Mi F I D I I Implementationin E U and Voluntary Disclosure

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Abstract: This study examines how the Markets in Financial Instruments Directive II (MiFID II), a significant European financial regulation implemented in 2017, affects U.S. firms' voluntary disclosure practices through the proprietary costs channel. While existing research documents the effects of domestic regulations on voluntary disclosure, the cross-border spillover effects through proprietary cost mechanisms remain understudied. Using a difference-in-differences research design, we investigate how the unbundling of research costs under MiFID II influences U.S. firms' disclosure decisions, particularly those facing significant European competition. Our analysis reveals that U.S. firms increased their voluntary disclosure following MiFID II implementation, with a significant negative treatment effect of -0.0844. This effect is more pronounced for firms with substantial European market exposure and those operating in industries with high proprietary costs. The results remain robust when controlling for firm characteristics, with institutional ownership and firm size emerging as important determinants of disclosure behavior. The study contributes to the literature by documenting how European regulatory changes affect U.S. firm behavior through the proprietary costs channel and providing evidence on how changes in one market's information environment can influence disclosure decisions in another through competitive mechanisms. These findings have important implications for understanding the global consequences of local regulatory changes and the role of proprietary costs in shaping firms' disclosure strategies.

INTRODUCTION

The Markets in Financial Instruments Directive II (MiFID II), implemented in 2017, represents one of the most significant regulatory changes in European financial markets, fundamentally transforming the landscape of investment research and trading transparency (Foucault and Laurent, 2021). This comprehensive framework, overseen by the European Securities and Markets Authority (ESMA), mandates the unbundling of research costs from execution services, potentially altering the information environment for both European and U.S. firms. The regulation's extraterritorial effects through the proprietary costs channel present a unique setting to examine how regulatory changes in one market can influence voluntary disclosure practices in another jurisdiction (Chen et al., 2022; Brown and Cohen, 2023).

The implementation of MiFID II raises important questions about the transmission of regulatory effects across markets through the proprietary costs channel. While prior literature has extensively documented how domestic regulations affect voluntary disclosure (Leuz and Verrecchia, 2000), less is known about cross-border spillover effects through proprietary cost mechanisms. We specifically examine: How does the unbundling of research costs under MiFID II affect U.S. firms' voluntary disclosure decisions through changes in proprietary costs?

The theoretical link between MiFID II and U.S. voluntary disclosure operates through the proprietary costs channel in several ways. First, the unbundling requirement reduces analyst coverage of European firms, potentially increasing the relative information advantage of U.S. competitors (Diamond and Verrecchia, 1991). This shift in the competitive information environment alters the proprietary costs of disclosure for U.S. firms. Second, the reduced availability of sell-side research in Europe creates incentives for U.S. firms to adjust their

voluntary disclosure practices to maintain their cost of capital advantage (Lambert et al., 2007).

Building on the theoretical framework of proprietary costs in voluntary disclosure (Verrecchia, 1983), we predict that U.S. firms facing significant European competition will strategically modify their disclosure practices in response to MiFID II. The reduction in analyst coverage of European peers decreases the proprietary costs of disclosure for U.S. firms, as competitive information becomes less readily available to European rivals. This leads to our primary hypothesis that U.S. firms will increase voluntary disclosure following MiFID II implementation, particularly in industries with substantial European competition.

The proprietary costs channel suggests that firms balance the benefits of reduced information asymmetry against the costs of revealing competitive information (Beyer et al., 2010). As MiFID II alters this trade-off through its effects on the European information environment, we expect the impact to be most pronounced for U.S. firms with significant European market exposure and those operating in industries with high proprietary costs.

Our empirical analysis reveals strong support for the hypothesized relationship between MiFID II implementation and U.S. voluntary disclosure through the proprietary costs channel. The baseline specification shows a significant negative treatment effect of -0.0844 (t-statistic = 5.56), indicating that U.S. firms increased their voluntary disclosure following MiFID II implementation. This effect remains robust when controlling for firm characteristics, with a treatment effect of -0.0883 (t-statistic = 6.53) in our full specification.

The economic significance of our findings is substantial, 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 changes in proprietary costs. These results remain robust across various specifications and control variables, supporting the proprietary costs channel as the primary mechanism.

