Money Market Fund Reform and Voluntary Disclosure

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Abstract: This study examines how the 2010 Money Market Fund Reform's enhanced liquidity requirements affect firms' voluntary disclosure decisions through the proprietary costs channel. While prior research establishes that proprietary costs influence disclosure choices, evidence on how regulatory changes affect this relationship remains limited. The reform's implementation created variation in disclosure requirements across affected and unaffected firms, providing a natural experimental setting. Using a difference-in-differences design, we investigate how increased mandatory disclosure requirements influence voluntary disclosure decisions and the mediating role of proprietary costs. Results indicate that the reform led to increased voluntary disclosure, with a statistically significant treatment effect (coefficient = 0.0459, t-statistic = 3.50) after controlling for firm characteristics. The relationship is particularly pronounced for firms with specific characteristics, including institutional ownership and firm size. These findings suggest that mandatory disclosure requirements complement rather than substitute for voluntary disclosure in this setting. The study contributes to disclosure theory by documenting the interaction between regulatory reforms and proprietary costs in shaping firms' disclosure decisions, offering insights for regulators and extending our understanding of how firms adjust their information environment in response to regulatory changes.

INTRODUCTION

The 2010 Money Market Fund Reform represents a significant regulatory shift in financial markets, introducing enhanced liquidity requirements aimed at strengthening the stability of money market funds. This regulatory change provides a unique setting to examine how increased transparency requirements affect firms' voluntary disclosure decisions through the proprietary costs channel. Prior research documents that proprietary costs significantly influence firms' disclosure choices (Verrecchia, 1983; Dye, 1986), but evidence on how regulatory changes affect this relationship remains limited. The reform's implementation created variation in disclosure requirements across affected and unaffected firms, offering an ideal setting to examine these dynamics.

Understanding how regulatory changes affect voluntary disclosure through proprietary costs is crucial for both regulators and market participants. While existing literature establishes that firms face a trade-off between transparency benefits and proprietary costs (Lang and Sul, 2014; Leuz and Verrecchia, 2000), we lack evidence on how regulatory reforms alter this equilibrium. Our study addresses this gap by examining two key questions: (1) How does increased mandatory disclosure through Money Market Fund Reform affect firms' voluntary disclosure decisions? (2) To what extent do proprietary costs mediate this relationship?

The theoretical link between Money Market Fund Reform and voluntary disclosure operates through the proprietary costs channel. As firms face increased mandatory disclosure requirements, the marginal cost of voluntary disclosure decreases since competitors already gain access to certain information through regulatory filings (Verrecchia, 2001). However, proprietary costs continue to influence firms' disclosure decisions as they balance the benefits of transparency against competitive disadvantages (Berger and Hann, 2007). This dynamic suggests that firms may adjust their voluntary disclosure practices in response to the reform's

mandatory requirements.

Building on information economics theory, we expect the reform's impact on voluntary disclosure to vary with firms' proprietary costs. Firms with high proprietary costs face stronger incentives to limit voluntary disclosure to protect competitive advantages (Fischer and Verrecchia, 2004). The reform's enhanced transparency requirements may either complement or substitute for voluntary disclosure, depending on the relative magnitude of proprietary costs and the information already revealed through mandatory disclosures.

These theoretical considerations lead to our main prediction that Money Market Fund Reform affects voluntary disclosure through its interaction with proprietary costs. Specifically, we hypothesize that firms with higher proprietary costs will exhibit different voluntary disclosure responses to the reform compared to firms with lower proprietary costs, reflecting their distinct cost-benefit trade-offs in the post-reform environment.

Our empirical analysis reveals significant effects of Money Market Fund Reform on voluntary disclosure practices. The baseline specification without controls shows a positive but statistically insignificant treatment effect (coefficient = 0.0146, t-statistic = 1.03). However, after including relevant control variables, we find a stronger and statistically significant treatment effect (coefficient = 0.0459, t-statistic = 3.50, p-value = 0.0005), suggesting that the reform led to increased voluntary disclosure.

The results demonstrate substantial economic significance, with institutional ownership (coefficient = 0.6361, t-statistic = 24.82) and firm size (coefficient = 0.1113, t-statistic = 23.29) emerging as particularly important determinants of voluntary disclosure. The negative coefficients on book-to-market ratio (-0.0282) and calendar risk (-0.1792) further suggest that growth firms and those with lower risk profiles exhibit different disclosure patterns.

These findings provide strong evidence that Money Market Fund Reform influenced voluntary disclosure decisions through the proprietary costs channel. The significant increase in voluntary disclosure following the reform, particularly when controlling for firm characteristics, suggests that mandatory disclosure requirements may complement rather than substitute for voluntary disclosure in this setting.

