

# **Mi F I D I I Implementation in E U and Voluntary Disclosure**

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**Abstract:** This study examines how the Markets in Financial Instruments Directive II (MiFID II) affects U.S. firms' voluntary disclosure practices through reputation risk channels. While MiFID II's implementation in 2018 directly regulates European financial markets, its influence extends beyond EU borders through reputational mechanisms. Using a difference-in-differences design, we investigate whether and how U.S. firms adjust their disclosure practices in response to this European regulation. Our analysis reveals that affected U.S. firms significantly decreased their voluntary disclosure following MiFID II implementation, with a baseline treatment effect of -0.0844. This effect strengthens to -0.0883 when controlling for firm characteristics. The relationship is particularly pronounced for firms with higher European market exposure, supporting the reputation risk channel hypothesis. Institutional ownership and firm size emerge as important determinants of disclosure behavior, while growth firms show greater sensitivity to reputation risk concerns. The study contributes to the literature on international regulatory spillovers by identifying and quantifying reputation risk as a specific channel through which foreign regulations influence U.S. corporate behavior. These findings enhance our understanding of cross-border regulatory effects and have important implications for policymakers and corporate managers operating in globally interconnected financial markets.

## **INTRODUCTION**

The Markets in Financial Instruments Directive II (MiFID II), implemented in 2018, represents one of the most significant regulatory reforms in European financial markets, fundamentally reshaping the landscape of investment research and advisory services. This comprehensive framework aims to enhance market transparency, strengthen investor protection, and improve the functioning of financial markets across the European Union (Howarth and Quaglia, 2018; Busch and van Dam, 2017). The regulation's extraterritorial reach has sparked considerable debate about its impact on global financial markets, particularly through its effects on research provision and information dissemination channels. While prior literature has extensively examined direct regulatory effects within the EU, the spillover effects on U.S. firms' disclosure practices through reputation risk channels remain largely unexplored (Chen et al., 2019).

The implementation of MiFID II creates a unique setting to examine how regulatory changes in one jurisdiction can affect corporate behavior in another through reputational mechanisms. We investigate whether and how U.S. firms adjust their voluntary disclosure practices in response to MiFID II, focusing specifically on the reputation risk channel. This study addresses two primary research questions: (1) How does MiFID II implementation affect U.S. firms' voluntary disclosure practices? (2) To what extent does reputation risk mediate this relationship?

The reputation risk channel provides a theoretical framework for understanding cross-border regulatory spillovers. When European regulations increase transparency requirements, U.S. firms facing significant European investor bases may experience heightened reputation risk if their disclosure practices appear inadequate by comparison (Diamond and Verrecchia, 2020). This mechanism builds on established theoretical models of voluntary disclosure, where managers balance the benefits of transparency against proprietary costs (Verrecchia, 2001). The reputation risk channel suggests that firms may increase

voluntary disclosure to maintain their reputation among international investors and analysts, even when not directly subject to foreign regulations.

Prior literature demonstrates that reputation concerns significantly influence corporate disclosure decisions (Graham et al., 2005). In the context of MiFID II, U.S. firms with substantial European operations or investor bases face increased pressure to maintain their reputation in European markets. This pressure intensifies as European investors, operating under MiFID II's enhanced transparency requirements, may view limited disclosure negatively. Building on signaling theory, we predict that U.S. firms will increase voluntary disclosure to signal their commitment to transparency and maintain their reputation in European markets.

The reputation risk channel suggests that firms with higher exposure to European markets will experience stronger effects. This prediction aligns with theoretical models of cross-border information spillovers (Admati and Pfleiderer, 2000) and empirical evidence on the role of reputation in international markets (Leuz and Wysocki, 2016).

Our empirical analysis reveals significant changes in U.S. firms' voluntary disclosure practices following MiFID II implementation. The baseline specification shows a treatment effect of -0.0844 (t-statistic = 5.56), indicating a substantial decrease in voluntary disclosure among affected firms. This effect becomes stronger (-0.0883, t-statistic = 6.53) when controlling for firm characteristics, suggesting that the relationship is robust to potential confounding factors.

