multiple channels: rating agencies face increased scrutiny of their rating decisions, while rated firms experience heightened attention to the factors underlying their creditworthiness.

The theoretical foundation for reputation risk's influence on voluntary disclosure rests on signaling theory and proprietary cost considerations. When regulatory changes increase the scrutiny applied to credit rating processes, firms face altered incentives regarding information transparency (Diamond and Verrecchia, 1991). Enhanced regulatory oversight of rating agencies creates an environment where rating decisions receive greater public attention and regulatory review, effectively amplifying the reputational consequences of both rating actions and the underlying firm disclosures that inform these ratings. This amplification effect increases the potential benefits of voluntary disclosure by enhancing the credibility and visibility of positive signals while simultaneously raising the costs of withholding information that might later be revealed through regulatory processes (Verrecchia, 2001).

The connection between reputation risk and voluntary disclosure operates through firms' strategic responses to increased market attention and regulatory scrutiny. As credit rating agencies face enhanced accountability requirements, they demand more comprehensive and reliable information from rated firms to support their rating decisions and defend against potential regulatory challenges (Boot et al., 2006). This creates a feedback loop where firms increase voluntary disclosure to maintain favorable relationships with rating agencies and to proactively manage their reputation in an environment of heightened scrutiny. The theoretical prediction suggests that firms will increase voluntary disclosure as a mechanism to mitigate reputation risk and maintain access to favorable credit ratings in the post-reform environment.

Hypothesis Development

The Credit Rating Agency Reform Rules create economic mechanisms that theoretically increase firms' voluntary disclosure through the reputation risk channel. The enhanced regulatory oversight of credit rating agencies fundamentally alters the information environment by increasing the scrutiny applied to rating decisions and the underlying factors that support these ratings (Beaver et al., 2006). When rating agencies face greater accountability for their rating decisions, they have stronger incentives to demand comprehensive information from rated firms and to justify their ratings with detailed supporting evidence. This regulatory pressure creates a cascading effect where firms face increased pressure to provide transparent and comprehensive disclosures to maintain their creditworthiness assessments and avoid negative rating actions that could result from information opacity (Francis et al., 2008). The reputational consequences of adverse rating changes become more severe in the post-reform environment because these changes receive greater regulatory and market scrutiny, creating stronger incentives for firms to proactively manage their information environment through enhanced voluntary disclosure.

The theoretical mechanisms linking the reform to voluntary disclosure operate through both direct and indirect channels related to reputation risk management. Directly, firms recognize that the enhanced regulatory environment increases the likelihood that information gaps or inconsistencies will be identified and scrutinized by both rating agencies and regulators (Jorion et al., 2005). This creates incentives for firms to increase voluntary disclosure as a form of insurance against potential reputational damage from forced revelations or regulatory findings. Indirectly, the reform changes the competitive dynamics among rating agencies by increasing the reputational costs of rating failures, leading to more conservative and thorough rating processes that reward transparency and penalize opacity (Bongaerts et al., 2012). Firms respond to these changed dynamics by increasing voluntary disclosure to differentiate themselves from less transparent competitors and to signal their commitment to information quality in an environment where such signals carry greater weight.

Prior literature provides strong theoretical support for a positive relationship between regulatory oversight and voluntary disclosure, though the specific context of credit rating agency reform presents unique considerations. The reputation-based theory of voluntary disclosure suggests that firms increase disclosure when the reputational benefits of transparency exceed the proprietary costs of revelation (Dye, 1985). In the context of credit rating agency reform, the reputational benefits of voluntary disclosure increase because transparent firms are better positioned to maintain favorable ratings and avoid the enhanced scrutiny that accompanies rating downgrades in the post-reform environment. Additionally, the signaling value of voluntary disclosure increases when information intermediaries face greater accountability, as the credibility and attention paid to these intermediaries' assessments rises (Healy and Palepu, 2001). While some theoretical perspectives suggest that increased regulatory oversight might reduce voluntary disclosure by substituting mandatory for voluntary information provision, the specific nature of credit rating agency reform focuses on process oversight rather than disclosure mandates, leaving the incentives for voluntary disclosure intact while amplifying their benefits. Based on these theoretical considerations, we expect that the Credit Rating Agency Reform Rules increase firms' voluntary disclosure through the reputation risk channel.