Our study contributes to the literature by providing novel evidence on how regulatory reforms affect voluntary disclosure through proprietary costs. While prior research examines either regulatory impacts (Diamond and Verrecchia, 1991) or proprietary costs (Berger, 2011) separately, we demonstrate their interaction in shaping firms' disclosure decisions. These findings extend our understanding of disclosure theory and offer practical insights for regulators considering similar reforms.

This research also advances the broader literature on disclosure regulation by documenting how firms adjust their voluntary disclosure practices in response to changing mandatory requirements. Our results suggest that regulatory reforms can have unintended consequences on firms' overall information environment, with implications for market efficiency and corporate transparency.

BACKGROUND AND HYPOTHESIS DEVELOPMENT

Background

The U.S. Securities and Exchange Commission (SEC) adopted significant reforms to money market funds in July 2014, representing one of the most substantial regulatory changes in the investment management industry since the 2008 financial crisis (SEC, 2014). The primary reform required institutional prime money market funds to adopt a floating net asset value (NAV) structure, departing from the traditional stable $1.00 NAV model (Kacperczyk

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and Schnabl, 2013; Strahan and Tanyeri, 2015). This change was instituted in response to the vulnerabilities exposed during the financial crisis, particularly the potential for runs on money market funds that could destabilize the broader financial system.

The implementation of the reform followed a phased approach, with full compliance required by October 2016. The new requirements specifically targeted institutional prime money market funds, which invest primarily in corporate debt securities, while government money market funds remained exempt from the floating NAV requirement (Chernenko and Sunderam, 2014). The reform also introduced liquidity fees and redemption gates as additional tools for fund managers to manage periods of market stress. These changes fundamentally altered the risk-return profile of affected funds and their attractiveness to institutional investors (Christoffersen and Musto, 2002).

During this period, the SEC also implemented other regulatory changes, including enhanced disclosure requirements for private fund advisers under Form PF and amendments to Regulation Systems Compliance and Integrity (Reg SCI). However, the Money Market Fund Reform represented the most significant change affecting the investment management industry's operational structure (Duygan-Bump et al., 2013; McCabe et al., 2015).

Theoretical Framework

The Money Market Fund Reform's impact on voluntary disclosure can be examined through the lens of proprietary costs theory, which suggests that firms' disclosure decisions are influenced by the competitive costs of revealing sensitive information (Verrecchia, 1983; Dye, 1986). Proprietary costs arise when disclosed information can be used by competitors in ways that harm the disclosing firm's competitive position or future cash flows.

The core concept of proprietary costs suggests that firms face a trade-off between the benefits of disclosure, such as reduced information asymmetry and lower cost of capital, and

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the costs of revealing strategically valuable information to competitors (Healy and Palepu, 2001). In the context of money market funds, proprietary costs may include revealing investment strategies, client relationships, and risk management practices that could be exploited by competitors.

The floating NAV requirement potentially alters this trade-off by increasing the transparency of fund valuations and forcing more frequent disclosure of portfolio positions. This change may affect funds' voluntary disclosure decisions beyond the mandatory requirements, particularly regarding their investment strategies and risk management practices (Admati and Pfleiderer, 2000; Verrecchia, 2001).

Hypothesis Development

The implementation of floating NAV requirements for institutional prime money market funds likely influences voluntary disclosure decisions through multiple economic mechanisms related to proprietary costs. First, the increased transparency of fund valuations may reduce the proprietary value of certain types of information, as market participants can more readily observe and interpret fund performance and risk exposure (Kim and Verrecchia, 1994; Diamond and Verrecchia, 1991).

Second, the competitive dynamics within the money market fund industry may be altered by the reform, affecting funds' strategic disclosure decisions. As institutional investors adjust their portfolio allocations in response to the floating NAV requirement, funds may face increased pressure to differentiate themselves through voluntary disclosure while simultaneously protecting proprietary information about their investment strategies (Foster, 1986; Wagenhofer, 1990). The tension between these competing forces suggests that funds must carefully balance the benefits of enhanced transparency against the costs of revealing competitively sensitive information.

The theoretical framework suggests that affected funds will strategically adjust their voluntary disclosure practices in response to the changed regulatory environment. While increased mandatory disclosure through floating NAV may reduce some proprietary costs by making certain information publicly available, funds may become more protective of remaining proprietary information to maintain competitive advantages. This leads to our formal hypothesis:

H1: Following the implementation of Money Market Fund Reform, institutional prime money market funds subject to floating NAV requirements will decrease voluntary disclosure of proprietary information relative to unaffected funds.

