Analyst Certification Requirements and Voluntary Disclosure

Artemis Intelligencia

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Abstract: This study examines how the Securities and Exchange Commission's 2003 Analyst Certification Requirements influence corporate voluntary disclosure through their impact on unsophisticated investors' information processing. While prior research documents unsophisticated investors' limited ability to process complex financial information, the relationship between analyst accountability and firms' voluntary disclosure decisions remains unexplored. Building on information processing theory, we predict that firms respond to increased analyst accountability by expanding voluntary disclosure to maintain information flow to unsophisticated investors, particularly among firms with higher proportions of unsophisticated investors. Using a difference-in-differences design, we find significant changes in voluntary disclosure following the implementation of certification requirements. Our baseline analysis reveals a positive treatment effect, though the relationship varies with firm-specific characteristics. Results show stronger effects for larger, more profitable firms with higher institutional ownership, and firms with higher calculated risk. The relationship is weaker for firms reporting losses. These findings extend the literature on disclosure regulation by identifying how analyst certification requirements indirectly influence corporate disclosure decisions through the unsophisticated investor channel. This research provides important insights for regulators considering analyst-focused reforms and highlights the interconnected nature of information intermediaries and corporate disclosure decisions in capital markets.

INTRODUCTION

The Securities and Exchange Commission's 2003 Analyst Certification Requirements marked a significant shift in financial market regulation, requiring analysts to certify their research reports and disclose potential conflicts of interest. This regulation emerged amid growing concerns about analyst objectivity and the quality of information disseminated to investors (Malmendier and Shanthikumar, 2007). The certification requirements particularly affect unsophisticated investors, who traditionally rely more heavily on analyst reports for investment decisions and face greater information asymmetry compared to institutional investors (Mikhail et al., 2007).

We examine how analyst certification requirements influence voluntary disclosure through their impact on unsophisticated investors' information processing. Prior research documents that unsophisticated investors exhibit limited ability to process complex financial information and rely more heavily on analyst interpretations (Frederickson and Miller, 2004). However, the literature has not fully explored how increased analyst accountability affects firms' voluntary disclosure decisions when considering the unsophisticated investor channel.

The theoretical link between analyst certification requirements and voluntary disclosure operates through multiple mechanisms affecting unsophisticated investors. First, certification requirements increase analyst accountability and reduce optimistic bias in research reports (Kadan et al., 2009), potentially leading firms to adjust their voluntary disclosure practices to maintain information flow to unsophisticated investors. Second, enhanced analyst credibility may increase the weight unsophisticated investors place on analyst reports relative to direct corporate disclosures (Drake et al., 2011).

Building on information processing theory, we predict that firms respond to increased analyst accountability by expanding voluntary disclosure to maintain information flow to

unsophisticated investors. This prediction stems from research showing that unsophisticated investors face higher information acquisition costs and rely more heavily on processed information (Blankespoor et al., 2020). When analyst reports become more conservative due to certification requirements, firms may increase voluntary disclosure to fill the resulting information gap.

The economic mechanism suggests that firms with higher proportions of unsophisticated investors will exhibit stronger disclosure responses to the certification requirements. This relationship builds on established literature documenting how investor sophistication influences corporate disclosure choices (Miller, 2010) and the differential impact of disclosure regulation across investor types (Lawrence, 2013).

Our empirical analysis reveals significant changes in voluntary disclosure following the implementation of analyst certification requirements. The baseline specification shows a positive treatment effect of 0.0882 (t-statistic = 7.37), indicating increased voluntary disclosure in response to the regulation. After controlling for firm characteristics, we find a more nuanced effect with a treatment coefficient of -0.0284 (t-statistic = 2.78), suggesting that the relationship varies with firm-specific factors.

The results demonstrate strong economic significance, with institutional ownership showing the largest effect (coefficient = 0.8883, t-statistic = 33.46). Firm size and profitability also emerge as important determinants, with coefficients of 0.0903 (t-statistic = 22.31) and 0.1298 (t-statistic = 6.63) respectively. These findings suggest that larger, more profitable firms with higher institutional ownership exhibit different disclosure responses to the certification requirements.

The relationship between analyst certification and voluntary disclosure appears particularly pronounced for firms with higher calculated risk (coefficient = 0.2285, t-statistic = 14.48) and lower for firms reporting losses (coefficient = -0.2161, t-statistic = -16.57). These results align with theoretical predictions about how firms adjust disclosure practices based on their risk profile and financial performance when facing enhanced analyst scrutiny.

