Can a Minor Regulatory Intervention Lower Corporate Borrowing Costs?*

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Abstract: Institutional investors repeatedly express concern about the substantial information processing costs in the primary corporate bond market. This study sheds light on this issue by exploring the impact of a decrease in information processing costs on corporate bond borrowing costs. Specifically, the U.S. Securities and Exchange Commission's 2017 Exhibit Hyperlink rule mandates the inclusion of hyperlinks to exhibits in registration statements, facilitating easier access to relevant information and reducing information processing costs for investors. Leveraging variations in this mandate across firm size and time in the corporate bond market, I find that hyperlink inclusion leads to a reduction in corporate bond yields in the primary market. Further evidence reveals that this effect is more pronounced when information processing costs are higher. In summary, this study shows that a minor regulatory intervention designed to alleviate information processing costs can significantly reduce bond borrowing costs.

1. Introduction

The corporate bond market is the largest source of capital for U.S. firms, raising $13.255 trillion between 2014 and 2021, while equity offerings lagged at just $1.974 trillion.[1] Numerous studies have uncovered pervasive information asymmetry in the corporate bond market, which can be partly attributed to extreme time constraints and information processing costs in the primary investment-grade bond market (e.g., Cai, Helwege, and Warga, 2007; Bonsall and Miller, 2017; Grennan and Musto, 2018; Wang, 2021). Institutional investors in bonds have repeatedly expressed concern about these substantial costs (The Credit Roundtable, 2015, 2016; SEC, 2020; Scaggs, 2021), which, although extensively investigated in the equity market (e.g., Christensen, Floyd, Liu, and Maffett, 2017; De; S. Kim and Kim, 2022), have been under-explored in terms of their direct impact on bond borrowing costs. This study aims to fill this void by examining how a minor regulatory intervention—the U.S. Securities and Exchange Commission's (SEC's) 2017 Exhibit Hyperlink rule, which was intended to streamline time constraints and reduce information processing costs—can influence bond borrowing costs.

The information processing costs in the corporate bond market deserve special attention due to being notably higher than those in the equity market. In the corporate bond market, these costs arise primarily from extreme time constraints, which are driven by both the unique feature of the bond issuance timeline and the large volume of new issue announcements. Concerning the bond issuance timeline, most new investment-grade bond issues are announced and priced on the same day.[2] In contrast to equity investors, who typically have several days to review new offerings,

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[1] Based on bond issuance and equity issuance data from Securities Industry and Financial Markets Association (SIFMA). See https://www.sifma.org/resources/archive/ research/statistics/.

[2] Investment-grade bonds are issued without pre-issuance roadshows due to the high demand, and junk bonds may hold roadshows before the issue announcement. Investment-grade bonds have a bond rating ranging from AAA (Aaa) to BBB- (Baa3) by Standard & Poor's (Moody's), and junk bonds are generally rated BB+ (Ba1) or lower by Standard & Poor's (Moody's).

corporate bond investors are often afforded only a very short period—typically, one-to-two hours—to acquire and review relevant information and make investment decisions after the announcement of a new issue (The Credit Roundtable, 2015, 2016; Grennan and Musto, 2018; SEC, 2020; Scaggs, 2021; Wang, 2021).[3] This already tight timeframe is further exacerbated by the large volume of new issues, which can overwhelm investors' attention and capacity to pre-assess available information, especially when such information is difficult to access and process.[4] Consequently, bond investors often face extreme time constraints when attempting to review information both before and after the announcement of a new issue.

The 2017 implementation of the Exhibit Hyperlink rule, which applies to all registration statements and periodic reports, has significantly eased time constraints and information processing costs for bond investors. Specifically, in the context of the bond market, this rule mandates the inclusion of an active hyperlink in each exhibit in the bond registration statements. These exhibits refer to a variety of supplementary filings relevant for investors to evaluate the issue risk and make informed investment decisions.[5] Before 2017, to retrieve an exhibit-referred file, investors had to read the exhibit description to identify the original filing and then navigate the registrant's archives to find the specific document. This process could be both time-consuming and cumbersome, especially given the typically short time investors have to review such

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[3] When an investment-grade company sells a new bond, investors' deadline for entering orders can be as short as 15 minutes (SEC, 2020).

[4] The credit roundtable, which is formed by a group of large buy-side institutional fixed income investors, reveals that "Over the last 5 years, on a compounded basis, US Dollar investment-grade primary issuance has grown +12.9% and +7.2% by dollar volume (projected to be over \$1.3 trillion this year) and number of bonds (projected to be over 1,500), respectively. Even more remarkable, most new investment grade bond issues are announced and priced on the same day, oftentimes within a few hours" and notes that "the concern of time limitation in pre-trading information processing is significant and persistent even for institutional investors with a large staff of experienced credit analysts" (The Credit Roundtable, 2015, 2016).

[5] One of the most relevant pieces of information is related to details of bond indentures (amendments) in Exhibit 4, which are agreements between the issuer and bond investors. Section 2.2 provides further elaboration on this point.

information. [6] With the new rule, bond investors can efficiently access the relevant exhibit information directly from the prospectus, significantly reducing the effort and time spent on information acquisition. When discussing the new rule, buy-side institutional investors stated:

> "*We believe the time savings resulting from hyperlinked exhibits will allow investors in the corporate bond market to make more informed and better decisions . . . From the time issues are announced, investors generally have a very short period to analyze the offering, review the relevant documentation and decide if they are comfortable participating at the indicated price guidance. Adding hyperlinks to exhibit indices will increase transparency and save investors precious time when evaluating an offering*"[7]
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> (The Credit RoundTable, 2016).

As evident in the investors' reasoning, I posit that the implementation of this rule facilitates easier and quicker access to relevant information, and leads to a decrease in information processing costs faced by bond investors. As a result, this rule provides a valuable opportunity to overcome the challenge of capturing information processing costs in the bond market and assessing their potential impacts on bond borrowing costs.

However, hyperlink inclusion might not necessarily influence the borrowing costs of corporate bonds. First, some exhibit-referred files were filed with the SEC and made public in advance. As a result, investors may have already reviewed their contents, thus making it unnecessary to revisit them even if new issues are established. Second, while hyperlinks help alleviate time constraints by facilitating quicker access to required documents, the extensive content in the prospectus might

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[6] Institutional bond investors have expressed concerns about the difficulty of accessing exhibit information and the limited time available for reviewing it before a deal is priced and closed. They are often required to navigate the issuer's EDGAR filings and review the exhibits to multiple previous filings (The Credit Roundtable, 2015; 2016).
[7] The SEC also suggests that hyperlinks reduce search costs, improve investors' ability to review an issuer's disclosures, and lead to more informed investment decisions, potentially enhancing allocative efficiency and capital formation (SEC, 2017).

still hinder investors from reviewing supplementary information (Grennan and Musto, 2018).[8] Collectively, it remains unclear to what extent bond investors use exhibit-referred information from the new bond prospectus and incorporate it into investment decisions, and whether adding a hyperlink to each exhibit impacts bond borrowing costs.

To answer these questions, I exploit the staggered implementation of the Exhibit Hyperlink rule as a shock to information processing costs in the primary bond market. Specifically, this rule took effect on September 1, 2017, for most companies; for "smaller reporting companies" and other filers that were neither "large accelerated filer(s)" nor "accelerated filer(s)," it took effect on September 1, 2018. Additionally, the SEC encouraged early compliance with the new filing requirements after the announcement of the rule on March 1, 2017. Furthermore, given that each "shelf" bond prospectus remains valid for up to three years from its announcement date, the rule only applies to issuers when they file a new prospectus after the rule's effective date.[9] The staggered effective fashion of this rule and the three-year validity of the bond prospectus lend this rule to a causal empirical design to alleviate concerns of contemporaneous factors.

Using a staggered difference-in-differences research design, I find that hyperlink inclusion to exhibits in bond registration statements leads to a 0.12 percent point decrease in corporate bond yields in the primary market between 2014 and 2021, accounting for 7.92 percent of the average yield (1.51 percent).[10] A standard dynamic test reveals no difference in pre-regulation trends in bond yields between issues with exhibit-hyperlinked prospectus and those without, supporting the parallel-trend assumption.

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[8] A bond prospectus often spans more than fifty pages.
[9] Since 1983, the introduction of "shelf" registration has enabled issuers to register multiple bond issues for sale under the same "shelf" registration statement "either on a continuous or delayed basis, although a portion of the securities may be offered immediately." More details are provided in Section 2.2.
[10] I discuss the potential bias associated with a staggered difference-in-differences approach in Section 3.

To further validate that the observed effect is indeed driven by reduced information processing costs, I examine whether the effect of hyperlink inclusion on bond borrowing costs varies predictably with different levels of information processing costs. As expected, I find that the effect of hyperlink inclusion on offering yields is more pronounced for bonds with a larger number of exhibits, higher financial constraints, a poorer information environment, and a less liquid pre-issuance secondary market. Each of these factors poses information processing challenges for investors and, in turn, magnifies the value of improved information accessibility through hyperlinks. Collectively, these findings support the notion that hyperlink inclusion lowers information processing costs for exhibits in bond prospectuses, ultimately influencing bond borrowing costs.

Next, I shift my focus to the extended effect of hyperlink inclusion on short-term trading in the secondary market. I find that including hyperlinks in exhibits enhances short-term liquidity in the secondary market, as evidenced by the increased number of trades and trading volume during the first week after the bond issue is priced. Additionally, I examine the potential impact of hyperlink inclusion on the investor base in the primary market. The results reveal that hyperlink inclusion can slightly alter the investor base by encouraging more investors to participate in the primary bond market. Collectively, these results indicate that easier access to exhibits through hyperlinks not only enhances short-term liquidity in the secondary market but also democratizes the primary market, facilitating quicker investment decisions and encouraging market participation.

I conduct a battery of robustness tests to strengthen my main inferences. First, I use post-offering trading prices in the secondary market as a benchmark to construct an underpricing proxy and demonstrate that the inclusion of hyperlinks alleviates the extent of bond underpricing. I also show that my results hold when considering standardized offering yield. Next, employing

alternative fixed effects, standard-error clustering levels, and control variables, I find that these specifications yield similar inferences to the baseline test. Additionally, I use propensity score matching and entropy balancing to create two matched samples, and the key findings remain consistent within these samples. Furthermore, I conduct several falsification tests using private market issues, which are unlikely to be affected by the rule aimed at the public market. I find no significant effect of hyperlink inclusion on bond prices for this group of bonds, indicating that the results in the public primary bond market are not driven by other concurrent factors.[11] Moreover, I conduct a falsification test regarding the secondary market consequences by exploring whether the impacts of hyperlink inclusion on secondary trading activities are present for other existing issues from the same issuer one week before the new issue is announced, and the results suggest that such effects do not exist. Finally, I document a significant increase in the number of exhibit views after the hyperlink inclusion, which indicates that bond investors actively use hyperlinks to access and review exhibit information in bond prospectuses.

This study contributes to the literature in several ways. First, it extends the literature on information processing costs from the equity market to the bond market. While existing literature has extensively explored information processing costs in the equity market,[12] there remains a gap in understanding their role in the corporate bond market, where they may be even more significant.

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[11] Private market issues are Rule 144A corporate bonds, which are first issued to Qualified Institutional Buyers (institutional investors that manage a minimum of $100 million in securities) in the private market. These issues are not subject to SEC rules aimed at bond issues in the public market. Therefore, the Exhibit Hyperlink rule has little impact on private market issues.

[12] For discussions of information processing costs in the equity market, see Asthana and Balsam (2001); Hirshleifer and Teoh (2003); Asthana, Balsam, and Sankaraguruswamy (2004); Hirshleifer, Lim, and Teoh (2009); Da, Engelberg, and Gao (2011); Chakrabarty and Moulton (2012); Drake, Roulstone, and Thornock (2012; 2015); Blankespoor, Miller, and White (2014a; 2014b); deHaan, Shevlin, and Thornock (2015); Lee, Hutton, and Shu (2015); Drake, Gee, and Thornock (2016); Twedt (2016); Ben-Rephael, Da, and Israelsen (2017); Christensen et al. (2017); deHaan, Madsen, and Piotroski (2017); Akbas, Markov, Subasi, and Weisbrod (2018); Blankespoor, deHaan, and Zhu (2018); Huang, Nekrasov, and Teoh (2018); Blankespoor, dehaan, Wertz, and Zhu (2019); Hirshleifer, Levi, Lourie, and Teoh (2019); Blankespoor et al. (2020); and Driskill, Kirk, and Tucker (2020).

