When Disclosure Pays: Evidence from the Over-The-Counter Markets[†]

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December 2025

Abstract

This paper analyzes the SEC's 2021 amendments to Rule 15c2-11, which introduced expanded public disclosure obligations for OTC-traded firms seeking to maintain publicly accessible quotations. Consistent with a desire to retain a liquid market for their shareholders, an issuer's decision to begin providing disclosures is positively correlated with both its prior liquidity and subsequent insider sales. Using an event study framework, we additionally analyze how the decision to disclose—or not—affected market liquidity and valuation. We find that firms that complied with the rule experienced immediate improvements in liquidity and significant positive market-adjusted returns, whereas firms that failed to disclose experienced a sharp drop in liquidity as they were relegated to a restricted "Expert Market" platform. Notably, firms benefited even when disclosing seemingly lackluster financial information. For example, among the set of newly compliant firms that disclosed a greater financial loss than reported in the prior quarter, the mean three-day cumulative market-adjusted return was 18.3%. However, there is evidence that investors "get it right" in seeing disclosure as a signal of relative quality: firms that transition to the disclosure regime are significantly more likely to survive over the subsequent two years than those that remain outside the disclosure regime.

JEL classification: G12, G14, G18, K22, M41
Keywords: OTC Markets, Securities Disclosure, Rule 15c2-11, Market Liquidity, Information Asymmetry, Financial Regulation

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[†] We thank OTC Markets, Inc. for generously sharing the data utilized in this study. We thank Dhruv Aggarwal, Bernie Black, Thomas Bourveau, Jung Ho Choi, Quinn Curtis, Ed deHaan, Emmanuel De George, Atif Ellahie, Josh Fischman, George Geis, Jeff Hales, Mirko Heinle, Eddy Hu, Paul Mahoney, Maureen O'Hara, Fernan Restrepo, Delphine Samuels, Megan Stevenson, and seminar participants at INSEAD, Northwestern, Stanford, UCLA, and the University of Virginia for helpful comments. We additionally thank Iris Wu, Eddie Yu, and Paolo Ramella for exceptional research assistance.

I. Introduction

Politicians and regulators commonly lament the declining number of publicly-traded companies. As noted by Securities and Exchange Commission (SEC) Commissioner Hester Peirce, the number of listed companies in the US dropped from roughly 8,000 in 1996 to approximately 4,200 in mid-2022 (Peirce, 2024). Increasing the number of publicly-listed companies has been a priority for both republican and democrat officials over the past decade.

Yet this debate often overlooks thousands of firms traded outside national exchanges on the over-the-counter (OTC) market. While not "listed" in the traditional sense, many of these firms' securities are publicly traded via broker-dealers and interdealer quotation systems (IDQS). For example, the largest IDQS—OTC Markets Group—enables retail investors to buy and sell the stock of nearly 5,000 U.S. issuers. By a functional definition of "publicly traded," the U.S. market may be considerably larger than the standard narrative suggests.

A critical distinction, however, lies in disclosure. Exchange-traded firms must comply with Section 13 of the Exchange Act, which ties eligibility for exchange trading to mandatory, periodic disclosures. In contrast, many OTC issuers historically provided no ongoing public financial information despite continuing to benefit from broker-dealer quotations. This separation of public trading and ongoing disclosure is unusual in U.S. securities markets, where the two are typically bundled.

In this paper, we study a regulatory reform—the SEC's 2021 amendment to Rule 15c2-11—that, for the first time, directly tied periodic disclosure and public trading in the OTC market. The reform effectively ended the longstanding anomaly that allowed firms to have publicly accessible quotations without providing current public financial and non-financial information. By mandating that broker-dealers could publish quotes only for issuers with current public disclosures, the amended rule bundled public trading and periodic reporting for the first time in the OTC markets. This regulatory change provides a unique natural experiment to assess the liquidity and valuation consequences of a mandatory disclosure regime that tethers public trading to public disclosure.

The stark nature of this regulatory change underpins our empirical design. Prior to 2020, brokers could publicly quote OTC securities without ensuring that issuers had provided current, publicly available information. However, on September 16, 2020, the SEC amended Rule 15c2-11 to prohibit public quotations for any OTC firm that had not begun providing "current" public

information as defined by the rule. The amendment took effect on September 28, 2021, after which non-disclosing firms were relegated to an "Expert Market" where quotes are restricted to unsolicited orders and are not publicly available.

For OTC issuers, the amended Rule 15c2-11 created a stark binary choice: commence disclosure by September 28, 2021 to retain a public quote, or decline and lose it. Given the prospect of processing hundreds—or even thousands—of new disclosures during this period, OTC Markets strongly encouraged OTC firms to submit their reports well ahead of the compliance deadline. As a result, firms submitted their filings intermittently between the publication of the final rule in September 2020 and the compliance deadline, enabling us to conduct an event study analysis of the effect of disclosure on a firm's value and stock market liquidity on the day a firm initiated disclosure.

Our analysis draws on the literature on pooling and separating equilibria to analyze the economic trade-offs influencing firms' disclosure decisions before and after the amended rule (e.g., Spence, 1973). We interpret the amendment to Rule 15c2-11 as disrupting a setting in which a set of firms uniformly chose non-disclosure. Among non-disclosing OTC issuers, some maintain viable and active business operations, while others are struggling or even defunct. In this environment, investors (including market makers) have limited ability to distinguish higher-value firms from lower-value ones without incurring significant search costs. Thus, in a classic pooling model, both "good" and "bad" non-disclosing firms trade at a common price that reflects investors' average beliefs about non-disclosing firms. Because higher-value firms trade below their fundamental value, non-disclosure imposes a cost on them; yet, if the costs of disclosure exceed this valuation discount, the pooling equilibrium persists.

The amended Rule 15c2-11 disrupted this pooling equilibrium by imposing a new liquidity penalty on non-disclosing firms after September 27, 2021. After this date, non-disclosing firms were relegated to the Expert Market, where quotes are limited to unsolicited quotes from non-affiliated retail and institutional investors. Thus, these securities likely lack a key liquidity source: traditional market makers' two-sided bids and asks. In addition, quotations in the Expert Market are not publicly visible; only broker-dealers have access to them.

The new penalty for non-disclosure arguably generated a separating equilibrium as firms reassessed the costs and benefits of non-disclosure. As some higher quality firms concluded that the costs of non-disclosure were now unacceptably high due to the larger discount, these firms

could opt to disclose over the one-year transition period. Moreover, as higher quality firms exited the non-disclosure pool, investors presumably (at the margin) applied a larger discount to non-disclosing firms, further incentivizing disclosure and resulting in unravelling. In sum, by imposing a liquidity penalty on non-disclosing firms, the amended rule forced firms to reevaluate the costs and benefits of non-disclosure, likely prompting some firms to begin disclosing and leading investors to increase their assessment of these firms' values.

Our research provides several key insights. First, we find that non-disclosing firms that chose to begin reporting in the twelve months preceding the September 28, 2021 deadline shared several common characteristics relative to firms that choose not to disclose. Most notably, firms that commenced disclosure were already more liquid and more heavily traded than those ultimately relegated, whereas the latter group more commonly consisted of issuers that had effectively been abandoned by market makers—reflected in the absence of any posted quotes in the months preceding the rule's finalization. There is also evidence that liquidity-seeking insiders influenced the decision to begin disclosure. Rule 144 of the Exchange Act requires public disclosure of the Rule 15c2-11 information before insiders can resell their securities. Consistent with the view that some issuers elected to disclose to preserve future insider liquidity, we observe that insiders at disclosing firms file Rule 144 notices following the firm's initiation of public disclosure.

Second, we provide the first analysis of how the 2021 amendment to Rule 15c2-11 affected firms in the OTC Market. We begin by examining firms that did not disclose and demonstrate that this sample of firms experienced significant adverse outcomes. The revised Rule 15c2-11 prohibited broker-dealers from publishing quotes for these securities, resulting in their immediate relegation to an "Expert Market" on OTC Markets. Although brokers could still offer to buy or sell such securities, they were restricted to handling bids and asks only for unsolicited orders (i.e., the broker received the customer order without prompting by the broker) and exclusively for transactions involving non-affiliates of the issuer. In other words, any quotes must represent unprompted limit orders placed by retail and institutional investors who are not insiders or controlling persons of the issuer. Moreover, these quotes are not displayed to the public; they are only accessible to other broker-dealers and qualified investors.

Consistent with this restriction, we show that the thousands of securities relegated to the Expert Market after September 27, 2021 experienced an immediate and severe decrease in liquidity. Before the implementation date, these securities had an average of nearly six brokers offering

quotes at the close of trading (i.e., six market makers). However, this number plummeted to fewer than three immediately following September 27, 2021. Unsurprisingly, the percentage of these securities with both a closing bid and a closing ask (a two-sided quoted) similarly dropped precipitously, from roughly 90% to less than 15%. Moreover, even among the securities that maintained a closing two-sided quote, there was a notable increase in round-trip trading costs (i.e., the cost of buying and then selling a security) as the implementation date approached.

Next, we examine the subset of firms that initiated disclosure and show that they experienced significant gains in both liquidity and valuation. Although liquidity remained largely stable around the September 28, 2021 implementation date, substantial effects emerge when we focus on the date of a firm's first financial disclosure signaling compliance with the rule. Among firms that commenced disclosures between September 16, 2020 and September 27, 2021, we find an immediate increase in the mean and median number of market makers quoting these securities, as well as a corresponding decrease in their mean and median quoted spreads.

Consistent with these liquidity improvements, we also show that stock prices increased considerably for firms that committed to public disclosure. Using closing quote prices and restricting the sample to firms that initiated disclosure during the same period, we find 3-day and 5-day market-adjusted returns of approximately 22% and 28%, respectively, following a firm's first public disclosure. The speed of this price adjustment is especially notable given that securities in this market typically lack the hallmarks of informational efficiency, such as equity analysts, significant short-selling activity, or frequent trading. That market makers nevertheless adjusted prices rapidly in response to the initial disclosures suggests that the trading environment for these OTC securities may be more informationally efficient than traditionally assumed in legal scholarship.

Finally, we explore whether these positive returns stem from a firm's commitment to the new disclosure regime or are related to the specific information in a firm's disclosure document. After all, if only firms with positive news chose to commence public disclosures, one would expect positive returns following the disclosures. Using financial data provided by OTC Markets, we show that positive stock price reactions persist even for firms that disclose indicators of financial distress. Specifically, we find no association between cumulative abnormal returns and several financial proxies for good news, including measures of growth, revenue, and net income. Furthermore, the mean and median returns we observe are not significantly reduced when we focus

on companies reporting both zero revenue and zero assets, or those reporting quarterly increases in their net losses.

The lack of a clear link between a firm's recent financial performance and its post-disclosure returns suggests that investors primarily responded to the positive signal conveyed when firms exited the pool of non-disclosing issuers. Consistent with this interpretation, we provide evidence that the amendment to Rule 15c2-11 prompted higher quality non-disclosing firms to commence reporting. In a survival analysis examining whether a firm disappears from FINRA's daily list of securities for reasons indicative of firm failure, we find that the two-year survival rate for firms relegated to the Expert Market on September 28, 2021, is significantly lower than that of firms that commenced disclosures by that date.[1] Taken together, these results indicate that the strong returns associated with a firm's adoption of disclosure likely reflect investors' perception of disclosure as a credible signal of firm quality.

Our paper contributes to several areas of literature. First, we add to prior literature on disclosure and information asymmetry. An extensive body of literature examines how information asymmetry influences a firm's cost of capital and liquidity. For instance, Amihud and Mendelson (1986) and Glosten and Milgrom (1985) demonstrate how market makers protect against adverse selection risks by setting wider spreads when they suspect traders have private information. Leuz and Verrecchia (2000) find that increased disclosure reduces information asymmetry, resulting in narrower spreads and increased trading volume. Similarly, Easley, Hvidkjaer, and O'Hara (2002) show that asset returns are significantly affected by the risk of adverse selection tied to private information. Our study complements this literature by demonstrating that, when issuers trading on OTC markets reduce information asymmetry through increased disclosure, liquidity and firm value improve—even when the disclosed information does not appear to convey positive news about the firm.

Second, we contribute to research on the value of mandating disclosures for firms that trade in U.S. securities markets. Transparency may enhance liquidity and reduce adverse selection, but disclosure also imposes both direct compliance costs and indirect strategic costs that can deter firms from reporting, raising an important policy question of how mandatory disclosure affects firm value. Early work by Stigler (1964) analyzed the effects of the Securities Act of 1933 on stock prices, while Benston (1973) examined the same for the Exchange Act. More recently, Ferrell

[1] We discuss FINRA's daily list and its indicators for firm failure in Section E(ii).

(2007) and Greenstone, Oyer, and Vissing-Jorgenson (2006) examine the extension of mandatory disclosure requirements to OTC firms in 1964. They compare the OTC firms newly subject to disclosure requirements with exchange-listed companies that were already subject to disclosure requirements. Finally, Bushee and Leuz (2005) study the SEC's 1999 mandate requiring firms traded on the OTCBB to either provide routine public disclosures or move to tiers within OTC Markets where trading without disclosure was permitted.

These papers have yielded mixed findings. Stigler (1964) and Benston (1973) find no significant differences in stock returns before and after the enactment of the statutes. In contrast, Ferrell (2007) and Greenstone, Oyer, and Vissing-Jorgenson (2006) find positive abnormal returns associated with the 1964 amendments. Bushee and Leuz (2005) find clear evidence of enhanced liquidity for firms opting to remain on the OTCBB and comply with mandatory disclosure requirements. However, they find that these newly compliant firms exhibited lower returns than already compliant firms at key announcement dates, suggesting that the rule forced newly compliant firms into a suboptimal choice.[2]

We provide new insights into this longstanding question because, unlike most prior studies, our unique institutional setting allows us to adopt an event study framework focused on each firm's decision to either commit to disclosure or remain non-disclosing. Prior studies have faced significant challenges in analyzing pre- and post-return periods, as those periods often span many years after the reforms. Bushee and Leuz (2005) avoid this challenge by examining returns for newly compliant firms around specific compliance deadlines. However, even these dates commonly followed the firms' initial signals of intent to comply. These issues present estimation challenges that may explain the inconsistent results. By tracking when our sample firms first signal their intent to comply with amended Rule 15c2-11, our event study method allows us to directly assess the market reaction to each firm's decision to comply with the amended rule's disclosure requirements.

Overall, our findings highlight both the benefits and costs to investors of a regime that bundles public trading with mandatory public disclosure. For OTC firms that opt in to the new Rule 15c2-11 disclosure regime, our findings show substantial liquidity and valuation benefits for

[2] Outside of the US, Leuz and Verrecchia (2000) study German firms that have switched from the German to an international reporting regime (1AS or U.S. GAAP), thereby committing themselves to increased levels of disclosure. They show that firms that commit to IAS or U.S. GAAP exhibit lower percentage bid-ask spreads and higher share turnover than firms using German GAAP.

stockholders. For those that opt out and remain in the Expert Market, the forgone benefits highlight just how costly disclosure must appear from the firm's perspective. Given our finding that the decision to disclose may also depend on whether a firm's insiders are looking to trade in the future, these results raise important corporate governance concerns about ensuring that disclosure decisions appropriately balance the costs and benefits for all investors, not just insiders.

