HOW DOES PUBLIC INFORMATION ACCESS SHAPE GOVERNMENT FINANCING COST?

EVIDENCE FROM FOIA AND MUNICIPAL BOND

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CERTIFICATE OF ORIGINALITY

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ABSTRACT

In the United States, each state has implemented an information openness law, commonly known as the Freedom of Information Act (FOIA), granting any person (or any "citizen" for some states) the right to request access to records from any government branch. However, the level of government transparency offered under the FOIA varies across states and over time. By reducing information asymmetry between municipal bond investors and the municipal government and facilitating the public monitoring on government, I document that the municipal borrowing cost is lowered after the government transparency offered under the FOIA improves. I employ staggered treatments to FOIA revisions and a stacked regression design and find when the general public gain easier access to government records following FOIA revisions, municipal borrowing costs, measured by offering yield and tax-adjusted offering spread, decrease significantly. The effect is more pronounced in counties with lower level of social capital, lower education level, or lower newspaper coverage, consistent with the notion that the information asymmetry is reduced more for less transparent government, and that government transparency offered under the FOIA substitutes community trust. The lower municipal bond yield also holds in the secondary market. And in both primary and secondary markets, the effect is present for institutional and retail investors, but the reduction is less for institutional investors. my robustness tests support the effect is causal and not driven by underlying macroeconomic conditions. Overall, this thesis documents the benefits of FOIA in public finance and contributes to literatures of municipal bonds and public information acquisition.

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1. Introduction

The municipal bond market in the U.S. has experienced impressive growth over the past two decades, expanding from approximately $2.8 trillion in 2004 to approximately $4.1 trillion as of the end of March 2022, representing a robust growth rate of 47%[1]. The growing frequency of municipal bond oversubscription also reflects the heighted interest of investors in this trillion-dollar market, further bolstering the significance of the municipal bond in the overall U.S. debt market. Municipal bonds facilitate public services across U.S: not only do these bonds benefit their holders, but they also generate broad societal benefits. Proceeds from municipal bonds are utilized to finance government projects, such as constructing roads, bridges, parks, heath care centres and schools, which are essential for ensuring the smooth functioning of society and thus ultimately benefit the public. Adelino et al. (2017) document that easing municipalities' financial constraints can have substantial real impacts, including improvements in local employment and economic growth.

The literature on information environment affecting financing cost primarily focuses on corporate bonds (Dhaliwal et al. 2011; Florou and Kosi 2015; Franco et al. 2016; Bonsall and Miller 2017; Givoly et al. 2017). Although municipal and corporate bonds are both in nature fixed-income assets, extrapolating findings from corporate bonds to municipal bonds is not straightforward. First, municipal bonds are backed by local tax revenue or cash flow from specific government projects, making it a relatively safe investment that attracts local households. In my sample period of 2005 to 2016, Municipal Securities Rulemaking Board (MRSB) reports that the average household ownership is around 50 percent[1]. In contrast, other fixed-income asset classes have

[1] Data source: MRSB June 2022 report https://www.msrb.org/sites/default/files/Trends-in-Municipal-Securities-Ownership.pdf.

much lower levels of household ownership. To the extent that retail investors comprise a significant investor group in the municipal bond market, how information acquisition affects financing cost could be different. Second, unlike corporate managers, municipal officers are less motivated to enhance transparency. Instead, they have strong personal incentives to preserve reputational capital and political connections, particularly when short-term political incentives outweigh the perceived capital market benefits of information transparency or dissemination (Cuny 2016). Third, issuers of municipal securities are exempt from most federal securities laws, resulting in the municipal bond market remaining opaque.[2] In the absence of mandatory disclosure regulation, it is easier for officials to manipulate information to cater their own benefits (Lyu et al. 2018). Municipal bond issuers typically disclose financial information at bond insurance, but they may not continue to make periodical financial disclosures. For instance, the rate of failure to file financial disclosures in 2009 was nearly 40 percent (Schmitt 2011). Given these differences, understanding how information environment of municipality affects municipal borrowing costs warrants further investigation.

This research identifies a novel channel through which municipal bond investors can acquire more information. Although municipal bond information disclosure is often limited and untimely, investors can alternatively acquire information through the Freedom of Information Act (FOIA), which allows individuals to access any record of any U.S. government branch unless it falls under national security, personal privacy, or law enforcement exemptions. All 50 states in the U.S. have adopted this government openness law and some states continuously revise their state-level FOIA. These revisions provide us with an ideal setting to investigate the influence of

[2] Comparing with the enforcement authority on public firms, SEC has little power to directly regulate municipal bond issuers and their disclosures (Butler et al. 2009).

government information acquisition on the municipal bond market. I posit that the easier access to government data under the FOIA influences municipal bond borrowing costs in the following ways. First, the FOIA can provide investors with valuable information about the financial health of the local government entity that issues the bond. For example, FOIA requests can provide information about the municipality's debt levels, financial statements, and other key financial data that are not timely disclosed otherwise. **Appendix A** provides some real-life examples of FOIA logs obtained from county government, which confirm that the public seeks information pertaining to the financial well-being of the government, including data regarding project grant, tax revenue, annual budget, and annual audit. The reduced information asymmetry regarding the financial performance and health of the municipality between municipal bond investors and the issuers results in lower financing cost. Second, in addition to providing investors with information, FOIA can also help to promote government transparency and accountability. By allowing the public to access government information, FOIA can help deter government officials from engaging in corrupt or unethical behavior. Cordis and Warren (2014) and Vadlamannati and Cooray (2016) find reductions in corruption and increasing in corruption detection after the switch from a weak to a strong state-level FOIA law. Even in the absence of actual information acquisitions, merely knowing their actions may be subject to public scrutiny, government officials may become more accountable in their decision-making processes.

Empirically, I test the impact of FOIA revisions on municipal bond financing cost based on the FOIA scores developed by Cordis and Warren (2014) and Cordis et al. (2021), with a higher score signifies greater government transparency and a lower cost of acquiring information for the public. In the sample period 2005 to 2016, 14

states underwent revisions of FOIA laws in different years, which provides staggered treatments to the FOIA laws. I rely on a stacked regression design by examining the treatment effects across cohorts and estimate the staggered DiD effects of the FOIA law revisions. The results show a significant and negative relationship between the change of government transparency, proxied by FOIA score revisions, and county-level municipal bond financing costs. This finding is also economically significant, with one-point increase in FOIA score leading to 17 basis points decrease in offering yield. Considering the aggregate amount of municipal bond issuance in 2022 was approximately $380 billion, one-point increase in FOIA score would result in a reduction of borrowing costs by $646 million in that year, with the saved financing costs benefiting local taxpayers and citizens. The results hold if using tax-adjusted offering spreads following Schwert (2017) to measure the financing cost.

I conduct additional tests with different samples to ensure the robustness of the results. First, the stacked regression approach utilized in the study requires the inclusion of "clean" controls for each cohort. To meet this requirement, the baseline results use states without any FOIA revision during each cohort-specific event window as controls. And the findings remain significant when restricting the sample to states without any FOIA revision throughout the entire sample period. Second, the findings remain robust when focusing solely on counties at state borders with different levels of government openness. These counties share similar economic conditions but are under different state-level FOIA. Third, I further use propensity score matching to identify the nearest five counties with similar macroeconomic characteristics as controls, and the result also confirms the robustness of the findings. Fourth, the result is robust when I use the full panel sample to regress municipal bond issuance cost on FOIA score in the same year.

This suggests that the negative association holds across the entire dataset, providing further support for robustness and a generalizable interpretation.

I also provide evidence that FOIA revisions lead to an increase in market liquidity. Specifically, I find that the price dispersion (Jankowitsch et al. 2011) and imputed round-trip cost (Feldhütter 2012) significantly decrease with higher FOIA score, while the bond turnover significantly increases within 90-day period after municipal bond issuance (Gao et al. 2020). Cross-sectionally, I find that the reduction of financing costs is more pronounced in counties with lower social capital, lower education level or lower newspaper coverage, as these counties have lower governance level ex-ante and experience a greater reduction in municipal borrowing costs after the FOIA offers greater government accountability. The cross-sectional analysis supports the channels of both improved government accountability and reduced information asymmetry.

Additionally, I examine whether the borrowing cost reductions differ when the municipal bond investors are retail or institutional investors. Following Cornaggia et al. (2022), I identify the primary market trades of institutional and retail investors, and find that decrease in primary market yield is statistically more significant among retail investors. In secondary market, around the short window (from -90 to 90 days) after the effective date of a FOIA positive revision, both institutional and retail investors ask for lower risk premium, but the effect is more pronounced for retail investors. The results are robust to alternative length of event window, alternating to (-60, 60) days and (-120, 120) days. In a longer three-year event window in the secondary market trading, I find that dealers' mark-up or markdown (Cuny 2018) towards institutional investors experience a significant decline, whereas no such effect is observed for retail investors. This suggests that only institutional investors exhibit enhanced bargaining power

against dealers. The results in total highlight that retail investors consider FOIA revision as an indicator of improved transparency and governance, but they may not extensively utilize it for negotiating against dealers. The findings imply an unintended adverse consequence of FOIA, namely, a more uneven playing field between retail and institutional investors.

This study offers the following contributions to the literature. First, it contributes to my understanding towards the role of information acquisition in government financing. By using a novel measures of government information accessibility, I demonstrate a positive impact of information acquisition in a relatively opaque market between municipal bond holders and the government. Providing investors with easier access to government records reduces the investors' perceived risk towards municipal bonds. Secondly, this study highlights the role of public scrutiny (Jin and Leslie 2003). Previous literature put considerable emphasis on media's role as external monitors and whistle-blowers for corporates frauds (Dyck et al. 2010) and government inefficiency (Gao et al. 2020; Snyder Jr and Strömberg 2010) while overlooking the role of individual citizens in promoting government accountability. FOIA grants the general public, rather than exclusively media or resourceful organizations, access to government records, and thus empowers the public and increases government accountability. The study's final contribution is to the understanding of determinants of municipal bond yield. Recent studies document various factors, including marijuana liberalization, opioid abuse, climate risk and local newspaper closure, influence the municipal bond borrowing cost (Cornaggia et al. 2022; Cheng et al. 2023; Gao et al. 2020; Painter 2020). This thesis shows that increased government openness and transparency lead to a significant issuance cost saving for municipalities, thereby benefiting the local taxpayers and broader community. Despite

the municipal bond market being less liquid and dominated by retail investors, this study demonstrates that the information environment still affects offering and trading price.

This paper proceeds as follows. In **Section 2**, I provide a comprehensive institutional background of FOIA, along with a conceptual framework to facilitate understanding of the potential impact of FOIA revision. Additionally, this section illustrates the methods used to measure these revisions. **Section 3** provides a review of related literature and hypothesis development. **Section 4** elaborates the sample selection, variable construction, and stacked regression research design. **Section 5** presents the baseline results showing the effect of FOIA revision on municipal offering yield. This section also includes robustness tests. In **Section 6**, I present the additional tests on municipal bond liquidity, bond yield and investor bargaining power in secondary market, and municipal bond issuance. And **Section 7** concludes.

2. Institutional Background of FOIA

The Freedom of Information Act (FOIA), enacted at federal level by Congress in 1966, provides public the right to access any records held by the federal government. In line with the philosophy of full transparency, federal agencies are required to disclose any information upon public request unless it falls under one of nine exemptions[3], primarily pertaining to personal privacy, national security, and law enforcement. Following or even proceeding Congress's step, all the 50 states in U.S. have implemented similar open government regulations. The state-level laws may vary in their scope, and some states do not explicitly name their provisions as FOIA[4], but the

[3] For more detailed information about the nine exemptions, refer government's central website for FOIA at https://www.foia.gov/about.html.
[4] For example, Alabama and Nevada have the Open Meetings Law and Pennsylvania has the Right to Know Law.

underlying principle is to provide any individual, or in some states any citizen, with the right to inspect any type of information held by state and local government agencies. In accordance with FOIA, government agencies must respond to the request within a specific time frame, and the requester may exercise the right to appeal if the request is denied or if the requester is not satisfied with the agency's response, further safeguarding public's right to access information. In summary, state-level FOIA serves as an important tool for promoting transparency and accountability of state and local government, and deterring abuse of authority by government officials.