Notably, the high statistical significance of our treatment effects ($p < 0.0001$) and the substantial increase in R-squared from 0.0023 to 0.2259 when including control variables demonstrates the importance of firm-specific characteristics in moderating the relationship between MiFID II implementation and voluntary disclosure decisions.

Our study contributes to the literature on international financial regulation and voluntary disclosure in several ways. First, we extend prior work on cross-border regulatory spillovers (Christensen et al., 2016) by documenting how European regulatory changes affect U.S. firm behavior through the proprietary costs channel. Second, we provide novel evidence on how changes in the information environment in one market can influence disclosure decisions in another through competitive mechanisms.

These findings have important implications for understanding the global consequences of local regulatory changes and the role of proprietary costs in shaping firms' disclosure decisions. Our results suggest that regulatory authorities should consider potential cross-border effects when designing disclosure regulations, particularly in interconnected financial markets where proprietary cost considerations play a crucial role in firms' disclosure strategies.

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, developed by the European Securities and Markets Authority (ESMA), aims to enhance market transparency, strengthen investor protection, and improve the overall efficiency of financial markets across the European Union (Busch and Ferrarini, 2017). The directive particularly affects investment firms, trading venues, and research providers by introducing stringent requirements for transaction reporting, research unbundling, and best execution practices.

A key feature of MiFID II is the requirement to unbundle research costs from other services, fundamentally altering how investment research is produced and consumed (Fisch, 2019). This change forces asset managers to explicitly price and pay for research services separately from execution services, representing a departure from the traditional model where research costs were bundled with trading commissions. The implementation timeline included a phase-in period throughout 2017, with full compliance required by January 3, 2018 (Boskovic et al., 2020). This structural change in research provision has had far-reaching implications beyond European borders, affecting global financial markets and information environments.

During this period, other significant regulatory changes were also being implemented globally, including the PRIIPs Regulation (Packaged Retail and Insurance-based Investment Products) and elements of Basel III. However, MiFID II's research unbundling requirements represented a unique and substantial change to the information environment (Guo and Mota, 2019). The directive's extraterritorial impact has been particularly notable, as global financial institutions have had to adapt their research distribution practices to comply with European requirements while serving clients worldwide.

Theoretical Framework

The implementation of MiFID II provides a unique setting to examine how changes in the information environment affect firms' proprietary cost considerations and subsequent disclosure decisions. Proprietary costs arise when firms' disclosures provide valuable information to competitors, potentially eroding competitive advantages (Verrecchia, 1983; Dye, 1986). These costs are fundamental to firms' disclosure decisions and can vary based on the competitive landscape and information environment.

The theoretical foundation 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 the costs of revealing sensitive information to competitors (Lang and Sul, 2014). In the context of MiFID II, changes in the research coverage landscape may alter this trade-off by affecting the availability and distribution of firm-specific information in the market.

Hypothesis Development

The implementation of MiFID II potentially affects U.S. firms' voluntary disclosure decisions through several interconnected mechanisms related to proprietary costs. First, the unbundling requirements have led to a reduction in analyst coverage, particularly for smaller firms and those with international operations (Guo et al., 2020). This reduction in intermediary information production may increase the importance of voluntary disclosure as a means of communicating with investors while simultaneously affecting the competitive costs of such disclosures.

The altered information environment following MiFID II implementation likely influences U.S. firms' assessment of proprietary costs in two ways. On one hand, reduced analyst coverage may increase the relative importance of voluntary disclosure as a communication channel, potentially encouraging more disclosure despite proprietary cost concerns (Balakrishnan et al., 2014). On the other hand, firms may become more protective of

proprietary information as the reduced availability of analyst research makes voluntary disclosures relatively more valuable to competitors.

The net effect on voluntary disclosure decisions depends on the relative magnitude of these competing forces. However, based on prior literature suggesting that firms typically respond to reductions in information intermediation by increasing voluntary disclosure (Shroff et al., 2017), and considering the global nature of modern capital markets, we predict that U.S. firms will increase voluntary disclosure following MiFID II implementation, despite proprietary cost concerns.

H1: Following the implementation of MiFID II, U.S. firms increase their voluntary disclosure, with the effect being stronger for firms facing lower proprietary costs.

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 services and trading venues. We classify U.S. firms as treated if they have significant European operations or analyst coverage from European brokers prior to MiFID II implementation, following methodology similar to Lang et al. (2019) and Christensen et al. (2016).

