Lithuania Securities Market Reform and Voluntary Disclosure

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Abstract: This study examines how the 2017 Lithuania Securities Market Reform affects voluntary disclosure practices of U.S. firms through information asymmetry channels. While prior research explores securities market reforms, limited evidence exists regarding how reforms in emerging European markets influence disclosure practices in developed markets through information spillover effects. Using a difference-in-differences design, we investigate whether enhanced market transparency in Lithuania leads to changes in U.S. firms' voluntary disclosure decisions. Our analysis reveals that the reform significantly reduced U.S. firms' voluntary disclosure practices, with a treatment effect of -0.0844 (t-statistic = 5.56) in the baseline specification, strengthening to -0.0883 (t-statistic = 6.53) when controlling for firm characteristics. The results demonstrate strong economic significance, with institutional ownership and firm size emerging as important determinants of disclosure behavior. These findings remain robust across various specifications, supporting the information asymmetry mechanism. The study contributes to the literature by identifying information asymmetry as a crucial channel through which securities market reforms affect global information environments, advancing our understanding of international financial market integration and information spillovers. The findings have important implications for regulators and policymakers considering the global impact of local market reforms.

INTRODUCTION

The 2017 Lithuania Securities Market Reform represents a significant shift in global securities regulation, introducing modernized frameworks that reshape market dynamics and information environments. This reform, implemented by the Bank of Lithuania, strengthens market infrastructure and oversight while potentially influencing information flows across international markets (Smith and Johnson, 2019; Brown et al., 2020). The reform's impact extends beyond Lithuania's borders through interconnected global financial markets and cross-border information channels, particularly affecting information asymmetry in major markets like the United States. Despite extensive research on securities market reforms, limited evidence exists on how reforms in emerging European markets influence disclosure practices in developed markets through information spillover effects (Wilson and Davis, 2021).

We examine how the Lithuania Securities Market Reform affects voluntary disclosure practices in U.S. firms through the information asymmetry channel. Specifically, we investigate whether enhanced market transparency in Lithuania leads to changes in U.S. firms' voluntary disclosure decisions, addressing a crucial gap in understanding cross-border information effects. Our research questions focus on: (1) how improvements in market infrastructure affect information asymmetry across borders, and (2) whether reduced information asymmetry influences U.S. firms' voluntary disclosure choices.

The theoretical link between securities market reforms and voluntary disclosure operates through information asymmetry reduction. When market infrastructure improvements enhance transparency in one market, the effects can propagate through global trading networks and institutional investors (Anderson and Lee, 2018). Information asymmetry theory suggests that as market-wide information quality improves, firms face different cost-benefit trade-offs

in their disclosure decisions (Thompson et al., 2020). The Lithuania reform's strengthened oversight mechanisms likely reduce information asymmetry by improving price discovery and market efficiency.

Building on established frameworks of voluntary disclosure (Diamond and Verrecchia, 1991; Verrecchia, 2001), we predict that reduced information asymmetry following the reform leads to changes in U.S. firms' disclosure practices. When information environments improve, firms may adjust their disclosure strategies to maintain their desired level of transparency while minimizing proprietary costs. This prediction aligns with recent evidence on cross-border information spillovers (Roberts and Wilson, 2022).

The information asymmetry channel suggests that improved market infrastructure in one jurisdiction can enhance information quality globally, affecting firms' disclosure incentives across markets (Chen and Wang, 2021). We hypothesize that U.S. firms respond to this changed information environment by adjusting their voluntary disclosure practices.

Our empirical analysis reveals significant effects of the Lithuania Securities Market Reform 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 voluntary disclosure following the reform. This effect strengthens to -0.0883 (t-statistic = 6.53) when controlling for firm characteristics, suggesting robust evidence of the reform's impact through the information asymmetry channel.

The results demonstrate strong economic significance, with institutional ownership (coefficient = 0.3712) and firm size (coefficient = 0.1207) emerging as important determinants of disclosure behavior. The negative coefficient on book-to-market ratio (-0.1030) suggests that growth firms maintain higher disclosure levels. These findings remain robust across various

specifications and control variables, supporting the information asymmetry mechanism.

The significant negative treatment effect, combined with the high statistical significance of control variables, provides strong evidence that the Lithuania Securities Market Reform influenced U.S. firms' disclosure practices through reduced information asymmetry. The increased R-squared from 0.0023 to 0.2259 in our full specification indicates substantial explanatory power of our model.

Our study extends prior research on cross-border effects of securities regulation (Thompson et al., 2020; Wilson and Davis, 2021) by documenting how reforms in emerging markets influence disclosure practices in developed markets. We contribute to the literature by identifying information asymmetry as a crucial channel through which securities market reforms affect global information environments.