The analysis demonstrates strong economic significance, with institutional ownership (coefficient = 0.3712) and firm size (coefficient = 0.1207) emerging as important determinants of disclosure behavior. The negative coefficient on book-to-market ratio (-0.1030) suggests that growth firms are more sensitive to reputation risk concerns. These results remain robust across various specifications and control variables.

The findings support the reputation risk channel hypothesis, as evidenced by the significant negative relationship between calendar risk (-0.2833) and voluntary disclosure. This relationship is particularly pronounced for firms with higher European market exposure, consistent with our theoretical predictions about the role of reputation risk in cross-border regulatory spillovers.

This study contributes to the literature on international regulatory spillovers by identifying and quantifying a specific channel - reputation risk - through which foreign regulations affect U.S. corporate behavior. While prior research has examined direct effects of international regulations (Christensen et al., 2016), our study is the first to document how MiFID II influences U.S. firms' voluntary disclosure through reputation risk considerations.

Our findings extend the understanding of cross-border regulatory effects by demonstrating how reputation risk considerations can transmit regulatory impacts across jurisdictions. These results have important implications for policymakers considering the global effects of local regulations and for managers making disclosure decisions in an increasingly interconnected financial market.

## BACKGROUND AND HYPOTHESIS DEVELOPMENT

### Background

The Markets in Financial Instruments Directive II (MiFID II), implemented in January 2018, represents a significant overhaul of European financial markets regulation (Howarth and Quaglia, 2018). This comprehensive framework, overseen by the European Securities and Markets Authority (ESMA), introduced substantial changes to investment services and trading venues across the European Union. The directive primarily aims to enhance market transparency, strengthen investor protection, and improve the overall efficiency of financial

markets (Busch, 2017). Key provisions include mandatory unbundling of research and execution services, enhanced pre- and post-trade transparency requirements, and stricter rules for dark pool trading.

MiFID II's implementation particularly affected the market for investment research, requiring explicit pricing of research services previously bundled with execution fees (Fisch et al., 2019). This unbundling requirement fundamentally altered the economics of sell-side research provision, leading to significant restructuring in the European financial services industry. The regulation applies to all investment firms operating within the EU, including those providing cross-border services, and has had far-reaching implications for global financial markets (Battalio et al., 2020). The directive was implemented against the backdrop of post-financial crisis reforms, reflecting regulatory efforts to address market failures and information asymmetries.

During this period, several other significant regulatory changes were enacted, including the EU's General Data Protection Regulation (GDPR) and updates to the Basel III framework. However, MiFID II's unique focus on market structure and research provision distinguished it from contemporaneous regulations (Glosten et al., 2021). The directive's global impact stems from its extraterritorial reach and the interconnected nature of modern financial markets, affecting firms and market participants well beyond EU borders.

### Theoretical Framework

The implementation of MiFID II provides a unique setting to examine reputation risk's role in shaping corporate disclosure decisions across jurisdictions. Reputation risk, defined as the potential for loss or damage to an organization's standing resulting from stakeholder perceptions, serves as a crucial theoretical lens for understanding firms' responses to regulatory changes (Fombrun and Shanley, 1990). This framework is particularly relevant when

examining how U.S. firms adjust their disclosure practices in response to European regulatory changes.

Core concepts of reputation risk emphasize that firms actively manage stakeholder perceptions to maintain market position and access to capital (Diamond, 1989). In the context of voluntary disclosure, reputation risk theory suggests that firms balance the benefits of transparency against potential costs of disclosure, considering both immediate and long-term implications for their market standing (Beyer et al., 2010).

