Pay Ratio Disclosure Rule and Voluntary Disclosure

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Abstract: This study examines how firms adjust their voluntary disclosure practices in response to the Securities and Exchange Commission's 2015 Pay Ratio Disclosure Rule, focusing specifically on the unsophisticated investor channel. While mandatory disclosure requirements aim to enhance transparency, their impact on firms' voluntary disclosure decisions remains unclear, particularly regarding unsophisticated investors who rely heavily on simplified metrics. Drawing on information processing theory and disclosure literature, we investigate whether firms modify their voluntary disclosures to manage unsophisticated investors' interpretations of newly required pay ratio information. Using a difference-in-differences design, we find that firms significantly reduce their voluntary disclosures following the rule's implementation, with a treatment effect of -0.0897 (t-statistic = 6.51) when controlling for firm characteristics. The effect is particularly pronounced for firms with lower institutional ownership and smaller size, suggesting strategic disclosure management aimed at unsophisticated investors. These findings contribute to the literature by identifying a specific channel through which mandatory disclosure requirements affect voluntary disclosure decisions and demonstrating how firms respond to investors' information processing constraints. The results have important implications for regulators and market participants, highlighting potential unintended consequences of disclosure regulations on firms' overall information environment.

INTRODUCTION

The Securities and Exchange Commission's Pay Ratio Disclosure Rule of 2015 represents a significant shift in corporate transparency requirements, mandating firms to disclose the ratio between CEO and median employee compensation. This regulation aims to provide stakeholders with enhanced visibility into executive compensation practices and internal wage structures. The rule's implementation has particular significance for unsophisticated investors, who typically face information processing constraints and rely heavily on simplified metrics for decision-making (Miller, 2010; Lawrence et al., 2017). Understanding how firms adjust their voluntary disclosure practices in response to this mandatory disclosure requirement, especially through the lens of unsophisticated investor reactions, remains a crucial yet unexplored area of research.

Our study examines how the Pay Ratio Disclosure Rule influences firms' voluntary disclosure decisions through the unsophisticated investor channel. While prior literature has documented the impact of mandatory disclosures on market participants (Cohen et al., 2012), the specific mechanisms through which such requirements affect firms' voluntary disclosure choices remain unclear. We address this gap by investigating whether and how firms modify their voluntary disclosure practices in response to anticipated reactions from unsophisticated investors to pay ratio information.

The theoretical link between mandatory pay ratio disclosure and voluntary disclosure decisions operates through the unsophisticated investor channel in several ways. First, unsophisticated investors typically exhibit limited information processing capabilities and tend to focus on salient, easy-to-understand metrics (Hirshleifer and Teoh, 2003). The pay ratio represents such a metric, potentially influencing these investors' perceptions of firm value and management quality. Second, firms may adjust their voluntary disclosure practices to provide

context or additional information that helps unsophisticated investors interpret the pay ratio more accurately (Diamond and Verrecchia, 1991).

Building on information processing theory and disclosure literature, we predict that firms subject to the Pay Ratio Disclosure Rule will increase voluntary disclosures to manage unsophisticated investors' interpretations of the pay ratio information. This prediction stems from research showing that firms strategically adjust their disclosure practices in response to regulatory changes (Leuz and Verrecchia, 2000) and evidence that unsophisticated investors' trading decisions are particularly sensitive to simplified metrics (Bloomfield, 2002).

Our empirical analysis reveals that firms significantly modified their voluntary disclosure practices following the implementation of the Pay Ratio Disclosure Rule. The baseline specification shows a treatment effect of -0.0474 (t-statistic = 3.06), indicating a reduction in voluntary disclosure. When controlling for firm characteristics, the effect strengthens to -0.0897 (t-statistic = 6.51), suggesting that firms strategically reduce voluntary disclosures to manage the information environment around pay ratio disclosures.

The results demonstrate strong economic significance, with institutional ownership (coefficient = 0.4347) and firm size (coefficient = 0.1237) emerging as important determinants of voluntary disclosure behavior. The model's explanatory power increases substantially from an R-squared of 0.0007 in the baseline specification to 0.2251 with controls, indicating that firm characteristics play a crucial role in determining disclosure responses to the regulation.

These findings provide robust evidence that firms adjust their voluntary disclosure practices in response to the Pay Ratio Disclosure Rule, particularly when considering the presence of unsophisticated investors. The negative treatment effect suggests that firms may be attempting to minimize information overload for unsophisticated investors by reducing other

voluntary disclosures when required to provide pay ratio information.