This study fills the gap by revealing the extreme, yet previously overlooked, time constraints faced by bond investors and demonstrating that a minor regulatory intervention to reduce information processing costs can lower borrowing costs in the primary corporate bond market, where sophisticated investors dominate. It is worth noting that a contemporaneous working paper by Griffin, Skinner, and Zechman (2024) examines the effect of the Exhibit Hyperlink rule in the context of the equity market. Although insignificant market reactions are observed in their baseline analyses, they find that, in alignment with my main inferences, the rule effectively reduces processing costs when acquiring additional information is most beneficial. Additionally, this study sheds light on how investors allocate their attention and effort in processing available information when faced with substantial information processing costs.

Second, this study also responds to the call made by Bessembinder, Spatt, and Venkataraman (2020) for researchers to pay closer attention to the issuance process and microstructure of fixed-income issues, which can directly impact issue pricing and post-issue liquidity. By focusing on the complexities and challenges inherent in the unique issuance process within the primary bond market, this study reveals its distinctive nature and provides novel insights into how even subtle enhancements during this issuance process may affect bond borrowing costs and short-term liquidity.

Lastly, the findings in this paper inform policymakers. The SEC introduced the Exhibit Hyperlink rule with the expectation that it would simplify access to exhibits for investors and other information users, thereby reducing the time and effort required to gather essential data (SEC, 2017). My findings indicate that this seemingly minor rule has indeed fulfilled its intended purpose within the corporate bond market. By improving the accessibility of exhibit-referred files, the rule has reduced the costs of obtaining critical exhibit information. This is particularly valuable in the

bond market, where investors often face tight time constraints and must process large volumes of information quickly.

2. Literature Review and Hypothesis Development

2.1 Information Processing Costs in the Equity Market

Information processing costs arise from market frictions and inherent challenges that investors encounter in recognizing, acquiring, and integrating information from disclosures. These costs can be categorized into three distinct types: information awareness costs, information acquisition costs, and information integration costs (e.g., Blankespoor et al., 2020). Extensive literature reviews the impacts of information processing costs on the equity market, including stock price informativeness, price responsiveness, liquidity, volatility, and volume(e.g., Grossman and Stiglitz, 1980; Kim and Verrecchia, 1994; Peng and Xiong, 2006; Goldstein and Yang, 2017; Avdis and Banerjee, 2019). [13] Specifically, one strand of studies has documented that technological improvements, such as the introduction of the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system and eXtensible Business Reporting Language (XBRL), substantially reduce information processing costs for shareholders and level the playing field for equity market participants (e.g., Blankespoor et al., 2014a, 2014b, 2019, 2020; Bhattacharya, Cho, and Kim, 2018; Gao and Huang, 2020). While all these studies shed light on the impact of information processing costs on the equity market, there is a limited understanding of the extent to which these costs might shape outcomes in the bond market.

2.2 Bond Issuance Process and Information Processing Costs in the Bond Market

The process of bond issuance begins with approaching and appointing a leading underwriter after a firm analyzes its financial situation and decides to raise capital in the bond market. The lead

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[13] See Blankespoor et al. (2020) for a comprehensive review of the literature on information processing costs.

underwriter can invite other investment banking firms to participate in the deal as members of an underwriting syndicate following the appointment. Legal documents, including the final agreement between the issuer and the underwriters and the prospectus, are prepared in parallel to ensure that they are ready at the time of operation. Additionally, it is recommended that the issuer secure a credit rating from a rating agency. Once these documents are ready, the issuer files registration statements with the SEC, which has adhered to shelf registration requirements since 1983; this allows the registration of multiple bond issues over a three-year period using the same preliminary prospectus. If available, only a prospectus supplement is filed at the time of issuing.[14]

The prospectus briefly outlines the issuer's business and bond characteristics, while exhibit-referred filings provide supplementary and validating details (Cheng, Li, and Lin, 2022).[15] Each exhibit-referred filing is listed in the exhibit index section of the prospectus. In the bond market, Exhibit 4 holds particular significance because it predominantly features bond indentures, the formal agreements specifying the covenants and obligations between issuers and investors. Thus, a thorough understanding of these indentures is essential for investors to evaluate bond risk and make investment decisions. Figure 1 illustrates specific details from exhibits-referred filings in three panels. Panel A highlights that while the main body of the prospectus summarizes bond covenants, detailed supplements and amendments are exclusively contained within the exhibit-referred bond indentures. Panel B, which shows a partial list of exhibits, reveals that indentures

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[14] Bond prospectus includes preliminary prospectus and prospectus supplement. A preliminary prospectus is the initial offering document that provides details about the proposed transaction. The prospectus supplement is offered when the offering has been announced and offered to the public for trading. Registration statement refers to the preliminary prospectus instead of the prospectus supplement (https://www.sec.gov/education/smallbusiness/goingpublic/registrationstatement).

[15] It is worth emphasizing that the exhibit index must be incorporated in the registration statement. Specifically, in the context of corporate bond issuance, the exhibit index is included in the shelf preliminary prospectus rather than in the prospectus supplement that is filed when announcing each individual new issue. Each exhibit index and its corresponding referred filings can apply to new bond issues within the next three years at maximum.

frequently undergo numerous amendments and updates over time.[16] Collectively, these panels highlight the critical role of bond exhibits in providing comprehensive and relevant information on credit risk.

The introduction of SEC regulatory reforms in 2005 further streamlined the bond issuance process, allowing qualified issuers to bring bonds to market without prior market notification or regulatory review (i.e., Grennan and Musto, 2018).[17] Consequently, issuers can register a new bond as soon as there is sufficient market interest. Once sufficient market interest is confirmed, a tentative issuance date is set. On the scheduled day, the lead underwriter announces the new issue and commences bookbuilding. During this phase, the sales force gathers preliminary orders, and the bond's pricing may be adjusted in response to market feedback. This bookbuilding process usually lasts between one and two hours. Once the book is finalized, the bonds are distributed to investors and subsequently become eligible for secondary market trading. Figure 2 provides an example of the bond issuance process.

The accelerated bond issuance process makes the issue of time constraints stand out. Specifically, most new investment-grade corporate bond issues are announced and priced on the same day (The Credit Roundtable, 2015; SEC, 2020; Scaggs, 2021).[18] Wang (2021) corroborates this evidence, noting that over 95% of the bonds in her study were issued, priced, and allocated within a single day. Furthermore, Grennan and Musto (2018) highlight the extreme time pressure on investors, who have only minutes to review an 86-page document with 25% of its content changed. This rapid timeline imposes considerable information processing costs on investors, who

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[16] Ameren Corporation's prospectus in 2020 has 5 pages of exhibits listing supplements and amendments to relevant indentures.

[17] "Well-Known Seasoned Issuers" could file an automatic shelf registration, which becomes effective immediately upon filing, allowing them to issue securities "off the shelf" quickly in response to market conditions.

[18] The Credit Roundtable (2015) also confirms the timing issue of corporate bond offerings, noting that new-issue order books can close from 15 minutes to several hours after the transaction announcement.

must assess pertinent details, including exhibits, to make informed decisions. Although preliminary reviews of exhibits can occur during bond roadshows for junk bonds or upon rumours of a new issue, a thorough re-examination is necessary post-announcement. Appendix III provides a practical example, detailing the issuance timeline for an H.J. HEINZ Company bond on June 23, 2015, where investors had merely hours to evaluate a comprehensive 140-page prospectus.

2.3 Institutional Background of Hyperlink Rule

Subject to Rule 411(c) and Rule 12b-23(c) under the Exchange Act, each registration statement and periodic report is required to include exhibit-referred filings to validate or supplement the file's main content.[19]

Before 2017, each exhibit and exhibit-referred filings were located separately in the SEC EDGAR. To access the contents of that file, investors had to review the exhibit description to identify the filing where the exhibit was originally attached, then search through the registrant's filings to locate *ex ante* filing on their own.[20] This process was manual and not reflective of any current technological capabilities.[21] In 2017, the U.S. SEC required its registrants to include a hyperlink to each exhibit listed in the exhibit index of registration statements and periodic reports, unless the exhibit was filed on paper according to a temporary or containing hardship exemption.[22]

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[19] Including Securities Act Forms (S-1, S-3, SF-1, SF-3, S-4, S-8, S-11, F-1, F-3, F-4) and Exchange Act Forms (10, 8-k, 10-D, 10-Q, 10-K).

[20] For instance, if investors wish to review information in Exhibit 4.1 in Analog Devices' bond prospectus on September 21, 2015, which pertains to the "Indenture dated June 3, by and between the Company and The Bank of New York Mellon Trust Company, N.A. (as Trustee), filed as Exhibit 4.1 to the Company's Current Report on Form 8-K (File No. 001-07819), as filed with the SEC on June 3, 2013," they would need to navigate to the EDGAR platform and search for the original Form 8-K to which the exhibit is attached. Upon locating the relevant Form 8-K, they can gain access to the exhibit file and review the contained information.

[21] SEC (2021): "Many market participants and data vendors have stated that currently, they may need to source corporate bond reference data through emails from underwriters or issuers as well as from deal documents or prospectuses. Despite the vast technological advancements our markets have experienced in recent years, there is currently no systematic method for providing impartial access to this basic information."

[22] Exhibit Hyperlinks and HTML Format, 33-10322, issued on March 01, 2017.

For such hyperlinks to be included, registrants were also required to submit all such filings in HyperText Markup Language ("HTML") format to enable the inclusion of exhibit hyperlinks.

The new rule was intended to facilitate simpler and more timely access to exhibits for investors and other information users. With the rulemaking, investors in the bond market can move directly from what they are currently reading in the prospectus to the exhibit-referred documents. Given the extreme time constraints faced by bond investors, the inclusion of the hyperlink is expected to lower the costs associated with acquiring and reviewing relevant information for these investors. This, in turn, has the potential to empower investors to make more informed investment decisions and reduce corporate bond borrowing costs.

2.4 Hypothesis Development

As discussed in Section 2.3, the bond market is characterized by the extremely limited time investors have to analyze new issues, review pertinent information, and make investment decisions. Specifically, once new bond issues are announced, investors usually have just one-to-two hours post-announcement to review all information provided and decide on their participation (The Credit Roundtable, 2015). Such a short period makes it challenging for investors to acquire and process the information in documents with a large amount of new content (Grennan and Musto, 2018). The difficulty is exacerbated by cumbersome access to exhibit-referred filings, which contain crucial information necessary for making informed investment choices.

The introduction of hyperlinks in exhibit filings has been a significant advancement. By enabling direct access to exhibits from the current document without having to navigate the SEC's EDGAR system, these hyperlinks substantially reduce the time needed to locate and review essential documents, thereby lowering information asymmetry and reducing corporate bond borrowing costs.

Even if investors occasionally review exhibit-referred filings before official announcements, the inclusion of hyperlinks in these documents still stands to significantly reduce information processing costs. Archival evidence indicates that the corporate bond market sees thousands of new issues annually, with often over a hundred issues being announced and prepared for pricing at the same time (SEC, 2021). Given the volume of new issues presented daily, investors must allocate their attention efficiently and review vast amounts of information quickly. The integration of hyperlinks facilitates this process by providing immediate access to relevant documents and reducing the overall information processing burden on investors. Collectively, hyperlink inclusion is expected to reduce bond borrowing costs by lowering information processing costs.

