When the Thin Bench Gets Thinner: Investment Bank Consolidation and Municipal Finance *

Renping Li

June 2024

Abstract

Do investment banks possess market power, and does their consolidation have anti-competitive effects? Using the geographically fragmented municipal bond underwriting market as a natural laboratory and a stacked difference-in-differences specification, I find that the underwriting spread rises by 5.3 basis points after within-market M&As from a sample mean of 103.0 basis points. The effects double for more significant M&As and triple in concentrated markets. While issuers become less likely to use credit ratings, bond insurance, or financial advisors, suggesting some efficiency gains to the M&As, these are insufficient to offset the rise in the underwriting spread. Effects hold when I examine M&As that are less likely to be driven by local economic dynamics and are absent in my placebo tests of cross-market M&As, commercial bank M&As, or withdrawn M&As. Using Census data, I confirm the detrimental effects of investment bank consolidation on local government financial health. My findings provide a novel perspective on bank antitrust regulations that traditionally focused on deposit-taking and lending activities.

Keywords: Municipal bond, investment bank, M&A, market power

JEL Classification: G24, G34, L22, H74

*PhD student at the Olin Business School, Washington University in St. Louis. Email: renpingli@wustl.edu. Website: renpingli.com. GitHub Repository for this project: github.com/renping-li/MuniUnderwriterMA. I am grateful for the guidance and support from my dissertation committee members Todd Gormley, Brett Green, David Sraer, Anjan Thakor, Nishant Vats, and Alminas Žaldokas. I gratefully acknowledge the late Radha Gopalan for initial support. I thank Richard Ryffel for offering guidance and expertise and John Barrios, Will Cassidy, Sergey Chernenko, Jack (Xiaoyong) Fu, Dan Garrett, Armando Gomes, Peter Haslag, Mark Leary, Yaron Leitner, Brittany Lewis, Cyrus Mevorach, Todd Milbourn, David Schwartzman, Aadhaar Verma, and seminar participants at Washington University in St. Louis for helpful comments.

1 Introduction

Security issuance is a pillar of the financial system. In the U.S. in 2022, the total amounts of newly issued corporate equity, corporate bonds, and municipal bonds are $102 billion, $883 billion, and $410 billion, respectively. Economists have found that imperfect competition and market power have significant roles in many parts of the financial system including corporate banking, consumer lending, security trading, and retail investment, but the role of underwriters' market power in security issuance is relatively underexplored. Theoretically, underwriters with market power could charge a higher underwriting spread than the competitive level. They could also influence offering terms in ways that make the securities easier to market and distribute but at the cost of issuers.

Despite much public interest, it remains an empirical question if and to what extent underwriters possess market power.[1] An empirical challenge for studying the more eye-catching market of corporate securities underwriting is that it is a national market. Firms across the nation tend to seek underwriting services from the same group of investment banks for bond and equity issuance. Hence, if any events such as M&As among underwriters shift the extent of underwriter market power, all issuing firms will be affected, and there lacks a valid control group. In this paper, I direct my attention to the municipal bond market, which rivals the corporate securities market in terms of its size.[2] I confirm the insight in Cestau (2020) that it is a much more geographically fragmented market than corporate securities underwriting. Moreover, it is a dynamic industry with significant consolidating activities among local and regional underwriters over the last several decades. Thus, it provides a natural laboratory for testing the effects of shifting market power on security underwriting

[1]For example, the OECD states in a report that the high underwriting costs of IPOs could be a reason for the decline in the number of companies tapping the public equity markets over the past decade, and "high levels of fees and parallel pricing (akin to tacit collusion) appear to have increased" (Financial Times, 2017). Underwriters earned $85 million in fees from the $3.4 billion Snap, Inc. IPO. The 2.5% ratio, however, actually lies in the lower range among recent tech IPOs (CNBC, 2017). As to the municipal bond market, Joffe (2015) estimates the annual total issuing costs in the U.S. to amount to $3-4 billion and calls for attention over potentially excess underwriting fees.

[2]Academics have raised concerns over the potential adverse effects of underwriter market power in the municipal bond market, especially for "issuers in smaller states and in some of the narrower, credit-challenged sectors" (Bloomberg Law News, 2023). It is pointed out that issuers can "easily be taken advantage of—urged to issue needless or poorly structured bonds, pushed to accept high interest rates or duped into paying hundreds of thousands in unreasonable fees" (The Hechinger Report, 2019).

outcomes.

I obtain the sample of municipal bonds in the U.S. during 1970-2022 from the SDC Global Public Finance Database. I first show that the municipal bond underwriting market is highly geographically fragmented. For example, none of the top three underwriters in California during 2010-2020 shows up among the top ten in Massachusetts, nor vice versa. Next, I assemble a sample of M&As among municipal bond underwriters. I find 256 M&A deals, among which 160 are between underwriters with geographic overlaps in their businesses. I define a market as a Combined Statistical Area (CSA) and identify treated and control markets. The treated markets consist of those that experience M&As that would lead to a greater than 100 rise in their underwriter Herfindahl–Hirschman Index (HHI). For each treated market, I find a matched control market that most resembles the treated in terms of local economic and demographic characteristics.

My main findings are that the underwriting spread rises by 5.3 basis points after within-market M&As from a sample mean of 103.0 basis points. There is no pre-M&A differential trend, and effects are similar when I define treated CSAs as cases where both the acquiror and the target have market shares above 5%, or where M&As would lead to a greater than 5% rise in the total market share of the top five underwriters in a market. For a median bond issue with a principal amount of $8.9 million, the rise corresponds to a $4,723 greater financial burden on the issuing government. My findings are robust to adding control variables, hold when controlling for issuer-underwriter-match or time-varying underwriter characteristics, and are present in both the earlier and the later half of the sample period.

Consistent with investment banks wielding their pricing power in more concentrated markets, the effects double for more significant M&As that would lead to a HHI increase of more than 300 and triple in concentrated markets with HHI above 2,500. Interestingly, both underwriters involved in the M&As and other underwriters in the same market raise their underwriting spread, suggesting an overall shift in the structure of the market. As to offering terms, I do not find statistically significant changes in the reoffering yield on average, although there is some evidence of an increase in the reoffering yield for more significant M&As and in less competitive markets. I also find a small rise in initial underpricing and a drop in the frequency of callable features on the bond, both making the bonds easier to

market and distribute but at the cost of issuers.

The primary challenge to a causal interpretation of my findings is that local economic dynamics could be driving both the M&As and the underwriting spread. To address endogeneity concerns, I show that the effects hold when I examine scenarios where the M&A-affected CSAs account for only a small fraction of the total businesses of the merging underwriters. In these cases, the M&As are less likely to be driven by local economic dynamics (Garmaise and Moskowitz, 2006; Dafny et al., 2012; Sunderam and Scharfstein, 2017). In addition, I classify the M&As based on the rationales for the deals according to the news reports. The most common rationales are "the acquiror's desire to gain local/regional dominance", "the acquiror's desire to expand geographically", "the acquiror's desire to gain industry-wide dominance", "synergy from combining different lines of business", and "synergy from cost management". While the first two could be related to the local economy, it is unlikely for the other three. I find that the effects hold when I use only M&As for which the reported rationales are available and orthogonal to the local economy.

To further rule out potential confounding factors, I conduct three placebo tests. First, I find that M&As among investment banks operating in different geographical areas do not lead to a rise in the underwriting spread. This confirms that it is within-market consolidation rather than M&As in general that have price effects. Second, I trace out the geographic distribution of commercial banks using the Summary of Deposits data from FDIC and show that within-market M&As among purely commercial banks do not lead to a higher underwriting spread, rendering it unlikely that my results are driven by omitted variables that lead to financial institution M&As in general. Third, I find that withdrawn within-market investment bank M&As are not followed by an increase in the underwriting spread.

While I have established that M&As that raise the degree of market concentration of underwriters lead to a higher underwriting spread, an interesting question in my specific setting is the overall welfare effects of M&As. I next investigate whether there are efficiency gains to the M&As, and if so, whether issuers enjoy benefits that could compensate for the rise in the underwriting spread. I find that issuers are less likely to use credit ratings, bond insurance, or financial advisors post M&As. These suggest that there could be some efficiency gains to the M&As. The underwriters might have gained stronger abilities to

market and distribute the bonds after M&As, which make the use of credit ratings, a type of third-party certification (Ramakrishnan and Thakor, 1984; Millon and Thakor, 1985; Boot et al., 2006) less necessary. Similarly, bond insurance, which is a form of credit guarantee where the insurance company promises to step in and repay in case of government default (Gore et al., 2004; Vanda and Singh, 2004; Cornaggia et al., 2023), can be less essential. The underwriters might also have acquired through M&As certain expertise that usually resides in the domain of financial advisors (Bergstresser and Luby, 2018), and this kind of in-house integration might reduce the issuers' demand for formally hiring a financial advisor. These effects are small though and I also find the costs of credit ratings, bond insurance, or financial advisors to be small relative to the underwriting spread. I compute a total issuing cost that incorporates all four components — the underwriting spread, credit rating fee, bond insurance fee, and financial advisor fee. I find that the reduction in other costs is far from sufficient to offset the rise in the underwriting spread.

Finally, I confirm the detrimental effects of investment bank consolidation on local government financial health using data from the Annual Survey of State and Local Government Finances conducted by the U.S. Census Bureau. I find that the total interest costs borne by local governments increase after within-market investment bank M&As. I also show a quantity effect in that the amount of new debt issuance drops in treated markets. Overall, the budget deficits of local governments widen. Across different types of local governments, school districts are better able to leverage their taxing abilities and weather the negative impacts of investment bank consolidation compared to municipalities/townships/counties. These findings are robust to using variables scaled by total expenditures, logged, or constructed on a per-student/per-capita basis and hold for M&As that are less likely to be driven by local economic dynamics. Also, I find little or no pre-treatment differentials.

My paper is the very first that studies investment bank M&As. The literature offers mixed evidence over whether borrowers on average are hurt by or benefit from commercial bank M&As. Some research finds that M&As have negative impacts on consumers. For example, Prager and Hannan (1998) document a drop in the deposit rate and Garmaise and Moskowitz (2006) find higher interest rates on commercial loans and negative real economy consequences after commercial bank M&As. Fraisse et al. (2018) and Nguyen (2019) find a

reduction in the quantity of credit. Ratnadiwakara and Yerramilli (2022) study M&As' effects on mortgage credit and find that credit access for borrowers in under-served communities may worsen. On the other hand, Focarelli and Panetta (2003) find more favorable prices for consumers in the long run after bank M&As, Sapienza (2002) finds lowered interest rates if the acquired bank has a small market share, and Erel (2011) shows that M&As reduce loan spreads on average for U.S. industrial and commercial loans, pointing to cost savings and efficiency gains from M&As as the mechanism. There is, however, a paucity of research on effects of M&As among investment banks. I find that, despite some evidence of efficiency gains, issuers are on the whole adversely affected by such M&As.

My paper contributes to the literature on competition and market power in the financial system in general.[3] Regarding corporate securities underwriting, Chen and Ritter (2000) argue that the prevalent 7% IPO underwriting spread is a collusive outcome. Hansen (2001) challenges the collusion argument in Chen and Ritter (2000). Liu and Ritter (2011) develop a theory of differentiated underwriting services and localized competition to explain the apparent lack of competition in IPO underwriting. Gande et al. (1999) and Kim et al. (2008) find that the underwriting spread of corporate securities drops after commercial banks become eligible to underwrite by law. Manconi et al. (2019) show that powerful corporate bond underwriters can extract rents at the expense of issuers. As for municipal bonds, Cestau (2019) finds that the use of competitive bidding reduces underwriters' market concentration. Cestau (2020) shows that underwriters tend to specialize in either competitive bidding or negotiated sales, and their specialization investments in respective fields contribute to their market power. Garrett and Ivanov (2023), the closest paper to mine, find that anti-ESG policies in Texas that lead to a shrink in the pool of underwriters significantly raise local governments' borrowing costs.

My paper speaks to the literature on the determinants of the underwriting spread and offering terms in the municipal bond market.[4] It echos prior findings on the geographical

[3]See, for example, Gissler et al. (2020) and Yannelis and Zhang (2023) for consumer lending, Petersen and Rajan (1995) and Boot and Thakor (2000) for relationship banking, Azar et al. (2022) for common ownership among banks, Becker and Milbourn (2011) for credit rating agencies, Hinzen (2022) for non-bank financial institutions, Griffin et al. (2023) for security brokerage, Fazio and Žaldokas (2023) for public procurement, and Hong and Kacperczyk (2010) for analyst forecasts.

[4]Prior research finds that better credit ratings per se (Adelino et al., 2017; Cornaggia et al., 2017) and access to renewable natural resources (Cornaggia and Iliev, 2024) reduce the reoffering yield, while corruption

fragmentation of municipal bond underwriting (Butler, 2008; Cestau, 2020) and the fragmentation in ownership as shown in Babina et al. (2020). As to the role of underwriters, Cestau et al. (2020) provide estimates for the effects of using negotiated sales on the reoffering yield, Garrett et al. (2022) find a greater than unity pass-through elasticity from tax subsidies to the borrowing cost that is attributable to the imperfectly competitive nature of auctions and the endogenous participation of underwriters, and Garrett (2023) finds that the ban of dual advisor-underwriters significantly brings down the reoffering yield.

I proceed as follows. I describe my data and sample construction in Section 2. In Section 3, I lay out my main findings in Sub-Section 3.1, tests to address endogeneity concerns in Sub-Section 3.2, placebo tests in Sub-Section 3.3, effects on the offering terms in Sub-Section 3.4, and evidence on efficiency gains from M&As in Sub-Section 3.5. I present my findings on local government financial health based on Census data in Section 4. I provide some additional tests in Section 5, discuss generalizability of my findings and industry trends in Section 6, and conclude in Section 7.

2 Data and Sample Construction

2.1 Data

I obtain data on municipal bond issuance from SDC Platinum Global Public Finance Database (GPF), which contains information on the issuer's identity, underwriter, purpose of debt, amount, maturity, underwriting spread, reoffering yield, and other characteristics. I provide summary statistics in Table 1 and a complete list of variable definitions and data sources in Table A2 in the Online Appendix. GPF also records the county in which the issuer is located in. Together with the Core-Based Statistical Areas Delineation Files provided by the U.S. Census, I identify which Combined Statistical Area (CSA) the issuer is in. I define the "local

(Butler et al., 2009), racial discrimination (Dougal et al., 2019), political uncertainty (Gao et al., 2019b), impaired information production (Gao et al., 2020), and climate risks (Painter, 2020; Goldsmith-Pinkham et al., 2023) raise the reoffering yield. In addition, Butler and Yi (2022), Cheng et al. (2023), Gao et al. (2019a), Gustafson et al. (2023), Han (2021), Li and Zhu (2019), Cornaggia et al. (2021), and Lu and Ye (2023) show the effects of a variety of demographic and legislative factors on the reoffering yield. Corruption, discrimination, and climate risks have also been shown to inflate the underwriting spread (Butler et al., 2009; Dougal et al., 2019; Painter, 2020). I refer readers to Table A1 in the Online Appendix for more complete descriptions of the findings in these research.

markets" to be each CSA as a CSA is by definition economically and socially closely connected within and to some extent isolated from other CSAs. As of 2023, the Census Bureau designates 181 CSAs in the U.S. Later I will show my findings to be robust to alternative market definitions. On average, an issuer makes 1.7 bond issues and all issuers in a county makes 12.3 issues annually. Figure A1 in the Online Appendix plots the distribution of the number of active underwriters in a CSA. A median CSA has 8 active underwriters in a year and there are more active underwriters in larger CSAs.

I hand-collect M&As among municipal bond underwriters active in 1970-2022 from public records including national and local newspapers, Wikipedia, firm websites, and corporate filings. I then complement the sample by matching underwriters in GPF to both the SDC Platinum M&A Database and the SNL Financial M&A Database (a part of S&P Global) by the name string using exact and fuzzy matching. I find 256 M&A deals, among which 160 have geographic overlaps. I list the M&As in Table A3 in the Online Appendix.

I also read through the news reports on the M&As to identify the reported rationales for the deals. I am able to find news reports with sufficient information to determine the rationales for 101 deals. Table A4 in the Online Appendix summarizes my findings. The top five reasons mentioned for M&As are "the acquiror's desire to gain local/regional dominance", "the acquiror's desire to expand geographically", "the acquiror's desire to gain industry-wide dominance", "synergy from combining different lines of business", and "synergy from cost management". Table A5 in the Online Appendix gives some examples on the top reasons as described in the news articles. Importantly, the vast majority of the deals do not seem to be explicitly driven by changing local economic conditions.

I obtain credit rating fees, bond insurance fees, and financial advisor fees from the California Debt and Investment Advisory Commission website. While GPF has information on whether an issuer is using credit ratings, credit enhancement, or financial advisors for a bond issue, the fees for these services are only available for the states of California and Texas.[5] I also obtain data on local government finances from the Annual Survey of State and Local Government Finances conducted by the U.S. Census Bureau.

[5]For Texas, these data are compiled by the Texas Bond Review Board. I do not use them as they are available for only one year.

2.2 Sample construction

I next measure the exposure of each CSA to M&As and identify "local M&A episodes". For each CSA and starting from the year 1970, I calculate the HHI of the CSA a × year t based on the market shares of municipal bond underwriters in the three years prior to year t. Then, I extract all M&A deals in the period from t to $t+3$ and calculate the would-be HHI if the acquiror and the target in these M&As became a single firm, also based on bond issues in CSA a in the three-year period prior to year t. I then take the difference between this *predicted* HHI and the actual HHI as the *predicted* Δ_{HHI}. Naturally, only within-market M&As, i.e., M&As among underwriters that operate in the same CSA, could lead to a *predicted* rise in the HHI. If *predicted* Δ_{HHI} exceeds 100, I say that CSA a experiences a "local M&A episode" that starts in t. I continue this process with $t+4$ if I find t to be the onset of a "local M&A episode" in CSA a and with $t+1$ if not.

I identify 215 "local M&A episodes". I refer to CSAs affected by "local M&A episodes" as "treated" CSAs. Next, I construct a treated-control matched sample. For each treated CSA, I find a control CSA that most resembles the treated CSA in terms of average income and population based on the Mahalanobis distance *and* is not affected by within-market M&As themselves in a nine-year period centered around the onset of the "local M&A episode". Each treated CSA and its control form a cohort. I assemble a sample with all bond issues in the year of the onset of a "local M&A episode", four years prior, and also four years after in both the treated and control CSAs.

Figures 1 and 2 illustrate how this treated-control matched sample is constructed. Panel A of Figure 1 shows the market shares in each CSA in 1995 of SunTrust Bank and Equitable Securities, two underwriters that later engaged in a M&A. While SunTrust Bank underwrote in many states in the U.S. Southeast, Equitable Securities was more localized and focused on the state of Tennessee. Their M&A would affect the CSAs where they both operated, such as the CSA "Nashville-Davidson–Murfreesboro, TN", but not the CSAs where only one side operated in, such as those in Florida. Figure 2 shows that based on average income and population, the CSA "Sacramento-Roseville, CA" is the closest match to "Nashville-Davidson–Murfreesboro, TN".

