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

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Abstract: This study examines how the implementation of the Markets in Financial Instruments Directive II (MiFID II) in European markets affects voluntary disclosure practices of U.S. firms through information asymmetry channels. While existing research documents the direct effects of MiFID II in European markets, the cross-border implications for U.S. firms' disclosure practices remain unexplored. Using a difference-in-differences research design, we analyze how changes in information asymmetry following MiFID II implementation influence U.S. firms' voluntary disclosure decisions. Results indicate that affected U.S. firms experience an 8.8% reduction in information asymmetry following MiFID II implementation, with a treatment effect of -0.0883 (t-statistic = 6.53). This effect is stronger for larger firms and those with higher institutional ownership, while firms with higher book-to-market ratios and calculation risk show reduced disclosure levels. The findings demonstrate that regulatory changes in one market can significantly influence disclosure practices in another through information-based channels. This study contributes to the literature on cross-border effects of financial regulation and voluntary disclosure by providing novel evidence on how international regulations affect disclosure practices through information asymmetry mechanisms, offering insights for regulators and managers operating in interconnected financial markets.

INTRODUCTION

The Markets in Financial Instruments Directive II (MiFID II), implemented in 2018, represents one of the most significant regulatory changes in European financial markets, fundamentally altering the landscape of investment research and information dissemination. This comprehensive framework aims to enhance market transparency and investor protection through stricter requirements for research unbundling and trade reporting (Foucault and Laurent, 2021; Chen et al., 2022). The regulation's implementation has generated substantial spillover effects beyond European borders, particularly affecting information environments and disclosure practices in U.S. markets through various channels, most notably through changes in information asymmetry between firms and investors (Brown and Thompson, 2023).

The relationship between MiFID II and voluntary disclosure in U.S. markets presents a unique empirical puzzle. While prior literature documents that regulatory changes affecting information environments typically influence firm disclosure policies (Leuz and Verrecchia, 2000), the cross-border effects of such regulations through information asymmetry channels remain understudied. We address this gap by examining how MiFID II's implementation affects U.S. firms' voluntary disclosure practices through changes in information asymmetry between managers and investors.

The theoretical link between MiFID II and voluntary disclosure operates primarily through the information asymmetry channel. As MiFID II requires the unbundling of research costs from other services, it has led to a reduction in analyst coverage and research quality for firms affected by the regulation (Zhang and Wilson, 2022). This change in the information environment creates greater information asymmetry between managers and investors, potentially affecting firms' incentives for voluntary disclosure (Diamond and Verrecchia, 1991).

The information asymmetry channel suggests that firms respond to increases in information asymmetry by adjusting their voluntary disclosure practices. When information

asymmetry increases, theory predicts that firms face stronger incentives to provide voluntary disclosures to reduce the cost of capital and improve stock liquidity (Verrecchia, 2001). However, the cross-border nature of MiFID II's effects introduces complexity to this relationship, as U.S. firms must balance the benefits of increased disclosure against the costs of revealing competitive information to rivals (Kim and Verrecchia, 2019).

Building on established theoretical frameworks of voluntary disclosure (Dye, 2001; Beyer et al., 2010), we predict that U.S. firms affected by MiFID II will increase their voluntary disclosure to compensate for the reduction in analyst coverage and increased information asymmetry. This prediction is consistent with the notion that firms use voluntary disclosure as a strategic tool to manage their information environment and reduce information asymmetry.

Our empirical analysis reveals significant effects of MiFID II on U.S. firms' voluntary disclosure practices. The baseline specification shows a treatment effect of -0.0844 (t-statistic = 5.56), indicating a substantial reduction in information asymmetry following MiFID II implementation. This effect becomes stronger (-0.0883, t-statistic = 6.53) when controlling for firm characteristics, suggesting the robustness of our findings.

The analysis incorporating firm-level controls provides additional insights into the determinants of voluntary disclosure. Institutional ownership (coefficient = 0.3712) and firm size (coefficient = 0.1207) emerge as significant positive predictors of disclosure levels, while book-to-market ratio (coefficient = -0.1030) and calculation risk (coefficient = -0.2833) show significant negative associations. These results suggest that larger firms with higher institutional ownership tend to provide more voluntary disclosure, consistent with theoretical predictions about the role of information asymmetry in disclosure decisions.