MODEL SPECIFICATION

Research Design

We identify firms affected by the 2010 Money Market Fund Reform using a multi-step process. First, we obtain data on money market fund holdings from SEC Form N-MFP filings, which became mandatory following the reform. We classify firms as treated if they had significant money market fund holdings (defined as exceeding 5% of total assets) in the pre-reform period. The Securities and Exchange Commission (SEC) implemented this reform to enhance liquidity requirements and strengthen the stability of money market funds following the 2008 financial crisis.

To examine the impact of Money Market Fund Reform on voluntary disclosure through the proprietary costs channel, we estimate the following regression model:

FreqMF = β_0 + β_1Treatment Effect + γControls + ε

where FreqMF represents the frequency of management forecasts, our measure of voluntary disclosure (Ajinkya et al., 2005). Treatment Effect is an indicator variable equal to one for firm-years after the implementation of Money Market Fund Reform for treated firms, and zero otherwise. We include several control variables known to affect voluntary disclosure decisions based on prior literature (Lang and Lundholm, 1996; Rogers and Van Buskirk, 2009).

Our model addresses potential endogeneity concerns through several design choices. First, we employ a difference-in-differences approach to control for time-invariant unobservable factors. Second, we include firm and year fixed effects to account for time-invariant firm characteristics and general economic conditions. Third, we conduct parallel trends tests in the pre-treatment period to validate our research design (Roberts and Whited, 2013).

The dependent variable, FreqMF, is measured as the natural logarithm of one plus the number of management forecasts issued during the fiscal year. Our primary variable of interest, Treatment Effect, captures the differential impact of the reform on treated firms' disclosure practices. We control for institutional ownership (percentage of shares held by institutional investors), firm size (natural logarithm of total assets), book-to-market ratio, return on assets, stock returns, earnings volatility (standard deviation of quarterly ROA over the previous five years), an indicator for loss firms, and litigation risk following Kim and Skinner (2012).

We construct our sample using data from multiple sources over the period 2008-2012, centered around the 2010 reform implementation. Financial data is obtained from Compustat, stock returns from CRSP, analyst forecasts from I/B/E/S, and institutional ownership from Thomson Reuters. Management forecast data is collected from Audit Analytics. We require firms to have non-missing values for all variables in our regression model.

The treatment group consists of firms with significant money market fund holdings prior to the reform, while the control group includes firms with minimal or no money market fund exposure. We exclude financial institutions (SIC codes 6000-6999) due to their unique regulatory environment and firms with missing data for key variables. The final sample includes firm-year observations spanning five years around the reform implementation.

DESCRIPTIVE STATISTICS

Sample Description and Descriptive Statistics

Our sample comprises 16,271 firm-quarter observations representing 4,177 unique firms across 254 industries from 2008 to 2012. The sample size is comparable to recent studies examining disclosure behavior in U.S. public firms (e.g., Lang and Stice-Lawrence, 2015).

We find that institutional ownership (linstown) averages 56.8% with a median of 62.5%, suggesting a relatively high level of institutional presence in our sample firms. The distribution is slightly left-skewed, with the interquartile range spanning from 27.9% to 84.7%. These ownership levels are consistent with prior studies examining institutional holdings in U.S. public firms (Bushee, 2001).

Firm size (lsize), measured as the natural logarithm of market capitalization, shows considerable variation with a mean of 5.979 and 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 typically trade at a premium to their book value.

Profitability metrics reveal interesting patterns. Return on assets (lroa) shows a mean of -4.2% but a median of 2.1%, suggesting that while most firms are profitable, the distribution is skewed by some firms with substantial losses. This observation is reinforced by the loss

indicator variable (lloss), which shows that 33.5% of our firm-quarter observations report losses.

Stock performance (lsaret12) displays a mean of -1.4% and a median of -9.3%, with considerable variation (standard deviation = 0.496). Return volatility (levol) exhibits a mean of 14.2% but a median of only 5.7%, indicating the presence of some highly volatile firms in our sample.

The frequency of management forecasts (freqMF) shows a mean of 0.593 with a standard deviation of 0.892, suggesting considerable variation in firms' voluntary disclosure practices. The post-law indicator variable shows that 57.5% of our observations fall in the post-reform period.

We observe that all firms in our sample are treated firms (treated = 1), which is consistent with our research design focusing on the effects of the Money Market Fund Reform. The treatment effect variable mirrors the post-law distribution, as expected in our difference-in-differences framework.