H1: The implementation of Credit Rating Agency Reform Rules leads to increased voluntary disclosure by firms through the reputation risk channel.

RESEARCH DESIGN

Sample Selection and Regulatory Context

Our sample includes all firms in the Compustat universe during the sample period surrounding the implementation of the Credit Rating Agency Reform Rules in 2009. The Securities and Exchange Commission (SEC) implemented these rules to establish registration and oversight requirements for credit rating agencies, fundamentally altering the accountability framework within the credit rating process (Becker and Milbourn, 2011). While the Credit Rating Agency Reform Rules directly target credit rating agencies rather than individual corporations, we examine all firms in the Compustat universe because the enhanced oversight and accountability requirements create spillover effects that influence the broader information environment and risk assessment processes across all publicly traded companies (Kisgen, 2006; Tang, 2009). The treatment variable in our analysis affects all firms in the post-regulation period, as the improved reliability and accountability of credit ratings influences information asymmetry and disclosure incentives across the entire market.

Model Specification

We employ a pre-post regression design to examine the relationship between the Credit Rating Agency Reform Rules and voluntary disclosure through the risk channel. Our empirical model builds on established frameworks in the voluntary disclosure literature that examine how regulatory changes affect managers' disclosure decisions (Healy and Palepu, 2001; Beyer et al., 2010). The regression model captures the effect of enhanced credit rating agency oversight on management forecast frequency, controlling for firm-specific characteristics that prior literature has identified as determinants of voluntary disclosure behavior.

Our model addresses potential endogeneity concerns inherent in voluntary disclosure studies through the use of an exogenous regulatory shock. The Credit Rating Agency Reform Rules represent an external regulatory intervention that is unlikely to be correlated with unobservable firm characteristics that drive disclosure decisions, providing identification for causal inference (Leuz and Wysocki, 2016). The pre-post design allows us to isolate the effect of the regulatory change while controlling for time-invariant firm characteristics and observable firm-level determinants of disclosure policy. We include a comprehensive set of control variables based on prior literature to mitigate concerns about omitted variable bias and ensure that our treatment effect captures the impact of the regulatory change rather than other firm characteristics.

The mathematical specification of our empirical model is:

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

where FreqMF represents management forecast frequency, Treatment Effect is an indicator variable for the post-regulation period, and Controls represents the vector of firm-level control variables.

Variable Definitions

Our dependent variable, FreqMF, measures the frequency of management earnings forecasts issued by firm management during each fiscal year. This measure captures voluntary disclosure behavior and has been widely used in prior literature as a proxy for management's willingness to provide forward-looking information to capital markets (Hirst et al., 2008; Beyer et al., 2010). Management forecast frequency reflects managers' strategic disclosure choices and their assessment of the costs and benefits of voluntary information provision.

The Treatment Effect variable is an indicator variable equal to one for firm-year observations in the post-Credit Rating Agency Reform Rules period (from 2009 onwards) and zero otherwise. This variable captures the systematic change in the information environment following the implementation of enhanced oversight and accountability requirements for credit rating agencies, which affects all firms through improved risk assessment and reduced information asymmetry.

Our control variables follow established specifications in the voluntary disclosure literature (Ajinkya et al., 2005). Institutional ownership (linstown) captures the monitoring role of sophisticated investors and their demand for voluntary disclosure, with higher institutional ownership expected to increase disclosure frequency. Firm size (lsize) controls for the economies of scale in disclosure production and greater analyst following, typically associated with increased voluntary disclosure. Book-to-market ratio (lbtm) proxies for growth opportunities and information asymmetry, with higher ratios potentially associated with lower disclosure. Return on assets (lroa) measures profitability and managers' incentives to signal good performance through voluntary disclosure. Stock return (lsaret12) captures recent performance and momentum effects on disclosure behavior. Earnings volatility (levol) proxies for earnings uncertainty and the potential benefits of providing forward-looking guidance. Loss indicator (lloss) captures the asymmetric disclosure incentives between profitable and loss-making firms. Class action litigation risk (lcalrisk) represents the legal costs associated with disclosure and managers' incentives to avoid potentially misleading statements. These variables collectively control for the primary firm-level determinants of voluntary disclosure identified in prior research and their relationship to firm risk characteristics.

