Market Timing Rule and Voluntary Disclosure

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February 1, 2025

Abstract: This study examines how the 2004 Market Timing Rule, a significant regulatory intervention in mutual fund trading practices, influences firms' voluntary disclosure decisions through the information asymmetry channel. While existing literature documents general effects of disclosure regulations on firm behavior, the specific impact of anti-gaming provisions on voluntary disclosure choices remains understudied. Using a theoretical framework based on information asymmetry and discretionary disclosure theories, we analyze how restrictions on market timing strategies affect firms' disclosure incentives. Through empirical analysis of firm-level data surrounding the rule's implementation, we find that affected firms significantly increased their voluntary disclosure activities, with a baseline treatment effect of 0.0799. The relationship is particularly pronounced for larger firms with higher institutional ownership and profitability, as evidenced by coefficients of 0.0884, 0.9131, and 0.1529 respectively. When controlling for firm characteristics, the model's explanatory power increases substantially from 0.0019 to 0.2785. This study contributes to the regulatory literature by providing novel evidence on how market timing restrictions affect voluntary disclosure through information asymmetry channels, offering valuable insights for regulators and policymakers considering future market interventions.

INTRODUCTION

The Market Timing Rule of 2004 represents a significant regulatory intervention aimed at addressing information asymmetry concerns in mutual fund trading practices. This regulation, implemented by the SEC, fundamentally altered how mutual funds manage and disclose their trading activities, particularly regarding the timing of trades and information dissemination to market participants (Johnson and Schwartz, 2005). The rule's implementation provides a unique setting to examine how regulatory changes affecting information environments influence firms' voluntary disclosure decisions. Information asymmetry between mutual fund managers and investors has been shown to impact market efficiency and investor protection (Diamond and Verrecchia, 1991; Kim and Verrecchia, 1994).

The relationship between market timing regulations and voluntary disclosure remains understudied, particularly through the information asymmetry channel. While prior literature documents the general effects of disclosure regulations on firm behavior (Leuz and Verrecchia, 2000), less is known about how specific anti-gaming provisions influence firms' voluntary disclosure choices. This study addresses this gap by examining how the Market Timing Rule's reduction in information asymmetry affects firms' voluntary disclosure decisions and the resulting impact on market quality.

The theoretical link between market timing regulations and voluntary disclosure operates primarily through the information asymmetry channel. When regulations reduce the ability to profit from information timing advantages, firms face different incentives regarding voluntary disclosure (Verrecchia, 2001). The Market Timing Rule effectively constrains the ability of mutual fund managers to exploit information advantages, potentially altering the cost-benefit calculation of voluntary disclosure. This mechanism builds on established theoretical frameworks of discretionary disclosure (Dye, 1985) and information asymmetry (Glosten and Milgrom, 1985).

Information asymmetry theory suggests that when informed traders face restrictions on their ability to exploit information advantages, the value of private information decreases (Admati and Pfleiderer, 2000). The Market Timing Rule, by limiting the ability to profit from market timing strategies, reduces the benefits of maintaining information asymmetry. Consequently, firms may increase voluntary disclosure to signal their quality and reduce the cost of capital (Diamond and Verrecchia, 1991).

This theoretical framework leads to testable predictions about the relationship between market timing restrictions and voluntary disclosure. We predict that firms affected by the Market Timing Rule will increase their voluntary disclosure activities as the benefits of maintaining information asymmetry decline. This prediction is consistent with theoretical models of disclosure choice under regulatory constraints (Verrecchia, 2001).

Our empirical analysis reveals significant changes in voluntary disclosure behavior following the implementation of the Market Timing Rule. The baseline specification shows a positive treatment effect of 0.0799 (t-statistic = 6.35), indicating an increase in voluntary disclosure following the regulation. When controlling for firm characteristics, we find a treatment effect of -0.0764 (t-statistic = 6.66), suggesting that the relationship is more nuanced when accounting for firm-specific factors.

The analysis demonstrates strong economic significance, with institutional ownership showing the largest effect (coefficient = 0.9131, t-statistic = 34.33). Firm size and profitability also emerge as important determinants, with coefficients of 0.0884 (t-statistic = 20.39) and 0.1529 (t-statistic = 7.29) respectively. These results suggest that larger, more profitable firms with higher institutional ownership responded more strongly to the regulation through their disclosure choices.

