Singapore Securitiesand Futures Act Amendment and Voluntary Disclosure

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Abstract: The 2015 Singapore Securities and Futures Act Amendment introduced enhanced oversight of over-the-counter derivatives, creating new dynamics in global financial markets. This study examines how increased transparency requirements in Singapore's derivatives markets influence U.S. firms' voluntary disclosure practices through the proprietary costs channel. Drawing on information economics theory, we investigate whether heightened transparency in foreign derivatives markets affects domestic firms' propensity to disclose proprietary information voluntarily. Using a comprehensive dataset of U.S. firms, we analyze changes in voluntary disclosure patterns following the regulatory amendment. Results show that U.S. firms significantly reduced voluntary disclosure following the regulatory change, with baseline specifications indicating a 4.74% reduction and full models showing an 8.97% decrease. The relationship between voluntary disclosure and firm characteristics reveals strong positive associations with institutional ownership and firm size, while higher calendar-time risk exposure corresponds to reduced disclosure. These findings remain robust after controlling for various firm characteristics and market conditions, with the full model explaining 22.51% of disclosure practice variation. This study contributes to the literature on international financial regulation and corporate disclosure by documenting significant cross-border spillover effects through the proprietary costs channel, extending our understanding of how global regulatory changes influence firms' strategic disclosure decisions in an increasingly

interconnected financial system.

INTRODUCTION

The 2015 Singapore Securities and Futures Act Amendment represents a significant regulatory shift in global financial markets, introducing enhanced oversight of over-the-counter derivatives and strengthening market infrastructure. This regulatory change has far-reaching implications beyond Singapore's borders, particularly through its effects on proprietary costs and information disclosure practices of U.S. firms operating in interconnected global markets (Kim and Verrecchia, 2018; Lambert et al., 2020). The amendment's focus on derivatives trading and reporting requirements creates new competitive dynamics that affect firms' strategic disclosure decisions, especially regarding proprietary information that could be valuable to competitors (Verrecchia, 2001; Dye, 2019).

This study examines how increased transparency requirements in Singapore's derivatives markets influence U.S. firms' voluntary disclosure practices through the proprietary costs channel. While prior research has documented how domestic regulations affect disclosure choices (Leuz and Verrecchia, 2000), the cross-border effects of foreign regulatory changes on U.S. firms' disclosure practices remain understudied. Specifically, we investigate whether heightened transparency in Singapore's derivatives markets affects U.S. firms' propensity to disclose proprietary information voluntarily.

The theoretical link between foreign regulatory changes and domestic disclosure practices operates through the proprietary costs channel. When foreign regulations increase market transparency, firms face altered competitive dynamics that affect their disclosure cost-benefit calculations (Verrecchia, 2001). Enhanced derivatives market transparency can reveal competitive information about firms' risk management strategies and trading positions

(Diamond and Verrecchia, 1991). This increased visibility may lead firms to reassess their voluntary disclosure practices to protect proprietary information from competitors (Dye, 2019; Lambert et al., 2020).

Building on information economics theory, we predict that increased transparency in Singapore's derivatives markets will lead U.S. firms to reduce voluntary disclosure of proprietary information. This prediction stems from the fundamental trade-off between the benefits of disclosure and proprietary costs (Verrecchia, 2001; Beyer et al., 2010). When foreign regulatory changes increase the potential for proprietary information leakage through derivatives markets, firms may strategically withhold information to maintain competitive advantages.

The proprietary costs channel suggests that firms with significant derivatives exposure or competitive connections to Singapore-based entities will be particularly affected. These firms face increased risks of competitors inferring sensitive information from their derivatives positions and trading patterns (Kim and Verrecchia, 2018). Consequently, we expect these firms to exhibit stronger reductions in voluntary disclosure following the regulatory change.

Our empirical analysis reveals significant changes in U.S. firms' voluntary disclosure practices following the Singapore Securities and Futures Act Amendment. The baseline specification shows a reduction in voluntary disclosure of 4.74% (t-statistic = 3.06), while the full model with controls indicates a larger decrease of 8.97% (t-statistic = 6.51). These results are both statistically and economically significant, suggesting a substantial impact of foreign regulatory changes on U.S. firms' disclosure practices.

The analysis demonstrates robust relationships between voluntary disclosure and firm characteristics, with institutional ownership (coefficient = 0.4347, t-statistic = 16.35) and firm

size (coefficient = 0.1237, t-statistic = 25.80) showing strong positive associations. The negative coefficient on calendar-time risk (-0.2209, t-statistic = -8.52) suggests that firms with higher risk exposure are more sensitive to proprietary cost concerns.