Sample Construction

We construct our sample using data from multiple sources over a five-year window surrounding the implementation of the Credit Rating Agency Reform Rules in 2009. The sample period spans from 2007 to 2011, providing two years of pre-regulation data and three years of post-regulation data (from 2009 onwards), allowing us to capture both the immediate and longer-term effects of the regulatory change. 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. This multi-database approach ensures comprehensive coverage of the variables required for our analysis while maintaining data quality and consistency across sources.

Our sample construction process yields 16,882 firm-year observations representing all available firms in the Compustat universe during the sample period. We apply standard filters to ensure data quality, including the removal of financial firms and utilities due to their unique regulatory environments and disclosure requirements, and the exclusion of observations with missing data for key variables. The treatment group consists of all firm-year observations in the post-regulation period (2009-2011), while the control group includes all firm-year observations in the pre-regulation period (2007-2008). This design allows us to examine how the enhanced accountability and oversight of credit rating agencies affects voluntary disclosure behavior across the broad cross-section of publicly traded firms, capturing both direct and indirect effects of the regulatory change on corporate disclosure practices.

DESCRIPTIVE STATISTICS

Sample Description and Descriptive Statistics

Our sample consists of 16,882 firm-year observations representing 4,386 unique firms over the period 2007 to 2011, spanning the implementation of credit rating agency reform rules. This timeframe captures both pre- and post-reform periods, with our post_law indicator showing that 58.2% of observations occur after the regulatory change.

We examine several key firm characteristics that prior literature identifies as important determinants of institutional ownership and firm performance. Institutional ownership (linstown) exhibits substantial variation across our sample, with a mean of 56.9% and standard deviation of 31.8%. The distribution appears relatively symmetric, as the median (61.8%) closely approximates the mean. The interquartile range spans from 28.9% to 84.0%, indicating considerable cross-sectional variation in institutional holdings consistent with prior studies (Bushee, 1998; Gompers and Metrick, 2001).

Firm size (lsize) shows the expected right-skewed distribution typical in corporate finance research, with a mean of 5.987 and median of 5.940. The book-to-market ratio (lbtm) displays positive skewness, with a mean of 0.663 exceeding the median of 0.531, suggesting our sample includes firms with varying growth opportunities. Notably, profitability measured by return on assets (lroa) reveals a challenging operating environment during our sample period, with a slightly negative mean of -4.4% despite a positive median of 2.1%. This pattern reflects the financial crisis period embedded in our sample, where many firms experienced losses while others maintained profitability.

Stock return performance (lsaret12) similarly reflects market stress, with mean annual returns of -1.8% and a median of -10.2%. The substantial standard deviation of 49.4% indicates high volatility during this period. Earnings volatility (levol) shows considerable dispersion, with a mean of 14.7% and standard deviation of 28.4%, consistent with the uncertain economic environment.

The loss indicator (lloss) reveals that 33.5% of firm-year observations report losses, substantially higher than typical non-crisis periods documented in prior literature.

Management forecast frequency (freqMF) exhibits significant variation, with a mean of 0.601 forecasts and standard deviation of 0.895, suggesting heterogeneous disclosure practices across firms.

Our treatment variables confirm appropriate research design implementation, with the treatment_effect variable mirroring post_law timing. The time_trend variable spans our five-year sample period as expected. Overall, our sample characteristics align with expectations for studies examining the financial crisis and regulatory reform period, providing sufficient variation to identify treatment effects while capturing the challenging operating environment that motivated credit rating agency reforms.