The FOIA log files are also records kept by government agencies and some governments make it available online. **Appendix A** gives real-life examples of FOIA log files obtained from Cook County FOIA Request Archive and Mathews County FOIA Request Log. These logs include details such as the request date, requester's name, and request summary. The Cook County also discloses the requester's organization if any. Around one-third of FOIA requests (697 out of 1,930) are made by individuals from 2018 to 2019. Moreover, a significant proportion of organizational requesters consisted of law firms, audit firms, financial firms, and newspapers. The requests made by the public cover a wide range of topics, including but not limited to, employment discrimination within government agencies, project expenditures, government efficiency, financial budgeting, and tax revenue. Even though the public can get tax, revenue, and budget data from government financial reports, such information is subject to a significant lag. The FOIA also offers access to exclusive content such as Board of Supervisors' email communications and details about employee layoffs that cannot be obtained from any other source.

FOIA requests can be made through various channels, such as online application, email, mail, phone call, fax, or in person visits. While some governments provide

sample forms for submitting FOIA requests, others accept any clear and reasonable request for the desired documents. Local governments may allow each government agency to handle its own FOIA requests, or they may establish a centralized office responsible for processing and coordinating with other agencies. For instance, the Arkansas state government established the Department of Transformation and Shared Services to handle all FOIA requests to state agencies, and Fairfax County, Virginia, has its Office of Public Affairs to process all FOIA requests submitted to the county government. It is worth noting that these minor differences in submitting or accepting FOIA requests do not substantially affect the public's ability to access information. Instead, factors such as response time, exemptions, costs, and penalties for noncompliance have a more significant impact on FOIA implementation. For example, some states have established independent oversight bodies or commissions to review FOIA requests and ensure compliance with the law, such as the Michigan Freedom of Information Act Advisory Committee and the Office of the Independent Inspector General in Cook County, Illinois.

Consequently, some states have stronger FOIA laws than others, creating cross sectional variation among states. And some states have continuously revised their state-level FOIA since the enaction, generating the time-series variation across years. To measure the local government information transparency induced by FOIA, Cordis and Warren (2014) and Cordis et al. (2021) develop a FOIA score ranging from 1 to 9 by examining each state's FOIA law records[5] and assigning one point for each of the ten criteria[6]. Therefore, a higher FOIA score indicates a better local government

[5] Open Government Guide is available at https://www.rcfp.org/open-government-guide/ .
[6] The ten criteria include whether there is a provision that creates a presumption in favour of disclosure and exempts specific records from public access; a provision that limits the fees charged for processing requests; that prohibits charging fees for the time spent searching and collecting records; that waive the cost of searching or copying records if disclosure is in the public interest; for the award of attorneys' fees

information environment. This score facilitates me to quantitively measure the feasibility of acquiring government information by public across different states and different time periods.

In this thesis, I argue these revisions are exogenous for municipal bond market primarily for two reasons. First, FOIA revision is not motivated by municipality financing need. Referring the evolution of government information transparency, many states have revised FOIA over time to strengthen openness or adapt to recent technology changes. Most often, these changes are a result of pressure from non-profit, nonpartisan journalism, media associations and open government advocacy groups (Cordis et al. 2021). No clear evidence proves that the government openness is directly associated with local macroeconomics. Panel A to Panel C in **Figure 1** present maps depicting the state-level average personal income, average FOIA score, and change in FOIA score respectively during the sample period. And Panel D and Panel E in **Figure 1** present maps depicting the state-level personal income and FOIA score at the beginning of the sample period. The darker shade in each map denotes a higher value. Notably, there is no obvious overlap between the regions of higher personal income and those of higher FOIA score or greater change in FOIA score. Moreover, FOIA revisions typically do not directly pertain to government financing activities. Municipal bond issuance is driven by the need to finance public projects such as schools, bridges, and other infrastructure initiatives. Governments opt to borrow from the public to benefit from lower borrowing costs relative to bank loans, and municipal bonds are attractive to investors due to tax exemption of interest payments. Neither the issuance nor the purchase of municipal bonds is linked to government information acquisition.

and costs to a successful plaintiff in a public records case; for criminal penalties for an agency's noncompliance; for civil penalties for an agency's noncompliance; for administrative appeal of a decision to deny a request for public records; that establishes that the response time to a request for records is 15 days or less; and the absence of a generic public-interest exemption provision.

Therefore, it is unlikely that state governments would amend FOIA laws with the aim of influencing municipal bond issuance or trading.

Second, I choose to focus on municipal bonds issued at the county level. The aforementioned differences in FOIA regulations or FOIA revisions are beyond the control of county governments since the decision to revise FOIA lies within state-level government. It is unlikely that the county-level municipal bond issuance and transaction will in turn have any impact on the regulation amendment by higher levels of government. Through empirical analysis, I do not find that higher FOIA is positively related with municipal bond issuance amount or likelihood of bond issuing, either bond new filing or refunding. The empirical evidence further rules out the possibility of county government lobbying higher level of government with legislative power to revise laws aimed at raising more funds. Taking together, changes in FOIA provide an ideal setting for examining the impact of public information acquisition in the municipal bond market.

3. Literature Review and Hypothesis Development

It is well documented that higher disclosure quality lowers the cost of capital for public firms (Sengupta 1998; Aboody et al. 2005; Easley and O'hara 2004; Hughes et al. 2007), and empirical research suggests these benefits extend to the municipal bond market as well. For example, municipalities in states imposing GAAP requirements enjoy lower municipal borrowing costs, and as a result, these states tend to rely more on public financing over private debt (Baber and Gore 2008). But if government restates the financial report, municipal bond investors will ask for higher risk premium (Baber et al. 2013). After the introduction of online disclosure repository EMMA which publishes municipal bond real-time trading information and issuer disclosures, Cuny

(2018) documents a reduction in trade premium. Furthermore, trading activity in the secondary market for municipal bonds increases after the financial disclosures are filed, and the effect is more pronounced for timelier disclosures (Cuny et al., 2021).

Prior research has also corroborated the arguments that FOIA broadens information sets and mitigates information asymmetry. Researchers document that equity market participants use FOIA to access federal government records, especially those maintained by SEC and FDA to get private information for their financial and non-financial decisions (Gargano et al. 2017; Glaeser et al. 2022; Klein et al. 2020). Regarding local government, the FOIA request log examples in **Appendix A** provide anecdotal evidence that the public uses FOIA to request information about municipalities' financial status. I thus infer FOIA can mitigate the information asymmetry between bond holders and issuers in municipal bond market.

In addition to get public more informed of government decisions and government financial status, FOIA also fosters government accountability. Switching from a weak form to a strong FOIA reduces corruption and increases the probability that a corruption is detected (Cordis and Warren 2014), indicating that FOIA has the discipline role for municipal officers. With the "disclose upon request" regulation, the municipal officers are more likely to act in a responsible manner if they know that their actions will be subject to public scrutiny. On the contrary, the reduction of external monitoring, for example resulting from local daily newspaper closures, worsens the government inefficiencies and corruptions and investors subsequently ask for higher premium of public finance (Gao et al. 2020). Higher state corruption or government inefficiency is also found to be associated with greater credit risk and higher bond yields (Butler et al. 2009; Wang et al. 2008; Schwert 2017).

Higher FOIA score releases positive signals to municipal bond investors so that

it shifts investors' perception of risk. Retail investors face significant information processing costs (Lee and Zhong 2022; Bushee et al. 2003) so that they make more subjective assessment towards investment decisions. Investors perceive FOIA as a positive signal for reduced credit risks even in the absence of actual information acquisition by themselves.

In summary, the FOIA positive revision is expected to reduce the information asymmetry between bond investors and issuers, hold government more accountable and lower investors' intuitive perception of credit risk. Therefore, I form the main hypothesis in the alternative forms, as follows:

$\mathbf{H_1}$: There is negative association between FOIA amendment and municipal bond offering yield.

4. Sample and Research Design

4.1 Data and Sample

The sample period ranges from 2005 to 2016. I start the sample from 2005 because municipal bond transaction data is not accessible before 2005 via WRDS sourced from the Municipal Securities Rulemaking Board (MSRB) and I stop at 2016 because the annual FOIA score, which is constructed by Cordis et al. (2021), is only available till 2016. **Appendix B** presents the time-series FOIA scores across all 50 states within the sample period. I highlight the score when there is a FOIA revision. Throughout the sample period, there were seventeen instances of FOIA revision in fourteen distinct states. Among these states, except for Iowa in 2012, Illinois in 2011 and New York State in 2009, all the other states enhanced their information openness to the public.

The U.S. municipal bond characteristics are mainly obtained from Refinitiv

Municipal Deals database via Refinitiv Eikon terminal, which provides the bond attributes including its CUSIP, issuance date, maturity date, offering yield, coupon type and coupon rate, issue amount, offering type (competitive or negotiated sale), the source of payment (general obligation, revenue or double barrelled), tax status, and whether the bond is callable, insured, or pre-refunded. I supplement the bond rating by S&P, Moody's and Fitch from Bloomberg. These two datasets are merged by bond's unique nine-digit CUSIP. The Refinitiv data also provides information on the bond issuer's type and issuer's county. Using the first six-digit of bond CUSIPs, I identify the level of bond issuer and issuer's county location. Finally, I match each county's Federal Information Processing Standards (FIPS) code based on 2010 Census county definition.

Municipal bonds are traded by investors and dealers in over-the-counter market, which is regulated by the Municipal Securities Rulemaking Board (MSRB). From MSRB portal in WRDS, I extract all historical trade-level observations from 2005 to 2016. For each transaction, the MSRB provides the bond CUSIP, trade date, dollar price of the trade, yield (if applicable), par-value traded, whether the transaction is reported as a primary market sale, whether the issue traded on or before the issue's initial settlement date, and the type of trade (an inter-dealer trade, a purchase from a customer by a dealer or a sale to a customer by a dealer).

I limit my analysis to municipal bonds issued within the United States, excluding those issued outside U.S. territories. As discussed earlier, I restrict the sample to county-level bonds to mitigate the concern that state-level legislation is influenced by state-level financing needs and costs. I only retain bonds if the source of payment is general obligation and drop revenue bonds as well as double barrelled bonds because I are unable to controls for revenue bonds' project-specific information(Schwert 2017; Cornaggia et al. 2022). I drop bond if its coupon, maturity or offering yield is missing

and remove the bond if it has variable coupon rate or if its maturity is more than 100 years, following Green et al. (2010). I further exclude federal taxable and alternative minimum tax (AMT)-subject bonds from the sample. The sample of primary market municipal bonds contains 25,744 bonds.

4.2 Bond Yield

The bond yield I obtained from Refinitiv or MSRB represents the premiums for credit risk and default risk. But unlike the corporate bond, municipal bonds' interest payments in the sample are tax-exempt at both federal and state levels, and the tax rate is an unneglectable factor in U.S. Taking these factors into consideration and following Schwert (2017), I define tax-adjusted yield as

$$\boldsymbol{yield_{i,t}^{T} = \frac{y_{i,t}}{(1-\tau_t^{fed})\,(1-\tau_{s,t}^{state})}}, \quad \textbf{(1)}$$

where $yield_{i,t}^{T}$ denotes the tax-adjusted yield for bond *i* (identified by its unique nine-digit CUSIP) issued or traded at year *t*, $y_{i,t}$ is the raw yield I directly obtained from the database. τ_t^{fed} reflects the marginal federal tax rate at year t and $\tau_{s,t}^{state}$ is the marginal state tax rate in state *s* during year *t*. In most cases, municipal bonds are only tax exempt within the issuers' states, so I ignore the diversification benefits and assume such tax benefits are identical for all tax-exempt municipal bonds issued in same states[7]. In line with Longstaff (2011) and Schwert (2017), I use the top statutory income tax at federal or state level as the marginal tax rate. To further capture the risk premium for municipal bond, I also estimate yield spread by subtracting risk-free rate from tax-adjusted yield defined in **Equation (1)** as

$$\boldsymbol{yield_{i,t}^{S} = yield_{i,t}^{T} - RiskFree_t}, \quad \textbf{(2)}$$

[7] We collect the statutory income tax brackets for federal and each state between 2005 to 2016 from Tax Foundation via https://taxfoundation.org/.

where $yield_{i,t}^{S}$ represents the tax-adjusted yield spread and $RiskFree_t$ is the maturity matched treasury rate from U.S. Department of the Treasury.

4.3 Empirical Model

Within the sample period, there are seventeen FOIA revisions happened in fourteen distinct states so I construct a staggered difference-in-difference model to examine whether increased government information accessibility to the general public, proxied by state-level FOIA score, will decrease the required risk premium of municipal bond in same state. The staggered timing of treatment effects invites treatment effect heterogeneity across these events. To mitigate the bias of staggered DiD estimates due to heterogonous treatment effects, I employ stacked regression suggested by Baker et al. (2022). More specifically, for each FOIA shock, I first build "clean" control states which do not experience FOIA score changes within the treatment window. These event-specific datasets are stacked together to form my sample. Secondly, I include dataset-specific unit- and time- fixed effects in the regression.