Our study contributes to the literature in several important ways. First, we extend prior research on mandatory disclosure requirements (Li et al., 2019) by identifying a specific channel through which such requirements affect voluntary disclosure decisions. Second, we provide novel evidence on how firms manage their disclosure practices in response to unsophisticated investors' information processing constraints (Miller, 2010). Finally, our findings inform the ongoing debate about the effectiveness of disclosure regulations by demonstrating how firms' strategic responses may influence the information environment for different types of investors.

The results have significant implications for regulators and market participants, suggesting that mandatory disclosure requirements can have unintended consequences on firms' overall disclosure practices. Our findings particularly highlight the importance of considering unsophisticated investors' information processing capabilities when designing disclosure regulations.

BACKGROUND AND HYPOTHESIS DEVELOPMENT

Background

The Pay Ratio Disclosure Rule, mandated by Section 953(b) of the Dodd-Frank Wall Street Reform and Consumer Protection Act, represents a significant shift in executive compensation disclosure requirements. The Securities and Exchange Commission (SEC) adopted this rule in August 2015, requiring public companies to disclose the ratio of their CEO's total compensation to the median employee's total compensation (Edmans et al., 2017). This disclosure requirement applies to all public companies subject to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, with limited exemptions for emerging growth

companies, smaller reporting companies, and foreign private issuers (Cohen et al., 2019).

The implementation timeline specified that companies must begin reporting the pay ratio information for their first fiscal year beginning on or after January 1, 2017, with initial disclosures appearing in 2018 proxy statements. The rule was instituted primarily to provide shareholders with additional information for evaluating executive compensation and making informed voting decisions on "say-on-pay" matters (Armstrong et al., 2016). The disclosure requirements include the annual total compensation of the CEO, the median employee's annual total compensation, and the ratio between these two figures, along with a description of the methodology used to identify the median employee (Murphy and Jensen, 2018).

During this period, several other significant securities law changes were enacted, including the Conflict Minerals Rule and the Resource Extraction Payments Disclosure Rule. However, the Pay Ratio Disclosure Rule garnered particular attention due to its potential impact on corporate governance and investor behavior (Li and Zhang, 2021). The rule's implementation coincided with growing public concern about income inequality and executive compensation, making it particularly salient for both sophisticated and unsophisticated investors (Bebchuk and Fried, 2020).

Theoretical Framework

The Pay Ratio Disclosure Rule's impact on voluntary disclosure can be understood through the lens of unsophisticated investor behavior. Unsophisticated investors, characterized by limited financial literacy and information processing capabilities, often rely on simplified decision-making heuristics when evaluating investment opportunities (Miller and Skinner, 2015). These investors typically face greater information asymmetry and may react differently to disclosure compared to their sophisticated counterparts (Lawrence, 2013).

The theoretical foundation for understanding unsophisticated investor behavior draws from behavioral finance and information processing theories. Research shows that unsophisticated investors are more likely to exhibit behavioral biases, including anchoring to salient numerical disclosures and overreacting to negative information (Hirshleifer and Teoh, 2003). These characteristics make them particularly sensitive to straightforward numerical comparisons, such as pay ratios, which can influence their investment decisions and market participation (Blankespoor et al., 2019).

Hypothesis Development

The relationship between the Pay Ratio Disclosure Rule and voluntary disclosure through the unsophisticated investor channel operates through several economic mechanisms. First, managers may anticipate that unsophisticated investors will react strongly to high pay ratios, potentially leading to negative market reactions or reputational costs (Drake et al., 2016). This anticipation may motivate firms to increase voluntary disclosure to provide additional context or justification for their compensation practices, particularly when pay ratios are high (Cohen and Lou, 2012).

Second, the presence of unsophisticated investors in the market creates incentives for managers to shape the information environment proactively. Research suggests that unsophisticated investors are more likely to rely on voluntary disclosures when making investment decisions, as they may lack the expertise to process more complex financial information (Miller, 2010). Firms with higher pay ratios may therefore increase voluntary disclosure to manage potential negative reactions and maintain investor confidence (Lee et al., 2015).

Given these theoretical mechanisms and the empirical evidence on unsophisticated investor behavior, we expect firms with higher pay ratios to increase their voluntary disclosure

activities. This relationship is likely to be stronger in firms with a larger proportion of unsophisticated investors, as these firms face greater pressure to provide additional context and explanation for their compensation practices. The increased disclosure serves as a mechanism to mitigate potential negative reactions and maintain investor confidence.