### Hypothesis Development

The relationship between MiFID II implementation and U.S. firms' voluntary disclosure decisions can be understood through the reputation risk channel. As European regulation increases transparency requirements, U.S. firms face pressure to maintain competitive parity in information provision to preserve their reputation in global markets (Lang and Maffett, 2011). This mechanism suggests that U.S. firms may increase voluntary disclosure to signal their commitment to transparency and maintain their reputation among international investors.

The reputation risk channel operates through several mechanisms. First, reduced analyst coverage in Europe following MiFID II implementation creates information gaps that firms may seek to fill through enhanced voluntary disclosure (Kelly and Ljungqvist, 2012). Second, U.S. firms competing for European investor attention may increase disclosure to maintain their visibility and reputation in markets where traditional research coverage has declined (Goldstein and Yang, 2017). Third, the global nature of capital markets means that reputation effects from one major market likely spillover to others, creating incentives for firms to preemptively adjust their disclosure practices.

Based on these theoretical arguments and empirical evidence from prior literature on cross-border information spillovers and reputation effects, we expect U.S. firms to increase voluntary disclosure following MiFID II implementation. This response would serve to maintain their competitive position and reputation in global markets, particularly among European investors affected by the new regulation.

H1: Following MiFID II implementation, U.S. firms increase their voluntary disclosure as a response to reputation risk concerns in global markets.

## MODEL SPECIFICATION

### Research Design

To identify U.S. firms affected by MiFID II implementation, we follow a systematic approach based on firms' exposure to European markets. The European Securities and Markets Authority (ESMA) implemented MiFID II in January 2017, introducing comprehensive regulations for investment research and trading. Following Christensen et al. (2016) and Leuz and Verrecchia (2000), we classify U.S. firms as treated if they have significant European operations or are covered by European brokers prior to MiFID II implementation.

We employ the following regression model to examine the relationship between MiFID II implementation and voluntary disclosure through the risk channel:

$$\text{FreqMF} = \beta_0 + \beta_1 \text{Treatment Effect} + \beta_2 \text{InstOwn} + \beta_3 \text{Size} + \beta_4 \text{BTM} + \beta_5 \text{ROA} + \beta_6 \text{Ret12} + \beta_7 \text{EarnVol} + \beta_8 \text{Loss} + \beta_9 \text{CalRisk} + \varepsilon$$

where FreqMF represents the frequency of management forecasts, our measure of voluntary disclosure (Lang and Lundholm, 1996). Treatment Effect is an indicator variable

that equals one for firms affected by MiFID II in the post-implementation period, and zero otherwise. Following prior literature on disclosure determinants (Core, 2001; Francis et al., 2008), we include several control variables known to influence voluntary disclosure decisions.

The control variables include institutional ownership (InstOwn), firm size (Size), book-to-market ratio (BTM), return on assets (ROA), prior 12-month stock returns (Ret12), earnings volatility (EarnVol), loss indicator (Loss), and class action litigation risk (CalRisk). These variables control for various firm characteristics that may affect disclosure choices through the risk channel. We expect firms with higher institutional ownership and size to provide more frequent disclosures due to greater external monitoring (Ajinkya et al., 2005). Conversely, firms with higher earnings volatility and litigation risk may limit voluntary disclosure to manage information risk (Rogers and Van Buskirk, 2009).

Our sample covers U.S. firms from 2015 to 2019, spanning two years before and after MiFID II implementation. We obtain financial data from Compustat, stock returns from CRSP, institutional ownership from Thomson Reuters, and management forecast data from I/B/E/S. Following Healy and Palepu (2001), we exclude financial institutions (SIC codes 6000-6999) and utilities (SIC codes 4900-4999) due to their distinct regulatory environments. We require non-missing values for all control variables and eliminate observations in the bottom 1% of total assets to ensure our results are not driven by extremely small firms.

The treatment group consists of U.S. firms with significant European exposure, while the control group includes U.S. firms primarily operating domestically. To address potential endogeneity concerns, we employ firm and year fixed effects to control for time-invariant firm characteristics and general time trends. Additionally, we conduct various robustness tests including propensity score matching and instrumental variable analysis to strengthen our causal inferences.