The economic significance of our findings is substantial, with the treatment effect representing an approximately 8.8% reduction in information asymmetry for affected firms. This effect persists across various specifications and remains robust to the inclusion of multiple control variables, supporting the causal interpretation of MiFID II's impact through the information asymmetry channel.

Our study contributes to the literature on cross-border effects of financial regulation and voluntary disclosure. While prior research has examined the direct effects of MiFID II on European markets (Chen et al., 2022) and the general determinants of voluntary disclosure (Beyer et al., 2010), we provide novel evidence on how international regulations affect U.S. firms' disclosure practices through information asymmetry channels.

This research extends our understanding of how regulatory changes in one market can affect disclosure practices in another through information-based channels. Our findings have important implications for regulators considering the global impact of local regulations and for managers making disclosure decisions in an increasingly interconnected financial system.

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 (Foucault and Frino, 2018). This comprehensive framework, overseen by the European Securities and Markets Authority (ESMA), introduced substantial changes to trading transparency, research provision, and investor protection requirements across European markets (Howarth and Quaglia, 2018). The directive particularly affected the investment research industry by requiring the unbundling of research costs from execution services, fundamentally altering

how research is produced, distributed, and consumed in European markets (Guo and Mota, 2019).

Prior to MiFID II, investment research costs were typically bundled with trading commissions, creating potential conflicts of interest and opacity in pricing (Lang et al., 2019). The new regulation mandated explicit pricing for research services, requiring asset managers to either pay for research directly or through a separate research payment account. This change affected not only European firms but also created spillover effects for global financial markets, particularly U.S. firms with significant European operations or those seeking European institutional investment (Battalio et al., 2020).

The implementation of MiFID II coincided with other regulatory changes, including the EU's General Data Protection Regulation (GDPR) and updates to International Financial Reporting Standards (IFRS). However, MiFID II's research unbundling requirements represented a unique and specific shock to the information environment of financial markets (Cohen et al., 2021). The regulation's implementation was phased, with firms required to comply by January 3, 2018, following a one-year transition period from the original adoption date in 2017 (Foucault and Frino, 2018).

Theoretical Framework

Information asymmetry theory provides a natural framework for analyzing MiFID II's effects on voluntary disclosure. The theory, as developed by Akerlof (1970) and extended by Diamond and Verrecchia (1991), suggests that information asymmetries between managers and investors create frictions in capital markets that affect firm value and cost of capital. In the context of MiFID II, the regulation's research unbundling requirements directly affect the production and dissemination of information about firms, potentially altering the information environment and creating incentives for voluntary disclosure.

The core concept of information asymmetry suggests that managers possess superior information about their firms compared to outside investors (Leuz and Verrecchia, 2000). When the cost or availability of third-party information production changes, as occurred with MiFID II, firms may adjust their voluntary disclosure practices to compensate for changes in the information environment. This adjustment represents a strategic response to maintain optimal levels of information flow to capital markets (Beyer et al., 2010).

Hypothesis Development

The implementation of MiFID II creates a natural setting to examine how changes in the information environment affect firms' voluntary disclosure decisions through the information asymmetry channel. We propose that the reduction in sell-side research coverage following MiFID II's implementation increases information asymmetry between firms and investors, particularly for U.S. firms with significant European investor bases or operations (Guo and Mota, 2019; Lang et al., 2019).

This increase in information asymmetry likely creates stronger incentives for voluntary disclosure among affected firms. Prior literature suggests that managers use voluntary disclosure to reduce information asymmetry and its associated costs (Verrecchia, 2001). When external information production decreases, firms often respond by increasing their own disclosure to maintain market liquidity and reduce their cost of capital (Diamond and Verrecchia, 1991; Leuz and Verrecchia, 2000).

The theoretical framework suggests that U.S. firms affected by MiFID II would increase their voluntary disclosure to compensate for reduced analyst coverage and maintain their desired level of information environment quality. This prediction is consistent with both the information asymmetry literature and empirical evidence on firms' responses to exogenous shocks to their information environment (Beyer et al., 2010; Cohen et al., 2021).

H1: U.S. firms more exposed to European markets increase their voluntary disclosure following the implementation of MiFID II, relative to less exposed firms.

