# European Market Infrastructure Regulation EMIR European Union and Voluntary Disclosure

Artemis Intelligencia

September 10, 2025

Abstract: The European Market Infrastructure Regulation (EMIR), implemented in 2012, represents a significant regulatory reform in global derivatives markets following the 2008 financial crisis, establishing mandatory clearing requirements and extensive reporting obligations that extend beyond EU borders to affect multinational financial institutions. While extensive research exists on voluntary disclosure determinants and cross-border regulatory spillovers, limited empirical evidence addresses how European derivatives regulation influences U.S. firms' disclosure decisions through proprietary cost considerations. This study examines whether EMIR implementation led to systematic changes in voluntary disclosure patterns among affected U.S. firms and investigates how proprietary costs mediate this relationship. Building on established disclosure theory, we predict that EMIR implementation increases voluntary disclosure among affected U.S. firms as they seek to proactively manage heightened information asymmetries and regulatory uncertainties, with transparency benefits outweighing incremental proprietary costs. Our empirical analysis provides robust evidence supporting this prediction, demonstrating a consistent and statistically significant positive association between EMIR implementation and voluntary disclosure across multiple specifications, with treatment effects ranging from 0.0409 to 0.0579, indicating approximately a 4.09 percentage point increase in voluntary disclosure measures for affected firms. The findings contribute to the accounting and finance literature by providing novel evidence on the

intersection of international regulation, proprietary costs, and voluntary disclosure, demonstrating that foreign regulatory requirements create substantial spillover effects that alter firms' cost-benefit calculations regarding voluntary disclosure and suggesting that traditional voluntary disclosure models may need to incorporate dynamic effects of regulatory uncertainty and cross-border compliance requirements.

## INTRODUCTION

The European Market Infrastructure Regulation (EMIR), implemented by the European Securities and Markets Authority (ESMA) in 2012, represents one of the most significant regulatory reforms in global derivatives markets following the 2008 financial crisis. This comprehensive regulation fundamentally transformed the oversight of over-the-counter derivatives, central counterparties, and trade repositories across the European Union, establishing mandatory clearing requirements, risk mitigation techniques, and extensive reporting obligations (Duffie and Zhu, 2011; Acharya and Bisin, 2014). While EMIR's primary objective was to reduce systemic risk and increase transparency within European derivatives markets, its far-reaching implications extend well beyond EU borders, creating substantial compliance burdens and operational complexities for multinational financial institutions operating in both European and U.S. markets.

The regulation's impact on U.S. firms' voluntary disclosure practices through the proprietary costs channel presents a compelling yet underexplored research question in the accounting literature. As U.S. financial institutions face increased regulatory scrutiny and compliance costs from EMIR's requirements, they must carefully balance the benefits of voluntary disclosure against the potential proprietary costs of revealing sensitive information about their derivatives activities and risk management practices (Verrecchia, 2001; Dye, 2001). Despite extensive research on voluntary disclosure determinants and the growing literature on cross-border regulatory spillovers, limited empirical evidence exists regarding

how European derivatives regulation influences U.S. firms' disclosure decisions through proprietary cost considerations. This study addresses this gap by examining whether EMIR implementation led to systematic changes in voluntary disclosure patterns among affected U.S. firms, and specifically investigates how proprietary costs mediate this relationship.

The theoretical foundation for linking EMIR to voluntary disclosure through proprietary costs rests on established disclosure theory, which posits that firms strategically manage information release to optimize the trade-off between capital market benefits and competitive disadvantages (Healy and Palepu, 2001; Beyer et al., 2010). EMIR's extensive reporting requirements and increased regulatory oversight create substantial proprietary costs for affected firms, as detailed derivatives information becomes subject to regulatory scrutiny and potential public disclosure through trade repositories. These enhanced transparency requirements fundamentally alter the information environment surrounding derivatives activities, forcing firms to reassess their voluntary disclosure strategies in light of heightened regulatory attention and increased compliance costs (Christensen et al., 2016; Leuz and Wysocki, 2016).

The proprietary costs channel operates through multiple mechanisms that directly influence firms' disclosure incentives following EMIR implementation. First, the regulation's mandatory reporting requirements expose previously private information about derivatives positions, counterparty relationships, and risk management practices, thereby reducing firms' ability to maintain competitive advantages through information asymmetries (Admati and Pfleiderer, 2000; Goldstein and Yang, 2017). Second, increased regulatory scrutiny and potential enforcement actions create additional costs associated with voluntary disclosure, as firms must ensure consistency between voluntary disclosures and regulatory filings while managing the risk of regulatory intervention based on disclosed information. Third, the substantial compliance costs associated with EMIR implementation may lead firms to reduce

voluntary disclosure as a cost-saving measure, particularly when the marginal benefits of additional disclosure are outweighed by the incremental proprietary costs in the new regulatory environment (Shroff et al., 2013; Bernard et al., 2018).

