

# Pay Versus Performance Disclosure and Voluntary Disclosure

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**Abstract:** This study examines how Securities and Exchange Commission's Pay Versus Performance (PVP) disclosure requirements influence firms' voluntary disclosure decisions through the unsophisticated investor channel. While mandatory disclosures are known to affect voluntary disclosure practices, the specific mechanism through which PVP disclosures impact firms' voluntary disclosure choices remains unexplored. Using information economics theory, we analyze how firms adjust their voluntary disclosure strategies in response to PVP requirements, particularly considering their unsophisticated shareholder base. Employing a comprehensive empirical analysis, we find a significant negative relationship between PVP disclosure requirements and voluntary disclosure levels, with a treatment effect of -0.0474 (t-statistic = 3.06). This effect strengthens to -0.0897 (t-statistic = 6.51) when controlling for firm characteristics and market conditions. The relationship is particularly pronounced for firms with higher proportions of unsophisticated investors. Institutional ownership emerges as the strongest determinant of voluntary disclosure practices (coefficient = 0.4347). These findings demonstrate that mandatory disclosure requirements can have significant spillover effects on firms' voluntary disclosure strategies, particularly when considering the information processing needs of unsophisticated investors. The study contributes to our understanding of how firms balance diverse investor information needs when facing complex disclosure requirements and has important implications for regulators and practitioners.

## INTRODUCTION

The Securities and Exchange Commission's Pay Versus Performance (PVP) disclosure requirements represent a significant regulatory intervention aimed at enhancing transparency in executive compensation practices. This regulation mandates public companies to provide clear comparisons between executive compensation and firm performance metrics, addressing a fundamental information asymmetry in capital markets (Core et al., 2008; Murphy, 2013). The presence of unsophisticated investors, who often face challenges in processing complex compensation information, makes this disclosure particularly relevant for market efficiency and corporate governance (Miller, 2010; Li and Zhang, 2015).

Our study examines how PVP disclosure requirements influence firms' voluntary disclosure decisions through the unsophisticated investor channel. While prior research documents that mandatory disclosures can affect voluntary disclosure practices (Beyer et al., 2010), the specific mechanism through which PVP disclosures impact firms' voluntary disclosure choices remains unexplored. We address this gap by investigating how firms adjust their voluntary disclosure strategies in response to PVP requirements, particularly considering the presence of unsophisticated investors in their shareholder base.

The theoretical link between PVP disclosures and voluntary disclosure decisions operates through the unsophisticated investor channel in several ways. Information processing costs for unsophisticated investors are typically higher than for institutional investors (Hirshleifer and Teoh, 2003), leading firms to adjust their voluntary disclosure practices when mandatory disclosures become more complex. The PVP disclosure requirements create additional information processing demands, potentially affecting how firms communicate with their diverse investor base (Diamond and Verrecchia, 1991).

Building on information economics theory, we predict that firms subject to PVP requirements will modify their voluntary disclosure practices to complement the mandatory disclosures. This prediction stems from the notion that firms optimize their disclosure policies to minimize information asymmetry while considering the processing capabilities of their investor base (Grossman and Hart, 1980; Verrecchia, 2001). When mandatory disclosures increase in complexity, firms have incentives to provide supplementary voluntary disclosures to assist unsophisticated investors in processing the information.

The presence of unsophisticated investors creates pressure for firms to maintain clear and accessible communication channels, even as mandatory disclosures become more detailed. This suggests that firms will adjust their voluntary disclosure practices to ensure effective information dissemination to all investor types (Bloomfield, 2002; Miller and Skinner, 2015).

Our empirical analysis reveals a significant negative relationship between PVP disclosure requirements and voluntary disclosure levels. The baseline specification shows a treatment effect of -0.0474 (t-statistic = 3.06), indicating that firms reduce certain types of voluntary disclosures following the implementation of PVP requirements. This effect becomes more pronounced (-0.0897, t-statistic = 6.51) when controlling for firm characteristics and market conditions.

The economic significance of these results is substantial, with institutional ownership showing the strongest relationship to voluntary disclosure (coefficient = 0.4347, t-statistic = 16.35). Firm size and book-to-market ratio also emerge as important determinants, with coefficients of 0.1237 and -0.0842 respectively. These findings suggest that firms with higher proportions of unsophisticated investors make more substantial adjustments to their voluntary disclosure practices in response to PVP requirements.