If there is a change in FOIA score, either decrease or increase, I define it as "event" year. As in Cordis et al. (2021), I take six years around the FOIA revision year as event window, i.e. three years before and three years since the change. To qualify as a "clean" control, I remove state-year observations that also experience changes in FOIA scores within the event window. For example, as shown in **Appendix B,** in 2009 the FOIA score in Connecticut increased from 8 to 9, then the event window is from 2006 to 2011. Municipal bonds issued between 2006 to 2011 by counties in Delaware, Illinois, Iowa, Maine, Minnesota, Nevada, New York, Pennsylvania, South Dakota, Texas and Wyoming are excluded from the control groups to meet the "clean" control requirement. After filtering out the event criteria, there are twelve FOIA shocks in

eleven distinct states (Wyoming improves its information freedom in 2006 as well as 2013). In the robustness tests in **Section 5.4**, I find consistent results with alternative research designs for control or treatment groups.

For states incur FOIA revision, $Adj.FOIA_{s,t}$ takes value of 0 in three years before the event and takes value of the change of FOIA score in three years since the event. For states without FOIA revision within same six-year event window, $Adj.FOIA_{s,t}$ takes value of 0. Taking Connecticut as an example, Connecticut's FOIA score increased in 2009, so year 2006 to 2008 are pre-event years and the $Adj.FOIA_{s,t}$ takes value of 0, while the post event years are 2009 to 2011 and the $Adj.FOIA_{s,t}$ takes value of 1.

I then test below stacked regression model,

$$\boldsymbol{Y_{i,t} = \alpha + \beta\, Adj.FOIA_{s,t} + \gamma'\, BondControls_{i,t} + \theta' County\ Controls_{j,t} + County * Event\ FE + Year * Event\ FE + \varepsilon_{it},} \quad \textbf{(3)}$$

where $Y_{i,t}$ denotes offering yield or tax-adjusted offering spread for bond *i* issued in year *t* as defined in **Section 4.2**. $Adj.FOIA_{s,t}$ is the variable of interest, indicating the change of government information environment for state *s* in year *t*. If $Adj.FOIA_{s,t}$ is positive, the general public have easier access to government records, while if $Adj.FOIA_{s,t}$ is negative, the information environment worsens. If $Adj.FOIA_{s,t}$equals to zero, it denotes no change for Freedom of Information Act. I hypothesize that easier information acquisition to government will strength government trustworthiness and lower required risk premium for municipal bond, then the β is expected to be negative and statistically significant. $BondControls_{i,t}$ is a vector of bond characteristic control variables including: (1) the maturity of the bond; (2) the natural log of issuance amount (in thousands dollar) of the bond; (3) indicator variable equals to one if the bond is issued by competitive sale and equals to zero for negotiated sale; (4) indicator variable

for whether the bond is callable; (5) indicator variable for whether the bond is insured; (6) indicator variable for bond credit rating. I convert the credit rating into numeric ratings from 0 to 21, where 21 corresponds to the highest rating, 1 indicates the lowest rating and 0 denotes the bond is not rated at issuance or the rating is missing. When rating information is available from multiple rating agencies, I use rating in this order: S&P, Moody, Fitch. $County\ Controls_{j,t}$ is a vector of county characteristics used to control the macroeconomic conditions for county j in year t, including: (1) natural log of county personal income (in dollar); (2) natural log of county population (in thousand); (3) change of county population (in percent); (4) the county unemployment rate (in percent); (5) change of county unemployment rate (in percent). The county population and personal income data are obtained from the U.S. Bureau of Economic Analysis, and the county unemployment rate is collected from the U.S. Bureau of Labour. There are twelve events in this stacked regression research design, so I control for state-event fixed effects and year-event fixed effects which capture the state level time-varying heterogeneity for each event, and the standard errors are double clustered by issuer-event.

5. Empirical Results

5.1 Descriptive Statistics

The final sample contains 92,901 event-specific bond observations for which data are available for all independent variables. Among them, there are distinct 25,744 county-level municipal bonds with 2,354 county-year observations. All continuous variables are winsorized at 1% and 99% percentiles of their distributions in the sample to mitigate the influence of extreme values. **Table 1** reports summary statistics of the

nonduplicated observations[8] used in the baseline regression. As presented in **Panel A of Table 1**, the municipal bonds in the sample have an average offering yield of 2.92% and tax adjusted offering spread of 2.44%. The average issuance amount in the sample is 1.773 million dollars, and average maturity is 12.92 years. Among these bonds, around 73% of the bonds are callable; approximately 22% of these bonds are insured. Finally, untabulated results indicate that 18.01% of these bonds are unrated, and others are classified as investment grade. **Panel B of Table 1** provides the macroeconomic and local governmental financial data for nonduplicated county-year observations. The annual average personal income is around 40,453 dollars, and the median personal income is 38,488 dollars, which are comparable to the personal income mean and median in the U.S. Most counties incur positive population growth and employment growth during the sample period.

[Insert Table 1 Here]

5.2 Baseline Results

To test the hypothesis that government with more transparency following FOIA revision is associated with lower public financing cost, I run the baseline regression model in **Equation (3)**. **Table 2** Column (1) and Column (2) report the regression results on offering yield and tax-adjusted offering spread using all municipal bond observations in the sample. The coefficients on *Adj. FOIA* are -0.170 and -0.350 respectively, and significantly negative (t-statistics = -2.43 and -3.12, respectively). According to the results, when FOIA score increases by one point, the average offering

[8] The summary statistics are not significantly different if we use all the 92,901 event-specific observations.

yield of county-level municipal bond will decrease by 17 basis points, and the tax-adjusted offering spread will decrease by 35 basis points. The results support my hypothesis that information acquisition can shape the government accountability and reduce required risk premium of municipal bond.

The coefficients of the control variables are consistent with determinacies of bond offering yield. Bonds with longer maturity have higher yields because longer term is associated with more uncertainty and bonds are exposed to greater interest rate and inflation risk. And the offering yields decrease in issuance amount. The municipal bonds can be issued through either negotiated sales or competitive sales. For competitive sales, the underwriters need to bid for the issuing rights and the one with lowest cost can win. But the negotiated sales which directly reach contractual agreement with underwriters are generally associated with higher underwriter gross spreads and thus costlier to borrow from public (Robbins 2002) as indicated by the negative coefficients on Offering Type in the regression results. When the interest rate decreases, the investors face the risk that bond issuers will call back the bond so that callable bonds have higher yield. I have converted character bond ratings to numerical ratings and higher number implies higher credit quality. The negative and significant coefficients on Credit Rating confirm that higher credit rating bonds have lower yield. Furthermore, the significance of variable of interest *Adj. FOIA* still holds after controlling for the rating, suggesting that the impact of FOIA is not fully accessed by third-party rating agencies and credit rating in municipal bond market might be too coarse to reflect all information available (Cornaggia et al. 2022; Cornaggia et al. 2018). I find that local macroeconomic conditions also have significant impact on municipal bond issuing. Counties with higher personal income and lower unemployment rate enjoy lower municipal bond issuance cost as these indicators are closely related to

economic prosperity.

[Insert Table 2 Here]

Each municipal bond has its offering yield at issuance without distinguishing the actual price paid by institutional or retail investors. I infer the primary market yield for institutional and retail investors from the MSRB municipal transaction data. Following Cornaggia et al. (2022), trades specifically flagged as when-issued trades or primary/offering takedown trades as well as trades within two weeks after the offering date are categorised as primary market trades. I discard inter-dealer trades and follow the market convention and previous literature to use the trade size $100,000 as threshold (Cuny 2018; Green et al. 2007) to distinguish institutional and retail investors. Institutional investors in municipal bond market have little incentive to split their orders due to the high transaction costs. If the par value traded is above $100,000 threshold, I consider it as institutional, and otherwise retail trading. For each bond, I aggregate the primary trades to bond-level by taking the par-value-traded weighted average yield as primary market yield for institutional and retail investors, respectively. Comparing with small investors, institutional investors have better and more information source and thus their perceived risks are less affected by FOIA revision. Therefore, I expect the coefficients on Adj. FOIA are more significant for retail investor primary trading.

The empirical results support this argument. Column (3) and (5) in **Table 2** report the results for institutional investors' primary market yield and tax-adjusted primary market spread. Column (4) and (6) represent the results for retail investors' primary trading. observe negative and significant coefficients on Adj. FOIA across all these columns. Both institutional and retail investors ask for lower risk premium,

indicating they are willing to pay higher price when subscribing the municipal bond at issuance. But the coefficients are more negative for retail investors, either for the primary market yield or tax-adjusted primary market spread. The difference is significant as well (p-value = 0.000).

Municipal bond investors primarily consist of individuals in higher tax brackets, and their level of sophistication surpasses that of retail investors in the corporate sectors (Green et al. 2010; Cheng 2021). As a result, these investors possess the ability to incorporate new market information into their investment decisions. In comparison to institutional investors, retail investors still face a greater information disadvantage, resulting in a more substantial improvement in their information set following an increase in the FOIA score[9]. Furthermore, unlike institutional investors, retail investors don't have the tax incentive to diversify their municipal bond holdings across various locations (Cornaggia et al. 2022; Chordia et al. 2022), rendering them more sensitive to changes in the information environment. Considering these factors, the revision of the FOIA exerts a more significant impact on retail investors.

5.3 Cross Sectional Tests

5.3.1 Social Capital

Social capital is defined as the norms and networks that foster cooperation, and it reflects a community's level of trust and willingness to fulfil obligations (Woolcock 2001; Putnam 2001). Previous literature suggests that high social capital benefits both public firms and municipalities by decreasing the required risk premium in debt financing (Hasan et al. 2017b; Li et al. 2016). Interchangeably, social capital may

[9] Untabulated results show that the FOIA revisions have more significant impact on states with lower ex-ante FOIA scores, providing additional evidence that transparency improvements were more substantial in states where there existed a greater ex-ante information disadvantage.

encourage municipalities to behave well even without FOIA and thus I conjecture that the borrowing cost reduction is less pronounced for high social capital counties. Following Hasan et al. (2017a) and Hasan et al. (2017b), I construct the variable Social capital as the first principal component from a factor analysis based on *Pvote, Respn, Assn,* and *Nccs*. The data is obtained from NRCRD at the Pennsylvania State University. *Pvote* is the voter turnouts in presidential elections; *Respn* stands for response rates in U.S. census surveys; *Assn* is the total number of ten types of social organizations for all U.S. counties; and *Nccs* is the total number of non-profit organizations. NRCRD provides data in 2005, 2009 and 2014. my sample period is 2005 to 2016, so I fill the data for missing years using the estimated social capital index in the preceding year in which the data are available. For example, for year 2010 to 2013, I use the 2014 social capital data. But the data is not available after 2014, so I drop the observations if the bonds are issued after 2014.

Then I divide the sample used in **Table 2** into high and low social capital groups based on the median county social capital for each cohort-year. **Table 3 Panel A** reports the empirical results for **Equation (3)** using two subsamples. Column (1) and (2) report the regression results on offering yield using high social capital group and low social capital group. And Column (3) and (4) show the regression results on tax-adjusted offering yield for the two groups. FOIA revisions have significant impact on municipal bond borrowing cost despite of the county social capital level, but the coefficients on $Adj.FOIA$ is statistically more negative for low social group when I conduct the coefficient test across the two subsamples. The results reinforce the argument that FOIA has discipline role in municipalities.

[Insert Table 3 Here]

5.3.2 Education Level

Prior researches document positive relation between political participation and education level (Sunshine Hillygus 2005). Therefore, similar to findings from (Call et al. 2017) that employee education quality is positive associated with disclosure quality and financial outcomes for public firms, counties with higher education level are supposed to have better ex-ante governance level and the FOIA revision has weaker impact in these counties. I split the sample into high and low education groups based on the median value of county education level for each cohort-year. The education data is obtained from U.S. Census Bureau which estimates the educational attainment for population 18 years old and over whose highest degree is a bachelor's, master's, or professional or doctorate degree.

Table 3 Panel B reports the regression results for the subsamples. Column (1) and Column (2) show the result for offering yield among counties with more or less bachelor holders. Column (3) and (4) present the results for tax-adjusted offering spread. The $\text{High} - \text{Low}$ indicates the coefficient difference on $Adj.FOIA$ between the two subsamples. As I expected, FOIA's revision has stronger effects when the state has fewer percentage of bachelor holders.