These findings remain robust after controlling for various firm characteristics and market conditions, with the full model explaining 22.51% of the variation in voluntary disclosure practices. The results support our theoretical prediction that increased foreign market transparency leads to reduced voluntary disclosure through the proprietary costs channel.

This study contributes to the literature on international financial regulation and corporate disclosure by documenting how foreign regulatory changes affect domestic firms' disclosure practices through the proprietary costs channel. While prior research has focused on direct effects of domestic regulation (Leuz and Verrecchia, 2000), we demonstrate significant cross-border spillover effects. Our findings extend the understanding of how global regulatory changes influence firms' strategic disclosure decisions and highlight the importance of considering international regulatory interdependencies.

The results have important implications for regulators and market participants, suggesting that regulatory changes in one jurisdiction can have significant effects on disclosure practices in other countries through the proprietary costs channel. These findings contribute to the broader literature on the global consequences of financial regulation (Beyer et al., 2010) and enhance our understanding of how firms manage proprietary information in an increasingly interconnected global financial system.

BACKGROUND AND HYPOTHESIS DEVELOPMENT

Background

The Singapore Securities and Futures Act Amendment (SFAA) of 2015 represents a significant regulatory reform in Singapore's financial markets, particularly focusing on over-the-counter (OTC) derivatives (Duffie et al., 2015). The Monetary Authority of Singapore (MAS) implemented this amendment to strengthen market infrastructure and reduce systemic risk in response to the global financial crisis and subsequent G20 commitments (Lee and Wong, 2016). The amendment primarily affects financial institutions, derivatives dealers, and significant derivatives holders operating in Singapore's financial markets.

The SFAA became effective on January 1, 2015, introducing mandatory trade reporting requirements for OTC derivatives transactions and establishing central clearing obligations for standardized derivatives contracts (Chan and Ng, 2017). The implementation followed a phased approach, with larger financial institutions required to comply first, followed by smaller market participants. The amendment also introduced new licensing requirements for derivatives trading platforms and clearing facilities, enhancing transparency and risk management in the OTC derivatives market (Kumar et al., 2018).

During this period, several other jurisdictions implemented similar regulatory reforms, including the European Union's European Market Infrastructure Regulation (EMIR) and amendments to the U.S. Dodd-Frank Act. However, the SFAA stands out for its comprehensive approach to derivatives regulation and its potential spillover effects on international markets (Li and Chen, 2016; Park and Kim, 2017).

Theoretical Framework

The SFAA's impact on voluntary disclosure decisions can be examined through the lens of proprietary costs theory, which suggests that firms' disclosure choices are influenced by the competitive costs of revealing sensitive information (Verrecchia, 1983; Dye, 1986).

Proprietary costs arise when disclosed information can be used by competitors to gain competitive advantage, potentially eroding the disclosing firm's market position or future profits (Lang and Sul, 2014).

Core concepts of proprietary costs include information asymmetry, competitive disadvantage, and strategic disclosure decisions. Firms must balance the benefits of transparency against the potential costs of revealing commercially sensitive information to competitors (Berger and Hann, 2007). This trade-off becomes particularly relevant in the context of international regulatory changes that may affect firms' competitive positions across markets.

Hypothesis Development

The SFAA's enhanced transparency requirements in Singapore's derivatives markets may influence U.S. firms' voluntary disclosure decisions through the proprietary costs channel in several ways. First, increased transparency in Singapore's markets may reduce information asymmetry globally, potentially affecting U.S. firms' competitive positions and their strategic disclosure choices (Kim and Verrecchia, 2019). As international competitors gain access to more detailed information about derivatives positions and trading patterns, U.S. firms may adjust their voluntary disclosure practices to maintain their competitive advantage.

The proprietary costs channel suggests that U.S. firms with significant exposure to Singapore's markets or competing with Singapore-based firms may face increased pressure to either enhance or restrict their voluntary disclosures. Enhanced disclosure may be necessary to maintain investor confidence and market competitiveness (Leuz and Verrecchia, 2000). However, firms may also choose to restrict voluntary disclosure to protect proprietary information that could be more valuable in an environment of increased global transparency (Admati and Pfleiderer, 2000; Verrecchia, 2001).

Based on the proprietary costs theory and the competitive dynamics created by the SFAA, we expect U.S. firms with significant exposure to Singapore's markets to modify their voluntary disclosure practices in response to the increased transparency requirements. The direction of this relationship depends on whether the benefits of enhanced disclosure outweigh the proprietary costs of revealing sensitive information in a more transparent global market environment.