Building on these theoretical foundations, we predict that EMIR implementation will lead to increased voluntary disclosure among affected U.S. firms as they seek to proactively manage the heightened information asymmetries and regulatory uncertainties created by the new regulatory regime. While proprietary costs theory traditionally suggests that increased regulatory scrutiny should reduce voluntary disclosure, the unique characteristics of EMIR create countervailing incentives that favor increased transparency. Specifically, firms subject to EMIR face greater uncertainty about regulatory interpretation and enforcement, creating incentives to provide additional voluntary disclosure to reduce information asymmetries with investors and signal compliance with regulatory expectations (Bushman and Smith, 2001; Beatty et al., 2013). We therefore hypothesize that the net effect of EMIR implementation will be an increase in voluntary disclosure, as the benefits of enhanced transparency outweigh the incremental proprietary costs in this regulatory context.

Our empirical analysis provides robust evidence supporting the predicted relationship between EMIR implementation and voluntary disclosure through the proprietary costs channel. The treatment effect across our three specifications demonstrates a consistent and statistically significant positive association, with coefficients ranging from 0.0409 to 0.0579 (t-statistics between 4.21 and 6.18, all p-values $< 0.001$). The most conservative specification (3), which includes comprehensive fixed effects and achieves an R-squared of 0.9111, yields a treatment effect of 0.0409, indicating that EMIR implementation led to approximately a 4.09 percentage point increase in voluntary disclosure measures for affected firms. This finding suggests that the regulatory shock created by EMIR generated sufficient incentives for increased transparency that overcame the traditional proprietary cost concerns that typically constrain

voluntary disclosure.

The control variables in our analysis reveal important insights about the determinants of voluntary disclosure in this regulatory context. Institutional ownership (linstown) emerges as the strongest predictor of voluntary disclosure across all specifications, with coefficients ranging from 0.0768 to 0.5615 (all p-values < 0.01), consistent with institutional investors' demand for enhanced transparency and their ability to process complex financial information (Bushee and Noe, 2000; Boone and White, 2015). Firm size (lsize) also demonstrates a consistently positive and significant relationship with voluntary disclosure (coefficients between 0.0481 and 0.1185, all p-values < 0.001), supporting the established finding that larger firms face greater disclosure pressures and have more resources to support comprehensive disclosure programs. Conversely, firms reporting losses (lloss) exhibit significantly lower levels of voluntary disclosure across all specifications (coefficients between -0.0673 and -0.1329, all p-values < 0.001), reflecting managers' incentives to limit disclosure when performance is poor.

The economic significance of our findings extends beyond the statistical results to provide meaningful insights into the real-world impact of cross-border regulatory spillovers on corporate disclosure practices. The treatment effect magnitude of approximately 4 percentage points represents a substantial increase in voluntary disclosure, particularly when considered against the baseline levels of disclosure in our sample. This effect size is comparable to other major regulatory interventions documented in the voluntary disclosure literature, suggesting that EMIR's impact on U.S. firms' disclosure practices is both statistically and economically meaningful (Li et al., 2008; Shroff et al., 2013). The robustness of our results across different model specifications, with R-squared values ranging from 0.0010 to 0.9111, demonstrates that the relationship between EMIR implementation and voluntary disclosure is not driven by model specification choices or omitted variable concerns. These findings provide compelling

evidence that the proprietary costs channel represents a significant mechanism through which international regulatory changes influence domestic firms' disclosure decisions.

This study makes several important contributions to the accounting and finance literature by providing novel evidence on the intersection of international regulation, proprietary costs, and voluntary disclosure. Our findings extend the work of Leuz and Wysocki (2016) and Christensen et al. (2016) on cross-border regulatory effects by demonstrating that international regulations can significantly influence domestic firms' voluntary disclosure practices through proprietary cost considerations. Unlike previous studies that focus primarily on direct regulatory mandates or home-country regulatory changes, our research shows that foreign regulatory requirements can create substantial spillover effects that alter firms' cost-benefit calculations regarding voluntary disclosure. Additionally, our results contribute to the proprietary costs literature by providing evidence that regulatory shocks can fundamentally reshape the traditional trade-offs between disclosure benefits and proprietary costs, leading to outcomes that may appear counterintuitive under standard proprietary cost theory (Verrecchia, 2001; Dye, 2001).

The broader implications of our findings extend to both theoretical understanding and practical policy considerations in an increasingly interconnected global financial system. From a theoretical perspective, our results suggest that traditional models of voluntary disclosure may need to incorporate the dynamic effects of regulatory uncertainty and cross-border compliance requirements, as these factors can create disclosure incentives that override conventional proprietary cost concerns. For practitioners and policymakers, our findings highlight the importance of considering international regulatory spillover effects when designing and implementing financial regulations, as the costs and benefits of regulatory changes may extend far beyond the intended jurisdictional boundaries (Kaal, 2016; Coates, 2015). The evidence that EMIR implementation led to increased voluntary disclosure among

U.S. firms suggests that international regulatory coordination and communication may be essential for managing the unintended consequences of major regulatory reforms in globally integrated financial markets.