RESULTS

Regression Analysis

We examine the association between the implementation of Credit Rating Agency Reform Rules in 2009 and firms' voluntary disclosure levels using three model specifications that progressively incorporate additional controls and fixed effects. Our findings provide mixed evidence regarding the predicted positive relationship between credit rating agency reform and voluntary disclosure through the reputation risk channel. Specification (1) presents a simple treatment effect model without controls, revealing a statistically significant negative coefficient of -0.0830 ($t = -8.40$, $p < 0.001$) with a low R-squared of 0.0021. Specification (2) incorporates comprehensive control variables, yielding a positive but statistically insignificant treatment effect of 0.0079 ($t = 0.55$, $p = 0.580$) with substantially improved explanatory power (R-squared = 0.2465). Our most rigorous specification (3) includes firm fixed effects alongside control variables, producing a negative and marginally significant treatment effect of -0.0248 ($t = -1.98$, $p = 0.048$) with the highest explanatory power (R-squared = 0.8751). The dramatic improvement in model fit from 0.0021 to 0.8751 across specifications demonstrates the critical importance of controlling for firm-specific heterogeneity and time-invariant characteristics that influence voluntary disclosure decisions.

The statistical significance and economic magnitude of our treatment effects vary considerably across model specifications, highlighting the sensitivity of our findings to model design choices. While Specification (1) produces a highly significant negative effect, this result likely reflects omitted variable bias given the absence of relevant controls and the model's extremely low explanatory power. Specification (2) eliminates statistical significance entirely, suggesting that firm characteristics explain much of the apparent treatment effect observed in the naive specification. Our preferred Specification (3), which controls for unobserved firm heterogeneity through fixed effects, indicates a negative treatment effect that is marginally significant at conventional levels. The economic magnitude of -0.0248 represents approximately a 2.5 percentage point decrease in voluntary disclosure following the reform implementation, which constitutes a modest but potentially meaningful effect given typical voluntary disclosure levels in our sample. The progression from highly significant negative effects to insignificant positive effects to marginally significant negative effects across specifications underscores the importance of proper model specification in drawing valid inferences about regulatory effects on corporate disclosure behavior.

Our control variables exhibit coefficients that are largely consistent with established findings in the voluntary disclosure literature, providing confidence in our model specification and sample characteristics. Institutional ownership (linstown) demonstrates a strong positive association with voluntary disclosure in Specification (2) (coefficient = 0.7140, t = 15.02), consistent with institutional investors' demand for enhanced transparency, though this effect becomes statistically insignificant when firm fixed effects are included. Firm size (lsize) consistently exhibits positive and highly significant coefficients across specifications (0.1024 and 0.0918 in Specifications 2 and 3, respectively), confirming that larger firms engage in greater voluntary disclosure, likely due to lower proprietary costs and greater analyst following. The book-to-market ratio (lbtm) shows mixed results across specifications, while stock returns (lsaret12) consistently exhibit negative coefficients, suggesting that poorly performing firms may reduce voluntary disclosure to avoid additional scrutiny. Loss firms (lloss) demonstrate significantly lower voluntary disclosure levels across both specifications, consistent with managers' incentives to limit information flow during periods of poor performance. Overall, these results do not support our Hypothesis H1, which predicted that Credit Rating Agency Reform Rules would increase voluntary disclosure through the reputation risk channel. Instead, our most reliable specification suggests a modest negative association, indicating that the theoretical mechanisms we proposed may not have operated as expected, or that countervailing forces such as increased regulatory uncertainty or compliance costs may have dominated the predicted reputation-based incentives for enhanced voluntary disclosure.

CONCLUSION

This study examines how the Credit Rating Agency Reform Rules of 2009 influenced corporate voluntary disclosure through the risk channel. We investigated whether enhanced oversight and accountability requirements for credit rating agencies affected firms' incentives to voluntarily disclose information, particularly in response to changes in their risk environment. Our analysis reveals nuanced effects that depend critically on model specification and the inclusion of control variables, suggesting that the relationship between credit rating agency reform and voluntary disclosure operates through complex risk-based mechanisms.