Finally, our work contributes to recent research examining the diverse regulatory practices within OTC Markets and their implications for firms and investors. Given the unique regulatory and institutional features of these markets, researchers have increasingly focused on this setting, as it is not clear that findings from more traditional public markets generalize to the OTC context. Eraker and Ready (2015) attribute OTC stocks' negative average returns and skewed payoffs to investors' lottery-like return preferences, amplified by information opacity and short-selling constraints. Brüggemann et al. (2018) find that stricter disclosure requirements in OTC markets enhance market quality by improving liquidity and reducing crash risk but increase compliance costs for smaller firms. Davis et al. (2023) show that enhanced transparency and disclosure standards in higher OTC tiers improve liquidity and reduce volatility, though compliance costs may deter smaller firms from higher-tier participation. Finally, Bourveau et al. (2025) examines OTC traded firms in the aftermath of the implantation of Rule 15c2-11 and finds that the firms with more voluntary disclosure are more likely to raise external capital, illustrating the role of disclosure and credibility in capital formation. We contribute to this literature by examining how modifications to Rule 15c2-11 address the information opacity in OTC Markets central to these studies.

II. Background on OTC Markets and Rule 15c2-11

On September 28, 2021, the amendments to SEC Rule 15c2-11 went into effect. Initially proposed on September 26, 2019 and adopted on September 16, 2020, the new amendments were intended "to better protect retail investors from incidents of fraud and manipulation in OTC securities, by requiring that certain issuer information the broker-dealer is required to review be current and publicly available, while modernizing the Rule to be more efficient and effective" (SEC, 2019). Crucially, the amendments significantly overhauled the "piggyback exception" found in the earlier iteration of Rule 15c2-11. This exception previously served as the main

pathway for securities lacking publicly available disclosures to be traded on over-the-counter markets. Below we provide relevant institutional background.

A. Disclosure Requirements and Disclosure Tiers for OTC Firms

To understand the disclosure practices of OTC firms, it is useful to review (1) the disclosure obligations of firms under federal law due to Section 13(a), (2) the incentives to disclose information created by Rule 15c2-11, and (3) the incentives that OTC Markets provides for firms to disclose voluntarily. Regarding federal disclosure obligations, Section 13(a) mandates that firms meeting a statutory definition of "public" file annual, quarterly, and interim reports with the SEC. However, firms can typically circumvent these reporting obligations if they refrain from listing their securities on an officially registered national stock exchange and maintain a shareholder base below a certain threshold.[3] Firms traded OTC commonly have a limited number of "holders of record" and do not have their securities listed on a registered stock exchange, meaning that they remain exempt from Section 13(a) disclosure obligations.

For firms exempt from Section 13(a), Rule 15c2-11 has historically created an incentive to disclose the specific set of financial and non-financial information set forth in the rule (the "Traditional 15c2-11 Information") by offering a carrot in the form of liquidity. Firms seeking to establish a liquid trading market for their securities will generally benefit from the immediate liquidity provided by having a market maker for their securities—that is, a broker-dealer prepared to both buy and sell these securities. However, Rule 15c2-11 generally prohibited broker-dealers from publicly publishing quotations for a security unless the broker-dealer previously received and reviewed the Traditional 15c2-11 Information from the security's issuer.

The effectiveness of this incentive, however, was significantly diminished by several exceptions, most notably the "piggyback exception." The piggyback exception permitted brokers to publish an IDQS quotation for a security without obtaining any information from the issuer if the security was already subject to regular and frequent quotations in the IDQS. If these requirements were met, a broker-dealer could "piggyback" on either its own or other broker-dealers' previously published quotations (SEC, 1991; Exchange Act Rule 15c2–11(f)(3)). Thus, once a security was piggyback eligible, additional broker-dealers could quote the security

[3] Critically, securities that are held in street name through intermediaries, such as brokers or custodians, are generally "held of record" by the intermediary (rather than the beneficial owner) under SEC rules, so the number of shareholders "of record" may be vastly different than the actual number of shareholders.

regardless of whether the original broker-dealer continued to quote the security or whether the company disclosed any current information. In essence, the piggyback exception created a self-perpetuating cycle of quotations that could continue indefinitely and was divorced from whether the issuer was providing ongoing disclosure. As the SEC noted in its proposed amendment to Rule 15c2-11, the piggyback exception could apply even if a company ceased to exist.

Lacking consistent incentives or rules, it is not surprising that disclosure practices varied greatly across firms on OTC Markets; some firms disclosed nothing and others complied voluntarily with the Section 13(a) reporting regime. To address the inconsistency, in 2007, OTC Markets —then named Pink OTC Markets Inc.—established a system of "tiers" to enable firms to provide a clearer signal of their commitment to disclosure and transparency. Following this change, and during the time of our study, there were three primary tiers: OTCQX, OTCQB and Pink. OTCQX is the most stringent tier and its eligibility criteria resemble those of a national exchange (e.g., NASDAQ). Among other things, the requirements for firms traded on OTCQX include minimum financial thresholds (e.g., average revenue of at least $6 million for the last three years), annual audit requirements, and strict ongoing disclosure obligations similar to those of Section 13(a). The OCTQB tier, OTC's "Venture Market," has similar disclosure requirements to OTCQX but lower financial thresholds.

Of particular interest for our study is OTC's "Pink" tier, which historically lacked disclosure requirements but labeled firms daily based on their public disclosure practices. Firms on this tier were labeled as "Pink Current," "Pink Limited", or "Pink No Information." Firms were labeled "Pink Current" if they published annual reports within 90 days and quarterly reports within 45 days of fiscal period ends on OTC Markets, where those reports needed to meet specific information requirements set forth in OTC's Pink Basic Disclosure Guidelines. Firms were labeled "Pink Limited" if they published current share counts, a balance sheet, and an income statement for a period ended within the previous 6 months. Finally, firms were labeled "Pink No Information" if they failed to meet "Pink Current" or "Pink Limited" disclosure standards.

In sum, during our sample period, OTC Markets maintained three tiers—OTCQX, OTCQB, and Pink—with three sub-categories within Pink. When the SEC proposed amending 15c2-11 in September 2019, the OTC Markets comprised nearly 9,500 "Pink" tier firms (roughly 6,400 "Pink Current", 250 "Pink Limited", and 2,800 "Pink No Information"). Slightly less than 200 U.S. firms traded on the OTCQX tier and almost 1,000 traded on the OTCQB tier.

B. Amended Rule 15c2-11

Rule 15c2-11 was amended primarily to ensure that all companies publicly quoted on an IDQS such as OTC Markets disclose a minimal level of current financial and non-financial information. Unlike the prior rule, the amended rule requires brokers to ensure that the required information is both current and publicly available before initiating a public quote (Rule 15c2-11(a)(1)(B)).[4] As such, a broker can no longer "piggyback" on another's quote unless the Rule 15c2-11 Information is current and publicly available at the time the new broker seeks to publish a quote. This modification of the piggyback exception effectively creates an ongoing disclosure obligation for firms to maintain their public quote.

Amended Rule 15c2-11 also expands the IDQS's role in ensuring that issuer information is current and public, and in determining whether a broker can publish a quote in compliance with the rule. For instance, brokers can now rely on an IDQS' determination of current and public issuer information, rather than assessing it themselves, when quoting through that IDQS. Similarly, Rule 15c2-11 allows brokers to rely on an IDQS' public determination that certain exceptions (including the piggyback exception) are available to brokers who wish to quote the security (Rule 15c2-11(f)). Finally, the rule defines "publicly available" to include IDQS websites, allowing an IDQS like OTC Markets to create and oversee public reporting and quotation systems for securities traded on its platform.

The new rules were most relevant for the thousands of securities that traded as "Pink No Information" and "Pink Limited." For the latter, OTC Markets modified the information requirements for "Pink Limited" firms to coincide with the revised, minimum information requirements set forth in Rule 15c2-11. For the former, "Pink No Information" firms risked losing their public quote if they didn't post their Rule 15c2-11(b) information by September 27, 2021. Without a public quote, these firms could only be traded in OTC Market's "Expert Market." In the Expert Market, brokers can trade securities only through unsolicited orders from non-affiliates. These quotes are not displayed to the public but are instead only accessible to other broker-dealers and qualified investors.

[4] Rule 15c2-11(b)(5) itemizes the required financial and non-financial disclosures, which now include a more expansive list of information relating to the company's insiders and stockholders. The rule generally requires such issuers to disclose their Rule 15c2-11(b)(5) information annually. A company's balance sheet is "current" only if it has a date less than 16 months before the day of the broker's quote. A company's income statement is "current" only if it covers the 12 months preceding the balance sheet date.

III. Data and Sample Construction

We assemble our dataset from a variety of sources. Our analysis focuses on firms that transitioned from non-disclosure to disclosure after the final rule was implemented, so we begin by collecting all securities traded on OTC Markets during 2020 using the end-of-day trade file for OTC Markets ("OTC Trade Data") available through Wharton Research Data Services (WRDS).[5] These data include daily trading volume, opening and closing prices, and market-maker counts for all securities traded on OTC Markets. Additionally, these data include a daily identifier for each security's OTC tier, and except for seven consecutive trading days in 2020, they also include all closing quotes, including those provided for securities traded on the Expert Market.[6] As such, the data allow us to track the disclosure status of each firm and all closing quotes regardless of whether the quotes were publicly-accessible at the time they were made.

We filter for Common Stock securities with an active (non-revoked) status as of September 16, 2020 (the publication date of the final rule). If the issuer has more than one class of securities, we retain the security with the greatest trading volume.[7] We merge the resulting 5,331 securities with financial and company data provided by OTC Markets ("OTC Markets Accounting Data"), resulting in the loss of 3 securities. With these filters, our sample represents 5,328 unique securities.

To identify companies that faced the decision of whether to adhere to the new Rule 15c2-11 disclosure requirements, we use the OTC Trade Data to categorize firms by their OTC tier as of the publication date of the final rule (i.e., September 16, 2020). Specifically, firms are classified as Disclosure Compliant (DC) if they are listed in a tier that requires periodic disclosure of at least the Rule 15c2-11 information (i.e., Pink Current, OTCQB, or OTCQX); otherwise, they are classified as Disclosure Non-Compliant (DNC). In our sample, 1,911 firms were identified as DC, while 3,417 were categorized as DNC.

We collect trade and liquidity data from the OTC Trade Data and obtain financial accounting data from either Compustat or the OTC Markets Accounting Data. As noted, firms traded on OTC

[5] In Section 4(A)(ii), we use these data to analyze stock returns for select OTC securities surrounding the release of the proposed rule in September 2019. This analysis uses the same filters as the main 2020 sample.

[6] When informed of these missing data, staff at OTC Markets confirmed to us that these trade data are missing from the OTC Markets' internal server and backup disks. As of this writing, they are unaware of the basis for their omission and are investigating whether these data can be retrieved. The missing days are August 30, 2020 through September 8, 2020.

[7] We drop two securities of an issuer that had zero trades in each security during 2020. We additionally drop seven securities that list more than one company (CompID) as the issuing firm.

Markets may voluntarily comply with Section 13(a) of the Exchange Act, which requires them to file all quarterly and annual reports using the Edgar reporting system tracked by Compustat.[8] For all other firms, we rely on the OTC Markets Accounting Data.

Table 1 presents summary statistics for our sample firms as of September 16, 2020, split by whether firms were DC (Panel A) or DNC (Panel B) as of this date. Some data were not available for all sample securities, so the combined total for DC and DNC firms is less than 5,328 in some analyses. As DNC firms did not disclose any accounting data, we focus on trading data that is available through the OTC Trade Data. All measures are calculated at their mean for the month preceding September 16, 2020, except for zero trade days, which is measured as the total number of days lacking a trade over the past month. Given positive skew in the data for most measures, we focus primarily on medians of those means.

As one might expect, DC firms are generally larger than DNC firms. The median DC firm had an average midpoint price of approximately $0.56 and a market capitalization of $15 million. In contrast, the median DNC firm had an average midpoint price of approximately 2 cents and a market capitalization of $0.9 million. The median DC firm was thus over fifteen times larger than the median DNC firm, yet considerably still smaller than a typical small capitalization firm traded on an exchange. To aid in comparison, Panel C presents the same statistics for firms within the Russell 2000 at the end of 2020 and shows that the median size of these firms was $656 million.

DC firms were also more liquid than DNC firms. While the median DC firm traded roughly twice per day in the month prior to September 16, 2020, the median DNC firm traded on average 0.42 times per day. The median DC firm also had one more market maker for its stock than the median DNC firm and lower relative quoted spreads (measured as the closing bid-ask spread relative to the midpoint price). Median DC firms also had moderately lower volatility—measured as the volatility of daily returns using the end-of-day quote midpoint—than median DNC firms. However, as with market capitalization, both DC and DNC firms were significantly less liquid and more volatile than median Russell 2000 constituents.

[Table 1]

[8] A firm may be traded on OTC markets but required to follow Section 13(a) because it has many holders of record or it may voluntarily file Section 13(a) reports to qualify for an OTC tier (i.e., OTCQB, OTCQX or Pink Current).

We track the disclosure medium for each firm in our sample by collecting all filings from Edgar and OTC Markets. As of September 16, 2020, approximately 40% of DC firms disclosed via Edgar filings, while the remaining 60% used OTC Markets' dissemination medium. In Table 2, we summarize how firms in our sample altered their disclosure policies between the time the final rule was published on September 16, 2020 and the compliance date of September 27, 2021.[9]

[Table 2]

By September 28, 2021, 1,549 (81%) of the original DC firms remained compliant with Rule 15c-11's new disclosure requirements, 218 (11%) failed to comply, and 82 (4%) were no longer quoted according to the OTC data file. Among the original DNC firms, 824 (24%) had gained compliance with Rule 15c-11's new disclosure requirements, 2,327 (68%) remained non-compliant, and 266 (8%) were no longer quoted according to the OTC data file. For the 824 firms that became compliant, the final three columns of Table 2 summarize the time elapsed since their previous disclosure via either Edgar or OTC Markets. Roughly two-thirds of newly compliant firms previously provided public disclosures, consistent with the notion that many OTC firms were once subject to the Exchange Act's periodic reporting requirements. Among these firms, the mean (median) number of days since the firm's last public disclosure was 1,865 (1,297), or roughly five years.

