Investment Company Liquidity Risk Management and Voluntary Disclosure

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Abstract: This study examines how the Securities and Exchange Commission's 2017 Investment Company Liquidity Risk Management regulation affects voluntary disclosure decisions through proprietary costs channels. While prior research documents the influence of proprietary costs on disclosure choices, the impact of liquidity risk management requirements on disclosure decisions remains unexplored. Using a difference-in-differences design, we investigate whether enhanced liquidity risk management requirements lead to changes in voluntary disclosure patterns through competitive channels. Our analysis reveals that affected investment companies significantly reduced voluntary disclosure following the regulation's implementation, with treatment effects showing approximately 8.8% reduction in voluntary disclosure relative to the pre-regulation period. This relationship remains robust after controlling for firm characteristics and market conditions. The findings demonstrate that investment companies strategically adjust their voluntary disclosure practices in response to increased proprietary costs from mandatory liquidity risk management requirements. This study contributes to the literature by providing novel evidence on how regulatory changes affect voluntary disclosure through the proprietary costs channel and highlights important spillover effects of risk management regulation on firms' information environment. The results have significant implications for regulators and market participants in understanding the indirect effects of disclosure requirements on firms' voluntary disclosure decisions.

INTRODUCTION

The Securities and Exchange Commission's 2017 Investment Company Liquidity Risk Management regulation represents a significant shift in how investment companies manage and disclose liquidity risk. This regulation requires funds to implement comprehensive liquidity risk management programs, affecting both operational practices and disclosure decisions (Diamond and Verrecchia, 1991; Verrecchia, 2001). The intersection of liquidity risk management and proprietary costs presents a unique setting to examine how regulatory changes influence firms' voluntary disclosure decisions through competitive channels. Prior literature documents that proprietary costs significantly influence firms' disclosure choices, particularly when such disclosures may reveal commercially sensitive information to competitors (Verrecchia, 1983; Dye, 1986).

We examine how the 2017 liquidity risk management requirements affect voluntary disclosure through the proprietary costs channel. While existing research has explored various aspects of disclosure regulation (Leuz and Wysocki, 2016), the impact of liquidity risk management requirements on proprietary cost-driven disclosure decisions remains unexplored. Specifically, we investigate whether enhanced liquidity risk management requirements lead to changes in voluntary disclosure patterns through competitive channels, and how these changes vary with firms' proprietary cost exposure.

The theoretical link between liquidity risk management requirements and voluntary disclosure operates through the proprietary costs channel in several ways. First, detailed liquidity risk management programs may reveal sensitive information about investment strategies and portfolio composition, increasing proprietary costs for investment companies (Verrecchia, 2001). Second, the required disclosure of liquidity classifications and risk management practices may provide competitors with valuable insights into a fund's trading

strategies and risk assessment methodologies (Graham et al., 2005). These mechanisms suggest that increased regulatory requirements around liquidity risk management could lead to strategic adjustments in voluntary disclosure practices.

The proprietary costs literature provides a framework for understanding how firms balance the benefits of disclosure against competitive costs. When proprietary costs are high, firms tend to restrict voluntary disclosure to protect their competitive advantage (Berger and Hann, 2007). The implementation of mandatory liquidity risk management programs potentially increases these proprietary costs by requiring more detailed information about fund operations and risk management practices. This suggests that affected firms may strategically reduce voluntary disclosure to offset the increased proprietary costs imposed by the regulation.

Building on established theoretical frameworks in disclosure theory (Verrecchia, 1983; Dye, 1986), we predict that investment companies subject to the new liquidity risk management requirements will reduce voluntary disclosure to minimize proprietary costs. This prediction is consistent with the notion that firms strategically manage their total information environment, considering both mandatory and voluntary disclosure channels (Beyer et al., 2010).

Our empirical analysis reveals a significant negative relationship between the implementation of liquidity risk management requirements and voluntary disclosure. The baseline specification shows a treatment effect of -0.0844 (t-statistic = -5.56), indicating that affected firms reduced voluntary disclosure following the regulation. This effect remains robust in our full specification with controls (-0.0883, t-statistic = -6.53), suggesting that the relationship is not driven by other firm characteristics or market conditions.

The economic significance of our findings is substantial, with the treatment effect representing approximately 8.8% reduction in voluntary disclosure relative to the pre-regulation period. Control variables demonstrate expected relationships, with institutional ownership (0.3712, t=13.56) and firm size (0.1207, t=25.51) positively associated with disclosure, while book-to-market ratio (-0.1030, t=-10.39) and calendar risk (-0.2833, t=-12.14) show significant negative associations.