5.3.3 Newspaper Coverage

FOIA allows public easier access to government records, thereby strengthening the public scrutiny towards government. If the government is under more monitoring ex-ante, the impact is supposed to be weaker. Gao et al. (2020) demonstrate that local newspaper plays an irreplaceable role in holding government accountable and the newspaper closure shocks lead to government inefficiencies, and investors require

higher risk premium to compensate. With FOIA, it is plausible that public security supplement media's role in monitoring government so that the FOIA's impact is supposed to be stronger for counties with lower media coverage.

I collect the newspaper data from the Editor and Publisher Yearbook, which provides the location, establishment date, address, and publish frequency of all U.S. newspapers. I follow Gao et al. (2020) and only retain the daily newspapers. And I drop the newspapers which are closed or merged between 2005 to 2016 using data from UNC's Centre for Innovation and Sustainability in Local Media's Database[10] (Kang and Nam 2021). Combining the information of these two data sources, I count the number of local daily newspaper for each county-year and then scale the number of newspapers by the population of the same county-year. Next, I split the sample based on the median value of newspaper coverage of each cohort-year. The results are presented in **Table 3 Panel C**. The FOIA revisions do not have significant impact on municipal bond offering yield or tax-adjusted offering spread if the bonds are issued by counties with high newspaper coverage. However, counties with relatively low daily newspaper coverage experience significant drop of municipal bond borrowing cost, indicated by both offering yield or tax-adjusted offering spread. The results further support my inference that lower information acquisition cost from government leads to more public scrutiny and improve the government efficiency. Therefore, municipal bond investors ask for lower risk premium.

[10] Data source of newspaper closure or merge: https://newspaperownership.com/additional-material/closed-merged-newspapers-map/

5.4 Robustness Test

5.4.1 Alternative sample

The main results are robust to alternative controls or alternative samples. Firstly, in my baseline test, I use states without any FOIA changes in each cohort as controls with the assumption that the FOIA revision's impact will decay after three years. I cannot fully rule out the possibility that the impact of FOIA revision will last longer than three years, therefore, to have more "clean" controls for the stacked regression, I only retain states without any FOIA change from 2005 to 2016 as controls in each cohort and my main findings are still robust as in column (1) and column (2) of **Table 4**. Secondly, I have controlled various macroeconomic factors when testing the hypothesis, but to further mitigate the concern that my main inference is driven by local economic conditions, I only retain counites at state borders in the sample as these counties encounter similar economic growth or recession at the same time but have different government openness due to different levels of FOIA in respective states. Column (3) and column (4) in **Table 4** show the stacked regression estimation using the counties at state borders sample. The sample size is dramatically cut but the coefficients on $Adj.FOIA$ remain significantly negative for both offering yield and tax-adjusted offering spread. Additionally, I use the propensity-score to match the nearest five counties concerning the macroeconomic conditions, including the size of population and population change, personal income, unemployment rate and change of unemployment rate. Column (5) and (6) in **Table 4** present the results using the matched controls for stacked regression estimation. And the results remain robust.

[Insert Table 4 Here]

5.4.2 Parallel Trend Assumption

In this section, I examine the parallel trend assumption of my staggered DiD design. I include time indicators for years prior to FOIA changes as well as years since the FOIA changes. Specifically, I consider following five new variables and replace Adj. FOIA in **Equation (3).** *Pretreatment (-2)* is an indicator variable equals 1 (-1) if the bond issuing county located in state improves (weakens) its FOIA two years after bond issuance year, and zero otherwise. *Pretreatment (-1)* is an indicator variable equals 1 (-1) if the bond issuing county located in state improves (weakens) its FOIA one year after bond issuance year, and zero otherwise. *FOIA (0), FOIA (1)* and *FOIA (2)* are indicator variables equal 1 (-1) if the bond issuing county located in states improve (weaken) its FOIA in bond issuance year, one year before bond issuance, or two years before bond issuance, and zero otherwise.

The results are shown in **Table 5** that the estimated coefficients on *Pretreatment (-2)* and *Pretreatment (-1)* are insignificant across Column (1) and Column (2), implying that there are no differential trends in offering costs between the counties incur or not incur their state level FOIA revision afterwards. The estimated coefficients are significantly negative for *FOIA (0)* and *FOIA (1)* when regressing on offering yield, and are significantly negative for *FOIA (0), FOIA (1)* and *FOIA (2)* when regression on tax-adjusted offering spread, validating my parallel trend assumption.

[Insert Table 5 Here]

5.4.3 Panel Regression on FOIA Score

In this section, I run the panel regression of offering yield or tax-adjusted offering yield on *FOIA Score* and controls, instead of using $Adj.FOIA$ scores. I use

same bond controls and county macroeconomic controls as in **Equation (3)**. I control for state fixed effects and year fixed effects, and the standard errors are clustered at issuer level. The empirical results are reported in **Table 6**. In column (1), the FOIA Score is negative associated with municipal bond offering yield. The effect is both statistically and economically significant. In Column (2), the results indicate that higher FOIA score is associated with lower tax-adjusted offering spread. The empirical results indicate that the negative association hold across the entire sample, further strengthening my finding that FOIA positive revision can save the borrowing costs of public financing.

[Insert Table 6 Here]

6. Additional Analysis

6.1 Municipal Bond Liquidity

The cross-sectional tests have reinforced my argument that greater government transparency under FOIA revisions improve government accountability. In addition, FOIA positive revision may potentially mitigate informational frictions between bond issuers and bond holders, as evidenced by **Appendix A** that public uses FOIA to access government financial data. Consequently, investors will encounter more liquid market afterwards. In this section, I test the stacked regression of municipal bond liquidity on the *Adj. FOIA*. As in Gao et al. (2020), I test the bond liquidity within 90-day period following the bond issuance date. More specifically, I use price dispersion, imputed round-trip cost (IRC) and turnover (Jankowitsch et al. 2011; Feldhütter 2012; Schwert 2017) to proxy for market liquidity. The daily price dispersion for bond i traded in day t is defined as

$$\boldsymbol{Price\ Dispersion_{i,t}} = \sqrt{\frac{\boldsymbol{Q_j}}{\sum \boldsymbol{Q_j}} * \sum \left(\boldsymbol{P_j} - \boldsymbol{M_t}\right)^2}, \quad \textbf{(4)}$$

where P_j is the transaction price at trade j, Q_j is the par value amount for the trade, and M_t is the value-weighted average price of day t. The price dispersion is then aggregated to bond-level by taking the mean of daily price dispersion. The daily IRC is calculated by

$$\boldsymbol{IRC_{i,t}} = \frac{\boldsymbol{P_{max} - P_{min}}}{\boldsymbol{P_{min}}} \quad \textbf{(5)}$$

where P_{max} is the highest price and P_{min} is the lowest price if there are two or more trades occur in each bond with the same trade size on the same day. The IRC is also aggregated to bond-level by taking the mean of daily IRC. The turnover ratio is the ratio of total trading volume within 90-day period following municipal bond offering date to the bond's issuance amount. I include bond rating, bond callable dummy and county annual macroeconomic controls as used in baseline regressions. And I further control the state-event fixed effect and year-event fixed effect. The standard errors are double clustered at issuer-event level.

Columns (1) to (3) in **Table 7** present the findings on price dispersion, IRC, and turnover. It reveals that price dispersion and IRC experience a significant reduction following a positive revision to FOIA regulations, whereas turnover demonstrates a significant increase post-revision. Taken together, the evidence in **Table 7** suggests that informational frictions are alleviated between government and municipal bond holders following improvement of FOIA score.

[Insert Table 7 Here]

6.2 Trading in Secondary Market

In my baseline results, although I control for the bond characteristics and local macroeconomic conditions, it is almost impossible to take all the possible influencing factors into considerations. To mitigate the concerns of confounding effects in three-year window, I also examine the municipal bond yield in secondary market within short window around the FOIA revising effective dates.

Among all the seventeen FOIA changes from 2005 to 2016, I are able to identify exact effective dates of six FOIA revisions by reading Open Government Guide[11] as in Cordis et al. (2021) and searching respective state websites about open information regulation. I then collect the secondary market trading details around these dates using a 180-day window, i.e., 90 days before and 90 days after the revision. I first apply same criteria to filter the county-level municipal bond as in **Section 4.1**. Next, I exclude the transactions if the par value traded is missing, if the yield is missing or greater than 50%, if the trades occur after the maturity of the bond, as these must be clerical errors, or if the trades occur after the bond is pre-refunded, as these bonds are essentially risk-free after the refunding. Since I am interested in whether investors will lower their required risk premium in response to more transparent government, I only retain the investors' transaction data. I further require each bond in the sample to have at least one investor transaction in both the pre-event period and post-event period so that each bond can act as its own control. To convert MSRB trade-level data to daily frequency, I take the average secondary yield of all customer trades for each trading day, weighted by par value traded. The tax-adjusted secondary spread is derived as in **Equation (1)** and **Equation (2)**.

[11] Available at https://www.rcfp.org/open-government-guide/

I continue to use a stacked regression approach to determine the effect of FOIA on municipal bond risk premium by examining the yield reflected by investors' trading in secondary market around the amendment shocks. In particular, I test the following model:

$$\boldsymbol{Y_{i,t} = \alpha + \beta_1 * Post_{i,t} + \beta_2\, Treat_{s,t} * Post_{i,t} + Bond * Event\ FE + \varepsilon_{i,t},} \quad \textbf{(7)}$$

where $Y_{i,t}$ denotes the bond i's secondary yield or tax-adjusted secondary spread at day t if there the bond is traded on that day. $Post_{i,t}$ is an indicator variable which equals one if the transaction happens within 90 days after the FOIA revision and equals zero otherwise. $Treat_{s,t}$ is an indicator variable that equals to 1 if state *s* improves its FOIA within the event window; equals to -1 if state *s* lowers its transparency and equals 0 if state *s* doesn't make any change on FOIA. $\mathrm{Treat_{s,t}} * \mathrm{Post_{i,t}}$ is the variable of interest and its coefficient β_2 is expected to be significantly negative. The datasets for each event are stacked together. I control for bond-event fixed effects and the standard errors are double clustered at bond-event level.

Table 8 Panel A reports empirical results for estimating **Equation (7)**. Column (1) and Column (2) use trading observations in (-90,90) days around new FOIA regulation effective dates and show that investors also ask for lower risk premium when they trade municipal bonds in secondary market, strengthening my inference that lower government information acquisition costs enhance investors' trust towards government. For robustness tests[12], I alternatively use (-60, 60) days or (-120, 120) days as event window and the results still hold as presented in Column (3) to Column (6).

[Insert Table 8 Here]

[12] In untabulated results, the results are robust if I only retain municipal bonds issued by counties at state borders in the sample.

I further test whether the effect differs between institutional investors and retail investors as in primary market. The MSRB do not identify the type of investors in the trading data, therefore I use the market convention and follow previous literature to use the trade size $100,000 as threshold (Cuny 2018; Green et al. 2007) to partition the observations into institutional trades if the par value traded is above this threshold and retail trades otherwise. **Table 8 Panel B** shows the regression results for secondary yield and tax-adjusted secondary spread using partitioned samples. Both institutional investors and retail investors ask for lower risk premium in secondary market trading. However, the impact of FOIA revision is more prominent among retail investors, indicating that the perceived risk of government by retail investors is more sensitive to changes in FOIA regulations.

6.3 Bargaining Power in Secondary Market

This paper demonstrates that with more government openness after the implementation of new FOIA provisions, investors lower their perceived credit risks of municipal bonds. In this section, I investigate whether municipal bond investors utilize FOIA as an information source to bargain with dealers in secondary market trading, and in particular, whether the effect is different between institutional investors and retail investors. Previous studies have revealed that analysts, sophisticated institutional investors and law or intellectual property firms use non-public information by raising FOIA requests to FDA or SEC to gain value-relevant information (Klein et al. 2020; Gargano et al. 2017) as well as firms' non-financial characteristics (Glaeser et al. 2022). As FOIA mitigates the information acquisition costs from municipalities, and the bond pricing related information should not fall under the nine exemptions of FOIA, I

anticipate that municipal bond investors also acquire private information via FOIA and incorporate the information into trading. Cuny (2018) has documented that the introduction of online disclosure repository Electronic Municipal Market Access Website (EMMA), which enables all investors to access bond issuers' fundamental information if it is disclosed, reduces trade premium that investors pay over the dealers. Therefore, I also examine whether higher FOIA score leads to smaller price mark-up (markdown) when investors buy from (sell to) dealers. I keep inter-dealer transactions, customer purchase transactions and customer sell transactions data from MSRB. Similar to Schultz (2012) and Cuny (2018), I measure the mark-up (markdown) for bond i's any transaction occurred in day t as:

$$\boldsymbol{Markup_{it}}\left(\boldsymbol{Markdown_{i,t}}\right) = \boldsymbol{TradeSign_{i,t}} * \mathbf{100} * \boldsymbol{In}\left(\frac{\boldsymbol{CustomerPrice_{i,t}}}{\boldsymbol{AvgInterDealerPrice_{i,t}}}\right) \qquad \textbf{(8)}$$

where *TradeSign* is an indicator variable equals to 1 if the trade is a customer purchase, equals to -1 if it is a customer sell, and equals to 0 if the trade is between dealers. *CustomerPrice* is the customer buy or sale trade price if at least one inter-dealer trade occurs on the same day. The *AvgInterDealerPrice* is the daily average inter-dealer trading price, weighted by the par value traded. The *Mark-up* (*Markdown*) is the percentage difference between inter-dealer price and customer price at the same trading day on same municipal bond. The higher value of *Mark-up* (*Markdown*) indicates lower investors' bargaining power. I exclude negative mark-up (markdown) as these are unusual or clerical errors.