While it is somewhat intuitive that the inclusion of the hyperlink can reduce information processing costs, it remains unclear the extent to which bond investors indeed access information contained in the exhibits and incorporate it into their decisions. First, some exhibit-referred files are filed with the SEC and previously made public.[23] Thus, it is possible that investors have already reviewed the information contained in those filings and don't need to revisit them even if new issues are established. Second, a bond prospectus typically consists of over fifty pages and contains a large amount of new information (Grennan and Musto, 2018), requiring investors to dedicate significant time to the review process. Consequently, the available time may still be insufficient for investors to review the supplementary information in exhibit-referred filings, even though hyperlink inclusion can alleviate time constraints to some extent. As such, it is *ex-ante* unclear the extent to which bond investors acquire exhibits from the new bond prospectus and incorporate

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[23] For instance, the file referred in exhibit 4.1 in Analog Devices' bond prospectus on September 21, 2015, which pertains to the "Indenture dated June 3, by and between the Company and The Bank of New York Mellon Trust Company, N.A. (as Trustee), filed as Exhibit 4.1 to the Company's Current Report on Form 8-K (File No. 001-07819), as filed with the SEC on June 3, 2013," was previously filed with the SEC in 2013.

them into their investment decisions, and whether adding the hyperlink to each exhibit can be useful for influencing bond borrowing costs.

3. Research Design

In this section, I explore whether adding a hyperlink to each exhibit in bond issuance filings can reduce potential investors' information processing costs and, in turn, lower bond borrowing costs. The Exhibit Hyperlink rule took effect for different types of companies at different times. Moreover, as discussed in Section 2.2, each preliminary prospectus could remain valid for up to three years. Consequently, preliminary prospectuses issued before the implementation of the Exhibit Hyperlink rule can retain their validity for up to three years after its introduction. Therefore, the Exhibit Hyperlink rule applies to issuers only when they announce a new prospectus after the rule's effective date.[24] This setting enables me to employ the following staggered difference-in-differences model to test my research question.[25]

$$Offering\ Yield\ Spread_{i,j,t} = \alpha + \beta_1 Hyperlink_{i,j,t} + \beta_2 X_{i,j,t} + \eta_j + \mu_t + \varphi_i + \varepsilon_{i,j,t} \quad (1)$$

where $Offering\ Yield\ Spread_{i,j,t}$ is the dependent variable for a bond issue i issued by firm j on date t, equal to the offering yield less the similar maturity Treasury bond yield expressed in percentage points (e.g., Bonsall and Miller, 2017; Brugler, Comerton-Forde, and Martin, 2022;

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[24] Consider the case of an issuer, firm A, that filed a bond prospectus in December 2016. As this prospectus was filed before the Hyperlink requirement date, it didn't contain hyperlinks in the exhibit section. The validity of this prospectus could remain for three years, until December 2019. Consequently, even if firm A issued new bonds between December 2016 and December 2019, these newly issued bonds would not be subject to the Hyperlink rule because they pertained to the prospectus filed before the rule's enactment. This issuer/issue will only become subject to the rule for the first prospectus filed after the requirement date.

[25] Employing the stacked regression as a robustness check is infeasible in this study due to the lack of a never-treated group or a group treated sufficiently late to serve as a clean control. Nonetheless, the concern regarding time-varying treatment effects, which could potentially result in biased estimates in staggered difference-in-differences (Baker, Larcker, and Wang, 2021), appears to be minimal in this setting, for two reasons. First, it is unlikely that the minor intervention would require some time to produce measurable changes. For example, there is no observed increase or decrease in the number of exhibits by bond issuers following the intervention. Second, the absence of structural changes in the bond market during the treatment period further reduces the likelihood of time-varying effects.

Helwege and Wang, 2021). A lower bond yield spread indicates lower bond borrowing costs. $Hyperlink_{i,j,t}$ is an indicator variable equal to one if the offering bond issue is announced after the first new prospectus is filed following the implementation of the Exhibit Hyperlink rule, and zero otherwise. I include issuer fixed effects (η_j), time fixed effects (μ_t), and bond rating fixed effects (φ_i) to control for unobservable issuer-level time-invariant characteristics, time-varying economy-wide trends, and variations in credit quality across bonds, respectively. The coefficient of interest is β_1, which estimates the impact of adding hyperlinks to exhibits on corporate bond borrowing costs.

$X_{i,j,t}$ is a vector of bond contractual characteristics, macroeconomic factors, and issuer-specific attributes (e.g., Bonsall and Miller, 2017; Wang, 2021; Brugler et al., 2022). Specifically, the bond contractual characteristics include the following: bond maturity in years at the time of issuance (*Maturity*), the logarithm of the issuance amount (*Offering Amount*), the logarithm of one plus the total number of covenants (*Number of Covenants*), the first non-missing bond rating from S&P (*Rating*), [26] and whether the bond is secured (*Secured*), subordinated (*Subordinated)*, or callable (*Callable*). Macroeconomic factors consist of the daily yield of the 10-year Treasury bond on the day of bond offering (*Treasury Yield*), the inflation rate measured by the monthly consumer price index of all items for the United States (*CPI*), and the monthly federal funds effective rate (*Fed Funds Rate*). Issuer-specific control variables include the issuer size (*Size*), leverage (*Leverage*), profitability (*Loss & ROA*), the ability to repay debt interest (*Interest Coverage*), and growth rate (*Asset Growth & Sales Growth*).[27] All variables are defined in Appendix I.

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[26] Untabulated analysis shows that replacing the S&P rating with Moody's rating yields similar results.
[27] Whether the issuer is an accelerated filer is also included as a control in an untabulated analysis, and the results remain consistent.

4. Data and Summary Statistics

Details of all public fixed-rate corporate bonds issued by U.S. firms denominated in U.S. dollars are obtained from Mergent Fixed Investment Securities Database (FISD). The sample period spans from January 1, 2014, to December 31, 2021. I started the data period in 2014 to maintain a relatively balanced sample before and after the rulemaking events. For each bond issue, I obtain data on the issuer, issue date, year to maturity, offering yield to benchmark Treasury (in percent), offering price, offering amount, covenants, and the S&P rating (converted to an integer scale ranging from 0 to 21, where AAA is represented as 0 and D as 21). Additionally, details on whether the bond is subordinated, secured, or callable are collected. Following prior studies (e.g., Cai et al., 2007; Wang, 2021; Brugler et al., 2022), I exclude foreign issues, issues from financial firms, Rule 144A issues, and those with missing values regarding offering date, offering price, maturity, offering yield, or other control variables. The final sample contains 3,985 unique bond issues. Panel A of Table 1 outlines the sample selection procedures. All continuous variables are winsorized at 1% and 99% levels. Panels B and C report the sample distribution by year and month, respectively, indicating no significant herding behaviors in bond issuance within the sample.

Panels A and B of Figure 2 present the distribution of the rulemaking effective dates and actual adoption dates for my sample issues, organized by year and month, respectively. As shown in Panel A, bond issues become subject to the Exhibit Hyperlink rule in September 2017, the month when the rule takes effect. Subsequently, there are increasingly affected bond issues until June 2020, reflecting the staggered application of the Exhibit Hyperlink rule across bond issuances during this period. Panel B differs from Panel A due to the presence of three early adopters who complied with this rule before its official effective date. Notably, there are no late adopters within the sample.[28]

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[28] *Hyperlink* of early adopters is coded as 0 before the rule effective date. I also re-estimate the baseline analyses by

Table 2 presents the summary statistics for the sample. The bonds in my sample have an average offering yield spread of 1.51 percent (151 basis points) and an average maturity of 13.8 years, which are consistent with prior studies (e.g., Wang, 2021; Brugler et al., 2022). On average, these bonds include 3.76 covenants. The median S&P rating is 7, which corresponds to a BBB+ rating. Callable bond issues represent the largest portion of the sample, indicated by the average value of 0.991 for *Callable*. Additionally, the majority of sample bonds are unsecured and senior bonds.

Macroeconomic data at the time of issuance for each bond are obtained from the St. Louis Fed website.[29] All issuer controls at the quarterly level are collected from the Compustat database. Regarding macroeconomic controls, the average daily yield for the 10-year Treasury bond is 0.019, the inflation rate averages 0.171, and the average monthly federal funds effective rate is 0.680. Turning to issuer-specific characteristics, approximately 9.5% of issuers experienced a loss in the prior quarter (*Loss*), and the average return on assets (*ROA*) is 0.024. The average interest coverage ratio (*Interest Coverage*) is 14.9. Additionally, I manually collect all bond prospectuses of the sample bonds from the SEC EDGAR database and identify their filing dates. Bonds issued with a hyperlinked-exhibit prospectus account for 43.2% of the sample, indicating that the sample is nearly evenly split between issues with and without a hyperlinked-exhibit prospectus.

[*Insert Table 2 here*]

I also obtain corporate bond trading records in the secondary market from the TRACE Enhanced database. This dataset contains essential trading details, such as trading price, volume, and time for all TRACE-eligible bonds in the secondary market. To ensure data accuracy and

dropping early adopters, and the inferences are unaltered.

[29] https://fred.stlouisfed.org/.

reliability, I follow procedures outlined in Dick-Nielsen (2014) to remove duplicate reports and handle trade reports that are corrected or reversed.

5. Results

5.1 Baseline Results

Table 3 presents the results of the staggered diff-in-diff regressions examining whether hyperlink inclusion affects bond offering yields. I assess the sensitivity of my inferences by estimating four variations of equation (1). Column (1) presents the findings from the estimation without any time-varying control variables—that is, relying solely on issuer, year-quarter, and bond rating fixed effects as controls for potential confounding factors. The coefficient on *Hyperlink*, -0.1328, is significant at the 5% level, suggesting that hyperlink inclusion in exhibits significantly reduces bond offering yields. In column (2), I replicate the regressions in the first column with control variables reflecting bond characteristics. The coefficient on *Hyperlink* continues to be negative and statistically significant. Turning to bond characteristics, the offering yields increase with the offering size and the time to maturity. Column (3) adds controls for macro-economic conditions. The coefficient on the variable of interest, *Hyperlink*, remains qualitatively and quantitatively similar. Column (4) reports the results with additional controls for issuer characteristics, and the coefficient on *Hyperlink* continues to be statistically significant at the 1% level.

The findings in Table 3 provide support for the non-trivial effect of hyperlink inclusion on corporate bond offering yield spreads. The effect is economically meaningful, accounting for approximately 7.92 percent of the average yield spread (151 bps), based on the most conservative estimate from column (4).

[Insert Table 3 here]

5.2 Parallel Trend Analysis

The validity of the difference-in-differences design depends on the parallel trend assumption: absent the hyperlink rule, hyperlinked issues' bond yields would have evolved in the same way as that of non-hyperlinked issues. While this assumption is inherently untestable, I can shed light on this by testing whether the time-series trend differed before the rulemaking. Specifically, I re-estimate equation (1) after replacing *Hyperlink* with the following indicator variables: *Hyperlinking^{-4}, Hyperlinking^{-3}, Hyperlinking^{-2}, Hyperlinking^{-1}, Hyperlinking^{1}, Hyperlinking^{2}, Hyperlinking^{3}*, and *Hyperlinking^{4+}*. These variables indicate the period interval of a specific prospectus filing date relative to the time point when the issuer is required to incorporate hyperlinks in its prospectus. For example, *Hyperlinking^{1}* indicates that the prospectus is filed within 1 year (0-365 days) after the issuer is required to incorporate hyperlinks in the prospectus. I treat *Hyperlinking^{-4}* as the benchmark. The results, shown in Table 4, indicate that the coefficients are systematically insignificant at conventional levels during the pre-rulemaking period, supporting the validity of the parallel trend assumption before the adoption of the hyperlink rule.

[*Insert Table 4 here*]

5.3 Cross-Sectional Tests

The previous section demonstrates that hyperlink inclusion in exhibits reduces corporate bond borrowing costs. To further validate that this effect stems from the decrease in information processing costs, this section examines whether the impact of hyperlink inclusion on bond yields varies with different levels of information processing costs. If the observed effects are indeed driven by these costs, the influence of hyperlink inclusion on bond yields should be more pronounced when information processing costs are higher. To measure these costs, I consider the following factors: (1) the amount of information in the exhibits, (2) the financial constraints

associated with the new bond issuance, (3) the surrounding information environment, and (4) the

liquidity in the secondary market prior to issuance.

5.3.1 The Amount of Information in Exhibits

The number of exhibits directly reflects the volume of information within exhibits and serves as a

proxy for information processing costs, as investors shall exert more effort to analyze a greater

amount of information. To this end, the effectiveness of hyperlink inclusion in reducing bond

yields might be more pronounced when the prospectus contains a larger number of exhibits.