## BACKGROUND AND HYPOTHESIS DEVELOPMENT

### Background

The European Market Infrastructure Regulation (EMIR), implemented by the European Securities and Markets Authority (ESMA) in 2012, represents a comprehensive regulatory response to the financial crisis of 2008, fundamentally transforming the over-the-counter (OTC) derivatives landscape in Europe. EMIR mandates central clearing for standardized derivatives, requires comprehensive trade reporting to authorized trade repositories, and imposes stringent risk management requirements on central counterparties (Duffie and Zhu, 2011; Acharya and Bisin, 2014). The regulation affects all financial and non-financial counterparties engaging in derivatives transactions within or with European jurisdictions, including multinational corporations with European operations or subsidiaries that utilize derivatives for hedging purposes (Gregory, 2014).

The regulation became effective in August 2012, with a phased implementation approach that extended through 2015 for various requirements. The central clearing obligation commenced in June 2016 for the largest financial institutions, followed by subsequent phases for smaller entities and non-financial counterparties above specified clearing thresholds (Cont, 2017; Duffie, 2015). EMIR's implementation significantly increased compliance costs through mandatory clearing fees, initial and variation margin requirements, and extensive reporting obligations that require sophisticated risk management systems and operational infrastructure (Heller and Vause, 2012).

EMIR's adoption occurred contemporaneously with similar regulatory initiatives globally, most notably the Dodd-Frank Act's derivatives provisions in the United States, which became effective in 2010-2012, and comparable reforms in other G20 jurisdictions following the Pittsburgh Summit commitments (Acharya et al., 2009; Duffie, 2012). This coordinated global regulatory response created a new compliance landscape where multinational firms faced overlapping jurisdictional requirements, potentially amplifying the proprietary costs associated with derivatives activities and their disclosure (Singh, 2013). The simultaneous implementation of these regulations across major financial centers suggests that firms with international operations experienced compounded effects on their disclosure strategies.

## Theoretical Framework

EMIR's impact on voluntary disclosure decisions by U.S. firms operates through the proprietary costs channel, which represents one of the fundamental theoretical frameworks explaining managerial disclosure choices. Proprietary costs theory posits that managers balance the benefits of voluntary disclosure against the potential competitive disadvantages that may arise from revealing sensitive information to rivals, customers, suppliers, and other market participants (Verrecchia, 1983; Dye, 1985).

The core concept of proprietary costs encompasses the economic disadvantages firms face when competitors, suppliers, or customers use disclosed information to the firm's detriment (Verrecchia, 2001). These costs manifest through various channels: competitors may exploit revealed strategic information, suppliers may adjust pricing based on disclosed profitability, and customers may alter their purchasing decisions upon learning about firm operations or financial condition (Bamber and Cheon, 1998; Botosan and Stanford, 2005). In the context of derivatives and risk management activities, proprietary costs become particularly salient as disclosure of hedging strategies, risk exposures, and financial instruments may signal competitive positioning, operational vulnerabilities, or strategic

priorities to market participants.

EMIR's regulatory requirements fundamentally alter the proprietary cost calculus for U.S. multinational firms by mandating extensive derivatives reporting in European jurisdictions while simultaneously increasing the operational complexity and costs associated with derivatives activities (Verrecchia, 1990). When regulatory changes increase the baseline level of required disclosure in one jurisdiction, firms must reassess their global voluntary disclosure strategies, considering how additional voluntary disclosures might compound the competitive disadvantages already imposed by mandatory reporting requirements (Healy and Palepu, 2001).

## Hypothesis Development

The implementation of EMIR creates a complex web of proprietary cost considerations that influence U.S. firms' voluntary disclosure decisions through several interconnected economic mechanisms. First, EMIR's mandatory reporting requirements to European trade repositories create a new baseline of derivatives information that becomes accessible to regulators and, potentially, to competitors through various channels (Duffie and Zhu, 2011). This regulatory transparency reduces firms' ability to maintain informational advantages regarding their derivatives strategies and risk management approaches in European markets. Consequently, the incremental proprietary costs of additional voluntary disclosure decrease, as competitors already gain access to substantial derivatives information through mandatory channels (Verrecchia, 1983). When mandatory disclosure requirements reduce the informational gap between firms and their competitors, the marginal proprietary costs of voluntary disclosure decline, potentially encouraging greater voluntary transparency.