These results provide strong evidence that investment companies strategically adjust their voluntary disclosure practices in response to increased proprietary costs from mandatory liquidity risk management requirements. The findings are consistent with theoretical predictions about firms' disclosure choices under proprietary cost constraints and suggest that regulatory requirements can have significant spillover effects on voluntary disclosure decisions.

Our study contributes to the literature by providing novel evidence on how regulatory changes affect voluntary disclosure through the proprietary costs channel. While prior research has examined the direct effects of disclosure regulation (Leuz and Verrecchia, 2000) and proprietary costs (Berger and Hann, 2007), we document how mandatory risk management requirements influence voluntary disclosure decisions through competitive channels. These findings enhance our understanding of the interplay between regulation, proprietary costs, and voluntary disclosure, with important implications for regulators and market participants.

The results extend recent work on disclosure regulation (Christensen et al., 2016) by highlighting an important indirect channel through which regulatory requirements affect firms' information environment. Our findings suggest that policymakers should consider potential spillover effects on voluntary disclosure when designing disclosure regulations, particularly when such regulations may increase proprietary costs for affected firms.

BACKGROUND AND HYPOTHESIS DEVELOPMENT

Background

The Securities and Exchange Commission (SEC) adopted Investment Company Liquidity Risk Management Rules (Rule 22e-4) in October 2017, representing a significant regulatory change in how investment companies manage and disclose liquidity risks (SEC, 2016). This regulation requires registered open-end management investment companies, including mutual funds and exchange-traded funds (ETFs), to establish comprehensive liquidity risk management programs. The primary motivation behind this regulation was to enhance investor protection and reduce systemic risk in the financial markets following the 2008 financial crisis (Goldstein, Jiang, and Ng, 2017; Chen, Goldstein, and Jiang, 2010).

The rule mandates several key requirements, including the classification of fund investments into four liquidity categories, establishment of a minimum percentage of assets in highly liquid investments, and implementation of policies to respond to shortfall events. Large entities (>$1 billion in assets) were required to comply by December 1, 2018, while smaller entities had until June 1, 2019 (SEC, 2016). The regulation also introduces new reporting requirements through Form N-PORT and Form N-LIQUID, requiring funds to regularly disclose their liquidity classifications and any breaches of highly liquid investment minimums (Agarwal, Hanouna, Moussawi, and Stahel, 2018).

This regulatory change occurred alongside other significant securities law adoptions, including the Investment Company Reporting Modernization Rule and amendments to Form ADV and Investment Advisers Act rules. However, the Liquidity Risk Management Rules represented the most substantial change to fund operations and disclosure requirements during this period (Chernenko and Sunderam, 2016; Zeng, 2017).

Theoretical Framework

The Investment Company Liquidity Risk Management Rules intersect with proprietary costs theory through the mandated disclosure of detailed portfolio liquidity information. Proprietary costs arise when firms must reveal commercially sensitive information that could be exploited by competitors, potentially eroding their competitive advantage (Verrecchia, 1983; Dye, 1986). In the context of investment companies, proprietary costs are particularly relevant as detailed liquidity classifications and risk management strategies may reveal valuable trading strategies and portfolio composition information.

The theoretical foundation of proprietary costs suggests that firms face a trade-off between the benefits of voluntary disclosure and the potential competitive disadvantages of revealing proprietary information (Healy and Palepu, 2001). This trade-off becomes more complex when mandatory disclosure requirements already reveal significant proprietary information, potentially affecting firms' voluntary disclosure decisions (Verrecchia, 2001).

Hypothesis Development

The relationship between liquidity risk management regulation and voluntary disclosure through the proprietary costs channel can be analyzed through several economic mechanisms. First, the mandatory disclosure of detailed liquidity classifications may reduce the marginal proprietary costs of voluntary disclosure, as significant portfolio information is already publicly available through regulatory filings (Leuz and Wysocki, 2016). This reduction in marginal proprietary costs could lead to increased voluntary disclosure as the incremental competitive disadvantage of additional disclosures decreases.

However, the opposite effect is also theoretically possible. Investment companies may reduce voluntary disclosures to minimize the total information available to competitors when combined with mandatory disclosures (Verrecchia, 2001). This defensive response could be

particularly pronounced for funds with unique investment strategies or those operating in highly competitive market segments (Brown and Schwarz, 2013). The net effect depends on whether the reduction in marginal proprietary costs outweighs the increased sensitivity to competitive threats from comprehensive disclosure.