Therefore, I use the number of exhibits as a measure of the information processing costs in

prospectus exhibits.[30] To test whether the impact of hyperlink inclusion varies on bond borrowing

costs with the number of exhibits, I estimate the following model:

$$Offering\ Yield\ Spread_{i,j,t} = \alpha + \beta_1 Hyperlink_{i,j,t} * LargeEx + \beta_2 X_{i,j,t} * LargeEx +$$

$$\beta_3 Hyperlink_{i,j,t} + \beta_4 LargeEx + \beta_5 X_{i,j,t} + \eta_j + \mu_t + \varphi_i + \varepsilon_{i,j,t} \quad (2)$$

This model extends equation (1) by introducing an indicator variable, *LargeEx*, interacting with

each of the original independent variables (e.g., De Franco, Edwards, and Liao, 2021). *LargeEx*

takes the value of one for bond issues with an above-median number of exhibits, and zero

otherwise. The significantly negative coefficient on *LargeEx*Hyperlink* in column (1) of Table 5

suggests that when a bond prospectus contains a larger number of exhibits, hyperlink inclusion is

more effective in reducing information processing costs and, thereby, lowering bond borrowing

costs. Subsequent cross-sectional tests follow the framework of equation (2), but replace *LargeEx*

with other heterogeneity variables.

5.3.2 Financial Constraints

Financially constrained bonds generally have more complex and riskier profiles, incurring higher

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[30] Bond issues in my sample have 30 exhibits, on average.

information processing costs for investors. Consequently, the impact of hyperlink inclusion on bond yields is expected to be more significant for bond issues with greater financial constraints. Following prior studies (e.g., Smith and Warner, 1979), I use the number of covenants as a measure of a bond issue's financial constraints. A bond issue is considered to be facing greater financial constraints when it incorporates a larger number of covenants. Column (2) in Table 5 reports the results for financial constraints, where *LargeCov* is an indicator variable equal to one for bond issues with an above-median number of covenants, and zero otherwise. The coefficient on *LargeCov*Hyperlink* is negative and significant, suggesting that the impact of hyperlink inclusion on bond borrowing costs is stronger for bond issues with greater financial constraints.

5.3.3 Information Environment

Bond investors in a less transparent information environment face higher information processing costs because they tend to spend more time and effort gathering and integrating available information to make informed decisions. Therefore, I expect that the effect of hyperlink inclusion might be stronger for bonds with a less transparent information environment. Following prior studies (e.g., The Credit Roundtable, 2015; SEC, 2021; Bessembinder, Jacobsen, Maxwell, and Venkataraman, 2022; Brugler et al., 2022), I use several measures to capture the information environment of new bond issues: the number of previous issues by the same issuer, the number of bonds issued concurrently on the same day, issuer size, and bond rating.[31] Specifically, bonds with a higher number of previous issues, fewer concurrent issues, larger issuers, and higher ratings are likely to have a more transparent information environment and lower information processing costs. To test this, I replace the heterogeneity variable in equation (2) with *LargePreIssue, LargeConcurrent, LargeSize, and BetterRating. LargePreIssue* is an indicator variable equal to one

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[31] Bond issues in my sample have 28 previous issues and 15 concurrent issues, on average.

for bond issues with an above-median number of previous issues, and zero otherwise. *LargeConcurrent* equals one for bonds with an above-median number of concurrently issued bonds, and zero otherwise. *LargeSize* is set to one for bond issues with an above-median issuer size, and zero otherwise. *BetterRating* equals one for bond issues with a below-median bond rating, and zero otherwise. Columns (3)-(6) in Table 5 present the results, showing that hyperlink inclusion has greater effects on bond yields when the information environment is less transparent.

5.3.4 Pre-Issuance Secondary Market Liquidity

In this section, I explore the cross-sectional effects related to issuers' pre-issuance secondary market liquidity. This analysis is motivated by the idea that issuers might be reluctant to include hyperlinks voluntarily in their bond prospectuses because investors in the primary bond market typically use secondary market transactions of previous issues as benchmarks for pricing new issues, rather than relying directly on prospectus information. This view suggests that a less liquid secondary market increases information processing costs for investors, thereby making the impact of hyperlink inclusion more pronounced. To test this hypothesis, I assess whether the impact of hyperlink inclusion on borrowing costs is more pronounced for issues with lower pre-announcement secondary market liquidity. Here, liquidity is measured by the trading volume, in terms of total par value of the issuers' bond trades in the previous quarter. *HighLiquid* is set to one for bond issues with above-median secondary market liquidity, and zero otherwise. Column (7) in Table 5 reports the results. The coefficient on *HighLiquid*Hyperlink* is positive and significant, suggesting that the effects of hyperlink inclusion on bond borrowing costs are stronger for issuers whose prior bond issues are less liquid in the secondary market. Consequently, when secondary market data are insufficient to fully inform the pricing of new issues, the readily accessible information enabled by hyperlinks in the prospectus becomes increasingly valuable.

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5.4 Other Consequences in the Primary Market and Secondary Market

In this section, I extend my analyses to the broader impact of hyperlink inclusion in both the primary and secondary markets. In addition to primary market borrowing costs, the SEC suggests that limited access to supplementary information of new bond issues may also have adverse impacts on short-term liquidity in the secondary market (SEC, 2021).[32] Accordingly, I expect that including hyperlinks in exhibits can enhance short-term liquidity in the secondary market. To capture this, I construct two variables, *Number of Trades*, defined as the logarithm of one plus the number of secondary market trades in the first week after issuance, and *Trading Volume*, calculated as the logarithm of one plus the sum of the secondary market trading amount in par value in the first week after issuance (e.g., Brugler et al., 2022). The results, shown in Panels A and B of Table 6, reveal that hyperlink inclusion increases both the number of trades and trading volume in the secondary market in the short run. These findings align with the argument that hyperlink inclusion contributes to increased short-term secondary market liquidity.

To provide more direct evidence of how hyperlink inclusion affects bond offering yields, I evaluate whether including hyperlinks in exhibits influences the investor base in the primary market. I expect that hyperlink inclusion, by reducing information processing costs, may attract more investors to participate in the primary market, leading to greater engagement and a less concentrated ownership structure upon issuance. However, this prediction is not without tension,

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[32] SEC (2021): "But, in the corporate bond market, where thousands of new issues come to market each year, many market participants do not have access to such information at the time a new issue begins secondary trading. Market participants that lack access to this data are hindered from timely participation, not only placing them at a competitive disadvantage but also adversely impacting liquidity in the particular bond issue on the first day the bond trades."

due to potential conflicts of interest between issuers and underwriters, who have incentives to cater to closely affiliated clients at the expense of issuers when determining allocations (e.g., Nagler and Ottonello, 2017; Nikolova, Wang, and Wu, 2020; Wang, 2021). To evaluate the effect on investor base, I construct two variables: *Number of Primary Investors*, defined as the natural logarithm of one plus the number of transactions that involve dealers selling to customers in the primary market, and *HHI*, calculated as the sum of the squared ratios of each primary trade dollar amount in par value to the total dollar amount of primary trades in par value. The results, presented in Panels A and B of Table 7, reveal that hyperlink inclusion broadens the investor base of new issues and results in less concentrated allocations in the primary market following the rulemaking, respectively. These results provide further evidence that the observed decrease in bond borrowing costs is, at least in part, attributable to a more level playing field in the primary corporate bond market.

[*Insert Table 7 here*]

5.5 Robustness Checks

In this section, I assess whether the baseline findings are robust to alternative dependent variables, alternative choices of fixed effects, clustering groups, and control variables. I also examine whether the results could be influenced by factors concurrent with the hyperlink rule.

5.5.1 Alternative Dependent Variables

Underpricing can serve as another proxy in the primary market to capture bond prices by incorporating post-offering trading prices from the secondary market as an additional benchmark. Therefore, I calculate *Underpricing* as the adjusted fractional difference between the offering price and the post-offering trading prices (Cai et al., 2007; Wang, 2021; Goh, Malatesta, and Yang,

2022).[33] By replacing the dependent variable in equation (1) with *Underpricing*, the results in Panel A of Table 7 show that hyperlink inclusion alleviates the degree of underpricing in the primary corporate bond market.

Additionally, to mitigate the effect of skewness in the distribution of bond offering yield spreads, I use the natural logarithm of one plus the original offering yield spread as an alternative dependent variable. The results presented in Panel B of Table 8 suggest that the transformed yield spread variable yields similar results, thereby reinforcing the robustness of my primary inferences.

5.5.2 Alternative Fixed Effects, Clustering Levels, and Controls

Panel C of Table 8 presents the results using alternative fixed effects. Columns (1)-(4) report results with issuer fixed effects and year-quarter fixed effects. Columns (5)-(7) report results using issuer fixed effects, bond rating fixed effects, and offering date fixed effects. Columns (8)-(11) report results incorporating issuer fixed effects, bond rating fixed effects, and year fixed effects. My inferences remain consistent across all these specifications.

Next, in Panel D of Table 7, I cluster the standard errors at the two-digit SIC industry level (columns (1)-(4)) and the bond issue level (columns (5)-(8)). The results continue to align with my baseline findings.

Last, I include additional controls to further capture broader market dynamics, including influences from the stock market and other macroeconomic factors: stock return volatility (*VOL*) (Correia, Kang, and Richardson, 2018; Beaver, Cascino, Correia, and McNichols, 2019), change in risk premium (*dRP*), change in volatility (*dVIX*), and change in term structure (*dTS*) (Correia, Richardson, and Tuna, 2012). The results are consistent with my baseline inferences and are unreported for brevity.

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[33] Details of *underpricing* construction are provided in Appendix IV.

5.5.3 Matched Sample

Panel E of Table 8 reports the results using matched samples generated through propensity score matching (column (1)) and entropy balancing (column (2)) methods. Both matching methods are based on various bond-level characteristics, including the year-quarter of issuance, the issuer's two-digit SIC industry, ratings, maturity, offering amount, number of covenants, and whether the bond is secured, subordinated, and callable. To maximize the size of the matched sample under the propensity score matching method, each treatment observation is matched to its nearest two neighbors based on propensity scores, with replacement allowed. The caliper distance in propensity scores between matched pairs is set at 0.01. These results further confirm the impact of hyperlink inclusion on corporate bond borrowing costs.

5.5.4 Falsification Test Based on Rule 144A Bonds

To further address the alternative explanation that my results may be influenced by other concurrent factors, I re-estimate the baseline specification for Rule 144A corporate bonds, which are initially issued to Qualified Institutional Buyers—institutional investors managing at least $100 million in securities—within the private Rule 144A market. Although issuers of public corporate bonds can also issue Rule 144A bonds, these bonds are exempt from the regulatory requirements that govern public offerings. As a result, Rule 144A bonds are not subject to the SEC hyperlink rule, which applies exclusively to public bond offerings. This allows me to use the non-applicability of the Exhibit Hyperlink rule to Rule 144A bonds as a falsification test. If the observed effect of hyperlink inclusion on public bond borrowing costs is not due to other factors, then there should be no impact on the yields of Rule 144A bonds.

Following this approach, I obtain the sample of Rule 144A corporate bonds based on the procedures in Table 8, Panel F. I define a *Pseudo Hyperlink* variable, taking the value of one if

there is at least one hyperlinked prospectus from the same issuer issued before the offering date of the Rule 144A bond, and zero otherwise. The results, presented in Table 8 Panel G, are consistent with my expectation that hyperlink inclusion has no effect on Rule 144A bond yields.

Notably, a number of Rule 144A corporate bonds are dropped in Panel G because they cannot be matched to a public firm in Compustat and thus have missing values regarding issuer-level control variables. To mitigate concerns about the impact of this sample loss, I include these previously omitted bonds in the falsification model by excluding firm-level control variables. The results, reported in Panel H of Table 8, align with those in Panel G.

To further assess the potential sensitivity of my baseline results to sample selection, I also add these Rule 144A corporate bonds as an additional control group in my baseline analysis. In this expanded sample, the primary variable of interest, *Hyperlink*, is consistently set to zero for all Rule 144A bonds. The results, presented in Panel I of Table 8, are consistent with the baseline findings, suggesting that they are unlikely to be influenced by sample selection bias.