Many observations are dropped because I require at least one inter-dealer trade occurs with customer trade on same day. I estimate the impact of FOIA revision on dealer's mark-up using following stacked regression model at transaction level:

$$\boldsymbol{Markup_{i,t}}\left(\boldsymbol{Markdown_{i,t}}\right) = \boldsymbol{\alpha} + \boldsymbol{\beta Adj.FOIA_{s,t}} + \boldsymbol{\mu Controls_{i,t}} + \boldsymbol{Bond} * \boldsymbol{Event\ FE} + \boldsymbol{Year} * \boldsymbol{Event\ FE} + \boldsymbol{\varepsilon_{i,t}}, \qquad \textbf{(9)}$$

where *Mark-up* is defined as **Equation (8)**. Following Cuny (2018), I control for bond characteristics, municipal bond market condition and local macroeconomics. More specifically, I control for the time to maturity (*TTM*) when the trade occurs, the nature log of trade size (*Trade Size*) for each transaction and the nature log of daily total traded par value (*Trade Volume*) for each bond. I also use the daily level of the 10-year treasury rate (*Treasury*) to control for interest rate changes. The Bond Buyer General Obligation 20-bond municipal bond index (*AAA GO Yield*) is used to control for change in municipal market conditions. I control for changes in credit risk premium with the yield differential between Moody's seasoned Baa corporate bond yield and Moody's seasoned Aaa corporate bond yield (*Risk Premium*)[13]. I further control whether dealer's inventory day is greater than one day. Inventory is a dummy variable which equals 1 if within one trading day a purchase (sale) does not follow (precede) a sale (purchase) and 0 otherwise. Lastly, I control local macroeconomics by the nature log of county GDP per capita. I then stack the twelve FOIA revision events together so that **Equation (9)** includes bond-event fixed effects and year-event fixed effects, and the standard errors are double clustered at bond-event level.

Table 9 reports the empirical results using all bond transactions in Column (1), institutional investor transactions in Column (2) and retail investor transactions in Column (3). The coefficient on *Adj. FOIA* is only statistically negative significant for institutional investor subsample. The result is also economically significant. When FOIA score improves by one point, the dealer's mark-up decreases around 74 basis points. In Column (3), I do not observe negative coefficient on *Adj. FOIA*, implying that mark-up (markdown) for retail investors do not change significantly with FOIA

[13] The *AAA GO Yield* data is collected on weekly basis from Federal Reserve Bank of St. Louis and the data discounted after Oct 6, 2016. The *Risk Premium* data is obtained on a monthly basis from the Federal Reserve Bank of St. Louis.

revision. And the coefficient difference is significant between Column (2) and (3), further suggesting that only institutional investors benefit from FOIA when bargain against municipal bond dealers. This finding is consistent with traditional wisdom that institutional investors, with better access to dealer networks and fundamental information, are supposed to get more favourable prices and pay lower transaction costs than retail investors (Harris and Piwowar 2006). Accordingly, it will become easier for these more sophisticated investors to acquire incremental information after FOIA upward revision so that their bargaining power increases. It echoes with previous research which documents that after the real-time municipal bond trade reports available since Jan 31, 2005, small purchasers continue to pay higher price than larger purchasers (Schultz 2012). In municipal bond secondary markets, FOIA has the unintended side effects of exacerbating the information gap between institutional and retail investors.

[Insert Table 9 Here]

The coefficients of control variables provide insights to the dealer mark-up (markdown) as well. The daily trade volume is positively associated with dealer's mark-up (markdown), indicating that dealer's bargaining power increases when there is larger amount of aggregate daily trade. Align with Harris and Piwowar (2006) that the trade size for each transaction is negatively associated with the transaction cost, while the transaction cost increases with time to maturity. And when the dealers have greater than one day inventory of the bond, they are more eager to liquidate the bonds and then ask for smaller mark-up.

6.4 Issuance Amount

So far, I have shown that lowering public' information acquisition can reduce risk premium of municipal bonds. And in this section, I investigate whether FOIA revision influences municipal bond issuance. Refinitiv Municipal Deals data also reports the purpose of bonds, and I retain these with the purpose of refunding (*Refunding*) or new filing (*New Filing*), and drop bonds with the capital type of remarketed, converted, restructured debt and sale cancelled. The net issuance is the amount difference between new filing bonds and refunding bonds (*Net Issuance*) and the total issuance is the sum of the amount of new filing bonds and refunding bonds (*Total Issuance*). In addition to the issuance amount, I also investigate the probability of bond issuance. *Prob (Refunding)*, *Prob (Net Filing)* and *Prob (Net Issuance)* are dummy variables equal to 1 if the amount of Refunding, Net filing or Net Issuance is greater than zero, and equal to 0 otherwise. Among the 2,354 county-year observation, only one observation does not have any general obligation municipal bond issuance, so I drop the regression on the probability of total issuance.

We then construct and test this stacked regression model:

$$\boldsymbol{Issuance_{j,t} = \alpha + \beta\, Adj.FOIA_{s,t} + \theta' County\ Controls_{j,t} + County * Event\ FE + Year * Event\ FE + \varepsilon_{it},} \quad \textbf{(10)}$$

where $Issuance_{j,t}$ stands for the natural log of refunding municipal bond amount *In(Refunding)*, new filing municipal bond amount *In(New Filing)*, net issuance amount *In(Net Issuance)* and total issuance amount *In(Total Issuance)* for county j in year t; or the possibility of issuing bonds with refunding purpose *Prob (Refunding)*, new filing purpose *Prob (Net Filing)* or having positive net issuance amount *Prob (Net Issuance)*. Following Cornaggia et al. (2022), the *CountyControls* are same as **Equation (3)**, and I control the state-event fixed effect and year-event fixed effect. The standard errors are

double clustered at county-event level.

[Insert Table 10 Here]

Table 10 shows the empirical results. Column (1) to Column (4) represents the results when regressed on the natural log of refunding municipal bond amount (*Refunding*), new filing municipal bond amount (*New Filing*), net issuance amount (*Net Issuance*) and total issuance amount (*Total Issuance*). None of the coefficient on $Adj.FOIA$ is statistically significant, indicating that the state-level FOIA revisions do not have any significant impact on the county municipal bond issuance amount. None of the coefficients on $Adj.FOIA$ in Column (5) to (7) is statistically significant, further implying that the issuance decision is not affected by the FOIA revisions. Furthermore, the results indicate that the states will not revise the FOIA with the purpose of helping their counties issue more bonds. The results on the amount of refunding bonds or the issuance of refunding bonds are consistent with Chen et al. (2022) that local governments exercise the callable option with significant delay, losing large amount from delayed refinancing. FOIA reduces the borrowing costs of municipal bond, but government does not actively refinance these bonds.

7. Conclusion

This study investigates the impact of state-level FOIA revision on county-level municipal bond yields. When the FOIA amendment alleviates public information acquisition costs, there is a statistically and economically significant decrease in municipal bond borrowing costs. In primary market trading, the effect is more pronounced for retail investors. Improved transparency resulting from the FOIA

revision can reduce information asymmetry between bond investors and issuers and improve government accountability. Specifically, an increase in the FOIA score by one point reduces the offering yield by 17 basis points. Given the trillion-dollar municipal bond market, more transparent government can result in substantial savings in issuance costs, ultimately benefiting taxpayers and the whole community.

Moreover, the thesis examines the effect of FOIA on the municipal bond secondary market. Around the short window (from -90 to 90 days), investors demand lower risk premiums around the revised FOIA effective date, with reduction is also more pronounced for retail investors. However, in the long run, only institutional investors gain stronger bargaining power against dealers. This finding shows an unintended negative consequence of FOIA, which aims to provide easier access to information but inadvertently lead to a more uneven playing field between retail and institutional investors. These results provide important implications for policymakers and investors seeking to understand the information acquisition on the municipal bond market.

Appendix A. Examples of FOIA Log files

Date	Request Summary	Data Source
2023/03/27	Request a list of names of individuals that have recently joined a government assisted living facility. The requester is conducting independent research on how I can better improve the facility and how I can improve the **elder community**.	Cook County, IL
2023/01/27	Request **Amusement Tax revenue** from the Cook County Department of Revenue; from companies and venues in Cook County from January 1, 2014 to December 31, 2022.	Cook County, IL
2022/10/27	Request the **annual budget** from 1992 until the present (2022) of the Cook County Circuit and the Chancery Division.	Cook County, IL
2022/09/07	Request the current **audit manual** for the Cook County Gas and Diesel Tax, and any related amendments from 2013 to present.	Cook County, IL
2021/05/19	How many **employees** that were terminated from the Department of Revenue from January 1, 2010 through December 31, 2019 were African American and how many were Caucasian? What were the titles for each of those positions that were terminated and what were the salaries for each position?	Cook County, IL
2020/08/22	Request electronic copies of any and all invoices, bills, estimates which have been "ear-marked" or general ledger coded as items which the County has determined it will be using any part of the **1.5 million dollars** of CARES Act funding to pay for.	Mathews County, VA
2020/01/16	Request a copy of those **budget proposals** [Fiscal Year 2020 to 2021] Department Heads and Constitutional Officers that were presented to the Board.	Mathews County, VA
2019/07/02	A listing of the **monies** which have been paid by Mathews County in reference but not limited to support, maintenance, utilities, upkeep, electrical, septic, taxes, insurance, etc. Any amount paid which in any way reflected an ownership cost to the County regarding the "Hole in the Wall" on Gwynn's Island since January 1, 2018 through the date of the response	Mathews County, VA
2019/02/19	Request Board of Supervisors **email communication** between February 9th-19th, 2019.	Mathews County, VA
2018/12/20	Request for a copy of the Main Street Enhancement Project **grants.**	Mathews County, VA

Appendix B. FOIA Scores from 2005 to 2016

State	05	06	07	08	09	10	11	12	13	14	15	16
Alabama	1	1	1	1	1	1	1	1	1	1	1	1
Alaska	4	4	4	4	4	4	4	4	4	4	4	4
Arizona	2	2	2	2	2	2	2	2	2	2	2	2
Arkansas	8	8	8	8	8	8	8	8	8	8	8	8
California	5	5	5	5	5	5	5	5	5	5	5	5
Colorado	7	7	7	7	7	7	7	7	7	7	7	7
Connecticut	8	8	8	8	**9**	9	9	9	9	9	9	9
Delaware	5	5	5	5	5	5	5	5	**6**	6	6	6
Florida	5	5	5	5	5	5	5	5	5	5	5	5
Georgia	6	6	6	6	6	6	6	6	6	6	6	6
Hawaii	5	5	5	5	5	5	5	5	5	5	5	5
Idaho	6	6	6	6	6	6	6	6	6	6	6	6
Illinois	7	7	7	7	7	7	**6**	6	6	6	6	6
Indiana	8	8	8	8	8	8	8	8	8	8	8	8
Iowa	5	5	5	5	5	5	5	**4**	4	4	4	4
Kansas	5	5	5	5	5	5	5	5	5	5	5	5
Kentucky	5	5	5	5	5	5	5	5	5	5	5	5
Louisiana	8	8	8	8	8	8	8	8	8	8	8	8
Maine	6	6	6	6	6	**7**	7	7	7	7	7	7
Maryland	5	5	5	5	5	5	5	5	5	5	5	5
Massachusetts	6	6	6	6	6	6	6	6	6	6	6	6
Michigan	7	7	7	7	7	7	7	7	7	7	7	**8**
Minnesota	5	5	5	5	5	5	**6**	6	6	6	6	6
Mississippi	5	5	5	5	5	5	5	5	5	5	5	5
Missouri	7	7	7	7	7	7	7	7	7	7	7	7
Montana	3	3	3	3	3	3	3	3	3	3	3	3
Nebraska	6	6	6	6	6	6	6	6	6	6	6	6
Nevada	3	3	3	**4**	4	4	4	4	4	4	4	4
New Hampshire	5	5	5	5	5	5	5	5	5	5	5	5
New jersey	7	7	7	7	7	7	7	7	7	7	7	7
New Mexico	6	6	6	6	6	6	6	6	6	6	6	6
New York	7	7	7	7	**6**	6	6	6	6	6	6	6
North Carolina	4	4	4	4	4	4	4	4	4	4	4	4
North Dakota	7	7	7	7	7	7	7	7	7	7	7	7
Ohio	5	5	5	5	5	5	5	5	5	5	5	5
Oklahoma	6	6	6	6	6	6	6	6	6	6	6	6
Oregon	5	5	5	5	5	5	5	5	5	5	5	5
Pennsylvania	8	8	8	8	**9**	9	9	9	9	9	9	9
Rhode Island	7	7	7	7	7	7	7	7	7	7	7	7
South Carolina	6	6	6	6	6	6	6	6	6	6	6	6
South Dakota	1	1	1	1	**2**	**5**	5	**6**	6	6	6	6
Tennessee	4	4	4	4	4	4	4	4	4	4	4	4
Texas	6	**7**	7	7	7	7	7	7	7	7	7	7