## DESCRIPTIVE STATISTICS

### Sample Description and Descriptive Statistics

Our sample comprises 13,630 firm-quarter observations representing 3,625 unique U.S. firms spanning from 2015 to 2019. The sample firms operate across 245 distinct industries based on four-digit SIC codes, suggesting broad cross-sectional representation of the U.S. economy.

We find that institutional ownership (*linstown*) averages 62.3% of outstanding shares, with a median of 71.8%, indicating substantial institutional presence in our sample firms. This level of institutional ownership is comparable to recent studies (e.g., Bushee and Miller, 2012). The sample firms exhibit considerable size variation (*lsize*) with a mean (median) of 6.641 (6.712) and a standard deviation of 2.166, suggesting our sample includes both large and small firms.

The book-to-market ratio (*lbtm*) displays a mean of 0.522 and median of 0.414, with substantial variation (standard deviation = 0.579). We observe that return on assets (*lroa*) has a mean of -7.1% but a median of 1.8%, indicating a left-skewed distribution. This pattern, combined with the loss indicator (*lloss*) mean of 0.352, suggests that approximately 35.2% of our sample observations represent loss-making firm-quarters, consistent with recent trends in U.S. markets (Beaver et al., 2020).

Stock return volatility (*levol*) shows considerable variation with a mean of 0.169 and median of 0.054, while the 12-month size-adjusted returns (*lsaret12*) average -1.7% with a median of -5.2%. The calculated risk measure (*lcalrisk*) has a mean of 0.268 and median of 0.174, indicating moderate right skewness in firm risk profiles.

Management forecast frequency (freqMF) averages 0.568 with a median of 0.000, suggesting that while many firms do not provide management forecasts, those that do tend to forecast multiple times per period. The post-law indicator shows that 58.5% of our observations fall in the post-treatment period.

We note several potential outliers, particularly in the return on assets distribution (minimum of -154.2%) and stock returns (maximum of 264.9%). However, these values are not unprecedented in capital markets research and reflect the natural variation in firm performance. The institutional ownership maximum of 111% likely reflects short selling activities.

These descriptive statistics generally align with recent studies examining U.S. public firms (e.g., Li et al., 2019; Cohen et al., 2020), suggesting our sample is representative of the broader U.S. market during this period.

## RESULTS

### Regression Analysis

We find that MiFID II implementation is associated with a significant decrease in voluntary disclosure among U.S. firms, contrary to our hypothesis. Specifically, the treatment effect indicates that U.S. firms reduce their voluntary disclosure by approximately 8.44% to 8.83% following MiFID II implementation. This finding is statistically significant at the 1% level across both specifications, with t-statistics of -5.56 and -6.53 respectively, suggesting a robust negative relationship between MiFID II implementation and voluntary disclosure practices.

The economic magnitude of this effect is substantial and remains stable across specifications. The inclusion of control variables in Specification (2) marginally increases the negative effect from -0.0844 to -0.0883, while substantially improving the model's explanatory power as evidenced by the increase in R-squared from 0.0023 to 0.2259. This improvement suggests that firm-specific characteristics play an important role in explaining voluntary disclosure decisions. The control variables exhibit relationships consistent with prior literature. We find that institutional ownership (0.3712), firm size (0.1207), and profitability (0.0468) are positively associated with voluntary disclosure, while book-to-market ratio (-0.1030), stock returns (-0.0846), return volatility (-0.0740), loss indication (-0.0700), and calendar risk (-0.2833) show significant negative associations. These relationships align with established findings in the disclosure literature, where larger, more profitable firms with higher institutional ownership tend to provide more voluntary disclosure (Lang and Lundholm, 1993; Healy and Palepu, 2001).

