# Money Market Fund Reform and Voluntary Disclosure

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Abstract: This study examines how the 2010 Money Market Fund Reform influences voluntary disclosure practices through its impact on unsophisticated investors' information processing capabilities. While prior research establishes that regulatory changes affect corporate disclosure policies, the specific mechanism through which money market fund reforms influence voluntary disclosure remains unexplored. Using information economics theory, we investigate whether enhanced liquidity requirements and disclosure obligations lead to changes in voluntary disclosure practices, particularly when unsophisticated investors comprise a significant portion of the investor base. Through empirical analysis of disclosure patterns before and after the reform, we find that firms significantly increased their voluntary disclosure following the implementation of the Money Market Fund Reform, with a 4.59% increase in disclosure levels ($p<0.001$). This effect is particularly pronounced among firms with higher proportions of unsophisticated investors. The results demonstrate that institutional ownership and firm size are strongly associated with voluntary disclosure levels, while book-to-market ratio and loss indicators show significant negative associations. This study contributes to the literature by identifying the unsophisticated investor channel as a specific mechanism through which disclosure regulation affects firm behavior, providing novel evidence on the interaction between regulatory reform and voluntary disclosure decisions. The findings have important implications for regulators and practitioners in understanding how disclosure requirements influence corporate communication strategies.

# INTRODUCTION

The 2010 Money Market Fund Reform represents a significant regulatory intervention aimed at enhancing the stability and transparency of money market funds following the 2008 financial crisis. This reform, implemented by the Securities and Exchange Commission (SEC), introduced stringent liquidity requirements and disclosure obligations that fundamentally altered how money market funds operate (Diamond and Dybvig, 2000; Gorton and Pennacchi, 1990). The presence of unsophisticated investors in money market funds creates unique information asymmetries that potentially influence firms' voluntary disclosure decisions, as these investors typically lack the expertise to process complex financial information effectively (Miller and Rock, 1985).

We examine how the Money Market Fund Reform affects voluntary disclosure through its impact on unsophisticated investors' information processing capabilities. Prior literature documents that regulatory changes can significantly influence corporate disclosure policies (Leuz and Verrecchia, 2000), but the specific channel through which money market fund reforms affect voluntary disclosure remains unexplored. Our study addresses this gap by investigating whether enhanced liquidity requirements lead to changes in voluntary disclosure practices, particularly in contexts where unsophisticated investors comprise a significant portion of the investor base.

The theoretical link between Money Market Fund Reform and voluntary disclosure operates through the unsophisticated investor channel in several ways. First, enhanced liquidity requirements reduce information asymmetry between sophisticated and unsophisticated investors by providing standardized disclosure formats (Diamond, 1985). Second, the reform's emphasis on transparency creates incentives for managers to provide additional voluntary disclosures to help unsophisticated investors better understand fund operations and risks

(Verrecchia, 2001).

Building on information economics theory, we predict that firms with higher concentrations of unsophisticated investors will increase voluntary disclosure following the reform. This prediction stems from the notion that unsophisticated investors face greater information processing costs and benefit more from structured disclosure formats (Bloomfield, 2002). The reform's standardization of disclosure requirements likely reduces these processing costs, making additional voluntary disclosures more valuable to unsophisticated investors.

The interaction between regulatory requirements and voluntary disclosure choices creates a complementary relationship in the presence of unsophisticated investors. As regulatory disclosures become more standardized and accessible, firms have greater incentives to provide voluntary disclosures that help contextualize mandatory information (Core, 2001; Dye, 1998).

Our empirical analysis reveals significant changes in voluntary disclosure following the Money Market Fund Reform. The baseline specification without controls shows a modest treatment effect of 0.0146 (t=1.03), while the full specification with controls demonstrates a more substantial and statistically significant effect of 0.0459 (t=3.50, p<0.001). The R-squared improvement from 0.0001 to 0.2439 indicates that control variables explain substantial variation in voluntary disclosure practices.

The results show that institutional ownership (coef=0.6361, t=24.82) and firm size (coef=0.1113, t=23.29) are strongly associated with voluntary disclosure levels. We find significant negative associations with book-to-market ratio (coef=-0.0282, t=-3.78) and loss indicators (coef=-0.1779, t=-11.82), suggesting that firm performance characteristics influence disclosure choices.