Appendix B(Cont'd)

State	05	06	07	08	09	10	11	12	13	14	15	16
Utah	7	7	7	7	7	7	7	7	7	7	7	7
Vermont	6	6	6	6	6	6	6	6	6	6	6	6
Virginia	5	5	5	5	5	5	5	5	5	5	5	5
Washington	6	6	6	6	6	6	6	6	6	6	6	6
West Virginia	6	6	6	6	6	6	6	6	6	6	6	**7**
Wisconsin	5	5	5	5	5	5	5	5	5	5	5	5
Wyoming	2	**3**	3	3	3	3	3	3	**4**	4	4	4

Appendix C. Variable Definitions

Variable	Definition
AAA GO yield	The daily yield on the Bond Buyer General Obligation 20-bond municipal bond index, in percent. The data is collected on weekly basis from Federal Reserve Bank of St. Louis and the data discounted after Oct 6, 2016.
Adj. FOIA	For states incur FOIA revision, Adj. FOIA takes value of 0 in three years before the event and takes value of the change of FOIA score in three years since the event. For states without FOIA revision within same six-year event window, Adj. FOIA takes value of 0.
Age	Years between the issue date of the bond and the date of the observation.
Bachelor	The percentage of the adult population with bachelor or higher degree in a county. I obtain the data from U.S. Census Bureau.
Callable	An indicator equal to one if the issuer has the option to redeem the bond before its scheduled maturity date.
Credit Rating	The municipal bond's credit rating at issuance by S&P, Moddy's and Fitch. The character ratings are converted into numeric ratings with 21 corresponding to the highest credit quality and 1 the lowest, and 0 indicates the bond is not rated. When rating information is available from multiple rating agencies, I use rating in this order: S&P, Moody, Fitch.
FOIA(0)	An indicator variable equals 1 (-1) if the bond issuing county located in states improve (weaken) its FOIA in bond issuance year, and zero otherwise.
FOIA(1)	An indicator variable equals 1 (-1) if the bond issuing county located in states improve (weaken) its FOIA 1 year before bond issuance year, and zero otherwise.
FOIA(2)	An indicator variable equals 1 (-1) if the bond issuing county located in states improve (weaken) its FOIA 2 years before bond issuance year, and zero otherwise.
GDP Per Capita	The real gross domestic product per capita for the county, in dollar. The data is obtained from U.S. Bureau of Economic Analysis.
General Obligation	An indicator variable equals to one if the municipal bond is general obligation bond and equals to zero if it is revenue bond.
Imputed Round-Trip Cost (IRC)	The mean of daily imputed round-trip cost as in Equation (5) during the 90-day period following municipal bond offering date (Schwert 2017).
Income Per Capita	Annual per capita personal income in the county, in dollar. The data is obtained from the U.S. Bureau of Economic Analysis.
Insured	An indicator variable equals to one if the municipal bond is insured and equals to zero otherwise.
Inventory	An indicator variable equals to one if a customer purchase (sale) does not follow (precede) a customer sale (purchase) within one day of trade date t.
Issuance Amount	The issuance amount of the bond, in thousand dollars.
Mark-up	The basis point difference between the average price at which dealers transact with one another and the price at which customers purchase the same bond on the same day, calculated by Equation (6) (Cuny 2018).
Maturity	Years between the issue date and the maturity date of the bond.
Net Issuance	The net issuance amount between new filing bonds and refunding bonds within one county for one year, in thousand dollars.
New Filing	The issuance amount of municipal bonds with the capital type of new filing within one county for one year, in thousand dollars.
Offering Spread	The tax adjusted offering spread of the municipal bond, calculated by Equation (1) and Equation (2) (Longstaff 2011; Schwert 2017) .

Appendix C (Cont'd)

Variable	Definition
Offering Type	An indicator variable equals to one if the municipal bond is issued through competitive sales and equals to one if through negotiated sales.
Offering Yield	Yield to maturity at the time of issuance, based on the coupon and any discount or premium to par value at the time of sale.
Pretreatment (-2)	An indicator variable equals 1 (-1) if the bond issuing county located in state improves (weakens) its FOIA 2 years after bond issuance year, and zero otherwise.
Pretreatment (-1)	An indicator variable equals 1 (-1) if the bond issuing county located in state improves (weakens) its FOIA 1 year after bond issuance year, and zero otherwise.
Population	The annual population of the county, in thousand. The data is obtained from the U.S. Bureau of Economic Analysis.
Population Change	The percentage change of year-by-year county population.
Post	An indicator variable equals one if the date is later than the FOIA revision effective date, and zero otherwise.
Price Dispersion	The mean of daily trading price standard deviation as in Equation (4) during the 90-day period following municipal bond offering date (Schwert 2017; Jankowitsch et al. 2011).
Primary Market Spread	The tax adjusted primary market spread of the municipal bond, converted from primary market spread by Equation (1) and Equation (2) (Longstaff 2011; Schwert 2017).
Primary Market Yield	Bond yield for primary market trades. Transactions in MSRB database specifically flagged as when-issued trades or primary/offering takedown trades as well as trades within two weeks of the offering date are categorised as primary market trades (Cornaggia et al. 2022).
Refunding	The issuance amount of municipal bonds with the capital type of refunding within one county for one year, in thousand dollars.
Risk premium	The yield difference between Moody's seasoned Baa corporate bond yield and Moody's seasoned Aaa corporate bond yield, in percent, obtained on a monthly basis from the Federal Reserve Bank of St. Louis.
RiskFree	Maturity matched annual treasury rate from the U.S. Department of the Treasury.
Secondary Spread	The tax adjusted daily secondary spread of the municipal bond, calculated by Equation (1) and Equation (2) (Longstaff 2011; Schwert 2017).
Secondary Yield	The average secondary yield of all customers buy transaction within each bond-day, weighted by the par valued traded.
Social Capital	The first principal component from a factor analysis based on Pvote, Respn, Assn, and Nccs. The data is obtained from NRCRD at the Pennsylvania State University (Hasan et al. 2017a; Hasan et al. 2017b).
Total Issuance	The sum of issuance amount for new filing bonds and refunding bonds within one county for one year, in thousand dollars.
Trade size	The par value traded for each transaction.
Trade volume	The aggregate par value of all transactions (inter-dealer, customer sales, and customer purchases) for a specific bond in one trading day.
Treasury	The daily yield on the 10-year treasury bond, obtained from the U.S. Department of the Treasury.
Treat	An indicator variable which equals one if the state revises the FOIA within the event window.
TTM	Time to maturity. Years between the date of the observation and the maturity date of the bond.

Appendix C (Cont'd)

Variable	Definition
Turnover	The ratio of total trading volume within 90-day period following municipal bond offering date to the bond's issuance amount.
Unemployment	The annual unemployment rate of the county, in percentage. The data is obtained from the U.S. Bureau of Labor Statistics.
Unemployment Change	The percentage change of year-by-year county unemployment rate.

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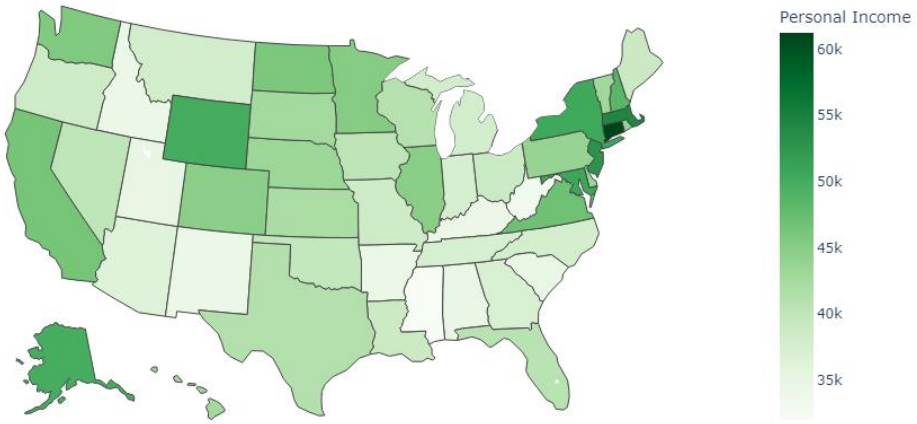
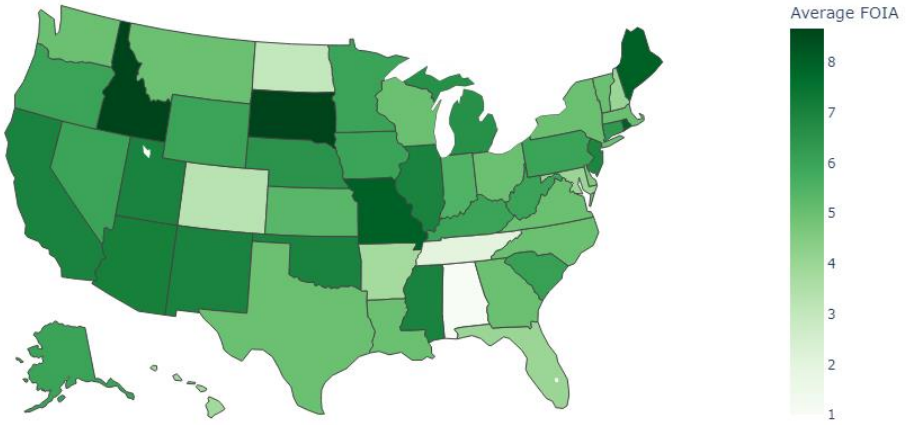
Figure 1 Geographic Variation of State Macroeconomic Conditions and FOIA Scores

Panel A: Average Personal Income for Each State within Sample Period



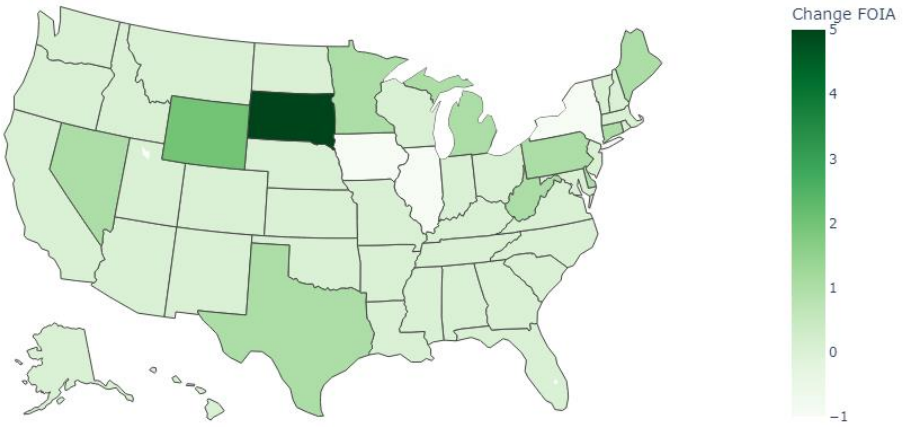
The figure depicts the average personal income across 50 U.S. states from 2005 to 2016, denominated in U.S. dollars. The personal income data is collected from U.S. Bureau of Economic Analysis. The shading in darker colour signifies higher personal income per capita.