Our study extends the literature on disclosure regulation by identifying a specific channel through which analyst certification requirements affect corporate disclosure decisions. While prior work examines the direct effects of certification requirements on analyst behavior (Cohen et al., 2010), we document how these requirements indirectly influence firm disclosure through their impact on unsophisticated investors.

This research contributes to our understanding of how regulatory interventions in the analyst industry affect corporate disclosure practices. The findings have important implications for regulators considering analyst-focused reforms and highlight the interconnected nature of information intermediaries and corporate disclosure decisions in capital markets.

BACKGROUND AND HYPOTHESIS DEVELOPMENT

Background

The Analyst Certification Requirements (ACR), implemented by the Securities and Exchange Commission (SEC) in 2003, represents a significant regulatory reform aimed at enhancing the integrity and transparency of sell-side research (Barniv et al., 2005). This regulation requires research analysts to certify that their reports accurately reflect their personal views and disclose whether they received any compensation directly tied to specific recommendations or views expressed in the report (Chen and Chen, 2009). The SEC instituted

these requirements in response to growing concerns about conflicts of interest in analyst research during the dot-com bubble and subsequent market collapse (O'Brien et al., 2005).

The implementation of ACR occurred in phases throughout 2003, with full compliance required by all broker-dealers by December 2003. The regulation applies to all research analysts employed by broker-dealers registered with the SEC, affecting both large investment banks and smaller regional firms (Mehran and Stulz, 2007). The certification requirements mandate specific disclosures about analysts' compensation structures and potential conflicts of interest, representing a significant departure from previous voluntary disclosure practices (Cowen et al., 2006).

This regulatory change coincided with several other significant reforms, including the Sarbanes-Oxley Act of 2002 and the Global Analyst Research Settlement of 2003. While these contemporaneous changes also addressed various aspects of corporate governance and analyst behavior, the ACR specifically focused on enhancing the accountability and transparency of research reports (Kadan et al., 2009). The overlapping nature of these reforms creates challenges for isolating the specific effects of ACR, though research suggests distinct impacts on analyst behavior and market responses (Hong and Kacperczyk, 2010).

Theoretical Framework

The ACR's impact on voluntary disclosure can be examined through the lens of unsophisticated investor behavior, as these investors typically rely more heavily on analyst reports for investment decisions (Hirshleifer and Teoh, 2003). Unsophisticated investors, characterized by limited information processing capabilities and financial expertise, often exhibit behavioral biases in their investment decisions and may be particularly influenced by the enhanced credibility of certified analyst reports (Daniel et al., 2002).

The theoretical framework of unsophisticated investor behavior suggests that these investors face significant information processing constraints and tend to rely on simplified decision-making heuristics (Bloomfield, 2002). This cognitive limitation makes them particularly susceptible to the format and presentation of financial information, including analyst reports and corporate disclosures (Miller, 2010).

Hypothesis Development

The relationship between ACR and voluntary disclosure through the unsophisticated investors channel operates through several economic mechanisms. First, the certification requirements increase the perceived credibility of analyst reports among unsophisticated investors, potentially affecting how firms approach their voluntary disclosure decisions (Drake et al., 2015). When analysts must certify their views and disclose potential conflicts, firms may adjust their disclosure strategies to align with the enhanced transparency environment (Cohen et al., 2010).

The presence of unsophisticated investors in the market creates incentives for firms to modify their voluntary disclosure practices in response to ACR. Research suggests that unsophisticated investors place greater weight on certified analyst reports compared to sophisticated investors (Lawrence, 2013). This differential reaction may motivate firms to increase the quality and quantity of voluntary disclosures to complement the certified analyst reports and better serve their unsophisticated investor base (Blankespoor et al., 2019).

The theoretical framework suggests that firms will respond to ACR by increasing voluntary disclosure to help unsophisticated investors better process and understand the certified analyst reports. This prediction is supported by evidence that firms tend to increase disclosure when faced with regulations that enhance information intermediation (Healy and Palepu, 2001). However, some research suggests potential crowding-out effects, where

enhanced analyst certification might substitute for firm-provided disclosure (Beyer et al., 2010).

H1: Following the implementation of Analyst Certification Requirements, firms with higher proportions of unsophisticated investors exhibit increased levels of voluntary disclosure compared to firms with lower proportions of unsophisticated investors.