IV. Empirical Analyses & Results

A. The Decision to Disclose

We begin our empirical analysis by examining characteristics of DNC firms that elected to commence disclosure between September 16, 2020, and September 27, 2021, and therefore

[9] To identify the first disclosure date for the original DNC firms that eventually complied with Rule 15c2-11's amended disclosure requirements, we scraped the OTC Markets website for each company's available documents, as the issuer website at OTC Markets listed disclosures whether made by means of the OTC Disclosure & News Service or via Edgar. Using Python, we automated access to each company's OTC disclosure page by looping over their ticker symbols. While the OTC Trade Data indicate that 824 of the original DNC firms avoided relegation to the Expert Market, we were unable to locate disclosure pages for 22 firms. For the remaining firms, we retrieved all available documents (whether filed via the OTC Disclosure & News Service or Edgar) along with their respective filing dates. We filtered this set to retain only those documents that qualify as formal disclosures under amended Rule 15c2-11, specifically: 10-K, 10-K/A, 1-K, 1-K/A, C-AR, C-AR/A, 10-Q, 10-Q/A, 1-SA, 1-SA/A, 8-A12G, 8-A12G/A, 8-A12B, 8-A12B/A, 10-12G, 10-12G/A, 10-12B, 10-12B/A, C, C/A, 1-A, 1-A/A, 10-K (OTC), 10-Q (OTC), Interim 10-Q (OTC). We further restricted the documents to those filed between September 16, 2020, and September 28, 2021. For each firm, the earliest filing date within this window was recorded as the firm's first disclosure date. This procedure yielded 812 firms that made a qualifying disclosure prior to September 28, 2021, which we define as their 'Initial 15c2-11 Disclosure."

avoided relegation to the Expert Market. In our context, modelling these firms' election to disclose (or not) is complicated by the absence of firm-specific disclosures for non-disclosing firms. For this reason, we focus primarily on firms' observable liquidity and trade data available through OTC Markets. Additionally, we supplement these data with two data series that we hypothesize may also be related to a firm's decision to commence disclosure.

First, we utilize Rule 144 data for firms in our sample. An OTC firm that discloses the required Rule 15c2-11 information ensures that insiders will have the ability to liquidate their stock positions by virtue of Rule 144 of the Securities Act of 1933. In general, "control" persons (e.g., executive officers, directors and controlling stockholders) must register their securities under the Securities Act before they can resell them in the market—a costly and time-consuming process. However, insiders of a firm that discloses the periodic financial and non-financial information listed in Rule 144—information that overlaps with that required by Rule 15c2-11—are exempt from this requirement, provided the insiders file a notice with the SEC indicating the number of shares they intend to sell under Rule 144. While this notice was filed physically with the SEC prior to 2023, we use a private data vendor to retrieve records of all Rule 144 notices filed with the SEC since 2016. After matching the notices to firms in our sample, we obtain 3,969 Rule 144 notices across 548 firms in our sample between 2016 and 2023.[10]

If insiders induce a firm to begin disclosing to preserve their ability to trade in the future, we should observe an increase in Rule 144 notices among these firms after September 27, 2021. A firm's historical rate of Rule 144 filings may also relate to its decision to disclose or not. Because Rule 144 requires an issuer to provide current information, a high volume of past filings may reflect a "disclosure pause" scenario in which a previously liquid, disclosing firm recently stopped reporting and is prompted to resume disclosure before September 28, 2021 to avoid relegation and maintain insiders' trading capacity. Alternatively, a high past filing rate may be consistent with a "fallen angel" theory in which a formerly liquid, disclosing firm encounters distress and subsequently trades on the OTC market without disclosure and with no viable prospects.

Second, in addition to Rule 144 data, we obtain from FINRA's "daily list" information on whether firms in our sample have declared and paid a cash or stock dividend in the year prior to

[10] We obtain Rule 144 data from The Washington Service, which physically obtains the Rule 144 data from the SEC for filings prior to 2023. To match a Rule 144 notice to sample firms, we manually match based on a firm's CIK, symbol, and/or name.

September 16, 2020. Securities Exchange Act Rule 10b-17 requires issuers with "publicly traded" securities (which includes firms traded on OTC Markets) to provide advance notice to FINRA of any dividend or other distribution on its securities, which FINRA tracks in its daily list along with other major corporate actions.[11] Because a recent dividend payment likely indicates that a company has active operations, we hypothesize that the likelihood of disclosure should increase with the frequency of a firm's recent dividend declarations.

In Table 3, we present the results of four cross-sectional regressions that examine the correlates of a firm's decision to commence disclosures, as well as the speed with which it signaled its intent to disclose following September 16, 2020. In column 1, we present the results of the following baseline logit model:

$$Y_i = \beta_0 + \beta_1 144_i + \beta_2 Dividends_i + \beta_3 Price_i + \beta_4 Subpenny + \beta_5 Volume_i + \beta_6 ZeroTrade_i + \beta_7 NoQuote_i + \beta_8 Caveat + \varepsilon_i \quad (1)$$

The outcome is a binary indicator for whether a sample firm commenced disclosure before September 28, 2021; *144* represents the count of Rule 144 notices filed by an issuer's insiders between January 1, 2016, and September 16, 2020; and *Dividends* is the number of dividends declared in the year preceding September 16, 2020. In addition, we also proxy for a stock's overall liquidity and perceived risk by OTC Markets during the six months prior to the publication of the final rule by including:

- *Price:* the natural log of the median price based on either an issuer's daily closing quotes or, if missing, the volume-weighted average price of daily trades (if any);[12]
- *Subpenny:* the fraction of days in which the price was less than a penny;
- *Volume*: the natural log of one plus the median daily dollar volume of trading;
- *Zero Trade*: the fraction of days with no reported trades;
- *No Quote:* an indicator for the absence of a closing best bid and ask for all trading days;
- *Caveat*: the fraction of days where OTC Markets labels an issuer as "Caveat Emptor", which occurs when OTC Markets concludes "there may be reason to exercise additional

[11] See FINRA, Over-the-Counter Equities Daily List User Guide (January 2017), available at https://www.finra.org/sites/default/files/OTCE_Daily_List_User_Guide.pdf.

[12] Specifically, where both the closing bid and ask are reported, we use the midpoint. If missing, we proxy for price using a hierarchy that prioritizes the closing bid, then the closing ask, and lastly, the VWAP of daily trades.

care and perform thorough due diligence before making an investment decision in that security."[13]

To facilitate interpretation, all coefficient estimates in columns (1) and (2) are presented as average marginal effects. Thus, all estimates reflect the association between a one unit change in the covariate and the predicted probability that an issuer will commence disclosures before September 28, 2021.

Overall, the results in column 1 are consistent with more liquid issuers opting to disclose to retain their public quotes, while less liquid, riskier issuers were relegated to the Expert Market. For instance, an issuer's trading volume is positively correlated with the decision to disclose, while stocks with a high incidence of zero trading days, those lacking closing quotes, and those labeled Caveat Emptor were more likely to be relegated. Notably, relegation was also correlated with a firm's past rate of Rule 144 notices, consistent with a "fallen angel" theory in which relegation is the culmination of a formerly listed firm's financial demise. Somewhat surprisingly, the coefficient on *Dividends*, while positive, is not statistically distinguishable from zero. Moreover, inspection of the data reveals that of the thirty-nine DNC firms that declared dividends in the year prior to the final rule, over half were relegated. Thus, while many relegated firms may reflect fallen angels, relegated firms also appear to include firms with existing operations.

[Table 3]

In column 2, we supplement the baseline regression shown in Equation (1) with additional return and liquidity data that requires both a closing best bid and ask during the six-months prior to September 16, 2020, thus excluding the roughly 1,300 firms that lack a closing best bid and ask throughout this entire six-month period. These additional covariates include:

- *Return*: the cumulative gross return on an issuer's security between March 16, 2020 and September 16, 2020 based on closing bid prices;
- *Zero Return*: the fraction of days where the daily return of the quote midpoint is zero;
- *Volatility*: the volatility of daily returns; and
- *Spread*: the median closing quoted spread relative to the closing midpoint.

[13] OTC Markets, Caveat Emptor Policy, available at https://www.otcmarkets.com/learn/caveat-emptor. OTC Markets states that the designation may be assigned when OTC Markets becomes aware of a misleading promotion, an investigation indicating fraud or other criminal activity, a regulatory suspension for public interest concerns or "other public interest concern".

Coefficient estimates for these covariates in column 2 indicate that both the frequency of zero-return days and return volatility were negatively associated with the decision to disclose. Additionally, the estimates for *Spreads* and *Return* suggest that firms with lower quoted spreads and higher six-month returns were more likely to disclose, though the results were not statistically significant under conventional standards. Coefficient estimates for the other variables are largely consistent with the estimates in column 1, except that *Zero Volume* is no longer statistically significant (possibly due to its multicollinearity with *Zero Return*).

Columns 3–4 report Cox proportional hazards models estimating the time until an issuer first initiates disclosure between September 16, 2020 and September 27, 2021. Issuers that never initiate disclosure by the deadline are right-censored at the deadline. We estimate hazards using the Breslow method for ties and heteroskedasticity-robust standard errors. Coefficients are presented as hazard ratios (HRs), where HR>1 indicates faster compliance (shorter time to disclose). Across both specifications, *Volume* (HR>1) is associated with faster disclosure, while *Dividends* is associated with faster disclosure in column 3. In contrast, *144*, *Zero Trade*, *Caveat Emptor*, and *No Quote* (HR<1) are associated with slower disclosure in column 3, and in column 4 the primary variables associated with slower disclosure are *144, Subpenny*, and *Volatility.* Magnitudes can be read directly as ratios: e.g., an HR of 1.105 for *Volume* implies a 10.5% higher instantaneous rate of disclosure per one-unit increase, holding other factors constant.

Finally, as noted, it is possible that issuers may have elected to disclose based on a desire to preserve the ability for insiders to rely on Rule 144 in the future. As testing this hypothesis requires examining the rate of Rule 144 notices *after* an issuer commences disclosure, we present in Figure 1 the percent of all 824 disclosing firms that filed a Rule 144 notice by month between January 2016 and December 2023. We also provide the same statistic for all DNC firms that were relegated on September 28, 2021. Overall, although the monthly percentage of firms filing a Rule 144 notice was modest for both groups, the pre-2020 filing rates show that issuers in both categories frequently provided Rule-144-compliant disclosures before becoming non-disclosing firms. More importantly, that disclosing firms continued to make filings under Rule 144 after 2020 is consistent with issuers electing to disclose to preserve the ability of insiders to sell securities in the future. In

contrast, Rule 144 filings for relegated firms cease after September 27, 2021, a finding that is not surprising given that Rule 144 requires public disclosure of the Rule 15c2-11 information.[14]

[Figure 1]

B. Relegation to the Expert Market: Market Liquidity and Valuation

Now that we have examined the decision to disclose, we turn to the consequences for DNC firms that failed to commence disclosures by September 27, 2021. Without the ability to maintain public quotations, we predict that these firms experienced a significant drop in liquidity when relegated to the Expert Market. Additionally, to the extent investors value liquidity—and anticipate that many non-disclosing firms will be relegated after the Rule 15c2-11 amendments—we predict that non-disclosing firms experienced a decline in value when the market learned of the proposed and final rule in September 2019 and September 2020, respectively.

To assess how relegation to the Expert Market impacted firms' liquidity and valuation, we identify all firms that were at risk of relegation. Accordingly, we turn to the 2,327 original DNC firms that remained non-compliant with Rule 15c2-11's disclosure requirements by September 28, 2021, along with the 218 original DC firms that had fallen out of compliance by September 28, 2021. Within this group, our analysis focuses on the 1,563 securities that transitioned from Pink No Information to the Expert Market on September 28, 2021.[15]

i. Relegation and Liquidity

We begin by studying the impact of relegation on liquidity in Figure 2. Panels A through E reflect our event study methodology and assess four liquidity measures over the roughly four-month trading window surrounding the September 2021 implementation date (i.e., from August 3rd, 2021 through November 30th, 2021). Panel A presents the daily mean number of market makers per security, as reported by OTC Markets, together with the 95% confidence intervals. Following a firm's relegation to the Expert Market, market makers could only post unsolicited quotes from non-affiliates of the issuer, effectively destroying the profitability of market making for these

[14] Note that insiders of three issuers that were relegated on September 28, 2021, filed Rule 144 notices in the weeks prior to being relegated even though the issuers were not currently disclosing the public information required by Rule 144.

[15] The remaining DNC securities were relegated to the Expert Market or a similarly opaque market called the Grey Market prior to this date. Even before the amendment to Rule 15c2-11, OTC securities could be relegated to either market if they lost piggyback eligibility and no broker initiated a public quotation.

securities. Not surprisingly, the average number of market makers falls dramatically, from roughly six to three, for firms relegated to the Expert Market on September 28, 2021.

[Figure 2]

Panels B and C analyze how often firms relegated to the Expert Market lacked closing quotes before and after September 28, 2021. Before this date, market makers for a company's securities were allowed to display two-sided quotes. However, as noted above, they were restricted to unsolicited quotes from non-affiliates of the issuer after this date. Similar to Panel A, Panel B reveals a dramatic drop in the percentage of securities that had both a bid and ask closing quote. Before September 28, 2021, over 80% of soon-to-be-relegated firms had two-sided quotes; after relegation, this number falls to approximately 20%. Panel C examines how often relegated firms lacked a closing bid versus a closing ask. The figure indicates that while the rate of missing quotes increases significantly on September 28, 2021, for both bids and asks, the rate of missing bids is approximately double that of missing asks after this date. As quotes following this date reflect only unsolicited orders, the higher rate of missing bids likely stems from more sell orders than buy orders for Expert Market securities, perhaps reflecting the limitations many brokerage firms place on purchasing (but not selling) these securities.[16]

Finally, Panel D presents the average quoted spread relative to the midpoint for securities relegated to the Expert Market on September 28, 2021. Because a quoted spread necessitates a two-sided quote, it is important to recall the significant decrease in firms with two-sided quotes after the rule's implementation (illustrated in Panel B of Figure 2). Furthermore, recall that the two-sided quotes available on and after September 28, 2021 consist solely of unsolicited quotes for non-affiliates.

With these caveats in mind, Panel D shows quoted spreads rising in the weeks before implementation, along with an apparent sudden increase on that date. The economic magnitude of the increase is notable. From early August to late November, the cost of a roundtrip trade (i.e., buying at the ask and then selling at the bid) for an average stock in this subsample nearly doubled, rising from roughly 80% to 140% of the stock's value. Additionally, visual inspection of the data

[16] For instance, Fidelity notes on its website that based "on Securities and Exchange Commission (SEC) requirements, Fidelity blocks buy orders and opening transactions in 'over-the-counter' ('OTC') securities classified as 'Expert Market', 'Grey Market', and 'Caveat Emptor'." Fidelity Trading FAQs: Placing Orders, https://www.fidelity.com/trading/faqs-placing-orders#:~:text=Based%20off%20of%20Securities%20and,failed%20to%20make%20current%20financial

indicates that many stocks lacking two-sided quotes following September 28, 2021, were previously less liquid securities, as characterized by wide quoted spreads prior to this date. Consequently, Panel E revisits the analysis presented in Panel D, focusing only on stocks with at least one day of two-sided closing quotes both before and after September 28, 2021. The figure again shows a significant and immediate increase in relative quoted spreads on the day the amended Rule 15c2-11 was implemented, showing that investors trading relegated securities after September 28, 2021 faced substantially higher trading costs.