2.3 Fragmentation of the municipal bond underwriting market

The municipal bond underwriting market is much more geographically fragmented compared to corporate securities underwriting (Cestau, 2020; Chen et al., 2022). While the latter is mostly served by large, national players that are usually headquartered on the Wall Street, there are a plethora of municipal bond underwriters for which the geographical coverage is limited to one or several states. Table A6 in the Online Appendix shows the top 10 underwriters in California and Massachusetts for each type of securities. While there is great overlap for corporate securities underwriters between the two states, the underwriters for municipal bonds are much more dissimilar. For example, none of the top three municipal bond underwriters in Massachusetts during 2010-2020 — Eastern Bank, Century Bank, or TD Bank — appears as a top ten in California, nor vice versa.

To quantitatively assess how fragmented the municipal bond underwriting market is, I calculate the cosine similarity of underwriters' market shares in each pair of states. I represent the market shares of all B underwriters in state s in year t as a vector $v_{s,t}$ of length B. For any pair of states s_1 and s_2, the cosine similarity in year t is

$$c_{s_1,s_2,t} = \frac{v_{s_1,t} \cdot v_{s_2,t}}{\|v_{s_1,t}\| \|v_{s_2,t}\|}. \tag{1}$$

I find the average cosine similarity of municipal bond underwriters for a state-pair is 0.193, while it is 0.613 for corporate bond underwriters and 0.508 for corporate equity underwriters. I confirm the differences in Table A7 in the Online Appendix in a regression specification, which also shows that the similarity of municipal bond underwriters diminishes with a greater geographic distance of the state-pair. Figure A2 in the Online Appendix further shows that the pattern holds throughout the sample period.

Such fragmentaion might seem surprising at first as municipal bond underwriting might appear to be a rather generic task. Several reasons lie behind the highly fragmented form of the municipal bond underwriting market. First, by using local or regional underwriters and keeping the business activities of underwriting in close geographic proximity, local governments can potentially promote local businesses, create more job opportunities, and even collect more income tax revenues from those underwriters. Such a motive is arguably

non-exist for corporate securities underwriting. Second, in most states, the income taxes on municipal bonds are exempt from state taxes for investors residing in the same state, but not for out-of-state investors, which makes the ownership fraction of same-state investors disproportionately high (Babina et al., 2020). Local and regional underwriters can have better knowledge about and access to local investors, which can give them a cost advantage in marketing and distributing the securities (Cestau, 2020). Third, local and regional underwriters tend to have substantial experience in underwriting for nearby governments. When selecting an underwriter under negotiated sales, a key criteria that the issuer considers about is past experience in serving the local area (U.S. Securities and Exchange Commission, 2012). Even under competitive bidding, a local or regional underwriter with greater local experience can have an informational advantage when formulating its bid. Such accumulated experience reinforces the entry barriers for non-local underwriters.

3 Evidence from Bond Issuance Outcomes

3.1 Main results

3.1.1 Underwriting spread

I start by examining how the underwriting spread evolves around M&As. The underwriting spread is "the difference between an underwriter's purchase price and resale price" and represents a major source of revenue for the underwriter. If the M&As lead to more concentrated local markets and raise the pricing power of underwriters, I would expect a rise in the underwriting spread following M&As. Another possibility is that M&As create synergies and lower underwriters' marginal cost of providing services, which, through competition, could be passed to local governments in the form of a lower underwriting spread.

I run the following regression,

$$y_{d,c} = \beta_1 Treated_{a,c} + \beta_2 Post_{c,t} + \beta_3 Treated_{a,c} \times Post_{c,t} + \theta_i + \theta_t + e_{d,c}. \tag{2}$$

Here d is the subscript for each bond issue, i.e., each deal, a is the subscript for each Combined Statistical Area (CSA), c is the subscript for each cohort of issues in a treated

CSA and its matched control CSA, i is the subscript for each issuer, and t is the subscript for the calendar year. $Treated$ equals one for issues in treated CSAs and $Post$ equals one in the year of the onset of "local M&A episodes" and the four years afterwards. Our methodology of pooling cohorts of treated and control observations together and estimating a difference-in-differences model follows Gormley and Matsa (2011), Gormley and Matsa (2016), and Gormley et al. (2023). Standard errors are clustered at the issuer level.

I report my findings in Table 3. In column (1), I show that the underwriting spread increases by 5.3 basis points after M&As from a sample mean of 103.0 basis points. For a bond issue with the median principal amount of \$8.9 million, this would translate into a \$4,723 greater underwriting spread. For a county with the median annual total issuance of \$35.4 million, the rise in the underwriting spread would imply an extra financial burden of \$18,788. This effect is not small as it amounts to 5.2% of the sample average and it doubles or triples in some subsamples. To put my estimates into context, I also provide a list of other variables that prior research shows to determine the underwriting spread and reoffering yield in the municipal bond market, along with the magnitudes of their effects in Table A1 in the Online Appendix.

I also estimate a dynamic version of Equation (2) with the year prior to M&As as the baseline year and plot the coefficients in Figure 3. I observe a sharp increase in the underwriting spread at the onset of the "local M&A episode", and I do not find pre-treatment differential trends between bond issues in treated and control CSAs. Figure A4 in the Online Appendix shows that there is no reversal of the effects in a longer horizon of 10 years.

I provide an estimate of the elasticity of the underwriting spread to the HHI of the local market in Table A8 in the Online Appendix. Using the $Treated \times Post$ dummy as an instrument variable for HHI, I find the elasticity to be 0.04. Hypothetically, going from 5 equal-sized underwriters to 4 equal-sized underwriters, which raises HHI by 500, is predicted to increase the underwriting spread by 19.0 basis points. Notably, I also obtain the OLS estimates of this elasticity and I do not find a statistically significant correlation between the underwriting spread and HHI. In the OLS regression of the underwriting spread on HHI, a key omitted variable, demand by local governments for the issuance of municipal bonds, could cause a bias in the estimates. When an area has weaker local demand, fewer

underwriters would enter the local market, making the HHI higher. At the same time, with weaker demand, the governments would only accept a lower underwriting spread. Such a demand factor biases the OLS estimate to the negative direction.

3.1.2 Robustness tests

I confirm the robustness of my findings to the definition of "local M&A episodes". Instead of using cases where M&As would lead to a greater than 100 rise in the *predicted* HHI, I use cases where the local market shares of both the acquiror and the target in the previous three-year period exceed 5% and show the estimate in column (3) of Table 3. I use cases where M&As would lead to a more than 5% rise in the *predicted* total local market share of top five underwriters and report the estimate in column (5). The effects hold under both definitions. Panels B and C of Figure 3 show that the pre-M&A parallel trend continues to hold. I also show my findings to be robust to defining the market at the finer Core-Based Statistical Area (CBSA) level, which I report in columns (2), (4), and (6) of Table 3. As of 2023, the Census Bureau designates 927 CBSAs in the U.S.

Table 4 shows that the effects are robust to including fixed effects for the underwriter in column (1) and for each issuer-underwriter pair in column (3), which control for any fixed characteristics of the underwriter or the issuer-underwriter match, or when I include the underwriter interacted with calendar year fixed effects in column (2), which control for any time-varying underwriter-specific factors that could affect the underwriting spread. In addition, they are robust to adding fixed effects for each method of sale, taxable status, source of repayment, and their interactions with the calendar year in column (4). These alleviate concerns that certain composition effects might be driving my findings.

The effects are also robust to controlling for the principal amount, length of maturity, and their squared terms in column (5). In the final column, I control for whether commercial banks are eligible to underwrite the bond issue by law. While the 1933 Glass-Steagall Act prohibited banks from underwriting most Revenue bonds on the premise that they are riskier than GO bonds, the passage of the Gramm-Leach-Bliley Act in 1997 removed all restrictions over commercial banks from underwriting municipal bonds (U.S. Congress, 1999).[6] I find

[6]The source of funding for the repayment of GO bonds (i.e., General Obligation bonds) is the overall

that the underwriting spread is 17.2 basis points lower when commercial banks are allowed to underwrite, likely due to greater competition. The main effect of M&As is unaffected by adding this control variable. Finally, Table A9 in the Online Appendix confirms that my findings are robust to using two or three matched control CSAs for each treated CSA in columns (1) and (2). Moreover, the findings are robust to using alternative co-variates in the matching process. Column (3) of Table A9 in the Online Appendix shows that the findings are robust to using a control CSA with the closest local income, population and also the growth rates of the prior two variables. While I do not match on issuance outcomes to avoid potential overfitting (Bonaimé and Wang, 2024), column (4) shows that the findings hold when matching on the past average gross spread and reoffering yield in the CSA.

3.1.3 Heterogeneities in effects

I report three groups of cross-sectional heterogeneities. First, I check cross-sections where theoretically I predict the effects to be stronger (Panel A of Table 5). Second, I examine cross-sections of particular interest in the institutional setting of the municipal bond market (Panel B). I also report some other cross-sectional heterogeneities of interest (Panel C). Depending on whether I are interested in the differential effects across groups or the effects in each particular group, I employ one of the two following specifications. First,

$$\begin{aligned} y_{d,c} = {} & \beta_1 Treated_{a,c} + \beta_2 Post_{c,t} + \beta_3 Treated_{a,c} \times Post_{c,t} \\ & + \sum_{g=2}^{G} \mathbb{1}_{\text{issue } d \text{ is in group } g} \times (\gamma_{0,g} + \gamma_{1,g} Treated_{a,c} + \gamma_{2,g} Post_{c,t} + \gamma_{3,g} Treated_{a,c} \times Post_{c,t}) \\ & + \theta_i + \theta_t + e_{d,c}, \end{aligned} \tag{3}$$

where G is the total number of cross-sectional groups and $g = 1$ is the left-out group that serves as the baseline, and second,

revenue of a whole government. For Revenue bonds, it is the revenue of a specific project. Revenue bonds are in general perceived to be riskier than GO bonds.

$$y_{d,c} = \sum_{g=1}^{G} \mathbb{1}_{\text{issue } d \text{ is in group } g} \times (\gamma_{0,g} + \gamma_{1,g} Treated_{a,c} + \gamma_{2,g} Post_{c,t} + \gamma_{3,g} Treated_{a,c} \times Post_{c,t}) + \theta_i + \theta_t + e_{d,c}. \tag{4}$$

The first specification yields the differences in the effects of M&As in other groups relative to the left-out group, while the second specification produces the estimated effects in each group separately.

In Panel A of Table 5, I first show that the effects of M&As are greater for more significant M&As, i.e., those that would lead to a greater increase in the *predicted* HHI. For "local M&A episodes" with *predicted* Δ_{HHI} greater than 300, the effect of M&As doubles in its magnitude and becomes 10.7 basis points. Consistent with underwriters wielding their bolstered pricing power post consolidation, the effects are stronger in more concentrated markets. The estimate triples and becomes 14.5 basis points when the CSA is a highly concentrated market with HHI greater than 2,500. I also find that the effects are stronger when the issuer is not formally hiring a financial advisor, suggesting that under such a scenario the issuer is more susceptible to the increased pricing power.[7]

Panel B shows that the effects exist for municipal bonds sold either under competitive bidding or negotiated sales. In Section III in the Online Appendix, I provide introduction to these two methods of sales. The underwriting spread rises for both tax-exempt bonds and bonds subject to the Alternative Minimum Tax.[8] I find a statistically yet insignificant effect for taxable bonds, which comprises only 6.4% of the sample. The effects are similar when the source of repayment is the overall revenue of a whole government (i.e., a General Obligation bond, usually abbreviated as a GO bond) or the revenue of a specific project (i.e., a Revenue bond). I also find that both underwriters involved in the M&As and other

[7] I investigate if and when having a financial advisor can undo the effects of M&As in Table A10 in the Online Appendix. I find that having an advisor can only nullify the effects of M&As in highly competitive markets with HHI less than 1,000. Interestingly, having a dual advisor, i.e., one that serves as the underwriter at the same time, which Garrett (2023) shows to create a significant conflict-of-interest problem, actually amplifies the effects of M&As.

[8] The Alternative Minimum Tax (AMT) is "a separate tax system that requires some taxpayers to calculate their tax liability twice — first, under ordinary income tax rules, then under the AMT — and pay whichever amount is highest" (Tax Foundation, 2023).

underwriters operating in the same market charge a higher underwriting spread post the M&As, consistent with a shift in the overall structure of the local market.

Column (1) of Panel C sheds light on the source of market power and the nature of competition in this market. One possible source of market power could be tacit coordination among underwriters in the form of price-fixing. Another possibility is, if issuers face switching costs when choosing underwriters, possibly resulting from information asymmetry, underwriters could also set the price of their services above the marginal cost. In such a scenario, underwriters could still be competing vigorouly with price and yet earning positive economic profits. Under the second possibility, I would expect the swithcing costs to be low and M&As to be less likely to shift the switching costs somehow if the issuer has worked with multiple underwriters in the past. However, I find that the effects of M&As on the underwriting spread are similar irrespective of the number of prior relationships that the issuers have. This is more consistent with price-fixing being the source of market power. M&As make new coordination easier to form or existing coordinated interaction more successful or sustainable, which warrants antitrust attention.

Column (2) shows that effects hold when I divide the sample into pre-2000 and post-2000. The effects are similar for bond issues with below median principal amount or with above median maturity in columns (3) and (4). In column (5), I do not find a statistically significant difference in effects for counties with the Black population ratio in the top quartile. Finally, in Figure 4 I check if the effects differ by the main use of proceeds, which include "general purpose", "education", "utilities", "housing", "economic development", "health care", "transportation", and "pollution control". The effects are the strongest for bond issues with the purpose of housing and are statistically significant in almost every category.

3.2 Addressing endogeneity concerns

In this section, I run two tests to tackle potential endogeneity concerns. The main challenge to a causal interpretation is that investment bank consolidation is not random and local economic dynamics could be driving both within-market investment bank consolidation and the underwriting spread.

In the first test, I examine scenarios where underwriters involved in a M&A have a

presence in the CSA, but the CSA itself makes up only a small fraction of the underwriters' operations. Under such scenarios, it is less likely that the CSA was an important driver of the M&A. More specifically, I zoom into "local M&A episodes" where the affected CSA makes up less than 5% of the underwriter's total businesses in the three years before the M&As. I put this requirement for both sides of the M&A deals. If a "local M&A episode" involves multiple M&As that all lead to within-market consolidation, I require the CSA to be less than 5% of every underwriter's total businesses for every M&A. Garmaise and Moskowitz (2006), Dafny et al. (2012), and Sunderam and Scharfstein (2017) use a similar approach to address the endogeneity of financial institution M&As to local economic dynamics.

There are 97 "local M&A episodes" that satisfy this criteria. I estimate Equation (2) using only treated and control CSAs in these episodes and report the estimates in Panel A of Table 6. The findings in Section 3.1.1 continues to hold. Interestingly, the magnitude of the effect becomes 9.2 basis points, which is larger than prior estimates. This could be due to the size of these CSAs tending to be smaller when I require them to account for a small percent of the underwriters' total businesses, and such CSAs tend to have a more concentrated underwriting market where the effects of M&As are more pronounced. Panel B of Figure A7 in the Online Appendix shows no pre-trends. I also alternatively require that the affected CSA makes up less than 3% or 10% of the underwriter's total businesses and obtain similar findings.

My next test makes use of the reasons mentioned in news reports for the M&As as described in Table A4 in the Online Appendix. While I believe it is quite unlikely that M&As driven by "the acquiror's desire to gain industry-wide dominance", "synergy from combining different lines of business", or "synergy from cost management" can correlate with the local economic prospects of the treated areas, it is possible that an acquiror's desire to gain local/regional dominance in an area or to expand to an area could be driven by local economic conditions, which could also affect the underwriting spread. In Panel B of Table 6, I restrict my attention to "local M&A episodes" where the M&As are driven by factors that are unlikely to correlate with local economic dynamics. Our approach is similar to the "narrative approach" that prior research adopted to identify changes in taxes that are unrelated to national or local economic dynamics (Romer and Romer, 2010; Mertens and

Ravn, 2012; Mukherjee et al., 2017).

In column (1), I exclude M&As driven by "the acquiror's desire to gain local/regional dominance" or "the acquiror's desire to expand geographically", and also M&As for which the driving reasons are unavailable in the news reports. There are 98 "local M&A episodes" that satisfy this criteria. I find the main effects still hold, and Panel D of Figure A7 in the Online Appendix provides a consistent message. Further, while Table A4 in the Online Appendix suggest that most cases of "financial distress of the target" are not directly driven by local economic conditions, I additionally exclude all such M&As in column (2). The findings again hold. I also examine the effects of M&As by the reported driving reasons in Figure A8 in the Online Appendix. While there is some variation and the effects are the strongest for M&As driven by "acquiror's desire to diversify its revenue sources" and "financial stress of the target", they are robust in all categories.

These findings make me more confident that M&As' effects on the underwriting spread are not spurious or driven by unobservable local economic dynamics.

3.3 Placebo tests

3.3.1 Cross-market M&As

In this section, I conduct three placebo tests to further rule out alternative explanations. My first placebo test examines the effects of cross-market M&As that do not lead to greater local concentration. For each "local M&A episode" in my sample in Section 3.1.1, I look for all CSAs where the acquiror in the M&A has a market share greater than 10%, the target in the M&A has no market share, *and* the CSA does not experience any other within-market consolidation in the year of the onset of the "local M&A episode", the four-year period prior, or the four-year period after. I then randomly pick one such CSA. These CSAs exprience cross-market M&As where an in-market underwriter consolidates with an out-of-market underwriter. I also look for CSAs where the target in the M&As operates and the acquiror does not based on a similar rule. These together form my treated CSAs, for which I find control CSAs following the same criteria as in Section 2.

Panel A of Table 7 shows the estimated effects of such cross-market M&As. I do not find

any statistically significant effects on the underwriting spread in column (1). Noting that the randomly picked CSAs tend to have small sizes as an underwriter is more likely to have market shares above 10% in a small market, I also assemble a sample where cross-market-M&A-affected CSAs is picked to be the closest to the within-market-M&A-affected CSAs in terms of their population size. Column (2) shows that the sample size increases, but I still see no effects of cross-market M&As. I also see no effects if I require underwriters to have any above 0% market shares in cross-market-M&A-affected CSAs rather than putting the 10% threshold in columns (3) and (4). I show in untabulated tests that the pattern is robust if I instead define a local market as a CBSA. These findings confirm that it is within-market investment bank consolidation rather than M&As among investment banks in general that has price effects, which is consistent with greater post-consolidation pricing power explaining my main findings in Section 3.1.1. Moreover, while cross-market M&As could arguably widen the distribution channel of underwriters and combine expertise, which could lower the marginal costs of providing underwriting services, I do not find a decrease in the underwriting spread afterwards. Hence, the synergies from cross-market M&As, if any, are not passed through to issuers in the form of a lower underwriting spread.

3.3.2 Within-market commercial bank M&As

My second placebo test examines the effects of within-market commercial bank (CB) M&As. I obtain a list of commercial bank M&As from both SDC Platinum M&A Database and SNL Financial M&A Database. I also obtain the county × bank × year level deposit data from the Summary of Deposits survey provided by FDIC during 1994-2022. Prior research, e.g., Cetorelli and Strahan (2006), Bouwman and Malmendier (2015), Goetz et al. (2016), and Kundu et al. (2022) has used the Summary of Deposits data to trace out the geographic presence of commercial banks.