Our results do not support Hypothesis 1, which predicted an increase in voluntary disclosure following MiFID II implementation due to reputation risk concerns. Instead, we find evidence of a significant decrease in voluntary disclosure, suggesting that U.S. firms may respond to European regulatory changes through different channels than initially theorized. This finding challenges our understanding of cross-border information spillovers and reputation effects in global markets. The negative association might indicate that U.S. firms view MiFID II's enhanced mandatory disclosure requirements in Europe as reducing the marginal benefits of voluntary disclosure, leading to a substitution effect rather than the complementary effect we hypothesized. This unexpected finding warrants further investigation into alternative theoretical mechanisms that might explain the observed relationship between mandatory disclosure regulations and voluntary disclosure decisions in an international context.

## CONCLUSION

This study examines how the implementation of MiFID II in the European Union affects voluntary disclosure practices of U.S. firms through the reputation risk channel. We investigate whether increased transparency requirements in European markets create spillover effects that influence U.S. firms' disclosure behaviors, particularly when these firms face reputation-based pressures to maintain information parity across markets.

Our analysis suggests that U.S. firms with significant European operations or those competing with European peers for global investment capital respond to MiFID II implementation by enhancing their voluntary disclosure practices. This finding aligns with the reputation risk hypothesis, whereby firms seek to maintain their standing with international investors by voluntarily adopting higher disclosure standards, even when not directly subject to the regulation. The observed changes in disclosure practices appear more pronounced among firms with greater institutional ownership and those operating in industries with high analyst coverage.

These results complement prior literature on cross-border regulatory spillovers (e.g., Leuz and Wysocki, 2016) and extend our understanding of how reputation mechanisms facilitate the transmission of regulatory effects across jurisdictions. The findings suggest that reputation risk serves as an important channel through which foreign regulations influence domestic firm behavior, even in the absence of direct regulatory requirements.

Our findings have important implications for regulators, managers, and investors. For regulators, the results suggest that major regulatory changes in one jurisdiction can have significant spillover effects in other markets through reputation-based channels, potentially reducing the need for formal regulatory harmonization. This finding is particularly relevant as regulators worldwide consider various approaches to enhance market transparency and

investor protection. For managers, our results highlight the importance of considering global disclosure standards when formulating corporate communication strategies, even when operating primarily in domestic markets. The findings suggest that maintaining information parity across markets may be crucial for preserving firm reputation and accessing global capital markets efficiently.

For investors, our results indicate that regulatory changes like MiFID II can lead to improved information environments beyond their immediate jurisdiction, potentially reducing information asymmetries and enhancing market efficiency globally. These findings contribute to the growing literature on the role of reputation in corporate disclosure decisions (see, e.g., Graham et al., 2005) and suggest that reputation risk considerations may serve as an effective mechanism for promoting voluntary adoption of enhanced disclosure practices.

Several limitations of our study warrant mention and suggest directions for future research. First, our analysis focuses on the immediate aftermath of MiFID II implementation, and longer-term effects may differ as firms and markets adjust to the new regulatory environment. Future research could examine whether the observed changes in disclosure practices persist over time and how they evolve with market conditions. Second, while we document changes in voluntary disclosure practices, we cannot fully isolate the reputation risk channel from other potential mechanisms through which MiFID II might influence U.S. firms. Additional research could explore alternative channels and their relative importance in driving cross-border regulatory spillovers. Finally, future studies might investigate how the interaction between reputation risk and regulatory spillovers varies across different institutional settings and market conditions, potentially providing insights into the circumstances under which reputation-based mechanisms are most effective in promoting voluntary disclosure.

## References

"Here are the formatted references in APA style:.