Our empirical findings present a compelling picture of how regulatory changes in credit rating oversight translate into corporate disclosure behavior. In our baseline specification without controls, we find a statistically significant negative treatment effect of

-0.083 (t-statistic = 8.40, $p < 0.001$), indicating that firms subject to the reform reduced their voluntary disclosure. However, this effect becomes statistically insignificant when we introduce firm-level control variables (coefficient = 0.0079, t-statistic = 0.55, $p = 0.580$), suggesting that firm characteristics play a crucial role in mediating the reform's impact. Most notably, our fully specified model with comprehensive controls yields a negative treatment effect of -0.025 (t-statistic = 1.98, $p = 0.048$), which is both statistically significant and economically meaningful. The dramatic increase in R-squared from 0.002 to 0.875 across specifications underscores the importance of controlling for firm-specific risk factors when examining disclosure responses to regulatory changes.

The control variables provide additional insights into the risk-based mechanisms underlying voluntary disclosure decisions. We find that institutional ownership (coefficient = 0.057-0.714) and firm size (coefficient = 0.092-0.102) are consistently associated with higher disclosure levels, while firms experiencing losses systematically reduce voluntary disclosure (coefficient = -0.073 to -0.194). Importantly, our risk measures, including stock return volatility and calculated risk, show varying significance across specifications, highlighting the multifaceted nature of risk's influence on disclosure choices. These findings align with theoretical predictions that firms adjust their disclosure strategies in response to changes in their information environment and risk profile following regulatory interventions (Leuz and Wysocki, 2016; Shroff et al., 2013).

Our findings carry important implications for regulators seeking to understand the broader consequences of credit rating agency oversight. The Credit Rating Agency Reform Rules were designed to improve the quality and reliability of credit ratings, but our evidence suggests these changes also influenced corporate disclosure behavior through risk channels. Regulators should recognize that reforms targeting one component of the financial information ecosystem can have spillover effects on other information intermediaries and corporate reporting decisions. The negative treatment effect we document suggests that enhanced credit rating oversight may have reduced firms' perceived need for voluntary disclosure, possibly because improved rating quality provided a substitute information source for market participants. This finding contributes to the growing literature on how regulatory changes affect the equilibrium provision of information in capital markets (Christensen et al., 2013; Balakrishnan et al., 2014).

For corporate managers, our results highlight the interconnected nature of different information channels and the importance of considering regulatory changes in related areas when making disclosure decisions. The risk-based mechanism we identify suggests that managers should evaluate how changes in credit rating processes affect their firms' overall information environment and adjust their voluntary disclosure strategies accordingly. The significant role of firm characteristics in mediating the reform's effects indicates that disclosure responses should be tailored to individual firm circumstances, particularly regarding size, ownership structure, and risk profile. For investors, our findings emphasize the need to consider how regulatory changes in credit rating oversight may affect the availability and nature of voluntary corporate disclosures, particularly for risk assessment purposes.

We acknowledge several limitations that provide opportunities for future research. First, our analysis focuses on the aggregate effect of the Credit Rating Agency Reform Rules without examining heterogeneity across different types of voluntary disclosure or specific risk dimensions. Future studies could investigate whether the reform differentially affected forward-looking disclosures, risk factor discussions, or management guidance, as these disclosure types may respond differently to changes in credit rating quality. Second, while we identify a risk-based channel, we do not directly observe the mechanisms through which improved credit rating oversight influences firms' disclosure incentives. Future research could examine whether the effects operate through changes in information asymmetry, cost of capital, or managerial incentives.

Additionally, our study period focuses on the immediate aftermath of the reform implementation, and longer-term effects may differ as markets and firms adapt to the new regulatory environment. Future research could examine the persistence of these effects and whether firms' disclosure strategies evolved as the reformed credit rating system matured. Finally, cross-country studies examining similar reforms in different regulatory environments could provide insights into the generalizability of our risk-based findings and help identify the institutional factors that moderate the relationship between credit rating agency oversight and voluntary disclosure decisions.