In Table 4, we provide point estimates of the change in these measures on September 28, 2021. For this purpose, we estimate the following regression model:

$$Y_{it} = \beta_0 + \beta_1 R_{it} + \beta_2 D_t + \beta_3 D_t \times R_{it} + \beta_4 R_{it}^2 + \beta_5 D_t \times R_{it}^2 + \varepsilon_{it} \quad (2)$$

where *Y* represents an outcome for security *i* on day *t*, *R* represents the continuous number of trading days before and after September 28, 2021, and *D* is an indicator for whether day *t* is on or after September 28, 2021. As shown in Figure 2, our outcome measures are a non-linear function of time; therefore, we incorporate R^2 in our analysis. As in Figure 2, our sample period is August 3, 2021 through November 30, 2021. We double cluster standard errors by both *R* and security *i.*

[Table 4]

Table 4 uses Equation (2) to present point estimates (i.e., β_2) and standard errors for all measures presented in Figure 2. In column 1, the point estimate of -2.645 suggests the average firm lost over two and half market makers beginning on September 28, 2021. Columns 2 through 5 provide a similar analysis for the incidence of two-sided closing quotes, missing bids or asks, and quoted spreads for all relegated securities. The point estimate in column 2 indicates that firms in this subsample experienced a decline in two-sided quotes of over 80 percentage points. Meanwhile, columns 3 and 4 confirm that this decline was driven primarily by the absence of quoted bids starting on September 28, 2021. In terms of quoted spreads, the point estimate in column 5 indicates, across all relegated firms, the mean quoted spread increased discontinuously by over 9 percentage points. This aligns with the visual representation from Panel D, which shows an increase in the cross-sectional data from roughly 1.2 to roughly 1.3. As in Panel E, column 6 presents the point estimate for quoted spreads, focusing specifically on relegated securities that had two-sided quotes both before and after September 28, 2021. For these securities, the point estimate indicates that quoted spreads increased by 37.9 percentage points on that date.

ii. Relegation and Valuation

We next examine the extent to which market prices anticipated these adverse liquidity events, focusing on two key moments: (1) publication of the initial proposal to amend Rule 15c2-11 and (2) publication of the final rule. The proposed rule was first published on September 26, 2019, and a Factiva search suggests this was the first public disclosure of the substantive proposals in Rule 15c2-11.[17] Using the OTC Trade Data, we thus focus our attention on the approximately 2,000 securities listed on the Pink No Information tier of OTC Markets during the 40 days before and after this date. For the final rule, we similarly focus on the approximately 2,300 securities listed on the Pink No Information tier during the 40 days before and after September 16, 2020, when the final rule was published. Due to the low trading rates among most stocks in our sample, we use the midpoint of the closing bid and ask prices to estimate valuation for each security.

Given the cross-correlation of stock prices with the overall market, a standard approach for examining returns around these dates would be to examine each stock's abnormal return in light of that stock's correlation with the market portfolio. However, in this context, the extreme illiquidity of these securities cautions against this approach given the classic joint-hypothesis challenge inherent in stock price event studies. That is, such a study will necessarily reflect both a test of market efficiency as well as a test for whether the event examined is economically meaningful. This challenge is especially pertinent here due to the very low trading levels of our stocks. Indeed, during 2019-2020, more than 50% of Pink No Information stocks had no daily trades on a given day. Given these conditions, a sample stock's price might not change on an event date, even if the event was value relevant. Equally important, absent indicia that a stock trades in an informationally efficient market, there is no empirical foundation for estimating abnormal returns using standard asset pricing models, as beta estimates and expected return benchmarks rely on the assumption that prices fully and promptly incorporate new information (Fama, 1970).

[17] A search for "15c2-11" during 2019 produced over 250 articles; however, all but four published prior to September 26, 2019, involved the announcement of enforcement actions by the SEC against OTC-traded firms. The first mention of the proposed amendment of Rule 15c2-11 appeared on September 23, 2019 in a Sunshine Act Meeting notice in the Federal Register, although no details concerning the proposal were disclosed. The first mention that the SEC might be concerned with the lack of public information concerning piggyback-eligible firms appeared in an ENP Newswire story published on September 25, 2019. However, the story did not provide details regarding the proposed amendments, noting only that the "Commission is considering ways to make Rule 15c2-11 more effective at protecting retail investors from incidents of fraud and manipulation in over-the-counter (OTC) securities-particularly the securities of issuers without information that is current and publicly available—and to appropriately tailor the Rule to be more efficient and effective." See Oversight of the Securities and Exchange Commission: Wall Street's Cop on the Beat, ENP Newswire, September 25, 2019.

With these concerns in mind, we first examine if stock prices appeared to react to the new regulatory regime before adjusting for market returns. For each firm, we calculate the cumulative gross return from holding its security from 40 days before to 40 days after the relevant publication date. Daily returns are computed as the continuously compounded daily return, measured as the log-difference between the midpoint price on day *t* relative to day *t*-1. Due to the large number of outliers, we winsorize daily returns at 5%. Standard errors are double clustered by both day and security.

Panel A of Table 5 presents the point estimate for the change in the mean cumulative gross returns at each date using Equation (2). Column 1 shows that cumulative gross returns decreased by nearly 5% on the date the proposed rule was published, while column 2 shows a similar 5% decrease on the date the final rule was published. However, given that these are gross returns and cumulative returns are non-stationary, it is important to interpret these results with caution.

[Table 5]

To account for overall market returns during these periods, we calculate market-adjusted buy-and-hold returns surrounding each date as in Bushee and Leuz (2005). We lack an OTC market index, so we construct one using all OTC securities listed on the two highest tiers unaffected by the rule change—OTCQX and OTCQB—during the six-months surrounding each date. Following Luft et al. (2001) and Bushee and Leuz (2005), we construct an equal-weighted index due to the unavailability of total shares outstanding for some firms, which are required for a value-weighted index. For each date, we compute 3- and 6-day market-adjusted returns for each security by subtracting the returns from the equal-weighted index of OTCQX and OTCQB firms from the security's return. The 3-day returns are compounded from day -1 to day +1 around the event date, and the 6-day returns are compounded from day -1 to day +5 around the event date (we use +5 due to aforementioned concerns of market efficiency in OTC markets).

Panel B of Table 5 presents point estimates for the market-adjusted returns surrounding both the proposed rule and the final rule. This approach mitigates some of the challenges associated with inferring statistical significance from non-stationary cumulative return data by using a shorter event window. However, it does not fully resolve econometric inference problems, especially those arising from event-induced volatility, cross-sectional dependence, and potential serial correlation. To address these concerns, we use three complementary statistical approaches to test if the average

market-adjusted returns during each window are significantly different from zero. First, as an initial benchmark, we run a simple cross-sectional t-test on the mean of all market-adjusted returns during the event window. Second, because our event date applies to all securities, we also use the Kolari and Pynnönen (2010) test, which corrects for event-induced changes in volatility and cross-correlation of returns. Last, we employ the Kolari and Pynnönen (2011) nonparametric rank test, which is robust to cross-sectional and serial correlation in abnormal returns, event-date clustering, and event-induced variance.

Overall, the results suggest that, relative to the OTCQX and OTCQB stock index, Pink No Information stocks depreciated 2 - 4% in the days surrounding the proposed rules' publication and 2 - 7% around the final rule's publication. However, only the standard t-test consistently rejects the null of no valuation change at conventional confidence levels for all estimates.

C. Liquidity and Disclosure

i. Hypothesis Development

Having examined the immediate liquidity costs for firms relegated to the Expert Market on September 28, 2021, we now consider the outcomes for DNC firms that avoided relegation. Given the extensive body of research relating illiquidity with information asymmetry and adverse selection in stock markets, we predict the new disclosures will increase liquidity and valuation for these firms through two mechanisms. First, as firms disclose, investors should increase their valuation, moving from the discounted average price of all non-disclosing firms to a price more reflective of the true value of the security, net of the costs of disclosure. Second, a firm that discloses provides a direct signal regarding the firm's recent financial performance. In a market where any given OTC security could be a non-operating firm, a company that discloses distinguishes itself as a presumably legitimate operating firm that has committed to ongoing disclosure. Likewise, the expense associated with the new filings plausibly communicates management's conclusion that the benefits of disclosure exceed its costs.

That said, predicting whether the overall effect from this signal is likely to be positive or negative for a firm's valuation is complicated by both the voluntary nature of a firm's disclosure choice as well as the difficulty of shorting in the OTC market. It would hardly be surprising if disclosing firms were dominated by those with something positive to say about their recent performance—thus leading to positive market returns for the group that discloses. At the same time, Ang et al. (2013) suggest that the difficulty of short-selling in the OTC context may lead to

systematic overvaluation of non-disclosing firms. In their model, disclosure reduces investors' disagreement over a firm's prospects, chastening overly-optimistic traders while driving valuations lower.

We further predict that these disclosures will impact liquidity in addition to valuation. When a firm's disclosures surpass or fall short of expectations, its perceived value accordingly rises or falls, potentially enhancing overall liquidity if these reset expectations generate new trading activity. However, the outcomes may be muted due to the unique circumstances of OTC markets. As noted, OTC Markets lack many of the characteristics commonly associated with an informationally efficient market, such as frequent daily trading, analyst coverage, and robust short selling.

ii. Liquidity Impact Upon Rule Implementation – September 28, 2021

This section examines liquidity effects of disclosure for the 824 DNC firms that maintained their public quotes by adhering to Rule 15c2-11's new disclosure requirements. In Figure 3, we replicate the analyses conducted in Figure 2 for this new subsample of firms. Figure 3's panels A-D show changes in market maker count, two-sided quote frequency, the percentage of securities lacking closing bids and asks, and quoted spreads, respectively. Unlike Figure 2's dramatic shifts for stocks relegated to the Expert Market, Figure 3 does not show any dramatic changes on September 28, 2021. Nonetheless, a close inspection of Figure 3 reveals a modest increase in liquidity for this subsample of stocks just before implementation. For instance, the modest upward trend in market maker count through August and early September accelerates slightly just before September 28, 2021. Likewise, the fraction of firms with two-sided quotes increases modestly, while the share lacking either bids or asks declines, in the days leading up to September 28, 2021. And quoted spreads—which appear to increase slightly during August and early September 2021—reverse course about two weeks before September 28, 2021, then increase slightly afterward.

[Figure 3]

Table 6 presents point estimates for changes in these market measures on September 28, 2021, using Equation (2). The estimates in Table 6 indicate a slight decrease in liquidity on this date, as proxied by the market maker count; column 1 shows the mean market maker count for these stocks decreased by roughly 0.09 on the day amended Rule 15c2-11 was implemented. In general,

however, the very low R^2 across all five models and lack of statistical significance on the variable of interest across columns 2 through 5 suggest that the September 28, 2021 implementation explains minimal cross-sectional variation in these liquidity measures.

[Table 6]

The contrast between Figures 2 and 3 may imply that a firm's decision to commence disclosures had minimal effects on liquidity, but this interpretation overlooks the differential importance of September 28, 2021 for these two subsamples of firms. For DNC firms without public disclosures by September 27, 2021, September 28 marked their first trading day without a public quote. In contrast, DNC firms that avoided relegation on this date began public disclosures well in advance. Indeed, OTC Markets set an informal deadline of June 30, 2021 for firms to submit preliminary disclosures, allowing time for OTC Markets to verify Rule 15c2-11 compliance (OTC Markets, 2021).

iii. Liquidity Impact Upon Rule Implementation – Initial 15c2-11 Disclosure Date

To gauge market response to Rule 15c2-11 compliance, we identify when firms first signaled their commitment to provide public disclosure and avoid Expert Market relegation. For each DNC firm avoiding Expert Market relegation, we identify the date it initiated public disclosures by filing either a quarterly or annual financial statement on Form 10-Q, 10-K, the analogous form on OTC Markets, or another Rule 15c2-11 compliant Exchange Act report.[18] Note that Rule 15c2-11 allows firms to meet information requirements through other mandatory disclosures, including banking, insurance, and international regulatory filings, so this approach focuses on issuers that are unlikely to be regulated financial institutions or foreign issuers. Of the 824 firms that avoided relegation to the Expert Market, we identify 812 that made a qualified filing prior to September 28, 2021, which we define as their "Initial 15c2-11 Disclosure."

Figure 4 plots the monthly counts of firms making these disclosures from the publication of the final rule on September 16, 2020 through September 27, 2021. The figure shows that many firms waited until August or September 2021 to file their disclosures, despite OTC Markets'

[18] Our code searched for the following filings: 10-K', '10-K/A','1-K','1-K/A','C-AR','C-AR/A','10-Q', '10-Q/A','1-SA','1-SA/A','8-A12G','8-A12G/A','8-A12B','8-A12B/A','10-12G', '10-12G/A', '10-12B', '10-12B/A','C', 'C/A','1-A', '1-A/A', '10-K (OTC)','10-Q (OTC)', 'Interim 10-Q (OTC)'.

encouragement to submit by June 30, 2021. Indeed, over 200 firms submitted their Initial 15c2-11 Disclosure in September alone.

[Figure 4]

As in our prior analyses, we adopt an event study framework, with the Initial 15c2-11 Disclosure date as day zero. Our analysis covers 40 days before and after this date. Figure 5 shows the results for market maker count, relative quoted spreads, and the proportion of firms within the subsample that traded daily. Panel A shows a slight upward trend in market maker count prior to a firm's Initial 15c2-11 Disclosure date, followed by a sudden increase from approximately 6.4 to 6.6 in the three days after. The number subsequently continues to rise. Panel A also presents the median market maker count per firm, which remains at 6 prior to firms' Initial 15c2-11 Disclosures but rises to 7 five days after it. This finding provides some assurance that market makers are attentive to a firm's disclosure status, even in a potentially informationally inefficient market.

[Figure 5]

Panel B presents a similar analysis for quoted spreads. Mean quoted spreads remain at approximately 44-45% of the quote midpoint from day -40 to -10 prior to the firms' Initial 15c2-11 Disclosures, then increase significantly from day -10 to 0. Inspection of the data indicates that this premature spike in spreads is driven almost exclusively by September filers, perhaps reflecting the market's anticipation of trading disruptions associated with the September 28, 2021 implementation date. On this date, mean quoted spreads drop back to approximately 44% and stay there for the next 40 days. As in Panel A, median quoted spreads follow a similar trend but with less of a premature spike, remaining at 29-31% from day -40 to 0, then dropping to roughly 22% afterward.

Finally, Panel C presents the mean percentage of securities traded daily during the event window. Roughly 70% of securities in the subsample traded daily in the first twenty days, declining to roughly 60% by the day prior to the issuers' Initial 15c2-11 Disclosures. On the disclosure date, the rate rises back to 70%. Panel C presents only the mean and not the median as the median number of securities traded is 1 for every day of the event window.[19]

[19] Figure A.1 in the Appendix replicates Figure 5 using a placebo date. The placebo date is the date of the first filing that occurs at least 60 days after a firm's Initial 15c2-11 disclosure. There appears to be a minor increase in liquidity associated with this placebo filing, but the magnitude pales in comparison with the change that occurs upon the Initial 15c2-11 Disclosure. Figure A.2 replicates Figure 6 using the same definition of placebo date and indicates that there is a slight increase in returns upon this date, but that the magnitude is again far smaller than for the Initial 15c2-11 disclosure. The disclosures included for these placebo dates reflect the same filings as noted in footnote 19.