I aggregate deposit data to the CSA × bank × year level and calculate the local market shares of CBs. I match M&As and deposits data using a combination of exact matching, fuzzy matching, and manual checks. Next, I identify "local CB M&A episodes" using a similar rule as in Section 2, except for that I use the market shares of CBs as measured by deposit amounts in place of those of municipal bond underwriters *and* I put the additional

requirement that the CSA is not affected by any within-market consolidation of underwriters in the concurrent period. My sample contains 1,424 pairs of CBs that engaged in within-market M&As and I identify 148 "local CB M&A episodes" that would lead to a rise of *predicted* CB HHI greater than 100.

I report the estimated effects of these CB M&As in Panel B of Table 7. I do not find any significant effects after within-market CB M&As that would lead to an increase in CB HHI more than 100. The patterns are similar when I use "local CB M&A episodes" that would lead to a rise in the *predicted* CB HHI greater than 20 or 50 instead of 100, or when I define a local market as a CBSA. These indicate that my findings are specific to within-market M&As among municipal bond underwriter and are unlikely to be driven by factors that lead to within-market financial institution M&As in general.

3.3.3 Withdrawn M&As

My third placebo test examines the effects of withdrawn M&As. I obtain a list of M&As among municipal bond underwriters that ended up withdrawn from both SDC Platinum M&A Database and SNL Financial M&A Database and construct a sample of "local withdrawn M&A episodes" by checking the would-be increase in HHI if these M&A deals went through. My sample contains 12 instances of withdrawn M&As between within-market peers and I identify 4 "local withdrawn M&A episodes" where the withdrawn M&As would lead to a more than 50 increase in HHI if they went through. In prior research, Seru (2014), Bena and Li (2014), and Bernstein (2015) have utilized withdrawn mergers as the control group to identify mergers' effects on firm outcomes.

In Panel C of Table 7, I show that using this sample I find no evidence of any increase in the underwriting spread after withdrawn M&As. The sample size is smaller than the other two placebo tests though due to the limited number of withdrawn M&As. I see similar patterns when using "local withdrawn M&A episodes" that would lead to a rise in HHI greater than 10 or 20, or when I define a local market as a CBSA. These findings are consistent with my estimated effects in Section 3.1.1 not being explained by confounding factors that drive both successful and withdrawn M&As.

3.4 Offering Terms

Similar to the underwriting spread, the theoretical predictions of the effects of M&As on the reoffering yield is ambiguous.[9] Underwriters incur significant inventory risks and exert efforts in the process of marketing and distributing the municipal bonds (Kidwell and Sorensen, 1983; Joehnk and Kidwell, 1984). Hence, holding the underwriting spread fixed, they naturally prefer a higher reoffering yield, i.e., a lower reoffering price, which makes easier the distribution process and reduces inventory risks. Moreover, underwriters often serve as dealers, and they could directly benefit from initial underpricing, i.e., a lower initial price relative to the medium-term (e.g., 30 days since the initial offering) price, as they often hold bonds they underwrote until after secondary market trading has started for the purpose of market support (Green et al., 2007). Under negotiated sales, if underwriters possess greater market power, they could strong-arm issuers into accepting a lower reoffering price.[10] [11] Alternatively, if the synergies of combining two businesses are large enough and significantly improve the ability of underwriters, they would be able to market and distribute the same bonds to investors at a higher reoffering price, which could pass on to and benefit issuers. For example, underwriters benefiting from synergies would agree on a higher reoffering price under negotiated sales, or submit higher bids under competitive pricing.

I investigate the effects of M&As on the reoffering yield in Table 8. I find that on average the reoffering yield does not significant alter after M&As in column (1). Consistent with underwriters influencing the offering terms with their market power, column (2) shows that it rises by 4.3 basis points in less competitive markets with HHI greater than 1,000. Panel A of Figure A5 shows that there is no pre-trend. In competitive markets with HHI less

[9] Reoffering yield is the yield calculated based on the reoffering price. For clarity, I distinguish between "offering price" and "reoffering price", the formering pertaining to the price that underwriters promise to issuers and the latter pertaining to the price that initial investors pay to underwriters (Green et al., 2007).

[10] Under negotiated sales, the underwriting spread is largely agreed upon at the employment of the underwriter and prior to setting the reoffering price. Conditional on a fixed underwriting spread, the revenue of underwriters will not shrink with a lower reoffering price.

[11] Under competitive bidding, however, a lower reoffering price means that the underwriting spread of the underwriter shrinks, so it is not preferred by the underwriter, unless the price is in the range so high that the marketing and distributing of the bonds is impossible. I expect the reoffering price under competitive bidding to be determined by investor demand and not by underwriters' market power over issuers. Hence, under competitive bidding, I do not predict underwriter consolidation to affect the reoffering yield via the market power channel.

than 1,000, however, I actually witness a drop in the reoffering yield by 11.7 basis points, suggesting that in less concentrated markets there are efficiency gains from M&As which are passed on to the issuers. Column (3) shows that while the reoffering yield drops by 5.8 basis points for smaller M&As that raise the *predicted* HHI by less than 200, there is a positive effect of 6.9 basis points for more significant M&As. Column (4) shows that effects do not vary by whether the issuer is employing a financial advisor and column (5) indicates a statistically significant drop in the reoffering yield under competitive bidding but not under negotiated sales.

I also examine how M&As affect the yield spread over the treasury rates. Following the methodology of Schwert (2017) and Li and Zhu (2019) outlined in Section IV.I in the Online Appendix, I calculate the tax-adjusted spread of the reoffering yield of each municipal bond relative to the yield of a comparable synthetic treasury security. Differently from the findings on the reoffering yield, in Table A11 in the Online Appendix I do not find M&As affecting the yield spread overall or in any subsample in either direction, except for a negative effect among bonds sold via competitive bidding that is marginally significant. In light of the inconsistency in our findings with different definitions of reoffering terms, some caution may be warranted in the interpretation of these results.

Next, following Garrett (2023), I calculate the initial underpricing, a common measure of the quality of security underwriting. A high quality underwriter is able to price a security close to the actual market value, which keeps interest costs low for issuers. A low quality underwriter, on the contrary, would place the bonds at a discount, which is reflected in the dynamics of trading prices as initial underpricing. I calculate the difference of the day-15-to-day-30 price of each bond minus its price on the initial trading day. I find in column (6) of Table 8 that, for each unit of face or par value of \$100, the initial underpricing rises by \$0.07 in areas affected by M&As. The fact that bonds are more underpriced post M&As are inconsistent with issuers benefiting from higher quality underwriting services.

Moreover, I find that bond issues are less likely to be callable post M&As. In the sample, 50.2% bond issues have the callable feature that allows the issuer to pay back the debt at a date prior to the bond's final maturity. Issuers would exercise this option if the interest rate falls and it becomes optimal to retire the old debt with high interest rate and potentially

refinance with new debt at lower interest rate. All else equal, callable bonds are harder to market as investors face reinvestment risks, which means that they will have to reinvest at lower interest rates if the issuer calls the bond. I show that the fraction of callable bond drops by 1.8% post M&As in column (7) of Table 8, suggesting that underwriters might be using their market power to influence debt features other than the reoffering yield to the detriment of issuers. Dynamics of initial underpricing and the callable feature around M&As are reported in Panels C and D of Figure A5 in the Online Appendix.

Overall, while there is no statistically significant overall effects of M&As on the reoffering yield, there is an increase for more significant M&As or in more concentrated markets, while efficiency gains materialize in the form of lower reoffering yield for less significant M&As or in less concentrated markets. There is a small rise in initial underpricing and a drop in the frequency of callable features on the bond, both making the bonds easier to market and distribute but at the cost of issuers. While the evidence is mixed, there is strong evidence that the offering terms become less favorable for issuers under scenarios where the positive effects on underwriting spread are also more pronounced.

3.5 Non-price efficiency gains

The debate on antitrust issues in M&As constantly revolves around two major themes — market power and efficiency gains. If M&As create synergies, it could lower the marginal cost of firms, which could be passed through to consumers (service users) in the form of lower prices and/or better products (services) (Focarelli and Panetta, 2003; Sapienza, 2002; Erel, 2011). While I have documented a positive price effect in Section 3.1.1 and show that on average the reoffering yield does not alter after M&As in Section 3.4, issuers could still be benefiting on other aspects in the issuing procedure and therefore compensated for the higher prices. Hence, I next examine how M&As affect the usage of credit ratings, bond insuance, and financial advisors. Based on the sample of issues in California, conditional on using any of the services, the costs of credit ratings, bond insurance, and financial advisors as a fraction of the principal amount are 12.4, 80.4, and 49.8 basis points, respectively. All of these, though, are smaller than that of the underwriting spread.

I first examine how M&As affect the use of credit ratings. The cost of credit ratings on

municipal bond issuers, despite being much smaller than the underwriting spread, could still be a financial burden on local governments (Joffe, 2017). I hypothesize that if underwriters gained through M&As improved ability to market and distribute the bonds, potentially due to the economies of scale or the transfer of expertise and investor relations, they could underwrite the same bonds without the third-party certification of credit ratings. As a result, issuers might find it optimal not to incur the costs of soliciting credit ratings. In column (1) of Table 9, I indeed see a 2.1% drop in the probability of having credit ratings for issues in treated areas after M&As.

I also hypothesize that issuers are less likely to purchase bond insurance when faced with a more efficiently-operating underwriter, as now the same bond can be distributed without the extra credit guarantee.[12] Moreover, the underwriters might have also acquired expertise that usually resides in the domain of financial advisors through M&As, and this kind of in-house integration might have reduced the issuers' demand for formally hiring a financial advisor. Indeed, I find that the fraction insured is 1.4% smaller and issuers are 2.1% less likely to formally hire an advisor post M&As.[13] Interestingly, I find in columns (2), (5), and (8) that the drop in these probabilities exists for issues underwritten by investment banks not involved in the M&As as well, although to smaller extents than for those involved. This suggests some spillover effects of the efficiency gains. These effects are robust to including control variables in columns (3), (6), and (9), and Table A12 in the Online Appendix shows robustness of the effects to using a Probit model. I also plot the coefficient estimates from a dynamic specification in Figure A6.

Noting these, I next investigate whether these efficiency gains can offset the rise in the underwriting spread. While I can observe *if* an issuer is using credit ratings, bond insurance, or financial advisors for all bond issues, the data on credit rating fees, bond insurance fees,

[12]During the Global Financial Crisis (GFC), many insurers went out of business, which led to a sharp drop in the fraction of bonds insured. The fraction of bond issues with insurance in the decade before GFC is 33.6% and in the decade after GFC is 11.3%. This does not confound my findings as I include year fixed effects in my regression specifications.

[13]The 2010 Dodd-Frank Act has made it more difficult (albeit not impossible) for issuers not to hire a financial advisor. In most cases, it is necessary for the issuer to hire a financial advisor if the issuance is carried out through competitive bidding, while issuers might not hire a financial advisor under negotiated sales. In untabulated tests, I include fixed effects for the method of sales and also their interactions with the calendar year and find similar results. It is unlikely that my findings on the probability of using financial advisors are driven by a composition effect of the method of sales.

and financial advisor fees are only available for the state of California. I devise a statistical model of these fees as a function of issue characteristics and estimate it using the California sample, which I report in Table A13 in the Online Appendix. I then impute these costs for every issue in my sample with the predicted values based on the model. With these, I calculate a total issuing cost, which is the sum of the underwriting spread, plus credit rating fee, bond insurance fee, and financial advisor fee if the issuer is using any of these services. Using my treatment-control matched sample, I find in Panel B of Table 9 that the total issuing cost increases by 5.0 basis points post M&As, which is only slightly lower than when I use the underwriting spread as the outcome variable. This is consistent with the fees for these services being small relative to the underwriting spread and the drops in the probability of using these services also being small. Overall, I find that the efficiency gains I document are too small to offset the rise in the underwriting spread from the standpoint of the issuers.

4 Evidence from Local Government Finances

I next examine how municipal bond underwriter M&As affect local government finances using data from the Annual Survey of State and Local Government Finances conducted by the U.S. Census Bureau. One motivation of these tests is to further validate my findings in Section 3.1. Another motivation is that the bond issue level outcomes might not be sufficient to fully quantify the total effects of M&As on local government finances. Brancaccio and Kang (2023) show that municipal bond issues can have complex features beyond the underwriting spread and the reoffering yield, such as call provisions, sinking fund provisions, irregular interest payment frequencies, and floating or variable interest rates. These features can be hard to price and can either add to or reduce the financial burden of local governments depending on the features themselves and the uncertain economic situations. In fact, Michael Piwowar, a then-commissioner at the U.S. Securities and Exchanges Commission (SEC), said that the municipal bond issues are "exceedingly complex".[14] As a result, quantifying the total

[14]Source: The 2014 Municipal Finance Conference presented by The Bond Buyer and Brandeis International Business School (Brancaccio and Kang, 2023).

costs on local governments using issuance outcomes alone can be challenging and insufficient. Hence, examining local government finances data might provide a better understanding over the full economic magnitudes of the impact of M&As.

Each year, the Census Bureau surveys states, counties, townships, municipalities, special districts, and school districts over the revenues, expenditures, and other aspects of their finances. I construct outcome variables including the interest paid, new issuance, budget surplus, total taxes, property taxes, and inter-governmental transfers, all expressed as ratios to total expenditures. I exclude special districts from my sample as their measurements and accounting rules can be too different from other types of local governments. The number of distinct counties, townships, municipalities, and school districts are 3,386, 18,584, 12,282, and 23,045 respectively.[15] I provide summary statistics in Table 1 and complete variable definitions in Table A2 in the Online Appendix. I find that for counties/townships/municipalities, the average per capita annual revenue is $1,243 and expenditure is $1,248. Interest payments account for 3.1% of all expenditures and the quantity of new debt issuance is equivalent to 5.9% of total expenditures. Total taxes and inter-governmental transfers cover 44.4% and 29.7% of total expenditures, respectively. As to school districts, they collect $12,746 per student per year on average and spend $13,619. Interest payments account for 2.0% of all expenditures and the average ratio of new debt issuance to total expenditures equals 5.4%. Total taxes cover 37.7% of expenditures and inter-governmental transfers cover 52.9% of expenditures.

I construct a treated-control matched sample in a similar manner as in Section 2, except for that I am using local government $\times$ year level observations rather than bond issue level observations. I estimate the following model,

$$y_{l,t,c} = \beta_1 Treated_{a,c} + \beta_2 Post_{c,t} + \beta_3 Treated_{a,c} \times Post_{c,t} + \theta_l + \theta_t + e_{l,t,c}, \tag{5}$$

where the new index l is for each local government. I cluster standard errors at the county

[15]The school districts in the Annual Survey of State and Local Government Finances are all independent school districts. They have substantial autonomy in collecting taxes and charges and issuing debt for the provision of educational services. They often levy and collect property taxes separately from counties/townships/municipalities. Dependent school districts, whose finances are controlled by the county/township/municipality that they depend on, are not part of the survey (U.S. Census Bureau, 2006).

level. I report my findings in Panel A of Table 10. All variables in this table are expressed as ratios to the total expenditures of the local government. I find that the interest paid increases on average by 0.07 percentage points (p.p.) for local governments in CSAs affected by municipal bond underwriter M&As. The new issuance of debt drops by 0.51 p.p. A median county impacted by consolidation incurs $0.15 million more in interest payments and cut new issuance by $1.06 million. The budget surplus ratio, which I define to be the difference of total revenues minus total expenditures scaled by total expenditures, changes by 1.02 p.p. to the negative direction, suggesting an overall deterioration of local government financial health.[16] Inter-governmental transfer drops by 2.20 p.p., suggesting that local governments can be both directly and indirectly adversely affected by underwriter consolidation.[17] Total taxes, chief among which is the property tax, increase by 1.42 p.p. These coefficients are all statistically significant and I see little or no pre-treatment differential for the outcome variables in Figure 5, except for some weak evidence that the issuing volume seems to be rising in treated areas relative to control areas before M&As.

I find in Panel B of Table 10 significant heterogeneities when I divide the sample into school districts versus municipalities/townships/counties. School districts significantly shrink their new debt issuance, and their interest payments as a fraction of total expenditures do not rise. They experience a relatively large drop in inter-governmental transfers and at the same time also a large increase in taxes levied. Their budget surplus ratio does not significantly alter post M&As. For counties/townships/municipalities, they do not reduce new debt issuance and incur more interest payments. They also experience less inter-governmental transfers, but they do not levy more taxes to compensate for that. Overall, their budget surplus ratio moves towards the negative direction. These results suggest that school districts are more capable at weathering the adverse effects of investment bank consolidation

[16] While I label this variable as the "surplus ratio", I also note that the Government Finance and Employment Classification Manual (U.S. Census Bureau, 2006) states that the Census data "are purely statistical in nature" and "cannot be used as financial statements, or to measure a government's fiscal condition". Hence, a "surplus ratio" less than 0 does not necessarily represent that the government is running on a deficit.

[17] Table A14 in the Online Appendix shows that the drop in inter-governmental transfer is due to a drop in transfer from the state government. It is likely that underwriter consolidation also raises the public-market financing costs of the state governments and their dependent agencies. As a result, the state governments might have to channel more fundings to state-wide projects, which could crowd out their transfer to local governments. In Table A15 in the Online Appendix, I indeed find an increase in state governments' expenditures on new constructions for states affected by underwriter consolidation.

with their taxing abilities compared to counties/townships/municipalities. I again do not see much pre-treatment differential in Figures A9 and A10.

Panels A and B of Table A16 in the Online Appendix confirm the robustness of my findings when I use the dollar amounts per capita or per student instead. Panels C and D of the table show that the findings also hold when I use logged dollar amounts. Table A17 in the Online Appendix shows that the findings are largely robust when I zoom into M&As that are less likely to be driven by local economic dynamics as discussed in Section 3.2.

Overall, the survey data suggest a deterioration in local government financial health after municipal bond underwriter M&As, which is consistent with my findings from the bond issue level outcomes.

5 Other Tests

5.1 Predictive factors of local market consolidation

In this section, I examine what local economic and demographic factors predict within-market consolidation. In Table A18 in the Online Appendix, I regress the *predicted* Δ_{HHI} over the next three years and also a dummy variable for whether *predicted* Δ_{HHI} exceeds 100 on factors including prior HHI, local population, population growth rate, local income, income growth rate, population age, minority ratio, and past issuance per capita. Columns (1) and (2) show that while some local demographic and economic characteristics significantly predict future changes in HHI, the magnitudes are generally small. For example, a 1% higher population growth rate is associated with 3.1 higher *predicted* Δ_{HHI}. A $\$1,000$ lower issuance per capita over the previous three years predicts 2.6 higher *predicted* Δ_{HHI}. Next, I re-estimate Equation (2) while controlling for factors that significantly predict *predicted* Δ_{HHI} in column (3) and controlling all local economic and demographic factors in column (4). The main findings hold in both cases. These further further increase my confidence that the main findings are not driven by local economic or demographic factors affecting both consolidation and underwriting spread.