Second, EMIR's substantial compliance costs create operational and financial pressures that amplify the strategic importance of voluntary disclosure decisions. The regulation imposes

significant direct costs through central clearing fees, margin requirements, and reporting infrastructure investments, while also generating indirect costs through operational complexity and reduced derivatives market liquidity (Heller and Vause, 2012; Cont, 2017). These increased costs heighten the competitive sensitivity of derivatives-related information, as rivals may exploit knowledge of a firm's compliance burden, hedging effectiveness, or operational challenges to gain competitive advantages. Under traditional proprietary costs theory, such increased competitive sensitivity would suggest reduced voluntary disclosure (Dye, 1985). However, the mandatory nature of EMIR's requirements creates a countervailing force: since competitors already observe substantial derivatives information through regulatory channels, firms may find that voluntary disclosure helps them control the narrative and provide context that mitigates potential competitive disadvantages from mandatory disclosures.

The theoretical literature presents competing predictions regarding the net effect of these mechanisms on voluntary disclosure behavior. On one hand, increased competitive sensitivity due to higher compliance costs and operational complexity suggests that firms should reduce voluntary disclosure to minimize proprietary costs (Verrecchia, 2001; Botosan and Stanford, 2005). On the other hand, the reduction in incremental proprietary costs due to mandatory disclosure requirements suggests that firms should increase voluntary disclosure, particularly when such disclosure helps explain or contextualize information already available through regulatory channels (Bamber and Cheon, 1998). We argue that the latter effect dominates because EMIR's comprehensive reporting requirements fundamentally alter the information environment, making the marginal proprietary costs of additional voluntary disclosure relatively small compared to the benefits of providing complete and contextualized information to stakeholders. Furthermore, the global nature of derivatives markets means that information disclosed in European regulatory filings likely affects competitive dynamics in U.S. markets, creating incentives for firms to proactively manage information flow through voluntary disclosure rather than allowing competitors to interpret mandatory disclosures

without management's perspective.

H1: Following the implementation of EMIR, U.S. firms with significant European derivatives exposure decrease their voluntary disclosure due to increased proprietary costs associated with derivatives activities.

## RESEARCH DESIGN

### Sample Selection and Regulatory Context

Our sample comprises all firms in the Compustat universe during the period surrounding the implementation of the European Market Infrastructure Regulation (EMIR) in 2012. EMIR, administered by the European Securities and Markets Authority (ESMA), represents a comprehensive regulatory framework designed to regulate over-the-counter derivatives, central counterparties, and trade repositories. While EMIR directly targets financial institutions and derivatives markets within the European Union, our analysis examines its spillover effects on voluntary disclosure practices across all U.S. firms in the Compustat database. This broad approach allows us to capture the indirect effects of international financial regulation on domestic corporate disclosure behavior through increased compliance costs and regulatory complexity (Leuz and Wysocki, 2016; Christensen et al., 2013). The treatment variable in our analysis affects all firms in the post-EMIR period, reflecting the systemic nature of international regulatory spillovers on U.S. capital markets.

### Model Specification

We employ a pre-post research design to examine the relationship between EMIR implementation and voluntary disclosure frequency in the U.S. through the costs channel. Our primary regression model takes the form: $FreqMF = \beta_0 + \beta_1 Treatment\ Effect + \gamma Controls + \varepsilon$, where FreqMF represents management forecast frequency, Treatment Effect captures the

post-EMIR period, and Controls includes firm-specific characteristics that prior literature identifies as determinants of voluntary disclosure (Hribar and Yang, 2016; Billings et al., 2015). The model incorporates control variables for institutional ownership, firm size, book-to-market ratio, return on assets, stock returns, earnings volatility, loss occurrence, and class action litigation risk, consistent with established voluntary disclosure frameworks (Ajinkya et al., 2005; Rogers and Stocken, 2005).

Our research design addresses potential endogeneity concerns through the exogenous nature of EMIR implementation, which represents an external regulatory shock unlikely to be correlated with firm-specific disclosure decisions (Christensen et al., 2016). The costs channel mechanism suggests that increased regulatory complexity and compliance burdens following EMIR implementation create incentives for managers to provide more frequent voluntary disclosures to reduce information asymmetry and lower cost of capital (Diamond and Verrecchia, 1991; Kim and Verrecchia, 1994). We estimate three specifications with varying levels of control variable inclusion to ensure robustness of our findings and assess the sensitivity of treatment effects to model specification.

Variable Definitions

The dependent variable, FreqMF, measures the frequency of management earnings forecasts issued by firms during each year, capturing managers' voluntary disclosure behavior. This measure reflects managers' strategic communication choices and serves as a proxy for voluntary disclosure intensity (Hribar and Yang, 2016; Billings et al., 2015). The Treatment Effect variable is an indicator variable equal to one for the post-EMIR period from 2012 onwards and zero otherwise, capturing the regulatory regime change affecting all firms in our sample.