Table 7 uses Equation (2) to provide point estimates and standard errors for the estimated change in these three measures beginning on the date of each firm's Initial 15c2-11 Disclosure. Overall, the estimates for all three measures indicate a significant increase in average liquidity. The results show an average increase of 0.157 market makers, a 5.69 percentage point decrease in spreads, and a 6.34 percentage point increase in traded securities. Overall, we interpret these findings as consistent with a sudden, positive increase in a security's liquidity on the Initial 15c2-11 Disclosure date.

[Table 7]

D. Disclosure and Returns

We also explore whether a firm's decision to comply with the new Rule 15c2-11 disclosure regime was associated with changes in a firm's valuation. For this analysis, we examine the market reaction to a firm's Initial 15c2-11 Disclosure for the 812 firms that initiated disclosure to avoid relegation.[20] Each firm's Initial 15c2-11 Disclosure date varies, so we calculate the cumulative return for each firm based on that firm's unique Initial 15c2-11 Disclosure date. As before, we infer daily valuations from the midpoint of the closing bid and ask price for each security, and we calculate the continuously compounded daily return as the log-difference between the midpoint price on day t relative to day t-1. Due to the large number of outliers, daily returns are winsorized for each day t at 5%. The results are presented in Figure 6 and Table 8. Across all analyses, there is significant evidence that stock prices increased on firms' Initial 15c2-11 Disclosure Dates.

Figure 6 shows stock returns in the 40 days before and after each firm's Initial 15c2-11 Disclosure Date. Panels A shows that mean cumulative gross returns are not statistically different from zero in advance of the firms' Initial 15c2-11 Disclosures, but leap to nearly 13% on the day of the Initial 15c2-11 Disclosure and continue to grow to nearly 30% in the days that follow. Results for median cumulative gross returns, presented in Panel B, indicate that the median firm had a modest decline in cumulative gross returns just prior to its Initial 15c2-11 Disclosure but similarly experienced a sizeable jump in cumulative gross returns commencing on the date of disclosure. Panels C and D show market-adjusted returns over this same period, where market-adjusted returns are calculated by subtracting the aforementioned OTC index. These panels

[20] In unreported tests, we also examine the market reaction for these firms on September 28, 2021. Although raw cumulative gross returns appear to show an increase on September 28, 2021, this finding is not statistically distinguishable from zero after adjusting for market returns.

likewise show that abnormal stock returns increased significantly on the day of a firm's Initial 15c2-11 Disclosure.

[Figure 6]

Table 8 provides point estimates and standard errors for the estimated change in returns. Panel A analyzes cumulative returns and estimates that the mean cumulative gross returns increased a notable 23% beginning on the day of firms' Initial 15c2-11 Disclosure.[21] Panel B analyzes market-adjusted returns using two event windows. For the event window (-1,+1), there is an estimated 3-day abnormal return of nearly 22%, which remains statistically distinguishable from zero across all three statistical tests previously described in Table 5. Extending the window to six days (-1,+5) results in a point estimate of over 28%, which is statistically distinguishable from zero across all three tests.[22]

[Table 8]

E. Firm Performance and Disclosure

These results suggest an increase in the valuation of these companies' securities on the day of their Initial 15c2-11 Disclosures. However, it is unclear whether investors were responding favorably to the contents of the disclosures themselves or to the underlying signal associated with the decision to disclose.

i. Financial Performance & Disclosure

Descriptive analysis suggests that much of these short-term returns stem from the signal generated by a commitment to periodic public disclosure rather than the disclosure of strong financial performance. Consider, for instance, Symmetry Technologies, Inc., which experienced one of the highest market-adjusted returns in the sample on the day of its Initial 15c2-11 Disclosure. On June 22, 2021, the company filed an annual report for both 2019 and 2020. Prior to this date, the company's most recent prior public disclosure was on August 22, 2018, when it described its

[21] As shown in Panel A of Figure 6, examination of returns very near the disclosure date show some evidence of non-linearity, potentially creating positive bias in this single day estimate. As a more conservative estimate, we run a modified version of Equation (2) in which we expand the model to be a fourth-order polynomial of R, thus permitting the model to more flexibly fit the data given the variance around the date of the Initial 15c2-11 Disclosure. As shown in Figure A.3 of the Appendix, this model adjusts for the distinct non-linearities in CARs around the disclosure date (thus raising risk of overfitting), but the point estimate for the disclosure day remains notable at 0.149 (robust s.e.= 0.016).

[22] As indicated in Panel B, we estimate disclosure day returns for 758 of the 812 firms where we can observe an Initial 15c2-11 Disclosure. The difference of 54 firms is due to the missing quote data from OTC Markets from August 30, 2021 through September 7, 2021.

business as the "development of eat-in restaurants in the greater Orlando, Florida, area that provide food and beverages to consumers residing in, or visiting, the area" (Symmetry, 2018). After nearly two years of non-disclosure, its annual report disclosed in June 2021 reported the following for the same section of its annual report: "No operations currently. Business plan is for the development of eat-in restaurants in the greater Orlando, Florida, area that provide food and beverages to consumers residing in, or visiting, the area" (Symmetry, 2021a). Moreover, the company's financial statements reflected a firm with exactly zero assets and zero revenue (Symmetry, 2021b). A search of Factiva and Reddit revealed no other news or discussion of the company at this time, but on the day these two annual reports were disclosed on OTC Markets' website its closing midpoint price was \$0.073—up an astonishing 540% from the prior day's closing midpoint price of \$0.0135.

Figure 7 shows that Symmetry Technologies is not an outlier in the sample, as many companies exhibit both weak financial performance and positive market-adjusted returns on the day of their initial 15c2-11 disclosures. Across the disclosing firms in Figure 6(c), we are able to match 539 firms to the OTC Markets Accounting Data (i.e., the period end date in the OTC Markets Accounting Data corresponds to the period end date in the company's Initial 15c2-11 Disclosure date). This allows us to identify 218 firms that, like Symmetry Technologies, disclose both zero revenue and zero assets at the time of their disclosure. Panel A of Figure 7 presents a histogram for the 3-day market-adjusted returns for these firms, showing they experienced overall positive returns in the 3-day period surrounding their Initial 15c2-11 Disclosures. The mean market-adjusted return for these firms was 24.3% and the median was 15.0%.

[Figure 7]

We also identified 84 firms whose financial statements at the time of their Initial 15c2-11 Disclosure reported a net loss in the current quarter that was larger than the net loss in the prior quarter, and we present a similar histogram of their 3-day returns in Panel B. Despite losing more money than in their prior disclosure, these firms exhibited positive abnormal returns on the day of their disclosures: across these 84 firms, the mean 3-day market-adjusted return was 18.3% and the median return was 4.6%.

Finally, Table 9 explores the extent to which the 3-day abnormal returns for these securities were related to other significant financial statement items. In particular, across the 539 firms where we have both market-adjusted returns and financial statement data as of their Initial 15c2-11

Disclosure, we classify firms by whether the 3-day market-adjusted return surrounding their Initial 15c2-11 Disclosure date is positive or negative. We then run a sequence of bivariate logit regressions of this indicator on each of the following metrics as of the time of the Initial 15c-11 Disclosure: Revenue, Quarterly Revenue Growth, Net Income, Net Income Quarterly Growth, Total Assets, Quarterly Asset Growth, Return on Assets (ROA), and Quarterly Change in ROA.[23] The coefficient estimates for all models are indistinguishable from zero with the exception of revenue and assets, which are moderately significant under conventional standards. The coefficients, however, are the opposite of what would be expected if a positive change in revenue or assets was associated with a positive return.

[Table 9]

ii. Survival & Disclosure

Despite the lackluster relationship between stock returns and financial performance, there is evidence that investors "got it right" in rewarding firms that elect to disclose. Figure 8 examines the survival rate for the original DNC firms that remained quoted as of September 27, 2021, comparing those that commenced disclosing by this date versus those that did not. To identify the survival rate, we identify all securities that disappear from the OTC trade data and match the security with the FINRA daily list to determine the cause of the disappearance. Each security is matched to the FINRA daily list event occurring closest to the date it disappears from the OTC trade data, provided that FINRA reports an event within three business days of the disappearance date. Securities categorized by the FINRA daily list archive as revoked, suspended, inactive, or bankrupt are deemed to be securities that did not survive.[24] Securities that disappear from OTC trade data for other reasons, such as a merger/acquisition or if a security instead moves to a non-OTC exchange, are considered to survive.

Figure 8 shows the daily survival rates for these firms based on whether firms remained disclosure non-compliant as of September 28, 2021, or became disclosure compliant by this date. By construction, the survival rates for each group are similar until the updated Rule 15c2-11 went into effect. After this date, the rates deviate immediately, as firms that remain disclosure non-

[23] Quarterly metrics are based on comparing the current quarter to the prior quarter. Given that many companies had recurring net losses, we define income growth as simply the difference in the current quarter's net income less the prior quarter's income.

[24] Securities deemed not to survive are those classified as 12(j) Registration Revoked by SEC, Bankruptcy Plan Effective Shares Cancelled/Distribution, CUSIP Suspended, Charter Cancelled/Dissolution, Financial Status Change Liquidation = L, Inactive Security, and Liquidation/Final Distribution.

compliant are significantly less likely to survive. Table A.1 in the Appendix presents t-tests comparing survival rates every six months and confirms that survival rates after Rule 15c2-11 went into effect differ at the 1% level within six months of the implementation date. Together with the positive returns for disclosing firms, the results suggest that the market correctly viewed a firm's commitment to disclosure as a positive signal of quality relative to non-disclosing firms, regardless of the strength of the financial results.

V. Conclusion

This study offers new evidence on how the 2021 amendments to SEC Rule 15c2-11 affected liquidity and valuation in OTC markets. We document a stark divergence in outcomes between firms that complied with the new disclosure requirements and those that did not. Compliant firms saw substantial improvements in liquidity, including increased market maker participation and narrower bid-ask spreads. In contrast, non-compliant firms suffered an immediate and severe contraction in liquidity upon relegation to the Expert Market. These results underscore the significant liquidity costs for investors when firms lose access to two-sided public quotes.

Moreover, we demonstrate that compliance with the new disclosure regime led to meaningful valuation effects. Non-disclosing firms that initiated disclosures saw market-adjusted returns of approximately 22% over three days and 28% over six days following their first public disclosure. These returns seem unrelated to firm fundamentals, suggesting investors valued liquidity and disclosure itself, not the specific content disclosed. Nonetheless, our evidence suggests that investors correctly interpret disclosure as a positive signal of quality, as firms that chose to disclose had significantly higher rates of survivorship.

Our findings also raise important policy considerations. The sharp decline in liquidity for firms relegated to the Expert Market suggests that the new rule effectively bifurcated the OTC market into two tiers: one consisting of publicly accessible, transparent securities, and another of opaque, thinly traded assets. While this segmentation may enhance investor protection by reducing the risk of fraud, it also creates new challenges for investors holding previously liquid OTC stocks—at least in terms of publicly accessible quotes—that became illiquid due to the rule change.

Taken together, our results highlight the broader implications of mandatory disclosure requirements in securities markets. While OTC markets have historically operated with varying degrees of transparency, our study provides compelling evidence of the value investors place on

both liquidity and disclosure. Our findings underscore the importance of ensuring that a firm's commitment to public disclosure properly considers the costs and benefits of such disclosures for all investors, not just insiders. These findings contribute to ongoing policy debates over mandatory disclosure versus reliance on private ordering.

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Figure 1

This figure presents the percent of Disclosure Non-Compliant (DNC) firms with Rule 144 filings made by the firm's insiders, separated by whether the firm elected to disclose between September 16, 2020 and September 27, 2021 or instead failed to disclose and was relegated to the Expert Market.

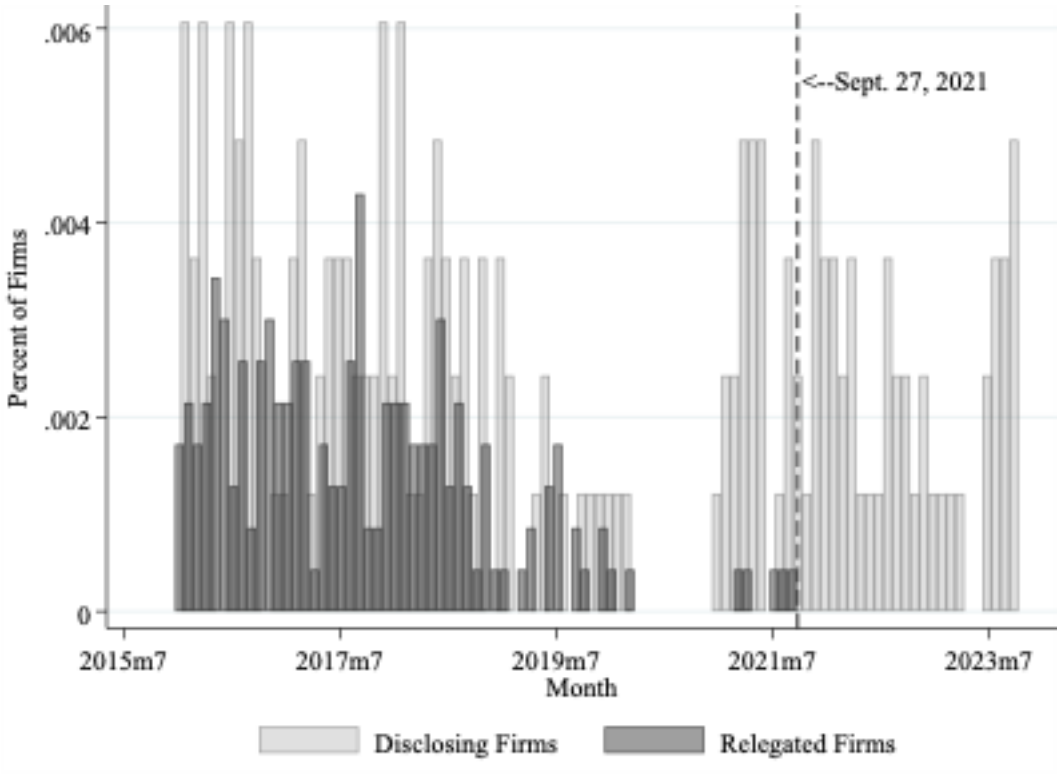
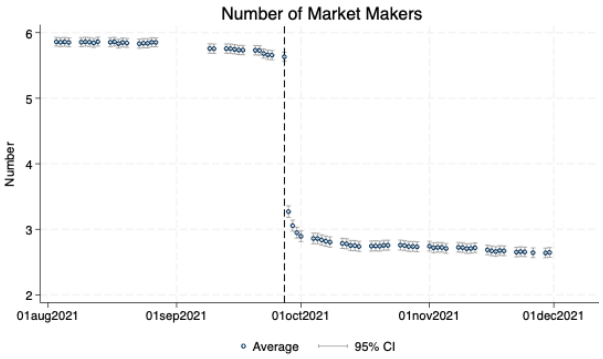


Figure 2

This figure studies the impact of relegation on liquidity. Each figure presents a different proxy for liquidity at its daily mean for August 3, 2021 through November 30, 2021. Panels A-D include all firms relegated to the Expert Market on September 28, 2021. Panel E includes the subset of those firms with at least one day of two-sided closing quotes both before and after September 28, 2021. In all panels, the missing observations for early September are due to the missing OTC trade data (described in footnote 7).