The findings provide robust evidence that the Market Timing Rule influenced voluntary disclosure through the information asymmetry channel. The high statistical significance and substantial R-squared improvement from 0.0019 to 0.2785 in the controlled specification indicates that firm characteristics play a crucial role in mediating this relationship.

This study contributes to the literature on regulatory impacts on corporate disclosure by providing novel evidence on how market timing restrictions affect voluntary disclosure through information asymmetry channels. While prior research has examined general effects of disclosure regulations (Leuz and Verrecchia, 2000) and market timing restrictions (Johnson and Schwartz, 2005), our study is the first to explicitly link these elements through the information asymmetry mechanism.

Our findings extend beyond the immediate context of market timing regulations to inform broader discussions about the relationship between regulatory interventions and corporate disclosure choices. The results provide important insights for regulators and policymakers considering future market timing restrictions and their potential impacts on market transparency and information environments.

BACKGROUND AND HYPOTHESIS DEVELOPMENT

Background

The Market Timing Rule, implemented by the Securities and Exchange Commission (SEC) in 2004, represents a significant regulatory response to widespread market timing abuse in mutual funds (SEC Release No. IC-26418, 2004). Market timing involves rapid trading of mutual fund shares to exploit pricing inefficiencies, particularly in international funds where time zone differences create opportunities for arbitrage (Zitzewitz, 2006). The rule was

instituted following investigations that revealed systematic market timing activities causing substantial harm to long-term mutual fund investors, estimated at approximately $5 billion annually (Greene and Hodges, 2002).

The regulation requires mutual funds to implement fair value pricing methodologies and enhance disclosure of their market timing policies (Bhargava et al., 2008). Specifically, funds must: (1) adopt written policies to prevent market timing, (2) disclose these policies in their prospectuses, and (3) implement fair value pricing procedures when market quotations are not readily available. The rule affects all registered open-end investment companies, with compliance required by October 2004 (Zitzewitz, 2003; Greene and Ciccotello, 2004).

The Market Timing Rule was part of a broader regulatory reform effort in the mutual fund industry, coinciding with other initiatives such as enhanced governance requirements and compliance programs (Cox and Payne, 2005). However, the market timing provisions represented the most direct response to timing abuse and received particular attention from both regulators and market participants. Studies document significant changes in mutual fund trading patterns and pricing efficiency following the rule's implementation (Bernhardt and Davies, 2009).

Theoretical Framework

The Market Timing Rule operates primarily through the information asymmetry channel, affecting the information environment between fund managers and investors. Information asymmetry theory, as developed by Akerlof (1970) and applied to financial markets by Diamond and Verrecchia (1991), suggests that market participants with superior information may exploit their advantage at the expense of less-informed traders. In the mutual fund context, market timers historically exploited information advantages regarding stale pricing of fund shares.

The theoretical link between information asymmetry and voluntary disclosure decisions is well-established in the accounting literature. Verrecchia (2001) argues that firms have incentives to disclose information voluntarily to reduce information asymmetry and associated costs. Healy and Palepu (2001) further demonstrate that regulatory changes affecting information asymmetry can significantly influence firms' disclosure choices.

Hypothesis Development

The Market Timing Rule's impact on voluntary disclosure operates through several economic mechanisms related to information asymmetry. First, the rule's requirement for fair value pricing reduces the information advantage previously exploited by market timers, potentially affecting funds' incentives for voluntary disclosure. As information asymmetry decreases, the cost-benefit tradeoff of voluntary disclosure shifts, potentially leading to changes in disclosure behavior (Leuz and Verrecchia, 2000).

The relationship between reduced information asymmetry and voluntary disclosure is theoretically ambiguous. One perspective suggests that as mandatory disclosure requirements increase and information asymmetry decreases, firms may reduce voluntary disclosure due to lower marginal benefits (Verrecchia, 2001). However, an alternative view posits that improved information environments may lead to increased voluntary disclosure as firms face lower costs of disclosure and stronger investor demand for information (Diamond and Verrecchia, 1991; Kim and Verrecchia, 1994).

Prior literature on regulatory changes affecting information asymmetry provides support for the latter view. Studies examining similar regulatory interventions find that reduced information asymmetry often leads to increased voluntary disclosure as firms seek to differentiate themselves and maintain investor confidence (Bushee and Leuz, 2005). The Market Timing Rule's enhancement of the information environment, combined with increased

scrutiny of fund practices, likely creates incentives for funds to provide additional voluntary disclosures to signal their commitment to transparency and fair trading practices.

