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Abstract

We study how regulation limiting ESG policies distorts financial market outcomes. In 2021 Texas enacted laws that prohibit municipalities from contracting with banks with certain ESG policies, leading to the exit of five of the largest municipal bond underwriters from the state. Issuers previously reliant on these underwriters face higher uncertainty and borrowing costs since the enactment of the laws. These effects are consistent with a deterioration in underwriter competition as issuers face fewer potential underwriters. Texas issuers will incur $300-$500 million in additional interest on the $31.8 billion borrowed during the first eight months following enactment.

Keywords: ESG Policies, Public Finance, Municipal Bonds, Banking Competition

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1 Introduction

Interest in environmental, social, and governance (ESG) policies of market participants has skyrocketed in the last two decades. Flows into investment funds targeting ESG objectives more than doubled between 2019 and 2021, with nearly $650 billion invested in 2021, alone.[1] This movement of capital has garnered significant attention in both financial markets and the academic literature. Financial services firms such as banks have been early adopters of a wide variety of ESG policies with most large banks in the US committing to at least some policies.[2] Bank ESG policies have outsize importance for the allocation of capital in the broader economy because banks are central in intermediating credit to households, businesses, and governments.

The migration of capital toward ESG-friendly firms is likely to adversely affect economies reliant on less sustainable industries such as fossil fuel production or firearms manufacturing (Jones, 2021). For example, fossil fuel companies have recently faced higher costs of capital as a result of the transition to a lower carbon economy (Quinson, 2021). In turn, governments dependent on less sustainable industries may attempt to counter ESG policy adoption, thereby imposing substantial costs on both financial intermediaries and affected economies. Recently, 17 states in the US have proposed or passed legislation curtailing public sector activity of financial services firms that take ESG-friendly actions (Schroeder, 2022).

We assess the impact of anti-ESG laws on financial market outcomes, exploiting a significant and unexpected regulatory change in the state of Texas, Senate Bills (SBs) 13 and 19, barring any Texas municipality from contracting with banks that restrict funding to oil & gas or firearms companies. The laws were implemented in September 2021 and led to the abrupt exit of five of the largest municipal bond underwriters from Texas. We find that municipal bond issuers face both higher uncertainty and higher borrowing costs in bond markets as a result of the anti-ESG laws.[3]

[1] See https://www.reuters.com/markets/us/how-2021-became-year-esg-investing-2021-12-23/

[2] A 2004 report of the UN and 20 large financial institutions as signatories discusses the adoption of ESG policies by the financial sector: https://www.unepfi.org/fileadmin/events/2004/stocks/who_cares_wins_global_compact_2004.pdf

[3] We focus on the municipal bond market because we can measure timely market outcomes, allowing us to make causal inferences. Anti-ESG laws may also restrict the management of pension assets. This may lead to additional costs to taxpayers because pension manager choice is important for fund returns (Dyck, Manoel and Morse, 2022).

We exploit the differential exposure of Texas municipalities to the five exiting underwriters to examine how anti-ESG laws affect borrower outcomes. Relationships between municipal issuers and underwriters are sticky with many issuers repeatedly choosing the same underwriters (Chen, Cohen and Liu, 2022). We use this stickiness to identify the reliance of municipal issuers on the exiting underwriters prior to the regulatory change. We find that issuers previously reliant on the targeted banks are more likely to negotiate pricing instead of holding an auction and receive worse prices after the implementation of the Texas laws.

Although negotiated sales are associated with higher issuance costs than competitive offerings, they also allow underwriters to obtain a more complete picture of the potential market for the municipal bond issue and better place the bond with investors when issue or market uncertainty is high (Sorensen, 1979*b*; Smith, 1987; Cestau, Green, Hollifield and Schürhoff, 2019). Thus, issuers with significant reliance on the targeted banks opt into negotiations to soften the large volatility we document among competitive sales. Nevertheless, borrowing costs still increase by approximately 10 basis points for issuers with an additional standard deviation of reliance on the targeted banks. Borrowing costs increase by up to 41 basis points for issuers that had previously raised the majority of bond financing through the exiting underwriters.

The remaining competitive offerings, which make up slightly less than half of the Texas market, provide a particularly clear window into the impact of the Texas laws on bank competition. The number of underwriting bidders declines sharply, the variance among remaining bids increases, and the winning bid in terms of yield to maturity increases after the implementation of the Texas laws for issuers with higher previous reliance on the targeted banks. These results suggest that the exit of the targeted underwriters from the Texas market due to anti-ESG laws has adverse impact on underwriter competition and that the remaining banks may enjoy increased market power.

Finally, we show that the Texas laws led to significant changes in the placement of municipal bonds with investors as issuers lose direct access to the distribution networks of the targeted banks. The large underwriters targeted by the new Texas laws typically have national distribution networks and may be better able to place municipal bonds with a wider array of investors than regional

and small underwriters. This is especially important for Texas municipal bonds that are widely-held out-of-state because the state does not levy individual income taxes (Babina, Jotikasthira, Lundblad and Ramadorai, 2021). The efficiency of bond placement can be assessed in part by comparing the underpricing of new issues around the implementation of the Texas laws. Higher-cost placement since the Texas laws should lead to a larger gap between the offering price and the eventual market price. We don't find any impact on underpricing, although this may be a byproduct of measurement shortcomings of the municipal trading data. We document significant changes in placement patterns that are consistent with more costly placement. Direct customer purchases increase as a share of trades and the average size of customer trades for affected issuers shrinks. These dynamics lead to a higher total dollar volume of customer purchases. Concurrently, average dealer trade size increases but dealer volume remains unchanged. These results combined imply a higher direct participation of retail investor trades and less dealer intermediation. To quantitatively assess the importance of the placement style changes, we extrapolate underwriter fixed effects from before 2021 and show the simple change in identities only explains about 2% of the increased financing cost. This evidence is consistent with issuers substituting the national intermediation of municipal bonds provided by the exiting banks with a more local placement, although the increase in local placement does not explain the higher borrowing costs.

We perform a variety of additional analyses to show that our results are not spuriously driven by contemporaneous factors. We highlight that pre-trends in issue type and offering yields are consistent between more and less affected borrowers in Texas and other states for the five years leading up to the implementation of the laws in September 2021. Additionally, given that previous reliance on the exiting banks is based on observable and potentially unobservable issuer characteristics, we employ a triple-difference approach to compare the evolution of outcomes for similar issuers in and out of Texas. The triple difference regressions are also useful for comparing Texas issuers unlikely to be directly affected by the Texas laws with non-Texas issuers around the US to test for potential spillover effects on the Texas control group. We also use an inverse probability weighting approach in the spirit of Hirano, Imbens and Ridder (2003) to directly compare

outcomes for observably similar issuers within Texas, ensuring the effects we document are not a function of different secular trends across issuer type. To rule out the possibility that seasonality affects our results, we use the auction data and show that a placebo shock starting on September 1, 2019 does not have any of the same effects on auction outcomes as the actual anti-ESG policies in 2021. Finally, we show that our difference-in-differences results are robust to dropping all auctions that occur during the most volatile period of the COVID-19 crisis.

Our paper contributes to the nascent literature on ESG investing by documenting the real effects of anti-ESG regulation. ESG policies in the financial services industries have proliferated substantially in recent years. Prior research shows that adopting sustainable investing can be consistent with shareholder value maximization (Jagannathan, Ravikumar and Sammon, 2018). For example, ESG policies can help hedge climate and other downside risks associated with companies' poor sustainability practices in an environment with ESG uncertainty (Chava, 2014; Ilhan, Sautner and Vilkov, 2021; Avramov, Cheng, Lioui and Tarelli, 2022; Gibson, Glossner, Krueger, Matos and Steffen, 2022; Hoepner, Sautner, Starks and Zhou, 2022; Krueger, Sautner and Starks, 2020). Recent shifts in the preferences for sustainable strategies of institutional investors and shocks to climate concerns have also exerted upward pressure on equity prices of ESG adopters (Riedl and Smeets, 2017; Bauer, Ruof and Smeets, 2021; Pastor, Stambaugh and Taylor, 2021), leading to even higher equity valuations (Krueger, Gibson and Mitali, 2021; Pelizzon, Rzeznik and Weiss Hanley, 2021; Flammer, 2013). Although some firms have not fully met sustainability commitments (Basu, Vitanza, Wang and Zhu, 2022; Gibson, Glossner, Krueger, Matos and Steffen, 2022) or some investors do not necessarily exhibit preferences for ESG policies (Moss, Naughton and Wang, 2021), the literature documents significant adoption of ESG policies in recent years that may have been further facilitated by investor engagement (Dimson, Karakas and Li, 2021). Although these trends have been largely driven by market forces, we show that governments dependent on less sustainable economic activity may impose additional costs on both financial intermediaries and taxpayers when attempting to slow ESG adoption.

Prior research shows that banks respond to increases in climate policy uncertainty by penaliz-

ing and divesting from corporate customers with less sustainable business models and increasing flexibility to revoke credit to these firms in the future (Delis, de Greiff and Ongena, 2019; Ivanov, Kruttli and Watugala, 2021; Kacperczyk and Peydró, 2021; Green and Vallee, 2022). Analogously, banks engage in less monitoring of environmental outcomes when they face less environmental liability (Bellon, 2021). The adoption of sustainable policies in banking may have been accelerated by the enhanced focus of the Securities and Exchange Commission (SEC), the primary financial markets regulator in the US, on ESG disclosures.[4] There is, however, substantial ambiguity as to how ESG policies in the banking sector affect stakeholders such as governments reliant on less sustainable industries and how these stakeholders may respond to ESG policies. In our empirical setting, Texas bars banks with ESG policies from public finance in the state. In perfectly competitive credit markets with homogeneous preferences and beliefs about asset payoffs (Fama and French, 2007), barring banks with ESG policies may have no effect on issuer outcomes as other banks without such policies enter the market. We show that such prohibition has large adverse consequences for Texas municipalities in terms of higher borrowing costs that are ultimately borne by taxpayers in the state.

This paper also contributes to the extensive literature since Petersen and Rajan (1995) and Gande, Puri and Saunders (1999) that studies how competition among financial intermediaries affects borrower outcomes (Yanelle, 1997; Boot and Thakor, 2000; Corwin and Schultz, 2005; Dick and Lehnert, 2010; Allen, Carletti and Marquez, 2011; Liu and Ritter, 2011; Cornaggia, Mao, Tian and Wolfe, 2015; Carletti and Leonello, 2019). While this literature has largely focused on deregulation and the resulting increase in competition due to bank entry, this paper highlights that the simultaneous loss of a significant number of intermediaries cannot be fully absorbed by a market even if the market is large and competitive. Going beyond the existing literature, we also show that the banks most likely to leave a market over ESG concerns are the largest, most interconnected banks. The exit of such banks with the largest dealer networks may lead to deterioration in distribution quality and adverse consequences for financial stability. Our results also comple-

[4]For a list of the six major categories of increased attention and enforcement priorities by the SEC, see https://www.sec.gov/sec-response-climate-and-esg-risks-and-opportunities.

ment the more extensive literature on competition in financial markets (Berk and Van Binsbergen, 2022; Clark, Houde and Kastl, 2021). The variation from these rule changes are appropriate for causal inference as they were unexpected and unlikely to be related to endogenous bank entry, bank integration decisions, or changes in municipal creditworthiness.

Finally, we also complement the literature studying intermediation in public finance markets (Green, Hollifield and Schürhoff, 2007; Brancaccio, Li and Schürhoff, 2017; Cestau, 2019, 2020; Garrett, 2021; Garrett, Ordin, Roberts and Suárez Serrato, Forthcoming) and the growing body of work on the impacts of social, political, and environmental issues on public finance markets (Gao, Lee and Murphy, 2020; Painter, 2020; Cornaggia, Li and Ye, 2021; Gao, Lee and Murphy, 2021; Goldsmith-Pinkham, Gustafson, Lewis and Schwert, 2021; Cornaggia, Hund, Nguyen and Ye, 2022). We find that forcing underwriters with ESG policies to exit the market leads to significant changes in public finance outcomes such as the method of sale, primary market costs, and secondary market placement patterns. Furthermore, we show that that even the largest issuers in the market are not immune from higher yields following a substantial reduction in the set of available underwriters.

2 Institutional Background

The public finance market in Texas has been used as an empirical setting in many studies because of a large and heterogeneous municipal bond market as well as rich school district voting and financial data (Martorell, Stange and McFarlin Jr, 2016; Yu, Chen and Robbins, 2022). The state was also early to publicly report granular data of competitive bond sales prior to the availability of nation-wide sources such as Ipreo and The Bond Buyer (Clarke, 1997). Finally, ownership of municipal bonds issued in Texas is more geographically diversified than that of bonds from most other states because Texas does not levy an individual income tax (Babina, Jotikasthira, Lundblad and Ramadorai, 2021).

The Texas municipal bond market is also a convenient laboratory to study anti-ESG regulation

in the US because of the ability of Texas to regulate the business practices of banks that engage in public finance within the state. The most recent round of such rules in Texas began in 2017 with House Bill 89/SB 252, the "Prohibition on Contracts with Companies Boycotting Israel," which prohibits the state and contained governments to contract with banks that have policies restricting credit to firms with ties to Israel. The Municipal Advisory Council of Texas (MAC) keeps a record of the compliance letters banks submit to the Texas Attorney General with 42 banks having such letters at the time.[5]

Since then, there have been increasing calls by both the general public and various stakeholders for banks to promote environmentally and socially sustainable investments and business practices. On the environmental side, many banks have increased their flexibility to divest from energy companies in response to current or expected future climate change regulation (Ivanov, Kruttli and Watugala, 2021). Texas is one of the largest producers of oil and gas in the U.S. and some Texas lawmakers saw this as a direct boycott of their state. In March 2021, lawmakers introduced SB 13 which would ban banks that limit credit to the oil and gas sector from participating in public finance markets in the state. Some Texas lawmakers discussed the measure as "boycott Texas, and we'll boycott you" (Adams-Heard, 2021). The new rule was slated to be implemented on September 1, 2021.

Some large financial services firms have also introduced company policies defining relations with the firearms industry in the aftermath of the Las Vegas shooting in 2017 and the Stoneman Douglas High School shooting in 2018. For example, Citigroup adopted a policy of limiting credit to firearm retailers that (1) do not always perform background checks, (2) sell firearms to those below 21 years of age, or (3) sell "bump stocks or high-capacity magazines." Citigroup stated that: "we want to do our part as a company to prevent firearms from getting into the wrong hands" (Skyler, 2018). Several other large banks followed suit by implementing similar policies in 2018 including JP Morgan Chase, Bank of America, and Goldman Sachs (Catlett, 2019). Consequently, the Texas legislature implemented SB 19 on September 1 2021, which prohibits state and local

[5] https://www.mactexas.com/Document/HB89Letter/

governments in Texas from contracting with lenders that limit business with the firearms industry.

Although Texas was the first state to adopt anti-ESG laws, it is important to note that sixteen other states including Arizona, Indiana, Kentucky, Missouri, Ohio, Oklahoma, South Dakota, West Virginia, and Wyoming have similar proposals either enacted or going through the legislative process.[6] In addition, even though an anti-ESG law in Lousiana has been vetoed by the governor, the Attorney General of the state has since rejected municipal bonds underwriters on anti-ESG grounds.[7] Finally, such anti-ESG laws have reached national prominence with the former vice president of the United States, Michael Pence, calling on states to adopt "measures to discourage the use of ESG principles."[8]

At least four banks seemed to be the target of the anti-ESG laws, particularly of SB 19: Citigroup, JP Morgan Chase, Goldman Sachs, and Bank of America. We also use a data-driven approach to check if other underwriters also left the Texas market. First, we create a list of banks underwriting or bidding for at least five municipal securities in Texas between 2008 and 2021. We then check whether each underwriter has filed a letter of compliance with the Texas Attorney General's office, as reported by the MAC. We consider an underwriter to have left the state if it has not filed a letter of compliance with the Texas laws and no longer participates in the Texas market starting in September 2021. Finally, we ensure that each institution underwrites at least five municipal bonds in non-Texas states after September 2021 so that we do not confuse exits from municipal underwriting with exits from Texas. This process indicates that Fidelity Capital Markets also left Texas in response to SB 13/19 and we treat them as a targeted bank in our analysis. We use "targeted" and "exiting" interchangeably to describe the set of banks that exited the Texas market. All five targeted underwriters stopped submitting competitive bids after the implementation of SB 13 and 19 (see Figure 1) although Citigroup tried to reenter the Texas market several times in following months.