5.5.5 Falsification Test on the Secondary Market

To ensure that the findings related to the secondary market are not influenced by other concurrent factors, I examine whether hyperlink inclusion affects the trading activities of other existing issues by the same issuer one week before the announcement of a new issue. The dependent variable is defined consistently with the approach outlined in Section 5.4. The results, reported in Panel J of Table 8, indicate that the impacts of hyperlink inclusion on the secondary market are not driven by other potential concurrent factors.

5.5.6 Exhibit View Volume

So far, there is still a lack of evidence regarding whether bond investors actually use hyperlinks to access information in exhibits, given the time constraints they face. Comparing the exhibit access

volume before and after the implementation of the Exhibit Hyperlink rule can directly shed light on this issue. Hence, I collect data on the access volume for exhibits on bond issuance day using the daily log file from the SEC's EDGAR system. My sample period covers two separate time frames: January 1, 2014, to June 30, 2017, and May 19, 2020, to December 31, 2021, as the SEC temporarily paused the release of these log files from July 1, 2017, to May 18, 2020. I then construct the key variable—the EDGAR access volume of exhibits—by counting the total number of access requests for Exhibit 4 (e.g., bond indentures) on the bond issuance day. The results in Panel K demonstrate that the average access volume for these exhibits increased from 12.154 before the hyperlink rulemaking to 24.494 after its implementation, indicating a substantial rise in the review of exhibit information following the incorporation of hyperlinks. These results collectively suggest that bond investors actively make use of hyperlinks to review exhibit information.[34]

[*Insert Table 8 here*]

6. Conclusion

Despite the significant importance of the corporate bond market and the substantial information processing costs it entails, evidence of the extent of these costs and their effects on bond pricing has been limited. By examining implementation of the Hyperlink Rule in 2017, I demonstrate that the inclusion of hyperlinks to exhibits in bond registration statements, designed to reduce information processing costs for bond investors, contributes to a decrease in corporate bond borrowing costs. Parallel trend analysis further confirms that this effect was absent prior to the rule's implementation. Furthermore, I show that the effect of hyperlink inclusion on bond

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[34] Untabulated results reveal a negative relationship between bond borrowing costs and the exhibit access volume, indicating that a better understanding of exhibit information by investors lowers borrowing costs for bonds.

borrowing costs is more pronounced for bond issues with higher information processing costs, which are captured by the amount of information in exhibits, financial constraints, the information environment, and pre-announcement secondary market liquidity. Additionally, I find that hyperlink inclusion can also enhance short-term liquidity in the secondary bond market and broaden the investor base in the primary bond market. My results remain robust across various alternative dependent variables, fixed effects, clustering groups, and multiple falsification tests. Collectively, this study provides novel insights into the time constraints faced by bond investors and demonstrates how a relatively minor regulatory change aimed at reducing information processing costs can significantly impact bond market outcomes. To this end, the findings not only fill a gap in the literature on information processing costs but also serve as a useful reference point for investors, issuers, and regulators.

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Appendix I. Variable Definitions

Variable Names	Definition
HHI	*HHI* is the Herfindahl concentration measure and is based on the amount purchased by primary market investors: the sum of (each primary trade dollar amount in par value/total dollar amount of primary trades in par value)^2.
Hyperlink	*Hyperlink* is an indicator variable equal to one if the offering bond issue is announced after the first new prospectus filed following the implementation of the Exhibit Hyperlink rule, and zero otherwise.
Number of Primary Investors	*Number of Primary Investors* is the natural logarithm of one plus the number of transactions that involve dealers selling to customers in the primary market, calculated from Enhanced TRACE data.
Number of Trades	*Number of Trades* is the logarithm of one plus the number of secondary market trades in the first week after issuance.
Offering Yield Spread	*Offering Yield Spread* is the offering yield spread less the similar maturity Treasury bond yield expressed in percent points.
Trading Volume	*Trading Volume* is the logarithm of one plus the sum of the secondary market trading amount in par value in the first week after issuance.

Bond Characteristics

Callable	*Callable* is an indicator variable equal to one if the bond is callable at issuance, and zero otherwise.
Maturity	*Maturity* is the bond maturity years at the time of issuance: (maturity date-offering date)/365.
Number of Covenants	*Number of Covenants* is the natural logarithm of one plus the total number of covenants.
Offering Amount	*Offering Amount* is the natural logarithm of the amount raised in the bond offering.
Ratings	*Ratings* is the first non-missing rating from S&P; if the bond rating is missing, I complement the bond rating with the issuer rating from Capital IQ. Ratings is a number between 0 and 21, where AAA is rated as 0 and D is rated as 21.
Secured	*Secured* is an indicator variable equal to one if the bond is secured by some collateral, and zero otherwise.
Subordinated	*Subordinated* is an indicator variable equal to one if the bond is subordinated to other bonds, and zero otherwise.

Macroeconomic Conditions

CPI	*CPI* is the monthly consumer price index of all items in the United States, from the Board of Governors of the Federal Reserve System.
Fed Funds Rate	*Fed Funds Rate* is the monthly federal funds' effective rate, from the Board of Governors of the Federal Reserve System.
Treasury Yield	*Treasury Yield* is the daily yield of the 10-year Treasury bond on the day of the bond offering, from the Board of Governors of the Federal Reserve System.

Issuer Firm Characteristics

Asset Growth   *Asset Growth* is the ratio of total assets in the fiscal quarter of the bond issuance divided by total assets in the fiscal quarter before the bond issuance.

Interest Coverage   *Interest Coverage* is operating income before depreciation divided by interest expense in the quarter t-1.

Leverage   *Leverage* is long-term debt divided by total assets in the quarter t-1.

Loss   *Loss* is an indicator variable equal to one if a firm's net income before extraordinary items is less than zero in the quarter t-1, and zero otherwise.

ROA   *ROA* is operating income before depreciation scaled by total assets in the quarter t-1.

Sales Growth   *Sales Growth* is the ratio of revenue in the fiscal quarter of the bond issuance divided by revenue in the fiscal quarter before the bond issuance.

Size   *Size* is the natural logarithm of total assets in the quarter t-1.

Others

BetterRating   *BetterRating* is an indicator variable equal to one for bond issues with a below-median bond rating, and zero otherwise.

dRP   *dRP* is the change in risk premium (RP_t-RP_{t-1}), where *RP* is defined as the difference between the Moody's Seasoned BAA Corporate Bond Yield (BAA) and the 10-Year Treasury constant maturity rate, both from the Board of Governors of the Federal Reserve System.

dTS   *dTS* is the change in term structure (TS_t-TS_{t-1}), where *TS* is defined as the difference between the 10-year Treasury constant maturity rate and the two-year Treasury constant maturity rate, both from the Board of Governors of the Federal Reserve System.

dVIX   *dVIX* is the change in volatility (VIX_t-VIX_{t-1}), where *VIX* is defined as the average daily CBOE Volatility Index from the Chicago Board Options Exchange (*VIX*) for month t, from the Board of Governors of the Federal Reserve System.

HighLiquid   *HighLiquid* is an indicator variable equal to one for bond issues with above-median secondary market liquidity, and zero otherwise. Liquidity is measured by the trading volume in terms of total par value of the issuers' bond trades in the previous quarter.

Hyperlink[1]   *Hyperlinking[1]* indicates that the prospectus is filed within one year (0-365 days) after the issuer is required to incorporate hyperlinks in the prospectus.

LargeConcurrent   *LargeConcurrent* is an indicator variable equal to one for bond issues with an above-median number of concurrent issued bonds, and zero otherwise.

LargeEx   *LargeEx* is an indicator variable equal to one for bond issues with an above-median number of exhibits, and zero otherwise.

LargePreIssue   *LargePreIssue* is an indicator variable equal to one for bond issues with an above-median number of previous issues, and zero otherwise.

LargeSize   *LargeSize* is an indicator variable equal to one for bond issues with an above-median issuer size, and zero otherwise.

LargeCov   *LargeCov* is an indicator variable equal to one for bond issues with an

	above-median number of covenants, and zero otherwise.
Pseudo Hyperlink	*Pseudo Hyperlink* is an indicator variable equal to one if there is at least one hyperlinked prospectus of the same issuer issued before the offering date of the Rule 144A corporate bond, and zero otherwise.
Rule 144A	*Rule 144A* is an indicator variable equal to one if the bond is issued as a Rule 144A corporate bond in the private market, and zero otherwise.
VOL	*VOL* is the return volatility, defined as the standard deviation of the firm's daily stock returns during the quarter prior to the new issue announcement.

Appendix II. Classification of Exhibit Items

Exhibit 1	Letter regarding Change in Certifying Accountant	Exhibit 20	Other Documents of Statement to Security Holders
Exhibit 2	Acquisition and Reorganization Plans	Exhibit 21	Subsidiaries of the Registrant
Exhibit 3	Articles of Incorporation and By-Laws	Exhibit 22	Published Report Regarding Matters Submitted to Vote of Security Holders
Exhibit 4	Instruments Defining the Rights of Security Holders	Exhibit 23	Consent of Experts and Counsel
Exhibit 5	Opinion regarding Legality	Exhibit 24	Power of Attorney
Exhibit 6	Opinion regarding Discount on Capital Shares	Exhibit 25	Statement of Eligibility of Trustee
Exhibit 7	Opinion regarding Liquidation Preferences	Exhibit 26	Invitations for Competitive Bid
Exhibit 8	Opinion regarding Tax Matters	Exhibit 27	Financial Data Schedule
Exhibit 9	Voting Trust Agreement	Exhibit 28	Information from Reports Furnished to State Insurance Regulatory Authority
Exhibit 10	Material Contracts	Exhibit 31	Rule 13a-14(a)/15d-14(a) Certifications and Rule 13a-14/15d-14 Certifications
Exhibit 11	Statement regarding Computation of Per Share Earnings	Exhibit 32	Section 1350 Certifications
Exhibit 12	Statements regarding the Computation of Ratios	Exhibit 33	Report on assessment of compliance with servicing criteria for asset-backed issuers
Exhibit 13	Annual Report of Security Holders	Exhibit 34	Attestation report on assessment of compliance with servicing criteria for asset-backed securities
Exhibit 14	Code of Ethics	Exhibit 35	Servicer compliance statement
Exhibit 15	Letter regarding Unaudited Interim Financial Information	Exhibit 36	Depositor Certification for shelf offerings of asset-backed securities
Exhibit 16	Letter regarding Change in Certifying Accountant	Exhibit 95	Mine safety disclosure exhibit
Exhibit 17	Letter regarding Director Resignation	Exhibit 96	Technical report summary
Exhibit 18	Letter regarding Change in Accounting Principles	Exhibit 99	Additional Exhibits
Exhibit 19	Reports Furnished to Security Holders		

Appendix III. Issuance Timeline Example of a New Bond

Time	Steps
8:45 AM	- Underwriters announce a new issue, via the Bloomberg system, phone, and instant Bloomberg (IB). This is an eight-tranche deal, initially expected to total $8 billion. Use of proceeds—provide a portion of the purchase price of Kraft foods. Initial price "talk" (IPT) is provided—not official guidance but simply the start of the process to determine pricing. - Salesforce begins discussions regarding investors' interest and price expectations (price discovery). - Investors attempt to evaluate the issuer's credit quality and prospectus terms. - Net roadshow available.
10:11 AM	Preliminary prospectus made available directly from underwriters. It is 140 pages, including 30 pages of "Description of Notes," which includes the covenants.
11:30 AM	The deal goes subject (orders after this time are submitted on a best-efforts basis).
12:45 PM	Revised price guidance issued: 20-25bp inside of IPT. The total amount raised to $10 billion.
4:30 PM	Underwriters advise investors of their allocation.
4:59 PM	The deal is priced.

Source: The Credit Roundtable (2015). Corporate bond underwriting and distribution practices, presented to the U.S. Securities and Exchange Commission on July 1, 2015.

Appendix IV. Construction of *Underpricing*

Overall, the extent of *underpricing* is calculated as the fractional difference between the offering price and the post-offering trading prices. The raw (unadjusted) underpricing of bond issue *i*, *Discount$_{i,t}$*, is measured as the initial difference between the offering price and average trade pricing on the post-offering trading day *t*, $P_{i,t}-P_{i,0}$, to the offering price.

$$Discount_{i,t} = \frac{P_{i,t} - P_{i,0}}{P_{i,0}}$$

where $P_{i,t}$ is the volume-weighted average prices of bond issue *i* on the first trading day *t* in the week after the offering.