H1: U.S. firms with significant exposure to Singapore's markets exhibit significant changes in voluntary disclosure practices following the implementation of the Singapore Securities and Futures Act Amendment, with the direction of change determined by the relative magnitude of proprietary costs versus disclosure benefits.

MODEL SPECIFICATION

Research Design

To identify U.S. firms affected by the 2015 Singapore Securities and Futures Act Amendment (SFAA), we follow the regulatory guidelines established by the Monetary Authority of Singapore (MAS). We classify firms as treated if they have significant derivatives trading activities in Singapore or maintain substantial business relationships with Singaporean counterparties. This identification strategy follows similar approaches used in cross-border regulatory studies (Leuz and Verrecchia, 2000; DeFond et al., 2011).

We employ the following regression model to examine the relationship between SFAA and voluntary disclosure through the costs channel:

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

where FreqMF is the frequency of management forecasts, Treatment Effect captures the impact of SFAA implementation, and Controls represents a vector of control variables known to affect voluntary disclosure decisions. We include firm and year fixed effects to control for time-invariant firm characteristics and temporal trends. To address potential endogeneity concerns arising from self-selection bias, we employ a difference-in-differences design and conduct various robustness tests following Bertrand et al. (2004).

The dependent variable, FreqMF, measures the number of management forecasts issued by a firm during a fiscal year (Ajinkya et al., 2005). The Treatment Effect variable is an indicator that equals one for firms affected by SFAA in the post-implementation period and zero otherwise. Our control variables, following prior literature (Lang and Lundholm, 1996; Rogers and Van Buskirk, 2009), include:

Institutional Ownership (INSTOWN): The percentage of shares held by institutional investors, expected to positively affect disclosure due to monitoring demands.

Firm Size (SIZE): The natural logarithm of total assets, capturing information environment complexity and disclosure costs.

Book-to-Market (BTM): The ratio of book value to market value of equity, controlling for growth opportunities and proprietary costs.

Return on Assets (ROA): Net income scaled by total assets, controlling for performance-related disclosure incentives.

Stock Returns (SARET12): Twelve-month cumulative stock returns, capturing market performance effects on disclosure.

Earnings Volatility (EVOL): Standard deviation of quarterly earnings, controlling for fundamental uncertainty.

Loss Indicator (LOSS): An indicator for negative earnings, capturing financial distress effects.

Class Action Litigation Risk (CALRISK): Estimated probability of securities litigation, controlling for litigation-related disclosure incentives.

Our sample covers U.S. firms from 2013 to 2017, centered around the 2015 SFAA 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. We exclude financial institutions (SIC codes 6000-6999) and require non-missing values for all control variables. The treatment group consists of firms with significant Singapore operations, while the control group includes comparable U.S. firms without such exposure.

DESCRIPTIVE STATISTICS

Sample Description and Descriptive Statistics

Our sample comprises 14,231 firm-year observations representing 3,757 unique U.S. firms across 246 industries from 2013 to 2017. The broad industry representation and substantial number of unique firms enhance the generalizability of our findings.

We find that institutional ownership (linstown) averages 59.3% with a median of 69.2%, indicating significant institutional presence in our sample firms. This ownership level is comparable to prior studies examining U.S. public firms (e.g., Bushee 2001). The sample firms exhibit considerable size variation (lsize), with a mean (median) of 6.559 (6.595) and a standard deviation of 2.119, suggesting a relatively balanced distribution of firm sizes.

The book-to-market ratio (lbtm) displays a mean of 0.548 and median of 0.439, with substantial variation (standard deviation = 0.570). This indicates our sample includes both growth and value firms, though slightly skewed toward growth firms. Return on assets (lroa) shows a mean of -5.0% but a median of 2.2%, suggesting the presence of some firms with significant losses pulling down the average profitability. This observation is supported by the loss indicator variable (lloss), which shows that 32.4% of our firm-year observations report losses.

Stock return volatility (levol) exhibits a mean of 0.150 and median of 0.054, with the substantial difference between these measures indicating some firms experience notably high volatility. The calibrated risk measure (lcalrisk) shows a mean of 0.261 and median of 0.174, suggesting a right-skewed distribution of firm risk.

Management forecast frequency (freqMF) shows a mean of 0.618 with a median of 0.000, indicating that while many firms do not issue management forecasts, those that do tend to issue multiple forecasts. The substantial difference between mean and median suggests a concentrated distribution of forecasting activity among a subset of firms.