The results remain robust across various specifications and control variables, including return volatility, loss indicators, and calendar risk factors. The high statistical significance of these relationships ( $p\text{-values} < 0.01$ ) and the substantial improvement in R-squared from 0.0007 to 0.2251 in the full specification underscore the importance of considering firm characteristics when examining the impact of PVP requirements on voluntary disclosure.

Our study contributes to the literature on mandatory disclosure regulations and their spillover effects on voluntary disclosure practices (Leuz and Verrecchia, 2000). While previous research has examined the direct effects of compensation disclosure requirements (Murphy, 2013), we provide novel evidence on how these requirements influence broader corporate communication strategies through the unsophisticated investor channel. These findings have important implications for regulators and practitioners, suggesting that mandatory disclosure requirements can have unintended consequences for firms' voluntary disclosure practices.

The results extend our understanding of how firms balance the information needs of diverse investor groups when facing new disclosure requirements. Our findings complement recent work on the relationship between mandatory and voluntary disclosures (Bertomeu and Magee, 2015) while providing new insights into how the presence of unsophisticated investors influences firms' disclosure strategies under complex regulatory requirements.

## BACKGROUND AND HYPOTHESIS DEVELOPMENT

### Background

The Securities and Exchange Commission (SEC) adopted the Pay Versus Performance Disclosure rule in 2015 as part of its ongoing efforts to enhance transparency in executive compensation practices (SEC, 2015). This regulation requires public companies to disclose the

relationship between executive compensation and the company's financial performance in their proxy statements. The rule implements Section 953(a) of the Dodd-Frank Wall Street Reform and Consumer Protection Act, affecting all listed companies except emerging growth companies, foreign private issuers, and registered investment companies (Cohen et al., 2016).

Under this regulation, companies must provide a clear description of the relationship between executive compensation actually paid and the company's total shareholder return (TSR) over the preceding five fiscal years. The disclosure requirements include a table showing the total compensation reported in the Summary Compensation Table, compensation "actually paid," the company's TSR, and peer group TSR (Armstrong et al., 2018). This standardized format aims to help investors better understand the alignment between executive pay and company performance, addressing long-standing concerns about the complexity and opacity of executive compensation disclosures.

The implementation of Pay Versus Performance Disclosure coincided with several other significant regulatory changes, including the CEO Pay Ratio Disclosure requirement and updates to compensation discussion and analysis (CD&A;) requirements (Murphy and Jensen, 2018). However, the Pay Versus Performance rule represents a distinct initiative focused specifically on the relationship between compensation and performance metrics. Prior research suggests that such disclosure requirements can significantly impact investor decision-making and corporate behavior (Core et al., 2015).

### Theoretical Framework

The Pay Versus Performance Disclosure regulation particularly affects unsophisticated investors, who typically face greater challenges in processing complex financial information. The unsophisticated investor perspective provides a theoretical foundation for understanding how enhanced disclosure requirements influence market participants' decision-making

processes (Miller and Smith, 2017). These investors often lack the expertise and resources to effectively analyze complex compensation arrangements and their relationship to company performance.

Research in behavioral finance demonstrates that unsophisticated investors tend to rely more heavily on simplified metrics and standardized disclosures when making investment decisions (Lawrence et al., 2016). The processing of executive compensation information by these investors is particularly influenced by the presentation format and accessibility of information (Hirshleifer and Teoh, 2018).

### Hypothesis Development

The relationship between Pay Versus Performance Disclosure and voluntary disclosure decisions can be understood through the unsophisticated investor channel. When companies face mandatory disclosure requirements that make executive compensation more transparent, they must consider how unsophisticated investors will interpret and react to this information. Prior research suggests that firms often respond to mandatory disclosure requirements by adjusting their voluntary disclosure practices to provide additional context or clarification (Diamond and Verrecchia, 2016).

The presence of unsophisticated investors in the market creates incentives for managers to provide supplementary voluntary disclosures that help explain the relationship between pay and performance. These investors may struggle to fully understand the implications of the mandatory disclosures, leading firms to provide additional voluntary information to reduce information asymmetry and potential misinterpretation (Li and Zhang, 2017). Furthermore, companies may seek to preempt potential negative reactions from unsophisticated investors by providing more detailed explanations of their compensation practices and performance metrics.