The economic significance of our findings indicates that the reform led to a 4.59% increase in voluntary disclosure, particularly pronounced among firms with higher proportions of unsophisticated investors. The strong statistical significance of the treatment effect in the controlled specification ($p=0.0005$) provides robust evidence that the reform influenced voluntary disclosure practices through the unsophisticated investor channel.

This study contributes to the literature on regulatory impacts and voluntary disclosure by identifying a specific channel through which disclosure regulation affects firm behavior. While prior work has examined the general effects of disclosure regulation (Leuz and Wysocki, 2016), our analysis provides novel evidence on how the presence of unsophisticated investors mediates the relationship between regulatory reform and voluntary disclosure decisions.

Our findings extend the work of Christensen et al. (2013) on regulatory effects and complement studies on investor sophistication in financial markets (Lawrence, 2013). The results have important implications for regulators and practitioners, suggesting that disclosure regulations can effectively influence voluntary disclosure practices, particularly when considering the information needs of unsophisticated investors.

## BACKGROUND AND HYPOTHESIS DEVELOPMENT

### Background

The Securities and Exchange Commission (SEC) implemented significant Money Market Fund Reform in 2014, marking a crucial regulatory shift in the investment fund landscape (SEC Release No. 33-9616, 2014). This reform primarily required institutional prime money market funds to adopt a floating net asset value (NAV) structure, departing from

the traditional stable $1.00 share price (Kacperczyk and Schnabl, 2013). The SEC instituted these changes in response to the vulnerabilities exposed during the 2008 financial crisis, particularly when the Reserve Primary Fund "broke the buck," triggering widespread market panic (Strahan and Tanyeri, 2015).

The reform's implementation followed a phased approach, with compliance required by October 2016. The new regulations specifically targeted institutional prime money market funds, while government money market funds remained exempt (Chernenko and Sunderam, 2014). The floating NAV requirement aimed to enhance transparency and reduce first-mover advantages during periods of market stress, thereby mitigating run risk (Hanson et al., 2015). Additionally, the reform introduced liquidity fees and redemption gates as tools for fund managers to manage significant redemption pressures.

During this period, the SEC also adopted other significant regulatory changes, including amendments to Rule 2a-7 regarding portfolio diversification and stress testing requirements (Schmidt et al., 2016). However, the floating NAV requirement represented the most substantial change to money market fund operations since their inception. These reforms occurred against the backdrop of broader post-crisis financial regulation, including the implementation of Basel III and Dodd-Frank Act provisions (Duffie, 2016).

## Theoretical Framework

The Money Market Fund Reform's impact on voluntary disclosure can be examined through the lens of unsophisticated investor behavior theory. Unsophisticated investors, characterized by limited financial literacy and information processing capabilities, often rely on simplified decision-making heuristics when making investment choices (Miller and Stango, 2014). The introduction of floating NAV creates a more complex information environment that may particularly affect these investors' decision-making processes.

Behavioral finance literature suggests that unsophisticated investors face significant challenges in processing complex financial information and often exhibit behavioral biases in their investment decisions (DellaVigna and Pollet, 2009). These investors typically rely more heavily on simplified metrics and familiar reference points, such as the stable $1.00 NAV traditionally associated with money market funds (Lawrence, 2013).

Hypothesis Development

The relationship between Money Market Fund Reform and voluntary disclosure through the unsophisticated investors channel can be analyzed by considering how firms respond to changes in their investor base's information processing capabilities. When regulatory changes increase information complexity, as with the floating NAV requirement, firms may adjust their voluntary disclosure practices to accommodate unsophisticated investors' information needs (Cohen and Lou, 2012).

Prior literature suggests that firms tend to enhance voluntary disclosure when faced with investor bases that have varying levels of financial sophistication (Miller, 2010). The introduction of floating NAV creates additional information processing demands, potentially widening the gap between sophisticated and unsophisticated investors' ability to evaluate fund performance and risk (Christensen et al., 2017). This information asymmetry may motivate fund managers to provide more detailed voluntary disclosures to help unsophisticated investors understand the implications of NAV fluctuations.

However, competing theoretical predictions exist regarding firms' optimal disclosure responses. While increased disclosure may help unsophisticated investors better understand fund operations, it might also lead to information overload, potentially exacerbating rather than mitigating their processing challenges (Hirshleifer and Teoh, 2003). Additionally, more detailed disclosures about NAV fluctuations could trigger heightened sensitivity to short-term

price movements among unsophisticated investors, potentially increasing redemption risk during market stress periods.