The anti-ESG laws may have an even larger impact on bank exit in the foreseeable future as the

[6] https://www.reuters.com/legal/legalindustry/challenge-investing-face-state-anti-esg-legislation-2022-08-24/

[7] See https://www.bondbuyer.com/news/louisiana-legislature-tries-again-to-implement-pro-gun-litmus-test.

[8] See https://www.wsj.com/articles/only-republicans-can-stop-the-esg-madness-woke-musk-consumer-demand-free-speech-corporate-america-11653574189?mod=trending_now_opn_6.

SEC has initiated regulatory probes against banks simultaneously declaring compliance with the Texas laws and providing ESG disclosures in their SEC filings.[9] Potentially in response to these probes, TD Securities withdrew their letter of compliance with SB 13 and 19 on March 8 according to the MAC and could end their municipal finance underwriting in Texas.

Municipal bond underwriters distribute bonds to investors such as mutual funds and individuals. In a negotiated sale, the underwriter works directly with the issuer to arrive at the best issue price/yield-to-maturity. In a competitive sale, the underwriter places a bid in terms of yield in a first-price, sealed-bid auction for a pre-determined bond package. The underwriter bidding the lowest yield wins the auction and distributes the bonds to investors.[10] The complexity of the offering type decision as well as the wide array of services offered by underwriters imply that a change in the structure of the underwriter market can have far-reaching effects on municipal securities beyond issue prices. The set of available underwriters can affect the method of sale, the structure of the eventual issue, the issuance costs incurred by municipalities, and whether municipalities seek external finance at all. Consequently, underwriters are key in determining the cost of public funds and potentially the scale of public investment.

3 Data

We obtain the universe of municipal bond issues between January 2007 and April 2022 from the Mergent Municipal Bond Securities Database (Mergent).[11] Mergent identifies a wide range of issuance characteristics both at the issue and the maturity level. These include the offering amount, type, maturities, the presence of bond insurance, and yields. These data also include the identity of the municipal underwriter for each offering. We exclude issues with missing issuer state information given our focus on Texas issuers. We also exclude variable rate demand obligations (VRDOs)

[9] https://www.reuters.com/markets/us/exclusive-secs-texas-office-probes-banks-over-disclosures-guns-fossil-fuels-2022-01-05/

[10] See Appendix B for a detailed discussion of the bond issuance process.

[11] We discuss why the sample ends in April 2022 in Section 6 and in Appendix F. We consider April 2022 the end of the unexpected quasi-experimental time period that started with the exit of the targeted banks from Texas in September 2021.

since only a very small fraction of issuers typically have access to such short-term financing. This results in a sample of 242,158 bond offerings by 37,934 unique issuers since 2007.

We obtain data on the competitive sales since 2008 from The Bond Buyer, a trade publication for the municipal bond market. The Bond Buyer publishes the outcomes of all public auctions on a daily basis and provides basic issue and issuer characteristics including the identity of all bidders and bids expressed in yield-to-maturity (The Bond Buyer, 2022). These data are particularly beneficial because they allow us to gauge changes in the competitive dynamics in Texas for issues placed in the auction market.

Finally, to test for the effect of the Texas laws on the placement of municipal bonds with investors, we use the universe of secondary market trades published on the Electronic Municipal Market Access (EMMA) website provided by the Municipal Securities Rulemaking Board (MSRB). We exclude issuers we are unable to identify in Mergent and remove trades occurring after a bond's maturity date, with non-transaction based compensation arrangements, where the MSRB is unable to verify the dollar price submitted by the dealer, or where the transaction amount or price are missing. As we are interested in trading activity related to the the initial distribution of municipal issues—those occurring within 30 days of the issue date—we focus on customer purchases and inter-dealer trades. Finally, to mitigate the effect of outliers and data errors, we trim trade prices at the 0.5^{th} and the 99.5^{th} percentiles.

3.1 Texas Borrowers Reliant on the Exiting Underwriters

In this section, we explore the characteristics of the banks that exit the Texas underwriting market after September 2021 and we describe the Texas borrowers previously reliant on the exiting banks. This description yields two novel facts that are important for interpreting our results. First, governments reliant on the exiting banks are the largest issuers in the Texas market. These issuers typically raise seven times as much in bond financing as other Texas issuers upon issuance, while having similar bond maturities, yields, and propensities to negotiate pricing or float taxable issues. Second, the exiting banks are more likely to underwrite municipal bonds nationally, albeit several

large, national banks maintain their municipal underwriting business in Texas immediately after SB 13/19.

We show summary statistics for the bond issues in our sample in Table 1. Panel (A) describes the differences between issues in Texas and in the rest of the US from 2017 through April 2022. Texas accounts for 9,546, or 12.4%, of the 76,992 bond issues in our sample between 2017 and April 2022. Offering amounts in Texas, ranging from $2 million at the 25^{th} percentile to over $18 million at the 75^{th} percentile and an average of $29 million, are very similar to offering amounts in the remaining US states. Texas municipalities issue longer maturity bonds than municipalities in other states, while yields and negotiated shares are similar across the two groups. Issuers in Texas have an average reliance on the five targeted banks of about 13% as compared to 16% for issuers in the rest of the country. Given the targeted banks tend to underwrite the largest issues, the dollar-weighted reliance in Texas in our estimation sample is 32%.

In Panel (B), we zoom in on the difference between issues in Texas underwritten by the exiting banks and by the remaining banks. The average issue underwritten by the exiting banks has a principal value of $135 million, while issues underwritten by the remaining banks are usually $1/6$ the size with an average value of $21 million. The size difference remains large along the distributions of the two groups—the median issue underwritten by the targeted and the non-targeted banks has a principal value of $5 and $36 million, respectively. However, on other margins, issues underwritten by the two groups of banks are more comparable. For example, within Texas, the exiting banks underwrote issues with maturities averaging 162 months compared to an average of 164 months for other underwriters. Texas issues underwritten by the exiting banks also had slightly higher interest cost and were slightly more likely to be competitive sales.

Municipal borrowers in Texas range from small special districts to large cities and state agencies. For example, Mesquite Independent School District (ISD) serves over 38,000 students in a suburb east of Dallas, TX. From 2007-2016, Mesquite ISD never worked with any of the exiting banks and thus has no reliance on the exiting banks according to our measures. On the other side of the spectrum, Pflugerville ISD serves over 25,000 students in a suburb to the north of Austin, TX,

and has historically relied on the targeted banks for approximately 70.2% of their bonds issuance volume. We consider Pflugerville ISD to be highly reliant on the exiting banks since they have over 50% of their historical borrowing underwritten by one of them. Similarly, cities and counties range from having no exposure to the targeted banks, such as Lewisville with 107,740 residents, to having high exposure, such as El Poso with 64% reliance and 678,815 residents. Larger cities and counties tend to have higher exposure to the targeted banks. Historically, the state of Texas itself has also had relied on these banks for over 60% of their underwriting volume.

The auction data further highlight the key role of the exiting banks in the Texas market and the types of borrowers most likely to be affected by the exit of these banks. These data cover 509 bidders that submit at least 5 bids from January 2017 through April 2022 in the entire US. 62 of these underwriters submit bids in Texas with five underwriters leaving the market after Senate Bills 13 and 19. Table 2 shows summary statistics on auctions based on all competitive bids submitted by each underwriter. The average exiting underwriter submitted 7,980 competitive bids for underwriting business between 2008 and 2021 with an average principal amount of $113.9 million, while the typical non-targeted underwriter submitted 4,145 bids with an average principal value of $54.9 million.[12]

Targeted banks tend to participate in the most competitive auctions with an average of 6.3 additional bidders per issue. These highly competitive auctions and the associated issuers may be most resilient to underwriter exit given that the marginal impact of an additional bidder on issue yield is declining in the number of bids (Garrett, Ordin, Roberts and Suárez Serrato, Forthcoming). Additionally, the exiting banks have greater national participation than the remaining banks, bidding, on average, in 47.4 states as compared to 34.7 states. Three of the five targeted banks were actively submitting underwriting bids in all 50 states in recent years. However, some remaining banks also have significant national presence, with over half of the remaining underwriters participating in auctions in at least 41 states. Finally, targeted banks submit 7.7% of their bids in Texas, while the remaining banks submit 21.1% of their bids in Texas, suggesting that the state's contribution to a

[12]We provide additional description and summary statistics of the auction data in Appendix G and in Table G.1.

bank's total underwriting business may be an important factor behind the exit decision.

We also examine the time series evolution of the share of underwriting and of competitive bidding by targeted banks over time in Figure 1, respectively. Before 2021, the five targeted banks underwrote about 35% of the municipal debt (Panel A) and made up just over 25% of bidding volume in Texas (Panel B). The share of underwriting by the targeted banks starts to decline slightly in early 2021, then falls to 0% in September 2021 as does the share of bids from targeted banks. A potential reason for the early decline in underwriting share as compared to the little change in competitive bidding before the passage of the anti-ESG laws is potential anticipation by market participants. Negotiated sales typically take several months to complete so issuers may have avoided the targeted underwriters in negotiated deals following the introduction of SB 13/19 on March 11, 2021. By contrast, competitive deals are placed with the underwriter on the issue date, so the targeted banks could underwrite such deals up until the enactment date.

Furthermore, underwriting and bidding shares do not remain at zero as Citigroup has tried to reenter the Texas market by submitting bids on a small number of issues in November and then again in 2022. In Panel A, the increase in underwriting in April 2022 is driven by Citigroup underwriting a $1.2 billion deal for the Dallas/Fort Worth International Airport. Citigroup's attempts to reenter the market suggest the importance of the Texas market to the bank and that the Texas laws may have adverse consequences for banks with ESG policies. We provide two estimates of the costs of leaving the Texas public finance market from the perspective of targeted banks in Section 6.

4 Empirical Design for Assessing Borrowing Outcomes

In this section, we detail the methodologies that we use to examine the effect of the anti-ESG laws on municipal bond issuers in the state.

4.1 Comparison of Affected Issuers in Texas

We first compare issuance outcomes around the implementation of the Texas law for issuers with differential past reliance on the targeted underwriters using a difference-in-differences regression:

$$y_{j,i,t} = \lambda Targeted\ Share_i \times Implementation_t + \psi_i + \phi_t + \delta_m + \varepsilon_{j,i,t}, \quad (1)$$

where t, j, and i denote offering date, distinct municipal bond offerings, and municipal issuers, respectively. $Targeted\ Share_i$ is the share of total dollar volume of municipal securities of each issuer underwritten by the targeted banks between 2007 and 2016, standardized by its in sample standard deviation of 0.19. $Implementation_t$ is an indicator variable that takes the value of one whenever the issue date is in September 2021 or later, and zero otherwise. ψ_i, ϕ_t, and δ_m are issuer, offering date, and time to maturity (in months) fixed effects.

We examine six major types of issuance outcomes: the likelihood of selecting a negotiated issue, offering yields, and placement characteristics for all issues in the sample and the number of bids, bid variance, and the winning bid for competitive issues. The placement characteristics shed light on how the offering is placed with investors in terms of underpricing, number of trades, trade size, and dealer/retail customer dollar volume as a share of total volume.

The model in Equation 1 estimates continuous treatment effects of previous underwriter reliance on the exiting banks on bond issuance outcomes after the implementation of the Texas laws. In alternative specifications, we use discrete versions of the treatment variable denoting whether an issuer's reliance on the targeted underwriters exceeds 10%, 20%, or 50% of the issuer's total previous issue volume between 2007 and 2016. In robustness specifications, we include calendar time $\times$ time-to-maturity fixed effects in addition to the offering date fixed effects to control for changes in the shape of the yield curve in the municipal bond market over time or for other time-varying risk factors related to bond maturity. Due to the large potential number of fixed effects, we convert the units of the time variable to calendar months and the time-to-maturity variable to years. Standard errors for all specifications are double clustered at the issuer and offering date level.

4.2 Additional Analysis and Heterogeneity

The regression specification in Equation 1 compares Texas issuers that differ in terms of their reliance on the five exiting banks. This framework naturally extends to a triple difference specification by expanding the sample to the rest of the municipal bond market in the US. Additionally, we estimate average treatment effects in the spirit of Hirano, Imbens and Ridder (2003) by using weights calculated from an issuer's likelihood of being most observably similar to the Texas issuers reliant on the exiting banks. Finally, we split the *Targeted Share* variable into the shares of negotiated and the share of competitive bond issues underwritten by the exiting banks to examine whether there is important heterogeneity in the nature of the relationship with targeted banks.

The triple difference specification allows us to difference out any impact of unobservable borrower type on borrowing costs around the implementation of the Texas laws. The underlying assumption of this model is that municipal issuers in Texas and other states select underwriters with ESG policies for similar unobservable reasons. For example, Texas and non-Texas issuers are likely to have significant reliance on JP Morgan Chase because the bank specializes in large, competitive issues that tend to be placed nationally. This analysis allows us to examine whether issuers reliant on the targeted banks in other states that do not bar intermediaries with ESG policies, have different outcomes than issuers reliant on the targeted banks in Texas. We add a new subscript, s, to the triple difference specification to describe the state in which each bond issue takes place:

$$\begin{aligned} y_{j,i,s,t} =& \lambda \mathit{Targeted\ Share}_i \times \mathit{Texas} \times \mathit{Implementation}_t \\ &+ \gamma \mathit{Targeted\ Share}_i \times \mathit{Implementation}_t + \xi \mathit{Texas} \times \mathit{Implementation}_t \\ &+ \psi_i + \phi_{s,t} + \delta_m + \varepsilon_{j,i,s,t} \end{aligned} \tag{2}$$

In Equation 2, the coefficient of interest is λ, which is the differential impact of previous reliance on the targeted banks in Texas relative to other states. The specification also includes calendar time $\times$ state fixed effects to allow state-specific time variation in issuance outcomes. To illustrate the benefits of the triple difference specification, assume that mutual funds working

exclusively with the targeted banks specialize in the municipal bonds of certain types of issuers. Changes in fund flows to these mutual funds would represent a common shock to all issuers reliant on the targeted banks. In this setting, γ will capture such concurrent effects on these types of issuers, while λ will only capture the the incremental impact of reliance on the targeted banks by Texas issuers after the implementation of the anti-ESG laws.

The triple difference approach has the added benefit of shedding light on potential spillover effects in Texas from the exit of the targeted banks. The exit of the targeted banks may also adversely affect financing outcomes for issuers with low/no reliance on these banks, or those we use as a control group in Equation 1. This could happen if the targeted banks represented a viable outside option for the less reliant issuers. We can test this hypothesis by removing the time $\times$ state fixed effects and adding an interaction term of $Implementation_t$ with an indicator variable for the state of Texas, ξ from Equation 2. This coefficient tells us whether financing outcomes change for Texas issuers that are potentially indirectly affected by the anti-ESG laws.

Another way of alleviating concerns that issuers reliant on the targeted banks may be different from non-reliant issuers is to directly re-weight the two groups, thereby making them observably very similar. We follow Hirano, Imbens and Ridder (2003) to estimate a first-stage logistic regression of the likelihood of reliance on the exiting banks. We discretize the reliance variable similar to the previous difference-in-differences models and define municipalities with over 50% of their previous issues underwritten by the exiting banks as "treated" and those with no previous reliance as "control" issuers. The regression includes the average issue size, the number of bond issues, the average maturity of the issues, the share of issues that are taxable, the share of issues that are refunding outstanding bonds, and the share of issues that are placed via negotiation.[13] We then create inverse probability weights of treatment according to:

$$weight_i = \frac{treat_i}{P(treat_i = 1)} + \frac{1 - treat_i}{P(treat_i = 0)},$$

where $P(treat_i = 1)$ is the treatment (targeted bank reliance) likelihood estimated in the first stage

[13] We present and discuss these estimates in Appendix C.

regression. We then use these weights to estimate Equation 1 with weighted least squares (WLS).[14]

One potential disadvantage of the targeted share variable as measured so far is that it masks variation in the type of transactions that underlie the issuer-underwriter relationship. For example, relationships based on negotiated issues may be different from relationships based on auctions. To address this potential heterogeneity, we also re-estimate 1 while splitting the targeted share into the share of previous negotiations and the share of previous competitive sales.