Panel B: Average FOIA Score for Each State within Sample Period



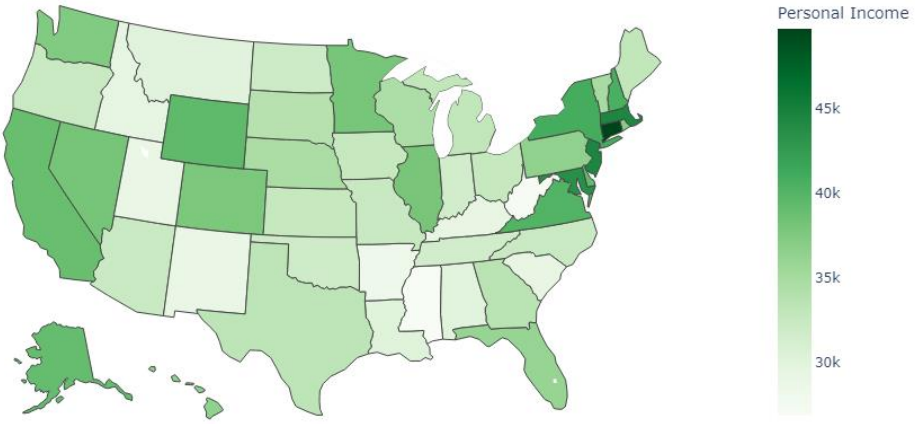
This figure gives visual presentation of the average FOIA scores across 50 U.S. states from 2005 to 2016. The data is collected from Cordis et al. (2021). The darker colour implies higher average FOIA scores in the sample period.

Panel C: FOIA Score Changes for Each State within Sample Period



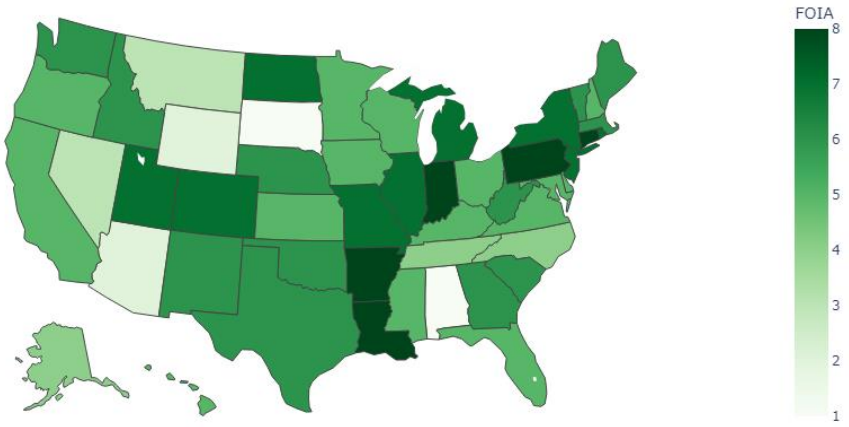
This figure plots the changes in FOIA scores for each state in the United States between the years 2005 to 2016. The FOIA score change here is calculated as the difference between the state's FOIA score in 2016 and its score in 2005. The shading in darker hues indicates a relatively more substantial improvement in the state's FOIA score.

Panel D: Personal Income for Each State in 2005



The figure depicts the personal income across 50 U.S. states in 2005, denominated in U.S. dollars. The personal income data is collected from U.S. Bureau of Economic Analysis. The shading in darker colour signifies higher personal income per capita.

Panel E: FOIA Score for Each State in 2005



This figure gives visual presentation of the average FOIA scores across 50 U.S. states in 2005. The data is collected from Cordis et al. (2021). The darker colour implies higher average FOIA scores in the sample period.

Table 1
Summary Statistics for Municipal Bond and County Sample

Panel A: Municipal Bond Offering Summary Statistics

Variable	Mean	Std Dev	Q1	Median	Q3
Offering Yield	2.92	0.80	2.30	2.85	3.42
Offering Spread	2.44	0.96	1.72	2.35	3.07
Maturity	12.92	4.43	10.00	12.00	16.00
Issuance Amount	1,773.57	3,128.17	280.00	660.00	1,860.00
Offering Type	0.63	0.48	0.00	1.00	1.00
Callable	0.73	0.44	0.00	1.00	1.00
Insured	0.22	0.41	0.00	0.00	0.00
Credit Rating	14.57	7.06	14.00	18.00	19.00

Panel B: County Macroeconomics Summary Statistics

Variable	Mean	Std Dev	Q1	Median	Q3
Income Per Capita	40,453.27	10,562.22	33,754.00	38,488.50	44,751.00
Population	249.35	539.20	28.72	79.05	251.62
Population Change (%)	0.61	1.35	-0.23	0.42	1.27
Unemployment (%)	6.89	2.43	5.10	6.60	8.40
Unemployment Change (%)	-5.99	15.72	-14.63	-9.14	-2.90

Panel A shows the summary statistics for nonduplicated county-level municipal bonds in my baseline sample. This sample comprises 25,744 distinct general obligation bonds that were issued between 2005 and 2016 and were fitted into my stacked regression model in Equation (3). Panel B reports the macroeconomics summary statistics for 2,354 nonduplicated county-year observations used in my baseline sample. Variables are defined in Appendix C.

Table 2
Municipal Bond Yield after FOIA Amendment

Dependent Variable=	**Offering Yield**	**Offering Spread**	**Primary Market Yield**		**Primary Market Spread**	
			Institutional Investors	**Retail Investors**	**Institutional Investors**	**Retail Investors**
	(1)	(2)	(3)	(4)	(5)	(6)
Adj. FOIA	-0.170**	-0.350***	-0.186***	-0.378***	-0.362***	-0.684***
	(-2.43)	(-3.12)	(-2.59)	(-3.51)	(-3.10)	(-3.80)
Maturity	0.109***	0.119***	0.108***	0.100***	0.118***	0.105***
	(143.83)	(97.15)	(144.91)	(107.29)	(98.94)	(72.11)
In(Issuance Amount)	-0.030***	-0.054***	-0.001	-0.049***	-0.002	-0.090***
	(-8.08)	(-8.78)	(-0.15)	(-12.53)	(-0.39)	(-13.93)
Offering Type	-0.105***	-0.177***	-0.086***	-0.080***	-0.140***	-0.137***
	(-9.89)	(-10.01)	(-8.34)	(-6.72)	(-8.05)	(-6.93)
Callable	0.161***	0.188***	0.122***	0.209***	0.132***	0.256***
	(28.11)	(20.40)	(21.58)	(28.93)	(14.34)	(22.38)
Insured	0.001	0.012	0.021	-0.101***	0.041*	-0.147***
	(0.10)	(0.49)	(1.42)	(-5.76)	(1.65)	(-4.89)
Credit Rating	-0.010***	-0.017***	-0.010***	-0.015***	-0.016***	-0.025***
	(-13.98)	(-13.85)	(-12.93)	(-14.31)	(-12.58)	(-14.30)
In(Income Per Capita)	-0.026	-0.033	-0.022	-0.134***	-0.028	-0.216***
	(-0.83)	(-0.61)	(-0.72)	(-3.77)	(-0.55)	(-3.62)
In(Population)	0.016***	0.029***	0.012***	0.010*	0.022***	0.022**
	(3.46)	(3.86)	(2.79)	(1.75)	(2.97)	(2.48)
Population Change (%)	0.016***	0.028***	0.011***	0.005	0.019***	0.010
	(4.90)	(5.14)	(3.04)	(1.21)	(3.22)	(1.45)

Unemployment (%)	0.018***	0.034***	0.015***	0.007	0.027***	0.016**
	(5.14)	(5.63)	(4.38)	(1.52)	(4.81)	(2.15)
Unemployment Change (%)	-0.001	-0.001	-0.000	0.001*	-0.001	0.001
	(-0.91)	(-1.20)	(-0.75)	(1.70)	(-0.89)	(1.07)
Constant	1.875***	1.322**	1.631***	3.487***	0.948*	4.047***
	(5.53)	(2.32)	(4.94)	(9.10)	(1.72)	(6.29)
Retail - Ins Difference			-0.192***		-0.322***	
p-value			(0.000)		(0.000)	
State-Event FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Event FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	92,901	92,901	76,495	38,673	76,495	38,673
Adjusted R-squared	0.757	0.525	0.750	0.780	0.525	0.580

***, **, * indicate statistical significance at 1 percent, 5 percent and 10 percent levels, respectively.

This table reports the regression results from Equation (3) for estimating the relation between FOIA revision and county level municipal bonds issuance costs. Column (1) and (2) report the results when regressing on bond offering yield and tax-adjusted spread; column (3) and (5) present the results when regressing on institutional investors' primary market yield and tax-adjusted primary market spread; column (4) and (6) show the results when regressing on retail investors' primary market yield and tax-adjusted primary market spread. The t-statistics are reported in parentheses and standard errors are double clustered by issuer-event. Retail - Ins Difference indicates the coefficient difference on Adj. FOIA between institutional investors' primary trading sample and retail investors' primary trading sample. The p-value of the difference is reported in parentheses.

Variables are defined in Appendix C.

Table 3
Cross Sectional Analysis

Panel A: Subsample Partitioned by Social Capital

Dependent Variable=	Offering Yield		Offering Spread	
	High Social Capital	**Low Social Capital**	**High Social Capital**	**Low Social Capital**
	(1)	(2)	(3)	(4)
Adj. FOIA	-0.161*	-0.282*	-0.349**	-0.565**
	(-1.77)	(-1.73)	(-2.34)	(-2.17)
Constant	1.269***	3.708***	0.447	3.930***
	(2.69)	(5.63)	(0.56)	(3.62)
High - Low	0.121**		0.216**	
p-value	(0.040)		(0.030)	
Bond Controls	Yes	Yes	Yes	Yes
County Controls	Yes	Yes	Yes	Yes
State-Event FE	Yes	Yes	Yes	Yes
Year-Event FE	Yes	Yes	Yes	Yes
Observations	59,410	17,236	59,410	17,236
Adj. R-squared	0.733	0.808	0.512	0.528

Panel B: Subsample Partitioned by Highest Education Level

Dependent Variable=	Offering Yield		Offering Spread	
	High Bachelor	**Low Bachelor**	**High Bachelor**	**Low Bachelor**
	(1)	(2)	(3)	(4)
Adj. FOIA	-0.143	-0.383***	-0.312**	-0.711***
	(-1.64)	(-3.23)	(-2.26)	(-3.51)
Constant	1.925***	3.465***	1.491**	3.490**
	(5.14)	(3.40)	(2.38)	(2.11)
High - Low	0.240***		0.399***	
p-value	(0.000)		(0.000)	
Bond Controls	Yes	Yes	Yes	Yes
County Controls	Yes	Yes	Yes	Yes
State-Event FE	Yes	Yes	Yes	Yes
Year-Event FE	Yes	Yes	Yes	Yes
Observations	75,774	16,681	75,774	16,681
Adj. R-squared	0.752	0.801	0.539	0.548

Table 3 (Cont'd)
Cross Sectional Analysis

Panel C: Subsample Partitioned by Newspaper Coverage

Dependent Variable=	Offering Yield		Offering Spread	
	High Newspaper	**Low Newspaper**	**High Newspaper**	**Low Newspaper**
	(1)	(2)	(3)	(4)
Adj. FOIA	-0.115	-0.198**	-0.259	-0.390**
	(-1.10)	(-2.02)	(-1.56)	(-2.35)
Constant	1.235**	1.689***	0.118	1.151
	(2.58)	(3.46)	(0.15)	(1.41)
High - Low	0.083**		0.131**	
p-value	(0.020)		(0.040)	
Bond Controls	Yes	Yes	Yes	Yes
County Controls	Yes	Yes	Yes	Yes
State-Event FE	Yes	Yes	Yes	Yes
Year-Event FE	Yes	Yes	Yes	Yes
Observations	60,437	32,458	60,437	32,458
Adj. R-squared	0.758	0.770	0.550	0.501

***, **, * indicate statistical significance at 1 percent, 5 percent and 10 percent levels, respectively.

This table reports the stacked regression results from **Equation (3)** for estimating the relation between FOIA revision and county level municipal bonds offering yield and tax-adjusted spread respectively across different subsamples. In Panel A, I divide my sample into high (low) social capital groups based on the median county social capital for each cohort-year. In Panel B, I split my sample into high (low) bachelor holder groups on county bachelor holder percentage for each cohort-year. In Panel C, I partition my sample into high (low) newspaper coverage groups based on the median county daily newspaper coverage for each cohort-year. The t-statistics are reported in parentheses and standard errors are double clustered by issuer-event. High - Low indicates the coefficient difference on Adj. FOIA between two subsamples. The p-value of the difference is reported in parentheses.