A



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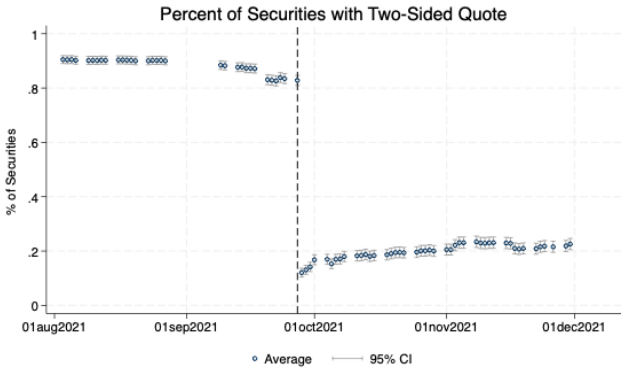

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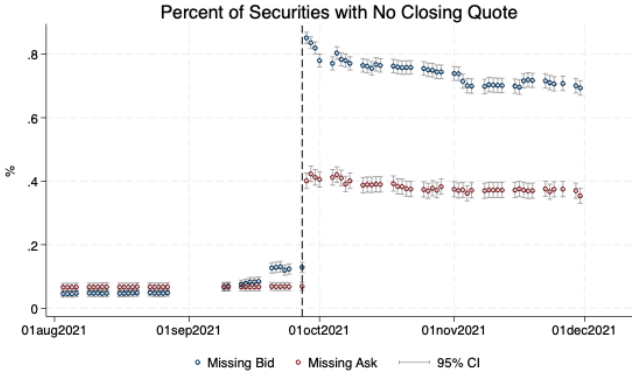

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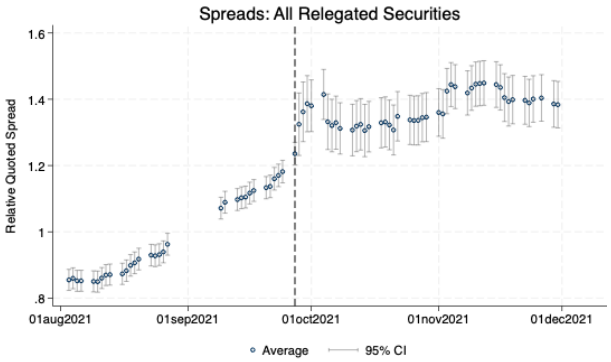


E

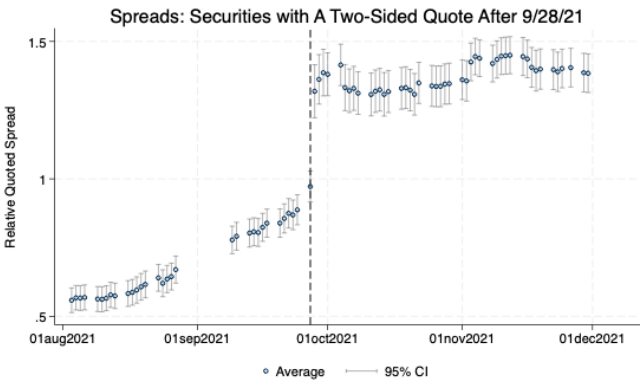


Figure 3

This figure studies liquidity for the subset of previously Disclosure Non-Compliant firms (DNC) that chose to comply with Rule 15c2-11's new disclosure requirements, thus maintaining their public quote. Each figure presents a different proxy for liquidity at its daily mean for August 3, 2021 through November 30, 2021. In all panels, the missing observations for early September are due to the missing OTC trade data (described in footnote 7).

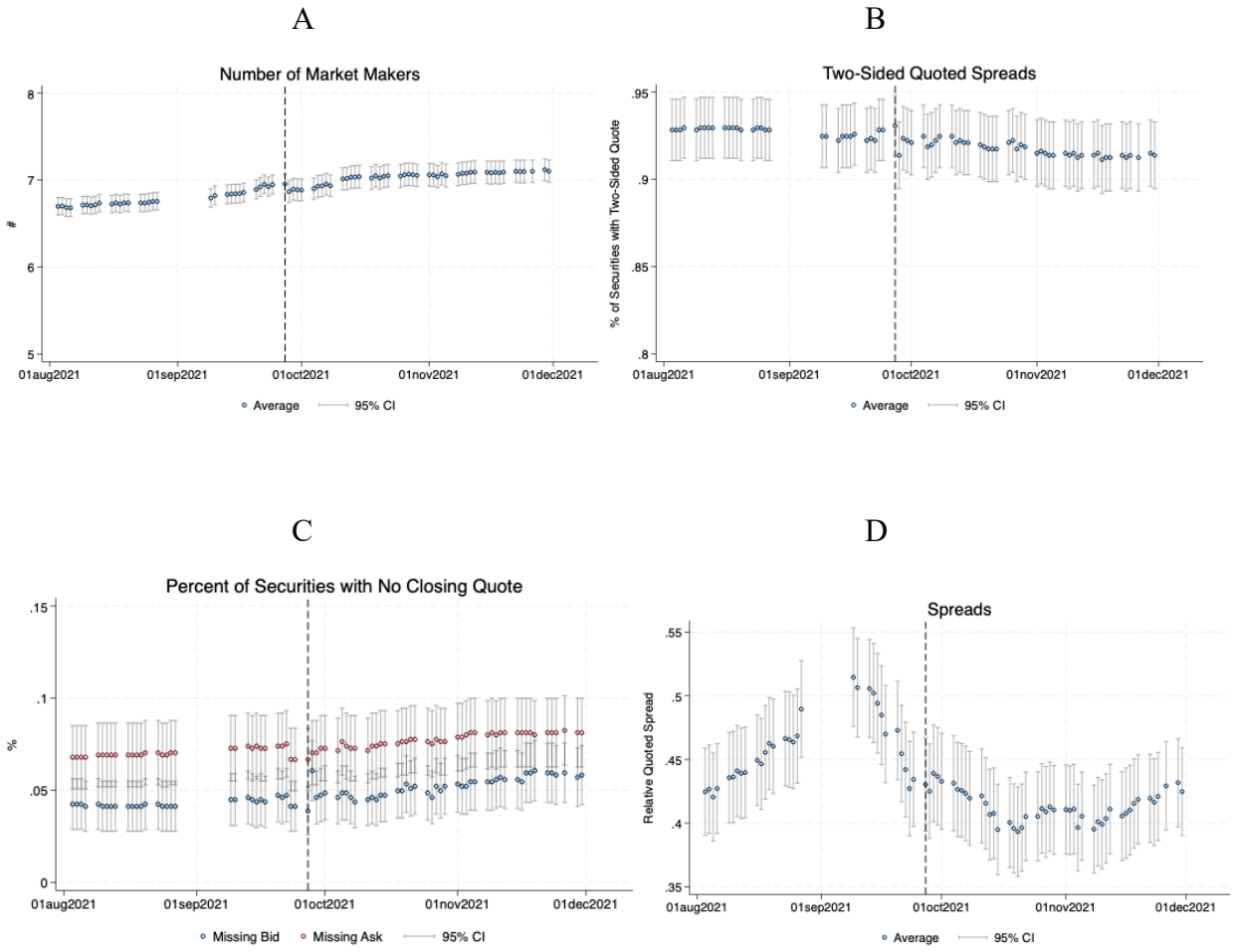


Figure 4

Figure 4 plots the monthly count of firms filing their Initial 15c2-11 Disclosure from September 2020 (when amended Rule 15c2-11 was adopted) through September 2021 (when amended Rule 15c2-11 went into effect).

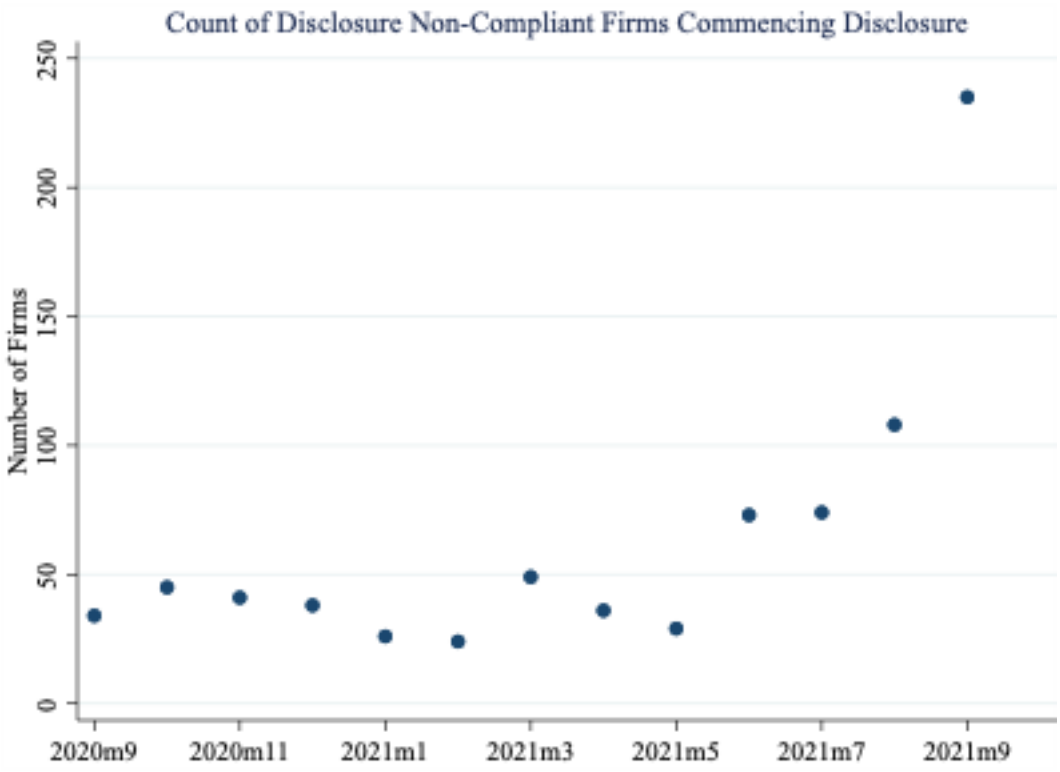


Figure 5

This figure shows liquidity measures for the subset of previously Disclosure Non-Compliant (DNC) firms that chose to comply with amended Rule 15c2-11 in the 40 days before and after their Initial 15c2-11 Disclosure was filed. Day 0 reflects each firm's Initial 15c2-11 Disclosure Date.

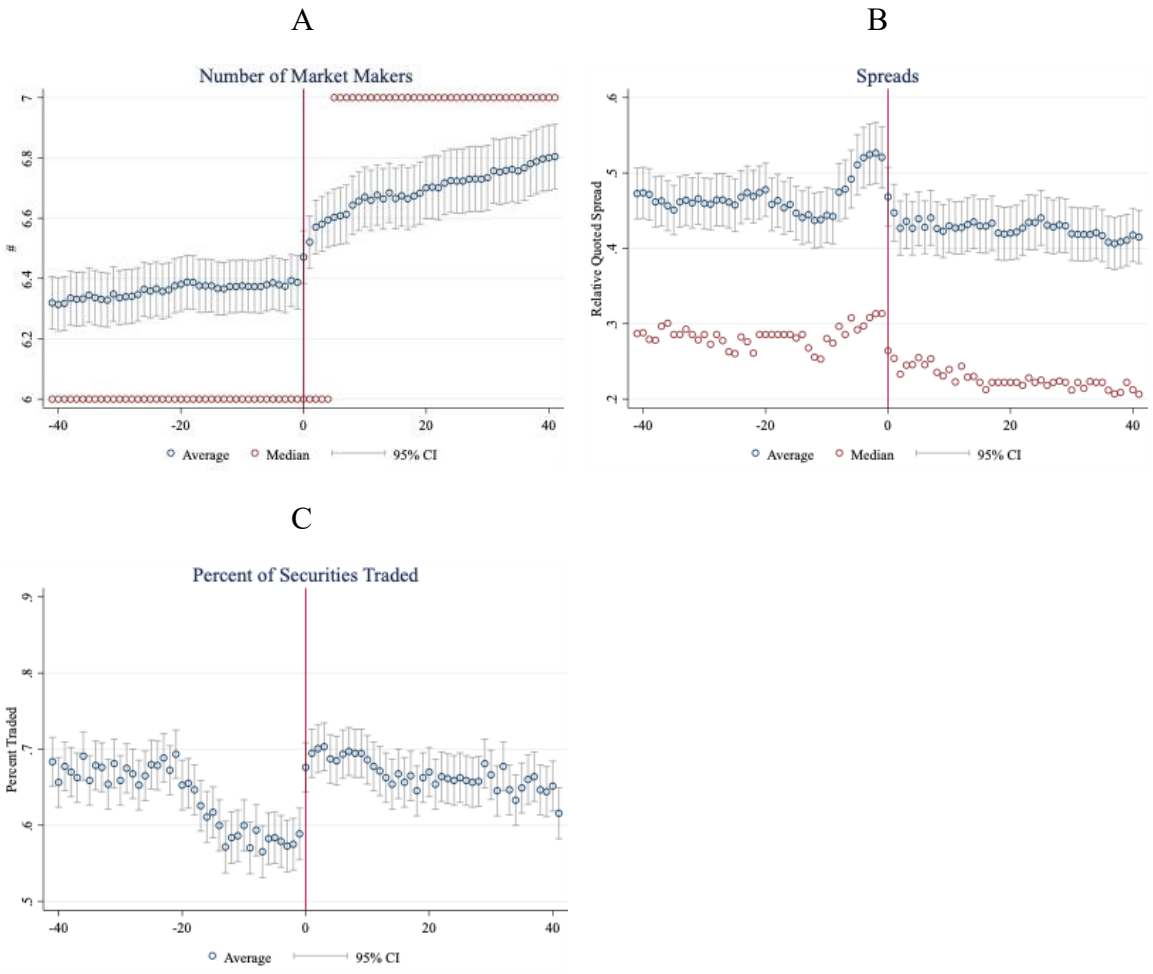


Figure 6

This figure shows stock returns for the subset of previously Disclosure Non-Compliant (DNC) firms that chose to comply with amended Rule 15c2-11 in the 40 days before and after each firm's Initial 15c2-Disclosure. Panels A and B show cumulative gross returns. Panels C and D show cumulative market-adjusted returns, where market-adjusted returns are calculated as that security's return after subtracting the returns from an equal-weighted index of OTCQX and OTCQB firms. Day 0 reflects each firm's Initial 15c2-11 Disclosure Date.

