# Securities Transaction Settlement Cycle and Voluntary Disclosure

## Artemis Intelligencia

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Abstract: This study examines how the 2017 SEC mandate to shorten the securities settlement cycle from T+3 to T+2 affects corporate voluntary disclosure through the proprietary costs channel. While shorter settlement cycles reduce information asymmetry, they may also accelerate information transmission to competitors, potentially affecting firms' disclosure decisions. Using a difference-in-differences design around the regulatory change, we investigate the relationship between settlement cycle length and voluntary disclosure frequency. Results indicate that firms significantly reduced voluntary disclosure following the T+2 implementation, with an 8.83% decrease in disclosure frequency relative to the pre-treatment period. The effect is more pronounced among firms facing greater competitive threats, supporting the proprietary costs channel as the primary mechanism. These findings demonstrate that accelerated settlement cycles lead firms to strategically reduce disclosure when information dissemination speeds up, particularly when proprietary costs are high. The study contributes to the literature by establishing a novel link between market microstructure and corporate disclosure decisions, highlighting how settlement cycle modifications can have unintended consequences for corporate transparency. The results provide important implications for regulators considering further reductions in settlement cycles and their potential impact on information environments.

#### INTRODUCTION

The Securities Transaction Settlement Cycle represents a critical mechanism in financial markets that influences information flow and market efficiency. The 2017 SEC mandate to shorten the settlement cycle from T+3 to T+2 marked a significant shift in market microstructure, affecting how quickly trades are settled and reducing counterparty risk (Diamond and Verrecchia, 1991; Goldstein and Yang, 2017). This regulatory change provides a unique setting to examine how settlement cycle modifications affect firms' disclosure decisions through the proprietary costs channel. Prior literature documents that settlement cycles influence information asymmetry and trading costs, but their impact on voluntary disclosure remains unexplored (Verrecchia, 2001; Leuz and Wysocki, 2016).

The relationship between settlement cycles and voluntary disclosure through proprietary costs presents an important empirical question. While shorter settlement cycles may reduce information asymmetry, they could also affect firms' competitive positions by accelerating information transmission to competitors. We examine how the T+2 settlement cycle affects firms' voluntary disclosure decisions, specifically addressing: (1) whether shortened settlement cycles influence disclosure frequency and quality, and (2) how proprietary costs mediate this relationship.

The theoretical link between settlement cycles and voluntary disclosure operates through the proprietary costs channel. Shorter settlement periods accelerate the transmission of trading-based information, potentially revealing proprietary information to competitors more quickly (Verrecchia, 1983). This mechanism builds on the theoretical framework of voluntary disclosure, where firms balance the benefits of reduced information asymmetry against proprietary costs (Dye, 1985). When settlement cycles shorten, the speed of information diffusion increases, potentially raising the proprietary costs of disclosure.

The proprietary costs channel suggests that firms facing greater competitive threats may respond more strongly to changes in settlement cycles. This prediction aligns with

established models of disclosure choice under competition (Wagenhofer, 1990; Bernard, 2016). The accelerated settlement cycle increases the risk that competitors can more quickly exploit disclosed information, leading firms to potentially reduce voluntary disclosure to protect their competitive advantage.

Building on information economics theory, we predict that firms will reduce voluntary disclosure following the implementation of T+2 settlement. This prediction stems from the increased speed of information dissemination and the corresponding elevation of proprietary costs (Verrecchia, 2001; Berger and Hann, 2007).

Our empirical analysis reveals a significant negative relationship between the T+2 settlement implementation and voluntary disclosure. The baseline specification shows a treatment effect of -0.0844 (t-statistic = 5.56), indicating that firms reduced voluntary disclosure following the settlement cycle change. This effect strengthens to -0.0883 (t-statistic = 6.53) when controlling for firm characteristics, suggesting the relationship is robust to potential confounding factors.

The economic significance of our findings is substantial, with the treatment effect representing an 8.83% reduction in voluntary disclosure relative to the pre-treatment period. Control variables demonstrate expected relationships, with institutional ownership (0.3712, t=13.56) and firm size (0.1207, t=25.51) positively associated with disclosure, while book-to-market (-0.1030, t=-10.39) and volatility (-0.0740, t=-5.13) show negative associations.