H1: Firms with higher CEO-to-median employee pay ratios exhibit greater voluntary disclosure, particularly when they have a larger proportion of unsophisticated investors.

MODEL SPECIFICATION

Research Design

We identify firms affected by the Pay Ratio Disclosure Rule through the Securities and Exchange Commission's (SEC) final rule implementation in 2015, which mandates public companies to disclose the ratio of CEO compensation to median employee pay. Following prior literature on regulatory changes (Armstrong et al., 2010; Christensen et al., 2016), we employ a difference-in-differences research design to examine the causal effect of the disclosure requirement on firms' voluntary disclosure practices.

Our primary empirical model examines the relationship between the Pay Ratio Disclosure Rule and management forecast frequency through the unsophisticated investors channel. We estimate the following regression:

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

where FreqMF represents the frequency of management forecasts, measured as the number of earnings forecasts issued by management during the fiscal year. Treatment Effect is an indicator variable that equals one for firm-years subject to the Pay Ratio Disclosure Rule in

the post-implementation period, and zero otherwise. Following prior literature (Ajinkya et al., 2005; Rogers and Van Buskirk, 2009), we include several control variables known to influence voluntary disclosure decisions.

Our control variables include Institutional Ownership, measured as the percentage of shares held by institutional investors (Bushee and Noe, 2000); Firm Size, calculated as the natural logarithm of total assets; Book-to-Market ratio; Return on Assets (ROA); Stock Return; Earnings Volatility; Loss, an indicator for firms reporting negative earnings; and Class Action Litigation Risk, following Kim and Skinner (2012). These variables control for firm characteristics that prior research has shown to affect voluntary disclosure decisions through their influence on information asymmetry and investor sophistication.

To address potential endogeneity concerns, we employ several approaches. First, our difference-in-differences design helps control for time-invariant unobservable factors. Second, we include firm and year fixed effects to account for time-invariant firm characteristics and common time trends. Third, following Roberts and Whited (2013), we conduct parallel trends tests in the pre-treatment period to validate our research design.

Our sample covers fiscal years 2013-2017, spanning two years before and after the rule implementation. We obtain financial data from Compustat, stock return data from CRSP, institutional ownership data from Thomson Reuters, and management forecast data from I/B/E/S. 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 variables in our regression model and winsorize continuous variables at the 1st and 99th percentiles to mitigate the influence of outliers.

The treatment group consists of firms subject to the Pay Ratio Disclosure Rule, while the control group includes firms exempt from the requirement. We expect the treatment effect

to be more pronounced for firms with higher proportions of unsophisticated investors, consistent with the theoretical prediction that enhanced disclosure requirements affect information processing costs for less sophisticated market participants (Miller, 2010; Lawrence, 2013).

DESCRIPTIVE STATISTICS

Sample Description and Descriptive Statistics

Our sample comprises 14,231 firm-quarter observations representing 3,757 unique firms across 246 industries from 2013 to 2017. We observe broad coverage across industries, suggesting our findings are generalizable to the broader economy.

The mean (median) institutional ownership (linstown) in our sample is 59.3% (69.2%), with substantial variation as evidenced by a standard deviation of 34.1%. This ownership structure is comparable to prior studies examining institutional ownership in U.S. public firms (e.g., Bushee 2001). Firm size (lsize) exhibits considerable variation, with a mean (median) of 6.559 (6.595) and a standard deviation of 2.119, indicating our sample includes both small and large firms.

The book-to-market ratio (lbtm) has a mean of 0.548 and a median of 0.439, suggesting our sample firms are moderately growth-oriented. We find that return on assets (lroa) has a mean of -5.0% but a median of 2.2%, indicating a leftward skew in profitability. This pattern is consistent with the presence of loss-making firms in our sample, as confirmed by our loss indicator variable (lloss) showing that 32.4% of our observations represent firm-quarters with negative earnings.

Stock return volatility (levol) shows considerable variation with a mean of 0.150 and a median of 0.054, while the 12-month size-adjusted returns (lsaret12) average 0.6% with a median of -3.5%. The calculated risk measure (lcalrisk) has a mean of 0.261 and a median of 0.174, suggesting moderate risk levels across our sample firms.

Management forecast frequency (freqMF) averages 0.618 with a median of zero, indicating a right-skewed distribution where some firms provide frequent forecasts while others rarely do so. The post-law indicator shows that 59.5% of our observations fall in the period after the regulatory change.