Based on the dominance of the first mechanism in prior literature and the reduced marginal proprietary costs following mandatory disclosure requirements, we predict that investment companies will increase their voluntary disclosure following the implementation of liquidity risk management rules. This prediction is consistent with studies showing that mandatory disclosure requirements can complement voluntary disclosure by reducing information asymmetry and proprietary costs (Leuz and Verrecchia, 2000).

H1: Investment companies increase their voluntary disclosure following the implementation of Investment Company Liquidity Risk Management Rules due to reduced marginal proprietary costs.

MODEL SPECIFICATION

Research Design

We identify firms affected by the Investment Company Liquidity Risk Management regulation through their status as registered investment companies under the Securities Exchange Act of 1934. The Securities and Exchange Commission (SEC) implemented this regulation in 2017, requiring investment companies to establish comprehensive liquidity risk management programs. Following prior literature (e.g., Leuz and Verrecchia, 2000; Verrecchia, 2001), we classify firms as treated if they are registered investment companies subject to the new requirements.

To examine the impact of liquidity risk management requirements on voluntary disclosure through the proprietary costs channel, we estimate the following regression model:

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

where FreqMF represents management forecast frequency, Treatment Effect captures the implementation of the liquidity risk management regulation, and Controls represents a vector of control variables known to affect voluntary disclosure decisions. We include firm and year fixed effects to control for time-invariant firm characteristics and temporal trends (Beatty et al., 2019; Christensen et al., 2016).

Our dependent variable, FreqMF, measures the frequency of management forecasts issued during the fiscal year, consistent with prior disclosure literature (Lang and Lundholm, 1996). The Treatment Effect variable is an indicator equal to one for periods following the implementation of the regulation for affected firms, and zero otherwise.

We include several control variables established in prior literature. Institutional Ownership controls for external monitoring (Ajinkya et al., 2005). Firm Size, measured as the natural logarithm of total assets, captures information environment effects (Diamond and Verrecchia, 1991). Book-to-Market ratio controls for growth opportunities and proprietary costs (Verrecchia, 1983). ROA and Stock Return control for firm performance (Miller, 2002). Earnings Volatility captures underlying business uncertainty (Lang and Lundholm, 1993). Loss is an indicator for negative earnings, and Class Action Litigation Risk controls for litigation concerns (Rogers and Van Buskirk, 2009).

Our sample spans from 2015 to 2019, encompassing two years before and after the 2017 regulation implementation. We obtain financial data from Compustat, stock returns from CRSP, analyst forecasts from I/B/E/S, and institutional ownership data from Thomson Reuters.

We require firms to have non-missing values for all variables and continuous listing status throughout the sample period. The treatment group consists of registered investment companies subject to the regulation, while the control group comprises similar financial institutions not subject to the requirements.

To address potential endogeneity concerns, we employ a difference-in-differences design that exploits the exogenous shock of the regulation's implementation. This approach helps isolate the causal effect of the liquidity risk management requirements on voluntary disclosure decisions by controlling for concurrent events and general market trends (Roberts and Whited, 2013).

DESCRIPTIVE STATISTICS

Sample Description and Descriptive Statistics

Our sample comprises 13,630 firm-quarter observations from 3,625 unique firms spanning 2015 to 2019. The firms represent 245 distinct industries, providing broad cross-sectional coverage of the U.S. economy. This sample size is comparable to recent studies examining corporate disclosure practices (e.g., Guay et al., 2016; Bourveau et al., 2020).

We find substantial variation in institutional ownership (linstown) across our sample firms, with a mean (median) of 62.3% (71.8%). The interquartile range of 35.7% to 89.0% suggests considerable heterogeneity in ownership structures. Firm size (lsize) exhibits a mean (median) of 6.641 (6.712), with a standard deviation of 2.166, indicating our sample includes both small and large firms. The book-to-market ratio (lbtm) has a mean of 0.522 and median of 0.414, suggesting our sample firms are generally growth-oriented.

Profitability metrics reveal interesting patterns. The mean return on assets (lroa) is -7.1%, while the median is 1.8%, indicating a leftward skew in profitability distribution. This pattern aligns with the high proportion of loss-making firms (lloss) in our sample, with 35.2% of observations reporting losses. The 12-month size-adjusted returns (lsaret12) show a mean of -1.7% and median of -5.2%, with substantial variation (standard deviation = 44.2%).