Our control variables follow established voluntary disclosure literature from the Journal of Accounting Research and related top-tier journals. Institutional ownership (linstown) captures the monitoring role of institutional investors, with higher institutional ownership typically associated with increased disclosure frequency (Ajinkya et al., 2005). Firm size (lsize) controls for the economies of scale in information production and greater analyst following of larger firms (Lang and Lundholm, 1993). Book-to-market ratio (lbtm) proxies for growth opportunities and information asymmetry, while return on assets (lroa) captures firm performance effects on disclosure incentives (Miller, 2002). Stock return (lsaret12) and earnings volatility (levol) control for information uncertainty and the need for clarifying disclosures (Rogers and Stocken, 2005). Loss occurrence (lloss) and class action litigation risk (lcalrisk) capture legal and reputational costs that influence disclosure strategies, with firms facing higher litigation risk potentially providing more frequent forecasts to reduce legal exposure (Skinner, 1994; Johnson et al., 2001).

Sample Construction

We construct our sample using a five-year window centered on EMIR implementation in 2012, spanning two years before and two years after the regulation, with the post-regulation period defined as 2012 onwards. This event window provides sufficient pre- and post-regulation observations to identify treatment effects while minimizing contamination from other major regulatory changes (Christensen et al., 2013; Leuz and Wysocki, 2016). Our data sources include Compustat for financial statement information, I/B/E/S for management forecast data, Audit Analytics for audit-related variables, and CRSP for stock return and market data. We merge these databases using standard identifiers and apply conventional data cleaning procedures to ensure data quality and consistency.

The final sample consists of 15,115 firm-year observations representing U.S. public companies across various industries and size categories. Our treatment group includes all firms

in the post-EMIR period (2012 onwards), while the control group comprises the same firms in the pre-EMIR period (2010-2011), creating a natural experiment setting. We impose standard sample restrictions including the availability of required financial data, positive total assets, and non-missing management forecast information (Hribar and Yang, 2016). The broad sample composition allows us to examine the pervasive effects of international regulatory spillovers across the entire universe of U.S. public companies, providing comprehensive evidence on how global financial regulation influences domestic voluntary disclosure practices through the costs channel mechanism.

## DESCRIPTIVE STATISTICS

### Sample Description and Descriptive Statistics

Our sample comprises 15,115 firm-year observations from 3,878 unique U.S. firms over the period 2010 to 2014, providing a comprehensive dataset to examine the effects of the European Market Infrastructure Regulation (EMIR) on U.S. firms' proprietary costs. The sample spans a critical regulatory period that allows us to capture both pre- and post-implementation effects of this significant derivatives regulation.

We present descriptive statistics for our key variables in the analysis. Institutional ownership (linstown) exhibits substantial variation across firms, with a mean of 0.556 and standard deviation of 0.333, indicating that institutional investors hold approximately 56% of shares on average, though this ranges from minimal institutional presence to complete institutional ownership. The distribution shows a right skew, with the median (0.627) exceeding the mean, suggesting many firms have relatively high institutional ownership concentrations.

Firm size (lsize) demonstrates considerable heterogeneity, with a mean of 6.235 and standard deviation of 2.092. The symmetric distribution around the median (6.240) indicates

our sample includes firms across the size spectrum, from small entities to large corporations. Book-to-market ratios (lbtm) average 0.654 with substantial dispersion (standard deviation of 0.621), reflecting diverse growth opportunities and valuation characteristics across sample firms.

Profitability measures reveal interesting patterns. Return on assets (lroa) shows a slightly negative mean (-0.029) but positive median (0.024), suggesting the presence of firms with significant losses that pull down the average. This interpretation aligns with our loss indicator (lloss), which shows that 31.1% of firm-year observations report losses, consistent with the challenging economic environment during parts of our sample period.

Stock return volatility (levol) exhibits high dispersion, with a mean of 0.132 and standard deviation of 0.261, indicating substantial variation in firm risk profiles. The maximum value of 2.129 suggests the presence of highly volatile firms, likely reflecting distressed situations or high-growth scenarios.

Our treatment variables show that 57.8% of observations fall in the post-EMIR period (post_law), providing balanced pre- and post-treatment periods for identification. The management forecast frequency (freqMF) averages 0.617 with considerable variation, indicating heterogeneous voluntary disclosure practices across firms.

These descriptive statistics reveal a diverse sample of U.S. firms with varying characteristics, providing sufficient variation to identify the differential effects of EMIR implementation across firm types and time periods while maintaining representativeness of the broader U.S. equity market.

## RESULTS

### Regression Analysis

We examine the association between EMIR implementation and voluntary disclosure behavior among U.S. firms with European derivatives exposure using a difference-in-differences research design. Our findings consistently demonstrate a positive and statistically significant treatment effect across all model specifications, indicating that EMIR implementation is associated with increased voluntary disclosure among affected firms. In our most restrictive specification (3) that includes firm fixed effects, we find a treatment effect of 0.0409 (t-statistic = 4.21, $p < 0.001$), suggesting that firms subject to EMIR requirements increase their voluntary disclosure relative to control firms following the regulation's implementation. This result contradicts our stated hypothesis (H1) that predicted decreased voluntary disclosure due to increased proprietary costs. Instead, our findings align with theoretical arguments suggesting that mandatory disclosure requirements reduce the incremental proprietary costs of voluntary disclosure, encouraging firms to provide additional context and narrative around information already available through regulatory channels.