6 Discussion

I concede that my findings in the municipal bond underwriting market might not generalize to corporate securities underwriting. It is likely that comptrollers in counties and cities and superintendents in school districts, who oversee bond issuance in these local governments, have less specialized or effective financial training compared to CFOs and other financing staffs in corporations. As a result, local governments might be more susceptible to the market power of underwriters compared to corporations. On the other hand, as corporate securities underwriting tends to have larger deal sizes, the potential collusive benefits per-deal can be greater, which can give underwriters more incentives to coordinate. I look forward to future research on corporate securities issuance that builds upon the contributions of Chen and Ritter (2000) and Manconi et al. (2019), which will give a more complete answer to the overarching question of the economic implications of underwriter market power. In particular, underwriter market power might be one of the contributing forces to the apparent decline in U.S. IPOs in recent decades among the regulatory costs of being public (Ewens et al., 2024), the supply of private capital (Ewens and Farre-Mensa, 2020), and others.

My findings do not contradict with the general decreasing trend of the underwriting spread in recent decades (Hund et al., 2024). Figure A11 in the Online Appendix shows that the average HHI first dropped from around 2,000 in 1970 to around 1,000 in 1990, and then gradually rose back to around 1,500 in 2022. The average underwriting spread, on the other hand, increased from around 140 basis points in 1970 to its peak of over 200 basis points in the early 80s, and experienced a secular decline since then. It was around 60 basis points in 2022. The simultaneous rise in the HHI and decline in the underwriting spread are not at odds with my findings. Rather, the shrinking spread was driven by factors such as the gradual entrance of commercial banks (The American Banker, 1988) that was hastened by the Gramm-Leach-Bliley Act (U.S. Congress, 1999), the advance of business automation technologies that reduced marginal operational costs, increased market transparency (Hund et al., 2024), anti-corruption initiatives (Butler et al., 2009), and other concurrent factors. My findings by research design are interpreted as, holding everything else fixed, greater concentration leads to a higher underwriting spread. I also predict that the underwriting spread would have

dropped even more under the counterfactual of no simultaneous consolidation.

7 Conclusion

Using data on the issuance outcomes of the geographically fragmented municipal bond underwriting market, I find that the underwriting spread rises after M&As among underwriters. My examinations of M&As that are less likely to be related to local economic dynamics and placebo tests allow me to rule out a range of alternative explanations, and the cross-sectional heterogeneities suggest the enhanced market power due to consolidation being the underlying mechanism. I find some evidence of efficiency gains from the M&As, although they are too small to offset the rise in the underwriting spread from the standpoint of the issuers. I also confirm that the financial health of local governments worsens after underwriter M&As based on Census data.

My findings provide a novel perspective on bank antitrust regulations that traditionally focus on deposit-taking and lending activities. President Biden has expressed support for bank antitrust reform (Reuters, 2023) and signed an executive order directing the Justice Department to work with bank regulators to heighten the scrutiny of bank M&A deals (Reuters, 2021). The policy debate (Tarullo, 2022; Kress, 2022) has been informed by research showing that bank mergers cause branch closures, raise borrowing costs and fees, reduce credit access, endanger communities' financial health and safety, and disproportionately impact low- and moderate-income communities (Garmaise and Moskowitz, 2006; Bord, 2018). My paper highlights an often-neglected aspect in bank antitrust scrutiny, investment banking activities, that is beyond the traditional scope and yet has significant implications for both the security issuance outcomes and issuers' overall financial health.

References

Adelino, M., I. Cunha, and M. A. Ferreira (2017): "The Economic Effects of Public Financing: Evidence from Municipal Bond Ratings Recalibration," *The Review of Financial Studies*, 30, 3223–3268.

Azar, J., S. Raina, and M. Schmalz (2022): "Ultimate Ownership and Bank Competition," *Financial Management*, 51, 227–269.

Babina, T., C. Jotikasthira, C. Lundblad, and T. Ramadorai (2020): "Heterogeneous Taxes and Limited Risk Sharing: Evidence from Municipal Bonds," *The Review of Financial Studies*, 34, 509–568.

Becker, B. and T. Milbourn (2011): "How Did Increased Competition Affect Credit Ratings?" *Journal of Financial Economics*, 101, 493–514.

Bena, J. and K. Li (2014): "Corporate Innovations and Mergers and Acquisitions," *The Journal of Finance*, 69, 1923–1960.

Bergstresser, D. and M. J. Luby (2018): "The Evolving Municipal Advisor Market in the Post Dodd-Frank Era," Working paper.

Bernstein, S. (2015): "Does Going Public Affect Innovation?" *The Journal of Finance*, 70, 1365–1403.

Bloomberg Law News (2023): "Bond Underwriting Industry Continues to Contract," Available at `https://news.bloomberglaw.com/banking-law/bond-underwriting-industry-continues-to-contract-muni-wise`.

Bonaimé, A. and Y. E. Wang (2024): "Mergers, Product Prices, and Innovation: Evidence from the Pharmaceutical Industry," *The Journal of Finance*, 79, 2195–2236.

Boot, A. W. A., T. T. Milbourn, and A. Schmeits (2006): "Credit Ratings as Coordination Mechanisms," *The Review of Financial Studies*, 19, 81–118.

Boot, A. W. A. and A. V. Thakor (2000): "Can Relationship Banking Survive Competition?" *The Journal of Finance*, 55, 679–713.

Bord, V. M. (2018): "Bank Consolidation and Financial Inclusion: The Adverse Effects of Bank Mergers on Depositors," Working paper.

Bouwman, C. H. S. and U. Malmendier (2015): "Does a Bank's History Affect Its Risk-Taking?" *American Economic Review*, 105, 321–25.

Brancaccio, G. and K. Kang (2023): "Search Frictions and Product Design in the Municipal Bond Market," Working paper.

Butler, A. W. (2008): "Distance Still Matters: Evidence from Municipal Bond Underwriting," *The Review of Financial Studies*, 21, 763–784.

Butler, A. W., L. Fauver, and S. Mortal (2009): "Corruption, Political Connections, and Municipal Finance," *The Review of Financial Studies*, 22, 2873–2905.

Butler, A. W. and H. Yi (2022): "Aging and Public Financing Costs: Evidence from U.S. Municipal Bond Markets," *Journal of Public Economics*, 211, 104665.

Cestau, D. (2019): "Competition and Market Concentration in the Municipal Bond Market," Working paper.

——— (2020): "Specialization Investments and Market Power in the Underwriting Market for

Municipal Bonds," Working paper.

Cestau, D., R. C. Green, B. Hollifield, and N. Schuerhoff (2020): "Should State Governments Prohibit the Negotiated Sales of Municipal Bonds?" Working paper.

Cetorelli, N. and P. E. Strahan (2006): "Finance as a Barrier to Entry: Bank Competition and Industry Structure in Local U.S. Markets," *The Journal of Finance*, 61, 437–461.

Chen, H., L. Cohen, and W. Liu (2022): "Calling All Issuers: The Market for Debt Monitoring," Working paper.

Chen, H.-C. and J. R. Ritter (2000): "The Seven Percent Solution," *The Journal of Finance*, 55, 1105–1131.

Cheng, S. F., G. De Franco, and P. Lin (2023): "Marijuana Liberalization and Public Finance: A Capital Market Perspective on the Passage of Medical Use Laws," *Journal of Accounting and Economics*, 75, 101516.

CNBC (2017): "Here's What Snap's Wall Street Underwriters Made off the IPO," Available at `https://www.cnbc.com/2017/03/03/snap-ipo-what-wall-street-banks-made.html`.

Cornaggia, J., K. J. Cornaggia, and R. D. Israelsen (2017): "Credit Ratings and the Cost of Municipal Financing," *The Review of Financial Studies*, 31, 2038–2079.

Cornaggia, J. and P. Iliev (2024): "Renewable Energy Resources and the Local Economy: Evidence from Municipal Bonds," Working paper.

Cornaggia, K., J. Hund, and G. Nguyen (2023): "The Price of Safety: The Evolution of Municipal Bond Insurance Value," *Management Science*, 0, null.

Cornaggia, K., J. Hund, G. Nguyen, and Z. Ye (2021): "Opioid Crisis Effects on Municipal Finance," *The Review of Financial Studies*, 35, 2019–2066.

Dafny, L., M. Duggan, and S. Ramanarayanan (2012): "Paying a Premium on Your Premium? Consolidation in the US Health Insurance Industry," *American Economic Review*, 102, 1161–85.

Dougal, C., P. Gao, W. J. Mayew, and C. A. Parsons (2019): "What's in a (School) Name? Racial Discrimination in Higher Education Bond Markets," *Journal of Financial Economics*, 134, 570–590.

Erel, I. (2011): "The Effect of Bank Mergers on Loan Prices: Evidence from the United States," *The Review of Financial Studies*, 24, 1068–1101.

Ewens, M. and J. Farre-Mensa (2020): "The Deregulation of the Private Equity Markets and the Decline in IPOs," *The Review of Financial Studies*, 33, 5463–5509.

Ewens, M., K. Xiao, and T. Xu (2024): "Regulatory Costs of Being Public: Evidence from Bunching Estimation," *Journal of Financial Economics*, 153, 103775.

Farrell, M., D. Murphy, M. Painter, and G. Zhang (2023): "The Complexity Yield Puzzle: A Textual Analysis of Municipal Bond Disclosures," Working paper.

Fazio, D. and A. Žaldokas (2023): "Kamikazes in Public Procurements," Working paper.

Financial Times (2017): "OECD Criticises High Fees and Tacit Collusion in IPO Underwriting," Available at `https://www.ft.com/content/ff5b3608-4533-11e7-8519-9f94ee97d996`.

Focarelli, D. and F. Panetta (2003): "Are Mergers Beneficial to Consumers? Evidence from the Market for Bank Deposits," *American Economic Review*, 93, 1152–1172.

Fraisse, H., J. Hombert, and M. Lé (2018): "The Competitive Effect of a Bank Megamerger

on Credit Supply," *Journal of Banking & Finance*, 93, 151–161.

Gande, A., M. Puri, and A. Saunders (1999): "Bank Entry, Competition, and the Market for Corporate Securities Underwriting," *Journal of Financial Economics*, 54, 165–195.

Gao, P., C. Lee, and D. Murphy (2019a): "Municipal Borrowing Costs and State Policies for Distressed Municipalities," *Journal of Financial Economics*, 132, 404–426.

——— (2020): "Financing Dies in Darkness? The Impact of Newspaper Closures on Public Finance," *Journal of Financial Economics*, 135, 445–467.

Gao, P., D. Murphy, and Y. Qi (2019b): "Political Uncertainty and Public Financing Costs: Evidence from U.S. Gubernatorial Elections and Municipal Bond Markets," Working paper.

Garmaise, M. J. and T. J. Moskowitz (2006): "Bank Mergers and Crime: The Real and Social Effects of Credit Market Competition," *The Journal of Finance*, 61, 495–538.

Garrett, D. (2023): "Conflicts of Interest in Municipal Bond Advising and Underwriting," Working paper.

Garrett, D. and I. Ivanov (2023): "Gas, Guns, and Governments: Financial Costs of Anti-ESG Policies," Working paper.

Garrett, D., A. Ordin, J. W. Roberts, and J. C. Suárez Serrato (2022): "Tax Advantages and Imperfect Competition in Auctions for Municipal Bonds," *The Review of Economic Studies*, 90, 815–851.

Gissler, S., R. Ramcharan, and E. Yu (2020): "The Effects of Competition in Consumer Credit Markets," *The Review of Financial Studies*, 33, 5378–5415.

Goetz, M. R., L. Laeven, and R. Levine (2016): "Does the Geographic Expansion of Banks Reduce Risk?" *Journal of Financial Economics*, 120, 346–362.

Goldsmith-Pinkham, P., M. T. Gustafson, R. C. Lewis, and M. Schwert (2023): "Sea-Level Rise Exposure and Municipal Bond Yields," *The Review of Financial Studies*, 36, 4588–4635.

Gore, A. K., K. Sachs, and C. Trzcinka (2004): "Financial Disclosure and Bond Insurance," *The Journal of Law and Economics*, 47, 275–306.

Gormley, T. A., M. Jha, and M. Wang (2023): "The Politicization of Social Responsibility," Working paper.

Gormley, T. A. and D. A. Matsa (2011): "Growing Out of Trouble? Corporate Responses to Liability Risk," *The Review of Financial Studies*, 24, 2781–2821.

——— (2016): "Playing it Safe? Managerial Preferences, Risk, and Agency Conflicts," *Journal of Financial Economics*, 122, 431–455.

Green, R. C., B. Hollifield, and N. Schürhoff (2007): "Dealer Intermediation and Price Behavior in the Aftermarket for New Bond Issues," *Journal of Financial Economics*, 86, 643–682.

Griffin, J. M., N. Hirschey, and S. Kruger (2023): "Do Municipal Bond Dealers Give Their Customers "Fair and Reasonable" Pricing?" *The Journal of Finance*, 78, 887–934.

Gustafson, M., P. Haslag, D. Weagley, and Z. Ye (2023): "A Flash in the Pan(demic)? Migration Risks and Municipal Bonds," Working paper.

Gürkaynak, R. S., B. Sack, and J. H. Wright (2007): "The U.S. Treasury Yield Curve: 1961 to the Present," *Journal of Monetary Economics*, 54, 2291–2304.

Han, Y. (2021): "Organized Labor and Capital Markets: Evidence from the U.S. Municipal Bond

Market," Working paper.

Hansen, R. S. (2001): "Do Investment Banks Compete in IPOs?: The Advent of the "7% Plus Contract"," *Journal of Financial Economics*, 59, 313–346.

Hinzen, F. (2022): "Nonbank Market Power in Leveraged Lending," Working paper.

Hong, H. and M. Kacperczyk (2010): "Competition and Bias," *The Quarterly Journal of Economics*, 125, 1683–1725.

Hund, J., C. Lundblad, C. Makridis, and G. Nguyen (2024): "Markup or Markdown: National Underwriters' Exit and the Changing Landscape of Municipal Finance," Working paper.

Joehnk, M. D. and D. S. Kidwell (1984): "The Impact of Market Uncertainty on Municipal Bond Underwriter Spread," *Financial Management*, 13, 37–44.

Joffe, M. (2015): "Doubly Bound: The Costs of Issuing Bonds," Research report, Haas Institute for a Fair and Inclusive Society.

——— (2017): "Doubly Bound: The Cost of Credit Ratings," Research report, Haas Institute for a Fair and Inclusive Society.

Kidwell, D. S. and E. H. Sorensen (1983): "Pricing of Municipal Bond Underwritings: It May Pay to Invest When Underwriters Don't," *Financial Analysts Journal*, 39, 58–64.

Kim, D., D. Palia, and A. Saunders (2008): "The Impact of Commercial Banks on Underwriting Spreads: Evidence from Three Decades," *Journal of Financial and Quantitative Analysis*, 43, 975–1000.

Kress, J. C. (2022): "Reviving Bank Antitrust," *Duke Law Journal*, 72, 519–598.

Kundu, S., S. Park, and N. Vats (2022): "The Geography of Bank Deposits and the Origins of Aggregate Fluctuations," Working paper.

Li, W. and Q. Zhu (2019): "The Opioid Epidemic and Local Public Financing: Evidence from Municipal Bonds," Working paper.

Liu, X. and J. R. Ritter (2011): "Local Underwriter Oligopolies and IPO Underpricing," *Journal of Financial Economics*, 102, 579–601.

Lu, R. and Z. Ye (2023): "Roe v. Rates: Reproductive Healthcare and Public Financing Costs," Working paper.

Manconi, A., E. Neretina, and L. Renneboog (2019): "Underwriter Competition and Bargaining Power in the Corporate Bond Market," Working paper.

Mertens, K. and M. O. Ravn (2012): "Empirical Evidence on the Aggregate Effects of Anticipated and Unanticipated US Tax Policy Shocks," *American Economic Journal: Economic Policy*, 4, 145–81.

Millon, M. H. and A. V. Thakor (1985): "Moral Hazard and Information Sharing: A Model of Financial Information Gathering Agencies," *The Journal of Finance*, 40, 1403–1422.

Mukherjee, A., M. Singh, and A. Žaldokas (2017): "Do Corporate Taxes Hinder Innovation?" *Journal of Financial Economics*, 124, 195–221.

Nguyen, H.-L. Q. (2019): "Are Credit Markets Still Local? Evidence from Bank Branch Closings," *American Economic Journal: Applied Economics*, 11, 1–32.

Painter, M. (2020): "An Inconvenient Cost: The Effects of Climate Change on Municipal Bonds," *Journal of Financial Economics*, 135, 468–482.

Petersen, M. A. and R. G. Rajan (1995): "The Effect of Credit Market Competition on Lending Relationships," *The Quarterly Journal of Economics*, 110, 407–443.

Prager, R. A. and T. H. Hannan (1998): "Do Substantial Horizontal Mergers Generate Significant Price Effects? Evidence from the Banking Industry," *The Journal of Industrial Economics*, 46, 433–452.

Ramakrishnan, R. T. S. and A. V. Thakor (1984): "Information Reliability and a Theory of Financial Intermediation," *The Review of Economic Studies*, 51, 415–432.

Ratnadiwakara, D. and V. Yerramilli (2022): "Effect of Bank Mergers on the Price and Availability of Mortgage Credit," Working paper.

Reuters (2021): "White House to Target Bank Mergers, Financial Data with Competition Order," Available at `https://www.reuters.com/business/exclusive-white-house-target-bank-mergers-financial-data-with-competition-order-2021-07-09/`.

——— (2023): "U.S. Justice Antitrust Chief Details Renewed Bank Merger Scrutiny," Available at `https://www.reuters.com/business/finance/us-justice-antitrust-chief-urges-update-bank-merger-guidelines-2023-06-20/`.

Romer, C. D. and D. H. Romer (2010): "The Macroeconomic Effects of Tax Changes: Estimates Based on a New Measure of Fiscal Shocks," *American Economic Review*, 100, 763–801.

Sapienza, P. (2002): "The Effects of Banking Mergers on Loan Contracts," *The Journal of Finance*, 57, 329–367.

Schwert, M. (2017): "Municipal Bond Liquidity and Default Risk," *The Journal of Finance*, 72, 1683–1722.

Seru, A. (2014): "Firm Boundaries Matter: Evidence from Conglomerates and R&D Activity," *Journal of Financial Economics*, 111, 381–405.

Sunderam, A. and D. Scharfstein (2017): "Market Power in Mortgage Lending and the Transmission of Monetary Policy," Working paper.

Tarullo, D. K. (2022): "Regulators Should Rethink the Way They Assess Bank Mergers," Commentary, The Brookings Institution.

Tax Foundation (2023): "TaxEDU: Alternative Minimum Tax (AMT)," Available at `https://taxfoundation.org/taxedu/glossary/alternative-minimum-tax-amt/`.

The American Banker (1988): "Banks Make Steady Progress In Municipal Bond Underwriting," Available in the historical archive.

The Hechinger Report (2019): "Short on Financial Knowledge, Some School Districts Get Bad Deals on Bonds," Available at `https://hechingerreport.org/short-on-financial-knowledge-some-school-districts-get-bad-deals-on-bonds/#:~:text=Researchers%20and%20financial%20experts%2C%20meanwhile,can%20help%20drive%20down%20costs.`

U.S. Census Bureau (2006): "Government Finance and Employment Classification Manual," Available at `https://www2.census.gov/govs/class/classfull.pdf`.

U.S. Congress (1999): "Gramm-Leach-Bliley Act," Available at `https://www.congress.gov/bill/106th-congress/senate-bill/900/text`.

U.S. Securities and Exchange Commission (2012): "Report on the Municipal Securities Market," Tech. rep.