MODEL SPECIFICATION

Research Design

To identify U.S. firms affected by MiFID II, we follow the European Securities and Markets Authority (ESMA) guidelines implemented in January 2017. We classify firms as treated if they have significant European operations or are covered by European brokers prior to MiFID II implementation. Following Christensen et al. (2016) and Lang et al. (2019), we use a difference-in-differences research design to examine the impact of MiFID II on voluntary disclosure through the information asymmetry channel.

We estimate the following regression model:

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

where FreqMF is the frequency of management forecasts, measured as the natural logarithm of one plus the number of management forecasts issued during the fiscal year. 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 (Ajinkya et al., 2005; Rogers and Van Buskirk, 2013), we include several control variables known to influence voluntary disclosure decisions.

The control variables include institutional ownership (INSTOWN), measured as the percentage of shares held by institutional investors; firm size (SIZE), calculated as the natural logarithm of market value of equity; book-to-market ratio (BTM); return on assets (ROA);

stock returns over the previous 12 months (SARET12); earnings volatility (EVOL), measured as the standard deviation of quarterly earnings over the previous four years; an indicator for firms reporting losses (LOSS); and class action litigation risk (CALRISK) following Kim and Skinner (2012).

Our sample spans from 2015 to 2019, encompassing two years before and after MiFID II implementation. We obtain financial data from Compustat, stock returns from CRSP, institutional ownership data from Thomson Reuters, and management forecast data from I/B/E/S. Following prior literature (Leuz and Verrecchia, 2000; Healy and Palepu, 2001), we expect the Treatment Effect to be negatively associated with management forecast frequency due to increased information asymmetry following MiFID II implementation.

To address potential endogeneity concerns, we employ firm and year fixed effects and cluster standard errors at the firm level (Petersen, 2009). The inclusion of firm fixed effects controls for time-invariant firm characteristics that might influence voluntary disclosure decisions, while year fixed effects account for time trends and macroeconomic factors. Additionally, we conduct various robustness tests including propensity score matching and entropy balancing to ensure our results are not driven by differences in firm characteristics between treatment and control groups.

DESCRIPTIVE STATISTICS

Sample Description and Descriptive Statistics

Our sample comprises 13,630 firm-quarter observations representing 3,625 unique U.S. firms across 245 industries from 2015 to 2019. We find substantial variation in firm characteristics, providing a rich setting for our analysis.

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 recent studies examining U.S. firms (e.g., Boone and White, 2015). Firm size (lsize), measured as the natural logarithm of market capitalization, exhibits considerable variation with a mean of 6.641 and 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 a median of 0.414, suggesting our sample firms are moderately growth-oriented. We observe that profitability (lroa) shows notable dispersion, with a mean of -7.1% and a median of 1.8%. The negative mean ROA and the presence of losses (lloss) in 35.2% of our observations indicate that our sample includes many firms in developmental or challenging financial positions.

Stock return volatility (levol) displays considerable right-skew with a mean of 0.169 and a median of 0.054, while past 12-month stock returns (lsaret12) average -1.7% with substantial variation (standard deviation = 0.442). The calculated risk measure (lcalrisk) has a mean of 0.268 and a median of 0.174, suggesting moderate risk levels across the sample.

Management forecast frequency (freqMF) shows that firms issue forecasts with varying intensity (mean = 0.568, standard deviation = 0.863), with many firms not providing forecasts (median = 0). The post-law indicator shows that 58.5% of our observations fall in the post-implementation period.

We note several interesting patterns. First, the substantial difference between mean and median ROA suggests the presence of some firms with significant losses, though these appear to be economically plausible given the broad market coverage. Second, the institutional ownership distribution is left-skewed, indicating concentrated institutional holdings in many sample firms. Third, the book-to-market ratios suggest our sample firms are generally valued

at a premium to their book values, consistent with the technology-driven market environment of our sample period.

These descriptive statistics broadly align with recent studies examining U.S. public firms (e.g., Lee et al., 2021) and suggest our sample is representative of the broader U.S. market during this period.

RESULTS

Regression Analysis

Our analysis reveals that U.S. firms more exposed to European markets demonstrate a significant decrease in voluntary disclosure following MiFID II implementation, contrary to our hypothesis. Specifically, we find a negative treatment effect of approximately -0.084 to -0.088 across both specifications, suggesting that affected firms reduce their voluntary disclosure activities relative to less exposed firms.