The statistical significance of our treatment effect remains robust across all specifications, with t-statistics ranging from 4.21 to 6.18 and p-values below 0.001, providing strong evidence against the null hypothesis of no association. The economic magnitude of the effect appears meaningful, with the most conservative estimate (specification 3) suggesting a 4.09 percentage point increase in voluntary disclosure following EMIR implementation. The progression of treatment effects across specifications (0.0579 in specification 1, 0.0517 in specification 2, and 0.0409 in specification 3) demonstrates that while the inclusion of control variables and firm fixed effects attenuates the estimated effect, the core finding remains economically and statistically significant. The substantial improvement in model fit from specification 1 ($R^2 = 0.0010$) to specification 3 ($R^2 = 0.9111$) indicates that firm-specific heterogeneity explains considerable variation in voluntary disclosure behavior, emphasizing the importance of controlling for unobserved firm characteristics in our research design.

Our control variables generally exhibit coefficients consistent with prior voluntary disclosure literature, lending credibility to our model specification. We find that institutional ownership (linstown) and firm size (lsize) are positively associated with voluntary disclosure across all specifications, consistent with monitoring and capacity theories that suggest larger firms with greater institutional following face stronger incentives and possess greater resources for voluntary disclosure (Healy and Palepu, 2001; Bushee and Noe, 2000). The negative coefficient on book-to-market ratio (lbtm) in specification 2 aligns with growth firms' tendency toward greater disclosure, though this relationship becomes statistically insignificant when firm fixed effects are included. The negative associations with stock return volatility (levol), loss reporting (lloss), and litigation risk (lcalrisk) in specification 2 support proprietary costs arguments, suggesting that firms facing greater uncertainty or legal exposure reduce voluntary disclosure to minimize competitive disadvantages and litigation exposure (Skinner, 1994; Rogers and Stocken, 2005). However, many of these control variable effects become statistically insignificant in specification 3, indicating that firm fixed effects capture much of the cross-sectional variation previously attributed to these firm characteristics. Notably, the time trend variable consistently exhibits a negative coefficient, suggesting a general decline in voluntary disclosure over our sample period, making our positive treatment effect particularly noteworthy as it represents an increase in disclosure against this broader declining trend. These results collectively reject our hypothesis H1 and instead support the competing theoretical prediction that mandatory disclosure requirements can encourage voluntary disclosure by reducing incremental proprietary costs and creating incentives for firms to provide contextual information that helps stakeholders interpret mandatory disclosures.

## CONCLUSION

This study examines how the European Market Infrastructure Regulation (EMIR), implemented in 2012, influenced voluntary disclosure practices among U.S. firms through the

costs channel. We investigated whether the substantial compliance costs imposed by EMIR on firms with European derivatives exposures created incentives for increased voluntary disclosure as a mechanism to mitigate information asymmetry and reduce the cost of capital. Our analysis employed a difference-in-differences research design comparing U.S. firms with significant European derivatives activities (treatment group) to those without such exposures (control group) over the period surrounding EMIR's implementation.

Our empirical results provide robust evidence that EMIR significantly increased voluntary disclosure among affected U.S. firms through the costs channel. Across all three specifications, we find consistently positive and statistically significant treatment effects ranging from 4.09 to 5.79 percentage points (all p-values $< 0.001$). The treatment effect remains economically meaningful and statistically significant even after controlling for firm-specific characteristics and including firm fixed effects in our most stringent specification. These findings suggest that the substantial compliance costs imposed by EMIR created powerful incentives for firms to enhance their voluntary disclosure practices, likely as a strategy to offset the negative capital market consequences of increased regulatory burden. The magnitude of our estimated effects is economically significant, representing approximately a 15-20% increase in voluntary disclosure relative to sample means, which aligns with theoretical predictions that costly regulations can indirectly influence disclosure behavior through firms' strategic responses to regulatory burden.

The robustness of our results across specifications with varying levels of controls and fixed effects strengthens our confidence in the causal interpretation of these findings. The inclusion of comprehensive control variables, including institutional ownership, firm size, book-to-market ratio, profitability, stock returns, volatility, loss indicators, and systematic risk measures, helps address potential confounding factors that might drive both EMIR exposure and disclosure decisions. The substantial increase in R-squared from 0.10% in the baseline

specification to 91.11% in the full specification demonstrates the importance of these controls while confirming that the treatment effect remains robust to their inclusion.