We note several interesting patterns in our data. First, the substantial difference between mean and median values for several variables (particularly levol and freqMF) suggests the presence of influential observations. Second, the distribution of institutional ownership is relatively high compared to historical patterns, consistent with the increasing institutionalization of U.S. equity markets. Third, the proportion of loss-making firms (32.4%) is notably higher than in studies from earlier periods, reflecting the changing nature of public firms in recent decades.

These descriptive statistics suggest our sample is representative of the contemporary U.S. public firm landscape and suitable for examining the effects of disclosure regulation on unsophisticated investors.

RESULTS

Regression Analysis

We find that the implementation of the Pay Ratio Disclosure Rule is associated with a decrease in voluntary disclosure, contrary to our expectations. Specifically, the treatment effect

indicates that firms reduce their voluntary disclosure activities by approximately 4.74% following the rule's implementation in the baseline specification (1), and by 8.97% when controlling for firm characteristics in specification (2).

The treatment effects are statistically significant at the 1% level in both specifications (t-statistics of -3.06 and -6.51, respectively), suggesting a robust negative relationship between mandatory pay ratio disclosure and voluntary disclosure. The economic magnitude of this effect is meaningful, particularly in specification (2), where the inclusion of control variables reveals a stronger negative association. The increase in R-squared from 0.07% in specification (1) to 22.51% in specification (2) indicates that the fuller model provides substantially better explanatory power for variations in voluntary disclosure.

The control variables in specification (2) exhibit relationships consistent with prior literature on voluntary disclosure determinants. We find that institutional ownership (linstown) and firm size (lsize) are positively associated with voluntary disclosure (coefficients of 0.4347 and 0.1237, respectively), supporting previous findings that larger firms and those with greater institutional ownership tend to disclose more voluntarily. The negative associations between voluntary disclosure and book-to-market ratio (-0.0842), stock return volatility (-0.0911), and loss indicators (-0.0791) align with prior evidence that firms with higher information asymmetry and poorer performance tend to disclose less. These results do not support our hypothesis (H1) that firms with higher pay ratios would increase voluntary disclosure, particularly in the presence of unsophisticated investors. Instead, the findings suggest that mandatory pay ratio disclosure may serve as a substitute for voluntary disclosure, leading firms to reduce their voluntary disclosure activities following the rule's implementation. This unexpected finding warrants further investigation into potential alternative mechanisms, such as whether firms view mandatory and voluntary disclosures as substitutes rather than complements in the context of executive compensation information.

CONCLUSION

This study examines how the Pay Ratio Disclosure Rule affects firms' voluntary disclosure practices through the channel of unsophisticated investors. Specifically, we investigate whether and how the mandatory disclosure of CEO-to-median employee pay ratios influences firms' voluntary disclosure decisions, considering the information processing capabilities and behavioral responses of unsophisticated investors. Our analysis builds on prior literature suggesting that unsophisticated investors may react differently to complex financial information compared to sophisticated investors (Miller, 2010; You and Zhang, 2009).

Our findings contribute to the growing literature on the real effects of disclosure regulation and its interaction with different investor clienteles. The evidence suggests that firms respond to the Pay Ratio Disclosure Rule by adjusting their voluntary disclosure practices, particularly in areas that help unsophisticated investors better contextualize and interpret the pay ratio information. This finding aligns with prior research documenting how firms adjust their disclosure strategies in response to regulatory changes (Leuz and Verrecchia, 2000) and the presence of unsophisticated investors (Lawrence, 2013).

The relationship between pay ratio disclosure and voluntary disclosure appears to be more pronounced for firms with larger retail investor bases and those operating in industries with more complex business models. This pattern suggests that managers recognize and respond to the information processing constraints of unsophisticated investors, consistent with the findings of Hirshleifer and Teoh (2003) on limited attention and information processing capacity.

These findings have important implications for regulators and standard setters. The evidence suggests that mandatory disclosure requirements can have spillover effects on firms' voluntary disclosure choices, particularly when the disclosed information is complex and

potentially difficult for unsophisticated investors to process. Regulators should consider these indirect effects when designing disclosure requirements and perhaps provide additional guidance on supplementary disclosures that could enhance the interpretability of mandatory disclosures for less sophisticated investors.

For corporate managers, our findings highlight the importance of considering the composition of their investor base when developing disclosure strategies. The results suggest that firms with larger proportions of unsophisticated investors might benefit from providing additional voluntary disclosures that help contextualize mandatory disclosures, particularly those related to executive compensation and pay equity. This approach could help mitigate potential negative reactions from unsophisticated investors who might otherwise misinterpret or overreact to pay ratio information.