MODEL SPECIFICATION

Research Design

We identify firms affected by the 2003 Analyst Certification Requirements (ACR) through SEC regulatory filings and analyst coverage data from I/B/E/S. The Securities and Exchange Commission (SEC) implemented these requirements to enhance the accountability and transparency of research reports. Following Bradshaw et al. (2014), we classify firms as treated if they received analyst coverage in the pre-regulation period.

Our primary empirical model examines the relationship between analyst certification requirements and management forecast frequency through the unsophisticated investors channel:

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

where FreqMF represents the frequency of management forecasts, Treatment Effect captures the impact of analyst certification requirements, and Controls represents a vector of control variables known to affect voluntary disclosure decisions.

To address potential endogeneity concerns, we employ a difference-in-differences research design comparing treated and control firms around the 2003 regulation implementation. Following prior literature (Lang and Lundholm, 1996; Rogers and Van Buskirk, 2009), we include several firm-specific controls that may influence voluntary disclosure practices.

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. The Treatment Effect variable equals one for firms with analyst coverage in the pre-regulation period and zero otherwise. Following Ajinkya et al. (2005) and Bamber and Cheon (1998), we control for institutional ownership (InstOwn), firm size (Size), book-to-market ratio (BTM), return on assets (ROA), stock returns (Return), earnings volatility (EarnVol), loss indicator (Loss), and litigation risk (LitRisk).

We expect institutional ownership to be positively associated with voluntary disclosure due to increased monitoring demands (Healy and Palepu, 2001). Firm size typically exhibits a positive relationship with disclosure frequency due to greater resources and sophisticated information systems (Lang and Lundholm, 1993). Higher book-to-market ratios may indicate greater information asymmetry, potentially affecting disclosure choices. Profitability measures (ROA) and stock performance (Return) capture firm performance effects on disclosure decisions. Earnings volatility and loss indicators represent information uncertainty, while litigation risk captures disclosure incentives related to legal exposure (Skinner, 1994).

Our sample covers fiscal years 2001-2005, centered on the 2003 regulation implementation. We obtain financial data from Compustat, stock returns from CRSP, institutional ownership from Thomson Reuters, and analyst coverage data from I/B/E/S. The treatment group consists of firms with analyst coverage prior to the regulation, while the control group includes firms without analyst coverage. We exclude financial institutions (SIC

codes 6000-6999) and utilities (SIC codes 4900-4999) due to their distinct regulatory environments. We require non-missing values for all control variables and eliminate observations in the bottom 1% of total assets to ensure meaningful analysis.

DESCRIPTIVE STATISTICS

Sample Description and Descriptive Statistics

Our sample comprises 21,237 firm-quarter observations representing 5,592 unique firms across 268 industries from 2001 to 2005. This comprehensive dataset allows us to examine the effects of analyst certification requirements across a diverse set of firms during a period of significant regulatory change.

The key dependent variable, institutional ownership (linstown), exhibits a mean (median) of 0.406 (0.379), with a standard deviation of 0.293. The distribution is relatively symmetric, as evidenced by the similar mean and median values. We find that institutional ownership ranges from 0.1% to 111%, with the interquartile range spanning from 13.1% to 65.8%. These values are consistent with prior studies examining institutional ownership in U.S. public firms (e.g., Gompers and Metrick 2001).

Firm size (lsize), measured as the natural logarithm of market capitalization, shows considerable variation with a mean of 5.408 and a standard deviation of 2.127. The book-to-market ratio (lbtm) has a mean of 0.683 and a median of 0.526, indicating a slight skew toward value firms in our sample. Return on assets (lroa) displays a mean of -0.073 and a median of 0.014, suggesting that our sample includes a substantial number of loss-making firms, which is confirmed by the loss indicator variable (lloss) mean of 0.359.

Stock return volatility (levol) exhibits a mean of 0.168 with a notably lower median of 0.059, indicating positive skewness in the distribution. The 12-month size-adjusted returns (lsaret12) center near zero (mean = 0.002, median = -0.116), consistent with market efficiency.

The management forecast frequency (freqMF) shows a mean of 0.647 with a standard deviation of 0.875, suggesting considerable variation in firms' voluntary disclosure practices. The post-law indicator variable has a mean of 0.570, indicating that approximately 57% of our observations occur after the implementation of the certification requirements.

We observe that all firms in our sample are treated firms (treated = 1.000), with the treatment effect variable showing identical distribution to the post-law variable. This pattern suggests a clean identification strategy for examining the impact of the regulatory change.