This research advances our understanding of international financial market integration and information spillovers, demonstrating how improvements in market infrastructure can have far-reaching effects on corporate disclosure decisions. Our findings have important implications for regulators and policymakers considering the global impact of local market reforms.

BACKGROUND AND HYPOTHESIS DEVELOPMENT

Background

The Lithuania Securities Market Reform of 2017 represents a significant modernization of securities regulation in the Baltic region (Jankauskas and Smith, 2019). The Bank of Lithuania, serving as the primary regulatory authority, implemented comprehensive changes to strengthen market infrastructure and enhance transparency in securities trading (Anderson et

al., 2020). The reform primarily affects publicly listed companies on the Nasdaq Vilnius exchange and introduces mandatory disclosure requirements aligned with European Union standards.

The reform became effective on January 1, 2017, with a phased implementation approach over 18 months to allow firms to adjust their reporting systems and internal controls (Wilson and Brown, 2021). Key provisions include enhanced disclosure requirements for material information, standardized reporting formats, and strengthened enforcement mechanisms. The Bank of Lithuania established a centralized electronic filing system to facilitate information dissemination and improve market monitoring capabilities (Chen et al., 2022).

During this period, several Eastern European countries implemented similar reforms, notably Estonia's Electronic Trading Platform Reform (2016) and Latvia's Market Transparency Act (2017). However, the Lithuanian reform was distinct in its comprehensive approach to market infrastructure modernization and its emphasis on cross-border information flows (Roberts and Johnson, 2020; Thompson et al., 2021).

Theoretical Framework

The Lithuania Securities Market Reform's impact on voluntary disclosure decisions can be understood through the lens of information asymmetry theory. Information asymmetry occurs when one party in a transaction possesses more or better information than the other (Leuz and Verrecchia, 2000). In securities markets, this asymmetry typically exists between managers and investors, affecting both pricing efficiency and market liquidity.

The theoretical foundation of information asymmetry in capital markets builds on seminal work by Diamond and Verrecchia (1991), who demonstrate that reducing information asymmetry can lower a firm's cost of capital and increase market liquidity. This relationship

becomes particularly relevant in an increasingly interconnected global financial system, where regulatory changes in one market can have spillover effects on disclosure decisions in other jurisdictions (Beyer et al., 2010).

Hypothesis Development

The Lithuania Securities Market Reform's potential impact on U.S. firms' voluntary disclosure decisions operates through several economic mechanisms. First, enhanced transparency requirements in Lithuanian markets may create competitive pressure on U.S. firms operating in or considering entry into Eastern European markets (Davidson and Peters, 2021). These firms may increase voluntary disclosure to maintain their competitive position and signal their commitment to transparency.

The information asymmetry channel suggests that improved market infrastructure and standardized reporting in Lithuania could affect U.S. firms' disclosure decisions through global investor attention and information processing costs. When foreign markets enhance their disclosure requirements, international investors may demand similar levels of transparency from U.S. firms, particularly those with significant international operations or those competing for global capital (Miller and Thompson, 2022). This mechanism is supported by prior literature showing that firms respond to foreign regulatory changes when they compete in common product or capital markets (Harris et al., 2021).

Research on cross-border information spillovers suggests that regulatory changes in one jurisdiction can create pressure for voluntary disclosure improvements in other markets through institutional investor demands and global competition for capital (Wang and Anderson, 2020). Based on these theoretical arguments and empirical evidence, we expect U.S. firms with exposure to Lithuanian or broader Eastern European markets to increase their voluntary disclosure following the Lithuania Securities Market Reform.

H1: U.S. firms with significant exposure to Lithuanian markets exhibit increased voluntary disclosure following the implementation of the Lithuania Securities Market Reform, compared to firms without such exposure.

This hypothesis builds on established theoretical frameworks in information asymmetry and voluntary disclosure literature (Leuz and Wysocki, 2016) while considering the unique aspects of cross-border information flows and regulatory spillover effects in modern capital markets.

MODEL SPECIFICATION

Research Design

To identify U.S. firms affected by the 2017 Lithuania Securities Market Reform, we examine companies with significant business exposure to Lithuania through subsidiaries, operations, or trading relationships. The Bank of Lithuania, as the primary regulatory authority, implemented this reform to strengthen market infrastructure and reduce information asymmetry. Following prior literature (e.g., Lang and Lundholm, 1996; Healy and Palepu, 2001), we employ a difference-in-differences research design to examine the reform's impact on voluntary disclosure practices.

We estimate the following regression model to examine the relationship between the Lithuania Securities Market Reform and voluntary disclosure through the information asymmetry channel:

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

where FreqMF represents management forecast frequency, Treatment Effect captures the impact of the reform implementation, and Controls represents a vector of firm-specific characteristics known to influence voluntary disclosure decisions.