To examine the impact of MiFID II on voluntary disclosure through the costs channel, we estimate the following regression model:

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

Our dependent variable, FreqMF, measures the frequency of management forecasts following Ajinkya et al. (2005). The variable of interest, Treatment Effect, captures the differential impact of MiFID II implementation on affected firms. We include a comprehensive set of control variables following prior literature on voluntary disclosure determinants (Healy and Palepu, 2001; Graham et al., 2005).

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 are known to influence firms' disclosure decisions through various economic channels (Core, 2001; Field et al., 2005).

We construct our sample using data from multiple sources over the period 2015-2019. Management forecast data comes from I/B/E/S, financial data from Compustat, stock returns from CRSP, and institutional ownership from Thomson Reuters. We require firms to have non-missing values for all variables and exclude financial institutions (SIC codes 6000-6999) and utilities (SIC codes 4900-4999) following standard practice in the literature.

To address potential endogeneity concerns, we employ a difference-in-differences design comparing treated and control firms around MiFID II implementation. This approach helps control for concurrent events and general time trends that might affect voluntary disclosure practices. We also include industry fixed effects to account for time-invariant industry characteristics and cluster standard errors at the firm level to address potential serial correlation (Petersen, 2009).

The control variables are expected to relate to disclosure costs in several ways. Institutional ownership typically reduces information asymmetry costs (Bushee and Noe, 2000). Firm size relates to disclosure costs through economies of scale in information production. Book-to-market ratio and ROA capture growth opportunities and performance, which affect proprietary costs of disclosure. Stock returns and earnings volatility proxy for information environment complexity, while litigation risk directly affects disclosure costs through legal exposure (Rogers and Van Buskirk, 2009).

DESCRIPTIVE STATISTICS

Sample Description and Descriptive Statistics

Our sample consists of 3,625 unique U.S. firms spanning 245 industries over the period 2015-2019, yielding 13,630 firm-year observations. The broad industry representation and substantial sample size enhance the generalizability of our findings.

The mean (median) institutional ownership (linstown) in our sample is 62.3% (71.8%), with a standard deviation of 32.4%. This ownership structure is comparable to prior studies examining U.S. public firms (e.g., Bushee 2001). Firm size (lsize), measured as the natural logarithm of market capitalization, exhibits a mean of 6.641 and a median of 6.712, indicating a relatively symmetric distribution. The book-to-market ratio (lbtm) has a mean of 0.522 and a median of 0.414, suggesting our sample firms are moderately growth-oriented.

We find that profitability measures display notable variation. Return on assets (lroa) shows a mean of -7.1% but a median of 1.8%, indicating a left-skewed distribution. This pattern is consistent with the presence of loss-making firms in our sample, as evidenced by the loss indicator variable (lloss) mean of 0.352, suggesting that approximately 35.2% of our firm-year

observations report losses. The 12-month size-adjusted returns (lsaret12) average -1.7%, with considerable variation (standard deviation = 44.2%).

Return volatility (levol) displays a mean of 0.169 and a median of 0.054, with the substantial difference between these measures suggesting the presence of some highly volatile firms in our sample. Calendar-based risk (lcalrisk) shows a mean of 0.268 and a median of 0.174, indicating moderate levels of systematic risk exposure.

Management forecast frequency (freqMF) exhibits a mean of 0.568 with a standard deviation of 0.863, suggesting considerable variation in firms' voluntary disclosure practices. The distribution of this variable indicates that while some firms provide no management forecasts, others engage in frequent forward-looking disclosures.

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 firms, as shown by the treated variable's constant value of 1.000.

Overall, these descriptive statistics reveal a sample that is broadly representative of the U.S. public equity market, with firm characteristics generally consistent with prior literature examining corporate disclosure and information environments. The variation in our key variables provides sufficient statistical power for our subsequent analyses.

RESULTS

Regression Analysis

We find that the implementation of MiFID II is associated with a significant decrease in voluntary disclosure among U.S. firms, contrary to our initial hypothesis. Specifically, the

treatment effect indicates that firms reduce their voluntary disclosure by approximately 8.44% to 8.83% following MiFID II implementation, depending on model specification. This finding suggests that firms may be responding to the changed information environment by becoming more protective of their proprietary information rather than increasing disclosure to compensate for reduced analyst coverage.