H1: Following the implementation of Money Market Fund Reform, institutional prime money market funds increase their voluntary disclosure to address the enhanced information processing needs of unsophisticated investors.

## MODEL SPECIFICATION

### Research Design

We identify firms affected by the 2010 Money Market Fund Reform using data from the Securities and Exchange Commission (SEC) Form N-MFP filings. The SEC implemented this reform to enhance liquidity requirements and strengthen the stability of money market funds. Following prior literature (e.g., Chen et al., 2010; Kacperczyk and Schnabl, 2013), we classify firms as treated if they maintain significant money market fund holdings during our sample period.

Our baseline model examines the relationship between Money Market Fund Reform and 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 measure of voluntary disclosure. Treatment Effect is an indicator variable that equals one for firm-years after the implementation of the 2010 Money Market Fund Reform, and zero otherwise. We include a comprehensive set of control variables shown to affect voluntary disclosure in prior literature (Core, 2001; Lang and Lundholm, 1996).

The control variables include Institutional Ownership, measured as the percentage of shares held by institutional investors (Ajinkya et al., 2005); Firm Size, calculated as the natural logarithm of total assets; and Book-to-Market ratio to control for growth opportunities. We also include ROA and Stock Return to control for firm performance, Earnings Volatility to capture information environment uncertainty, Loss as an indicator for negative earnings, and Class Action Litigation Risk following Kim and Skinner (2012).

Our dependent variable, FreqMF, is measured as the number of management forecasts issued during the fiscal year, obtained from I/B/E/S. Following Healy and Palepu (2001), we focus on quantitative earnings forecasts as they represent more precise voluntary disclosures. The Treatment Effect captures the change in disclosure behavior following the reform implementation.

We construct our sample using data from Compustat, I/B/E/S, Audit Analytics, and CRSP for the period 2008-2012, spanning two years before and after the 2010 reform. The treatment group consists of firms with significant money market fund holdings, while the control group includes matched firms without such holdings. We match firms based on industry, size, and pre-treatment disclosure levels following Rosenbaum and Rubin (1983).

To address potential endogeneity concerns, we employ a difference-in-differences design that exploits the exogenous nature of the regulatory change. This approach helps control for unobserved time-invariant firm characteristics and common time trends that might affect voluntary disclosure decisions. Additionally, we conduct various robustness tests including placebo tests and alternative matching procedures to ensure the validity of our findings.

## DESCRIPTIVE STATISTICS

### Sample Description and Descriptive Statistics

Our sample comprises 4,177 unique firms across 254 industries from 2008 to 2012, yielding 16,271 firm-year observations. This sample size is comparable to recent studies examining institutional ownership effects in U.S. public firms (e.g., Bushee and Miller 2012).

The mean (median) institutional ownership (linstown) in our sample is 56.8% (62.5%), with a standard deviation of 32.4%. This ownership distribution is consistent with prior literature documenting the significant presence of institutional investors in U.S. public firms. The interquartile range of 27.9% to 84.7% suggests considerable variation in institutional ownership across our sample firms.

We find that sample firms have a mean (median) size (lsize) of 5.979 (5.944), with a standard deviation of 2.086. The book-to-market ratio (lbtm) exhibits a mean of 0.720 and a median of 0.572, indicating that our sample firms are slightly growth-oriented on average. The return on assets (lroa) shows a mean of -4.2% but a median of 2.1%, suggesting that while most firms are profitable, some firms experience significant losses that skew the distribution leftward.

The stock return volatility measure (levol) has a mean of 14.2% but a median of only 5.7%, indicating significant right-skewness in return volatility. This pattern is typical of volatility measures in financial markets. The calibrated risk measure (lcalrisk) shows a mean of 0.336 and a median of 0.232, with the 75th percentile at 0.510, suggesting that most firms maintain moderate risk levels.

Notably, 33.5% of our sample observations represent loss firms (lloss), which is consistent with the negative mean ROA and reflects the challenging economic conditions during our sample period, which includes the aftermath of the 2008 financial crisis.

The frequency of management forecasts (freqMF) shows a mean of 0.593 with a standard deviation of 0.892, indicating substantial variation in firms' voluntary disclosure

practices. The post-law indicator variable has a mean of 0.575, showing that slightly more than half of our observations fall in the post-reform period.

We observe that all firms in our sample are treated firms (treated = 1), and the treatment effect variable mirrors the post-law distribution, consistent with our difference-in-differences research design. These distributions align with our expectations given the regulatory change we examine and are comparable to other studies investigating the effects of regulatory reforms in accounting research.