5 The Texas Laws and Borrowing Outcomes

5.1 Difference-in-Differences Results

We first explore how the propensity of issuers to negotiate bond pricing has changed around the implementation of the Texas laws for issuers affected by these laws. We expect affected issuers to increase the use of negotiations following the implementation of the laws as issue uncertainty is likely to be substantially higher with the exit of five of the largest underwriters in the market. Negotiated sales allow underwriters to obtain a more complete picture of the potential market for the municipal bond issue and better place the issue with investors when uncertainty is high (Sorensen, 1979*b*; Smith, 1987).

Panel A of Table 3 presents the estimates of the difference-in-differences specification described in Equation 1, where the outcome of interest, $y_{i,j,t}$, is an indicator variable equal to one whenever the issue is placed via negotiation, and zero otherwise. The first column shows a difference-in-differences estimate of 0.074, which is significant at the 1% level. This means that a one standard deviation increase in issuer reliance on the targeted banks in Texas (0.19 in sample) is associated with 7.4 percentage point (pp.) higher probability of issuing bonds through negotiation after September 2021. Negotiations make up just over 50% of issues in Texas since September 2021, so an increase of 7.4pp. is indicative of a substantial change in issuer behavior away from

[14]These weights can be very large if issuers strongly predicted to receive one type of treatment receive the other type of treatment. We ensure that predicted probabilities of receiving the opposite treatment from what is observed do not exceed 99.9% or fall below 0.1%.

public auctions toward negotiations. Columns 2 through 4 of Panel A discretize the extent of reliance on the targeted banks to show that the impact on negotiations is increasingly economically significant with greater reliance. Issuers with a targeted share of at least 10% of their historical underwriting with the exiting banks are 18.9pp. more likely to negotiate, while issuers with over 50% of previous reliance on the exiting banks increase their likelihood of negotiation by 23.1pp (all statistically significant at the 1% level). Our results show that affected issuers attempt to mitigate the increased volatility associated with the exit of the targeted banks by retaining underwriters earlier in the issuance process.

The main assumption behind this analysis is that issuers with no reliance and issuers with high reliance on the exiting banks would have chosen the same method of issue sale absent the Texas laws barring the five banks from the Texas market. While this assumption is not directly testable, we provide evidence that this assumption has historically held in the Texas market. Specifically, we estimate Equation 1 while replacing the implementation indicator with an indicator variable for each quarter (three-month period) since the implementation of the laws.[15] We define reliant issuers as those with historical reliance on the exiting banks of 50% or higher. Panel A of Figure 2 shows that from the first quarter of 2017 through the second quarter of 2021, the difference in negotiation propensity between the two groups is very close to zero. By contrast, negotiation propensity starts increasing in the last quarter of 2021 and jumps significantly in the first two quarters of 2022 well above all historical estimates. The long pre-period shows no other change of this magnitude and no other statistically significant change, which is evidence in favor of the parallel trends assumption. The time series estimates show a sudden and large increase in the likelihood of negotiating or retaining an underwriter significantly earlier in the issuance process, which suggests a large increase in perceived uncertainty.

Even though issuers adjust the issue sale method as they lose access to the five major underwriters, borrowing costs could still be affected. To the extent that the exit of five of the largest underwriters reduces underwriter competition in the Texas market, issuers may face higher offer-

[15]For the sake of presentation, 2021Q4 is defined as September through November, 2022Q1 as December-February, and 2022Q2 as March and April. This ensures the SB 13/19 implementation happens between quarters.

ing yields. However, affected issuers are also forced to choose new underwriters, which may lead to lower borrowing costs if sticky relationships allowed the exiting banks to extract local monopoly rents prior to the enactment of the Texas laws.

Panel B of Table 3 presents the regression estimates in the offering yield specification (in percentage points). Column 1 shows an estimate of 0.083, which indicates that a one standard deviation increase in issuers' reliance on the targeted banks is associated with 8.3 basis points (bps) higher offering yields after the implementation of the Texas laws. Columns 2-4 highlight that this effect is driven by issuers that are most reliant on the targeted banks. For example, offering yields increase by 17.4bps for issuers that have at least 10% of their previous underwriting business with the targeted banks. Offering yields increase by roughly 20bps and 38bps for issuers with reliance of over 20% and 50%, respectively. The difference-in-differences estimates suggest that issuers that were previously most reliant on exiting banks for underwriting services face a reduced ability to use competitive sales and, consequently, higher interest costs. The average offering yield from September 2021 through April 2022 was 2.00pp., which means that the issuers with over 50% previous reliance on the targeted banks had a roughly 19% (0.38/2.00) increase in borrowing costs due to SB 13 and 19.[16]

We also show that the impact on offering yields over time (Panel B of Figure 2) exhibits a very similar pattern to the evolution of the negotiated sales estimates. Between the first quarter of 2017 and the third quarter of 2021, bond issue yields for reliant and non-reliant issuers track each other closely despite the large amount of volatility in the market during this period. Then, in the the fourth quarter of 2021 and the first quarter of 2022, yields for the most reliant issuers increase substantially and remain elevated through April. The individual quarterly point estimates are not statistically significant due to a lack of power, but the pooled impact of these three estimates is a statistically significant 38bps (displayed in the fourth column of Table 3, Panel B).

[16]The inclusion of offering type controls has no effect on our coefficients in the yield specification.

5.2 Design Robustness and Heterogeneity

Table 4 presents results from the triple difference specification described in Equation 2, corroborating the robustness of our results to state-specific as well as national trends in bond issuance outcomes over time. For the sake of comparability, we present two sets of specifications for each measure of issuer reliance on the targeted banks—one with the set of controls and fixed effects from Table 3 and one allowing for the yield curve, issuance size, and state to have a differential effect on issuance outcomes over time, as well as issuer fixed effects to vary with issue type (general obligation or revenue). Panel A shows the estimates of the negotiation propensity specification, while Panel B presents the results of the offering yields specification. In line with the difference-in-differences results, issuers most reliant on the targeted banks ($> 20\%$ and $> 50\%$) in Texas are 14-18pp more likely to issue bonds through negotiation relative to similarly reliant issuers in other states after the implementation of the anti-ESG laws. Panel B shows an increase in offering yield for issuers reliant on the targeted banks in Texas relative to similarly reliant issuers in other states. Our baseline, saturated specification in column 2 shows that offering yields increase by 10.7bps for a one standard deviation increase in reliance on targeted banks starting in September 2021, which is significant at the 5% level. Columns 5 and 6 show triple difference estimates of 30-41bps for the Texas issuers that were over 50% reliant on the exiting banks, which is very close to the 38bps estimated in the difference-in-differences specification.

Another way of putting these estimates into context is to calculate the additional expenditure required to raise the same amount of debt at the new borrowing costs. Municipalities in Texas issued $31.8 billion in municipal bonds from September 2021 through April 2022, or about $4 billion per month, and have an average 1.35 standard deviations reliance on the targeted banks accounting for issue size within the triple difference estimation sample ($\approx 0.319/0.237$). Assuming there are no spillover effects to control borrowers in Texas, our estimates imply that barring banks with ESG policies led to 14.4bps ($\approx 1.35 * 0.107$) higher yields on the average dollar of borrowing. Assuming municipal bonds will be outstanding until maturity, the higher yields on the $31.8 billion issued since SBs 13 and 19 with an average duration of 11 years leads to an additional cost

to taxpayers of about \$504 million ($\approx 31.8 * 0.00144 * 11.0$). This calculation follows Gao, Lee and Murphy (2021) and is based on the intuition that duration is the scalar characterizing of price changes corresponding to change in yield. If we instead assume all bonds will be called on the first call date, the average duration is 6.2 years with a total cost to taxpayers of \$284 million.[17] Yet another way of contextualizing these estimates is to focus on aggregate debt in equilibrium. Texas and its contained municipalities had \$289 billion in outstanding public bonds according to the 2017 Census of Governments. If this policy were to remain in place long enough that the interest rate on that debt went up by 14.4bps, and there were no endogenous entry responses by other entities or any endogenous weakening of the enforcement due to perceived costs, this would cost taxpayers in the state of Texas an additional \$416 million per year in interest payments ($\approx 289 * 0.00144$). In 2017, Texas and contained municipalities paid \$10.8 billion in interest, suggesting the response to these laws would increase interest expenditure outlays in the state by about 4%. Total state and local expenditures in Texas were \$263 billion in 2017, suggesting this additional spending could be about 0.16% of the total public budget.

The triple difference approach is also useful in showing potential spillover effects in Texas from the exit of the targeted banks to issuers with low/no exposure to the targeted banks. The specifications in columns 1, 3, and 5 examine this possibility by showing the estimate on the Texas $\times$ Post term and excluding the time $\times$ state fixed effects. The estimates in Panel A show the propensity to negotiate pricing remains similar for issuers with low/no reliance after the implementation of the Texas law. Column 1 of Panel B indicates a 5.2bps increase in yields for these issuers but focusing on the most reliant issuers shows a smaller and statistically insignificant change in offering yields in columns 3 and 5. These results suggest that the spillover effects to less reliant issuers are likely to be limited.

We complement to the triple difference analysis with inverse probability weighted regression estimates in Table 5, re-weighting the treatment and control groups to be more observably similar.

[17] The estimates in an earlier version of this paper using this same calibration were slightly larger, ranging from \$302 to \$532 million (Albright and Moran, 2022). This difference is a byproduct of using a May 2022 vintage of the Mergent data, which are updated and sometimes backfilled over time. The results in this version of the paper are based on a November 30, 2022, vintage of Mergent and has 30 more sample observations than the earlier vintage.

The first column shows that the likelihood of choosing a negotiation for issuers that are at least 50% reliant relative to the control group of issuers with no reliance increases by 29bps. This estimate is similar to that in the difference-in-differences and baseline triple difference specifications. The point estimate in column 2 indicates that issuers reliant on the exiting banks face an increase in offering yields of roughly 27bps, also closely comparable, albeit slightly smaller, to the 41bps point estimate shown in Panel B of Table 4. The analysis provides further evidence that the observed higher likelihood of negotiated sales and the increase in borrowing costs are unlikely to be driven by issuer selection based on unobservable or observable issuer and issue characteristics.

Finally, Table 6 explores the heterogeneity in source of treatment. Issuer-underwriter relationships can be formed through repeated negotiated sales with the same underwriter or through underwriters consistently winning the issuer's auctions. These different types of relationships may have different implications for how capital acquisition outcomes for affected municipalities may change after the implementation of the Texas laws. We test this hypothesis by constructing the targeted share variable based separately on either negotiated or auction offerings, but not both.

The estimates in the first two columns replicate Table 3. In columns 3 and 4 we construct the targeted share variable only based on previous negotiations, while in columns 5 and 6 the targeted share variable is based only on previous competitive sales. Issuers that have no negotiated or competitive deals between 2007 and 2016 have a missing targeted share in columns 3 and 4 or 5 and 6, respectively. These estimates point to an increase in the share of negotiations across both measures, but show a slightly different pattern for previous competitive interactions of issuers with the targeted banks. Issuers reliant on the targeted banks in previous auctions are more likely to switch away from competitive to negotiated sales. Finally, the effect of targeted reliance on offering yields is similar across specifications.

5.3 The Texas Laws and Underwriter Competition

In this section we examine the evolution of auction outcomes around the enactment of the Texas laws, which sheds light on how the municipal bond market responds to the decrease in potential

competition from the five large, exiting underwriters. Such evidence is useful for understanding the potential for competition to contribute to the results in Section 5.1. We therefore estimate Equation 1 only for the subset of competitive sales for three different auction outcomes: the winning bid (yield to maturity), the number of participating bidders, and the variance of the submitted bids. The outcome of interest, targeted share, is similarly normalized in terms of in-sample standard deviations, which is only 9% in the auction data leading to smaller estimated coefficients than in the Mergent data that includes negotiations.

Panel A of Table 7 shows the difference-in-difference estimates for the specifications matching Table 3. Column 1 shows that issuers most reliant on the exiting banks face significant increases in the winning bid of about 3.6bps. The number of bidders, a measure positively correlated with underwriter competition, decreases by 0.8 bidders for an additional standard deviation in reliance on the targeted banks (in column 2). Similarly, we find that an additional standard deviation of reliance on the targeted banks increases bid variance by 12.2bps, typically an outcome decreasing with competition in first price auctions (Garrett, Ordin, Roberts and Suárez Serrato, Forthcoming). In other words, fewer institutions participate in auctions, leading to less aggressive bidding by the remaining underwriters conditional on entry.

In Panel B of 7, we show these results are robust to the substantial primary market volatility during the COVID-19 pandemic by dropping all issues from March 2020 through August 2021. The results in all panels are qualitatively similar albeit slightly larger in economic magnitude for the number of bidders and the winning bid, while the point estimate of bid variance is similar but loses some statistical significance. Panel C presents a placebo test such that treatment begins on September 1, 2019 instead of in 2021, avoiding both COVID-19 and SB 13/19.[18] We fail to find any evidence that reliance on the targeted banks affects the competitive landscape in normal times, suggesting that general seasonality in auction participation around the implementation of the Texas laws does not explain our difference-in-differences estimates.

[18] We provide additional placebos in Appendix E.

5.4 Placement of Offerings with Investors

The increase in negotiation propensity and offering yield presented so far is consistent with a decrease in underwriter competition. It is important to understand whether these results are also driven by changes in the quality of underwriting services in the Texas market.

As issuers face lower access to the distribution networks of the targeted banks, underpiricing of the municipal bonds of affected issuers may also increase. The large underwriters targeted by the new Texas laws are much more likely to have national distribution networks and may be better at placing municipal bonds with a wider array of investors than the non-targeted regional or small underwriters. Similar to Bergstresser and Luby (2018) and Bergstresser and Herb (2021), we define underpricing as the log-difference of the volume-weighted average customer purchase prices within thirty days of the offering and the offering price of each maturity, averaged across different maturities proportional to a maturity's outstanding dollar volume in the issue.

Table 8 shows that average underpricing of the municipal bonds of affected issuers remains similar after the implementation of the laws even for issuers previously reliant on the targeted banks for the majority of their underwriting (column 4 through 6). Overall, the Texas laws do not appear to have an additional effect on pricing beyond decreasing bank competition. We also numerically calculate the decrease in yields that would explain the 9bp increase in underpricing for affected issuers from column 4. Given that the average bond from issuers with over 50% previous reliance on targeted banks has a maturity of 13.67 years, coupon rate of 3.65%, and offering yield of 1.79%, the lower average offering price is equivalent to a 0.1bps increase in offering yields.[19] This amounts to 1% of the estimated impact on yields from column 6 of Panel B of Table 4. While this effect is small economically and statistically insignificant, underpricing in the thirty days following a municipal bond offering may not be a comprehensive measure of underwriter quality. If new underwriters are not able to place bonds with the investors who value them most in 30 days,the underpricing measure will understate any adverse secondary market consequences of

[19]We estimate this implied yield increase by calculating bond prices at average characteristics with and without the observed underpricing. We numerically solve for the increase in yield associated with the lower offering price while holding cash flows constant, which is 0.1bps.

anti-ESG laws.

Table 9 also shows that the number of customer purchases increases by approximately 7-9% in response to a one standard deviation increase in reliance on the targeted banks. While the average size of customer trades declines since the implementation of the Texas laws, the total dollar volume of customer purchases as a fraction of outstanding issue amount increases by between 2.0-3.7%. Concurrently, average dealer trade size increases but dealer volume remains unchanged. These results imply a significant shift towards retail investor trades, or substituting away from the national intermediation chains of the exiting banks to a more local placement of bonds.

5.5 Decomposition of Yield Increases

So far, we have shown that Texas municipalities most affected by SB 13/19 (1) increase their use of negotiations and (2) face a large increase in borrowing costs. These patterns are consistent across a large set of robustness specifications. Additionally, there is a material decline in auction participation and a movement toward placing issues through a larger number of smaller, retail trades. In this section we quantify the importance of observable factors such as offering type and underwriter identity in explaining the observed increase in borrowing costs. While our results and robustness tests suggest that it is the anti-ESG laws that drive the increases in borrowing costs, it is plausible that merely switching the offering and underwriter type mechanically accounts for the bulk of our estimates. We rely on an effect decomposition in the spirit of Kitagawa-Oaxaca-Blinder (Kitagawa, 1955; Oaxaca, 1973; Blinder, 1973), in which the predicted change in outcomes can be decomposed into the change in characteristics multiplied by the original coefficients plus the change in coefficients multiplied by the original controls. We focus on the endogenous changes in discrete choices and their impacts on borrowing costs holding the yield impacts of those choices constant since we already control for the underlying characteristics of the bonds.