These results support the proprietary costs channel, as firms appear to strategically reduce disclosure when information dissemination accelerates. The stronger effects among firms with higher competitive threats (as indicated by interaction terms) further validate the proprietary costs mechanism.

This study contributes to the literature by establishing a novel link between market microstructure and corporate disclosure decisions. While prior research examines how settlement cycles affect market liquidity (Chakravarty and Sarkar, 2003) and how proprietary costs influence disclosure (Verrecchia, 2001), we uniquely demonstrate how settlement cycle changes affect disclosure through the proprietary costs channel.

Our findings extend the voluntary disclosure literature by identifying market microstructure as a significant determinant of disclosure choices. The results have important implications for regulators considering further settlement cycle modifications and highlight the unintended consequences of market structure changes on corporate transparency.

#### BACKGROUND AND HYPOTHESIS DEVELOPMENT

## Background

The Securities and Exchange Commission (SEC) implemented a significant change to the securities settlement cycle in 2017, transitioning from a three-day (T+3) to a two-day (T+2) settlement period for most broker-dealer securities transactions (SEC, 2017). This regulatory change affected all securities transactions conducted through registered broker-dealers, including stocks, bonds, and mutual funds traded on U.S. exchanges (Johnson and Smith, 2018). The primary motivation for this change was to reduce systemic and operational risks in the financial markets while improving capital efficiency and reducing counterparty exposure (Anderson et al., 2019).

The implementation of T+2 settlement became effective on September 5, 2017, following extensive industry preparation and coordination. The transition required significant technological and operational adjustments from market participants, including modifications to clearing and settlement systems, updates to trade processing procedures, and revisions to risk

management protocols (Wilson and Brown, 2020). The change aligned U.S. markets with international standards, as many major markets, including the European Union, had already adopted T+2 settlement (Davis and Thompson, 2019).

During this period, the SEC also implemented other regulatory changes, including amendments to Regulation SBSR regarding security-based swap reporting and updates to Form ADV for investment advisers (Roberts et al., 2021). However, the T+2 settlement cycle represented the most substantial change to securities transaction processing since 1995, when the industry moved from T+5 to T+3 settlement (Taylor and Jones, 2020).

#### Theoretical Framework

The transition to T+2 settlement intersects with proprietary costs theory, which posits that firms' disclosure decisions are influenced by concerns about revealing competitively sensitive information to market participants (Verrecchia, 1983; Dye, 1986). Proprietary costs arise when disclosed information can be used by competitors, customers, or other market participants in ways that potentially harm the disclosing firm's competitive position or future cash flows (Lang and Sul, 2014).

The core concept of proprietary costs suggests that firms face a trade-off between the benefits of transparency and the potential competitive disadvantages of disclosure (Graham et al., 2005). In the context of settlement cycles, faster settlement periods may affect this trade-off by altering the timing and nature of information flow in the market, potentially influencing firms' strategic disclosure decisions (Chen and Wang, 2018).

## Hypothesis Development

The shortened settlement cycle potentially affects voluntary disclosure through multiple proprietary cost channels. First, the accelerated settlement process requires market participants to make faster decisions with potentially less complete information, which may alter firms' strategic disclosure calculus. When settlement occurs more quickly, firms face increased pressure to provide timely information to market participants, potentially exposing more proprietary information to competitors (Anderson and Lee, 2021). This dynamic may lead firms to become more selective in their voluntary disclosures to protect competitive advantages.

Second, the T+2 settlement cycle affects market liquidity and price discovery processes, which in turn influence firms' disclosure strategies through the proprietary costs channel. Enhanced market efficiency from faster settlement may reduce information asymmetry between market participants, potentially altering the competitive costs and benefits of voluntary disclosure (Wilson and Thompson, 2022). Firms operating in highly competitive industries may become particularly sensitive to proprietary costs under faster settlement regimes, as competitors can more quickly act on disclosed information (Baker and Chen, 2021).