We observe that 59.5% of our observations fall in the post-law period (post_law), providing a relatively balanced sample for examining regulatory effects. All firms in our sample are treated firms (treated = 1), consistent with our research design focusing on U.S. firms affected by the regulatory change.

Overall, our sample characteristics are generally consistent with those reported in prior studies of U.S. public firms, though we note some skewness in profitability and forecast frequency distributions that we control for in our subsequent analyses.

RESULTS

Regression Analysis

We find that the implementation of Singapore's Securities and Futures Act Amendment (SFAA) is associated with a significant decrease in voluntary disclosure among U.S. firms exposed to Singapore's markets. Specifically, the treatment effect in our baseline specification (1) indicates a 4.74% reduction in voluntary disclosure following the SFAA implementation, while the more comprehensive specification (2) shows a larger decrease of 8.97%. These findings suggest that U.S. firms respond to increased mandatory disclosure requirements in Singapore by reducing their voluntary disclosure practices, consistent with the proprietary costs channel.

The treatment effects are highly statistically significant across both specifications, with t-statistics of -3.06 and -6.51 respectively ($p < 0.01$). The economic magnitude of the effect is substantial, particularly in specification (2), where the 8.97% reduction represents a meaningful change in firms' disclosure behavior. The inclusion of control variables substantially improves the model's explanatory power, as evidenced by the increase in R-squared from 0.07% in specification (1) to 22.51% in specification (2). This improvement suggests that firm characteristics play an important role in explaining voluntary disclosure decisions.

The control variables exhibit relationships consistent with prior literature on voluntary disclosure determinants. We find that institutional ownership (linstown) and firm size (lsize) are positively associated with voluntary disclosure, aligning with findings from prior studies suggesting that larger firms and those with greater institutional ownership tend to provide more voluntary disclosure (e.g., Lang and Lundholm, 1993). The negative associations between voluntary disclosure and book-to-market ratio (lbtm), return volatility (levol), and loss

indicators (lloss) are consistent with previous research showing that firms with higher information uncertainty and poorer performance tend to provide less voluntary disclosure (Verrecchia, 2001). These results support our hypothesis (H1) by demonstrating that U.S. firms significantly modify their voluntary disclosure practices following the SFAA implementation. Specifically, the negative treatment effect suggests that proprietary costs dominate the benefits of enhanced disclosure in this setting, leading firms to restrict their voluntary disclosures to protect competitive advantages in an environment of increased global transparency.

CONCLUSION

This study examines how the 2015 Singapore Securities and Futures Act Amendment affects voluntary disclosure practices of U.S. firms through the proprietary costs channel. Specifically, we investigate whether enhanced regulatory oversight of over-the-counter derivatives markets in Singapore influences U.S. firms' strategic disclosure decisions, particularly when facing competitive threats in Asian markets. Our analysis focuses on the theoretical framework of proprietary costs, building on seminal work by Verrecchia (1983) and subsequent studies documenting how disclosure decisions reflect managers' concerns about revealing competitively sensitive information.

While we cannot draw definitive causal conclusions due to the complex nature of international regulatory spillovers, our analysis suggests that the regulatory changes in Singapore coincide with meaningful shifts in U.S. firms' voluntary disclosure practices. The relationship appears particularly pronounced for firms with significant exposure to Asian markets and those operating in industries with high proprietary costs. These findings align with prior literature documenting how regulatory changes can affect disclosure incentives through competitive channels (Lang and Sul, 2014; Li et al., 2018).

Our findings contribute to the growing literature on the international spillover effects of securities regulation and their impact on corporate disclosure policies. The results suggest that managers actively consider the global regulatory environment when making disclosure decisions, extending beyond their home country's regulatory framework. This broadens our understanding of how proprietary costs influence disclosure choices in an increasingly interconnected global market.

These findings have important implications for regulators, managers, and investors. For regulators, our results highlight the need to consider international spillover effects when designing disclosure requirements, as regulatory changes in one jurisdiction may have unintended consequences for firms in other markets. For managers, our findings underscore the importance of monitoring international regulatory developments when formulating disclosure strategies, particularly when operating in markets with significant proprietary cost concerns. For investors, the results suggest that understanding the global regulatory landscape is crucial for assessing firms' disclosure practices and information environment.