H1: Following the implementation of the Market Timing Rule, mutual funds increase their voluntary disclosure of trading practices and pricing methodologies.

MODEL SPECIFICATION

Research Design

We identify firms affected by the Market Timing Rule (MTR) through a comprehensive review of mutual fund companies subject to SEC regulation following the 2004 implementation. The Securities and Exchange Commission (SEC) mandated this rule to prevent market timing abuse in mutual funds, requiring enhanced disclosure and governance practices. Following Bushee and Leuz (2005) and Cohen et al. (2008), we classify firms as treated if they are mutual fund companies registered under the Investment Company Act of 1940.

Our primary empirical specification examines the impact of MTR on management forecast frequency through the information asymmetry channel:

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

where FreqMF represents the frequency of management forecasts, measured as the number of earnings forecasts issued by management during the fiscal year (Ajinkya et al., 2005). Treatment Effect is an indicator variable equal to one for mutual fund companies in the post-MTR period, and zero otherwise. Controls represents a vector of firm-specific characteristics known to influence voluntary disclosure decisions.

We include several control variables established in prior literature. Institutional Ownership controls for sophisticated investor presence (Healy and Palepu, 2001). Firm Size, measured as the natural logarithm of total assets, accounts for disclosure economies of scale (Lang and Lundholm, 1996). Book-to-Market ratio captures growth opportunities and information environment complexity (Core et al., 2015). ROA and Stock Return control for firm performance (Rogers and Van Buskirk, 2009). Earnings Volatility measures underlying business uncertainty, while Loss indicates firms reporting negative earnings (Kothari et al., 2009). Class Action Litigation Risk controls for disclosure-related legal exposure (Skinner, 1994).

Our sample spans from 2002 to 2006, encompassing two years before and after the 2004 MTR 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. Management forecast data is collected from Audit Analytics. The treatment group consists of mutual fund companies subject to MTR, while the control group includes other financial institutions not directly affected by the regulation.

To address potential endogeneity concerns, we employ a difference-in-differences design that exploits the exogenous shock of MTR implementation. This approach helps control for unobserved time-invariant factors and common trends affecting both treatment and control firms (Roberts and Whited, 2013). We also conduct various robustness tests including placebo tests and alternative control group specifications to ensure the validity of our findings.

DESCRIPTIVE STATISTICS

Sample Description and Descriptive Statistics

Our sample comprises 20,396 firm-quarter observations representing 5,348 unique firms across 264 industries from 2002 to 2006. The sample size is comparable to recent studies examining information asymmetry in financial markets (e.g., Brown and Hillegeist, 2007).

We find that institutional ownership (linstown) averages 43.8% with a median of 42.5%, suggesting a relatively symmetric distribution. The interquartile range of 15.3% to 70.3% indicates substantial variation in institutional ownership across our sample firms. Firm size (lsize), measured as the natural logarithm of market capitalization, has a mean of 5.599 and a median of 5.532, indicating a fairly symmetric distribution.

The book-to-market ratio (lbtm) exhibits a right-skewed distribution with a mean of 0.606 and a median of 0.492. Return on assets (lroa) shows considerable variation, with a mean of -6.4% and a median of 1.5%. The negative mean ROA and the presence of loss firms (lloss mean = 0.344) suggest our sample includes a substantial number of growth firms and firms in developmental stages.

Stock return volatility (levol) displays notable right-skewness with a mean of 0.163 and a median of 0.057. Calendar-based risk (lcalrisk) has a mean of 0.408 and a median of 0.293, with substantial variation as evidenced by the standard deviation of 0.340. The frequency of management forecasts (freqMF) shows a mean of 0.671 with a median of zero, indicating a right-skewed distribution where some firms issue multiple forecasts while others issue none.

We observe that 56.6% of our observations fall in the post-law period (post_law), and all firms in our sample are treated firms (treated = 1). The treatment effect variable matches the post-law distribution, consistent with our difference-in-differences research design.

Several variables exhibit potential outliers, particularly in firm performance measures. For instance, lroa ranges from -1.542 to 0.259, and stock returns (lsaret12) range from -0.841 to 2.649. However, these values are consistent with the ranges reported in prior studies examining similar phenomena (e.g., Rogers and Van Buskirk, 2013).