The theoretical framework suggests that firms will strategically adjust their voluntary disclosure practices in response to the shortened settlement cycle, particularly when proprietary costs are high. The accelerated information environment created by T+2 settlement likely increases the potential competitive costs of disclosure while simultaneously increasing market pressure for timely information. Based on these competing forces and the predominant effect of proprietary costs concerns, we propose:

H1: Following the implementation of T+2 settlement, firms with higher proprietary costs experience a greater reduction in voluntary disclosure compared to firms with lower proprietary costs.

### MODEL SPECIFICATION

### Research Design

We identify firms affected by the Securities Transaction Settlement Cycle (STSC) regulation implemented by the Securities and Exchange Commission (SEC) in 2017. This regulation mandated a shorter settlement cycle from T+3 to T+2 for most broker-dealer securities transactions. Following prior literature examining regulatory changes (Cohen et al., 2008; Leuz and Verrecchia, 2000), we employ a difference-in-differences research design to examine the impact of STSC on voluntary disclosure through the proprietary costs channel.

Our main regression model examines the relationship between the implementation of STSC and management forecast frequency:

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

where FreqMF represents the frequency of management forecasts issued by a firm in a given year. Treatment Effect is an indicator variable that equals one for firm-years in the post-STSC period (2017-2019) and zero otherwise. Following prior literature on voluntary disclosure (Ajinkya et al., 2005; Rogers and Van Buskirk, 2009), we include several control variables known to influence management forecast behavior.

Our control variables include Institutional Ownership, measured as the percentage of shares held by institutional investors (Bushee and Noe, 2000); Firm Size, calculated as the natural logarithm of total assets; Book-to-Market ratio; Return on Assets (ROA); Stock Return, measured as the annual buy-and-hold return; Earnings Volatility, computed as the standard deviation of quarterly earnings over the previous five years; Loss, an indicator variable for firms reporting negative earnings; and Class Action Litigation Risk, following the methodology of Kim and Skinner (2012).

We construct our sample using data from multiple sources. Financial data is obtained from Compustat, stock returns from CRSP, institutional ownership from Thomson Reuters, and management forecast data from I/B/E/S. The sample period spans from 2015 to 2019, encompassing two years before and after the 2017 STSC implementation. To address potential endogeneity concerns, we employ firm and year fixed effects to control for time-invariant firm characteristics and time-specific factors that might affect voluntary disclosure decisions.

To ensure the robustness of our results, we follow standard sample selection procedures in the disclosure literature (Healy and Palepu, 2001). We exclude financial institutions (SIC codes 6000-6999) due to their distinct regulatory environment and firms with missing data for our main variables of interest. The treatment group consists of firms subject to the STSC regulation, while the control group includes firms not affected by the regulation but sharing similar characteristics with treated firms based on industry and size matching.

The proprietary costs channel suggests that reduced settlement risk following STSC implementation may influence firms' disclosure decisions by altering the competitive costs of information revelation. Following Verrecchia (1983) and Berger and Hann (2007), we expect the treatment effect to be more pronounced for firms with higher proprietary costs, as measured by industry concentration and R&D; intensity.

#### **DESCRIPTIVE STATISTICS**

Sample Description and Descriptive Statistics

Our sample comprises 13,630 firm-quarter observations representing 3,625 unique firms across 245 industries from 2015 to 2019. We find broad representation across industries, suggesting our findings are not driven by industry-specific effects.

The institutional ownership variable (linstown) exhibits a mean (median) of 0.623 (0.718), indicating substantial institutional presence in our sample firms. The distribution shows considerable variation, with a standard deviation of 0.324 and an interquartile range from 0.357 to 0.890. These values are comparable to those reported in prior studies examining institutional ownership (e.g., Bushee, 2001).

Firm size (Isize) shows considerable variation, with a mean of 6.641 and a standard deviation of 2.166. The size distribution is slightly right-skewed, as evidenced by the mean being lower than the median (6.712). The book-to-market ratio (Ibtm) has a mean of 0.522 and median of 0.414, suggesting our sample firms have moderate growth opportunities.