Following prior studies (Cai et al., 2007; Wang, 2021; Goh et al., 2022), underpricing is further adjusted by the fractional changes in yields of the maturity-matched Treasury benchmark *(ΔT$_{i,t}$)* and the rating-matched Bank of America Merrill Lynch bond return indices *(Δindex$_{i,t}$)* during the same period. Specifically, *ΔT$_{i,t}$* is the fractional change in maturity-matched Treasury yields from the offering date to the first trading date; *Δindex$_{i,t}$* is the fractional change in Bank of America Merrill Lynch bond return indices with the same letter rating from the offering date to the first trading date.

$$\Delta T_{i,t} = \frac{T_{i,t} - T_{i,0}}{T_{i,0}}$$

$$\Delta index_{i,t} = \frac{Index_{i,t} - Index_{i,0}}{Index_{i,0}}$$

The adjusted *underpricing* is then calculated by subtracting from the raw discount the *ex-ante* benchmark returns.

$$Underpricing_{i,t} = Discount_{i,t} - \Delta T_{i,t} - \Delta index_{i,t}$$

Figure 1. Information Contained in Exhibits

Panel A. Bond Indenture from Fortune Brands Home & Security, S-3ASR, 2015-06-01

We will issue debt securities in one or more series under an indenture to be entered into after the date of this prospectus among us and Wilmington Trust, National Association, as Trustee, and Citibank, N.A., as Securities Agent, the form of which has been included as an exhibit to the registration statement. The indenture may be supplemented from time to time. Any indenture supplement we elect to use for debt securities issued under the indenture will be filed with the SEC. The terms of the debt securities of any series will be those specified in or pursuant to the indenture, any supplemental indenture we use for those debt securities, the applicable debt securities for that series and those made part of the indenture by the Trust Indenture Act of 1939, as amended (the "Trust Indenture Act").

This prospectus includes a summary of the indenture. This summary does not include or reflect any changes that may be made through any supplemental indenture. Any supplemental indenture may affect some or all debt securities we issue under the indenture. You should refer to the specific terms of the indenture, and any supplemental indentures we may file, for more detailed information and not rely only on the summary in this prospectus, or any summary contained in any applicable prospectus supplement. Some of the capitalized terms used in the following discussion are defined in the indenture. Those definitions are incorporated by reference into this prospectus. When we use italics, we are referring to sections in the indenture. Wherever we refer to particular provisions of the indenture, those provisions are incorporated by reference in our summary.

Panel B. Partial Exhibit List from Ameren Corporation, S-3ASR, 2020-10-14

**4.13	Indenture, dated as of December 1, 2001, from Ameren to The Bank of New York Mellon Trust Company, N.A., as successor trustee (relating to the senior debt securities) ("Ameren Senior Indenture") (Exhibit 4.5, File No. 333-81774).
**4.14	First Supplemental Indenture to Ameren Senior Indenture dated as of May 19, 2008 (June 30, 2008 Form 10-Q, Exhibit 4.1, File No. 1-14756).
**4.15	Ameren Senior Indenture Company Order, dated November 24, 2015, establishing the 3.65% Senior Notes due 2026 (including the global note) (November 24, 2015 Form 8-K, Exhibits 4.3, 4.4 and 4.5, File No. 1-14756).
**4.16	Ameren Senior Indenture Company Order, dated September 16, 2019, establishing the 2.50% Senior Notes due 2024 (including the global note) (September 16, 2019 Form 8-K, Exhibits 4.3 and 4.4, File No. 1-14756).
**4.17	Ameren Senior Indenture Company Order, dated April 3, 2020, establishing the 3.50% Senior Notes due 2031 (including the global notes) (April 3, 2020 Form 8-K, Exhibits 4.3 and 4.4, File No. 1-14756).
**4.18	Form of company order establishing the issuance of one or more series of Ameren senior debt securities (including the form of senior debt security) (Exhibit 4.8, File No. 333-114274).
**4.19	Form of indenture of Ameren relating to subordinated debt securities (Exhibit 4.17, File No. 333-222108).
+4.20	Form of supplemental indenture or other instrument establishing the issuance of one or more series of Ameren subordinated debt securities (including the form of subordinated debt security).
**4.21	Form of Ameren Purchase Contract Agreement (Exhibit 4.19, File No. 333-114274).
**4.22	Form of Ameren Pledge Agreement (Exhibit 4.20, File No. 333-114274).
**4.23	Indenture of Mortgage and Deed of Trust, dated June 15, 1937 ("Ameren Missouri Mortgage"), from Ameren Missouri to The Bank of New York Mellon, as successor trustee, as amended May 1, 1941, and Second Supplemental Indenture dated May 1, 1941 (Exhibit B-1, File No.

Panel B (Continued)

Exhibit No.	Description
**4.25	Supplemental Indenture to the Ameren Missouri Mortgage dated as of April 1, 1971 (Exhibit 4.23, File No. 333-222108).
**4.26	Supplemental Indenture to the Ameren Missouri Mortgage dated as of February 1, 1974 (Exhibit 4.24, File No. 333-222108).
**4.27	Supplemental Indenture to the Ameren Missouri Mortgage dated as of July 7, 1980 (Exhibit 4.25, File No. 333-222108).
**4.28	Supplemental Indenture to the Ameren Missouri Mortgage dated as of October 1, 1993 (1993 Form 10-K, Exhibit 4.8, File No. 1-2967).
**4.29	Supplemental Indenture to the Ameren Missouri Mortgage dated as of February 1, 2000 (2000 Form 10-K, Exhibit 4.1, File No. 1-2967).
**4.30	Supplemental Indenture to the Ameren Missouri Mortgage dated August 15, 2002 (August 23, 2002 Form 8-K, Exhibit 4.3, File No. 1-2967).
**4.31	Supplemental Indenture to the Ameren Missouri Mortgage dated March 5, 2003, relative to Series BB (March 11, 2003 Form 8-K, Exhibit 4.4, File No. 1-2967).
**4.32	Supplemental Indenture to the Ameren Missouri Mortgage dated February 1, 2004, relative to Series 2004A (1998A) (March 31, 2004 Form 10-Q, Exhibit 4.1, File No. 1-2967).
**4.33	Supplemental Indenture to the Ameren Missouri Mortgage dated February 1, 2004, relative to Series 2004B (1998B) (March 31, 2004 Form 10-Q, Exhibit 4.2, File No. 1-2967).
**4.34	Supplemental Indenture to the Ameren Missouri Mortgage dated February 1, 2004, relative to Series 2004C (1998C) (March 31, 2004 Form 10-Q, Exhibit 4.3, File No. 1-2967).
**4.35	Supplemental Indenture to the Ameren Missouri Mortgage dated February 1, 2004, relative to Series 2004H (1992) (March 31, 2004 Form 10-Q, Exhibit 4.8, File No. 1-2967).
**4.36	Supplemental Indenture to the Ameren Missouri Mortgage dated September 1, 2004 relative to Series GG (September 23, 2004 Form 8-K, Exhibit 4.4, File No. 1-2967).

Figure 2. Bond Issuance Process

Appointing Underwriter and Preparation → Announcement and Pricing

Appointing Underwriter and Preparation
- Appoint a lead underwriter
- Form the underwriting syndicate
- Prepare legal documents
- Obtain a credit rating is necessary

Announcement and Pricing
- File the prospectus supplement to the SEC
- Announce the bond issue and provide price guidance and net roadshow if available
- Book-building: accept Indications of Interests and refine the book
- Allocate bonds to each investor
- Establish the price of bonds

Figure 3. Distribution of the Exhibit Hyperlink Rule Effective Date

Panels A and B of this figure display the distribution of the Exhibit Hyperlink rule effective dates and actual adoption dates for the sample issues, categorized by year and month, respectively. The difference between Panels A and B arises from three early adopters who complied with the rule prior to its effective date.

Panel A. Distribution of Rule Effective Date by Month
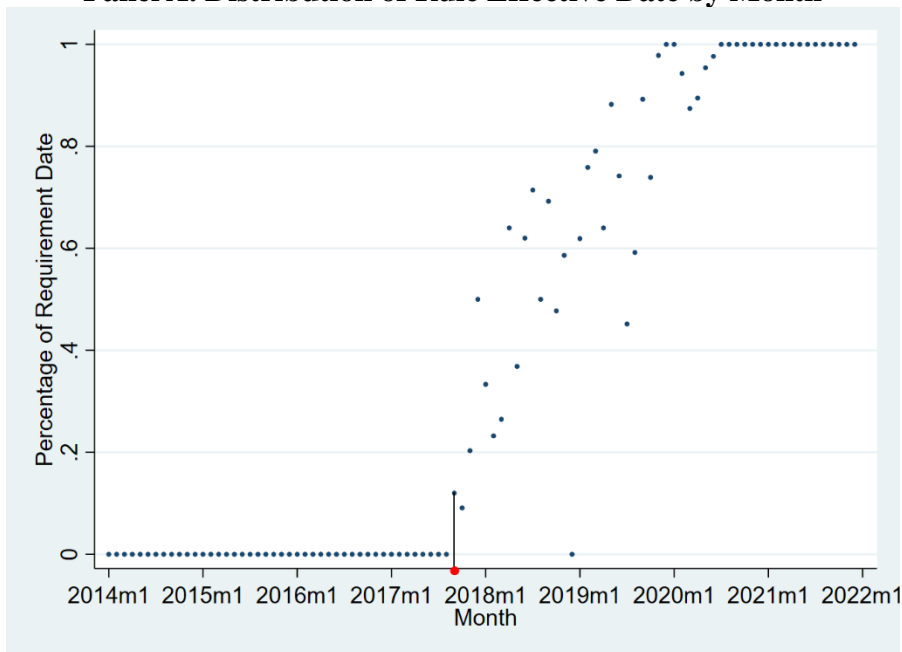
Panel B. Distribution of Rule Adoption Date by Month
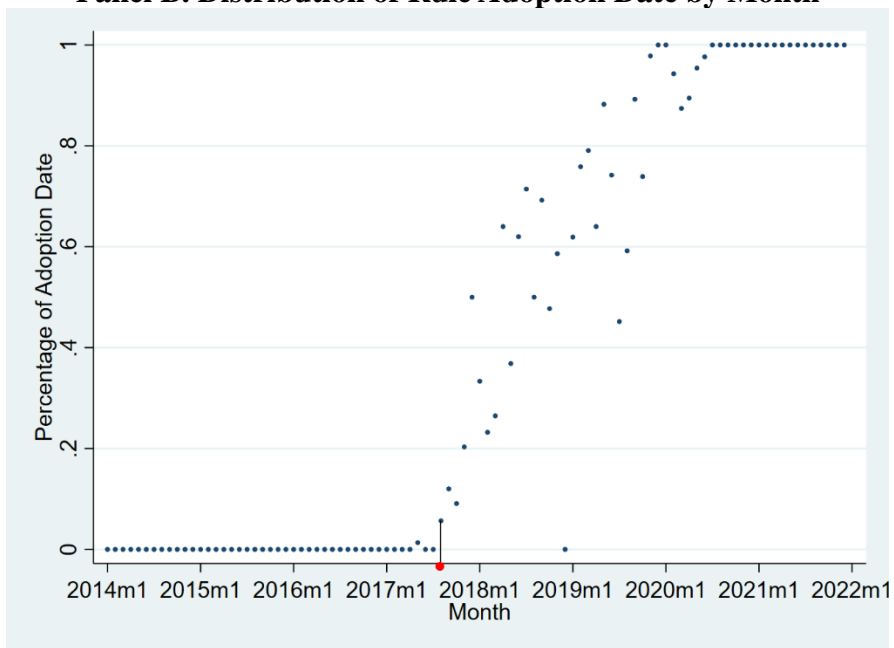
Table 1. Sample Overview

This table provides an overview of the sample. Panel A outlines the procedures used to construct the sample. Panel B shows the sample distribution by year, while Panel C displays the distribution by month.