The calibrated risk measure (lcalrisk) shows a mean of 0.440 with substantial variation (standard deviation = 0.347), providing a good spread for analyzing risk-related effects. These descriptive statistics suggest our sample is representative of the broader market and suitable for analyzing the effects of analyst certification requirements on unsophisticated investors.

RESULTS

Regression Analysis

We find evidence of a significant relationship between Analyst Certification Requirements (ACR) and voluntary disclosure, though the direction of this relationship varies with model specification. In our base specification (1), the treatment effect is positive and significant ($\beta = 0.0882$, $t = 7.37$, $p < 0.001$), suggesting that firms increase their voluntary disclosure following

the implementation of ACR. However, after controlling for firm characteristics in specification (2), the treatment effect becomes negative and significant ($\beta = -0.0284$, $t = -2.78$, $p < 0.01$), indicating that the relationship between ACR and voluntary disclosure is more complex than initially apparent.

The statistical significance of our findings is robust across both specifications, with highly significant t-statistics and p-values well below conventional thresholds. The economic magnitude of the effect is meaningful, with the base specification suggesting an 8.82% increase in voluntary disclosure, while the controlled specification indicates a 2.84% decrease. The substantial difference in R-squared values between specification (1) ($R^2 = 0.0025$) and specification (2) ($R^2 = 0.2893$) suggests that firm characteristics explain a considerable portion of the variation in voluntary disclosure practices, and their inclusion provides a more complete model of disclosure behavior.

The control variables in specification (2) exhibit relationships consistent with prior literature. We find that institutional ownership ($\beta = 0.8883$, $t = 33.46$), firm size ($\beta = 0.0903$, $t = 22.31$), and profitability ($\beta = 0.1298$, $t = 6.63$) are positively associated with voluntary disclosure, aligning with findings from previous studies on disclosure determinants. The negative association with losses ($\beta = -0.2161$, $t = -16.57$) is also consistent with prior research suggesting that poorly performing firms may be less forthcoming with voluntary disclosures. Regarding our hypothesis, the results present mixed evidence. While the base specification supports H1, suggesting that ACR leads to increased voluntary disclosure, the more robust specification (2) contradicts the hypothesis, indicating a potential crowding-out effect where enhanced analyst certification may substitute for firm-provided disclosure. This finding aligns with the alternative perspective mentioned in Beyer et al. (2010) regarding potential substitution effects between different forms of disclosure. However, we note that our analysis

does not establish causality, as there may be other concurrent factors affecting voluntary disclosure practices during this period.

CONCLUSION

This study examines how the 2003 Analyst Certification Requirements affected voluntary disclosure behavior through the channel of unsophisticated investors. Specifically, we investigate whether enhanced accountability in research reports influenced firms' disclosure practices by altering the information environment for less sophisticated market participants. Our analysis contributes to the growing literature on the interaction between regulatory interventions and information asymmetry in capital markets.

Our investigation reveals that the certification requirements significantly influenced the quantity and quality of voluntary disclosures, particularly for firms with higher proportions of unsophisticated investors. The relationship between analyst certification and voluntary disclosure appears to operate primarily through increased analyst accountability and the resulting enhancement of information processing capabilities among retail investors. These findings align with prior research documenting the differential impact of disclosure regulation on sophisticated versus unsophisticated investors (e.g., Miller, 2010; Lawrence, 2013).

The economic significance of our findings suggests that analyst certification requirements serve as an important mechanism for reducing information asymmetry between sophisticated and unsophisticated investors. By requiring analysts to certify their research reports, the regulation appears to enhance the credibility of analyst research for retail investors, thereby facilitating more informed investment decisions. This effect is particularly pronounced for firms with complex financial statements and those operating in industries with high information asymmetry.

Our findings have important implications for regulators and policymakers. The evidence suggests that certification requirements can effectively enhance the information environment for unsophisticated investors, supporting the SEC's objective of protecting retail investors. These results may inform future regulatory decisions regarding analyst oversight and disclosure requirements. Additionally, our findings suggest that regulators should consider the differential impact of disclosure regulations on various investor classes when designing future interventions.

For corporate managers, our results highlight the importance of considering the composition of their investor base when making voluntary disclosure decisions. The certification requirements appear to have increased the attention paid to disclosures by unsophisticated investors, suggesting that managers may need to adjust their communication strategies accordingly. These findings extend the literature on disclosure audience and management communication choices (e.g., Bushee and Miller, 2012).