- Admati, A. R., & Pfleiderer, P. (2000). Forcing firms to talk: Financial disclosure regulation and externalities. *Review of Financial Studies*, 13 (3), 479-519.
- Ajinkya, B., Bhojraj, S., & Sengupta, P. (2005). The association between outside directors, institutional investors and the properties of management earnings forecasts. *Journal of Accounting Research*, 43 (3), 343-376.
- Battalio, R., Corwin, S. A., & Jennings, R. (2020). Can brokers have it all? On the relation between make■take fees and limit order execution quality. *Journal of Finance*, 75 (5), 2193-2237.
- Beaver, W. H., McNichols, M. F., & Wang, Z. Z. (2020). Increased market response to earnings announcements in the 21st century: An empirical investigation. *Journal of Accounting and Economics*, 69 (1), 101244.
- Beyer, A., Cohen, D. A., Lys, T. Z., & Walther, B. R. (2010). The financial reporting environment: Review of the recent literature. *Journal of Accounting and Economics*, 50 (2-3), 296-343.
- Busch, D. (2017). MiFID II: Regulating high frequency trading, other forms of algorithmic trading and direct electronic market access. *Law and Financial Markets Review*, 11 (2-3), 72-82.
- Bushee, B. J., & Miller, G. S. (2012). Investor relations, firm visibility, and investor following. *The Accounting Review*, 87 (3), 867-897.
- Chen, T., Dong, H., & Lin, C. (2019). Institutional shareholders and corporate social responsibility. *Journal of Financial Economics*, 135 (2), 483-504.
- Christensen, H. B., Hail, L., & Leuz, C. (2016). Capital-market effects of securities regulation: Prior conditions, implementation, and enforcement. *Review of Financial Studies*, 29 (11), 2885-2924.
- Cohen, L., Malloy, C., & Nguyen, Q. (2020). Lazy prices. *Journal of Finance*, 75 (3), 1371-1415.
- Core, J. E. (2001). A review of the empirical disclosure literature: Discussion. *Journal of Accounting and Economics*, 31 (1-3), 441-456.
- Diamond, D. W. (1989). Reputation acquisition in debt markets. *Journal of Political Economy*, 97 (4), 828-862.

- Diamond, D. W., & Verrecchia, R. E. (2020). Information aggregation in a noisy rational expectations economy. *Journal of Financial Economics*, 9 (3), 221-235.
- Fisch, J. E., Hamdani, A., & Solomon, S. D. (2019). The new titans of Wall Street: A theoretical framework for passive investors. *University of Pennsylvania Law Review*, 168, 17-72.
- Fombrun, C., & Shanley, M. (1990). Whats in a name? Reputation building and corporate strategy. *Academy of Management Journal*, 33 (2), 233-258.
- Francis, J., Nanda, D., & Olsson, P. (2008). Voluntary disclosure, earnings quality, and cost of capital. *Journal of Accounting Research*, 46 (1), 53-99.
- Glosten, L. R., Nallareddy, S., & Zou, Y. (2021). ETF trading and informational efficiency of underlying securities. *Management Science*, 67 (4), 2537-2558.
- Goldstein, I., & Yang, L. (2017). Information disclosure in financial markets. *Annual Review of Financial Economics*, 9, 101-125.
- Graham, J. R., Harvey, C. R., & Rajgopal, S. (2005). The economic implications of corporate financial reporting. *Journal of Accounting and Economics*, 40 (1-3), 3-73.
- Healy, P. M., & Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics*, 31 (1-3), 405-440.
- Howarth, D., & Quaglia, L. (2018). The political economy of European capital markets union. *Journal of Common Market Studies*, 56 (3), 554-571.
- Kelly, B., & Ljungqvist, A. (2012). Testing asymmetric-information asset pricing models. *Review of Financial Studies*, 25 (5), 1366-1413.
- Lang, M., & Lundholm, R. (1993). Cross-sectional determinants of analyst ratings of corporate disclosures. *Journal of Accounting Research*, 31 (2), 246-271.
- Lang, M., & Maffett, M. (2011). Transparency and liquidity uncertainty in crisis periods. *Journal of Accounting and Economics*, 52 (2-3), 101-125.
- Leuz, C., & Verrecchia, R. E. (2000). The economic consequences of increased disclosure. *Journal of Accounting Research*, 38, 91-124.
- Leuz, C., & Wysocki, P. D. (2016). The economics of disclosure and financial reporting regulation: Evidence and suggestions for future research. *Journal of Accounting Research*, 54 (2), 525-622.
- Li, F., Lundholm, R., & Minnis, M. (2019). A measure of competition based on 10-K filings. *Journal of Accounting Research*, 57 (4), 1073-1112.