Panel A. Data Filters

		# Issues
Corporate bonds issued by companies between January 1, 2014 and December 31, 2021		15,898
Exclude Yankee issues, Canadian issues, and Foreign Currency issues	(3,979)	
Exclude variable rate issues	(1,086)	
Exclude issues by financial firms	(2,254)	
Exclude Rule144A bonds	(2,905)	
Exclude issues with missing offering date, offering price, or maturity	(820)	
Exclude issues with missing offering yield	(471)	
Exclude issues with other missing control variables	(398)	
Total bond issue observations		3,985

Panel B. Distribution by Year

Year	Number of Bonds
2014	467
2015	517
2016	453
2017	503
2018	390
2019	432
2020	797
2021	426

Panel C. Distribution by Month

Month	Number of Bonds
1	214
2	391
3	544
4	284
5	492
6	371
7	175
8	374
9	392
10	235
11	399
12	114

Table 2. Descriptive Statistics

This table provides descriptive statistics for the analysis sample. Panel A shows statistics for the entire sample used in this study. Panel B details statistics for bond issues without hyperlinks to exhibits in bond registration statements, while Panel C covers bond issues that include such hyperlinks. Detailed variable definitions are provided in Appendix I.

Variable	N	Mean	SD	P25	Median	P75
Panel A. Entire Sample						
Offering Yield Spread (%)	3,985	1.510	0.991	0.860	1.230	1.850
Maturity (years)	3,985	13.800	10.400	6.070	10.000	20.100
Offering Amount (millions)	3,985	833.264	645.973	450.000	600.000	1,000.000
Number of Covenants	3,985	1.560	0.530	1.390	1.610	1.950
Ratings	3,985	6.720	2.590	5.000	7.000	8.000
Secured	3,985	0.086	0.281	0.000	0.000	0.000
Subordinated	3,985	0.003	0.052	0.000	0.000	0.000
Callable	3,985	0.991	0.095	1.000	1.000	1.000
Treasury Yield	3,985	0.019	0.007	0.015	0.021	0.024
CPI	3,985	0.171	0.336	0.002	0.186	0.423
Fed Funds Rate (%)	3,985	0.680	0.772	0.090	0.340	1.160
Size	3,985	10.500	1.200	9.620	10.500	11.400
Leverage	3,985	0.313	0.139	0.215	0.304	0.390
Loss	3,985	0.095	0.294	0.000	0.000	0.000
ROA	3,985	0.024	0.019	0.012	0.021	0.033
Interest Coverage	3,985	14.900	19.700	5.300	9.260	16.700
Asset Growth	3,985	1.000	0.005	0.999	1.000	1.000
Sales Growth	3,985	1.010	0.166	0.930	1.010	1.070
Number of Primary Investors	3,985	3.330	2.100	0.000	4.410	4.800
HHI	3,921	0.068	0.044	0.042	0.057	0.080
Number of Trades	3,985	4.660	1.020	4.260	4.750	5.250
Trading Volume	3,985	18.800	2.820	18.500	19.200	19.800
Panel B. *Hyperlink=0*						
Offering Yield Spread (%)	2,264	1.450	0.905	0.850	1.200	1.750
Maturity (years)	2,264	13.500	10.200	5.280	10.000	20.000
Offering Amount (millions)	2,264	799.379	673.504	400.000	600.000	1,000.000
Number of Covenants	2,264	1.460	0.599	1.390	1.610	1.950
Ratings	2,264	6.610	2.680	5.000	7.000	8.000
Secured	2,264	0.081	0.273	0.000	0.000	0.000
Subordinated	2,264	0.004	0.063	0.000	0.000	0.000
Callable	2,264	0.988	0.111	1.000	1.000	1.000
Treasury Yield	2,264	0.022	0.004	0.020	0.023	0.025
CPI	2,264	0.151	0.306	-0.005	0.167	0.405
Fed Funds Rate (%)	2,264	0.598	0.644	0.110	0.370	0.910

Size	2,264	10.400	1.220	9.490	10.400	11.300
Leverage	2,264	0.296	0.139	0.195	0.285	0.376
Loss	2,264	0.079	0.270	0.000	0.000	0.000
ROA	2,264	0.026	0.019	0.014	0.023	0.034
Interest Coverage	2,264	15.800	20.500	5.590	9.690	18.000
Asset Growth	2,264	1.000	0.004	1.000	1.000	1.000
Sales Growth	2,264	1.010	0.155	0.942	1.010	1.070
Number of Primary Investors	2,264	4.530	0.655	4.280	4.585	4.890
HHI	2,243	0.071	0.046	0.043	0.059	0.082
Number of Trades	2,264	4.623	0.977	4.190	4.682	5.190
Trading Volume	2,264	18.731	2.417	18.400	19.033	19.600

Panel C. *Hyperlink*=1

Offering Yield Spread (%)	1,721	1.600	1.090	0.875	1.250	2.000
Maturity (years)	1,721	14.300	10.600	7.020	10.000	30.000
Offering Amount (millions)	1,721	877.839	605.169	500.000	700.000	1,000.000
Number of Covenants	1,721	1.700	0.381	1.610	1.790	1.950
Ratings	1,721	6.850	2.450	5.000	7.000	8.000
Secured	1,721	0.093	0.290	0.000	0.000	0.000
Subordinated	1,721	0.001	0.034	0.000	0.000	0.000
Callable	1,721	0.995	0.068	1.000	1.000	1.000
Treasury Yield	1,721	0.015	0.008	0.007	0.015	0.018
CPI	1,721	0.197	0.369	0.002	0.207	0.491
Fed Funds Rate (%)	1,721	0.789	0.902	0.080	0.090	1.580
Size	1,721	10.600	1.170	9.780	10.600	11.400
Leverage	1,721	0.336	0.137	0.246	0.326	0.410
Loss	1,721	0.117	0.321	0.000	0.000	0.000
ROA	1,721	0.022	0.019	0.010	0.018	0.031
Interest Coverage	1,721	13.800	18.600	4.990	8.510	14.700
Asset Growth	1,721	1.000	0.005	0.999	1.000	1.000
Sales Growth	1,721	1.000	0.180	0.922	1.010	1.070
Number of Primary Investors	1,721	4.530	0.868	4.360	4.654	4.940
HHI	1,678	0.065	0.041	0.041	0.056	0.076
Number of Trades	1,721	4.708	1.069	4.360	4.828	5.300
Trading Volume	1,721	18.810	3.271	18.800	19.334	19.900

Table 3. The Effect of Hyperlink Inclusion on Corporate Bond Yield Spread

This table contains estimates for the effect of hyperlink inclusion, resulting in a change in information processing costs, on corporate bond yields. The dependent variable is the offering date yield-to-maturity less the similar maturity Treasury bond yield expressed in percentage points. *Hyperlink* is an indicator variable equal to one if the offering bond issue is announced after the first new prospectus is filed following the implementation of the Exhibit Hyperlink rule, and zero otherwise. All other variables are defined in Appendix I. Issuer, year-quarter, and rating fixed effects are included. Robust standard errors are clustered at the firm issuer level. T-statistics are reported in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

| | *Offering Yield Spread* | | | |
	(1)	(2)	(3)	(4)
Hyperlink	-0.1328**	-0.1282**	-0.1355***	-0.1217***
	(-2.12)	(-2.41)	(-2.67)	(-2.59)
Maturity		0.0201***	0.0206***	0.0209***
		(25.94)	(27.64)	(27.76)
Offering amount		0.1638***	0.1600***	0.1453***
		(3.94)	(4.22)	(4.59)
Number of Covenants		0.0172	0.0089	0.0294
		(0.65)	(0.36)	(1.15)
Secured		0.0906	0.1189	0.1017
		(0.96)	(1.38)	(1.16)
Subordinated		0.0019	-0.0155	-0.0830
		(0.01)	(-0.10)	(-0.59)
Callable		0.0125	0.0233	-0.0046
		(0.19)	(0.37)	(-0.06)
Treasury Yield			-16.0648	-18.4396*
			(-1.60)	(-1.88)
CPI			-0.4123***	-0.3773***
			(-4.74)	(-4.82)
Fed Funds Rate			-1.2644***	-1.2460***
			(-8.65)	(-8.93)
Size				-0.0682
				(-0.79)
Leverage				0.7782***
				(2.73)
Loss				0.2894***
				(4.21)
ROA				-6.2070***
				(-3.23)
Interest Coverage				0.0032***
				(3.66)
Asset Growth				3.2164
				(0.84)

Sales Growth				-0.0596
				(-0.64)
Constant	1.5710***	-0.9569*	0.3300	-2.0749
	(58.09)	(-1.73)	(0.64)	(-0.52)
Issuer FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes
Observations	3,985	3,985	3,985	3,985
Adjusted R^2	0.721	0.766	0.801	0.812

Table 4. Parallel Trend Analysis for the Baseline Test

This table reports the parallel trend tests examining the effect of hyperlink inclusion on corporate bond yields. The dependent variable is the offering date yield-to-maturity minus the similar maturity Treasury bond yield, expressed in percent points. The series of hyperlink variables reflect the time intervals of specific prospectus filing dates relative to when issuers are mandated to incorporate hyperlinks in the exhibit index of their prospectuses. Definitions for all other variables are provided in Appendix I. Issuer, year-quarter, and rating fixed effects are included. Robust standard errors are clustered at the firm issuer level. T-statistics are reported in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	Offering Yield Spread			
	(1)	(2)	(3)	(4)
$Hyperlink^{-3}$	-0.0454	-0.0435	-0.0342	-0.0481
	(-0.89)	(-0.89)	(-0.74)	(-1.07)
$Hyperlink^{-2}$	0.0461	0.0486	0.0483	0.0110
	(0.26)	(0.29)	(0.30)	(0.06)
$Hyperlink^{-1}$	-0.1584	-0.0978	-0.1648	-0.1759
	(-1.01)	(-0.54)	(-0.87)	(-0.90)
$Hyperlink^{1}$	-0.1816**	-0.1805***	-0.1813***	-0.1824***
	(-2.46)	(-2.72)	(-2.95)	(-3.02)
$Hyperlink^{2}$	-0.3515**	-0.3183**	-0.2748**	-0.3150**
	(-2.51)	(-2.12)	(-2.13)	(-2.53)
$Hyperlink^{3}$	-0.2641**	-0.2520**	-0.2351**	-0.2347**
	(-2.04)	(-2.12)	(-1.99)	(-2.10)
$Hyperlink^{4+}$	-0.1675	-0.2018*	-0.1850	-0.1866*
	(-1.29)	(-1.67)	(-1.64)	(-1.70)
Controls (Bond Characteristics)	No	Yes	Yes	Yes
Controls (Market Conditions)	No	No	Yes	Yes
Controls (Issuer Characteristics)	No	No	No	Yes
Issuer FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes
Observations	3,985	3,985	3,985	3,985
Adjusted R^2	0.721	0.767	0.801	0.812

Table 5. Cross-Sectional Test

This table contains estimates for the heterogeneity effect of hyperlink inclusion on the corporate bond yields. The dependent variable is the offering date yield-to-maturity minus the similar maturity Treasury bond yield, expressed in percent points. *Hyperlink* is an indicator variable equal to one if the offering bond issue is announced after the first new prospectus filed following the implementation of the Hyperlink rule, and zero otherwise. *LargeEx* indicates the amount of information contained in exhibits; *LargeCov* indicates the financial constraints; *LargePreIssue, LargeConcurrent, LargeSize,* and *BetterRating* indicate the information environment; *HighLiquid* indicates the pre-issuance secondary market liquidity. Details of these variables are provided in Appendix I. Issuer, year-quarter, and rating fixed effects are included. Robust standard errors are clustered at the firm issuer level. T-statistics are reported in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	Offering Yield Spread						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Hyperlink	0.0890	-0.0820	-0.2303***	-0.0429	-0.1704***	-0.1793***	-0.1361***
	(0.98)	(-1.51)	(-3.38)	(-0.70)	(-3.15)	(-2.58)	(-2.93)
*LargeEx*Hyperlink*	-0.2408**						
	(2.57)						
*LargeCov*Hyperlink*		-0.1376**					
		(-2.09)					
*LargePreIssue*Hyperlink*			0.1477**				
			(2.06)				
*LargeConcurrent*Hyerplink*				-0.1148*			
				(-1.69)			
*LargeSize*Hyperlink*					0.1107*		
					(1.73)		
*BetterRating*Hyperlink*						0.1238*	
						(1.75)	
*HighLiquid*Hyperlink*							0.1783***
							(2.80)
Controls (Bond Characteristics)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls (Market Conditions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls (Issuer Characteristics)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Issuer FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,985	3,985	3,985	3,985	3,985	3,985	3,985
Adjusted R^2	0.814	0.817	0.814	0.813	0.814	0.825	0.814