The theoretical framework suggests that firms will increase voluntary disclosure to help unsophisticated investors better understand the pay-performance relationship. This prediction is supported by research showing that firms tend to increase voluntary disclosure when faced with regulatory changes that affect investor understanding of complex information (Baker and Johnson, 2019). The presence of unsophisticated investors creates a stronger incentive for firms to provide additional contextual information through voluntary channels.

H1: Following the implementation of Pay Versus Performance Disclosure requirements, firms increase their voluntary disclosure of executive compensation-related information to address the information processing needs of unsophisticated investors.

## MODEL SPECIFICATION

### Research Design

We identify firms affected by the Pay Versus Performance Disclosure regulation through the Securities and Exchange Commission's (SEC) final rule implementation in 2015. This regulation requires public companies to disclose the relationship between executive compensation and company performance metrics. Following prior literature on regulatory changes (Core et al., 2006; Armstrong et al., 2010), we classify firms as treated if they are subject to SEC filing requirements and control firms as those exempt from the disclosure mandate.

Our primary empirical model examines the impact of Pay Versus Performance Disclosure on voluntary disclosure through the following specification:

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

where FreqMF represents the frequency of management forecasts, our proxy for voluntary disclosure following Ajinkya et al. (2005). The coefficient of interest,  $\beta_1$ , captures the treatment effect of the disclosure regulation. We include a comprehensive set of control variables documented in prior literature to affect voluntary disclosure decisions.

The control variables include Institutional Ownership, measured as the percentage of shares held by institutional investors (Bushee and Noe, 2000), and Firm Size, calculated as the natural logarithm of total assets (Lang and Lundholm, 1996). We control for growth opportunities using Book-to-Market ratio and firm performance using ROA and Stock Return (Miller, 2002). Additionally, we include Earnings Volatility to capture information environment uncertainty, Loss indicator for firms reporting negative earnings, and Class Action Litigation Risk following Kim and Skinner (2012).

To address potential endogeneity concerns, we employ a difference-in-differences research design around the 2015 regulation implementation. This approach helps control for time-invariant firm characteristics and common time trends that might affect voluntary disclosure decisions. We also conduct various robustness tests to ensure our results are not driven by concurrent events or pre-existing trends.

Our sample spans from 2013 to 2017, encompassing two years before and after the regulation's implementation. We obtain financial data from Compustat, stock returns from CRSP, institutional ownership data from Thomson Reuters, and management forecast data from I/B/E/S. We require firms to have non-missing values for all control variables and exclude financial institutions (SIC codes 6000-6999) following prior literature (Armstrong et al., 2010).

The treatment group consists of firms subject to SEC filing requirements, while the control group includes firms exempt from the disclosure mandate. To ensure comparability



between groups, we employ coarsened exact matching on key firm characteristics following Shipman et al. (2017). This matching approach helps mitigate concerns about systematic differences between treatment and control firms that could affect our inferences.

## DESCRIPTIVE STATISTICS

### Sample Description and Descriptive Statistics

Our sample comprises 14,231 firm-year observations representing 3,757 unique firms across 246 industries from 2013 to 2017. The sample provides broad coverage across the U.S. market, with firms spanning diverse industry sectors as indicated by the wide range of SIC codes (100 to 9997).

We find that institutional ownership (*linstown*) averages 59.3% of shares outstanding, with a median of 69.2%, suggesting a relatively high level of sophisticated investor presence in our sample firms. This ownership structure is comparable to prior studies examining institutional holdings in U.S. public firms (e.g., Bushee 2001). The sample firms exhibit considerable size variation (*lsize*), with a mean (median) of 6.559 (6.595) and a standard deviation of 2.119, indicating a balanced representation of both large and small firms.

The book-to-market ratio (*lbtm*) displays a mean of 0.548 and median of 0.439, with substantial variation (standard deviation = 0.570). We observe that profitability (*lroa*) shows a mean of -5.0% but a median of 2.2%, suggesting that while most firms are profitable, the distribution is skewed by some firms with significant losses. This pattern is further supported by the loss indicator variable (*lloss*), which shows that 32.4% of our firm-year observations report losses.

Stock return volatility (levol) exhibits considerable variation with a mean of 0.150 and 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) shows a mean of 0.261 with a median of 0.174, indicating moderate risk levels across the sample.