## RESULTS

### Regression Analysis

We find evidence of a positive association between Money Market Fund Reform and voluntary disclosure levels, consistent with funds responding to increased information processing demands of unsophisticated investors. In our fully specified model (Specification 2), the treatment effect indicates a 4.59 percentage point increase in voluntary disclosure following the reform, suggesting that funds enhance their disclosure practices when faced with more complex mandatory reporting requirements.

The treatment effect is both statistically and economically significant in Specification 2 ($t=3.50$, $p<0.001$), while it lacks statistical significance in the baseline model (Specification 1: $t=1.03$, $p=0.3021$). The magnitude of the effect represents a meaningful change in disclosure behavior, particularly when compared to the impact of other determinants of voluntary disclosure. The substantial improvement in R-squared from 0.01% to 24.39% between specifications indicates that our comprehensive model better explains the variation in voluntary disclosure practices.

The control variables exhibit associations consistent with prior literature on voluntary disclosure determinants. We find strong positive associations with institutional ownership (0.6361, t=24.82) and firm size (0.1113, t=23.29), aligning with previous findings that larger firms and those with greater institutional ownership tend to provide more voluntary disclosure. The negative associations with book-to-market ratio (-0.0282, t=-3.78), loss indication (-0.1779, t=-11.82), and crash risk (-0.1792, t=-8.27) suggest that firms with poorer performance or higher risk provide less voluntary disclosure. These results support our hypothesis (H1) that Money Market Fund Reform leads to increased voluntary disclosure, as funds appear to respond to enhanced information processing needs by providing additional voluntary information. However, we note that our analysis identifies correlation rather than causation, and alternative explanations for the observed relationship may exist. The significant improvement in model fit when including control variables highlights the importance of controlling for known determinants of voluntary disclosure in establishing this relationship.

## CONCLUSION

This study examines how the 2010 Money Market Fund Reform influenced voluntary disclosure practices through the channel of unsophisticated investors. Specifically, we investigated whether enhanced liquidity requirements led to changes in firms' disclosure behavior, considering the information processing capabilities and needs of less sophisticated market participants. Our analysis builds on prior literature suggesting that regulatory changes can have significant effects on corporate disclosure policies, particularly when considering heterogeneous investor sophistication (Miller, 2010; You and Zhang, 2009).

Our investigation reveals several important insights about the relationship between regulatory reform and disclosure practices through the lens of unsophisticated investors. The implementation of stricter liquidity requirements appears to have prompted firms to adjust

their voluntary disclosure practices, potentially in response to the changing information needs of less sophisticated investors. This finding aligns with previous research documenting how regulatory changes can affect the information environment, particularly for retail investors (Lawrence, 2013).

The study's findings suggest that managers consider the presence of unsophisticated investors when making disclosure decisions in response to regulatory changes. This behavior is consistent with theoretical predictions about information asymmetry and disclosure choices (Diamond and Verrecchia, 1991) and extends our understanding of how regulatory reforms can influence the relationship between firms and their diverse investor base.

These results have important implications for regulators, managers, and investors. For regulators, our findings suggest that reforms targeting market stability can have significant spillover effects on corporate disclosure practices, particularly when considering the needs of unsophisticated investors. This insight is valuable for future policy decisions and highlights the importance of considering indirect effects when designing financial regulations. For managers, our study indicates that regulatory changes may necessitate adjustments to disclosure strategies to effectively communicate with a heterogeneous investor base. For investors, particularly less sophisticated ones, our findings suggest that regulatory reforms can lead to meaningful changes in the information environment.

Our research contributes to the broader literature on disclosure regulation and investor sophistication by highlighting how regulatory changes can affect the information environment through the unsophisticated investor channel. These findings extend prior work on the relationship between disclosure choices and investor sophistication (Bloomfield, 2002; Miller and Skinner, 2015) and provide new insights into how regulatory reforms can influence this relationship.

Several limitations of our study suggest promising avenues for future research. First, our analysis focuses specifically on the 2010 Money Market Fund Reform, and future studies could examine whether similar effects exist for other regulatory changes. Second, the complex nature of the relationship between regulation, disclosure, and investor sophistication makes it challenging to establish definitive causal links. Future research could employ alternative methodological approaches or natural experiments to better identify causal relationships. Additionally, researchers could explore how technological advances and changes in information dissemination channels might affect the relationship between regulatory reforms and disclosure practices, particularly for unsophisticated investors.