Table 6. The Effect of Hyperlink Inclusion on the Secondary Market Liquidity

This table contains estimates for the effect of hyperlink inclusion on the short-term liquidity in the secondary bond market. The dependent variable in Panel A is the number of trades, equal to the logarithm of one plus the number of secondary market trades in the first week after issuance. The dependent variable in Panel B is trading volume, equal to the logarithm of one plus the sum of the secondary market trading amount in par value in the first week after issuance. *Hyperlink* is an indicator variable equal to one if the offering bond issue is announced after the first new prospectus filed following the implementation of the Hyperlink rule, and zero otherwise. All other variables are defined in Appendix I. Issuer, year-quarter, and rating fixed effects are included. Robust standard errors are clustered at the firm issuer level. T-statistics are reported in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. The Effect of Hyperlink Inclusion on the Number of Trades

	Number of Trades			
	(1)	(2)	(3)	(4)
Hyperlink	0.1528*	0.1501**	0.1525**	0.1426**
	(1.77)	(2.25)	(2.21)	(1.99)
Controls (Bond Characteristics)	No	Yes	Yes	Yes
Controls (Market Conditions)	No	No	Yes	Yes
Controls (Issuer Characteristics)	No	No	No	Yes
Issuer FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes
Observations	3,985	3,985	3,985	3,985
Adjusted R^2	0.442	0.566	0.565	0.569

Panel B. The Effect of Hyperlink Inclusion on Trading Volume

	Trading Volume			
	(1)	(2)	(3)	(4)
Hyperlink	0.4424*	0.4224**	0.4225*	0.4035*
	(1.85)	(2.02)	(1.91)	(1.75)
Controls (Bond Characteristics)	No	Yes	Yes	Yes
Controls (Market Conditions)	No	No	Yes	Yes
Controls (Issuer Characteristics)	No	No	No	Yes
Issuer FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes
Observations	3,985	3,985	3,985	3,985
Adjusted R^2	0.364	0.427	0.426	0.428

Table 7. Other Consequences of Hyperlink Inclusion on the Primary Market

This table contains estimates for the effect of hyperlink inclusion on the investor base in the primary bond market. The dependent variable in Panel A is the *Number of Primary Investors*, equal to the natural logarithm of one plus the number of transactions that involve dealers selling to customers in the primary market, calculated from Enhanced TRACE data. The dependent variable in Panel B is *HHI*, equal to the Herfindahl concentration measure, and is based on the amount purchased by primary market investors: the sum of (each primary trade dollar amount in par value/ total dollar amount of primary trades in par value)^2. *Hyperlink* is an indicator variable equal to one if the offering bond issue is announced after the first new prospectus filed following the implementation of the Exhibit Hyperlink rule, and zero otherwise. All other variables are defined in Appendix I. Issuer, year-quarter, and rating fixed effects are included. Robust standard errors are clustered at the firm issuer level. T-statistics are reported in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. The Effect of Hyperlink Inclusion on the Number of Primary Investors

	Number of Primary Investors			
	(1)	(2)	(3)	(4)
Hyperlink	0.0966*	0.0925*	0.0958*	0.0861
	(1.66)	(1.73)	(1.77)	(1.54)
Controls (Bond Characteristics)	No	Yes	Yes	Yes
Controls (Market Conditions)	No	No	Yes	Yes
Controls (Issuer Characteristics)	No	No	No	Yes
Issuer FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes
Observations	3,985	3,985	3,985	3,985
Adjusted R^2	0.384	0.457	0.460	0.463

Panel B. The Effect of Hyperlink Inclusion on the HHI of Primary Investors

	HHI			
	(1)	(2)	(3)	(4)
Hyperlink	-0.0063*	-0.0061*	-0.0062*	-0.0061*
	(-1.73)	(-1.75)	(-1.75)	(-1.70)
Controls (Bond Characteristics)	No	Yes	Yes	Yes
Controls (Market Conditions)	No	No	Yes	Yes
Controls (Issuer Characteristics)	No	No	No	Yes
Issuer FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes
Observations	3,921	3,921	3,921	3,921
Adjusted R^2	0.156	0.177	0.177	0.177

Table 8. Robustness Check

This table contains robust estimates for the effect of hyperlink inclusion on corporate bond yields. Panel A documents the results using an alternative pricing proxy. Panel B presents the results for an alternative proxy of the offering yield spread, ln(1+*Offering Yield Spread*), to adjust for skewness. Panel C reports estimates including alternative fixed effects. Panel D reports estimation results for clustering standard errors at alternative groups. Panel E presents the robustness checks using matched samples. Panel F-I report robustness tests by considering Rule 144A bond as a falsification group. Panel J presents the falsification results for secondary market consequences of the bond issuer one week before the new bond issuance. Panel K presents the EDGAR view volume for Exhibit 4 before and after the implementation of the rulemaking. *Hyperlink* is an indicator variable equal to one if the offering bond issue is announced after the first new prospectus filed following the implementation of the Exhbit Hyperlink rule, and zero otherwise. All other variables are defined in Appendix I. T-statistics are reported in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Alternative Pricing Proxy

	Underpricing			
	(1)	(2)	(3)	(4)
Hyperlink	-0.0092**	-0.0094**	-0.0091**	-0.0086**
	(-2.14)	(-2.19)	(-2.25)	(-2.19)
Controls (Bond Characteristics)	No	Yes	Yes	Yes
Controls (Market Conditions)	No	No	Yes	Yes
Controls (Issuer Characteristics)	No	No	No	Yes
Issuer FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes
Observations	3,884	3,884	3,884	3,884
Adjusted R^2	0.187	0.190	0.231	0.237

Panel B. Alternative Offering Yield Spread Proxy

	Ln (1+ Offering Yield Spread)			
	(1)	(2)	(3)	(4)
Hyperlink	-0.0367**	-0.0353**	-0.0378***	-0.0338***
	(-1.99)	(-2.33)	(-2.80)	(-2.67)
Controls (Bond Characteristics)	No	Yes	Yes	Yes
Controls (Market Conditions)	No	No	Yes	Yes
Controls (Issuer Characteristics)	No	No	No	Yes
Issuer FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes
Observations	3,985	3,985	3,985	3,985
Adjusted R^2	0.696	0.783	0.824	0.831

Panel C. Alternative Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
					Offering Yield Spread						
Hyperlink	-0.1183*	-0.1278**	-0.1340**	-0.1219**	-0.1685**	-0.1655***	-0.1669***	-0.1442*	-0.1321**	-0.1529**	-0.1364**
	(-1.66)	(-2.28)	(-2.47)	(-2.45)	(-2.37)	(-2.70)	(-2.95)	(-1.91)	(-1.98)	(-2.55)	(-2.42)
Controls (Bond Characteristics)	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes
Controls (Market Conditions)	No	No	Yes	Yes	No	No	Omitted	No	No	Yes	Yes
Controls (Issuer Characteristics)	No	No	No	Yes	No	No	Yes	No	No	No	Yes
Issuer FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No
Rating FE	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Offering Date FE	No	No	No	No	Yes	Yes	Yes	No	No	No	No
Year FE	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes
Observations	3,985	3,985	3,985	3,985	3,985	3,985	3,985	3,985	3,985	3,985	3,985
Adjusted R^2	0.672	0.747	0.780	0.795	0.810	0.870	0.876	0.677	0.722	0.741	0.751

Panel D. Alternative Clustering Group

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Offering Yield Spread				
Hyperlink	-0.1328**	-0.1282***	-0.1355***	-0.1217***	-0.1328***	-0.1282***	-0.1355***	-0.1217***
	(-2.17)	(-2.80)	(-3.18)	(-3.07)	(-3.05)	(-3.28)	(-3.59)	(-3.38)
Controls (Bond Characteristics)	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Controls (Market Conditions)	No	No	Yes	Yes	No	No	Yes	Yes
Controls (Issuer Characteristics)	No	No	No	Yes	No	No	No	Yes
Issuer FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Industry	Industry	Industry	Industry	Issue	Issue	Issue	Issue
Observation	3,985	3,985	3,985	3,985	3,985	3,985	3,985	3,985
Adjusted R^2	0.721	0.767	0.801	0.812	0.721	0.767	0.801	0.812

Panel E. Matched Sample

	Offering Yield Spread	
	(1) Propensity Score Matching Sample	(2) Entropy Balancing Sample
Hyperlink	-0.1422**	-0.1277**
	(-2.38)	(-2.55)
Controls (Bond Characteristics)	Yes	Yes
Controls (Market Conditions)	Yes	Yes
Controls (Issuer Characteristics)	Yes	Yes
Issuer FE	Yes	Yes
Year-Quarter FE	Yes	Yes
Rating FE	Yes	Yes
Observations	1,417	3,985
Adjusted R^2	0.826	0.821

Panel F. Rule 144 Bond Sample Selection

		# Issues
Corporate bonds issued by companies between January 1, 2014 and December 31, 2021		15,898
Exclude Yankee issues, Canadian issues, and Foreign Currency issues	(3,979)	
Exclude variable rate issues	(1,086)	
Exclude issues by financial firms	(2,254)	
Exclude Non-Rule 144A bonds	(5,674)	
Exclude issues with missing offering date, offering price, or maturity	(199)	
Exclude issues with missing offering yield	(163)	
Exclude issues with other missing control variables at the bond level and market condition level	(304)	2,239
Exclude issues that cannot be matched with a public firm in Compustat and with missing control variables at the firm level	(1,552)	
Final bond issues		687

Panel G. Rule 144A Bond Offering

| | Offering Yield Spread | | | |
	(1)	(2)	(3)	(4)
Pseudo Hyperlink	-0.2090	-0.1845	-0.2443	-0.2877
	(-0.70)	(-0.60)	(-0.87)	(-1.22)
Controls (Bond Characteristics)	No	Yes	Yes	Yes
Controls (Market Conditions)	No	No	Yes	Yes
Controls (Issuer Characteristics)	No	No	No	Yes
Issuer FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes
Observations	687	687	687	687
Adjusted R^2	0.765	0.768	0.789	0.827

Panel H. Rule 144A Bond Offering

| | Offering Yield Spread | | |
	(1)	(2)	(3)
Pseudo Hyperlink	0.1550	0.1676	0.1308
	(1.06)	(1.13)	(0.92)
Controls (Bond Characteristics)	No	Yes	Yes
Controls (Market Conditions)	No	No	Yes
Controls (Issuer Characteristics)	No	No	No
Issuer FE	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes
Observations	2,239	2,239	2,239
Adjusted R^2	0.835	0.838	0.850

Panel I. Include Rule 144A Bonds as an Additional Control Group

| | Offering Yield Spread | | | |
	(1)	(2)	(3)	(4)
Hyperlink	-0.1454**	-0.1259**	-0.1354**	-0.1453***
	(-2.27)	(-2.16)	(-2.45)	(-2.87)
Rule 144A	0.3348***	0.3561***	0.3067***	0.3184***
	(3.50)	(3.71)	(3.34)	(3.62)
Controls (Bond Characteristics)	No	Yes	Yes	Yes
Controls (Market Conditions)	No	No	Yes	Yes
Controls (Issuer Characteristics)	No	No	No	Yes
Issuer FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes
Observations	4,672	4,672	4,672	4,672
Adjusted R2	0.807	0.828	0.846	0.857

Panel J. Falsification Test on the Secondary Market

	(1) *Number of Trades*	(2) *Trading Volume*
Hyperlink	-0.2589	-0.6154
	(-1.45)	(-0.99)
Controls (Bond Characteristics)	Yes	Yes
Controls (Market Conditions)	Yes	Yes
Controls (Issuer Characteristics)	Yes	Yes
Issuer FE	Yes	Yes
Year-Quarter FE	Yes	Yes
Rating FE	Yes	Yes
Observations	3,985	3,985
Adjusted R^2	0.783	0.656

Panel K. EDGAR View Volume of Exhibit 4 on Offering Dates

Pre_Offering Date Volume	*Post_Offering Date Volume*	Difference	T-Value
12.154	24.493	12.340***	8.568