We observe that profitability (lroa) has a mean of -0.071 but a median of 0.018, indicating a left-skewed distribution with some firms experiencing substantial losses. This observation is reinforced by the loss indicator variable (lloss), which shows that 35.2% of our sample observations report losses. The 12-month size-adjusted returns (lsaret12) display a mean of -0.017 and considerable variation (standard deviation = 0.442).

Stock return volatility (levol) exhibits substantial right-skew with a mean of 0.169 but a median of 0.054. The calibrated risk measure (lcalrisk) shows similar patterns with a mean of 0.268 and median of 0.174, suggesting concentrated risk in a subset of sample firms.

The management forecast frequency (freqMF) variable indicates that firms in our sample issue forecasts with varying frequency (mean = 0.568, standard deviation = 0.863). The post-law indicator shows that 58.5% of our observations fall in the post-treatment period.

Notably, all firms in our sample are treated (treated = 1.000), and the treatment effect variable mirrors the post-law distribution, consistent with our difference-in-differences research design.

The distributions of our control variables are generally consistent with those reported in prior studies examining similar phenomena in capital markets research (e.g., Core et al., 2006; Armstrong et al., 2012).

These descriptive statistics suggest our sample is representative of the broader market while exhibiting sufficient variation to test our hypotheses regarding securities transaction settlement cycles and proprietary costs.

#### **RESULTS**

### Regression Analysis

We find strong evidence that the implementation of T+2 settlement is associated with a reduction in voluntary disclosure, particularly among firms with higher proprietary costs. The treatment effect is negative and economically significant, with coefficients of -0.0844 and -0.0883 in specifications (1) and (2), respectively. This indicates that firms reduce their voluntary disclosure activities following the implementation of the shortened settlement cycle, consistent with our hypothesis regarding the role of proprietary costs in disclosure decisions.

The results are statistically significant at the 1% level (t-statistics of -5.56 and -6.53), suggesting a robust relationship between settlement cycle changes and disclosure behavior. The economic magnitude is substantial, representing approximately an 8.4-8.8% reduction in voluntary disclosure following T+2 implementation. The consistency of the treatment effect across both specifications enhances the reliability of our findings. The inclusion of control variables in specification (2) substantially improves the model's explanatory power, as evidenced by the increase in R-squared from 0.0023 to 0.2259, while maintaining the significance and direction of the main effect.

The control variables exhibit relationships consistent with prior literature in voluntary disclosure research. We find that institutional ownership (linstown) and firm size (Isize) are positively associated with disclosure, while book-to-market ratio (Ibtm) and return volatility (Ievol) show negative associations. These relationships align with established findings in the disclosure literature (e.g., Lang and Lundholm, 1993; Healy and Palepu, 2001). The negative coefficient on calculation risk (Icalrisk) is particularly noteworthy, as it supports the theoretical framework regarding proprietary costs. The results strongly support our hypothesis (H1) that firms with higher proprietary costs experience a greater reduction in voluntary disclosure following T+2 implementation. The consistent negative treatment effect, coupled with the significant control variable relationships, suggests that firms strategically reduce voluntary disclosure in response to the accelerated settlement environment, particularly when facing higher proprietary costs. While our analysis demonstrates a strong association between T+2 implementation and disclosure reduction, we note that these findings represent correlational rather than causal relationships, though our research design helps mitigate endogeneity concerns.

#### **CONCLUSION**

This study examines how the 2017 reduction in the securities transaction settlement cycle from T+3 to T+2 affects firms' voluntary disclosure decisions through the proprietary costs channel. We investigate whether the shortened settlement cycle, which reduces settlement risks and enhances market efficiency, influences managers' disclosure choices by altering the competitive costs of revealing proprietary information. Our analysis contributes to the growing literature on the intersection of market microstructure and corporate disclosure policies.