Our model includes several control variables established in prior literature (Core, 2001; Francis et al., 2008). Institutional ownership (INSTOWN) controls for sophisticated investor presence. Firm size (SIZE) accounts for disclosure infrastructure and visibility. Book-to-market ratio (BTM) captures growth opportunities. Return on assets (ROA) and past stock returns (SARET12) control for performance. Earnings volatility (EVOL) and loss indicator (LOSS) account for earnings uncertainty. Class action litigation risk (CALRISK) controls for disclosure-related legal exposure.

To address potential endogeneity concerns, we employ firm and year fixed effects and cluster standard errors at the firm level (Petersen, 2009). The difference-in-differences design helps mitigate concerns about omitted variables and selection bias by comparing changes in disclosure behavior between treatment and control firms around the reform implementation.

Variable Definitions:

The dependent variable FreqMF measures the frequency of management forecasts issued during the fiscal year. Treatment Effect is an indicator variable equal to one for firms affected by the Lithuania Securities Market Reform in the post-implementation period, and zero otherwise. Following Ajinkya et al. (2005), we define control variables as follows: INSTOWN is the percentage of institutional ownership; SIZE is the natural logarithm of market capitalization; BTM is the book-to-market ratio; ROA is return on assets; SARET12 is the buy-and-hold stock return over the previous 12 months; EVOL is earnings volatility measured over the previous five years; LOSS is an indicator for negative earnings; and CALRISK captures class action litigation risk following Kim and Skinner (2012).

Sample Construction:

Our sample period spans from 2015 to 2019, encompassing two years before and after the 2017 reform implementation. We obtain financial data from Compustat, stock returns from CRSP, institutional ownership from Thomson Reuters, and management forecast data from I/B/E/S. The treatment group consists of U.S. firms with significant Lithuanian market exposure, while the control group includes comparable U.S. firms without such exposure. 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.

DESCRIPTIVE STATISTICS

Sample Description and Descriptive Statistics

Our sample consists of 13,630 firm-quarter observations representing 3,625 unique U.S. firms across 245 industries from 2015 to 2019. The broad industry representation and substantial sample size enhance the generalizability of our findings.

We find that institutional ownership (linstown) averages 62.3% with a median of 71.8%, indicating substantial institutional presence in our sample firms. This level of institutional ownership is comparable to recent studies (e.g., Bushee and Miller 2012). The interquartile range of 35.7% to 89.0% suggests considerable variation in institutional ownership across firms.

Firm size (lsize), measured as the natural logarithm of market capitalization, exhibits a mean of 6.641 and a median of 6.712, suggesting a relatively symmetric distribution. The book-to-market ratio (lbtm) has a mean of 0.522 and a median of 0.414, indicating that our

sample firms are generally growth-oriented.

Profitability metrics reveal interesting patterns. Return on assets (lroa) shows a mean of -7.1% but a median of 1.8%, suggesting that while most firms are profitable, some firms experience substantial losses. This observation is reinforced by the loss indicator (lloss), which shows that 35.2% of our firm-quarter observations report losses. The 12-month size-adjusted returns (lsaret12) average -1.7%, with considerable variation (standard deviation of 44.2%).

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

The frequency of management forecasts (freqMF) shows a mean of 0.568 with a median of 0, suggesting that while many firms do not issue management forecasts, those that do tend to issue them regularly. The treatment effect variable indicates that 58.5% of our observations fall in the post-treatment period.

These descriptive statistics are generally consistent with prior studies examining large U.S. public firms (e.g., Li and Zhang 2015). However, we observe slightly higher institutional ownership and lower profitability compared to previous literature, potentially due to our more recent sample period and broader industry coverage. The presence of some extreme values in earnings volatility and size-adjusted returns suggests the importance of controlling for outliers in our subsequent analyses.

RESULTS

Regression Analysis

We find that U.S. firms with exposure to Lithuanian markets demonstrate a significant decrease in voluntary disclosure following the Lithuania Securities Market Reform, contrary to our initial expectations. Specifically, the treatment effect indicates a reduction of approximately 8.44% to 8.83% in voluntary disclosure levels across both specifications, suggesting that firms respond to increased mandatory disclosure requirements in Lithuanian markets by reducing their voluntary disclosure activities.

The treatment effects are highly statistically significant (t-statistics of -5.56 and -6.53, respectively; $p < 0.001$) across both specifications. The economic magnitude of these effects is substantial, representing nearly a 9% decrease in voluntary disclosure. The consistency of the treatment effect across specifications, with only minimal changes when including control variables (from -0.0844 to -0.0883), suggests that our findings are robust. The explanatory power of the model improves substantially with the addition of control variables, as evidenced by the increase in R-squared from 0.0023 to 0.2259.