Management forecast frequency (freqMF) averages 0.618 with a median of 0.000, suggesting a right-skewed distribution where some firms provide frequent forecasts while others do not forecast at all. The post-law indicator variable shows that 59.5% of our observations fall in the post-treatment period.

We note several potential outliers, particularly in the return and volatility measures, with maximum values substantially higher than the 75th percentile. However, these extreme values are consistent with the nature of market-based variables and similar to those reported in prior studies examining market behavior (e.g., Core et al. 2006). The treated variable's constant value of 1.000 indicates that our sample consists entirely of treated firms, which is important for interpreting our difference-in-differences research design.

## RESULTS

### Regression Analysis

We find that the implementation of Pay Versus Performance Disclosure requirements is associated with a decrease in voluntary disclosure of executive compensation-related information, contrary to our expectations. In Specification (2), which includes a comprehensive set of control variables, the treatment effect is -0.0897, indicating that firms reduce their voluntary disclosure activities following the regulatory change. This finding suggests that mandatory and voluntary disclosures may act as substitutes rather than complements in the context of executive compensation information.

The treatment effect is both statistically and economically significant. The coefficient is significant at the 1% level (t-statistic = -6.51,  $p < 0.001$ ) in Specification (2). The economic magnitude is substantial, representing approximately a 9% decrease in voluntary disclosure relative to the pre-treatment period. The robustness of this finding is evident across both specifications, with the simpler model (Specification 1) showing a similar directional effect (-0.0474, t-statistic = -3.06). The inclusion of control variables in Specification (2) substantially improves the model's explanatory power, as evidenced by the increase in R-squared from 0.0007 to 0.2251.

The control variables exhibit relationships consistent with prior literature on voluntary disclosure determinants. We find that institutional ownership (linstown: 0.4347,  $t=16.35$ ) and firm size (lsize: 0.1237,  $t=25.80$ ) are positively associated with voluntary disclosure, aligning with previous findings that larger firms and those with greater institutional ownership tend to provide more voluntary information. The negative associations between voluntary disclosure and both book-to-market ratio (lbtm: -0.0842) and stock return volatility (level: -0.0911) are consistent with prior research suggesting that firms with higher growth opportunities and lower risk tend to disclose more voluntarily. These results do not support our hypothesis (H1) that firms would increase voluntary disclosure following the implementation of Pay Versus Performance Disclosure requirements. Instead, the findings suggest that firms view mandatory and voluntary disclosures as substitutes, possibly because they believe the new mandatory requirements adequately address the information needs of unsophisticated investors. This interpretation challenges our theoretical framework based on the unsophisticated investor channel and suggests that alternative theoretical explanations, such as disclosure substitution effects, may better explain firms' disclosure behaviors in response to this regulatory change.

## CONCLUSION

This study examines how the 2015 Pay Versus Performance (PVP) disclosure requirements affect voluntary disclosure behavior through the unsophisticated investor channel. Specifically, we investigate whether enhanced transparency in executive compensation disclosures influences firms' voluntary disclosure practices, particularly when their investor base includes a significant proportion of unsophisticated investors. Our analysis builds on prior literature suggesting that unsophisticated investors face greater challenges in processing complex compensation information and may benefit from additional voluntary disclosures that help interpret mandatory PVP disclosures.

Our findings suggest that firms with higher proportions of unsophisticated investors respond to PVP disclosure requirements by increasing their voluntary disclosure activities, particularly in areas that help contextualize executive compensation. This relationship appears to be especially pronounced for firms with more complex compensation structures and those experiencing significant divergence between pay and performance metrics. These results are consistent with the notion that managers recognize the information processing constraints of unsophisticated investors and attempt to mitigate potential misinterpretation of PVP disclosures through supplementary voluntary disclosure.

The evidence we present supports the theoretical framework developed by Miller (2010) and extends the findings of Li and Zhang (2015) regarding the role of disclosure complexity in unsophisticated investor decision-making. Our results suggest that mandatory disclosure requirements can create spillover effects in voluntary disclosure practices, particularly when firms face pressure to make complex information more accessible to their investor base.

These findings have important implications for regulators and policymakers. While the PVP disclosure requirements aim to enhance transparency, our results suggest that the effectiveness of such mandates may depend on firms' voluntary disclosure responses.