We show that issuers are more likely to negotiate pricing in response to the anti-ESG laws. Prior literature finds a mixed impact of negotiated sales on issue yields (see, for example, Sorensen, 1979*a*; Smith, 1987; Kriz, 2003; Liu, 2017; Cestau, Green, Hollifield and Schürhoff, 2019). To

assess the importance of this adjustment for interpreting our results, we combine estimates of the cost differential for negotiations from prior literature with our result that a 1 s.d. increase in targeted share translates to 8.2pp. increase in negotiations (Table 4, Panel A, column 2). To the extent that negotiating pricing allows issuers to obtain lower yields, our estimates are likely to understate the true impact on borrowing costs as yields would have been higher if issuers were not able to switch to negotiations. Using a selection model, Kriz (2003) estimates that negotiations translate to 24bps lower yields than counterfactual competitive sales, which combined with our estimates implies that the cost impact would have been 2bps ($\approx 24bps \times 8.2\%$) larger without this adjustment margin. By contrast, two more recent studies, Cestau, Green, Hollifield and Schürhoff (2019) and Liu (2017), show an average increase in yields of 17bps and 22bps, respectively, when choosing negotiations. The average of these estimates suggests that a 1 s.d. increase in targeted share leads to 1.6bps higher issue yields ($\approx 8.2\% \times 19.5bps$), or 15% of our yield estimate of 10.7bps in column (2) of Table 4. Thus, the higher negotiation propensity, at most, accounts for a relatively small portion of the higher offering yields we document following Texas SB 13/19.

Next, we quantify the impact of time-invariant underwriter characteristics. One of the mechanical effects of removing the five underwriters from the market is that issuers match with different underwriters after SB 13/19. To the extent that the newly-selected underwriters of affected issuers always place bonds through a different, higher-cost, distribution network, we may expect average yields to go up. Using the same intuition as above, we assess the importance of this mechanical change in underwriters by first estimating underwriter fixed effects for each underwriter in the pre-SB 13/19 period and then multiplying the targeted share in the post-period by the underwriter fixed effects. We estimate the underwriter fixed effects in the issue yield specification using equation 2 on the pre-period data (following column (2) of Table 4). The average underwriter fixed effects for issuers with 24% reliance on the targeted banks (a 1 s.d.) in the pre-period in Texas is -0.34bps—such issuers enjoyed roughly a 0.34 basis point lower issue yield than the average issue. Following SB 13/19 in Texas, this changes to -0.12bps, an increase of 0.22bps. Relative to column (2) of Table 4, time-invariant underwriter identity mechanically explains 2% of the yield increase.

Overall, based on this decomposition, time-invariant factors such as offering type and underwriter identity explain up to 17% of our yield estimate. Given such limited explanatory power of time-invariant factors and the decline in underwriter competition (see Section 5.3), it is plausible that higher mark-ups associated with reduced competition account for the bulk of the effect of SB 13/19 on offering yields. However, there are other potentially relevant explanations for the increase in offering yields such as underwriter capacity constraints (Boeh and Dunbar, 2016) or destruction of underwriter relationship assets (Dick-Nielsen, Nielsen and von Rüden, 2021).

6 Policy Implications

The frequent attempts of Citigroup to reenter the Texas market since the enactment of SB 13 and 19 suggests the anti-ESG laws may also be expensive to the targeted banks. In order to get a sense of the magnitude of potential losses, we provide two estimates of the underwriting profits targeted banks had to forgo as a result of the laws. Joffe (2016) conducts an audit study of municipal bond issuance fees, showing that issuers pay 1.02% of the proceeds of the average bond in issuance fees. Of these fees, 46.03% are underwriter discounts and 1.67% are other underwriter fees. Taken together with the fact that the targeted banks accounted for 35% of underwriting in the Texas market, these figures suggest these banks gave up $54 million in revenues during the sample period ($35\% \times \$31.8 \text{ billion} \times 1.02\% \times 47.7\% = \$0.054 \text{ billion}$). This measurement ignores costs incurred by banks during the underwriting process, so the ultimate profits are likely to be lower than $54 million. Another approach to estimate foregone profits is to use markup estimates from competitive auction bidding in Garrett, Ordin, Roberts and Suárez Serrato (Forthcoming), which estimates the largest issuers pay markups of 13.8bps on average. This approach also captures any other sources of potential underwriter profits such as dealer fees from secondary market trading (Brancaccio and Kang, 2022). Using the duration identity, this suggests a combined economic loss to the 5 targeted banks of up to $95 million, although this markup estimate may be inflated because it is not weighted according to dollar value and smaller issues have larger markups ($35\% \times \$31.8 \text{ billion} \times$

$6.2 \times 0.00138 = \$0.095$ billion). Both estimates suggest the potential for economically important losses to the banks leaving the Texas market.

After Citigroup conspicuously reentered the Texas municipal bond market through the Dallas-Fort Worth International Airport issue in April 2022 (highlighted in red in Panel A of Figure 1), three things happened in the market that make it difficult to identify whether the short-run effects we estimate will persist in the future. First, the state began sending letters to other municipal underwriters beyond the original targeted banks in early May to ask for information about potential discrimination of oil and gas firms (Hagan, Albright and Moran, 2022). Second, on May 13, 2022 JP Morgan Chase submitted a letter of compliance with the Texas laws, which was accompanied by a sustained increase in auction activity from the targeted banks as documented in Appendix Figure F.1. Citigroup, JP Morgan Chase, and Fidelity also all show up as municipal bond underwriters in Texas starting after April. Third, an early version of this paper circulated in May and generated interest in the press and among potential market entrants.[20]

We also leave open the possibility that the targeted banks may have changed their policies in some way to move into compliance with the Texas laws, although there is little evidence of such changes in the public discussions around the anti-ESG laws. The exiting banks deny discriminating against the oil and gas and firearms industries, instead arguing that limiting dealings with less sustainable industries for "ordinary business reasons."[21] We cannot rule out that more capital may flow into less sustainable industries in Texas than in the absence of SB 13 and 19, although we have no knowledge of such benefits to date.

Finally, the long-run effects of anti-ESG laws may also be dependent on the changing nature of the ESG landscape and other states adopting such laws. Throughout 2022, 17 states in total have proposed or passed laws to bar financial intermediaries with ESG policies from public finance

[20] See Albright and Moran (2022) for an early example of the public discussion.

[21] In a letter to Texas Comptroller Hegar on May 13, 2022, JP Morgan Chase stated "JPMC does not "boycott energy companies," as defined in Chapter 809 of the Texas Government Code... [T]he decisions JPMC makes are based on ordinary business reasons and reflect its overall objective of managing its business – including reputation risk – in a manner that balances serving the interests of its clients, customers and investors while protecting its own safety and soundness and complying with its obligations under all applicable laws." The letter is available at https://thetexan.news/wp-content/uploads/2022/05/2022-05-13-JPMorgan-Chase-Co.pdf, accessed Dec. 22, 2022.

markets (Schroeder, 2022). One such state is West Virginia, announcing in July 2022 that five financial institutions, JP Morgan Chase, Citigroup, Wells Fargo, Morgan Stanley, and Blackrock, would be banned from working with the state due to their policies toward the coal industry (Benoit, 2022). This list only shares one firm in common with the August 2022 list Texas Comptroller Hegar put forward regarding Texas SB 13 – Blackrock.[22] If the 17 states coordinate on the anti-ESG laws, they could substantially increase the costs to financial service companies as Texas only represents about 1/10 of the municipal bond market. A consortium of states could increase the costs to underwriters well above the $54 million in lost revenue discussed earlier. In other words, the costs of ESG policies from banks' perspective could start to outweigh the benefits. So far, anti-ESG laws do not appear to be coordinated across states. For example, Texas focuses on firearm policies, while WV emphasizes coal policies.

7 Conclusion

Taking ESG concerns and risks seriously through new policies has become one of the top priorities for the banking sector. Such policies, however, may pose significant challenges for jurisdictions that have historical reliance on less sustainable industries. The recent laws in Texas highlight how governments can respond to ESG policies of financial institutions to the detriment of local markets.

This paper explores how the policy change in Texas in 2021 through Senate Bills 13 and 19 affected municipal bond market outcomes. These laws stipulate that banks with ESG policies restricting credit to oil & gas companies or to firearms firms can no longer contract with local governments, causing five of the largest underwriters to exit municipal underwriting in the state. We exploit the stickiness of underwriter relationships in the municipal market to examine the impact of the anti-ESG laws on municipal financing.

We show that affected issuers face higher uncertainty in bond markets, receive fewer and less competitive bids from underwriters, and incur higher borrowing costs after the state prohibits banks

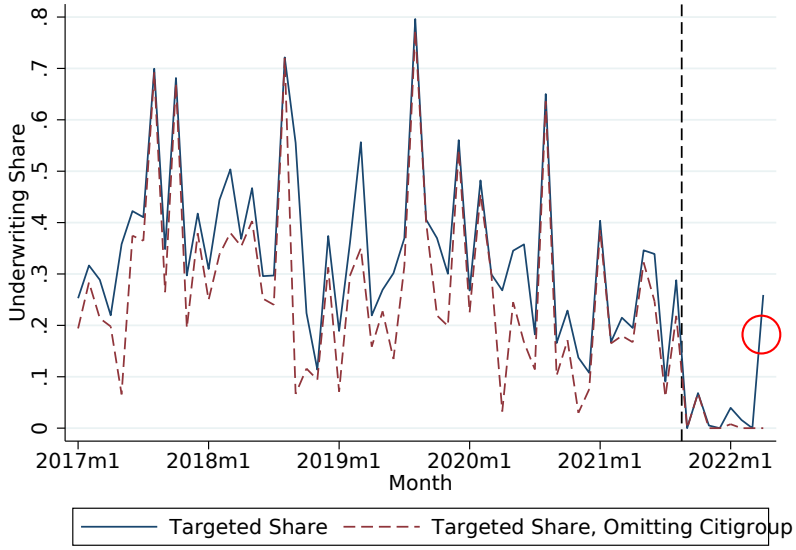
[22] See https://comptroller.texas.gov/about/media-center/news/20220824-texas-comptroller-glenn-hegar-announces-list-of-financial-companies-that-boycott-energy-companies-1661267815099.

with ESG policies from operating in the market. If this short-run impact were sustained in the long-run, Texas taxpayers could expect these bills to cost them about $416 million a year in additional borrowing costs. If more banks were to leave, these costs could go up. Ultimately, borrowing costs increase because there are fewer municipal underwriters competing for the state's municipal bonds, while the national bond placement networks of the major banks do not appear to have much explanatory power on their own. Our results suggest that if economies around the world that are heavily reliant on less sustainable industries attempt to undo specific bank ESG policies by imposing restrictions on the financial sector, local borrowers are likely to face significant adverse consequences such as decreased credit access and poor financial markets outcomes.

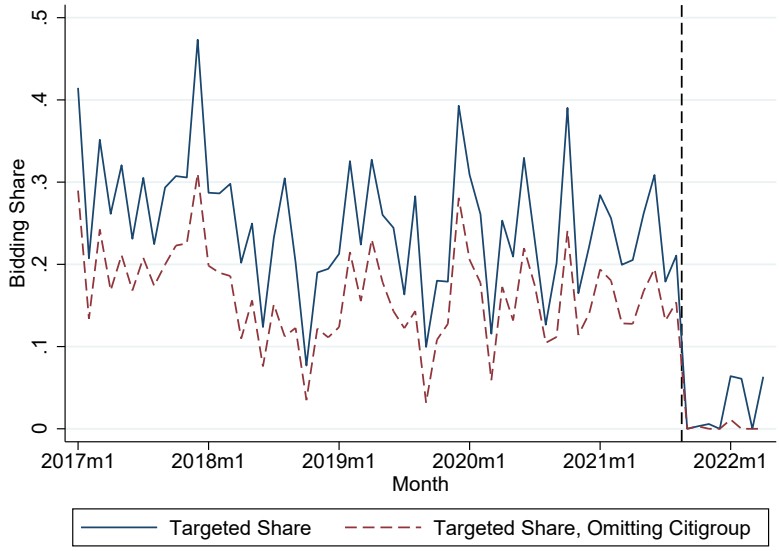
Figures

Figure 1: Texas Market Share of Targeted Banks

A. Share of Underwriting by Targeted Banks, Weighted by Offering Amt

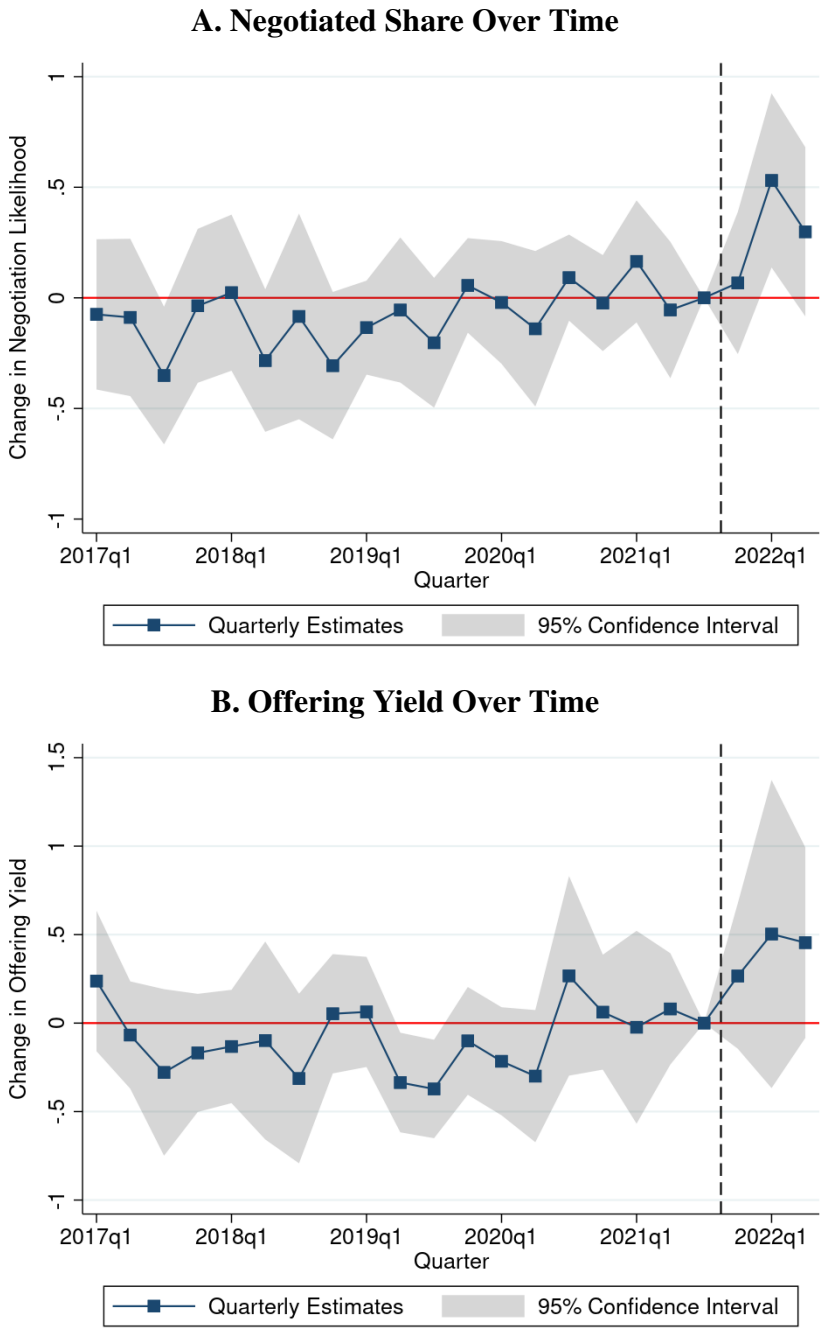


B. Share of Bids from Targeted Banks, Weighted by Principal



Note: Figure 1 shows the share of total underwriting activity (Panel A) and competitive bidding (Panel B) in Texas by banks targeted by Texas SB 13/19. Both panels are weighted according to par value of the issues. Before 2021, targeted banks underwrote around 40% of municipal bonds in Texas and submitted around 25% of competitive bids. These shares both drop to 0% in September 2021. The vertical dashed line represents the break before September 2021 when Senate Bills 13 and 19 were implemented. In following months, Citigroup attempts to resume submitting a small number of bids and underwriting in a limited capacity. In Panel A, the increase in underwriting in April 2022, circled in red, is due to Citigroup underwriting a $1.2 billion deal for the Dallas/Fort Worth International Airport.