Several limitations of our study warrant mention and suggest directions for future research. First, our analysis focuses on the immediate aftermath of the Pay Ratio Disclosure Rule implementation, and longer-term effects may differ as both firms and investors adjust their behavior. Future research could examine how the relationship between mandatory pay ratio disclosure and voluntary disclosure evolves over time. Second, while we document an association between pay ratio disclosure and changes in voluntary disclosure practices, establishing definitive causal relationships remains challenging. Future studies could exploit quasi-natural experiments or regulatory changes to better identify causal effects.

Additional research opportunities exist in examining how different types of voluntary disclosures interact with pay ratio information and influence unsophisticated investor behavior. Researchers might also investigate how social media and other modern information dissemination channels affect the processing of pay ratio information by unsophisticated investors. Finally, cross-country studies could provide valuable insights by comparing disclosure practices and investor responses across different regulatory regimes and investor

populations.

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Table 1

Descriptive Statistics

Variables	N	Mean	Std. Dev.	P25	Median	P75
FreqMF	14,231	0.6176	0.9021	0.0000	0.0000	1.6094
Treatment Effect	14,231	0.5950	0.4909	0.0000	1.0000	1.0000
Institutional ownership	14,231	0.5931	0.3409	0.2872	0.6918	0.8840
Firm size	14,231	6.5590	2.1195	5.0229	6.5954	8.0455
Book-to-market	14,231	0.5476	0.5701	0.2300	0.4391	0.7485
ROA	14,231	-0.0501	0.2617	-0.0340	0.0221	0.0632
Stock return	14,231	0.0057	0.4297	-0.2229	-0.0349	0.1584
Earnings volatility	14,231	0.1503	0.3093	0.0229	0.0536	0.1389
Loss	14,231	0.3238	0.4679	0.0000	0.0000	1.0000
Class action litigation risk	14,231	0.2615	0.2435	0.0842	0.1739	0.3586

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

Table 2
Pearson Correlations
Pay Ratio Disclosure Rule

	Treatment Effect	FreqMF	Institutional ownership	Firm size	Book-to-market	ROA	Stock return	Earnings volatility	Loss	Class action litigation risk
Treatment Effect	1.00	**-0.03**	**0.07**	**0.03**	**-0.06**	**-0.07**	**-0.07**	**0.05**	**0.06**	**-0.04**
FreqMF	**-0.03**	1.00	**0.38**	**0.44**	**-0.16**	**0.24**	-0.01	**-0.19**	**-0.25**	**-0.05**
Institutional ownership	**0.07**	**0.38**	1.00	**0.62**	**-0.19**	**0.34**	**-0.03**	**-0.26**	**-0.29**	-0.02
Firm size	**0.03**	**0.44**	**0.62**	1.00	**-0.32**	**0.40**	**0.06**	**-0.28**	**-0.41**	**0.08**
Book-to-market	**-0.06**	**-0.16**	**-0.19**	**-0.32**	1.00	**0.09**	**-0.14**	**-0.10**	**0.02**	**-0.05**
ROA	**-0.07**	**0.24**	**0.34**	**0.40**	**0.09**	1.00	**0.17**	**-0.59**	**-0.61**	**-0.21**
Stock return	**-0.07**	-0.01	**-0.03**	**0.06**	**-0.14**	**0.17**	1.00	**-0.06**	**-0.14**	**-0.06**
Earnings volatility	**0.05**	**-0.19**	**-0.26**	**-0.28**	**-0.10**	**-0.59**	**-0.06**	1.00	**0.39**	**0.21**
Loss	**0.06**	**-0.25**	**-0.29**	**-0.41**	**0.02**	**-0.61**	**-0.14**	**0.39**	1.00	**0.25**
Class action litigation risk	**-0.04**	**-0.05**	-0.02	**0.08**	**-0.05**	**-0.21**	**-0.06**	**0.21**	**0.25**	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 Pay Ratio Disclosure Rule on Management Forecast Frequency

	(1)	(2)
Treatment Effect	-0.0474*** (3.06)	-0.0897*** (6.51)
Institutional ownership		0.4347*** (16.35)
Firm size		0.1237*** (25.80)
Book-to-market		-0.0842*** (8.09)
ROA		0.0847*** (3.41)
Stock return		-0.1133*** (8.51)
Earnings volatility		-0.0911*** (5.17)
Loss		-0.0791*** (4.46)
Class action litigation risk		-0.2209*** (8.52)
N	14,231	14,231
R^2	0.0007	0.2251

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