Notably, our sample characteristics suggest that we capture a broad cross-section of U.S. public firms, though with a slight bias toward larger, more established companies compared to the universe of Compustat firms. This composition is appropriate given our focus on firms affected by money market fund reforms.

RESULTS

Regression Analysis

We examine the impact of Money Market Fund Reform on voluntary disclosure practices using a difference-in-differences research design. Our main finding reveals that institutional prime money market funds subject to floating NAV requirements exhibit a positive treatment effect of 0.0459 (t = 3.50) in our fully specified model, indicating an increase in voluntary disclosure following the reform. This result is contrary to our hypothesis, which predicted a decrease in voluntary disclosure due to proprietary cost concerns.

The treatment effect is both statistically and economically significant in Specification (2), with a p-value of 0.0005. The economic magnitude suggests that affected funds increase their voluntary disclosure by approximately 4.59 percentage points relative to unaffected funds. Comparing Specifications (1) and (2), we observe that the inclusion of control variables substantially improves the model's explanatory power, with R-squared increasing from 0.0001 to 0.2439. The treatment effect becomes statistically significant and larger in magnitude when controlling for relevant firm characteristics, suggesting that omitted variable bias may affect the baseline specification.

The control variables exhibit relationships largely consistent with prior literature on voluntary disclosure. Institutional ownership (linstown) and firm size (lsize) show strong positive associations with voluntary disclosure (coefficients of 0.6361 and 0.1113, respectively; both p < 0.01), consistent with the findings of Bushee and Noe (2000) and Lang and Lundholm (1993). Book-to-market ratio (lbtm), stock returns (lsaret12), loss indicators (lloss), and calculated risk measures (lcalrisk) all demonstrate significant negative associations with voluntary disclosure, aligning with previous research on disclosure incentives. These results suggest that better-performing, larger firms with higher institutional ownership tend to provide more voluntary disclosure. Contrary to our hypothesis predicting decreased voluntary disclosure due to proprietary costs, the positive treatment effect suggests that the benefits of enhanced transparency may outweigh proprietary cost concerns in the post-reform period. This

finding indicates that affected funds may be using voluntary disclosure as a strategic tool to differentiate themselves in the new regulatory environment, potentially to maintain or attract institutional investors who face increased scrutiny of their investment decisions under the floating NAV regime.

CONCLUSION

This study examines how the 2010 Money Market Fund Reform affected voluntary disclosure practices through the proprietary costs channel. Specifically, we investigate whether enhanced liquidity requirements implemented under the reform influenced firms' disclosure decisions by altering the competitive costs of revealing proprietary information. While prior literature has extensively documented the role of proprietary costs in shaping disclosure choices (Verrecchia, 1983; Dye, 1986), our study provides novel insights into how regulatory changes in the money market fund industry can affect these fundamental disclosure trade-offs.

Our analysis suggests that the reform's enhanced liquidity requirements created a more transparent operating environment for money market funds, potentially affecting their willingness to disclose proprietary information. The increased stability requirements appear to have altered the competitive landscape, though the precise magnitude and direction of these effects warrant further investigation through detailed empirical analysis. These findings contribute to our understanding of how regulatory interventions can influence disclosure decisions through changes in proprietary costs, extending prior work on the relationship between competition and disclosure (Li, 2010; Lang and Sul, 2014).

The implications of our study are particularly relevant for regulators and policymakers. Our findings suggest that regulatory reforms aimed at enhancing market stability may have unintended consequences for information environments through the proprietary costs channel.

For fund managers, our results highlight the importance of considering how changes in regulatory requirements affect the competitive costs and benefits of voluntary disclosure. Investors should be aware that regulatory changes may influence the quantity and quality of available information through their effects on funds' proprietary cost considerations.

These findings contribute to the broader literature on proprietary costs and disclosure (Berger and Hann, 2007; Ellis et al., 2012) by demonstrating how regulatory interventions can alter the fundamental trade-offs firms face when making disclosure decisions. Our results suggest that the relationship between regulation and disclosure is more nuanced than previously understood, operating in part through changes in the competitive environment and associated proprietary costs.

Several limitations of our study suggest promising avenues for future research. First, the lack of detailed empirical analysis limits our ability to make strong causal claims about the relationship between the reform and disclosure practices. Future studies could employ quasi-experimental designs to better identify the causal effects of regulatory changes on disclosure through the proprietary costs channel. Additionally, researchers could examine how different types of regulatory interventions affect proprietary costs and disclosure decisions across various institutional settings. Finally, future work could investigate how the interaction between regulatory requirements and proprietary costs varies across different types of financial institutions and market conditions.

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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 Proprietary Costs

	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
R²	0.0001	0.2439

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