Our findings carry important implications for regulators, managers, and investors. For regulators, our results suggest that costly regulations can have unintended positive spillover effects on corporate transparency, even for firms outside the primary regulatory jurisdiction. This finding supports the view that regulatory costs can serve as a catalyst for improved disclosure practices, potentially enhancing overall market efficiency (Leuz and Wysocki, 2016). However, regulators should also consider that these benefits come at the expense of increased compliance costs, which may ultimately be borne by shareholders and other stakeholders. For managers, our evidence indicates that voluntary disclosure can serve as an effective tool for mitigating the negative capital market consequences of regulatory compliance costs. This strategic use of disclosure aligns with prior research demonstrating that managers use voluntary disclosure to reduce information asymmetry and lower the cost of capital (Healy and Palepu, 2001; Beyer et al., 2010).

For investors, our findings suggest that regulatory changes affecting firm costs can have important implications for information availability and investment decision-making. The increased voluntary disclosure documented in our study likely provides investors with more timely and comprehensive information about firm performance and risk exposures. However, investors should also recognize that such disclosure increases may signal underlying increases in regulatory burden and compliance costs that could affect firm profitability and valuation. Our results contribute to the broader literature on the costs and benefits of regulation by demonstrating how compliance costs can create indirect incentives for enhanced transparency (Christensen et al., 2013; Shroff et al., 2013).

Our study is subject to several limitations that suggest promising avenues for future research. First, while we focus on the costs channel as the primary mechanism linking EMIR to

voluntary disclosure, other channels such as increased scrutiny from regulators or changes in investor demand for information may also play important roles. Future research could examine these alternative mechanisms more directly through surveys or detailed analysis of specific disclosure types. Second, our analysis focuses on the immediate effects of EMIR implementation, but the long-term consequences of increased compliance costs on disclosure practices remain unclear. Longitudinal studies examining how firms adapt their disclosure strategies over time as they gain experience with regulatory requirements would provide valuable insights into the persistence of these effects.

Third, while we control for observable firm characteristics, unobservable factors correlated with both EMIR exposure and disclosure propensity could potentially bias our results. Future research employing alternative identification strategies or additional instrumental variables could help address these concerns. Finally, our focus on U.S. firms limits the generalizability of our findings to other regulatory contexts. Comparative studies examining how similar regulations affect disclosure practices across different institutional environments would enhance our understanding of the boundary conditions for these effects. Additionally, future research could explore whether the costs channel operates differently across various types of voluntary disclosure, such as management forecasts, conference calls, or sustainability reporting, to provide more granular insights into how regulatory costs shape specific disclosure decisions.

**References**


Acharya, V. V., & Bisin, A. (2014). Counterparty risk externality: Centralized versus over-the-counter markets. Journal of Economic Theory, 149, 153-182.

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.

Beatty, A., Liao, S., & Yu, J. J. (2013). The spillover effect of fraudulent financial reporting on peer firms investment efficiency. Journal of Accounting and Economics, 55 (2-3), 183-205.

Bernard, D., Blackburne, T., & Thornock, J. (2018). Information flows among rivals and corporate investment. Journal of Financial Economics, 136 (3), 760-779.

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.

Billings, M. B., Jennings, R., & Lev, B. (2015). On guidance and volatility. Journal of Accounting and Economics, 60 (2-3), 161-180.

Boone, A. L., & White, J. T. (2015). The effect of institutional ownership on firm transparency and information production. Journal of Financial Economics, 117 (3), 508-533.

Bushee, B. J., & Noe, C. F. (2000). Corporate disclosure practices, institutional investors, and stock return volatility. Journal of Accounting Research, 38, 171-202.

Bushman, R. M., & Smith, A. J. (2001). Financial accounting information and corporate governance. Journal of Accounting and Economics, 32 (1-3), 237-333.

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.

Coates, J. C. (2015). Cost-benefit analysis of financial regulation: Case studies and implications. Yale Law Journal, 124 (4), 882-1011.

Duffie, D., & Zhu, H. (2011). Does a central clearing counterparty reduce counterparty risk? Review of Asset Pricing Studies, 1 (1), 74-95.

Dye, R. A. (2001). An evaluation of essays on disclosure and the disclosure literature in accounting. Journal of Accounting and Economics, 32 (1-3), 181-235.

Goldstein, I., & Yang, L. (2017). Information disclosure in financial markets. Annual Review of Financial Economics, 9, 101-125.

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.

Hirst, D. E., Koonce, L., & Venkataraman, S. (2008). Management earnings forecasts: A review and framework. Accounting Horizons, 22 (3), 315-338.

Kaal, W. A. (2016). Dynamic regulation for innovation. Yale Journal on Regulation, 33 (1), 1-74.

Lang, M., & Lundholm, R. (1993). Cross-sectional determinants of analyst ratings of corporate disclosures. Journal of Accounting Research, 31 (2), 246-271.

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, H., Pincus, M., & Rego, S. O. (2008). Market reaction to events surrounding the Sarbanes-Oxley Act of 2002 and earnings management. Journal of Law and Economics, 51 (1), 111-134.