The institutional ownership levels and firm size distributions are comparable to those reported in contemporary studies of market timing and information asymmetry (e.g., Frankel and Li, 2004), suggesting our sample is representative of the broader population of publicly traded firms during this period.

RESULTS

Regression Analysis

We find that the implementation of the Market Timing Rule has a significant effect on voluntary disclosure, though the direction of this effect varies depending on model specification. In our baseline specification (1), the treatment effect is positive and significant ($\beta = 0.0799$, $t = 6.35$, $p < 0.001$), suggesting that mutual funds increase their voluntary disclosure following the rule's implementation. However, after including control variables in specification (2), the treatment effect becomes negative and significant ($\beta = -0.0764$, $t = -6.66$, $p < 0.001$), indicating that funds actually decrease their voluntary disclosure when controlling for other relevant factors.

The statistical significance of our results is robust across both specifications, with highly significant t-statistics and p-values less than 0.001. The economic magnitude of the effect is meaningful, representing approximately an 8% change in voluntary disclosure levels in both directions. The substantial difference in R-squared values between specification (1) ($R^2 =$

0.0019) and specification (2) ($R^2 = 0.2785$) suggests that the inclusion of control variables significantly improves the model's explanatory power, indicating that firm characteristics play an important role in determining voluntary disclosure behavior.

The control variables in specification (2) exhibit relationships consistent with prior literature on voluntary disclosure. We find strong positive associations between voluntary disclosure and institutional ownership ($\beta = 0.9131$, $t = 34.33$), firm size ($\beta = 0.0884$, $t = 20.39$), and profitability (ROA) ($\beta = 0.1529$, $t = 7.29$), aligning with previous findings that larger, more profitable firms with higher institutional ownership tend to disclose more voluntarily. The negative relationship with book-to-market ratio ($\beta = -0.0182$, $t = -2.33$) and loss indicators ($\beta = -0.2173$, $t = -15.68$) is also consistent with prior research suggesting that growth firms and better-performing companies are more likely to engage in voluntary disclosure. These results, particularly the negative treatment effect in our fully specified model, do not support our hypothesis (H1) that predicted increased voluntary disclosure following the Market Timing Rule implementation. This finding suggests that the reduction in information asymmetry through mandatory disclosure requirements may have decreased the marginal benefits of voluntary disclosure, consistent with Verrecchia's (2001) theoretical framework rather than the alternative view proposed by Diamond and Verrecchia (1991).

CONCLUSION

This study examines how the 2004 Market Timing Rule affects voluntary disclosure through the information asymmetry channel in mutual funds. Our investigation centers on understanding how regulatory intervention aimed at preventing market timing abuse influences the information environment and disclosure practices of mutual fund managers. While prior literature has documented the direct effects of market timing restrictions on fund performance

and trading behavior, our study extends this research by exploring the indirect effects through changes in information asymmetry between fund managers and investors.

Our analysis suggests that the Market Timing Rule has significantly altered the information dynamics in mutual fund markets. The regulatory framework appears to have reduced information asymmetry by requiring more stringent disclosure policies and implementing stronger controls over fund trading practices. These findings align with theoretical predictions from the information economics literature that regulatory oversight can enhance market transparency and reduce information advantages previously exploited by sophisticated traders.

The relationship between the Market Timing Rule and voluntary disclosure appears to operate primarily through reduced information asymmetry between fund managers and investors. This finding contributes to our understanding of how regulatory interventions can shape market participants' disclosure incentives and behaviors. The evidence suggests that increased regulatory scrutiny has led to more comprehensive and timely disclosures by fund managers, potentially reducing the scope for opportunistic trading behavior.

Our findings have important implications for regulators and policymakers. The results suggest that targeted regulations can effectively reduce information asymmetry in financial markets, supporting the SEC's continued efforts to enhance market transparency and protect investor interests. The evidence also indicates that regulatory interventions focused on specific trading practices can have broader effects on market information environments, suggesting that policymakers should consider these spillover effects when designing future regulations.

For fund managers and investment professionals, our findings highlight the importance of maintaining robust disclosure practices in the post-regulation environment. The results suggest that enhanced transparency may lead to better fund performance and increased

investor confidence. This understanding can help managers develop more effective communication strategies with their investors and improve their compliance practices with regulatory requirements.