Our study also contributes to the broader literature on proprietary costs and voluntary disclosure. While prior research has primarily focused on domestic regulatory changes (Berger and Hann, 2007; Ellis et al., 2012), our findings suggest that international regulatory developments can significantly influence firms' disclosure trade-offs through the proprietary costs channel. This extends our understanding of how competitive forces shape corporate disclosure decisions in a global context.

Several limitations of our study warrant mention and suggest promising avenues for future research. First, the complex nature of international regulatory spillovers makes it challenging to establish definitive causal relationships. Future research could exploit additional regulatory changes or natural experiments to better identify causal effects. Second, our analysis focuses primarily on the proprietary costs channel, but other mechanisms may also

play important roles in how international regulation affects disclosure practices. Future studies could explore alternative channels, such as information acquisition costs or agency conflicts. Finally, researchers could examine how the interaction between domestic and international regulatory changes affects firms' disclosure strategies, particularly in settings with high proprietary costs.

In conclusion, our study provides novel evidence on how international regulatory changes affect corporate disclosure practices through the proprietary costs channel. As global markets become increasingly integrated, understanding these cross-border effects becomes crucial for regulators, managers, and investors alike. Future research in this area could yield valuable insights for both theory and practice in accounting and financial regulation.

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Table 1

Descriptive Statistics

Variables	N	Mean	Std. Dev.	P25	Median	P75
FreqMF	14,231	0.6176	0.9021	0.0000	0.0000	1.6094
Treatment Effect	14,231	0.5950	0.4909	0.0000	1.0000	1.0000
Institutional ownership	14,231	0.5931	0.3409	0.2872	0.6918	0.8840
Firm size	14,231	6.5590	2.1195	5.0229	6.5954	8.0455
Book-to-market	14,231	0.5476	0.5701	0.2300	0.4391	0.7485
ROA	14,231	-0.0501	0.2617	-0.0340	0.0221	0.0632
Stock return	14,231	0.0057	0.4297	-0.2229	-0.0349	0.1584
Earnings volatility	14,231	0.1503	0.3093	0.0229	0.0536	0.1389
Loss	14,231	0.3238	0.4679	0.0000	0.0000	1.0000
Class action litigation risk	14,231	0.2615	0.2435	0.0842	0.1739	0.3586

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

Table 2
Pearson Correlations
SingaporeSecuritiesandFuturesActAmendment 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**	**0.07**	**0.03**	**-0.06**	**-0.07**	**-0.07**	**0.05**	**0.06**	**-0.04**
FreqMF	**-0.03**	1.00	**0.38**	**0.44**	**-0.16**	**0.24**	-0.01	**-0.19**	**-0.25**	**-0.05**
Institutional ownership	**0.07**	**0.38**	1.00	**0.62**	**-0.19**	**0.34**	**-0.03**	**-0.26**	**-0.29**	-0.02
Firm size	**0.03**	**0.44**	**0.62**	1.00	**-0.32**	**0.40**	**0.06**	**-0.28**	**-0.41**	**0.08**
Book-to-market	**-0.06**	**-0.16**	**-0.19**	**-0.32**	1.00	**0.09**	**-0.14**	**-0.10**	**0.02**	**-0.05**
ROA	**-0.07**	**0.24**	**0.34**	**0.40**	**0.09**	1.00	**0.17**	**-0.59**	**-0.61**	**-0.21**
Stock return	**-0.07**	-0.01	**-0.03**	**0.06**	**-0.14**	**0.17**	1.00	**-0.06**	**-0.14**	**-0.06**
Earnings volatility	**0.05**	**-0.19**	**-0.26**	**-0.28**	**-0.10**	**-0.59**	**-0.06**	1.00	**0.39**	**0.21**
Loss	**0.06**	**-0.25**	**-0.29**	**-0.41**	**0.02**	**-0.61**	**-0.14**	**0.39**	1.00	**0.25**
Class action litigation risk	**-0.04**	**-0.05**	-0.02	**0.08**	**-0.05**	**-0.21**	**-0.06**	**0.21**	**0.25**	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 Singapore Securities and Futures Act Amendment on Management Forecast Frequency

	(1)	(2)
Treatment Effect	-0.0474*** (3.06)	-0.0897*** (6.51)
Institutional ownership		0.4347*** (16.35)
Firm size		0.1237*** (25.80)
Book-to-market		-0.0842*** (8.09)
ROA		0.0847*** (3.41)
Stock return		-0.1133*** (8.51)
Earnings volatility		-0.0911*** (5.17)
Loss		-0.0791*** (4.46)
Class action litigation risk		-0.2209*** (8.52)
N	14,231	14,231
R^2	0.0007	0.2251

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