Stock return volatility (levol) displays considerable right-skew, with a mean of 16.9% substantially exceeding the median of 5.4%. Calendar-based risk (lcalrisk) shows similar patterns, with a mean of 26.8% exceeding the median of 17.4%. The frequency of management forecasts (freqMF) averages 0.568, with substantial variation (standard deviation = 0.863), suggesting heterogeneous disclosure practices across firms.

The treatment effect variable shows a mean of 0.585, indicating that 58.5% of our observations fall in the post-treatment period. All firms in our sample are treated (treated = 1), consistent with our research design focusing on affected entities.

These descriptive statistics reveal several notable features of our sample. First, the substantial variation in institutional ownership and firm size suggests our results should generalize across different firm types. Second, the profitability metrics indicate our sample includes both financially successful and struggling firms, mitigating concerns about selection bias. Third, the distribution of management forecast frequency aligns with prior literature on voluntary disclosure (e.g., Li and Zhang, 2015), supporting the representativeness of our sample.

RESULTS

Regression Analysis

We find a negative and significant relationship between the implementation of liquidity risk management rules and voluntary disclosure levels. Specifically, the treatment effect indicates that investment companies reduce their voluntary disclosure by approximately 8.44% to 8.83% following the regulatory change. This finding contradicts our initial hypothesis that predicted increased voluntary disclosure due to reduced marginal proprietary costs.

The treatment effect is highly statistically significant across both specifications, with t-statistics of -5.56 and -6.53 ($p < 0.001$) in specifications (1) and (2), respectively. The economic magnitude is substantial, suggesting that the regulatory change materially influences firms' disclosure decisions. The inclusion of control variables in specification (2) improves the model's explanatory power substantially, with R-squared increasing from 0.23% to 22.59%, while the treatment effect remains stable across specifications, indicating robustness of our findings.

The control variables in specification (2) exhibit relationships consistent with prior literature. We find that institutional ownership (0.3712, t=13.56) and firm size (0.1207, t=25.51) are positively associated with voluntary disclosure, aligning with previous research on disclosure determinants. The negative coefficients on book-to-market (-0.1030, t=-10.39) and stock return volatility (-0.0740, t=-5.13) suggest that growth firms and firms with higher risk provide less voluntary disclosure. These findings support the alternative theoretical mechanism proposed in our hypothesis development, where firms strategically reduce voluntary disclosure to minimize total information availability when faced with increased mandatory disclosure requirements. This behavior is consistent with Verrecchia's (2001) arguments about defensive disclosure strategies and suggests that the increased sensitivity to competitive threats dominates any reduction in marginal proprietary costs. Our results indicate that investment companies appear

to view mandatory and voluntary disclosures as substitutes rather than complements in the context of liquidity risk management regulation.

CONCLUSION

This study examines how the 2017 Investment Company Liquidity Risk Management requirements affect voluntary disclosure through the proprietary costs channel. Specifically, we investigate whether enhanced liquidity risk management programs influence investment companies' disclosure decisions by altering the competitive costs of revealing proprietary information. Our analysis contributes to the growing literature on the intersection of regulation, disclosure choices, and proprietary costs in financial markets.

Our investigation reveals that the implementation of mandatory liquidity risk management programs has significant implications for funds' disclosure practices. The regulatory requirements appear to modify the traditional proprietary cost considerations that have historically influenced voluntary disclosure decisions. While prior literature has documented that firms limit voluntary disclosure when proprietary costs are high (Verrecchia, 1983; Dye, 1986), our findings suggest that enhanced liquidity management requirements create new dynamics in this relationship. The structured approach to liquidity risk assessment appears to standardize certain aspects of fund management, potentially reducing the proprietary nature of some information.

The empirical evidence suggests that the regulation's impact operates through multiple channels within the proprietary costs framework. First, the standardization of liquidity risk management practices appears to reduce information asymmetry between funds and their competitors, altering the traditional proprietary cost calculus. Second, the enhanced monitoring and reporting requirements seem to create new incentives for voluntary disclosure, as funds

attempt to signal their compliance and risk management capabilities to stakeholders.

These findings have important implications for regulators and policymakers. The results suggest that mandatory risk management requirements can have unintended consequences on firms' voluntary disclosure practices through their effect on proprietary costs. This interaction should be considered when designing future regulations, particularly those affecting competitive dynamics in the investment management industry. Our findings also contribute to the ongoing debate about the optimal balance between transparency and proprietary information protection in financial markets.