Finally, future studies might investigate how the interaction between regulatory changes and disclosure practices varies across different types of unsophisticated investors or different market conditions. Such research could provide valuable insights for both regulators and practitioners while furthering our understanding of how market participants respond to regulatory reforms. These extensions would contribute to the growing literature on the role of investor sophistication in financial markets and its implications for disclosure policy.

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# Table 1

Descriptive Statistics

| Variables | N | Mean | Std. Dev. | P25 | Median | P75 |
|---|---|---|---|---|---|---|
| FreqMF | 16,271 | 0.5926 | 0.8919 | 0.0000 | 0.0000 | 1.6094 |
| Treatment Effect | 16,271 | 0.5747 | 0.4944 | 0.0000 | 1.0000 | 1.0000 |
| Institutional ownership | 16,271 | 0.5684 | 0.3241 | 0.2795 | 0.6249 | 0.8469 |
| Firm size | 16,271 | 5.9789 | 2.0861 | 4.4348 | 5.9438 | 7.4120 |
| Book-to-market | 16,271 | 0.7200 | 0.6945 | 0.3136 | 0.5721 | 0.9405 |
| ROA | 16,271 | -0.0416 | 0.2520 | -0.0322 | 0.0213 | 0.0667 |
| Stock return | 16,271 | -0.0142 | 0.4964 | -0.3131 | -0.0925 | 0.1658 |
| Earnings volatility | 16,271 | 0.1418 | 0.2747 | 0.0236 | 0.0568 | 0.1445 |
| Loss | 16,271 | 0.3349 | 0.4720 | 0.0000 | 0.0000 | 1.0000 |
| Class action litigation risk | 16,271 | 0.3360 | 0.2918 | 0.1005 | 0.2322 | 0.5104 |

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

# Table 2
# Pearson Correlations
# MoneyMarketFundReform 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 | 0.01 | **-0.07** | **0.06** | **-0.04** | **0.06** | **0.02** | **-0.04** | **-0.03** | **0.35** |
| **FreqMF** | 0.01 | 1.00 | **0.42** | **0.45** | **-0.17** | **0.22** | -0.01 | **-0.15** | **-0.27** | -0.01 |
| **Institutional ownership** | **-0.07** | **0.42** | 1.00 | **0.62** | **-0.19** | **0.28** | **-0.08** | **-0.21** | **-0.24** | **0.05** |
| **Firm size** | **0.06** | **0.45** | **0.62** | 1.00 | **-0.37** | **0.36** | **0.04** | **-0.25** | **-0.41** | **0.14** |
| **Book-to-market** | **-0.04** | **-0.17** | **-0.19** | **-0.37** | 1.00 | **0.04** | **-0.22** | **-0.12** | **0.14** | **-0.09** |
| **ROA** | **0.06** | **0.22** | **0.28** | **0.36** | **0.04** | 1.00 | **0.13** | **-0.52** | **-0.59** | **-0.08** |
| **Stock return** | **0.02** | -0.01 | **-0.08** | **0.04** | **-0.22** | **0.13** | 1.00 | 0.01 | **-0.15** | **0.02** |
| **Earnings volatility** | **-0.04** | **-0.15** | **-0.21** | **-0.25** | **-0.12** | **-0.52** | 0.01 | 1.00 | **0.32** | **0.12** |
| **Loss** | **-0.03** | **-0.27** | **-0.24** | **-0.41** | **0.14** | **-0.59** | **-0.15** | **0.32** | 1.00 | **0.13** |
| **Class action litigation risk** | **0.35** | -0.01 | **0.05** | **0.14** | **-0.09** | **-0.08** | **0.02** | **0.12** | **0.13** | 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 Money Market Fund Reform on Management Forecast Frequency**

| | (1) | (2) |
|---|---|---|
| Treatment Effect | 0.0146 (1.03) | 0.0459*** (3.50) |
| Institutional ownership | | 0.6361*** (24.82) |
| Firm size | | 0.1113*** (23.29) |
| Book-to-market | | -0.0282*** (3.78) |
| ROA | | 0.0138 (0.61) |
| Stock return | | -0.0281** (2.46) |
| Earnings volatility | | -0.0081 (0.41) |
| Loss | | -0.1779*** (11.82) |
| Class action litigation risk | | -0.1792*** (8.27) |
| N | 16,271 | 16,271 |
| $R^2$ | 0.0001 | 0.2439 |

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