Figure 2: Long Term Trends in Negotiated Share and Offering Yields by Targeted History



Note: Figure 2 shows the quarterly distribution of the estimated effect of issuer targeted bank reliance on share negotiated (Panel A) and offering yield (Panel B) over time. We estimate these effects using specifications with issuer, offering date, maturity (in months), and issue type (in the yield specification) fixed effects. Issuer reliance on the targeted banks takes the value of one if these banks underwrite at least 50% of the issuer's municipal bond volume between 2007 and 2016. The quarterly effects are defined relative to the implementation of the Texas law of September 1, 2021. In other words, 2021Q4 corresponds to September, October, and November of 2021, while 2022q1 corresponds to December, January, and February of 2022.

Tables

Table 1: Municipal Bonds Issuance Characteristics

A. Differences Between Texas and non-Texas offerings

	Mean	SD	Obs	25^{th}	50^{th}	75^{th}
Average Offering Amount (Mil), 2017-22	32	121	76992	2	7	22
Non-Texas	33	113	67446	2	7	22
Texas	29	165	9546	2	6	18
Average Maturity (Months)	131	97	69299	55	118	186
Non-Texas	127	99	61507	46	110	179
Texas	164	73	7792	116	159	204
Average Yield (Percent)	1.96	1.24	74309	1.17	1.79	2.51
Non-Texas	1.97	1.26	64903	1.17	1.79	2.51
Texas	1.88	1.06	9406	1.21	1.77	2.48
Targeted Share	0.16	0.26	64502	0.00	0.00	0.26
Non-Texas	0.16	0.26	56861	0.00	0.00	0.27
Texas	0.13	0.23	7641	0.00	0.00	0.16
Negotiated Share	0.50	0.50	76992	0.00	1.00	1.00
Non-Texas	0.50	0.50	67446	0.00	1.00	1.00
Texas	0.51	0.50	9546	0.00	1.00	1.00
Fraction Taxable	0.14	0.34	69299	0.00	0.00	0.00
Non-Texas	0.14	0.35	61507	0.00	0.00	0.00
Texas	0.09	0.29	7792	0.00	0.00	0.00

B. Within Texas Statistics: Targeted Bank Reliance

	Mean	SD	Obs	25^{th}	50^{th}	75^{th}
Average Offering Amount (Mil), 2017-22	32	121	76992	2	7	22
Texas, Non-targeted	21	65	8807	2	5	14
Texas, Targeted	135	536	739	15	36	112
Average Maturity (Months)	131	97	69299	55	118	186
Texas, Non-targeted	164	72	7058	116	160	204
Texas, Targeted	162	83	734	106	150	208
Average Yield (Percent)	1.96	1.24	74309	1.17	1.79	2.51
Texas, Non-targeted	1.87	1.07	8683	1.19	1.75	2.47
Texas, Targeted	2.04	0.84	723	1.43	2.04	2.60
Negotiated Share	0.50	0.50	76992	0.00	1.00	1.00
Texas, Non-targeted	0.51	0.50	8807	0.00	1.00	1.00
Texas, Targeted	0.44	0.50	739	0.00	0.00	1.00
Fraction Taxable	0.14	0.34	69299	0.00	0.00	0.00
Texas, Non-targeted	0.09	0.28	7058	0.00	0.00	0.00
Texas, Targeted	0.12	0.32	734	0.00	0.00	0.00

Note: Table 1 presents summary statistics of municipal offerings comparing offerings based on Texas and non-Texas offerings (Panel A) and based on whether the bond was underwritten by one of the targeted banks or not (Panel B). The data come from Mergent and are restricted to the sample from 2017 through April 2022.

Table 2: Characteristics of Underwriter Auction Participation by Targeted Status

	Mean	SD	Obs	25^{th}	50^{th}	75^{th}
Total Number of Bids, 2008-21	771.3	2649.6	509	10.0	33.0	233.0
Texas Presence, Non-targeted	4145.2	5624.2	57	634.0	2479.0	5718.0
Texas Presence, Targeted	7980.0	4954.5	5	3655.0	10217.0	10521.0
Average Size of Issue (Millions)	14.1	60.7	509	1.5	3.0	8.6
Texas Presence, Non-targeted	54.9	162.0	57	6.9	14.7	29.6
Texas Presence, Targeted	113.9	98.3	5	83.8	88.0	104.0
Average Maturity of Issue with Bid	6.7	5.9	509	1.1	4.2	11.5
Texas Presence, Non-targeted	13.7	4.9	57	11.4	14.4	16.4
Texas Presence, Targeted	14.6	1.5	5	13.4	15.4	15.6
Average Number of Other Bidders	4.0	1.8	509	3.1	3.8	4.8
Texas Presence, Non-targeted	6.1	1.9	57	4.9	5.9	6.7
Texas Presence, Targeted	7.3	1.1	5	7.1	7.1	7.4
Texas Bids as a Share of all bids	4.1	14.1	509	0.0	0.0	0.0
Texas Presence, Non-targeted	21.1	29.0	57	3.3	10.0	26.2
Texas Presence, Targeted	7.7	3.0	5	4.7	8.6	9.6
Number of States with Bids	8.9	14.2	509	1.0	2.0	8.0
Texas Presence, Non-targeted	34.7	15.8	57	24.0	41.0	47.0
Texas Presence, Targeted	47.4	4.3	5	47.0	50.0	50.0

Note: Table 2 presents summary statistics of the Bond Buyer data aggregated to the bidder level. 509 banks submit at least 5 bids from 2008 to April 2022, of which 62 participate in the Texas Market. This exhibit shows the average characteristics separately for all 509 underwriters, the 57 underwriters that underwrite in Texas and do not appear to leave in September 2021, and the 5 targeted banks that leave the Texas municipal underwriting market in September 2021.

Table 3: **Within Texas Impact on Borrowing Outcomes**

A. Effects on Negotiated Share

	Negotiated			
	(1)	(2)	(3)	(4)
Targeted Share × Post	0.074***			
	(0.020)			
Targeted Share 10% × Post		0.189***		
		(0.055)		
Targeted Share 20% × Post			0.172***	
			(0.062)	
Targeted Share 50% × Post				0.231**
				(0.090)
Observations	6,805	6,805	6,805	6,805
Issuer FE	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes
Maturity-Month FE	Yes	Yes	Yes	Yes
Offering Type FE	No	No	No	No

B. Effects on Offering Yields

	Offering Yield			
	(1)	(2)	(3)	(4)
Targeted Share × Post	0.083***			
	(0.031)			
Targeted Share 10% × Post		0.174***		
		(0.058)		
Targeted Share 20% × Post			0.204***	
			(0.073)	
Targeted Share 50% × Post				0.381***
				(0.142)
Observations	6,740	6,740	6,740	6,740
Issuer FE	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes
Maturity-Month FE	Yes	Yes	Yes	Yes
Offering Type FE	Yes	Yes	Yes	Yes

Note: This table investigates the relation between bond issuance outcomes and issuer reliance on the underwriters targeted by Texas SB 13/19. We study two outcomes at the municipal offering level between January 2017 and April 2022: the probability of a negotiated offering (Panel A) and average yield. Targeted Share is defined as the share of the total dollar volume of municipal securities of each issuer underwritten by the targeted banks between 2007 and 2016. Targeted Share 10%, 20%, and 50% are indicator variables taking the value of one whenever the targeted banks had underwritten at least 10%, 20%, and 50% of offering volume for a given issuer and zero otherwise. Post takes the value of one since the implementation of SB 13/19 in September of 2021 and zero otherwise. All specifications include the natural logarithm of the total offering dollar amount as well as the fixed effects denoted at the end of each panel. The standard errors are double clustered at the issuer and offering date level.

Table 4: **Impact on Borrowing Outcomes: Triple Difference**

A. Effects on Negotiated Share

	(1)	(2)	(3)	(4)	(5)	(6)
Targeted Share × Post × TX	0.081***	0.082***				
	(0.026)	(0.024)				
Targeted Share 20% × Post × TX			0.177***	0.171***		
			(0.066)	(0.062)		
Targeted Share 50% × Post × TX					0.144	0.159*
					(0.093)	(0.091)
Post × TX	0.007		-0.036		-0.012	
	(0.028)		(0.033)		(0.031)	
Observations	59,736	57,672	59,736	57,672	59,736	57,672

B. Effects on Offering Yields

	Yield					
	(1)	(2)	(3)	(4)	(5)	(6)
Targeted Share × Post × TX	0.065	0.107**				
	(0.042)	(0.045)				
Targeted Share 20% × Post × TX			0.086	0.152**		
			(0.073)	(0.072)		
Targeted Share 50% × Post × TX					0.296**	0.407**
					(0.148)	(0.170)
Post × TX	0.052**		0.028		0.025	
	(0.026)		(0.028)		(0.025)	
Observations	57,972	55,980	57,972	55,980	57,972	55,980
Issuer FE	Yes	No	Yes	No	Yes	No
GO x Issuer FE	No	Yes	No	Yes	No	Yes
Date FE	Yes	Yes	Yes	Yes	Yes	Yes
Maturity FE	Yes	No	Yes	No	Yes	No
Mat x Month FE	No	Yes	No	Yes	No	Yes
State x Month FE	No	Yes	No	Yes	No	Yes
Issuance Amt x Month FE	No	Yes	No	Yes	No	Yes

Note: This table investigates the relation between bond issuance outcomes and issuer exposure to the underwriters targeted by Texas SB 13/19. We study two outcomes at the municipal offering level between January 2017 and April 2022: the probability of a negotiated offering (Panel A) and average yield (Panel B). Targeted Share is defined as the share of the total dollar volume of municipal securities of each issuer underwritten by the targeted banks between 2007 and 2016. Targeted Share 10%, 20%, and 50% are indicator variables taking the value of one whenever the targeted banks had underwritten at least 10%, 20%, and 50% of offering volume for a given issuer and zero otherwise. Post takes the value of one since the implementation of SB 13/19 in September of 2021 and zero otherwise. TX is an indicator equal to one if the issue takes place in Texas. All specifications include the natural logarithm of the total offering dollar amount as well as the fixed effects denoted at the bottom of Panel B. The standard errors are double clustered at the issuer and offering date level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: **Within Texas Impact on Borrowing Outcomes: Inverse Probability Weights**

	Negotiated	Yield
	(1)	(2)
Targeted Share 50% × Post	0.288**	0.274**
	(0.118)	(0.133)
Log(Issuance Amt)	0.024**	-0.073
	(0.011)	(0.064)
Observations	3,371	3,328
Issuer FE	Yes	Yes
Month FE	Yes	Yes
Maturity FE	Yes	Yes
Offering Type FE	No	Yes

Note: This table investigates the relation between bond issuance outcomes and issuer exposure to the underwriters targeted by Texas SB 13/19. We study 2 outcomes at the municipal offering level between January 2017 and April 2022: (1) the probability of a negotiated offering and (2) average yield. The observations are weighted according to the inverse likelihoods from a first-stage logistic regression predicting the likelihood of having over 50% reliance on the targeted banks (described in Appendix C). Targeted Share 50% is an indicator variable equal to one whenever the targeted banks had underwritten at least 50% of the municipal securities of a given issuer between 2007 and 2016 and zero if the issuer has no reliance on targeted banks. This ensures issuers with intermediate values of reliance are not included in the sample. Post takes the value of one since the implementation of SB 13/19 in September of 2021 and zero otherwise. The standard errors are double clustered at the issuer and offering date level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: **Within Texas Impact on Borrowing Outcomes: Heterogeneity**

	Negotiated	Yield	Negotiated	Yield	Negotiated	Yield
	(1)	(2)	(3)	(4)	(5)	(6)
Targeted Share × Post	0.074***	0.083***				
	(0.020)	(0.031)				
Targeted Share (NEG) × Post			0.066**	0.065**		
			(0.028)	(0.027)		
Targeted Share (COMP) × Post					0.087***	0.060**
					(0.022)	(0.025)
Observations	6,805	6,740	4,931	4,878	5,862	5,813
Issuer FE	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Maturity FE	Yes	Yes	Yes	Yes	Yes	Yes
Offering Type FE	No	Yes	No	Yes	No	Yes

Note: This table investigates the relation between bond issuance outcomes and issuer exposure to the underwriters targeted by Texas SB 13/19. We study two outcomes at the municipal offering level between January 2017 and April 2022: the probability of a negotiated offering (columns 1, 3, and 5) and offering yield (columns 2, 4, and 6). Targeted Share is defined as the share of the total dollar volume of municipal securities of each issuer underwritten by the targeted banks between 2007 and 2016. We compute Share Targeted (NEG) and (COMP) within the subset of past negotiated or competitive offerings, respectively. Post takes the value of one since the implementation of SB 13/19 in September of 2021 and zero otherwise. All specifications include the natural logarithm of the total offering dollar amount as well as the fixed effects denoted at the end of each panel. The standard errors are double clustered at the issuer and offering date level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Within Texas Impact on Competitive Sale Outcomes

A. Outcomes for Affected Auctions

	Winning Bid	# Bidders	Bid Variance
	(1)	(2)	(3)
Targeted Share × Post	0.036***	-0.772***	0.122***
	(0.014)	(0.242)	(0.041)
Log(Issuance Amt)	-0.035***	0.565***	0.004
	(0.009)	(0.113)	(0.021)
Observations	2425	2425	2425
Issuer FE	Yes	Yes	Yes
Date FE	Yes	Yes	Yes
Maturity Month FE	Yes	Yes	Yes

B. Robustness to Dropping COVID-19 Months

	Winning Bid	# Bidders	Bid Variance
	(1)	(2)	(3)
Targeted Share × Post	0.061***	-1.470***	0.100*
	(0.018)	(0.305)	(0.059)
Log(Issuance Amt)	-0.053***	0.538***	0.024
	(0.011)	(0.200)	(0.032)
Observations	1424	1424	1424
Issuer FE	Yes	Yes	Yes
Date FE	Yes	Yes	Yes
Maturity Month FE	Yes	Yes	Yes

C. Outcomes for Placebo Auctions

	Winning Bid	# Bidders	Bid Variance
	(1)	(2)	(3)
Targeted Share × Post (2019)	0.011	0.201	0.008
	(0.016)	(0.216)	(0.034)
Log(Issuance Amt)	-0.047***	0.662***	0.012
	(0.014)	(0.113)	(0.027)
Observations	1793	1806	1806
Issuer FE	Yes	Yes	Yes
Date FE	Yes	Yes	Yes
Maturity Month FE	Yes	Yes	Yes

Note: This table presents regression estimates of Equation 1 for competitive auction outcomes as a function of the standardized share of bids that historically came from the targeted banks. These outcomes are the winning bid (true interest cost), the number of bidders, and the variance of all submitted bids. Panel A shows the baseline estimates. Panel B shows the effects, while omitting the Covid pandemic period (March 2020 through August 2021), and Panel C replaces the Post indicator with a Post (2019) indicator that is equal to 1 for September 2019 through April 2020 and the sample ends in April 2020 matching the actual treatment ending in April 2022. Standard errors are double clustered at the issuer and offering day levels. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: **Underpricing of Municipal Bonds.**

	Underpricing					
	(1)	(2)	(3)	(4)	(5)	(6)
Targeted Share × Post	0.0001	-0.0001	-0.0000			
	(0.0002)	(0.0003)	(0.0003)			
Targeted Share 50% × Post				0.0009	0.0007	0.0007
				(0.0009)	(0.0011)	(0.0011)
Log(Issuance Amt)	0.0003**			0.0003**		
	(0.0001)			(0.0001)		
Log(Av. Trade Size)	-0.0009***	-0.0010***		-0.0009***	-0.0010***	
	(0.0001)	(0.0001)		(0.0001)	(0.0001)	
Observations	6,148	5,389	5,389	6,148	5,389	5,389
Issuer FE	Yes	No	No	Yes	No	No
GO x Issuer FE	No	Yes	Yes	No	Yes	Yes
Date FE	Yes	Yes	Yes	Yes	Yes	Yes
Maturity FE	Yes	Yes	Yes	Yes	Yes	Yes
Offering Type FE	Yes	Yes	Yes	Yes	Yes	Yes
Mat x Month FE	No	Yes	Yes	No	Yes	Yes
Log(Issuance) x Month FE	No	Yes	Yes	No	Yes	Yes
Log(Av. Trade Size) x Month FE	No	No	Yes	No	No	Yes