Vanda, V. and R. Singh (2004): "Bond Insurance: What Is Special About Munis?" *The Journal*

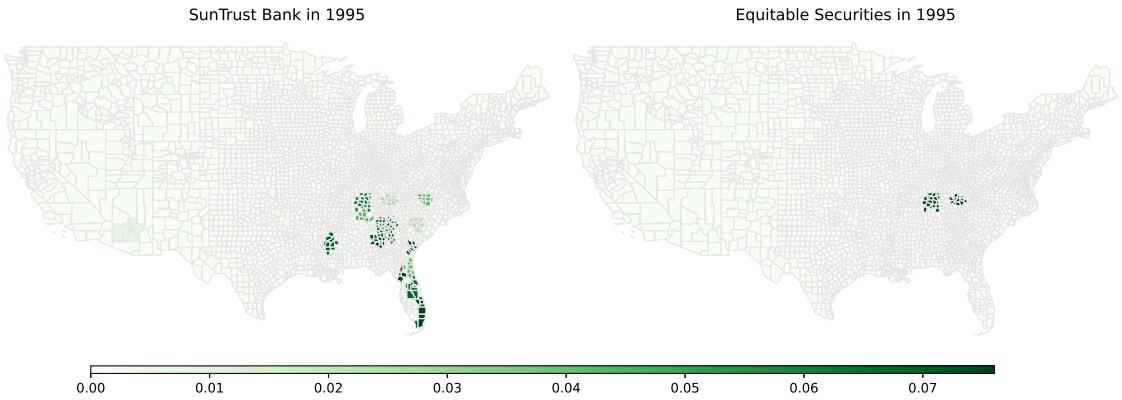
of Finance, 59, 2253–2280.

Yannelis, C. and A. L. Zhang (2023): "Competition and Selection in Credit Markets," *Journal of Financial Economics*, 150, 103710.

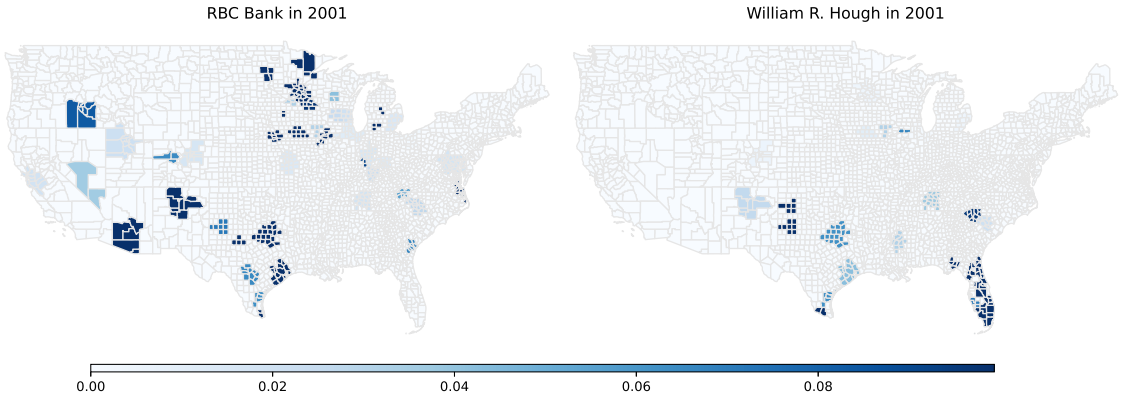
A. Figures

Figure 1: Local Market Shares of Merging Underwriters

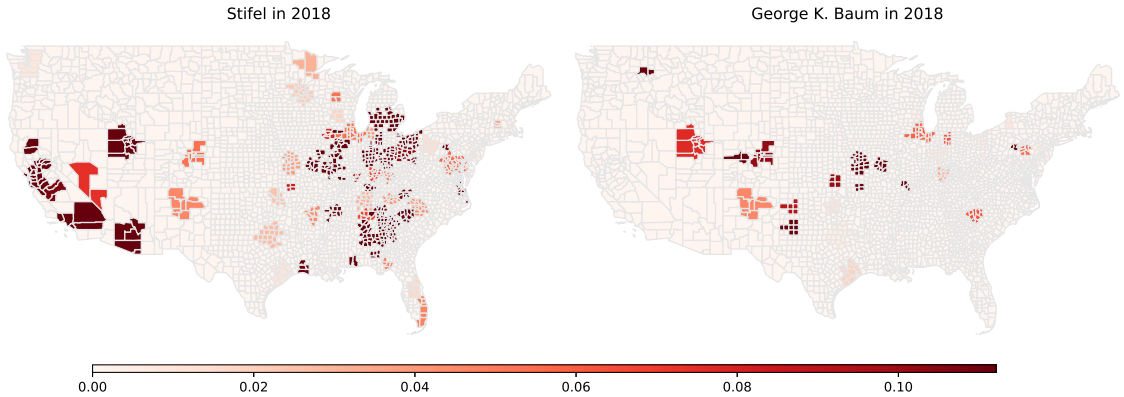
Panel A: Example 1, SunTrust Bank and Equitable Securities



Panel B: Example 2, RBC Bank and William R. Hough

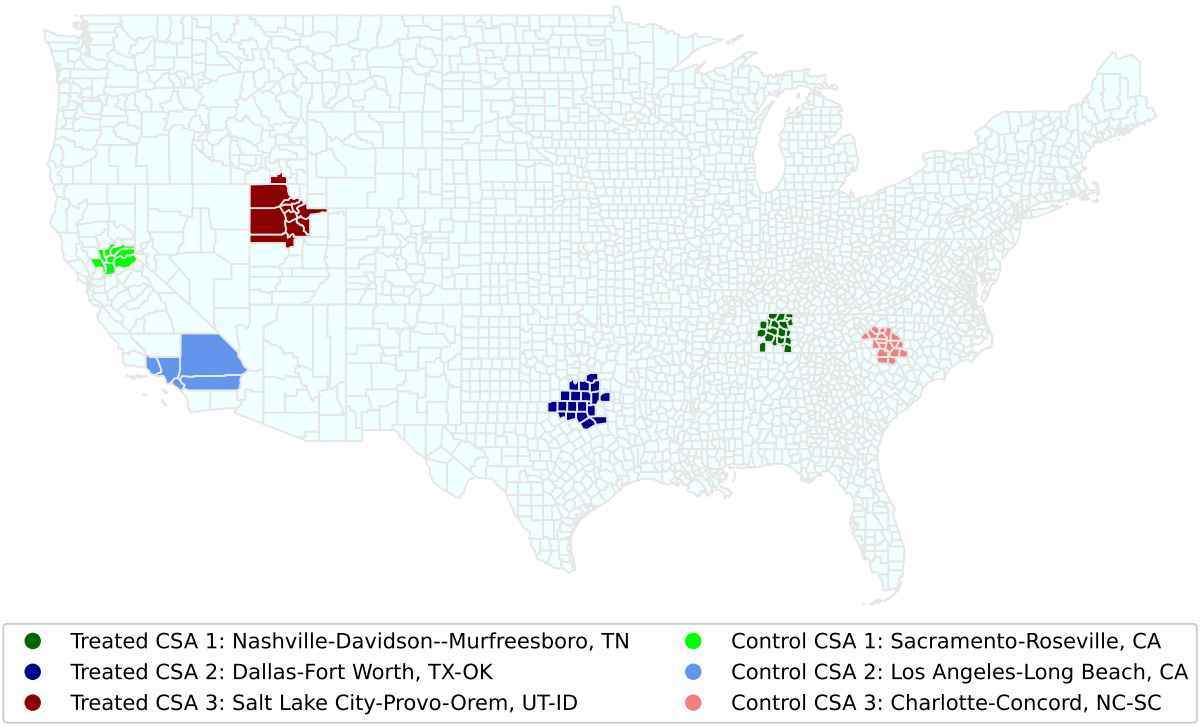


Panel C: Example 3, Stifel and George K. Baum



Note: This figure shows three randomly picked examples of municipal bond underwriters engaging in M&A. I plot the CSA-level market share of each bank in the year prior to the M&As. A darker shade represents a higher market share.

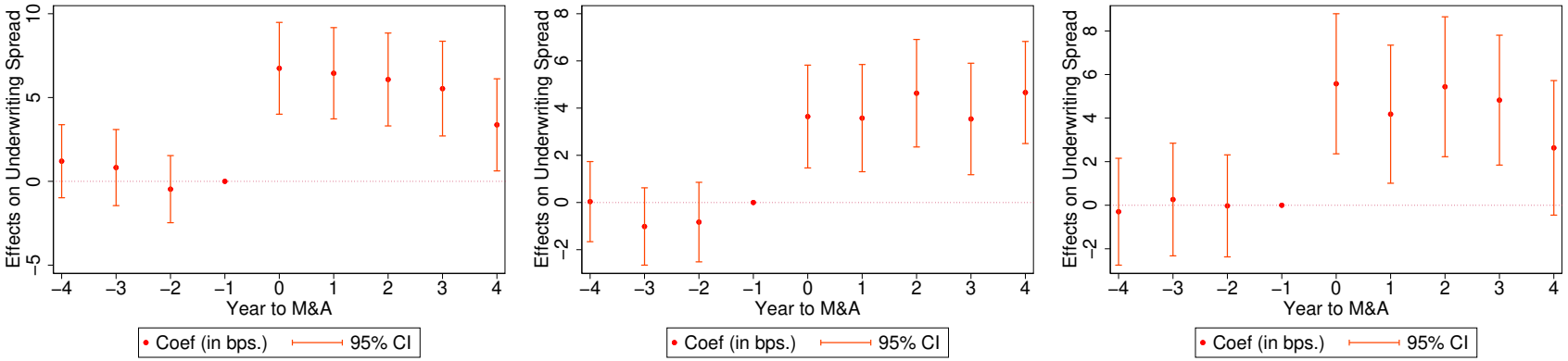
Figure 2: Illustration of Treated-Control Matched Sample



Note: This figure shows three randomly picked M&A-affected CSAs along with their matched control. For each treated CSA, I find a control CSA that most resembles the treated CSA in terms of average income and population based on the the Mahalanobis distance *and* is not affected by within-market M&As themselves in a nine-year period centered around the onset of the "local M&A episode". Theses three groups of treated and control CSAs correspond to the three panels in Figure 1 above.

Figure 3: Effects of M&As on Underwriting Spread

Panel A: *Predicted* $\Delta_{HHI} >= 100$ Panel B: Local market shares $>= 5\%$ Panel C: *Predicted* $\Delta_{Top\ 5\ Share} >= 5\%$



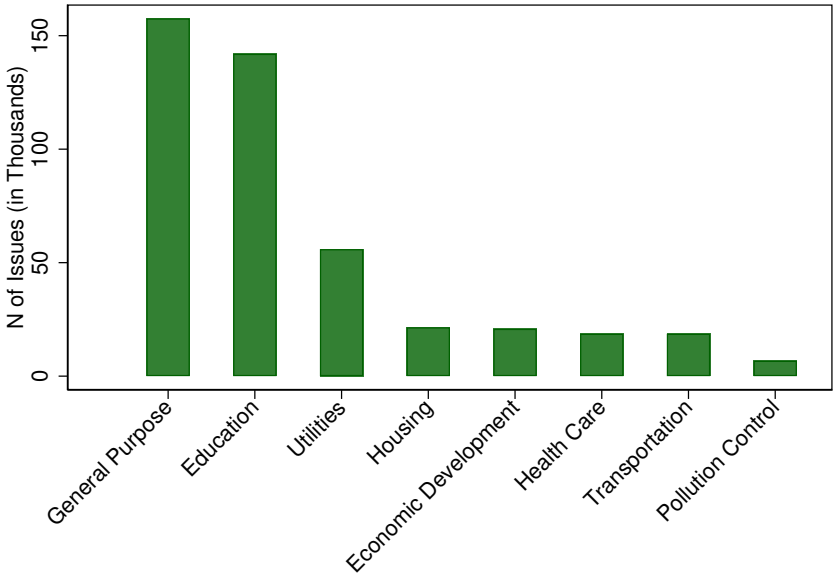
Note: This figure plots the evolvement of the underwriting spread for issues in treated CSAs relative to control CSAs. Panel A uses M&As with *predicted* $\Delta_{HHI} >= 100$. Panel B uses M&As with local market shares of both the acquiror and the target $>= 5\%$. Panel C uses M&As with *predicted* $\Delta_{Top\ 5\ Share} >= 5\%$. I estimate the following regression

$$Y_{d,c} = \alpha \times Treated_{a,c} + \beta \times Post_{c,t} + Treated_{a,c} \times \Big(\sum_{s=-4}^{-2} \gamma_s \times \mathbb{1}(\tau = s)_{c,t} + \sum_{s=0}^{4} \gamma_s \times \mathbb{1}(\tau = s)_{c,t} \Big) + \theta_i + \theta_t + e_{d,c}. \quad (6)$$

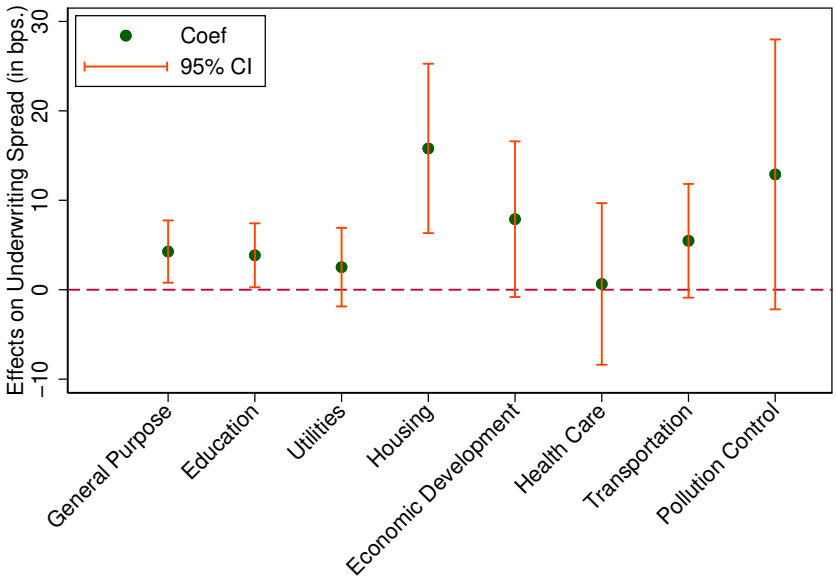
Here t represents the calendar year and τ represents the year relative to the treatment. $\mathbb{1}(\tau = s)_{c,t}$ is a dummy variable that turns on if the observation is $-s$ years before the treatment (for $s = -4, -3, -2$) or if the observation is s years after the treatment (for $s = 0, 1, 2, 3, 4$). I plot the estimates for each γ_s along with their 95% confidence intervals. Standard errors are clustered at the issuer level.

Figure 4: Effects of M&As on Underwriting Spread by Main Use of Proceeds

Panel A: Number of issues by the main use of proceeds

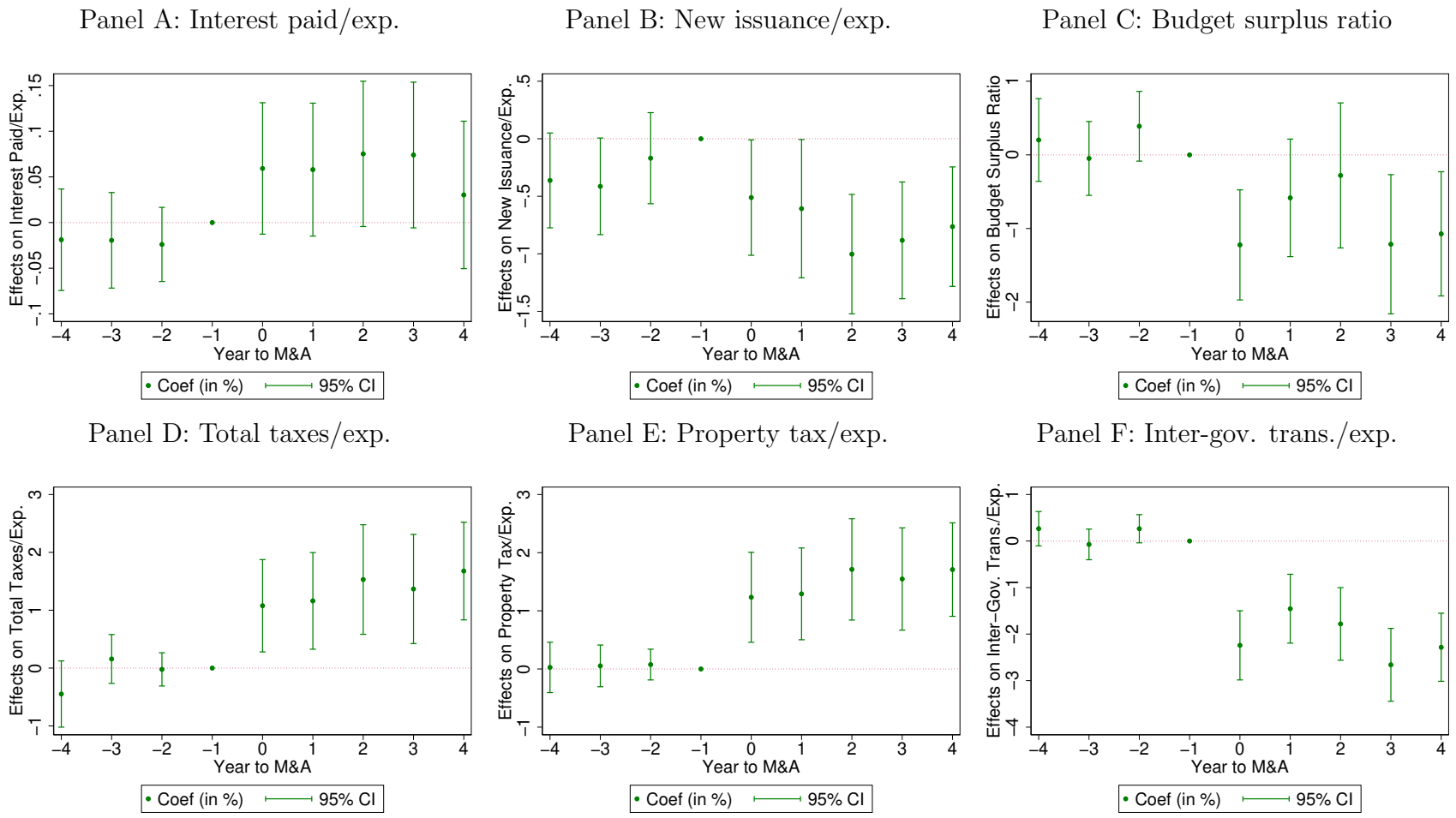


Panel B: Estimated effects by the main use of proceeds



Note: Panel A shows the number of bond issues by the main use of proceeds during 1970-2022. Bond issues are classified into different groups according to the "Main Use of Proceeds" variable in GPF. Panel B shows the break down of effects of M&As on the underwriting spread by the main use of proceeds of the issue. I estimate a version of Equation (4) and plot each $\gamma_{3,g}$ from the left to the right. Standard errors are clustered at the issuer level.