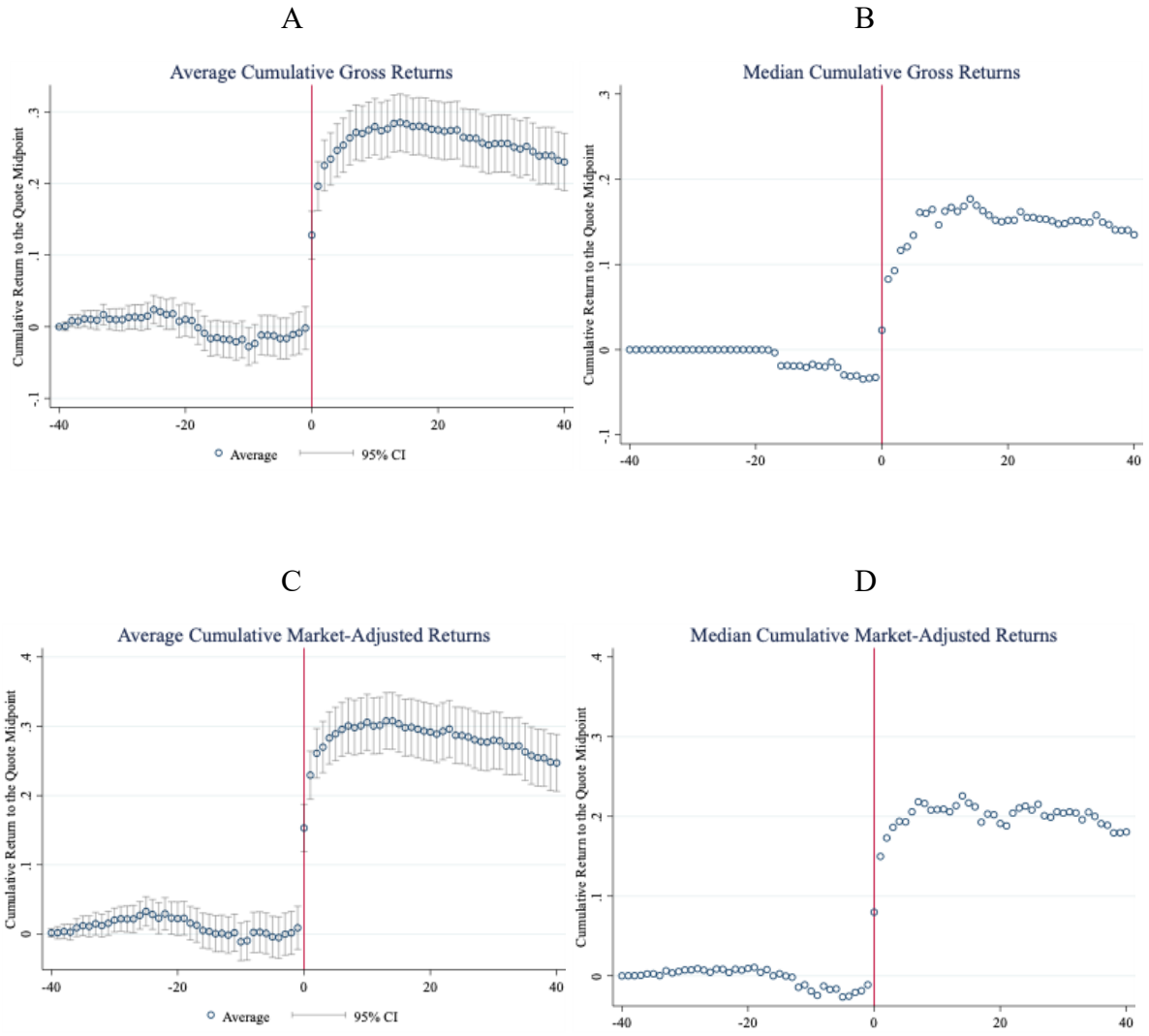
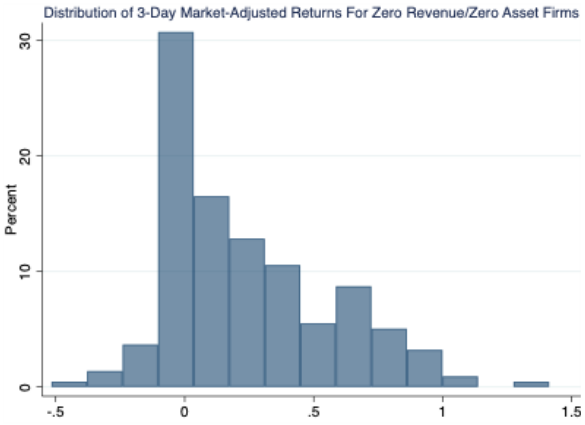


Figure 7

This figure presents a histogram of the 3-day market-adjusted returns for the 213 firms that report both zero revenue and zero assets at the time of their Initial 15c2-11 Disclosure (Panel A) and for the 84 firms that report larger losses than in the prior quarter (Panel B). Market-adjusted returns are calculated as that security's return after subtracting the returns from an equal-weighted index of OTCQX and OTCQB firms.

A



B

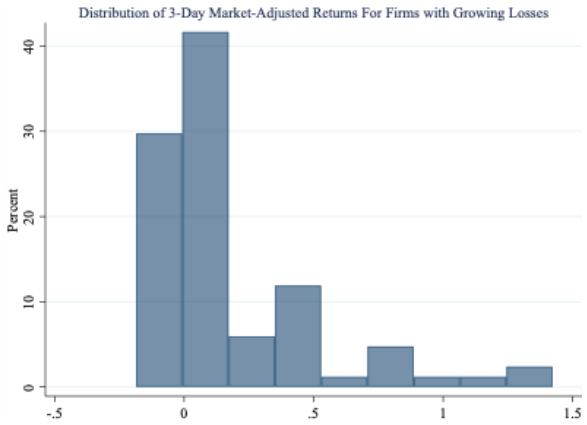


Figure 8

This figure presents daily survival rates for the firms classified as Disclosure Non-Compliant (DNC) on September 16, 2020. Firms are grouped based on whether they remain non-compliant or become compliant following Rule 15c2-11. The survival rate is determined by identifying all securities that disappear from the OTC trade data and matching the security with the corresponding event from the FINRA daily list to determine the cause of the disappearance. Firms that disappear for neutral reasons, such as mergers or acquisitions, are considered to survive while firms that disappear because the firm itself is not viable (e.g., securities revocation or suspension) are not considered to survive.

Table 1

Panel A: Disclosure Compliant	No. of Firms	mean	std	p25	p50	p75	p95
Midpoint Price	1,759	208.21	3,084.33	0.06	0.56	9.78	68.45
Average Daily Trade Count	1,911	50.70	335.15	0.26	2.05	15.00	167.05
Zero Trade Days	1,911	8.52	8.40	0.00	7.00	16.00	19.00
Market Cap (millions)	1,729	7,299.89	259,622.08	4.27	15.18	50.83	320.71
Market Maker Count	1,911	7.88	3.49	6.00	7.00	10.00	14.37
Relative Spread	1,759	0.30	0.42	0.05	0.13	0.35	1.30
Midpoint Volatility	1,755	8.81	41.29	1.07	4.16	8.66	24.17
Panel B: Disclosure Non-Compliant	No. of Firms	mean	std	p25	p50	p75	p95
Midpoint Price	2,273	173.87	3,604.68	0.00	0.02	0.15	22.61
Average Daily Trade Count	3,417	6.40	67.13	0.05	0.42	1.89	18.47
Zero Trade Days	3,417	12.26	6.70	7.00	14.00	18.00	19.00
Market Cap (millions)	2,165	3,064.46	135,428.61	0.29	0.88	3.93	73.03
Market Maker Count	3,417	4.22	2.79	0.00	6.00	6.00	7.00
Relative Spread	2,273	0.69	0.50	0.32	0.56	0.90	1.85
Midpoint Volatility	2,256	348.28	15,788.79	0.90	5.39	11.90	33.43
Panel C: Russell 2000	No. of Firms	mean	std	p25	p50	p75	p95
Midpoint Price	2,028	42.68	55.21	13.64	26.74	51.74	130.69
Average Daily Trade Count	1,306	4,965.02	9,250.63	1,072.59	2,659.09	5,574.73	14,603.82
Market Cap (millions)	2,028	1,112.66	1,160.35	277.96	656.12	1,541.01	3,587.44
Market Maker Count	1,306	43.73	8.02	37.32	45.00	50.00	55.00
Relative Spread	2,028	0.00	0.00	0.001	0.001	0.002	0.010
Midpoint Volatility	2,027	3.07	2.0477	1.9083	2.6203	3.5915	6.1842

Table 1

This table presents summary statistics for firms as of September 16, 2020, split by whether firms were Disclosure Compliant (DC) (Panel A) or Disclosure Non-Compliant (DNC) (Panel B). Panel C presents the same statistics for Russell 2000 firms at the end of 2020.

Table 2

Disclosure Compliant Firms	Number of Firms	# of Firms with Prior Public Disclosures	Mean # of Days Since Last Disclosure	Median # of Days Since Last Disclosure
15c2-11 Status as of 9/28/21				
Compliant	1,549			
Non-Compliant	218			
No Longer Quoted	144			
Total:	1,911			
Disclosure Non-Compliant Firms				
15c2-11 Status as of 9/28/21				
Compliant	824	752	1,865	1,297
Non-Compliant	2,327			
No Longer Quoted	266			
Total:	3,417			

Table 2

Table 2 summarizes the status of each firm in our sample, split by whether that firm was Disclosure Compliant (DC) or Disclosure Non-Compliant (DNC) on September 16, 2020 (when amended Rule 15c2-11 was published). The firms within each category are then classified as Compliant, Non-Complaint, or No Longer Quoted as of September 28, 2021 (when amended Rule 15c2-11 went into effect).

Table 3

	(1)	(2)	(3)	(4)
	Begin Disclosure		Time to Disclosure	
144	-0.0166**	-0.0392***	0.8949**	0.8415***
	[0.0076]	[0.0135]	[0.0405]	[0.0512]
Dividends	0.0291	0.0376	1.1558*	1.1511
	[0.0193]	[0.0259]	[0.1017]	[0.1078]
Price	0.0007	-0.0086	0.9971	0.9691
	[0.0031]	[0.0054]	[0.0158]	[0.0199]
Subpenny	0.0046	-0.0507	0.9494	0.8069*
	[0.0231]	[0.0330]	[0.1063]	[0.0986]
Volume	0.0168***	0.0220***	1.1031***	1.1051***
	[0.0046]	[0.0070]	[0.0236]	[0.0284]
Zero Trade	-0.1123***	-0.0501	0.5613***	0.8214
	[0.0401]	[0.0706]	[0.1087]	[0.2082]
No Quote	-0.2766***		0.2060***	
	[0.0434]		[0.0471]	
Caveat	-0.1941***	-0.1729***	0.4220***	0.5127***
	[0.0285]	[0.0380]	[0.0628]	[0.0832]
Return		0.0009		1.0028
		[0.0011]		[0.0040]
Zero Return		-0.1602**		0.6068*
		[0.0695]		[0.1685]
Volatility		-0.4700**		0.1787***
		[0.1830]		[0.1140]
Spread		-0.0162		0.9398
		[0.0289]		[0.1045]
Observations	3,305	2,036	3,305	2,036

Table 3

Table 3 uses Equation (1) to present cross-sectional regressions examining the determinants of a firm's decision to commence disclosures, as well as the speed with which it chose to disclose following September 16, 2020. Equation (1) is as follows: $Y_i = \beta_0 + \beta_1 144_i + \beta_2 Dividends_i + \beta_3 Price_i + \beta_4 Subpenny + \beta_5 Volume_i + \beta_6 ZeroTrade_i + \beta_7 Caveat_i + \beta_8 NoQuote_i + \varepsilon_i$. In columns (1) and (2), the dependent variable is a binary indicator for whether a sample firm began disclosing before September 28, 2021. Columns (3) and (4) report Cox proportional hazards models estimating the time until an issuer first initiates disclosure between September 16, 2020 and September 27, 2021. Robust standard errors are in brackets.

Table 4

	(1) Market Maker Count	(2) Two-Sided Quotes	(3) No Bid	(4) No Ask	(5) Spreads - All	(6) Spreads - Quoted Post
Point Estimate	-2.645***	-0.838***	0.845***	0.508***	0.0969**	0.379***
Std. Error	[0.0725]	[0.0774]	[0.0816]	[0.0813]	[0.0398]	[0.0384]
Observations	131,277	131,292	131,292	131,292	57,982	30,314
R-squared	0.519	0.333	0.315	0.091	0.094	0.255

Table 4

This table uses Equation (2) to study the liquidity-related outcomes for relegated firms, where Equation (2) is as follows: $Y_{it} = \beta_0 + \beta_1 R_{it} + \beta_2 D_t + \beta_3 D_t \times R_{it} + \beta_4 R_{it}^2 + \beta_5 D_t \times R_{it}^2 + \varepsilon_{it}$. *Y* represents an outcome for security *i* on day *t*, *R* represents the continuous number of trading days before and after September 28, 2021, and *D* is an indicator for whether day *t* is on or after September 28, 2021. The analysis includes the 1,563 securities that transitioned from Pink No Information to the Expert Market on September 28, 2021, and the sample period is August 3, 2021 through November 30, 2021. Standard errors are double clustered by both *R* and security *i.* Market Maker Count reflects the number of market makers for that security. Two-Sided Quotes is a dummy variable equal to 1 if there is a daily two-sided closing quote available for the security. No Bid is a dummy variable equal to 1 if the security lacks a daily closing bid price. No Ask is a dummy variable equal to 1 if the security lacks a daily closing ask price. Spreads – All reflects the daily closing quoted spread for all securities in the sample. Spreads – Quoted Post reflects the daily closing quoted spread for the subset of relegated securities that had two-sided quotes both before and after September 28, 2021.

Table 5

Panel A: Gross Returns

	Proposed Rule	Final Rule
Point Estimate	-0.0428***	-0.0516***
Std. Error	[0.00913]	[0.0136]
Observations	165,200	171,760
R-squared	0.231	0.124

Panel B: Market Adjusted Returns

	Proposed Rule		Final Rule	
	Window (-1,1)	Window (-1,5)	Window (-1,1)	Window (-1,5)
CAR	-0.01848	-0.03968	-0.0230	-0.0705
t-test	-18.7686***	-26.1006***	-14.4618***	-27.725***
Kolari	-0.0693	-0.0656	-0.3249	-0.6517
GRANK-T test	0.8527	0.2091	0.3528	-0.0428
# Securities	2,234	2,234	2,362	2,362

Table 5

This table presents the stock market reaction to the proposed amended Rule 15c2-11 (September 26, 2019) and final amended Rule 15c2-11 (September 16, 2020). Panel A uses Equation (2) to study the one-day change in cumulative gross returns for all firms listed as Pink No Information in the 40 days before and after the proposed rule (column 1) and final rule (column 2), where Equation (2) is as follows: $Y_{it} = \beta_0 + \beta_1 R_{it} + \beta_2 D_t + \beta_3 D_t \times R_{it} + \beta_4 R_{it}^2 + \beta_5 D_t \times R_{it}^2 + \varepsilon_{it}$. Y represents the cumulative gross returns for security *i* on day *t*, *R* represents the continuous number of trading days before and after the proposed rule (column 1) or final rule (column 2), and *D* is an indicator for whether day *t* is on or after September 26, 2019 (column 1) or September 16, 2020 (column 2). Standard errors are double clustered by both *R* and security *i.* Market-adjusted returns in Panel B are calculated as that security's daily return after subtracting the return from an equal-weighted index of OTCQX and OTCQB firms. The analysis includes all 2,236 firms trading continuously on the Pink No Information tier for the full 40 days before and after September 26, 2019 for column 1, and all 2,362 firms trading continuously on the Pink No Information tier for the full 40 days before and after September 16, 2020 for column 2. Panel B presents the point estimates for market-adjusted returns during the specified event windows. Below the point estimate, we report the results of a simple cross-sectional t-test on the mean of all market-adjusted returns during the event window, the Kolari and Pynnönen (2010) test, and the Kolari and Pynnönen (2011) nonparametric rank test.