Note: This table investigates the relation between 30-day underpricing and issuer exposure to the underwriters targeted by Texas SB 13/19. Underpricing is the log-difference of the volume-weighted average customer purchase prices within 30 days of the offering and the offering price of a given bond series, averaged across all series in a given issue that trade on the secondary market proportionally to the principal amount of each series. The sample runs from January 2017 through April 2022. Targeted Share is the issuer-level share of sales of each type that were underwritten by the exiting banks from 2007 through 2016, while Post takes the value of one since the implementation of SB 13/19 in September of 2021 and zero otherwise. All specifications include the natural logarithm of the total offering dollar amount, the natural logarithm of the average par value per customer trade, as well as the fixed effects denoted at the end of each panel. The standard errors are double clustered at the issuer and offering date level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: **Placing the Issuance with Investors.**

A. Base Specification

	Log(# Trades)		Log(Trade Size)		Volume	
	Customer	Dealer	Customer	Dealer	Customer	Dealer
	(1)	(2)	(3)	(4)	(5)	(6)
Targeted Share × Post	0.066*	-0.041	-0.130***	0.035	0.020**	0.051
	(0.038)	(0.060)	(0.043)	(0.048)	(0.009)	(0.044)
Observations	6,431	5,608	6,431	5,608	6,805	6,805
Issuer FE	Yes	Yes	Yes	Yes	Yes	Yes
Date FE	Yes	Yes	Yes	Yes	Yes	Yes
Maturity FE	Yes	Yes	Yes	Yes	Yes	Yes
Offering Type FE	Yes	Yes	Yes	Yes	Yes	Yes

B. Robustness

	Log(# Trades)		Log(Trade Size)		Volume	
	Customer	Dealer	Customer	Dealer	Customer	Dealer
	(1)	(2)	(3)	(4)	(5)	(6)
Targeted Share × Post	0.094*	-0.039	-0.167***	0.104	0.037***	0.096
	(0.055)	(0.082)	(0.062)	(0.073)	(0.012)	(0.060)
Observations	5,687	4,870	5,687	4,870	6,062	6,062
GO x Issuer FE	Yes	Yes	Yes	Yes	Yes	Yes
Date FE	Yes	Yes	Yes	Yes	Yes	Yes
Mat (years) x Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Issuance Amt x Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Offering Type FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table investigates the relation between trade count, average trade size, and total par traded volume in the secondary municipal bond market within 30 days of an issue's offering date and issuer exposure to the underwriters targeted by Texas Senate Bills 13/19. Log(# Trades) is the natural logarithm of the total trade count of all bonds underlying a given bond issue. Log(Trade Size) is the natural logarithm of the average trade size for a given bond series, averaged across all bonds in a given issue that trade on the secondary market proportionally to the principal amount of each bond series. Volume is the total par value of a given bonds issue, divided by the total principal amount of the series within the issue that trade on the secondary market. The sample runs from January 2017 through April 2022. Targeted Share is the issuer-level share of bond sales that were underwritten by the exiting banks from 2007 through 2016, while Post takes the value of one since the implementation of SB 13/19 in September of 2021 and zero otherwise. All specifications include the natural logarithm of the total offering dollar amount, the natural logarithm of the average par value per customer trade, as well as the fixed effects denoted at the end of each panel. The standard errors are double clustered at the issuer and offering date level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

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Internet Appendix: Not For Publication

This appendix includes several sections of supplemental information. Appendix A contains definitions for all the variables used in the paper. Appendix B provides a brief overview of the municipal bond issuance process. Appendix C shows the logit estimates describing the types of issuers who selected to work with targeted banks. Appendix D shows the estimated impact on quantity of bonds issued. Appendix E includes many robustness and specification checks to the analysis in the main paper. Appendix F discusses market changes after April 2022. Appendix G describes the auction data from The Bond Buyer in more detail.

A Variable Definitions

Variable Name	**Description**
Targeted Banks	The targeted banks are the 5 banks that were targeted and do appear to have exited the Texas market after Texas Senate Bills 13/19. These banks include JPMorgan Chase, Citigroup, Goldman Sachs, Bank of America, Fidelity Capital Markets. This list includes banks that (1) were active in Texas underwriting in 2007-2021, (2) did not file a letter of compliance, (3) do not underwrite in Texas in September 2021, and (4) continue underwriting in other states during the period when they do not operate in Texas. *Source:* The Municipal Advisory Council of Texas and manual data gathering by the authors.
Targeted Share	The share of an issuer's total dollar value of bond sales underwritten by the targeted banks between 2007 and 2016. *Source:* Authors' calculations from the Mergent Municipal data.
Targeted Share X%	An indicator variable taking the value of one whenever the issuer's share of bond sales underwritten by the targeted banks between 2007 and 2016 exceeds X% (by issue amount), and zero otherwise. X takes the value of 10, 20, and 50. *Source:* Authors' calculations from the Mergent Municipal data.
Targeted Share (Bids)	The share of all bids, weighted by the principal value of the underlying issue, received from the targeted banks. *Source:* Authors' calculations from The Bond Buyer.
Post	Post-August 31, 2021, indicator.
Offering Amount	Also referred to as "issuance amount" throughout the text, is the total principal dollar value of a given bond issue. The offering amount is also the sum of the principal amounts across all bonds series of a given issue. A given bond issue is typically comprised of different series, or "maturities." *Source:* Mergent Municipal.

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Table A.1 – *Continued from previous page*

Variable	**Description**
Offering Date	The date at which the underwriter purchases the municipal bond issue from the issuer. *Source:* Mergent Municipal.
Maturity	The issue maturity is the principal-weighted average maturity across all series of a given bonds issue, rounding the resulting values to the nearest month. The maturity of a given bond series is defined as the difference between the maturity date of the series and the issue offering date. *Source:* Mergent Municipal.
Type of Sale	This is a description of how a bond is placed with an underwriter or final investor. The main categories are competitive sales (auctions) and negotiations. Other categories include limited and private placements. *Source:* Mergent Municipal.
Offering Yield	The offering yield at the issue level is the average of offering yields across different bond series in the same bond issue. The offering yield for a given bond series is the original yield at which the series is made available to issuers. *Source:* Mergent Municipal.
Underpricing	The log-difference of the volume-weighted average customer purchase prices within 30 days of the offering and the offering price of a given bond series, averaged across all series in a given issue that trade on the secondary market proportionally to each series principal amount. *Source:* MSRB Trade Data.
Log(# Trades)	The natural logarithm of the total trade count across all trades of a given bond issue within 30 days of the offering date. We compute this measure separately for customer purchases and dealer trades. *Source:* MSRB Trade Data.
Log(Trade Size)	The natural logarithm of the average trade size for a given bond series within 30 days of the offering date, averaged across all series in a given issue that trade on the secondary market proportionally to the principal amount of each series. We compute this measure separately for customer purchases and dealer trades. *Source:* MSRB Trade Data.
Volume	The total par value of a given bonds issue traded within 30 days of the offering date, divided by the total principal amount of the bonds series within the issue that trade on the secondary market. We compute this measure separately for customer purchases and dealer trades. *Source:* MSRB Trade Data and Mergent Municipal.
Issuer	The group of the long issuer name and the state in which the issuer exists. *Source:* Mergent Municipal.

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Table A.1 – *Continued from previous page*

Variable	Description
State of Issue	The state in which a given issuer exists. *Source:* Mergent Municipal.
Winning Bid	The yield that the winning underwriter submitted in each auction. *Source:* The Bond Buyer.
# Bidders	The count of bids submitted in each auction. *Source:* The Bond Buyer.
Bid Variance	The variance of bids that are submitted in each auction. *Source:* Authors' calculations from The Bond Buyer.
Low Local Clientele	A group of states without state-level beneficial tax treatment for local muni bond interest. This includes all states without a personal income tax (Alaska, Florida, New Hampshire, Nevada, South Dakota, Tennessee, Texas, Washington, and Wyoming) as well as states that do not exempt income on local bonds from state taxes (Illinois, Iowa, Nebraska, Oklahoma, Utah, and Wisconsin).

B Municipal Bond Primary Market Process

State and local governments in the US issue around $400 billion per year of municipal bonds to finance projects such as roads, schools, water treatment plants, hospitals, and other local infrastructure. Over 50,000 unique state and local governments have issued municipal bonds since 1965 and there are currently over 1.2 million individual securities outstanding in the market. The bond issuance process exhibits substantial heterogeneity driven by differences in state regulations and project type. After selecting an investment project, municipalities typically choose four major aspects of the issuance process: (1) the bond counsel and municipal advisor, (2) whether to hold a public sale (a first price, sealed bid auction) or to negotiate directly with the underwriter, (3) the issuance amount and a timeline of repayment, and (4) covenants and contract terms such as call provisions credit enhancements, and collateral.

The bond counsel is a law firm that ensures the bond offering complies with state and local statutes (for further discussion, see Kraft (2012)). Similarly, the municipal advisor is a financial firm that offers a variety of services guiding a municipal entity through the issuance process and aids with public disclosure (Bergstresser and Luby, 2018; Garrett, 2021). The sale type—either public sale through an auction, negotiation with a single underwriter, or private placement with a final investor—guides the rest of the issuance process. In a public sale, the municipality first structures the bond package into different securities based on maturities and other characteristics then creates the necessary public disclosure documents. Underwriters compete to offer the lowest combined yield-to-maturity to the municipality, referred to as "True Interest Cost." The underwriter with the lowest bid purchases the entire issue at this price and then sells it to investors.

In a negotiation, the issuer involves the underwriter earlier in the issuance process. The underwriter can help the municipality choose a term structure and other bond characteristics that are

most appropriate for both parties. Many municipalities still try to encourage competitive forces to keep costs low in a negotiation by holding a request for proposals before choosing an underwriter with whom to negotiate. In a private placement, the timeline is more similar to a negotiation than to a public sale, but the final securities do not need to be structured in a way that would allow sale in the secondary market.

The offering type decision depends on two key aspects of the issue. The first aspect pertains to whether the bond will trade on the secondary market—competitive or negotiated offerings typically do, while bank loans and private placements do not. Ivanov and Zimmermann (2021) explore the increase in "private" debt in the municipal space in the last 20 years noting that it has become a more substantial portion of the market. The second aspect relates to whether the issuer chooses an underwriter before or after the bond is structured. The choice of competition vs. negotiation is one of the oldest lines of inquiry in the security design literature (Sorensen, 1979*a*), with recent studies corroborating this margin has a large impact on municipal borrowing costs. For example, Cestau, Green, Hollifield and Schürhoff (2019) finds that negotiations are costlier than competitive sales while focusing on variation in offering types driven by statutory requirements.

C Estimates of Selection Model for Inverse Probability Weights

Before Texas Senate Bills 13 and 19, the targeted banks were not working with a perfectly random sample of issuers in Texas. These banks, by their stature as large national banks, often work with the largest issuers and issuers who may be trying to place bonds outside of Texas. In Section 5.2, we present an inverse probability of treatment weights approach that allows us to focus the attention of the analysis on marginally treated issuers. In that analysis, we discretize the treatment into issuers who were over 50% reliant on exiting banks while the control group is made up of issuers who had no interaction with exiting banks. The idea of the analysis is to verify that the selection on issuer types is not the key factor driving the results. The weighted regressions find very similar magnitudes as the baseline triple differences specifications, which suggests that these differences in issuer observables is not important for our inference although the selection may be very important for contextualizing the business these banks engage in.

In a first stage in the inverse probability weights analysis, we estimate a logit model that describes the likelihood of being in the treated group relative to the control. The control variables are all defined by the historical issuing patterns of the issuer from January 2017 through August 2021. The control variables include average issue size in millions of nominal dollars, the number of issues, the share of issues that were placed with an underwriter by negotiation, the share of issues that are exempt from all personal income taxes, the share of issues that were refunding outstanding debt and the average time to final maturity in years.

The estimates from this regression are presented in Table C.1. The results paint a striking picture of how issuers with more reliance on targeted banks are different from other issuers. First, the issuers with a large targeted share are much larger than other issuers, issuing larger bonds more frequently than the control issuers. There is not readily apparent selection by issuers who prefer to negotiate or hold competitive auctions. Issuers with more taxable bond issues, which are often placed with a more national or global set of investors instead of the general in-state segmentation common with municipal bonds (Babina, Jotikasthira, Lundblad and Ramadorai, 2021), are more likely to be reliant on the exiting banks. However, it does not appear this is related to the TCJA new tax treatment of advanced refunding issues because those issuers with relatively more refunding

Table C.1: **Selection of Targeted Banks**

	Targeted Share (50%)
	(1)
Average Issue Size (Millions)	0.032***
	(0.004)
Number of Issues	0.060***
	(0.013)
Share Negotiated	0.532
	(0.418)
Share Tax Exempt	-0.796*
	(0.475)
Share Refunding	-0.824*
	(0.452)
Average Maturity (Years)	-3.130**
	(1.239)
Observations	1,272

Note: Table C.1 presents estimates from a logit regression that predicts which issuers, as a function of their recent borrowing histories, are likely to be heavily reliant on the exiting banks. The sample for this regression is restricted to issuers who issue at least once in Texas between January 2017 and August 2021. Robust standard errors are included in parentheses. See Section C for a discussion of the control variables. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

issues are less likely to have been reliant on exiting banks. Finally, issuers with shorter maturity bonds, on average, are more likely to be reliant on the targeted banks.

D Credit Quantity Responses

A possible margin of response when losing access to a certain group of underwriters is whether to issue at all or to change the size of a municipal issuance. A change in equilibrium quantities of credit could arise either due to the change in prices – the increasing yield decreases quantity of credit demanded – or due to losing market access through a relationship with an intermediary.

This section tests whether there are observable changes on the extensive margin of seeking credit or on the intensive margin of the size of the issue. To begin, we aggregate the bond issuance data in Mergent Municipal to the issuer-month level for all issuers in Texas with at least one bond issue between 2017 and April 2022. The variables of interest are the count of issues and the total principal value issued in each month for each issuer from January 2017 through April 2022. With this panel, we follow a similar difference-in-differences specification as described in equation 1 while changing the outcome variable to be one of three quantity outcomes: (1) an indicator equal to one for a month-issuer with a bond issue, (2) the inverse hyperbolic sine of the principal issued, and (3) the nominal amount of principal issued. The specifications include month and issuer fixed effects, but they must omit day and maturity controls due to the level of aggregation.

We regress each outcome on the interaction of $\textit{Targeted Share}_i$, which is fixed at the issuer level, and an indicator for months after August 2021 in addition to the issuer and month fixed effects. The coefficient of interest is the marginal impact of having more reliance on exiting banks

Table D.1: **Impact on Likelihood and Amount of Borrowing**

A. Quantities Compared within Texas, Difference-in-Differences

	P(Issue)	IHS(Principal Issued)	Principal Issued
	(1)	(2)	(3)
Targeted Share × Post	-0.001	-0.023	-86013.137
	(0.002)	(0.047)	(63953.738)
Observations	103,168	103,168	103,168
Issuer FE	Yes	Yes	Yes
Month FE	Yes	Yes	Yes

B. Comparing Texas to Other States, Triple Difference

	P(Issue)	IHS(Principal Issued)	Principal Issued
	(1)	(2)	(3)
Targeted Share × Post × Texas	-0.001	-0.016	-48908.265
	(0.002)	(0.044)	(59286.147)
Observations	1,054,784	1,054,784	1,054,784
Issuer FE	Yes	Yes	Yes
State × Month FE	Yes	Yes	Yes

Note: Table D.1 investigates the relation between bond issuance outcomes and issuer exposure to the underwriters targeted by Texas Senate Bills 13/19. We study three outcomes at the issuer-month level between January 2017 and April 2022: probability of issuing (column 1), the inverse hyperbolic sine of the principal issued (column 2), and the (column 3). Targeted Share is defined as the share of the total dollar volume of municipal securities of each issuer underwritten by the targeted banks between 2007 and 2016 scaled to standard deviations. Post takes the value of one since the implementation of SB 13/19 in September of 2021 and zero otherwise. All specifications include issuer and month fixed effects. Panel A shows the estimates from a difference-in-differences specification while the second panel shows estimates from a triple difference specification with state-by-month fixed effects. Standard errors clustered at the issuer and month levels are included in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

after the 5 large banks were barred from operating in Texas. These estimates are displayed in Panel A of Table D.1. The column (1) shows the estimate for the linear probability regression where the outcome is a dummy variable equal to one if an issuer issues any bond in a given month. The sample average of the issuance dummy is 0.039, which indicates that the average issuer has a 3.9% chance of issuing a bond in a given month. After the Texas rules that restrict the set of underwriters, a 1 s.d. increase in the share of previous reliance on existing banks leads to a 0.1pp decline in the likelihood of borrowing, which is statistically insignificant at conventional levels. While this could be a non-trivial economic quantity, the standard error of the estimate suggests we can reject a decline of 0.5pp with 90% confidence.