Figure 5: Effects of M&As on Local Government Finances



Note: This figure plots the evolvement of local government finances outcomes for governments in treated CSAs relative to control CSAs. All variables are expressed as ratios to the total expenditures of the local government. I estimate the following regression

$$Y_{l,t,c} = \alpha \times Treated_{a,c} + \beta \times Post_{c,t} + Treated_{a,c} \times (\sum_{s=-4}^{-2} \gamma_s \times \mathbb{1}(\tau = s)_{c,t} + \sum_{s=0}^{4} \gamma_s \times \mathbb{1}(\tau = s)_{c,t}) + \theta_l + \theta_t + e_{l,t,c}. \quad (7)$$

Here t represents the calendar year and τ represents the year relative to the treatment. $\mathbb{1}(\tau = s)_{c,t}$ is a dummy variable that turns on if the observation is $-s$ years before the treatment (for $s = -4, -3, -2$) or if the observation is s years after the treatment (for $s = 0, 1, 2, 3, 4$). Then I plot the estimates for each γ_s along with their 95% confidence intervals. Standard errors are clustered at the county level.

B. Tables

Table 1: Summary Statistics

	Mean	SD	25%	Median	75%	N
Panel A: SDC Sample						
Amount ($ Million)	28.90	64.25	3.07	8.50	23.46	442,091
Maturity (Years)	6.19	7.94	1.01	1.73	9.60	285,025
Underwriting Spread (bps.)	103.01	65.43	55.00	89.00	140.00	162,001
Reoffering Yield (bps.)	338.33	218.44	150.56	335.00	475.00	284,257
Reoffering Yield Spread (bps.)	84.14	81.77	31.42	62.17	111.73	263,222
Initial Underpricing ($)	0.39	1.36	–0.24	0.33	1.15	82,195
HHI	1232.05	882.89	720.49	991.74	1427.93	442,091
Method of Sale: Competitive Bidding	0.48	0.50	0.00	0.00	1.00	442,091
Method of Sale: Negotiated Sales	0.48	0.50	0.00	0.00	1.00	442,091
Method of Sale: Private Placement	0.04	0.20	0.00	0.00	0.00	442,091
Tax Status: Tax Exempt	0.91	0.29	1.00	1.00	1.00	442,091
Tax Status: Taxable	0.06	0.24	0.00	0.00	0.00	442,091
Tax Status: Alternative Minimum Tax	0.03	0.17	0.00	0.00	0.00	442,091
Soource of Repayment: General Obligation	0.66	0.47	0.00	1.00	1.00	442,091
Soource of Repayment: Revenue	0.34	0.47	0.00	0.00	1.00	442,091
Has Advisor	0.49	0.50	0.00	0.00	1.00	442,091
Has Dual Advisor	0.01	0.12	0.00	0.00	0.00	442,091
Has Credit Rating	0.15	0.36	0.00	0.00	0.00	442,091
Insured Ratio	0.18	0.39	0.00	0.00	0.00	442,091
If Insured	0.19	0.39	0.00	0.00	0.00	442,091
If Callable	0.50	0.50	0.00	1.00	1.00	442,091
If Commercial Banks Eligible	0.87	0.34	1.00	1.00	1.00	442,091
Panel B: Local M&A Episodes						
Acquiror Market Share	0.12	0.10	0.05	0.09	0.17	215
Target Market Share	0.11	0.10	0.04	0.09	0.15	215
Delta HHI	295.48	305.63	125.27	188.65	332.94	215
Panel C: California Sample						
Financial Advisor Fee (bps.)	49.82	55.96	12.38	29.36	67.04	14,537
Credit Rating Fee (bps.)	12.35	9.38	6.14	9.79	15.43	12,480
Insurance Fee (bps.)	80.42	69.51	28.88	54.23	111.76	5,965

Table 2: Summary Statistics

	Mean	SD	25%	Median	75%	N
Panel D: School Districts Sample						
Revenue Per Student	12746.48	6333.35	8518.44	11497.25	14981.61	396,125
Expenditure Per Student	13619.00	7914.79	8402.38	11557.52	16295.94	396,125
Interest Paid/Exp. (%)	2.03	2.27	0.25	1.36	3.03	396,125
New Issuance/Exp. (%)	5.42	16.18	0.00	0.00	0.00	396,125
Surplus Ratio (%)	–1.96	15.94	–6.69	1.20	6.39	396,125
Total Taxes/Exp. (%)	37.67	23.07	20.03	34.08	52.07	396,125
Property Tax/Exp. (%)	36.74	22.87	19.35	32.84	50.75	396,125
Inter-Gov. Trans./Exp. (%)	52.91	23.01	36.27	53.78	70.14	396,125
Inter-Gov. Trans. from Federal/Exp. (%)	0.84	2.90	0.00	0.00	0.35	396,125
Inter-Gov. Trans. from State/Exp. (%)	49.01	22.10	32.63	49.97	65.75	396,125
Inter-Gov. Trans. from Local/Exp. (%)	2.63	6.10	0.00	0.51	2.45	396,125
Panel E: Municipalities/Townships/Counties Sample						
Revenue Per Capita	1242.53	1317.42	355.07	814.24	1634.47	517,569
Expenditure Per Capita	1248.43	1384.94	332.63	784.98	1632.08	517,569
Interest Paid/Exp. (%)	3.08	4.56	0.00	1.26	4.23	517,569
New Issuance/Exp. (%)	5.90	16.63	0.00	0.00	0.00	517,569
Surplus Ratio (%)	6.92	26.18	–6.78	3.50	15.93	517,569
Total Taxes/Exp. (%)	44.42	25.83	25.16	40.84	59.59	517,569
Property Tax/Exp. (%)	32.34	25.68	12.69	25.52	46.67	517,569
Inter-Gov. Trans./Exp. (%)	29.65	22.52	12.62	24.48	41.55	517,569
Inter-Gov. Trans. from Federal/Exp. (%)	4.75	7.43	0.00	1.72	6.30	517,569
Inter-Gov. Trans. from State/Exp. (%)	21.15	19.30	7.05	15.38	29.85	517,569
Inter-Gov. Trans. from Local/Exp. (%)	3.25	7.85	0.00	0.04	2.15	517,569

Note: All variables have been winsorized at the 1% and 99% percentiles. The complete definitions are available in Table A2 in the Online Appendix.

Table 3: Effects of M&As on Underwriting Spread

	Predicted $\Delta_{HHI} >= 100$		Market Share >= 5%		*Predicted* $\Delta_{Top\ 5\ Share} >= 5\%$	
	(1)	(2)	(3)	(4)	(5)	(6)
	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)
Treated × Post	5.31***	5.90***	4.47***	4.63***	4.54***	5.65***
	(4.82)	(5.26)	(5.16)	(5.60)	(3.66)	(4.73)
Observations	89,636	87,576	170,254	145,053	82,928	72,534
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Issuer FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustering	Issuer	Issuer	Issuer	Issuer	Issuer	Issuer
Market Definition	CSA	CBSA	CSA	CBSA	CSA	CBSA
Adjusted R-squared	0.547	0.584	0.538	0.573	0.518	0.580

Note: In this table, I report estimates from a double-differences specification using the underwriting spread as the outcome variable. Columns (1) and (2) use M&As with *predicted* $\Delta_{HHI} >= 100$. Columns (3) and (4) use M&As with local market shares of both acquiror and target >= 5%. Columns (5) and (6) use M&As with *predicted* $\Delta_{Top\ 5\ Share} >= 5\%$. The market is defined as a CSA in columns (1), (3), and (5) and as a CBSA in columns (2), (4), and (6). T-stats are in parentheses. Standard errors are clustered at the issuer level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4: Robustness Checks of Effects of M&As on Underwriting Spread

VARIABLES	(1) Underwriting Spread (bps.)	(2) Underwriting Spread (bps.)	(3) Underwriting Spread (bps.)	(4) Underwriting Spread (bps.)	(5) Underwriting Spread (bps.)	(6) Underwriting Spread (bps.)
Treated × Post	5.57***	2.46***	3.70***	4.18***	4.63***	4.71***
	(5.10)	(2.62)	(3.63)	(4.02)	(4.49)	(4.30)
Amount (Million)					-0.48***	
					(-18.02)	
Maturity (Years)					2.81***	
					(14.64)	
Amount (Million)^2					0.00***	
					(15.38)	
Maturity (Years)^2					-0.06***	
					(-8.90)	
If Commercial Banks Eligible						-17.16***
						(-13.61)
Observations	89,523	88,577	75,048	89,633	74,850	89,636
Year FE	Yes	No	Yes	No	Yes	Yes
Issuer FE	Yes	Yes	No	Yes	Yes	Yes
Underwriter FE	Yes	No	No	No	No	No
Underwriter × Year FE	No	Yes	No	No	No	No
Issuer × Underwriter FE	No	No	Yes	No	No	No
Taxable × Year FE	No	No	No	Yes	No	No
Method of Sale × Year FE	No	No	No	Yes	No	No
Source of Repayment × Year FE	No	No	No	Yes	No	No
Clustering	Issuer	Issuer	Issuer	Issuer	Issuer	Issuer
Adjusted R-squared	0.531	0.645	0.749	0.571	0.606	0.552

Note: In this table, I report estimates from double-differences specifications using M&As with *predicted* $\Delta_{HHI} >= 100$ and the underwriting spread as the outcome variable. Column (1) includes fixed effects for the underwriter. Column (2) inlucdes the underwriter fixed effects interacted with the calender year fixed effects. Column (3) includes fixed effects for each issuer-underwriter pair. Column (4) includes the interaction of the method of sales, taxable status, and source of repayment fixed effects with year fixed effects. Column (5) controls for the amount and maturity of the issue and their squared terms. Column (6) controls for whether commercial banks are eligible to underwrite. T-stats are in parentheses. Standard errors are clustered at the issuer level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5: Cross-Sectional Heterogeneity in Effects of M&As on Underwriting Spread

Panel A: Cross-sections where effects are predicted to be stronger

	(1) Underwriting Spread (bps.)	(2) Underwriting Spread (bps.)	(3) Underwriting Spread (bps.)
Treated × Post	4.90***	3.86**	
	(4.34)	(2.33)	
Treated × Post × *predicted* Δ_{HHI} in [200,300)	-0.17		
	(-0.14)		
Treated × Post × *predicted* $\Delta_{HHI} \geq 300$	5.78***		
	(3.76)		
Treated × Post × HHI in [1000,2500)		1.97	
		(0.89)	
Treated × Post × HHI $\geq$ 2500		10.61**	
		(2.20)	
Treated × Post × Has Advisor			3.29**
			(2.46)
Treated × Post × No Advisor			6.59***
			(4.05)
Observations	89,636	89,636	89,636
Year FE	Yes	Yes	Yes
Issuer FE	Yes	Yes	Yes
Clustering	Issuer	Issuer	Issuer
Adjusted R-squared	0.547	0.547	0.550

Note: In this table, I report estimates from triple-differences specifications using the underwriting spread as the outcome variable. Column (1) reports estimates from a triple-differences specification by the significance of merging underwriters in the treated CSA, which I measure as the *predicted* Δ_{HHI} for the treated CSA due to the M&As. Column (2) reports estimates from a triple-differences specification by the degree of market concentraion in the CSA, which I measure as the HHI of the CSA. Column (3) reports estimates from a triple-differences specification by whether the issuer is using a financial advisor. Columns (1) and (2) use the specification of Equation (3) where the group with *predicted* Δ_{HHI} in between 100 and 200 and the group with HHI of the CSA less than 1,000 serve as the baseline group, respectively. Column (3) uses the speficiation of Equation (4). T-stats are in parentheses. Standard errors are clustered at the issuer level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Panel B: Cross-sections of interest in the municipal bond market

	(1) Underwriting Spread (bps.)	(2) Underwriting Spread (bps.)	(3) Underwriting Spread (bps.)	(4) Underwriting Spread (bps.)
Treated × Post × Competitive Bidding	5.76**			
	(2.57)			
Treated × Post × Negotiated Sales	5.12***			
	(4.10)			
Treated × Post × Tax-Exempt		5.29***		
		(4.68)		
Treated × Post × Taxable		3.60		
		(1.30)		
Treated × Post × Alternative Minimum Tax		7.53*		
		(1.79)		
Treated × Post × REV			5.97***	
			(3.87)	
Treated × Post × GO			4.02***	
			(2.83)	
Treated × Post × Bank is in M&A				3.53**
				(2.32)
Treated × Post × Bank is not in M&A				6.29***
				(4.93)
Observations	89,636	89,636	89,636	89,636
Year FE	Yes	Yes	Yes	Yes
Issuer FE	Yes	Yes	Yes	Yes
Clustering	Issuer	Issuer	Issuer	Issuer
Adjusted R-squared	0.551	0.547	0.555	0.547

Note: In this table, I report estimates from triple-differences specifications using the underwriting spread as the outcome variable. Column (1) reports estimates from a triple-differences specification by whether the method of sales is competitive bidding or negotiated sales. Column (2) reports estimates from a triple-differences specification by whether the taxable status of the bond is Taxable, Tax Exempt, or subject to Alternative Minimum Tax. Column (3) reports estimates from a triple-differences specification by whether the source of repayment of the bond is Revenue or General Obligation. Column (4) reports estimates from a triple-differences specification by whether the bond is underwritten by an investment bank involved in the M&As. All columns use the specification of Equation (4). T-stats are in parentheses. Standard errors are clustered at the issuer level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Panel C: Other cross-sections

	(1) Underwriting Spread (bps.)	(2) Underwriting Spread (bps.)	(3) Underwriting Spread (bps.)	(4) Underwriting Spread (bps.)	(5) Underwriting Spread (bps.)
Treated × Post			5.29***	4.66***	5.43***
			(4.43)	(2.88)	(4.39)
Treated × Post × 0-2 Relationships	3.70**				
	(2.40)				
Treated × Post × 3-5 Relationships	6.82***				
	(3.66)				
Treated × Post × More than 5 Relationships	5.38***				
	(2.65)				
Treated × Post × Pre-2000		5.06***			
		(3.25)			
Treated × Post × Post-2000		5.09***			
		(3.41)			
Treated × Post × Small Deals			-0.32		
			(-0.15)		
Treated × Post × Long Maturity				0.85	
				(0.40)	
Treated × Post × Black					-0.50
					(-0.20)
Observations	89,636	89,636	89,636	89,636	89,636
Year FE	Yes	Yes	Yes	Yes	Yes
Issuer FE	Yes	Yes	Yes	Yes	Yes
Clustering	Issuer	Issuer	Issuer	Issuer	Issuer
Adjusted R-squared	0.547	0.547	0.549	0.552	0.547

Note: In this table, I report estimates from triple-differences specifications using the underwriting spread as the outcome variable. Column (1) reports estimates from a triple-differences specification by the number of distinct underwriters that the issuer worked with to issue municipal bonds in the past ten years. Column (2) reports estimates from a triple-differences specification by whether the M&As are prior to or post 2000. Column (3) reports estimates from a triple-differences specification by whether the amount of the deal is less than median when sorted within each year. Column (4) reports estimates from a triple-differences specification by whether the maturity of the deal is longer than median when sorted within each year. Column (5) reports estimates from a triple-differences specification by whether the county of the issuer is in the top quartile in terms of the Black population ratio when sorted within each year. Columns (1) and (2) use the specification of Equation (4). Columns (3), (4), and (5) use the specification of Equation (3) where the group with the deal size above median, the group with the length of maturity below median, and the group with the county of the issuer in the bottom three quartiles in terms of the Black population ratio serve as the baseline group, respectively. T-stats are in parentheses. Standard errors are clustered at the issuer level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6: Effects of M&As on Underwriting Spread, Using Select Sample of M&As

Panel A: CSA makes up a small fraction of the total businesses of the merging underwriters

	Weight of CSA <= 10%	Weight of CSA <= 5%	Weight of CSA <= 3%
	(1)	(2)	(3)
	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)
Treated × Post	9.40***	9.24***	10.37**
	(4.39)	(2.89)	(2.36)
Observations	19,942	8,619	5,086
Year FE	Yes	Yes	Yes
Issuer FE	Yes	Yes	Yes
Clustering	Issuer	Issuer	Issuer
Adjusted R-squared	0.553	0.577	0.571

Panel B: M&As are driven by factors likely orthogonal to local economic dynamics according to news reports

	(1)	(2)
	Underwriting Spread (bps.)	Underwriting Spread (bps.)
Treated × Post	5.78***	4.41**
	(3.23)	(2.18)
Observations	26,815	18,753
Year FE	Yes	Yes
Issuer FE	Yes	Yes
Clustering	Issuer	Issuer
Adjusted R-squared	0.536	0.531

Note: In Panel A, I report estimates from a double-differences specification where the treated CSAs account for a small percentage of the underwriter's total businesses. The treated CSAs make up less than 10% (5%/3%) of the underwriter's total businesses in column (1) ((2)/(3)). In Panel B, I report estimates from a double-differences specification where the M&As are not driven by factors that could potentially correlate with local economic dynamics according to the news reports. Column (1) excludes all M&As driven by "acquiror's desire to gain local/regional dominance" and "acquiror's desire to expand geographically". Column (2) additionally excludes M&As driven by "financial stress of the target". Standard errors are clustered at the issuer level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 7: Placebo Tests for the Effects of M&As on Underwriting Spread

Panel A: Effects of cross-market M&As

	Market Share >= 10%		Market Share >= 0%	
	(1)	(2)	(3)	(4)
	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)
Treated × Post	-1.97	0.69	0.85	1.62
	(-1.00)	(0.33)	(0.72)	(1.12)
Observations	31,267	53,936	126,240	119,209
Year FE	Yes	Yes	Yes	Yes
Issuer FE	Yes	Yes	Yes	Yes
Clustering	Issuer	Issuer	Issuer	Issuer
If Similar Population	No	Yes	No	Yes
Adjusted R-squared	0.618	0.586	0.572	0.560

Note: In this table, I report estimates from a double-differences specification where the treatment is a cross-market M&A that would not increase the *predicted* HHI of the CSA and use the underwriting spread as the outcome variable. In columns (1) and (3), I randomly select a CSA where no within-market consolidation takes place *and* an underwriter which engaged in within-market consolidation in another CSA has a market presence. Columns (2) and (4) also use CSAs affected by cross-market M&As but additionally require the population to be similar to CSAs treated with within-market M&As. In columns (1) and (2), I require the underwriter involved in the cross-market M&A to have at least 10% local market share. In columns (3) and (4), I require the underwriter involved in the cross-market M&A to have an above 0% local market share. T-stats are in parentheses. Standard errors are clustered at the issuer level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Panel B: Effects of commercial banks M&As

	Predicted $\Delta_{CB\ HHI} >= 100$		*Predicted* $\Delta_{CB\ HHI} >= 50$		*Predicted* $\Delta_{CB\ HHI} >= 20$	
	(1)	(2)	(3)	(4)	(5)	(6)
	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)
Treated × Post	1.03	-1.37	2.64	-0.72	2.40*	-1.55
	(0.52)	(-0.82)	(1.56)	(-0.48)	(1.77)	(-1.14)
Observations	12,035	18,305	18,380	27,429	26,372	36,893
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Issuer FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustering	Issuer	Issuer	Issuer	Issuer	Issuer	Issuer
Market Definition	CSA	CBSA	CSA	CBSA	CSA	CBSA
Adjusted R-squared	0.547	0.560	0.562	0.558	0.575	0.560