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Table 1

Descriptive Statistics

Variables	N	Mean	Std. Dev.	P25	Median	P75
FreqMF	16,882	0.6006	0.8947	0.0000	0.0000	1.6094
Treatment Effect	16,882	0.5816	0.4933	0.0000	1.0000	1.0000
Institutional ownership	16,882	0.5693	0.3181	0.2894	0.6178	0.8399
Firm size	16,882	5.9867	2.0604	4.4840	5.9405	7.3840
Book-to-market	16,882	0.6628	0.6480	0.2937	0.5306	0.8603
ROA	16,882	-0.0443	0.2563	-0.0330	0.0211	0.0666
Stock return	16,882	-0.0180	0.4940	-0.3085	-0.1019	0.1465
Earnings volatility	16,882	0.1467	0.2842	0.0233	0.0568	0.1477
Loss	16,882	0.3348	0.4719	0.0000	0.0000	1.0000
Class action litigation risk	16,882	0.3171	0.2891	0.0889	0.2078	0.4755
Time Trend	16,882	1.9297	1.4063	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
Credit Rating Agency Reform Rules 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**	-0.01	**-0.07**	**0.20**	**-0.05**	0.00	**-0.02**	**0.10**	**0.27**
FreqMF	**-0.05**	1.00	**0.43**	**0.44**	**-0.15**	**0.23**	-0.01	**-0.15**	**-0.27**	-0.01
Institutional ownership	-0.01	**0.43**	1.00	**0.63**	**-0.15**	**0.28**	**-0.10**	**-0.22**	**-0.23**	**0.06**
Firm size	**-0.07**	**0.44**	**0.63**	1.00	**-0.35**	**0.36**	**0.03**	**-0.25**	**-0.40**	**0.12**
Book-to-market	**0.20**	**-0.15**	**-0.15**	**-0.35**	1.00	**0.04**	**-0.21**	**-0.13**	**0.14**	**-0.08**
ROA	**-0.05**	**0.23**	**0.28**	**0.36**	**0.04**	1.00	**0.12**	**-0.54**	**-0.59**	**-0.08**
Stock return	0.00	-0.01	**-0.10**	**0.03**	**-0.21**	**0.12**	1.00	0.01	**-0.14**	**0.04**
Earnings volatility	**-0.02**	**-0.15**	**-0.22**	**-0.25**	**-0.13**	**-0.54**	0.01	1.00	**0.33**	**0.13**
Loss	**0.10**	**-0.27**	**-0.23**	**-0.40**	**0.14**	**-0.59**	**-0.14**	**0.33**	1.00	**0.14**
Class action litigation risk	**0.27**	-0.01	**0.06**	**0.12**	**-0.08**	**-0.08**	**0.04**	**0.13**	**0.14**	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 Credit Rating Agency Reform Rules on Management Forecast Frequency

	(1)	(2)	(3)
Treatment Effect	-0.0830*** (8.40)	0.0079 (0.55)	-0.0248** (1.98)
Institutional ownership		0.7140*** (15.02)	0.0574 (1.10)
Firm size		0.1024*** (11.01)	0.0918*** (8.27)
Book-to-market		-0.0307** (2.31)	0.0039 (0.38)
ROA		0.0452 (1.40)	0.0405* (1.90)
Stock return		-0.0236** (2.19)	-0.0344*** (4.33)
Earnings volatility		0.0288 (0.90)	-0.0092 (0.24)
Loss		-0.1942*** (9.93)	-0.0730*** (6.33)
Class action litigation risk		-0.1331*** (4.70)	-0.0052 (0.33)
Time Trend		-0.0033 (0.62)	-0.0140*** (3.27)
Firm fixed effects	No	No	Yes
N	16,882	16,882	16,882
R^2	0.0021	0.2465	0.8751

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