The relatively low frequency of issuance, about once every 18 months for the average issuer, leads to a lack of power on the extensive margin. Another method of measuring the equilibrium quantity of credit provided is the scale the principal issued by the inverse hyperbolic sine. This scaling gives the same interpretation as the natural log in the limit, but allows the inclusion of zeros, which implicitly weights the intensive and extensive margins. The estimates from this specification are displayed in column (2), and suggest a 1 s.d. increase in Targeted Share led to a 2.3% decrease in issuance, although this is still insignificant at traditional levels. We can reject declines larger than 10.1% with 90% confidence. The final column shows the corresponding estimate when the outcome variable is the nominal principal value winsorized at the 1% level. This specification is similarly negative but indistinguishable from zero, statistically but does indicate an average decline of $86 thousand, which is economically meaningful and further suggests size of issuance is a margin of response.

Panel B of D.1 shows the corresponding estimates from a triple difference specification which compares the relative change in frequency and quantity of borrowing for issuers with previous reliance on banks targeted by Texas Senate Bills 13 and 19. The results are very similar with the specification and are all similarly negative and insignificant. We take this to mean there may be declines in borrowing on the part of affected issuers, but these declines are relatively small and not statistically significant. We can rule out a large scale change in frequency of issuing or in quantities issued.

E Robustness to Specification and Controls

This appendix presents a series of robustness checks to the primary analysis in the paper by using variations of the difference-in-differences results presented in Table 3 and of the primary triple difference results presented in column 2 of Table 4. First, we present estimates of the preferred difference-in-differences regressions allowing for time-varying impacts of maturity. Second, in the triple difference we show the impact of sequentially adding issue-level controls (including flexible time- and size- controls from the previous robustness) on the main coefficients of interest. Third, we show robustness to restricting the sample to bonds that are not guaranteed by state programs intended to insure borrowing for education. Fourth, we redefine issuers by the 6-digit CUSIP instead of issuer name in Mergent to test whether issuer aggregation matters. Fifth, we show that the results are robust to the group of control states that either (i) have no personal income tax from which bond income can be exempt or (ii) do not exempt the interest on local bonds from the state income tax. Sixth, we include two new measurements of yield based on aggregating the offering prices in Mergent that assumes either all bonds are called on first call date or all bonds are left outstanding to maturity. Seventh, we show the triple difference impacts are not a function of

seasonality by showing placebos in the Mergent data for September 1^st of 2020, 2019, and 2018.

In Table E.1 estimate a version of the within Texas difference-in-differences specifications that allows for the yield curve and issuance size to have a differential effect on issuance outcomes over time, and issuer fixed effects to vary with issue type (general obligation or revenue). This specification adds maturity (in years) $\times$ month of sale fixed effects, the natural logarithm of the issuance amount interacted with month of sale fixed effects, and fixed effects for issuer $\times$ an indicator for general obligation bonds to our main specification. The idea behind these heavily saturated regressions is to allow differential time trends for different types of debt to be removed from the variation in outcomes. The past issuer reliance on the targeted banks loses both statistical and economic significance in explaining the choice of negotiated offerings after the inclusion of the additional fixed effects. Including the fixed effects in a sequential manner (in unreported tests) shows that adding issuance amount interacted with month of sale fixed effects reduces the size of the difference-in-differences estimate. Table D.1 sheds light on this seemingly puzzling result in that issuers previously most reliant on the targeted underwriters who issue the largest bonds raise lower offering amounts after the implementation of the Texas laws especially when measured in levels, although the estimates are statistically imprecise. The higher propensity of affected issuers to choose negotiations is correlated with these same issuers raising less financing after the implementation of the Texas laws. The inclusion of issuance amount $\times$ time fixed effects is likely a bad control in Texas in that it controls for a portion of the effect of interest. The issuance amount interacted with month of sale fixed effects are unlikely to pose a problem in our main specification in column 2 of panel B of Table 4 because of the substantially weaker reduction in issuance amount in Panel B of Table D.1. Additionally, the effect on negotiation likelihood is still large and significant at the 1% level when we include these fixed effects in column 2 of panel B of Table 4. Overall, the effect attenuation in this robustness check is not material to the our analysis.

The average effect of issuer targeted bank reliance on offering yields with this more saturated specification is very similar to results reported in Table 3 with an increase of 10.7bps instead of 8.3bps in the baseline specification. For the specification focusing on issuers with over 50% reliance on the targeted banks, the estimate is 38.3bps and still statistically significant at the 5% level despite the very granular controls. We further use the triple difference specifications to show robustness to the use of different issue-level controls added sequentially, to the exclusion of bonds with state-provided insurance, to the definition of an issuer, to the set of control issuers and control states, and to the measurement of yield with relation to call options in Appendix E. All of these results show that our findings of increased use of negotiations and higher borrowing costs in Texas for affected issuers after SB 13/19 are not sensitive to parametric modeling decisions in the regressions specifications.

To show the impact of individual controls more clearly, we also show the estimates of the triple difference regressions with sequential addition of issue-level controls in Table E.2. The first three columns use the outcome of an indicator variable equal to one for negotiations. The first column matches column (1) of Panel A of Table 4. The second column adds a series of issue level controls with their coefficients. These controls include the share of a bond issue that is taxable, the share of a bond issue that is senior, the share of a bond issue that is bank-qualified (also exempt from corporate taxes when held by banks), the share of a bond issue backed by a specific revenue source, the share of an issue that is refunding an outstanding bond, and the share of a bond issue that is insured by any source. All of these shares are scaled between 0 and 1. Column (3) also adds interactions of maturity with month FE and state with month FE. Across all 3 columns, the

coefficient is between 0.080 and 0.081 and statistically significant at the 1% level. Columns (4) through (6) provide the same exercise where the outcome is the offering yield. Column (6) matches the specification in column (2) of Panel B of Table 4. The coefficient with additional controls is 0.089 instead of 0.107 without controls, and both coefficients are significant at the 5% level. Our results are not sensitive to the inclusion of a plethora of issue-specific controls.

Next, we show that the results are the same in Table E.3 when we restrict to only examine the set of bonds that are not backed by specific state guarantees for certain school bonds. Texas has a program that provides additional guarantees to certain education bonds: the Texas Permanent School Fund. This fund is backed by the state to provide additional credit enhancement and will pay investors in the event of default. Such insured bonds are said to have a PSF wrap. This sort of state guarantee can eliminate most or all credit risk and means that insured bonds may trade very differently and among different investors and the underwriting issues may be different. In order to make sure idiosyncratic issues affecting the state-guaranteed market are not driving our results, we replicate the continuous results from Table E.2 with the sample restricted to only bonds that do not have any sort of state guarantee. The estimate for the impact on negotiation is 0.079, which is indistinguishable from the baseline estimate of 0.082. The impact of reliance on targeted underwriters on offering yields is larger in this sample, with an estimate of one standard deviation increasing yields by 13.0bps after SB 13/19.

In Table E.4, we replicate the triple difference estimates where we create issuer identifiers based on the first six digits of the CUSIP code instead of by the long issuer names defined by Mergent. The first six digits of the CUSIP generally signify the issuer of a security, although some municipal issuers under a given name will issue under multiple CUSIP codes. We rerun the regressions using this more narrow definition of issuer and verify that the pooling of issuer identities does not have a material impact on our results.

Table E.5 shows that our results are robust to different control states included to be more similar to Texas in the tax treatment of municipal bond income. We restrict the comparison sample to make sure that Texas' somewhat unique tax treatment of their munis, which leads to lower local market clientele Babina, Jotikasthira, Lundblad and Ramadorai (2021), does not have any impact on our estimated coefficients. To this end, we define a set of control states that do not have special tax treatment for local bonds. This includes states that have no income tax from which to exempt bond interest (Alaska, Florida, New Hampshire, Nevada, South Dakota, Tennessee, Washington, and Wyoming) as well as states that do not exempt income on local bonds from state taxes (Illinois, Iowa, Nebraska, Oklahoma, Utah, and Wisconsin). These states all likely have less segmented ownership of local bonds and may experience different secular trends than the rest of the market. We show the estimates when restricting to this sample of low local clientele control states in Table E.5 where columns (2) and (4) show that the impacts on both the negotiated share and on yields are 10pp and 11bps per standard deviation, respectively, indicating that our results are not sensitive to the control states.

Mergent provides two different variables that can be used to measure the original pricing of a bond. The first is the offering yield, which is our primary measure of pricing in the paper. However, this yield assumes that a bond is outstanding to maturity, while many bonds include options to be called early. Trading data through the MSRB is reported in "yield to worst," which assumes that a bond will be called at the first available date. We create a version of yield to worst using the "offering price" variable in Mergent, the second variable that characterizes initial pricing. We use this new variable to replicate the results. To be exact, we calculate True Interest Cost according

to MSRB Rule G-33.b.i.B while allowing the offering price to be the amount of money raised in the issue (P). We plug the offering price in for P, call price in for redemption value RV, normalize to 30 day months, and only include interest payments up to the first call date. We then calculate the internal rate of return that sets this price equal to the value of the future interest and coupon payments for all bonds in a given bond package (Y in Rule G-33 parlance). Given that the MSRB Rule G-33 guideline leads to yields that are potentially inconsistent with how yields are calculated in other contexts, we calculate a version of yield to maturity using this same process as well. We show the results of the triple difference regressions using these new measurements of the yield outcome in Table E.6. We find results that are very similar to our baseline triple difference results and are significantly different than zero at the 10% level but are not distinguishable from each other. However, the point estimate for the yield to worst outcome is slightly larger in magnitude than the yield to maturity outcome, indicating that presence of call options does not have a material bearing on our results.

In Table E.7 we show that the triple difference results are not a function of seasonality by showing placebo interactions for September firsts of earlier years that are in our sample. In the first column, we show the baseline triple difference estimate starting on September 1, 2021, and ending in April 2022. Column 2 replicates this analysis for a placebo treatment starting on September 1, 2020 with the sample ending in April 2021. The results from the first column match the baseline specification in column 2 of Table 4 but the placebo in column 2 shows no effect. In columns 3 and 4, we show the same type of placebo for September 1, 2019, which matches the auction placebo in Panel C of Table 7, and September 1, 2018. All 3 placebos show that there is not a positive impact on yields for issuers in Texas on September firsts in general, but days after the September first on which SBs 13 and 19 were implemented did see higher borrowing costs for reliant issuers.

Table E.1: **Within Texas Impact on Borrowing Outcomes: Robustness**

A. Effects on Negotiated Share

	Negotiated			
	(1)	(2)	(3)	(4)
Targeted Share × Post	0.029			
	(0.028)			
Targeted Share 10% × Post		0.052		
		(0.069)		
Targeted Share 20% × Post			0.057	
			(0.080)	
Targeted Share 50% × Post				0.006
				(0.125)
Observations	6,062	6,062	6,062	6,062

B. Effects on Offering Yields

	Yield			
	(1)	(2)	(3)	(4)
Targeted Share × Post	0.107***			
	(0.040)			
Targeted Share 10% × Post		0.198**		
		(0.078)		
Targeted Share 20% × Post			0.206**	
			(0.091)	
Targeted Share 50% × Post				0.383**
				(0.168)
Observations	6,004	6,004	6,004	6,004
GO x Issuer FE	Yes	Yes	Yes	Yes
Date FE	Yes	Yes	Yes	Yes
Mat (years) x Month FE	Yes	Yes	Yes	Yes
Issuance Amt. x Month FE	Yes	Yes	Yes	Yes
Offering Type FE	Yes	Yes	Yes	Yes

Note: This table presents investigates the relation between bond issuance outcomes and issuer exposure to the underwriters targeted by Texas Senate Bills 13/19. We study two outcomes at the municipal offering level between January 2017 and April 2022: the probability of a negotiated offering (Panel A) and average yield. Targeted Share is defined as the share of the total dollar volume of municipal securities of each issuer underwritten by the targeted banks between 2007 and 2016. Targeted Share 10%, 20%, and 50% are indicator variables taking the value of one whenever the targeted banks had underwritten at least 10%, 20%, and 50% of offering volume for a given issuer and zero otherwise. Post takes the value of one since the implementation of SB 13/19 in September of 2021 and zero otherwise. All specifications include the natural logarithm of the total offering dollar amount as well as the fixed effects denoted at the end of each panel. The specifications in this table include time (year-month) X time-to-maturity (in years) fixed effects. The standard errors are double clustered at the issuer and offering date level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table E.2: Triple Difference with Sequential Controls

	Negotiated			Yield		
	(1)	(2)	(3)	(4)	(5)	(6)
Targeted Share × Post × TX	0.081***	0.081***	0.080***	0.065	0.058	0.089**
	(0.026)	(0.025)	(0.024)	(0.042)	(0.036)	(0.042)
Share Taxable		0.017***	0.009		0.619***	0.641***
		(0.006)	(0.006)		(0.013)	(0.013)
Share Senior		-0.062***	0.002		-0.233***	-0.373***
		(0.008)	(0.011)		(0.019)	(0.037)
Share Bank-Qualified		0.011*	0.005		-0.043***	-0.032***
		(0.006)	(0.006)		(0.008)	(0.008)
Share Revenue		0.045***	0.034**		0.163***	0.182***
		(0.014)	(0.015)		(0.028)	(0.033)
Share Refunding		0.092***	0.086***		-0.067***	-0.064***
		(0.009)	(0.010)		(0.009)	(0.008)
Share Insured		0.040***	0.040***		-0.098***	-0.116***
		(0.011)	(0.012)		(0.021)	(0.023)
Observations	59,736	59,736	57,672	57,972	57,972	55,980
Issuer FE	Yes	Yes	Yes	Yes	Yes	Yes
GO x Issuer FE	No	No	Yes	No	No	Yes
Date FE	Yes	Yes	Yes	Yes	Yes	Yes
Maturity FE	Yes	Yes	No	Yes	Yes	No
Additional Controls	No	Yes	Yes	No	Yes	Yes
Mat x Month FE	No	No	Yes	No	No	Yes
State x Month FE	No	No	Yes	No	No	Yes
Issuance x Month FE	No	No	Yes	No	No	Yes
Offering Type FE	No	No	No	No	Yes	Yes

Note: This table presents investigates the robustness of the relation between bond issuance outcomes and issuer exposure to the underwriters targeted by Texas Senate Bills 13/19 to the inclusions of additional control variables. We study two outcomes at the municipal offering level between January 2017 and April 2022: the probability of a negotiated offering (columns 1-3) and average yield (column 4-6). Targeted Share is defined as the share of the total dollar volume of municipal securities of each issuer underwritten by the targeted banks between 2007 and 2016. Post takes the value of one since the implementation of SB 13/19 in September of 2021 and zero otherwise. TX is an indicator equal to one if the issue takes place in Texas. All specifications include the natural logarithm of the total offering dollar amount as well as the fixed effects denoted at the end of each panel. The standard errors are double clustered at the issuer and offering date level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table E.3: Triple Difference Dropping Issues with State Guarantees

	Negotiated		Yield	
	(1)	(2)	(3)	(4)
Drop Guaranteed	N	Y	N	Y
Targeted Share × Post × TX	0.082***	0.079***	0.107**	0.130**
	(0.024)	(0.026)	(0.045)	(0.051)
Observations	57,672	48,185	55,980	46,518
GO x Issuer FE	Yes	Yes	Yes	Yes
Date FE	Yes	Yes	Yes	Yes
Mat x Month FE	Yes	Yes	Yes	Yes
State x Month FE	Yes	Yes	Yes	Yes
Issuance x Month FE	Yes	Yes	Yes	Yes