Variables are defined in Appendix C.

Table 4
Robustness Test

	Pure Clean Samples		Counties at State Borders		PSM Samples	
	Offering Yield	**Offering Spread**	**Offering Yield**	**Offering Spread**	**Offering Yield**	**Offering Spread**
	(1)	(2)	(3)	(4)	(5)	(6)
Adj. FOIA	-0.145**	-0.296***	-0.382**	-0.601**	-0.015**	-0.033***
	(-2.15)	(-2.73)	(-2.54)	(-2.52)	(2.32)	(3.00)
Bond Controls	Yes	Yes	Yes	Yes	Yes	Yes
County Controls	Yes	Yes	Yes	Yes	Yes	Yes
State-Event FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Event FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	73,082	73,082	2,178	2,178	33,238	33,238
Adjusted R-squared	0.762	0.520	0.791	0.622	0.739	0.483

***, **, * indicate statistical significance at 1 percent, 5 percent and 10 percent levels, respectively.
Column (1) and (2) present the results using six-year window but only retain counties located in states never incur FOIA change from 2005 to 2016 as controls. Column (3) and (4) report the regression results from **Equation (3)** using six-year window but only retain counties at state borders in the sample. Column (5) and (6) show the results using propensity-score-matched counties without FOIA revision in each event window as controls.
Variables are defined in Appendix C.

Table 5
Parallel Trend Assumption

	Offering Yield	**Offering Spread**
	(1)	(2)
Pretreatment (-2)	-0.285	-0.491
	(-1.31)	(-1.45)
Pretreatment (-1)	-0.361	-0.579
	(-1.56)	(-1.62)
FOIA (0)	-1.128***	-1.877***
	(-5.51)	(-5.90)
FOIA (1)	-0.559***	-1.020***
	(-2.73)	(-3.13)
FOIA (2)	-0.289	-0.535*
	(-1.44)	(-1.71)
Constant	-0.651	-6.484*
	(-0.28)	(-1.82)
Bond Controls	Yes	Yes
County Controls	Yes	Yes
State-Event FE	Yes	Yes
Year-Event FE	Yes	Yes
Observations	86,167	86,167
Adjusted R-squared	0.666	0.561

***, **, * indicate statistical significance at 1 percent, 5 percent and 10 percent levels, respectively.
This table reports the regression results when replacing Adj. FOIA in **Equation (3)** with Pretreatment (-2), Pretreatment (-1), FOIA (0), FOIA (1) and FOIA (2) to test the parallel trend assumption. Column (1) and (2) reports the results on offering yield and tax-adjusted offering spread, respectively. The t-statistics are reported in parentheses and standard errors are double clustered by issuer-event.
Variables are defined in Appendix C.

Table 6
Municipal Bond Yield and FOIA Score

	Offering Yield	**Offering Spread**
	(1)	(2)
FOIA Score	-0.159***	-0.286***
	(-3.92)	(-4.07)
Constant	2.482***	2.640**
	(3.97)	(2.45)
Bond Controls	Yes	Yes
County Controls	Yes	Yes
State FE	Yes	Yes
Year FE	Yes	Yes
Observations	41,281	41,281
Adjusted R-squared	0.773	0.557

***, **, * indicate statistical significance at 1 percent, 5 percent and 10 percent levels, respectively.
This table reports the panel regression results for municipal bond yield and FOIA Score in the bond issuance year. Column (1) and Column (2) reports the results on bond offering yield and tax adjusted offering spread, respectively. I use the same bond control and county control variables as in Equation (3). I include state fixed effects and year fixed effects. The t-statistics are reported in parentheses and standard errors are clustered by issuer.
Variables are defined in Appendix C.

Table 7
Municipal Bond Liquidity After FOIA Amendment

Dependent Variable=	**Price Dispersion**	**IRC**	**Turnover**
	(1)	(2)	(3)
Adj. FOIA	-0.014**	-0.002***	0.535**
	(-2.50)	(-4.12)	(2.10)
Constant	0.006	-0.001	-2.326***
	(0.40)	(-0.20)	(-2.68)
Rating controls	Yes	Yes	Yes
Callable controls	Yes	Yes	Yes
County Controls	Yes	Yes	Yes
State-Event FE	Yes	Yes	Yes
Year-Event FE	Yes	Yes	Yes
Observations	28,760	28,760	28,760
Adjusted R-squared	0.142	0.130	0.081

***, **, * indicate statistical significance at 1 percent, 5 percent and 10 percent levels, respectively.
This table reports the effect of FOIA revision on municipal bond liquidity. Following Schwert (2017), the price dispersion metric is the mean of daily standard deviation of price changes from transactions during the 90-day period following municipal bond offering date; the imputed round-trip cost (IRC) is the mean of daily IRC during the 90-day period following municipal bond offering date; the turnover is the ratio of total trading volume within 90-day period following municipal bond offering date to the bond's issuance amount. I include state-event fixed effects and year-event fixed effects. The t-statistics are reported in parentheses and standard errors are double clustered by issuer-event.
Variables are defined in Appendix C.

Table 8
Trading in Secondary Market after FOIA Amendment

Panel A: Short Window Trading in Secondary Market with All Observations

	(-90,90) Days Window		(-60,60) Days Window		(-120,120) Days Window	
Dependent Variable=	**Secondary Yield**	**Secondary Spread**	**Secondary Yield**	**Secondary Spread**	**Secondary Yield**	**Secondary Spread**
	(1)	(2)	(3)	(4)	(5)	(6)
Post	0.055***	0.272***	-0.048***	0.090***	0.083***	0.327***
	(3.90)	(12.40)	(-3.41)	(4.28)	(5.50)	(13.65)
Treat*Post	-0.326***	-0.418***	-0.209***	-0.211***	-0.419***	-0.574***
	(-13.01)	(-10.42)	(-8.34)	(-5.30)	(-15.55)	(-13.26)
Bond-Event FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,471	13,471	8,497	8,497	19,046	19,046
Adjusted R-squared	0.811	0.699	0.845	0.742	0.788	0.670

Table 8 (Cont'd)
Trading in Secondary Market after FOIA Amendment

Panel B: Trading by Institutional and Retail Investors

Dependent Variable=	**Secondary Yield**		**Secondary Spread**	
	Institutional Investors	**Retail Investors**	**Institutional Investors**	**Retail Investors**
	(1)	(2)	(3)	(4)
Post	0.077***	0.049***	0.312***	0.262***
	(2.66)	(3.14)	(6.92)	(10.73)
Treat*Post	-0.280***	-0.337***	-0.355***	-0.434***
	(-5.99)	(-11.29)	(-4.86)	(-9.02)
Ins - Retail Difference	0.057***		0.079***	
p-value	(0.000)		(0.000)	
Bond-Event FE	Yes	Yes	Yes	Yes
Observations	1,865	10,571	1,865	10,571
Adjusted R-squared	0.792	0.808	0.674	0.694

***, **, * indicate statistical significance at 1 percent, 5 percent and 10 percent levels, respectively.
This table reports the regression results from **Equation (7)** for estimating the relation between FOIA revision and secondary yield and tax-adjusted secondary spread. In Panel A, I report the reports using (-90,90) days event window in Column (1) (2), (-60,60) days event window in Column (3) (4), (-120, 120) days event window in Column (5) (6). In Panel B, I divide the sample into institutional investor and retail investor trading using $100,000 as cut off. Ins - Retail Difference indicates the coefficient difference on Treat*Post between institutional investor trading sample and retail investor trading sample. The p-value of the difference is reported in parentheses.
Variables are defined in Appendix C.

Table 9
Price Mark-up in Secondary Market after FOIA Amendment

	All Investors	Institutional Investors	Retail Investors
	(1)	(2)	(3)
Adj. FOIA	0.066	-0.740**	0.091
	(0.47)	(-2.26)	(0.61)
TTM	0.172***	0.154***	0.172***
	(19.70)	(4.99)	(18.05)
In (Trade Volume)	0.108***	0.079	0.118***
	(7.24)	(1.36)	(7.14)
In (Trade Size)	0.141***	0.228***	0.124***
	(8.77)	(4.24)	(7.09)
Treasury	0.136***	0.090***	0.141***
	(14.17)	(2.91)	(13.47)
AAA GO Yield	0.134***	0.088***	0.141***
	(37.21)	(5.78)	(39.30)
Risk Premium	-0.203***	-0.258***	-0.138***
	(-55.53)	(-13.77)	(-35.68)
Inventory	-0.116***	-0.057***	-0.121***
	(-20.36)	(-2.94)	(-18.67)
In (GDP Per Capita)	0.253***	0.501	0.254***
	(2.95)	(1.32)	(2.71)
Constant	-3.942***	-4.745	-4.738***
	(-4.10)	(-1.13)	(-4.51)
Ins - Retail Difference		-0.831***	
p-value		(0.000)	
Bond-Event FE	Yes	Yes	Yes
Year-Event FE	Yes	Yes	Yes
Observations	426,919	49,850	371,317
Adjusted R-squared	0.376	0.304	0.373

***, **, * indicate statistical significance at 1 percent, 5 percent and 10 percent levels, respectively.
This table reports the regression results from **Equation (9)** for estimating the relation between FOIA revision and investors' bargaining power with dealers. Column (1) reports the results using all bond transactions. Taking $100,000 as cut off for par value traded, the sample is split into institutional investors' trading in Column (2) and retail investors' trading in Column (3). The t-statistics are reported in parentheses and standard errors are double clustered by bond-event. Ins - Retail Difference indicates the coefficient difference on Adj. FOIA between institutional investor trading sample and retail investor trading sample. The p-value of the difference is reported in parentheses.
Variables are defined in Appendix C.

Table 10
Municipal Bond Issuance After FOIA Amendment

	Issuance Amount				Financing Activity		
Dependent Variable=	**ln(Refunding)**	**ln(New Filing)**	**ln(Net Issuance)**	**ln(Total Issuance)**	**Prob(Refunding)**	**Prob(New Filing)**	**Prob(Net Issuance)**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Adj. FOIA	-0.496	-0.109	0.106	-0.068	-0.034	0.027	0.056
	(-0.77)	(-0.19)	(0.34)	(-1.51)	(-0.40)	(0.34)	(0.66)
ln(Income Per Capita)	0.890***	0.407	-0.118	0.084***	0.026	0.020	-0.021
	(3.52)	(1.38)	(-0.96)	(4.16)	(0.92)	(0.59)	(-0.67)
ln(Population)	0.588***	0.647***	0.040**	0.113***	0.026***	0.047***	0.014***
	(16.16)	(15.06)	(2.28)	(36.62)	(6.40)	(9.87)	(3.11)
Population Change (%)	0.164***	-0.017	-0.044***	0.013***	0.019***	-0.007**	-0.009**
	(5.80)	(-0.59)	(-3.08)	(6.63)	(5.39)	(-1.97)	(-2.37)
Unemployment (%)	0.078***	-0.011	-0.024*	0.004**	0.008**	-0.001	-0.006*
	(2.92)	(-0.37)	(-1.78)	(2.10)	(2.32)	(-0.41)	(-1.86)
Unemployment Change (%)	-0.019***	-0.009**	-0.000	-0.002***	-0.001**	-0.001	-0.001
	(-4.38)	(-2.01)	(-0.10)	(-7.71)	(-2.19)	(-1.53)	(-1.00)
Constant	-7.356***	-3.373	0.857	0.717***	0.195	0.056	0.617*
	(-2.68)	(-1.05)	(0.64)	(3.24)	(0.63)	(0.15)	(1.84)
State-Event FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Event FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,281	10,281	10,281	10,281	10,281	10,281	10,281
Adjusted R-squared	0.230	0.165	0.151	0.437	0.176	0.159	0.148

***, **, * indicate statistical significance at 1 percent, 5 percent and 10 percent levels, respectively.
This table reports the regression results from Equation (5) for estimating the relation between FOIA revision and county level municipal bonds issuance. From Column (1) to Column (4), the dependent variables are natural log of the amount of bonds with the purpose of refunding, the amount of bonds with the purpose of new filing, the amount of bonds net issuance and the amount of total bond issuance. From Column (5) to (7), the dependent variable is the binary variable with one indicating bond issuance with refunding purpose, with new filing purpose, and if the net issuance is positive for the county-year observation. The t-statistics are reported in parentheses and standard errors are double clustered by county-event.
Variables are defined in Appendix C.