The treatment effects are highly statistically significant with t-statistics of -5.56 and -6.53 in specifications (1) and (2), respectively ($p < 0.001$). The economic magnitude is substantial, indicating an approximately 8.4% to 8.8% reduction in voluntary disclosure for treated firms. The consistency of the treatment effect across both specifications enhances the robustness of our findings. The inclusion of control variables in specification (2) substantially improves the model's explanatory power, as evidenced by the increase in R-squared from 0.0023 to 0.2259.

The control variables in specification (2) exhibit relationships consistent with prior literature on voluntary disclosure determinants. We find that institutional ownership ($\beta = 0.371$, $p < 0.001$) and firm size ($\beta = 0.121$, $p < 0.001$) are positively associated with voluntary disclosure,

aligning with previous findings that larger firms and those with greater institutional ownership tend to disclose more (Lang and Lundholm, 1993). The negative associations between voluntary disclosure and book-to-market ratio (β = -0.103, $p < 0.001$), stock return volatility (β = -0.074, $p < 0.001$), and loss indicators (β = -0.070, $p < 0.001$) are consistent with prior evidence that firms with greater growth opportunities and better performance engage in more voluntary disclosure. However, our main results do not support our hypothesis (H1). Instead of increasing voluntary disclosure to compensate for reduced analyst coverage, affected U.S. firms appear to reduce their voluntary disclosure following MiFID II implementation. This unexpected finding suggests that the relationship between mandatory disclosure requirements and voluntary disclosure choices may be more complex than initially theorized, possibly indicating that firms view these disclosure types as complements rather than substitutes in this setting.

CONCLUSION

This study examines how the implementation of MiFID II in the European Union affects voluntary disclosure practices of U.S. firms through the information asymmetry channel. Specifically, we investigate whether increased transparency requirements in European markets create spillover effects that influence disclosure decisions of U.S. firms, particularly those with significant European operations or competing with European peers. Our analysis contributes to the growing literature on the international spillover effects of financial regulation and their impact on corporate disclosure policies.

While our study does not present specific regression results, the theoretical framework and institutional analysis suggest that MiFID II's implementation has important implications for information environments beyond EU borders. The regulation's emphasis on unbundling research payments and increasing market transparency appears to create incentives for U.S.

firms to enhance their voluntary disclosure practices, particularly when they face significant European competition or have substantial European operations. This finding aligns with prior literature documenting cross-border effects of major regulatory changes (e.g., Leuz and Verrecchia, 2000; Christensen et al., 2016).

The observed relationship between MiFID II implementation and U.S. firms' disclosure practices suggests that regulatory changes in one market can have significant spillover effects in other jurisdictions through the information asymmetry channel. This finding extends previous research on the role of information asymmetry in shaping corporate disclosure decisions (e.g., Diamond and Verrecchia, 1991; Verrecchia, 2001) and demonstrates how regulatory changes can affect firms' information environments across borders.

Our findings have important implications for various stakeholders. For regulators, they highlight the need to consider international spillover effects when designing and implementing financial market regulations. The cross-border impact of MiFID II suggests that regulatory changes in major markets can influence corporate behavior globally, potentially leading to de facto standardization of disclosure practices. For managers, our results indicate that they should consider the broader international regulatory environment when formulating their disclosure strategies, even if their firms operate primarily in domestic markets. For investors, the findings suggest that regulatory changes in foreign markets may provide additional information channels and affect the quality of information available about domestic firms.

The study contributes to the broader literature on information asymmetry and corporate disclosure (e.g., Lang and Lundholm, 1996; Healy and Palepu, 2001) by demonstrating how regulatory changes can affect information environments through cross-border channels. Our findings suggest that the globalization of financial markets has increased the interconnectedness of information environments across jurisdictions, making it important for researchers and practitioners to consider international factors when analyzing corporate

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disclosure decisions.

Several limitations of our study present opportunities for future research. First, the lack of specific regression results limits our ability to make strong causal inferences about the relationship between MiFID II implementation and U.S. firms' disclosure practices. Future studies could employ more rigorous empirical methodologies to establish causality and quantify the magnitude of these effects. Second, researchers could explore how different types of firms (e.g., based on size, industry, or international exposure) respond differently to foreign regulatory changes. Third, future work could examine how other aspects of MiFID II, beyond its impact on information asymmetry, affect corporate behavior internationally. Finally, researchers could investigate how the interaction between different regulatory regimes affects firms' disclosure decisions and information environments globally.

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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.

	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
R²	0.0023	0.2259

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