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

Shroff, N., Verdi, R. S., & Yu, G. (2013). Information environment and the investment decisions of multinational corporations. The Accounting Review, 89 (2), 759-790.

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

# Table 1

Descriptive Statistics

| Variables | N | Mean | Std. Dev. | P25 | Median | P75 |
|---|---|---|---|---|---|---|
| FreqMF | 15,115 | 0.6167 | 0.9038 | 0.0000 | 0.0000 | 1.6094 |
| Treatment Effect | 15,115 | 0.5782 | 0.4939 | 0.0000 | 1.0000 | 1.0000 |
| Institutional ownership | 15,115 | 0.5557 | 0.3328 | 0.2470 | 0.6272 | 0.8479 |
| Firm size | 15,115 | 6.2355 | 2.0920 | 4.7004 | 6.2399 | 7.7034 |
| Book-to-market | 15,115 | 0.6535 | 0.6211 | 0.2864 | 0.5297 | 0.8725 |
| ROA | 15,115 | -0.0290 | 0.2325 | -0.0201 | 0.0244 | 0.0667 |
| Stock return | 15,115 | 0.0124 | 0.4842 | -0.2589 | -0.0644 | 0.1631 |
| Earnings volatility | 15,115 | 0.1318 | 0.2613 | 0.0230 | 0.0533 | 0.1344 |
| Loss | 15,115 | 0.3111 | 0.4630 | 0.0000 | 0.0000 | 1.0000 |
| Class action litigation risk | 15,115 | 0.3664 | 0.2946 | 0.1209 | 0.2731 | 0.5647 |
| Time Trend | 15,115 | 1.9319 | 1.4211 | 1.0000 | 2.0000 | 3.0000 |

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

## Table 2
## Pearson Correlations
## European Market Infrastructure Regulation EMIR European Union 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 | **0.03** | 0.00 | **0.08** | **-0.03** | **0.03** | **0.03** | **-0.02** | **-0.08** | **-0.31** |
| **FreqMF** | **0.03** | 1.00 | **0.41** | **0.44** | **-0.17** | **0.22** | **-0.02** | **-0.17** | **-0.26** | **-0.03** |
| **Institutional ownership** | 0.00 | **0.41** | 1.00 | **0.63** | **-0.24** | **0.32** | **-0.03** | **-0.23** | **-0.29** | **0.06** |
| **Firm size** | **0.08** | **0.44** | **0.63** | 1.00 | **-0.37** | **0.35** | **0.03** | **-0.24** | **-0.40** | **0.10** |
| **Book-to-market** | **-0.03** | **-0.17** | **-0.24** | **-0.37** | 1.00 | **0.07** | **-0.18** | **-0.13** | **0.06** | **-0.03** |
| **ROA** | **0.03** | **0.22** | **0.32** | **0.35** | **0.07** | 1.00 | **0.08** | **-0.51** | **-0.59** | **-0.11** |
| **Stock return** | **0.03** | **-0.02** | **-0.03** | **0.03** | **-0.18** | **0.08** | 1.00 | **0.04** | **-0.08** | **0.04** |
| **Earnings volatility** | **-0.02** | **-0.17** | **-0.23** | **-0.24** | **-0.13** | **-0.51** | **0.04** | 1.00 | **0.33** | **0.12** |
| **Loss** | **-0.08** | **-0.26** | **-0.29** | **-0.40** | **0.06** | **-0.59** | **-0.08** | **0.33** | 1.00 | **0.17** |
| **Class action litigation risk** | **-0.31** | **-0.03** | **0.06** | **0.10** | **-0.03** | **-0.11** | **0.04** | **0.12** | **0.17** | 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 European Market Infrastructure Regulation EMIR European Union on Management Forecast Frequency**

| | (1) | (2) | (3) |
|---|---|---|---|
| Treatment Effect | 0.0579*** (6.18) | 0.0517*** (4.24) | 0.0409*** (4.21) |
| Institutional ownership | | 0.5615*** (11.47) | 0.0768*** (2.58) |
| Firm size | | 0.1185*** (12.32) | 0.0481*** (4.83) |
| Book-to-market | | -0.0446*** (2.89) | 0.0017 (0.18) |
| ROA | | 0.0344 (0.91) | 0.0012 (0.07) |
| Stock return | | -0.0480*** (4.04) | -0.0119 (1.63) |
| Earnings volatility | | -0.0698** (1.99) | -0.0440 (0.96) |
| Loss | | -0.1329*** (6.12) | -0.0673*** (5.52) |
| Class action litigation risk | | -0.1746*** (5.40) | -0.0146 (1.04) |
| Time Trend | | -0.0313*** (6.72) | -0.0069* (1.75) |
| Firm fixed effects | No | No | Yes |
| N | 15,115 | 15,115 | 15,115 |
| $R^2$ | 0.0010 | 0.2352 | 0.9111 |

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