For fund managers, our results highlight the need to reassess disclosure strategies in light of changing regulatory requirements and their impact on proprietary costs. The findings suggest that managers should consider how standardized risk management practices affect the competitive sensitivity of different types of information. This understanding can help optimize disclosure policies to maintain competitive advantages while meeting regulatory requirements and stakeholder expectations.

Our study faces several limitations that future research could address. First, the relatively recent implementation of the liquidity risk management requirements limits our ability to assess long-term effects. Future studies could examine how disclosure practices evolve as funds adapt to the regulatory framework. Second, our analysis focuses primarily on the proprietary costs channel, while other mechanisms may also influence the relationship between risk management requirements and disclosure decisions. Additional research could explore alternative channels, such as agency costs or information processing costs.

Future research could also extend our findings by examining how the interaction between liquidity risk management and proprietary costs varies across different fund types and market conditions. Moreover, researchers could investigate whether similar effects exist in

other regulatory contexts where mandatory risk management requirements intersect with proprietary information concerns. Such studies would further enhance our understanding of how regulations influence the complex relationship between proprietary costs and voluntary disclosure decisions in financial markets.

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Table 1

Descriptive Statistics

Variables	N	Mean	Std. Dev.	P25	Median	P75
FreqMF	13,630	0.5675	0.8632	0.0000	0.0000	1.6094
Treatment Effect	13,630	0.5850	0.4927	0.0000	1.0000	1.0000
Institutional ownership	13,630	0.6230	0.3236	0.3570	0.7179	0.8904
Firm size	13,630	6.6413	2.1663	5.0774	6.7122	8.1551
Book-to-market	13,630	0.5217	0.5791	0.2064	0.4139	0.7156
ROA	13,630	-0.0714	0.2930	-0.0552	0.0175	0.0613
Stock return	13,630	-0.0165	0.4417	-0.2599	-0.0520	0.1494
Earnings volatility	13,630	0.1690	0.3454	0.0230	0.0538	0.1480
Loss	13,630	0.3525	0.4778	0.0000	0.0000	1.0000
Class action litigation risk	13,630	0.2679	0.2524	0.0863	0.1741	0.3628

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

Table 2
Pearson Correlations
InvestmentCompanyLiquidityRiskManagement 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	**-0.05**	**0.05**	0.01	**-0.03**	**-0.05**	-0.01	**0.03**	**0.04**	**0.09**
FreqMF	**-0.05**	1.00	**0.37**	**0.44**	**-0.16**	**0.25**	0.02	**-0.21**	**-0.26**	**-0.10**
Institutional ownership	**0.05**	**0.37**	1.00	**0.64**	**-0.15**	**0.37**	**-0.02**	**-0.30**	**-0.30**	**-0.02**
Firm size	0.01	**0.44**	**0.64**	1.00	**-0.28**	**0.44**	**0.10**	**-0.33**	**-0.45**	**0.02**
Book-to-market	**-0.03**	**-0.16**	**-0.15**	**-0.28**	1.00	**0.09**	**-0.17**	**-0.09**	**0.03**	**-0.04**
ROA	**-0.05**	**0.25**	**0.37**	**0.44**	**0.09**	1.00	**0.18**	**-0.61**	**-0.61**	**-0.26**
Stock return	-0.01	0.02	**-0.02**	**0.10**	**-0.17**	**0.18**	1.00	**-0.06**	**-0.14**	**-0.10**
Earnings volatility	**0.03**	**-0.21**	**-0.30**	**-0.33**	**-0.09**	**-0.61**	**-0.06**	1.00	**0.40**	**0.25**
Loss	**0.04**	**-0.26**	**-0.30**	**-0.45**	**0.03**	**-0.61**	**-0.14**	**0.40**	1.00	**0.29**
Class action litigation risk	**0.09**	**-0.10**	**-0.02**	**0.02**	**-0.04**	**-0.26**	**-0.10**	**0.25**	**0.29**	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 Investment Company Liquidity Risk Management on Management Forecast Frequency

	(1)	(2)
Treatment Effect	-0.0844*** (5.56)	-0.0883*** (6.53)
Institutional ownership		0.3712*** (13.56)
Firm size		0.1207*** (25.51)
Book-to-market		-0.1030*** (10.39)
ROA		0.0468** (2.23)
Stock return		-0.0846*** (6.77)
Earnings volatility		-0.0740*** (5.13)
Loss		-0.0700*** (4.02)
Class action litigation risk		-0.2833*** (12.14)
N	13,630	13,630
R^2	0.0023	0.2259

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