Note: This table investigates the robustness of the relation between bond issuance outcomes and issuer exposure to the underwriters targeted by Texas Senate Bills 13/19 when excluding bonds guaranteed by state school funds. We study two outcomes at the municipal offering level between January 2017 and April 2022: the probability of a negotiated offering (columns 1-3) and average yield (column 4-6). Targeted Share is defined as the share of the total dollar volume of municipal securities of each issuer underwritten by the targeted banks between 2007 and 2016. Post takes the value of one since the implementation of SB 13/19 in September of 2021 and zero otherwise. TX is an indicator equal to one if the issue takes place in Texas. All specifications include the natural logarithm of the total offering dollar amount as well as the fixed effects denoted at the end of each panel. The standard errors are double clustered at the issuer and offering date level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table E.4: Triple Difference Estimates with Different Issuer Definition

	Negotiated		Yield	
	(1)	(2)	(3)	(4)
Targeted Share × Post × TX	0.064**	0.063**	0.101**	0.137***
	(0.028)	(0.028)	(0.047)	(0.051)
Observations	58,606	56,588	56,849	54,915
Issuer FE	Yes	No	Yes	No
GO x Issuer FE	No	Yes	No	Yes
Date FE	Yes	Yes	Yes	Yes
Maturity FE	Yes	No	Yes	No
Additional Controls	No	Yes	No	Yes
Mat x Month FE	No	Yes	No	Yes
State x Month FE	No	Yes	No	Yes
Issuance x Month FE	No	Yes	No	Yes

Note: This table investigates the robustness of the relation between bond issuance outcomes and issuer exposure to the underwriters targeted by Texas Senate Bills 13/19 to alternative definition of issuers. We define issuers in terms of the 6-digit CUSIP associated with the largest proceeds in a given offering. We study two outcomes at the municipal offering level between January 2017 and April 2022: the probability of a negotiated offering (columns 1-2) and average yield (columns 3-4). Post takes the value of one since the implementation of SB 13/19 in September of 2021 and zero otherwise. TX is an indicator equal to one if the issue takes place in Texas. All specifications include the natural logarithm of the total offering dollar amount as well as the fixed effects denoted at the end of each panel. The standard errors are double clustered at the issuer and offering date level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table E.5: Triple Difference Comparing to States without Taxes or Exemptions

	Negotiated		Yield	
	(1)	(2)	(3)	(4)
Low local clientele	N	Y	N	Y
Targeted Share × Post × TX	0.082***	0.101***	0.107**	0.105*
	(0.024)	(0.028)	(0.045)	(0.057)
Observations	57,672	20,082	55,980	19,562
GO x Issuer FE	Yes	Yes	Yes	Yes
Date FE	Yes	Yes	Yes	Yes
Mat x Month FE	Yes	Yes	Yes	Yes
State x Month FE	Yes	Yes	Yes	Yes
Issuance x Month FE	Yes	Yes	Yes	Yes

Note: This table investigates the robustness of the relation between bond issuance outcomes and issuer exposure to the underwriters targeted by Texas Senate Bills 13/19 when restricting the sample to states that have no income taxes or municipal bond income exemptions. We study two outcomes at the municipal offering level between January 2017 and April 2022: the probability of a negotiated offering (columns 1-2) and average yield (columns 3-4). Targeted Share is defined as the share of the total dollar volume of municipal securities of each issuer underwritten by the targeted banks between 2007 and 2016. Post takes the value of one since the implementation of SB 13/19 in September of 2021 and zero otherwise. TX is an indicator equal to one if the issue takes place in Texas. All specifications include the natural logarithm of the total offering dollar amount as well as the fixed effects denoted at the end of each panel. The standard errors are double clustered at the issuer and offering date level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table E.6: Triple Difference using Yield to Worst and Yield to Maturity Calculated from Offering Prices

	Yield to Maturity		Yield to Worst	
	(1)	(2)	(3)	(4)
Targeted Share × Post × TX	0.066	0.071*	0.064	0.082*
	(0.041)	(0.041)	(0.047)	(0.048)
Observations	57182	55188	56717	54742
Issuer FE	Yes	No	Yes	No
GO x Issuer FE	No	Yes	No	Yes
Date FE	Yes	Yes	Yes	Yes
Maturity FE	Yes	No	Yes	No
Additional Controls	No	Yes	No	Yes
Mat x Month FE	No	Yes	No	Yes
State x Month FE	No	Yes	No	Yes
Issuance x Month FE	No	Yes	No	Yes

Note: This table tests the robustness of the primary triple difference specification to recreating measurements of the outcome variable equal to yield to maturity and yield to worst (first call date) using MSRB Rule G-33 definitions and the offering price variable in Mergent. The first two columns replicate Table 4 with the constructed yield to maturity variable. Columns 3 and 4 replicate the same specifications, but instead use the newly calculated yield to worst, which assumes the bonds are called at the first possible date at the contractually agreed upon price. When comparing the estimate in column 2 to the estimate in column 4, we find that assuming bonds are called on the first call date increases the magnitude of the yield impact, although the difference is not statistically distinguishable from zero. The standard errors are double clustered at the issuer and offering date level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table E.7: Triple Difference Placebos

	Yield			
	2021	2020	2019	2018
	(1)	(2)	(3)	(4)
Targeted Share × Post September × TX	0.107**	-0.007	0.025	-0.081
	(0.045)	(0.038)	(0.030)	(0.049)
Observations	55,980	43,917	30,195	18,381
GO x Issuer FE	Yes	Yes	Yes	Yes
Date FE	Yes	Yes	Yes	Yes
Mat x Month FE	Yes	Yes	Yes	Yes
State x Month FE	Yes	Yes	Yes	Yes
Issuance x Month FE	Yes	Yes	Yes	Yes

Note: This table tests the robustness of the primary triple difference specification to using September firsts from earlier years to show that there is no seasonality related to the reliance on targeted banks before SB 13/19. The first column replicates column 2 of Table 4. Columns 2, 3, and 4 redo this same regression defining the treatment as starting on September 1, 2020, September 1, 2019, and September 1, 2018, respectively. We see that the only positive yield impact happens starting in September 2021, which is also the only statistically significant impact. The standard errors are double clustered at the issuer and offering date level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

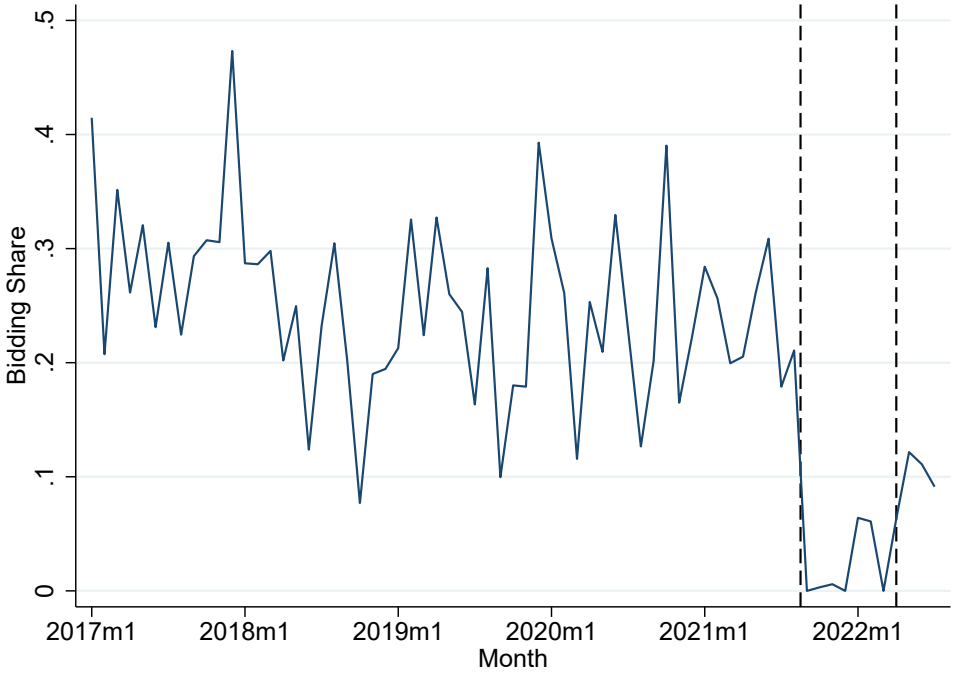
F Re-entry After April 2022

We end the sample in April 2022 after Citigroup conspicuously reentered the Texas municipal bond market through the Dallas-Fort Worth International Airport issue (highlighted in red in Panel A of Figure 1). We find that the unexpected treatment that started in September 2021 no longer is a good measurement of the ongoing arguments over financial institution ESG policies after Citigroup largely reenters the market, but there are a confluence of factors that make gleaning larger lessons challenging.

First, the state of Texas began sending letters to other municipal bond underwriters beyond the original targeted banks to ask for information about potential discrimination against oil and gas businesses.[23] This means that other banks appear to exit the market for a few weeks at a time throughout May, June, and July in the underwriting data, and our targeted share value becomes incorrect and may be negatively correlated with having a municipality's underwriter threatened by anti-ESG law enforcement after April 2022 with our extremely granular fixed effects. Next, JP Morgan Chase submitted and made public a letter stating that they believed they were in compliance with the Texas laws on May 13, 2022, which was coupled with increased auction activity from the targeted banks as documented in Appendix Figure F.1. This increase in auction participation left the targeted banks below their historical average level, but in the range of market share from recent history. Third, an early version of this paper began circulating in May that generated interest in the press and among potential market entrants.[24] For these reasons, we focus this paper on the sample from 2017 through April 2022, although we briefly discuss in the text what the dissipation of the short-run effects we estimate means for generalization.

[23] Hagan, Albright and Moran (2022) documents how these letters were sent in May and the initial public response.
[24] See Albright and Moran (2022) for an early example of the public discussion.

Figure F.1: Auction Participation by Targeted Banks in the Long-Run



Note: Figure F.1 shows the share of competitive bidding (Panel B) in Texas by banks targeted by Texas SB 13/19. The data are weighted according to par value of the issues. Before 2021, targeted banks underwrote around 40% of municipal bonds in Texas and submitted around 25% of competitive bids. These shares both drop to 0% in September 2021. The first vertical dashed line represents the break before September 2021 when Senate Bills 13 and 19 were implemented. Our sample ends at the second dashed vertical line which represents April 2022. We see bidding by the 5 banks increases to above 10% for May through August of 2022, which is back in the range of observed market shares before the SBs 13 and 19.

G Extended Auction Information

This appendix describes the auction data and summary statistics. The auction results are derived from the Bond Sales Results Archive posted by The Bond Buyer, which details the bidding results for bond auctions. The reports go back to early 2008. The data include the bids submitted by each underwriter in terms of "True Interest Cost" (or sometimes Net Interest Cost if that is the statutorily relevant outcome) for the complete package from each bidder as well as the complete term structure for the winning bidder. An example of the reported data is shown in Figure G.1, which shows the city of Richmond, TX, receiving 5 bids from underwriters with Baker Group winning the auction with a bid of 2.3854%. The winning yields for each individual maturity are only available for the winning bid. The other bids and identities are shown at the bottom.

The auction data aggregated to the issuer level are described in Table G.1. Here, we compare issuers in Texas to other issuers who host auctions elsewhere in the US. Auctions are often controlled by statute in a way such that auctions in Texas may be different than auctions in other places. These statutory restrictions are discussed at length in Cestau, Green, Hollifield and Schürhoff (2019).

Outside of Texas, the average issuer who holds at least 1 auction holds 7.2 total auctions, or about 0.55 auctions per year. In Texas, the average issuer only hosts 4.1 auctions, closer to 0.3 auctions per year. The sizes are similar with bond auctions mostly being for issues with principal value of 12 million, but the Texas issues have much longer maturities—20.3 years instead of 11.8 years elsewhere in the US. Texas auctions are also among the most competitive in the US, with the average issuer getting 5.5 bids instead of 4.6 bids in other states. This higher competition is also consistent with the lower bid variance in Texas relative to other states and consistent with the low average markup estimates for Texas from Garrett, Ordin, Roberts and Suárez Serrato (Forthcoming).

The share of bids from targeted banks at the issuer level (scaled by 100 in the table) is around 4% for the average issuer both in an out of Texas. This distribution is very skewed with the 75^{th} percentile being 3.3% and the 90^{th} percentile being 16% across the whole US. In Texas, the distribution is similarly skewed with 3.7% and 18% being the 75^{th} and 90^{th} percentiles, respectively. To put this differently, if we assume all Texas issuers receive the state average 5.5 bids in each auction, 10% of such issuers are receiving at least one bid (# bids$\approx$1/0.18) from a targeted bank in every single auction.

Table G.1: Auction Data Characteristics

	Mean	SD	Obs	25^{th}	50^{th}	75^{th}
Total Number of Auctions, 2008-21	6.8	9.8	13529	1.0	3.0	8.0
Non-Texas	7.2	10.2	11945	1.0	3.0	9.0
Texas	4.1	5.4	1584	1.0	2.0	5.0
Average Issue Size	11.9	38.1	13529	2.2	4.7	9.9
Non-Texas	11.9	31.6	11945	2.0	4.7	10.0
Texas	12.0	69.6	1584	3.3	5.0	9.0
Average Issue Maturity	12.8	7.6	13529	6.3	12.9	19.0
Non-Texas	11.8	7.2	11945	5.5	11.6	17.0
Texas	20.3	5.7	1584	17.2	20.5	24.7
Average Auction Participation	4.7	2.2	13529	3.2	4.5	6.0
Non-Texas	4.6	2.1	11945	3.0	4.3	5.8
Texas	5.5	2.2	1584	4.0	5.3	7.0
Average Bid Variance	0.3	0.5	13529	0.0	0.1	0.4
Non-Texas	0.3	0.5	11945	0.0	0.1	0.4
Texas	0.2	0.4	1584	0.0	0.0	0.2
Share Bids from Targeted Banks	4.0	8.7	11593	0.0	0.0	3.3
Non-Texas	4.0	8.7	10367	0.0	0.0	3.3
Texas	3.9	8.2	1226	0.0	0.0	3.7

Note: This table shows the characteristics of the issuers that hold auctions reported in the Bond Buyer data. The issuers are split into Texas and the non-Texas. There are 13,529 issuers who host auctions 6.8 times on average over the sample.

Figure G.1: Auction Report Example

TEXAS
Richmond (City)
23-Feb-22 $5,215,000
Combination Tax and Revenue Certificates of Obligation, Series 2022 (bank qualified) (book entry).
Dated Mar 1, 2022.
Due Mar 1, 2023 to 2042.
Callable Mar 1, 2031 at par.
Winning bid: Baker Group, at 106.4195, TIC 2.3854%.

DUE	AMOUNT	CPN	YIELD	CONC	INS
3/1/2023	$210,000	4.00%	0.95%		BAM
3/1/2024	$220,000	3.75%	1.20%		BAM
3/1/2025	$230,000	3.00%	1.35%		BAM
3/1/2026	$235,000	2.75%	1.45%		BAM
3/1/2027	$235,000	2.63%	1.60%		BAM
3/1/2028	$245,000	4.00%	1.65%		BAM
3/1/2029	$260,000	4.00%	1.75%		BAM
3/1/2030	$265,000	4.00%	1.80%		BAM
3/1/2031	$275,000	4.00%	1.85%		BAM
3/1/2032	$290,000	3.00%	1.90%		BAM
3/1/2033	$295,000	2.00%	2.00%		BAM
3/1/2034	$305,000	3.00%	2.00%		BAM
3/1/2035	$310,000	3.00%	2.05%		BAM
3/1/2036	$320,000	3.00%	2.10%		BAM
3/1/2037	$330,000	3.00%	2.15%		BAM
3/1/2039	$455,000	3.00%	2.20%		BAM
3/1/2041	$485,000	3.00%	2.30%		BAM
3/1/2042	$250,000	3.00%	2.35%		BAM

L.O.: Hunton Andrews Kurth LLP, Houston, TX; and State Attorney General.
F.A.: Hilltop Securities Inc., Houston, TX.
Other bidders were:
BOK Fin Secs, TIC 2.4306%
FHN Fin Cap Mkts, TIC 2.5419%
Raymond James, TIC 2.5529%
Baird, TIC 2.6085%

Note: This figure gives an example of the Competitive Sale Reports from The Bond Buyer. The example is for Richmond's $5.2 million bond issued on February 22, 2022. The winning bidder was Baker Group with a yield of 2.3854%. The total term structure for Baker Group's bid is shown in the table. The other bidder identities and bids are displayed at the bottom.