Note: In this table, I report estimates from a double-differences specification where the treatment is within-market M&As among commercial banks that would lead to an increase above a certain threshold in terms of *CB HHI*, i.e., the HHI based on local deposit market shares of commercial banks. The threshold is 100 (50/20) in columns (1) and (2) ((3) and (4)/(5) and (6)). The market is defined as a CSA in columns (1), (3), and (5) and as a CBSA in columns (2), (4), and (6). Standard errors are clustered at the issuer level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Panel C: Effects of withdrawn M&As

	Predicted $\Delta_{HHI} >= 50$		*Predicted* $\Delta_{HHI} >= 20$		*Predicted* $\Delta_{HHI} >= 10$	
	(1)	(2)	(3)	(4)	(5)	(6)
	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)
Treated × Post	-5.80	-4.18	-9.85*	-22.09***	6.12	-11.60
	(-0.47)	(-0.35)	(-1.69)	(-3.00)	(1.13)	(-1.41)
Observations	129	483	1,418	1,575	4,034	1,884
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Issuer FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustering	Issuer	Issuer	Issuer	Issuer	Issuer	Issuer
Market Definition	CSA	CBSA	CSA	CBSA	CSA	CBSA
Adjusted R-squared	0.168	0.353	0.509	0.620	0.396	0.579

Note: In this table, I report estimates from a double-differences specification where the treatment is withdrawn M&As among municipal bond underwriters that would lead to an increase in the *predicted* HHI above a certain threshold if they went through. I use withdrawn M&As that would hypothetically lead to an implied Δ_{HHI} greater than 50 (20/10) in columns (1) and (2) ((3) and (4)/(5) and (6)). The market is defined as a CSA in columns (1), (3), and (5) and as a CBSA in columns (2), (4), and (6). Standard errors are clustered at the issuer level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 8: Effects of M&As on Offering Terms

	(1) Reoffering Yield (bps.)	(2) Reoffering Yield (bps.)	(3) Reoffering Yield (bps.)	(4) Reoffering Yield (bps.)	(5) Reoffering Yield (bps.)	(6) Initial Underpricing	(7) If Callable
Treated × Post	-2.53					0.07**	-0.02***
	(-1.54)					(2.14)	(-3.38)
Treated × Post × *predicted* Δ_{HHI} in [100,200)		-5.80***					
		(-3.13)					
Treated × Post × *predicted* $\Delta_{HHI} \geq 200$		6.90***					
		(2.62)					
Treated × Post × HHI < 1000			-11.67***				
			(-4.37)				
Treated × Post × HHI ≥ 1000			4.27**				
			(2.19)				
Treated × Post × Has Advisor				-2.79			
				(-1.33)			
Treated × Post × No Advisor				-3.31			
				(-1.32)			
Treated × Post × Competitive Bidding					-5.02**		
					(-2.46)		
Treated × Post × Negotiated Sales					-2.61		
					(-1.16)		
Observations	170,112	170,112	170,112	170,112	170,112	36,334	259,753
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Issuer FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustering	Issuer	Issuer	Issuer	Issuer	Issuer	Issuer	Issuer
Adjusted R-squared	0.753	0.753	0.753	0.753	0.759	0.200	0.380

Note: In this table, I use M&As with *predicted* $\Delta_{HHI} >= 100$. Columns (1), (2), (3), (4), and (5) use the reoffering yield as the outcome variable. Column (1) reports estimates from a double-differences specification. Column (2) uses a triple-differences specification by the significance of merging underwriters in the CSA. Column (3) uses a triple-differences specification by whether the HHI of the CSA is above $1,000$. Column (4) uses a triple-differences specification by whether the issuer is using a financial advisor. Column (5) uses a triple-differences specification by whether the method of sales is negotiated sales or competitive bidding. Columns (2), (3), (4), and (5) use the specification of Equation (4). Column (6) uses initial underpricing for each unit of face or par value of $100 as the outcome variable. Column (7) uses a dummy variable for whether the bond issue is callable as the outcome variable. T-stats are in parentheses. Standard errors are clustered at the issuer level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 9: Effects of M&As on Use of Credit Rating, Bond Insurance, and Financial Advisor

Panel A: Linear model or linear probability model

	(1) Has Rating	(2) Has Rating	(3) Has Rating	(4) Insured Ratio	(5) Insured Ratio	(6) Insured Ratio	(7) Has Advisor	(8) Has Advisor	(9) Has Advisor
Treated × Post	-0.021***	-0.015**		-0.014***	-0.008		-0.021***	-0.006	
	(-4.30)	(-2.50)		(-2.76)	(-1.23)		(-3.66)	(-0.96)	
Treated × Post × Bank not in M&A			-0.018***			-0.010*			-0.021***
			(-3.45)			(-1.81)			(-3.50)
Treated × Post × Bank is in M&A			-0.030***			-0.027**			-0.023**
			(-2.87)			(-2.51)			(-2.05)
Observations	259,753	170,619	259,753	259,753	170,619	259,753	259,753	170,619	259,753
Controls	No	Yes	No	No	Yes	No	No	Yes	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Issuer FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustering	Issuer	Issuer	Issuer	Issuer	Issuer	Issuer	Issuer	Issuer	Issuer
Adjusted R-squared	0.377	0.458	0.377	0.387	0.452	0.387	0.578	0.602	0.578

Note: In this table, I use M&As with *predicted* $\Delta_{HHI} >= 100$ and a dummy variable for whether the bond issue has credit ratings, the insured ratio of the bond issue, or a dummy variable for whether the issuer is hiring a financial advisor as the outcome variable. Columns (1), (4), and (7) report estimates from the double-differences specification of Equation (2). Columns (2), (5), and (8) control for the amount and maturity of the issue and their sqaured terms. Columns (3), (6), and (9) report estimates from a triple-differences specification by whether the bond is underwritten by an underwriter involved in the M&A. These three columns use the specification of Equation (4). T-stats are in parentheses. Standard errors are clustered at the issuer level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Panel B: Effects of M&As on Total Issuing Cost

	Predicted $\Delta_{HHI} >= 100$		Market Share $>= 5\%$		*Predicted* $\Delta_{Top\ 5\ Share} >= 5\%$	
	(1)	(2)	(3)	(4)	(5)	(6)
	Total Issuing Cost (bps.)	Total Issuing Cost (bps.)	Total Issuing Cost (bps.)	Total Issuing Cost (bps.)	Total Issuing Cost (bps.)	Total Issuing Cost (bps.)
Treated × Post	4.99***	5.72***	3.63***	4.04***	4.70***	5.24***
	(3.93)	(4.09)	(3.60)	(4.11)	(3.34)	(3.49)
Observations	88,419	86,348	167,656	142,981	81,953	71,125
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Issuer FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustering	Issuer	Issuer	Issuer	Issuer	Issuer	Issuer
Market Definition	CSA	CBSA	CSA	CBSA	CSA	CBSA
Adjusted R-squared	0.533	0.570	0.526	0.563	0.506	0.565

Note: In this table, I report estimates from a double-differences specification using the total issuing cost, i.e., the sum of the underwriting spread, credit rating fee, insurance fee, and financial advisor fee expressed as a fraction of the principal amount as the outcome variable. Columns (1) and (2) use M&As with *predicted* $\Delta_{HHI} >= 100$. Columns (3) and (4) use M&As with local market shares of both the acquiror and the target $>= 5\%$. Columns (5) and (6) use M&As with *predicted* $\Delta_{Top\ 5\ Share} >= 5\%$. The market is defined as a CSA in columns (1), (3), and (5) and as a CBSA in columns (2), (4), and (6). T-stats are in parentheses. Standard errors are clustered at the issuer level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 10: Effects of M&As on Local Government Finances

Panel A: All governments

	(1) Interest Paid/ Exp. (in %)	(2) New Issuance/ Exp. (in %)	(3) Inter-Gov. Trans./ Exp. (in %)	(4) Total Taxes/ Exp. (in %)	(5) Property Tax/ Exp. (in %)	(6) Budget Surplus Ratio (in %)
Treated × Post	0.07**	-0.51***	-2.20***	1.42***	1.45***	-1.02***
	(2.05)	(-2.68)	(-5.88)	(3.42)	(3.56)	(-2.98)
Observations	342,378	342,378	342,378	342,378	342,378	342,378
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Government FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustering	County	County	County	County	County	County
Adjusted R-squared	0.626	0.131	0.814	0.756	0.828	0.324

Note: In this table, I report estimates from a double-differences specification as in Equation (5) and using various local government finances outcomes as the outcome variable. All variables are expressed as ratios to the total expenditures of the local government. Panels A and B of Table A16 in the Online Appendix confirm the robustness of the findings when using the dollar amounts per capita or per student instead. Panels C and D of the table also show that the findings hold when using logged dollar amounts. The definitions of the varibles are provided in Table A2 in the Online Appendix. Standard errors are clustered at the county level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Panel B: School district versus municipality/township/county

	(1) Interest Paid/ Exp. (in %)	(2) New Issuance/ Exp. (in %)	(3) Inter-Gov. Trans./ Exp. (in %)	(4) Total Taxes/ Exp. (in %)	(5) Property Tax/ Exp. (in %)	(6) Budget Surplus Ratio (in %)
Treated × Post × Is School Dist.	-0.02	-1.14***	-4.24***	3.73***	3.84***	-0.08
	(-0.45)	(-3.70)	(-5.30)	(4.19)	(4.48)	(-0.22)
Treated × Post × Is Other Gov.	0.14**	-0.06	-0.71***	-0.29	-0.34	-1.76***
	(2.46)	(-0.30)	(-2.81)	(-1.10)	(-1.45)	(-3.88)
Observations	342,378	342,378	342,378	342,378	342,378	342,378
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Government FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustering	County	County	County	County	County	County
Adjusted R-squared	0.626	0.131	0.815	0.757	0.829	0.324

Note: In this table, I report estimates from the following triple differences specification,

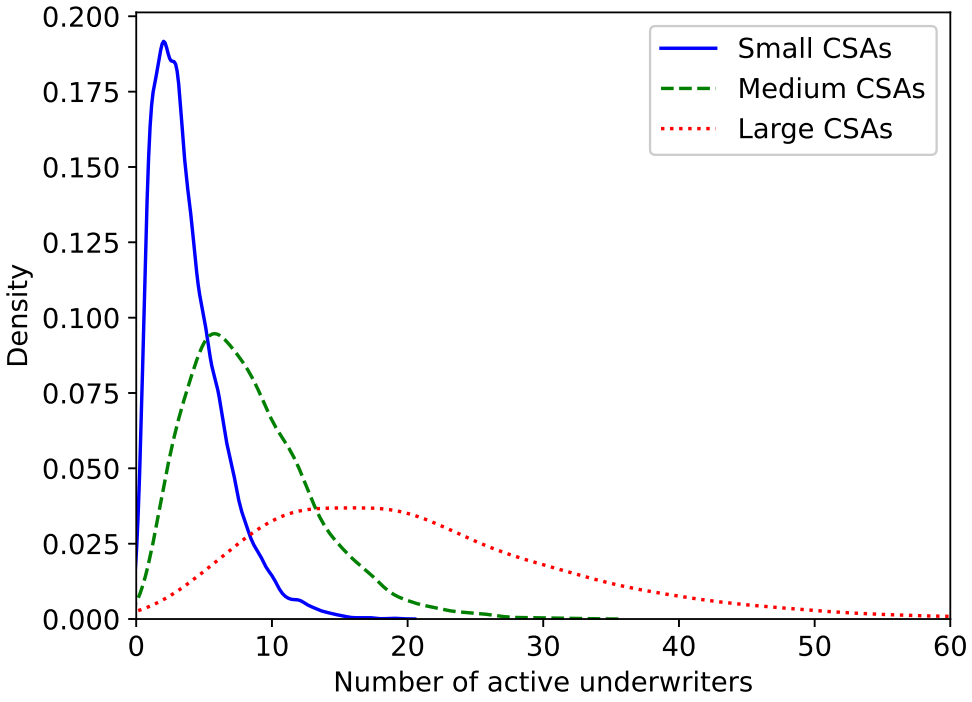
$$y_{l,t,c} = \sum_{g=1}^{G} \mathbb{1}_{\text{local government } l \text{ is in group } g} \times (\gamma_{1,g} Treated_{a,c} + \gamma_{2,g} Post_{c,t} + \gamma_{3,g} Treated_{a,c} \times Post_{c,t}) + \theta_l + \theta_t + e_{l,t,c}. \quad (8)$$

Here $G = 2$ and each group corresponds to the local government being a school district or a municipality/township/county. I use various local government finances outcomes as the outcome variable. All variables are expressed as ratios to the total expenditures of the local government. Panels A and B of Table A16 in the Online Appendix confirm the robustness of the findings when using the dollar amounts per capita or per student instead. Panels C and D of the table also show that the findings hold when using logged dollar amounts. The definitions of the varibles are provided in Table A2 in the Online Appendix. Standard errors are clustered at the county level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Online Appendix

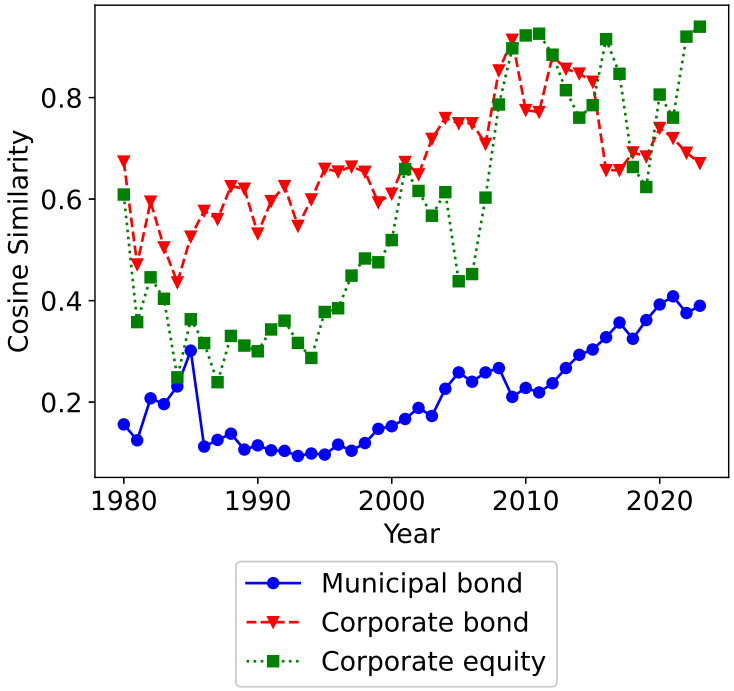
I. Figures in the Online Appendix

Figure A1: Distribution of the Number of Active Underwriters in a CSA



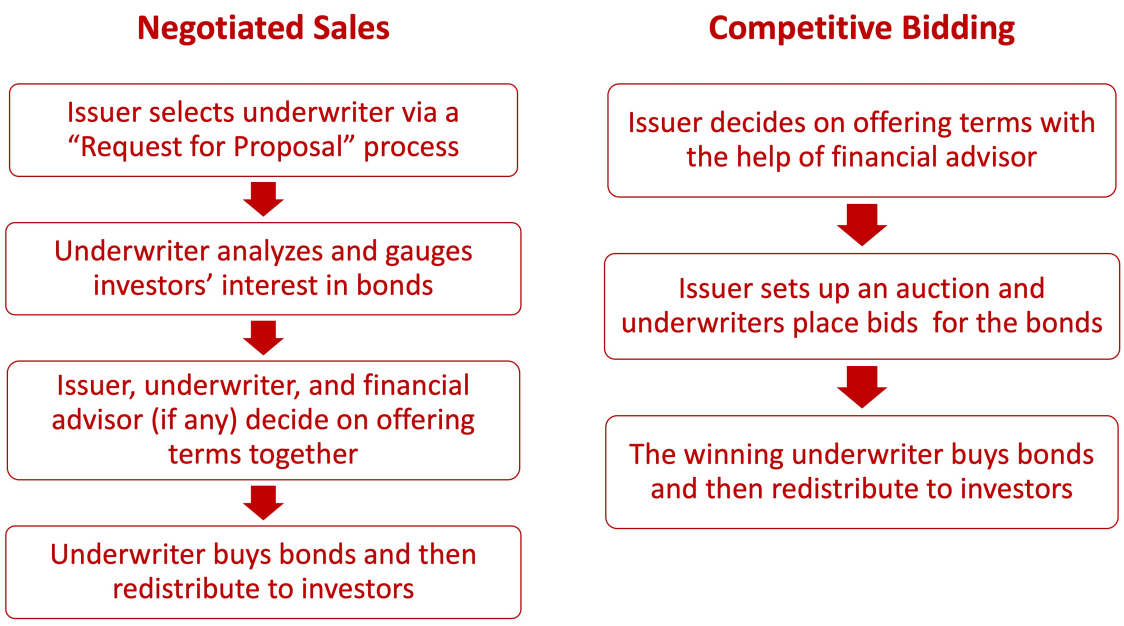
Note: This figure plots the kernel density of the distribution of the number of active underwriters in a CSA in a year. I divide all CSAs into three equal-sized groups based on total issue sizes and plot the kernel density within each group.

Figure A2: Underwriter Similarity for State-Pairs by Each Security Type



Note: This figure plots the average cosine similarity of underwriters' market shares in each pair of states for municipal bonds, corporate bonds, and corporate equity respectively from 1980 to 2022.

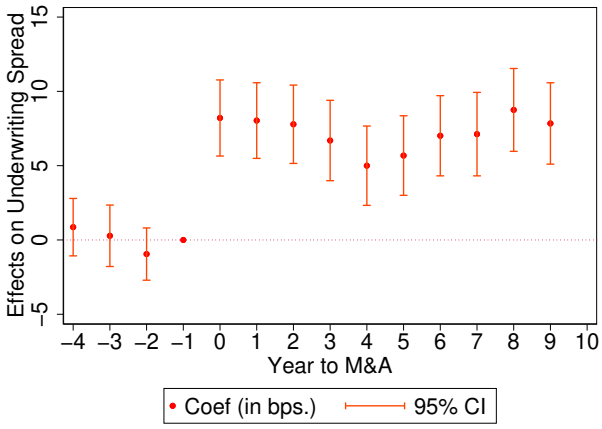
Figure A3: Illustration of Negotiated Sales and Competitive Bidding



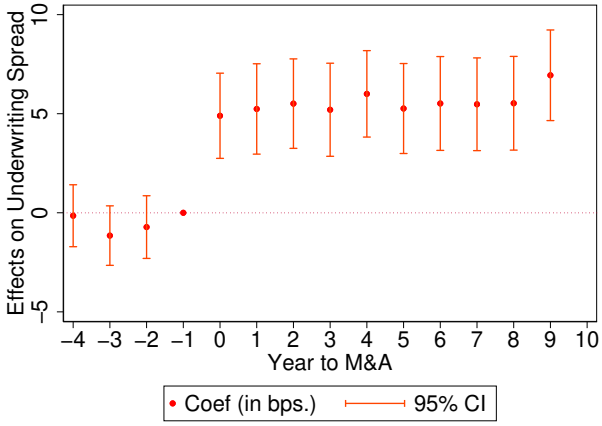
Note: This figure illustrates the steps in the process of negotiated sales and of comptitive bidding.