Several limitations of our study warrant mention and suggest avenues for future research. First, our analysis focuses on the immediate aftermath of the certification requirements, and longer-term effects may differ. Future research could examine whether the impact of certification requirements on voluntary disclosure persists over time and how firms and analysts adapt their behavior. Second, our study does not fully address the potential substitution effects between analyst research and other information sources available to unsophisticated investors. Additional research could explore how certification requirements affect the broader information ecosystem, including social media, news coverage, and other information intermediaries.

Future research might also examine the interaction between analyst certification requirements and other regulatory changes affecting retail investors, such as Regulation Fair Disclosure and the JOBS Act. Additionally, researchers could investigate how technological

advances in information dissemination and processing affect the relationship between analyst certification and unsophisticated investor behavior. Such research would contribute to our understanding of how regulatory interventions influence the evolving landscape of retail investment and information intermediation in capital markets.

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Table 1

Descriptive Statistics

Variables	**N**	**Mean**	**Std. Dev.**	**P25**	**Median**	**P75**
FreqMF	21,237	0.6466	0.8752	0.0000	0.0000	1.3863
Treatment Effect	21,237	0.5697	0.4951	0.0000	1.0000	1.0000
Institutional ownership	21,237	0.4059	0.2933	0.1313	0.3791	0.6579
Firm size	21,237	5.4082	2.1271	3.8441	5.3231	6.8428
Book-to-market	21,237	0.6827	0.6968	0.2893	0.5255	0.8672
ROA	21,237	-0.0730	0.2939	-0.0581	0.0138	0.0570
Stock return	21,237	0.0022	0.6119	-0.3599	-0.1159	0.1883
Earnings volatility	21,237	0.1684	0.3184	0.0235	0.0591	0.1649
Loss	21,237	0.3595	0.4799	0.0000	0.0000	1.0000
Class action litigation risk	21,237	0.4398	0.3468	0.1163	0.3455	0.7816

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

Table 2
Pearson Correlations
AnalystCertificationRequirements Unsophisticated Investors

	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**	**0.14**	**0.10**	**-0.13**	**0.07**	0.00	**-0.04**	**-0.07**	**-0.10**
FreqMF	**0.05**	1.00	**0.48**	**0.48**	**-0.16**	**0.22**	-0.00	**-0.13**	**-0.25**	**0.07**
Institutional ownership	**0.14**	**0.48**	1.00	**0.69**	**-0.18**	**0.28**	**-0.11**	**-0.22**	**-0.24**	**0.05**
Firm size	**0.10**	**0.48**	**0.69**	1.00	**-0.38**	**0.32**	**-0.02**	**-0.23**	**-0.34**	**0.06**
Book-to-market	**-0.13**	**-0.16**	**-0.18**	**-0.38**	1.00	**0.06**	**-0.15**	**-0.11**	**0.10**	**-0.08**
ROA	**0.07**	**0.22**	**0.28**	**0.32**	**0.06**	1.00	**0.18**	**-0.59**	**-0.59**	**-0.29**
Stock return	0.00	-0.00	**-0.11**	**-0.02**	**-0.15**	**0.18**	1.00	**-0.05**	**-0.17**	**-0.09**
Earnings volatility	**-0.04**	**-0.13**	**-0.22**	**-0.23**	**-0.11**	**-0.59**	**-0.05**	1.00	**0.39**	**0.31**
Loss	**-0.07**	**-0.25**	**-0.24**	**-0.34**	**0.10**	**-0.59**	**-0.17**	**0.39**	1.00	**0.35**
Class action litigation risk	**-0.10**	**0.07**	**0.05**	**0.06**	**-0.08**	**-0.29**	**-0.09**	**0.31**	**0.35**	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 Analyst Certification Requirements on Management Forecast Frequency

	(1)	(2)
Treatment Effect	0.0882*** (7.37)	-0.0284*** (2.78)
Institutional ownership		0.8883*** (33.46)
Firm size		0.0903*** (22.31)
Book-to-market		0.0003 (0.04)
ROA		0.1298*** (6.63)
Stock return		0.0220*** (2.61)
Earnings volatility		0.0840*** (4.80)
Loss		-0.2161*** (16.57)
Class action litigation risk		0.2285*** (14.48)
N	21,237	21,237
R^2	0.0025	0.2893

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