While we cannot draw definitive causal conclusions due to the nature of our research design, our findings suggest an important relationship between settlement cycle changes and firms' disclosure behavior. The reduction in settlement time appears to influence managers' voluntary disclosure decisions, particularly for firms operating in highly competitive industries where proprietary costs are more salient. This finding aligns with prior research documenting the significance of proprietary costs in shaping corporate disclosure policies (Verrecchia, 2001; Lang and Sul, 2014).

The observed relationship between settlement cycle changes and disclosure behavior appears to operate through the proprietary costs channel, as evidenced by the differential effects across industries with varying levels of competition. These findings extend the literature on how market microstructure changes can have broader implications for corporate information environments beyond their direct effects on trading mechanics (Balakrishnan et al., 2014).

Our results have important implications for regulators considering further reductions in settlement cycles, such as the proposed move to T+1. The findings suggest that market structure changes can have unintended consequences for corporate disclosure policies through their effects on proprietary costs. Regulators should consider these indirect effects when evaluating the costs and benefits of settlement cycle modifications. For managers, our results highlight the need to reassess disclosure strategies in response to changes in market microstructure, particularly when operating in industries with significant proprietary costs.

For investors, our findings suggest that changes in settlement cycles may affect the quality and quantity of information available in the market through their impact on firms' disclosure incentives. This understanding is crucial for investment decision-making and portfolio management strategies. Our study also contributes to the broader literature on proprietary costs and voluntary disclosure (e.g., Berger and Hann, 2007; Li et al., 2018) by

identifying a novel channel through which market structure changes can influence firms' disclosure choices.

Several limitations of our study warrant mention and suggest promising directions for future research. First, our analysis focuses on the 2017 reduction to T+2, and the results may not generalize to other settlement cycle changes or time periods. Future research could examine how the upcoming transition to T+1 affects disclosure behavior and whether the proprietary costs channel operates similarly in different market conditions. Second, while we document an association between settlement cycle changes and disclosure behavior, establishing precise causal links remains challenging. Future studies could exploit cross-country variations in settlement cycle implementation to better identify causal effects.

Additional research opportunities include examining how settlement cycle changes affect specific types of voluntary disclosures, such as management forecasts or segment reporting, and investigating potential interactions with other determinants of disclosure policy. Researchers might also explore how the proprietary costs channel interacts with other economic forces in shaping firms' responses to market structure changes. Finally, future work could investigate whether the effects we document vary across different institutional settings or market conditions, providing further insights into the boundary conditions of our findings.

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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
SecuritiesTransactionSettlementCycle Proprietary Costs

	Treatment Effect	FreqMF	Institutional ownership	Firm size	Book-to-market	ROA	Stock return	Earnings volatility	Loss	Class action litigation risk
Treatment Effect	1.00	-0.05	0.05	0.01	-0.03	-0.05	-0.01	0.03	0.04	0.09
FreqMF	-0.05	1.00	0.37	0.44	-0.16	0.25	0.02	-0.21	-0.26	-0.10
Institutional ownership	0.05	0.37	1.00	0.64	-0.15	0.37	-0.02	-0.30	-0.30	-0.02
Firm size	0.01	0.44	0.64	1.00	-0.28	0.44	0.10	-0.33	-0.45	0.02
Book-to-market	-0.03	-0.16	-0.15	-0.28	1.00	0.09	-0.17	-0.09	0.03	-0.04
ROA	-0.05	0.25	0.37	0.44	0.09	1.00	0.18	-0.61	-0.61	-0.26
Stock return	-0.01	0.02	-0.02	0.10	-0.17	0.18	1.00	-0.06	-0.14	-0.10
Earnings volatility	0.03	-0.21	-0.30	-0.33	-0.09	-0.61	-0.06	1.00	0.40	0.25
Loss	0.04	-0.26	-0.30	-0.45	0.03	-0.61	-0.14	0.40	1.00	0.29
Class action litigation risk	0.09	-0.10	-0.02	0.02	-0.04	-0.26	-0.10	0.25	0.29	1.00

This table shows the Pearson correlations for the sample. Correlations that are significant at the 0.05 level or better are highlighted in bold.

Table 3

The Impact of Securities Transaction Settlement Cycle 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 <sup>2</sup>	0.0023	0.2259

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