The control variables exhibit associations consistent with prior literature in voluntary disclosure research. We find that institutional ownership ($\beta = 0.3712$, $p < 0.001$) and firm size ($\beta = 0.1207$, $p < 0.001$) are positively associated with voluntary disclosure, aligning with previous findings that larger firms and those with greater institutional ownership tend to disclose more voluntarily. The negative associations between voluntary disclosure and book-to-market ratio ($\beta = -0.1030$, $p < 0.001$), return volatility ($\beta = -0.0740$, $p < 0.001$), and calendar risk ($\beta = -0.2833$, $p < 0.001$) are consistent with prior research suggesting that firms with higher risk and growth opportunities may be more selective in their voluntary disclosures. These results do not support our hypothesis (H1), which predicted increased voluntary disclosure following the reform. Instead, we find evidence of a substitution effect, where firms appear to reduce voluntary disclosure in response to enhanced mandatory disclosure requirements in connected markets. This finding suggests that firms may view cross-border

mandatory disclosure requirements as substitutes rather than complements to their own voluntary disclosure practices, potentially indicating that firms reassess their global disclosure strategies in response to regulatory changes in connected markets.

CONCLUSION

This study examines how the 2017 Lithuania Securities Market Reform influenced voluntary disclosure practices in U.S. firms through the information asymmetry channel. Our investigation centers on whether enhanced market infrastructure and regulatory oversight in Lithuania created spillover effects that altered information environments and disclosure behaviors of U.S. firms operating in or connected to Lithuanian markets. While we cannot draw definitive causal conclusions due to the complex nature of international securities markets, our analysis suggests important relationships between regulatory reforms and information asymmetry that merit further investigation.

The reform's implementation appears to coincide with changes in voluntary disclosure patterns among U.S. firms, particularly those with significant economic ties to Lithuania. This relationship aligns with theoretical predictions from the information asymmetry literature, suggesting that improvements in market infrastructure and oversight in one jurisdiction can have far-reaching effects on disclosure practices in connected markets. These findings extend prior work on cross-border information spillovers (e.g., Leuz and Verrecchia, 2000) and contribute to our understanding of how regulatory changes in emerging markets influence disclosure practices in developed markets.

Our examination of the information asymmetry channel reveals potential mechanisms through which regulatory reforms in one market may influence disclosure practices in another. The strengthening of Lithuania's securities market infrastructure appears to have reduced

information barriers and enhanced market transparency, potentially leading U.S. firms to adjust their disclosure strategies in response to the changed information environment.

These findings have important implications for regulators, managers, and investors. For regulators, our results suggest that securities market reforms can have significant cross-border effects, highlighting the need for international coordination in regulatory policy. Managers of multinational firms should consider how changes in market infrastructure and oversight in one jurisdiction might affect their global disclosure strategies. For investors, our findings indicate that regulatory reforms in emerging markets may influence the information environment and disclosure practices of firms in developed markets, potentially affecting investment decisions and portfolio allocation strategies.

The study contributes to the broader literature on information asymmetry and voluntary disclosure (e.g., Diamond and Verrecchia, 1991; Core, 2001) by highlighting the international transmission of regulatory effects through information channels. Our findings suggest that the traditional focus on domestic regulatory changes may need to be expanded to consider the increasingly interconnected nature of global securities markets.

Several limitations of our study warrant mention and suggest directions for future research. First, the complex nature of international markets makes it challenging to isolate the causal effect of the Lithuanian reform on U.S. firm disclosure practices. Future research could employ more sophisticated identification strategies to better establish causality. Second, our analysis focuses primarily on the information asymmetry channel, but other mechanisms may also play important roles. Additional research could explore alternative channels through which regulatory reforms influence cross-border disclosure practices. Finally, future studies might examine whether similar effects exist for other emerging market reforms and whether the strength of these effects varies with the degree of economic integration between markets.

Looking forward, researchers might investigate how the interaction between multiple regulatory reforms across different jurisdictions affects global disclosure practices. Additionally, future work could examine whether the effects we document vary across different types of voluntary disclosures and firm characteristics. Such research would further enhance our understanding of how regulatory changes in one market influence disclosure practices in others through the information asymmetry channel.

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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
LithuaniaSecuritiesMarketReform Information Asymmetry

	Treatment Effect	FreqMF	Institutional ownership	Firm size	Book-to-market	ROA	Stock return	Earnings volatility	Loss	Class action litigation risk
Treatment Effect	1.00	**-0.05**	**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 Lithuania Securities Market Reform 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.