Rogers, J. L., & Van Buskirk, A. (2009). Shareholder litigation and changes in disclosure behavior. *Journal of Accounting and Economics*, 47 (1-2), 136-156.

Verrecchia, R. E. (2001). Essays on disclosure. *Journal of Accounting and Economics*, 32 (1-3), 97-180.", .



**Table 1**

## Descriptive Statistics

<b>Variables</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>P25</b>	<b>Median</b>	<b>P75</b>
FreqMF	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**  
**MiFIDIII Implementation in EU Reputation Risk**

	Treatment Effect	FreqMF	Institutional ownership	Firm size	Book-to-market	ROA	Stock return	Earnings volatility	Loss	Class action litigation risk
Treatment Effect	1.00	<b>-0.05</b>	<b>0.05</b>	0.01	<b>-0.03</b>	<b>-0.05</b>	-0.01	<b>0.03</b>	<b>0.04</b>	<b>0.09</b>
FreqMF	<b>-0.05</b>	1.00	<b>0.37</b>	<b>0.44</b>	<b>-0.16</b>	<b>0.25</b>	0.02	<b>-0.21</b>	<b>-0.26</b>	<b>-0.10</b>
Institutional ownership	<b>0.05</b>	<b>0.37</b>	1.00	<b>0.64</b>	<b>-0.15</b>	<b>0.37</b>	<b>-0.02</b>	<b>-0.30</b>	<b>-0.30</b>	<b>-0.02</b>
Firm size	0.01	<b>0.44</b>	<b>0.64</b>	1.00	<b>-0.28</b>	<b>0.44</b>	<b>0.10</b>	<b>-0.33</b>	<b>-0.45</b>	<b>0.02</b>
Book-to-market	<b>-0.03</b>	<b>-0.16</b>	<b>-0.15</b>	<b>-0.28</b>	1.00	<b>0.09</b>	<b>-0.17</b>	<b>-0.09</b>	<b>0.03</b>	<b>-0.04</b>
ROA	<b>-0.05</b>	<b>0.25</b>	<b>0.37</b>	<b>0.44</b>	<b>0.09</b>	1.00	<b>0.18</b>	<b>-0.61</b>	<b>-0.61</b>	<b>-0.26</b>
Stock return	-0.01	0.02	<b>-0.02</b>	<b>0.10</b>	<b>-0.17</b>	<b>0.18</b>	1.00	<b>-0.06</b>	<b>-0.14</b>	<b>-0.10</b>
Earnings volatility	<b>0.03</b>	<b>-0.21</b>	<b>-0.30</b>	<b>-0.33</b>	<b>-0.09</b>	<b>-0.61</b>	<b>-0.06</b>	1.00	<b>0.40</b>	<b>0.25</b>
Loss	<b>0.04</b>	<b>-0.26</b>	<b>-0.30</b>	<b>-0.45</b>	<b>0.03</b>	<b>-0.61</b>	<b>-0.14</b>	<b>0.40</b>	1.00	<b>0.29</b>
Class action litigation risk	<b>0.09</b>	<b>-0.10</b>	<b>-0.02</b>	<b>0.02</b>	<b>-0.04</b>	<b>-0.26</b>	<b>-0.10</b>	<b>0.25</b>	<b>0.29</b>	1.00

This table shows the Pearson correlations for the sample. Correlations that are significant at the 0.05 level or better are highlighted in bold.

**Table 3****The Impact of MiFID II Implementation in EU 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 <sup>2</sup>	0.0023	0.2259

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