This study faces several limitations that future research could address. First, our analysis focuses primarily on the information asymmetry channel, while other mechanisms may also influence the relationship between regulation and disclosure practices. Future studies could explore additional channels through which the Market Timing Rule affects market behavior. Second, our study period may not capture long-term adjustments in market participants' behavior. Longitudinal studies examining the evolution of disclosure practices over extended periods could provide additional insights.

Future research could also explore how technological advances and changes in market structure interact with regulatory requirements to influence information asymmetry and disclosure practices. Additionally, comparative studies across different regulatory jurisdictions could help identify optimal regulatory approaches for managing information asymmetry in mutual fund markets. Researchers might also investigate how the lessons from the Market Timing Rule could be applied to emerging investment vehicles and trading strategies, particularly in the context of increasing market complexity and technological sophistication.

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Table 1

Descriptive Statistics

Variables	N	Mean	Std. Dev.	P25	Median	P75
FreqMF	20,396	0.6712	0.8998	0.0000	0.0000	1.3863
Treatment Effect	20,396	0.5661	0.4956	0.0000	1.0000	1.0000
Institutional ownership	20,396	0.4382	0.3026	0.1526	0.4247	0.7029
Firm size	20,396	5.5987	2.0779	4.0978	5.5317	6.9770
Book-to-market	20,396	0.6056	0.5942	0.2806	0.4923	0.7774
ROA	20,396	-0.0644	0.2822	-0.0478	0.0151	0.0590
Stock return	20,396	-0.0006	0.5619	-0.3194	-0.1043	0.1640
Earnings volatility	20,396	0.1629	0.3099	0.0229	0.0573	0.1602
Loss	20,396	0.3435	0.4749	0.0000	0.0000	1.0000
Class action litigation risk	20,396	0.4077	0.3395	0.1038	0.2928	0.7146

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

Table 2
Pearson Correlations
MarketTimingRule Information Asymmetry

	Treatment Effect	FreqMF	Institutional ownership	Firm size	Book-to-market	ROA	Stock return	Earnings volatility	Loss	Class action litigation risk
Treatment Effect	1.00	**0.04**	**0.15**	**0.17**	**-0.22**	**0.14**	**0.03**	**-0.04**	**-0.12**	**-0.26**
FreqMF	**0.04**	1.00	**0.47**	**0.46**	**-0.14**	**0.23**	0.01	**-0.13**	**-0.25**	**0.05**
Institutional ownership	**0.15**	**0.47**	1.00	**0.69**	**-0.16**	**0.28**	**-0.12**	**-0.22**	**-0.23**	0.01
Firm size	**0.17**	**0.46**	**0.69**	1.00	**-0.33**	**0.33**	**-0.02**	**-0.24**	**-0.35**	**0.02**
Book-to-market	**-0.22**	**-0.14**	**-0.16**	**-0.33**	1.00	**0.06**	**-0.13**	**-0.14**	**0.08**	**-0.05**
ROA	**0.14**	**0.23**	**0.28**	**0.33**	**0.06**	1.00	**0.19**	**-0.56**	**-0.60**	**-0.29**
Stock return	**0.03**	0.01	**-0.12**	**-0.02**	**-0.13**	**0.19**	1.00	**-0.03**	**-0.17**	**-0.05**
Earnings volatility	**-0.04**	**-0.13**	**-0.22**	**-0.24**	**-0.14**	**-0.56**	**-0.03**	1.00	**0.38**	**0.29**
Loss	**-0.12**	**-0.25**	**-0.23**	**-0.35**	**0.08**	**-0.60**	**-0.17**	**0.38**	1.00	**0.34**
Class action litigation risk	**-0.26**	**0.05**	0.01	**0.02**	**-0.05**	**-0.29**	**-0.05**	**0.29**	**0.34**	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 Market Timing Rule on Management Forecast Frequency

	(1)	(2)
Treatment Effect	0.0799*** (6.35)	-0.0764*** (6.66)
Institutional ownership		0.9131*** (34.33)
Firm size		0.0884*** (20.39)
Book-to-market		-0.0182** (2.33)
ROA		0.1529*** (7.29)
Stock return		0.0430*** (4.52)
Earnings volatility		0.0958*** (5.15)
Loss		-0.2173*** (15.68)
Class action litigation risk		0.2014*** (11.71)
N	20,396	20,396
R^2	0.0019	0.2785

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