Table 6

Panel A	(1) Market Maker Count	(2) Two-Sided Quotes	(3) No Bid	(4) No Ask	(5) Spreads
Point Estimate	-0.0887***	-0.00249	0.0037	0.000	0.00147
Std. Error	[0.0252]	[0.00249]	[0.00382]	[0.00248]	[0.00611]
Observations	68,623	69,216	69,216	69,216	63,830
R-squared	0.007	0.000	0.001	0.000	0.004

Table 6

This table uses Equation (2) to study the liquidity-related outcomes for previously Disclosure Non-Compliant (DNC) firms on September 28, 2021, where Equation (2) is as follows: $Y_{it} = \beta_0 + \beta_1 R_{it} + \beta_2 D_t + \beta_3 D_t \times R_{it} + \beta_4 R_{it}^2 + \beta_5 D_t \times R_{it}^2 + \varepsilon_{it}$. Y represents an outcome for security i on day t, R represents the continuous number of trading days before and after September 28, 2021, and D is an indicator for whether day t is on or after September 28, 2021. The analysis includes the 824 firms that transitioned from Disclosure Non-Compliant to Disclosure Compliant by September 28, 2021, and the sample period includes the two months before and after September 28, 2021. Standard errors are double clustered by both R and security i. Market Maker Count reflects the number of market makers for that security. Two-Sided Quotes is a dummy variable equal to 1 if there is a daily closing two-sided quote available for the security. No Bid is a dummy variable equal to 1 if the security lacks a daily closing bid price. No Ask is a dummy variable equal to 1 if the security lacks a daily closing ask price. Spreads reflects the daily closing quoted spread for all securities in the sample.

Table 7

	(1) Market Makers	(2) Spreads	(3) Traded
Point Estimate	0.157***	-0.0569***	0.0634***
Std. Error	[0.0126]	[0.00938]	[0.0121]
Observations	46,995	43,681	47,891
R-squared	0.014	0.002	0.001

Table 7

This table uses the following Equation (1) to study the liquidity-related outcomes for previously Disclosure Non-Compliant firms upon their Initial 15c2-11 Disclosure, where Equation (1) is as follows: $Y_{it} = \beta_0 + \beta_1 R_{it} + \beta_2 D_t + \beta_3 D_t \times R_{it} + \beta_4 R_{it}^2 + \beta_5 D_t \times R_{it}^2 + \varepsilon_{it}$. *Y* represents an outcome for security *i* on day *t*, *R* represents the continuous number of trading days before and after a firm's Initial 15c2-11 Disclosure date, and *D* is an indicator for whether day *t* is on or after a firm's Initial 15c2-11 Disclosure date. The analysis includes the 802 firms that transitioned from Disclosure Non-Compliant to Disclosure Complaint by September 28, 2021, and the sample period is 40 days before and after the date each firm filed its Initial 15c2-11 Disclosures. Standard errors are double clustered by both *R* and security *i.* Market Maker Count reflects the number of market makers for that security. Spreads represents the security's relative quoted spread, measured as the closing bid-ask spread relative to the midpoint price. Traded is an indicator variable for whether the security was traded daily.

Table 8

Initial Disclosure

Panel A		Panel B		
			Window	
			(-1,1)	(-1,5)
Point Estimate	0.231***	CAR	0.219	0.2823
Std. Error	[0.0187]	t-test	50.006***	40.946***
		Kolari	11.241***	9.289***
		GRANK-T test	10.577***	11.726***
Observations	65,772			
R-squared	0.073	N	758	758

Table 8

Panel A uses the following Equation (2) to study the stock price response to firm's Initial 15c2-11 Disclosures, where Equation (2) is as follows: $Y_{it} = \beta_0 + \beta_1 R_{it} + \beta_2 D_t + \beta_3 D_t \times R_{it} + \beta_4 R_{it}^2 + \beta_5 D_t \times R_{it}^2 + \varepsilon_{it}$. *Y* represents the cumulative gross return for security *i* on day *t* where *t=0* is the date 40 days prior to a firm's Initial 15c2-11 Disclosure, *R* represents the continuous number of trading days before and after the firm's Initial 15c2-11 Disclosure, and *D* is an indicator for whether day *t* is on or after a firm's Initial 15c2-11 Disclosure date. The analysis includes the 802 firms that transitioned from Disclosure Non-Compliant to Disclosure Complaint by September 28, 2021, and the sample period is 40 days before and after the date each firm filed its Initial 15c2-11 Disclosures. Standard errors are double clustered by both *R* and security *i.* Panel B provides point estimates for two event windows surrounding each firm's Initial 15c2-11 Disclosure. Each column reports market-adjusted returns, where market-adjusted returns are calculated as that security's return after subtracting the returns from an equal-weighted index of OTCQX and OTCQB firms. Below the point estimate, we report the results of a simple cross-sectional t-test on the mean of all market-adjusted returns during the event window, the Kolari and Pynnönen (2010) test, and the Kolari and Pynnönen (2011) nonparametric rank test.

Table 9

	Revenue	Quarterly Revenue Growth	Net Income	Quarterly Net Income Growth	Assets	Quarterly Asset Growth	ROA	Quarterly Change in ROA
Point Estimate	-0.0198*	-0.029	0.00467	-0.0185	-0.000805**	0.00463	-6.34E-05	-1.22E-05
Std. Error	[0.0113]	[0.0273]	[0.0186]	[0.0128]	[0.000337]	[0.00344]	[5.39e-05]	[4.44e-05]
Observations	539	109	539	379	443	185	300	179

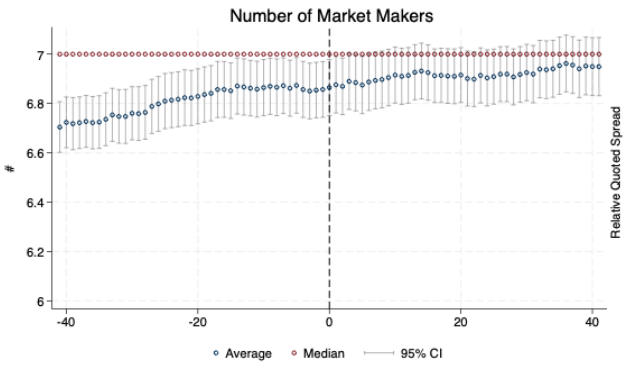
Table 9

This table provides evidence on whether each firm's stock price response is related to the financial content disclosed in its Initial 15c2-11 Disclosure, where the equation is $Y_i = \beta_0 + \beta_1 X_i + \varepsilon_i$. Y is an indicator variable that represents whether firm i had positive or negative three-day market-adjusted cumulative return surrounding its Initial 15c2-11 Disclosure, and X represents one of eight financial metrics reported by firm i in its Initial 15c2-11 Disclosure. The analysis includes the 535 firms where we have both market-adjusted returns and financial statement data as of their Initial 15c2-11 Disclosure. The table shows the results of bivariate logit regressions of this indicator on each of the following metrics as of the time of the Initial 15c-11 Disclosure: Revenue, Quarterly Revenue Growth, Net Income, Net Income Quarterly Growth, Total Assets, Quarterly Asset Growth, Return on Assets (ROA), and Quarterly Change in ROA. Robust standard errors are in brackets.

Appendix: Figure A.1

This figure replicates Figure 5 using a placebo date. Using the same sample as in Figure 5, the placebo date is the first date a disclosure is filed after the Initial 15c2-11 Disclosure, provided that the disclosure occurs least 60 days after the Initial 15c2-11 Disclosure date.

A



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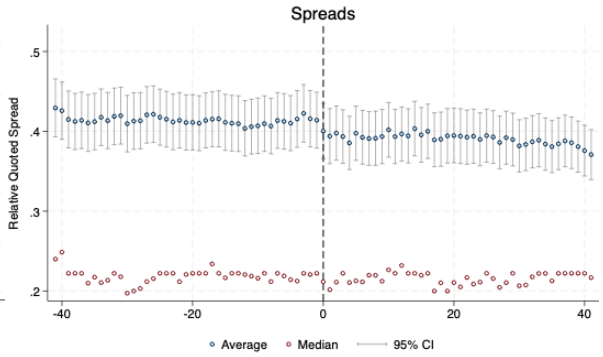
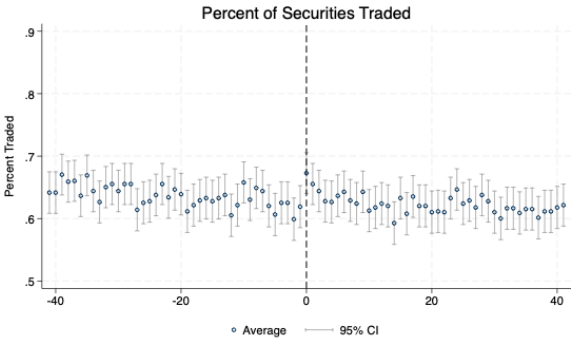


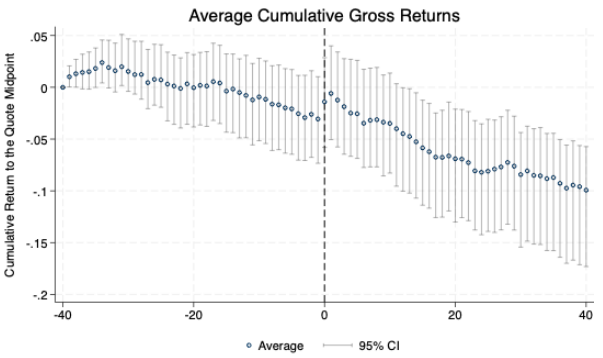
C



Appendix: Figure A.2

This figure replicates Figure 6 using a placebo date. Using the same sample as in Figure 6, the placebo date is the first date a disclosure is filed after the Initial 15c2-11 Disclosure, provided that the disclosure occurs least 60 days after the Initial 15c2-11 Disclosure date.

A



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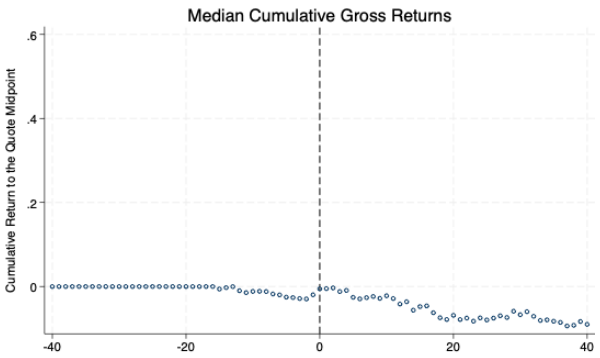

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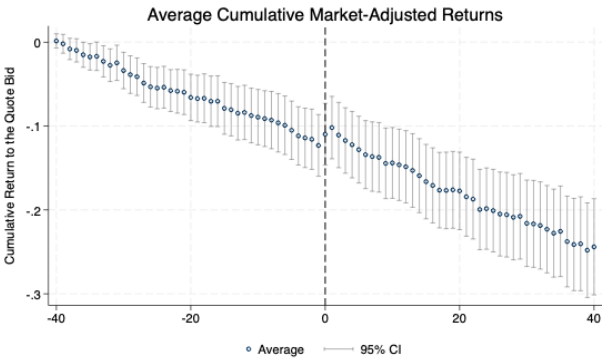

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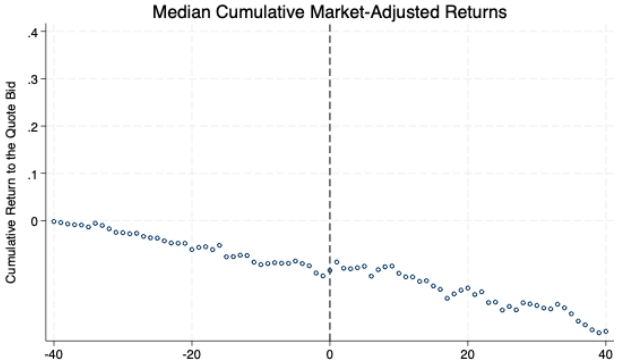
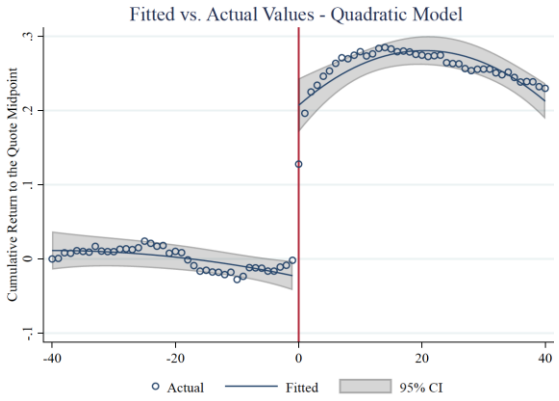


Appendix: Figure A.3

This figure compares point estimates for the one-day change in cumulative gross returns on firms' Initial 15c2-Disclosure date using the original specification of Equation (2) (Panel A) versus an expanded model with a fourth-order polynomial in R (Panel B). The comparison highlights the risk of overfitting associated with the more flexible specification.

A



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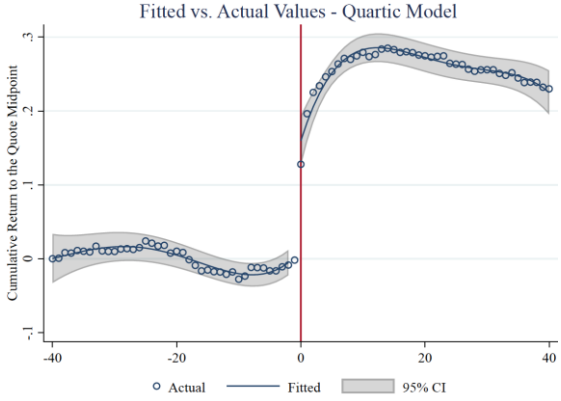

Appendix: Table A.1

This table provides t-tests for the firms included in the survival analysis in Figure 6. The t-tests compare the survival rates for the firms that remained disclosure non-compliant with those that became disclosure compliant at six-month intervals.

	Survival Rate (%)			
Date	DNC to DC	DNC	t-val	p-val
9/16/2020	100	100	.	.
3/16/2021	99.76	99.96	-1.13	0.26
9/16/2021	99.88	99.91	-0.26	0.79
3/16/2022	99.64	96.78	6.77	0.00
9/16/2022	99.51	92.05	12.22	0.00