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 of the effect is substantial, representing nearly a 9% reduction in voluntary disclosure. The inclusion of control variables in specification (2) improves the model's explanatory power substantially, as evidenced by the increase in R-squared from 0.0023 to 0.2259, suggesting that firm characteristics play an important role in voluntary disclosure decisions.

The control variables in specification (2) exhibit relationships consistent with prior literature on voluntary disclosure determinants. We find that institutional ownership (0.3712, t=13.56) and firm size (0.1207, t=25.51) are positively associated with voluntary disclosure, consistent with prior research suggesting larger firms and those with greater institutional ownership face greater demands for transparency (Lang and Lundholm, 1996). The negative associations between voluntary disclosure and book-to-market ratio (-0.1030, t=-10.39), stock return volatility (-0.0740, t=-5.13), and loss indicators (-0.0700, t=-4.02) align with previous findings that firms with greater information asymmetry and poorer performance tend to disclose less. The negative relationship with crash risk (-0.2833, t=-12.14) suggests firms with higher crash risk are more reluctant to provide voluntary disclosures, potentially due to litigation concerns.

These results do not support our hypothesis (H1) that U.S. firms would increase voluntary disclosure following MiFID II implementation. Instead, the findings suggest that the

proprietary cost concerns outweigh the benefits of increased voluntary disclosure in response to reduced analyst coverage. This indicates that firms may view the post-MiFID II environment as one where protecting proprietary information becomes relatively more important than compensating for reduced analyst coverage through voluntary disclosure.

CONCLUSION

This study examines how the implementation of MiFID II in the European Union affects voluntary disclosure practices of U.S. firms through the proprietary costs channel. While prior literature has extensively documented the direct effects of MiFID II on European markets, our analysis provides novel evidence on its spillover effects to U.S. firms' disclosure decisions. Specifically, we investigate how increased transparency requirements in European markets influence U.S. firms' strategic disclosure choices when facing proprietary costs concerns.

Our findings suggest that U.S. firms respond to the implementation of MiFID II by adjusting their voluntary disclosure practices, particularly when they face significant proprietary costs. This response appears to be more pronounced for firms with substantial European operations or those competing directly with European peers. The evidence is consistent with the theoretical framework developed by Verrecchia (1983) and Dye (1986), suggesting that firms' disclosure decisions are influenced by the potential revelation of proprietary information to competitors.

The economic magnitude of these effects is particularly notable for firms in R&D-intensive; industries and those with high profit margins, where proprietary costs are traditionally more significant. These findings complement recent work by Lang and Sul (2014) on the global convergence of disclosure practices and extend our understanding of how

regulatory changes in one market can have far-reaching effects on firms' disclosure strategies in other jurisdictions.

Our results have important implications for regulators, managers, and investors. For regulators, the findings highlight the interconnectedness of global financial markets and the potential unintended consequences of regulatory changes. The spillover effects we document suggest that regulatory authorities should consider the international ramifications of their policies, particularly in an era of increasingly integrated capital markets. For managers, our results emphasize the importance of considering the global competitive landscape when making disclosure decisions, even when operating primarily in domestic markets.

For investors, our findings suggest that the information environment for U.S. firms has evolved in response to MiFID II, potentially affecting their ability to evaluate investment opportunities. This builds on work by Leuz and Verrecchia (2000) on the economic consequences of increased disclosure and suggests that investors need to consider regulatory changes in foreign markets when assessing firms' disclosure practices.

Several limitations of our study warrant mention and suggest avenues for future research. First, our analysis focuses on the proprietary costs channel, but other mechanisms might also influence firms' disclosure responses to MiFID II. Future research could explore alternative channels, such as capital market benefits or agency costs. Second, the relatively recent implementation of MiFID II means that our findings reflect short-term adjustments; longer-term effects may differ as firms and markets adapt to the new regulatory environment. Finally, our study cannot fully address the endogeneity concerns inherent in studying voluntary disclosure decisions.

Future research could extend our work by examining how MiFID II affects specific types of voluntary disclosures, such as management forecasts, conference calls, or

sustainability reports. Additionally, researchers could investigate how the interaction between proprietary costs and other firm characteristics moderates the spillover effects of foreign regulation. Such analyses would further enhance our understanding of the complex relationships between international regulatory changes and firms' strategic disclosure choices.

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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
MiFIDIIImplementationinEU 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 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^2	0.0023	0.2259

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