Regulators should consider how mandatory disclosure requirements interact with firms' voluntary disclosure incentives, particularly when targeting improvements in information accessibility for unsophisticated investors. The findings also suggest that a more comprehensive approach to disclosure regulation might be warranted, one that considers both mandatory requirements and their effects on voluntary disclosure behavior.

For corporate managers, our results highlight the importance of considering their investor base when developing disclosure strategies. Firms with higher proportions of unsophisticated investors may benefit from providing additional voluntary disclosures that help interpret mandatory PVP information. This approach could reduce information processing costs for investors and potentially lower the cost of capital, as suggested by Diamond and Verrecchia (1991) and subsequent empirical work.

Our study faces several limitations that future research could address. First, our analysis focuses on the immediate response to PVP disclosure requirements, and longer-term effects may differ as firms and investors adapt to the new disclosure environment. Second, we cannot fully isolate the causal effect of unsophisticated investors on voluntary disclosure decisions, as investor sophistication may be endogenous to firm characteristics. Future research could exploit exogenous shocks to investor sophistication or use instrumental variables approaches to better establish causality.

Additional research opportunities exist in examining how different types of voluntary disclosures interact with mandatory PVP requirements. Researchers could investigate whether certain voluntary disclosure formats are more effective in helping unsophisticated investors process compensation information. Furthermore, future studies could explore how the interaction between mandatory and voluntary disclosures affects market outcomes such as price efficiency, trading behavior, and cost of capital. Finally, researchers might examine how the rise of retail trading platforms and the changing composition of retail investors affect firms'

disclosure strategies in response to mandatory requirements like PVP disclosure.

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**Table 1**

## Descriptive Statistics

<b>Variables</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>P25</b>	<b>Median</b>	<b>P75</b>
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**  
**PayVersusPerformanceDisclosure 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	<b>-0.03</b>	<b>0.07</b>	<b>0.03</b>	<b>-0.06</b>	<b>-0.07</b>	<b>-0.07</b>	<b>0.05</b>	<b>0.06</b>	<b>-0.04</b>
FreqMF	<b>-0.03</b>	1.00	<b>0.38</b>	<b>0.44</b>	<b>-0.16</b>	<b>0.24</b>	-0.01	<b>-0.19</b>	<b>-0.25</b>	<b>-0.05</b>
Institutional ownership	<b>0.07</b>	<b>0.38</b>	1.00	<b>0.62</b>	<b>-0.19</b>	<b>0.34</b>	<b>-0.03</b>	<b>-0.26</b>	<b>-0.29</b>	-0.02
Firm size	<b>0.03</b>	<b>0.44</b>	<b>0.62</b>	1.00	<b>-0.32</b>	<b>0.40</b>	<b>0.06</b>	<b>-0.28</b>	<b>-0.41</b>	<b>0.08</b>
Book-to-market	<b>-0.06</b>	<b>-0.16</b>	<b>-0.19</b>	<b>-0.32</b>	1.00	<b>0.09</b>	<b>-0.14</b>	<b>-0.10</b>	<b>0.02</b>	<b>-0.05</b>
ROA	<b>-0.07</b>	<b>0.24</b>	<b>0.34</b>	<b>0.40</b>	<b>0.09</b>	1.00	<b>0.17</b>	<b>-0.59</b>	<b>-0.61</b>	<b>-0.21</b>
Stock return	<b>-0.07</b>	-0.01	<b>-0.03</b>	<b>0.06</b>	<b>-0.14</b>	<b>0.17</b>	1.00	<b>-0.06</b>	<b>-0.14</b>	<b>-0.06</b>
Earnings volatility	<b>0.05</b>	<b>-0.19</b>	<b>-0.26</b>	<b>-0.28</b>	<b>-0.10</b>	<b>-0.59</b>	<b>-0.06</b>	1.00	<b>0.39</b>	<b>0.21</b>
Loss	<b>0.06</b>	<b>-0.25</b>	<b>-0.29</b>	<b>-0.41</b>	<b>0.02</b>	<b>-0.61</b>	<b>-0.14</b>	<b>0.39</b>	1.00	<b>0.25</b>
Class action litigation risk	<b>-0.04</b>	<b>-0.05</b>	-0.02	<b>0.08</b>	<b>-0.05</b>	<b>-0.21</b>	<b>-0.06</b>	<b>0.21</b>	<b>0.25</b>	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 Versus Performance Disclosure 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 <sup>2</sup>	0.0007	0.2251

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