Figure A4: Long-Term Effects of M&As on Underwriting Spread

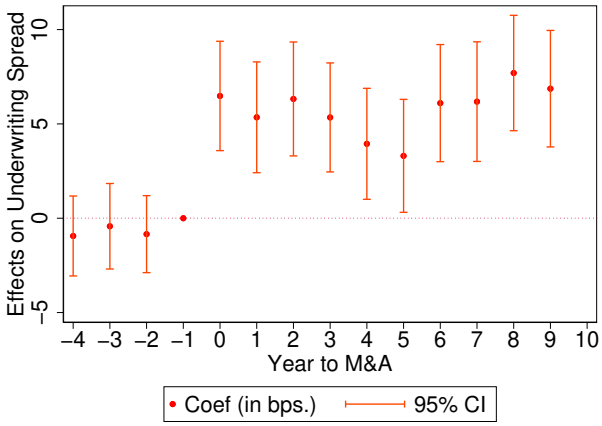
Panel A: *Predicted* $\Delta_{HHI} >= 100$



Panel B: Local market shares >= 5%



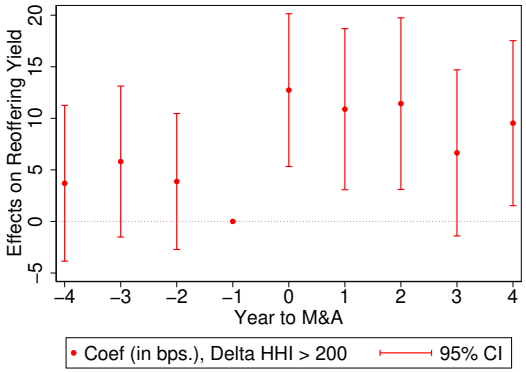
Panel C: *Predicted* $\Delta_{Top\,5\ Share} >= 5\%$



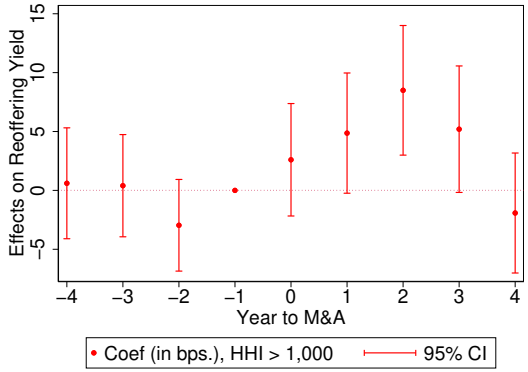
Note: This figure plots the evolvement of the underwriting spread for issues in treated CSAs relative to control CSAs with a longer post-treatment period of 10 years.

Figure A5: Effects of M&As on Reoffering Terms

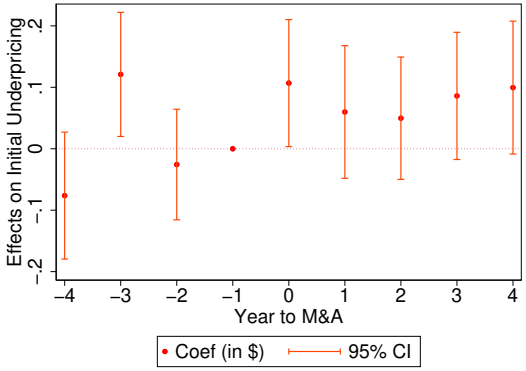
Panel A: Reoffering yield when *predicted* $\Delta_{HHI} \geq 200$



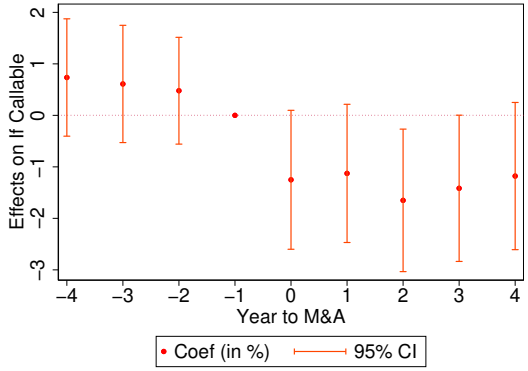
Panel B: Reoffering yield when HHI $\geq$ 1000



Panel C: Initial underpricing

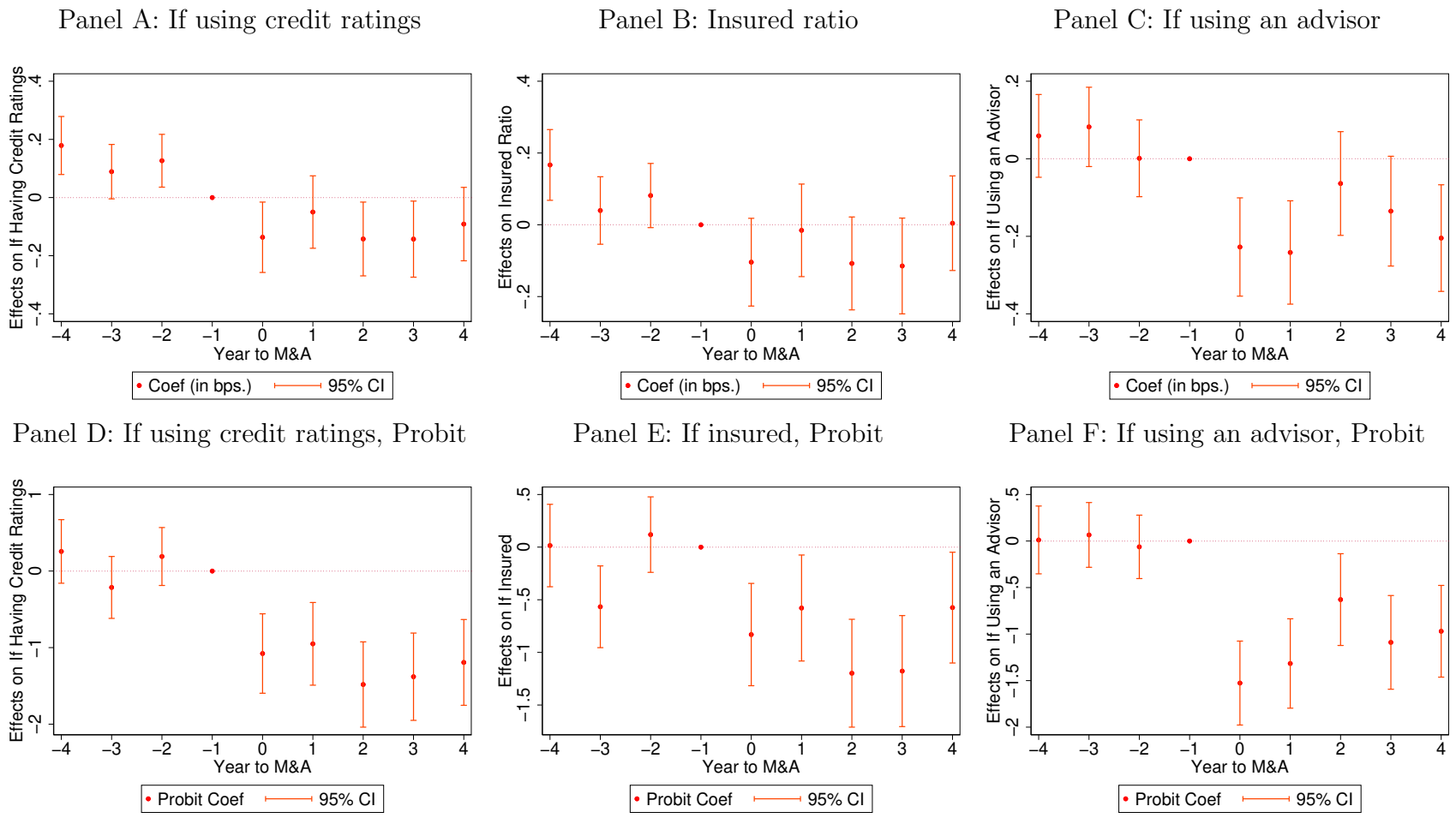


Panel D: If callable



Note: This figure plots the evolvement of the offering terms for issues in treated CSAs relative to control CSAs. Panel A plots the evolvement of the reoffering yield for more significant M&As with *predicted* $\Delta_{HHI} >= 200$. Panel B plots the evolvement of the reoffering yield in less competitive markets with HHI greater than 1,000. Panel C uses initial underpricing as the outcome variable. Panel D uses a dummy variable for whether the bond issue has callable features as the outcome variable. I plot the estimates for each γ_s along with their 95% confidence intervals. Standard errors are clustered at the issuer level.

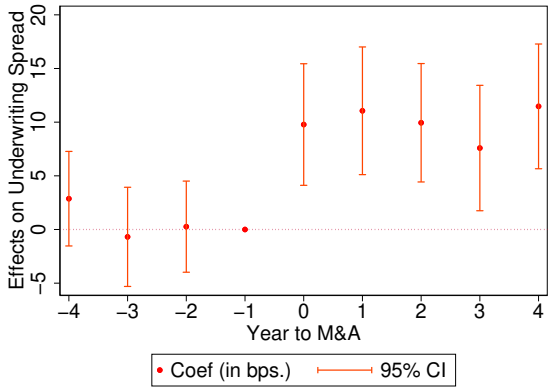
Figure A6: Effects of M&As on the Use of Credit Rating, Bond Insurnace, and Financial Advisor



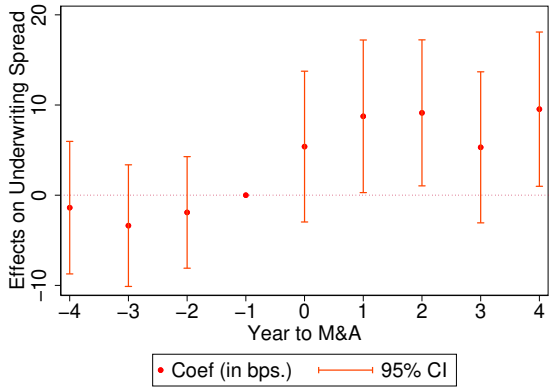
Note: This figure plots the evolvement of whether the issuers are using credit rating, bond insurance, and financial advisors for the bond issue in treated CSAs relative to control CSAs. In Panels A, B, and C, I estimate Equation (6) with a dummy variable for whether the issuer is using credit ratings, the ratio of the bond issue that is insured, and a dummy variable for whether the issuer is using a financial advisor as the outcome variable, respectively. In Panels D, E, and F, I estimate a Probit model with dummy variables for whether the issuers are using these services as the outcome variables and the same fixed effects, and plot the Probit coefficients. Standard errors are clustered at the issuer level.

Figure A7: Effects of M&As on Underwriting Spread, Using Select Sample of M&As

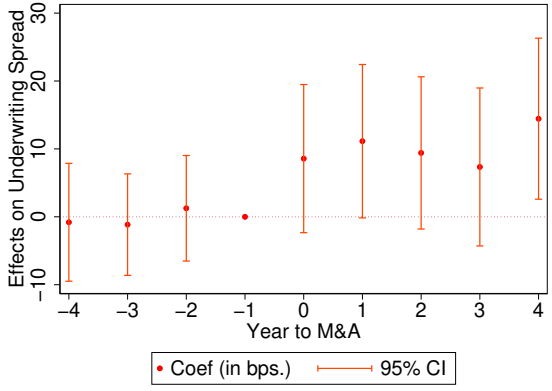
Panel A: CSA makes up less than 10%



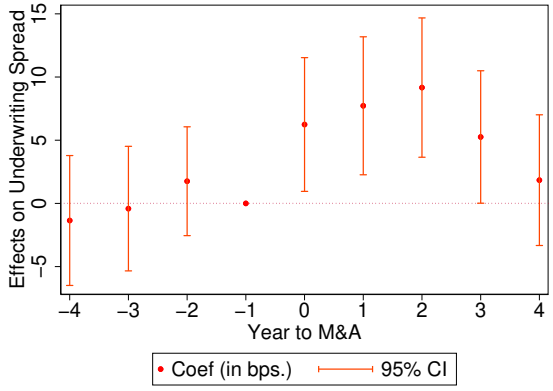
Panel B: CSA makes up less than 5%



Panel C: CSA makes up less than 3%

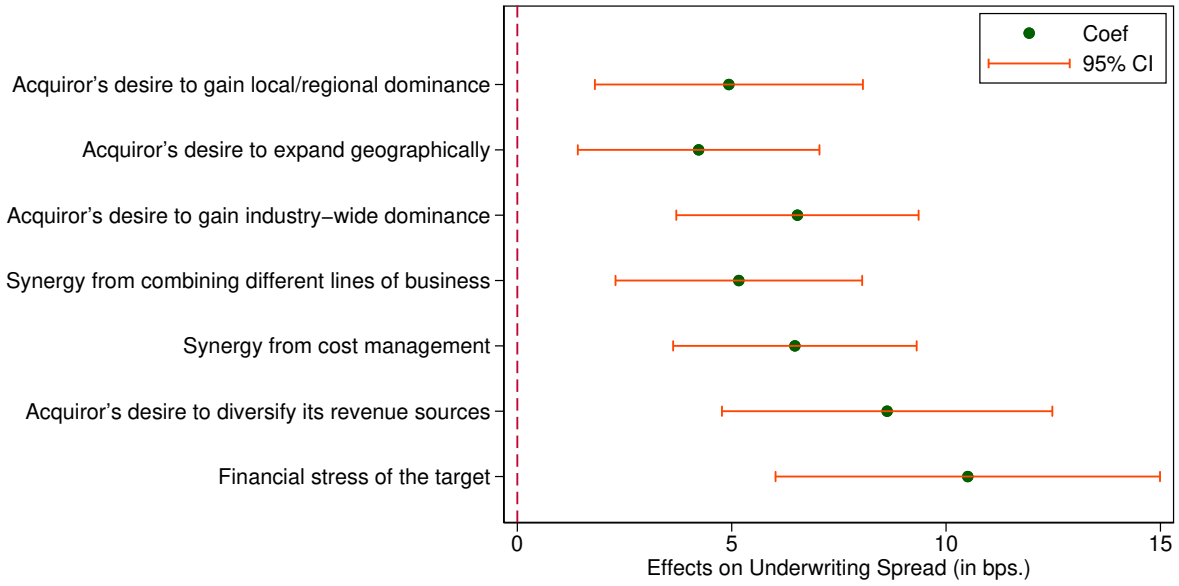


Panel D: M&As are driven by factors likely orthogonal to local economic dynamics



Note: Panels A, B, and C plot the evolvement of the underwriting spread for issues in treated CSAs relative to control CSAs when the treated CSAs make up a small fraction of the merging underwriters' total businesses. I require the treated CSAs make up less than 10%, 5%, or 3% of the merging underwriters' total businesses in Panels A, B, and C, respectively. Panel D plots the evolvement of the underwriting spread for issues in treated CSAs relative to control CSAs when the M&As are not be driven by factors that could potentially correlate with local economic dynamics according to the news reports. Standard errors are clustered at the issuer level.

Figure A8: Effects of M&As on Underwriting Spread by Driving Reasons According to News Reports

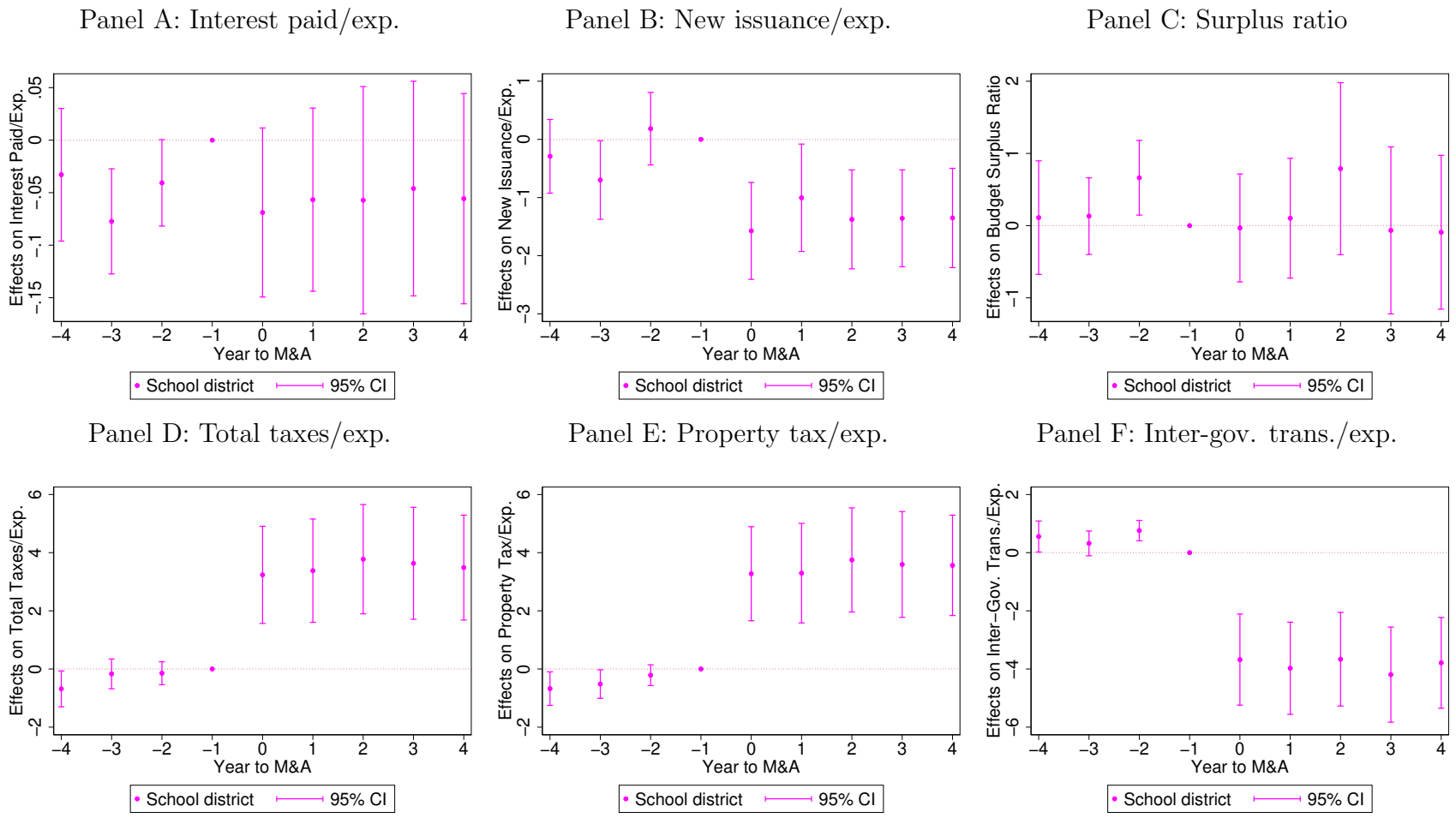


Note: This figure plots the effects of M&As on underwriting spread by each category of driving reasons according to news reports. To obtain the first coefficient, I divide the "local M&A episodes" based on whether they involve an M&A that is driven by "acquiror's desire to gain local/regional dominance" according to the news reports. I run the following regression,

$$\begin{aligned} y_{d,c} = {} & \beta_1 TreatedLocalDominance_{a,c} + \beta_2 TreatedNotLocalDominance_{a,c} + \beta_3 Post_{c,t} \\ & + \beta_4 TreatedLocalDominance_{a,c} \times Post_{c,t} + \beta_5 TreatedNotLocalDominance_{a,c} \times Post_{c,t} \\ & + \theta_i + \theta_t + e_{d,c}. \end{aligned}$$

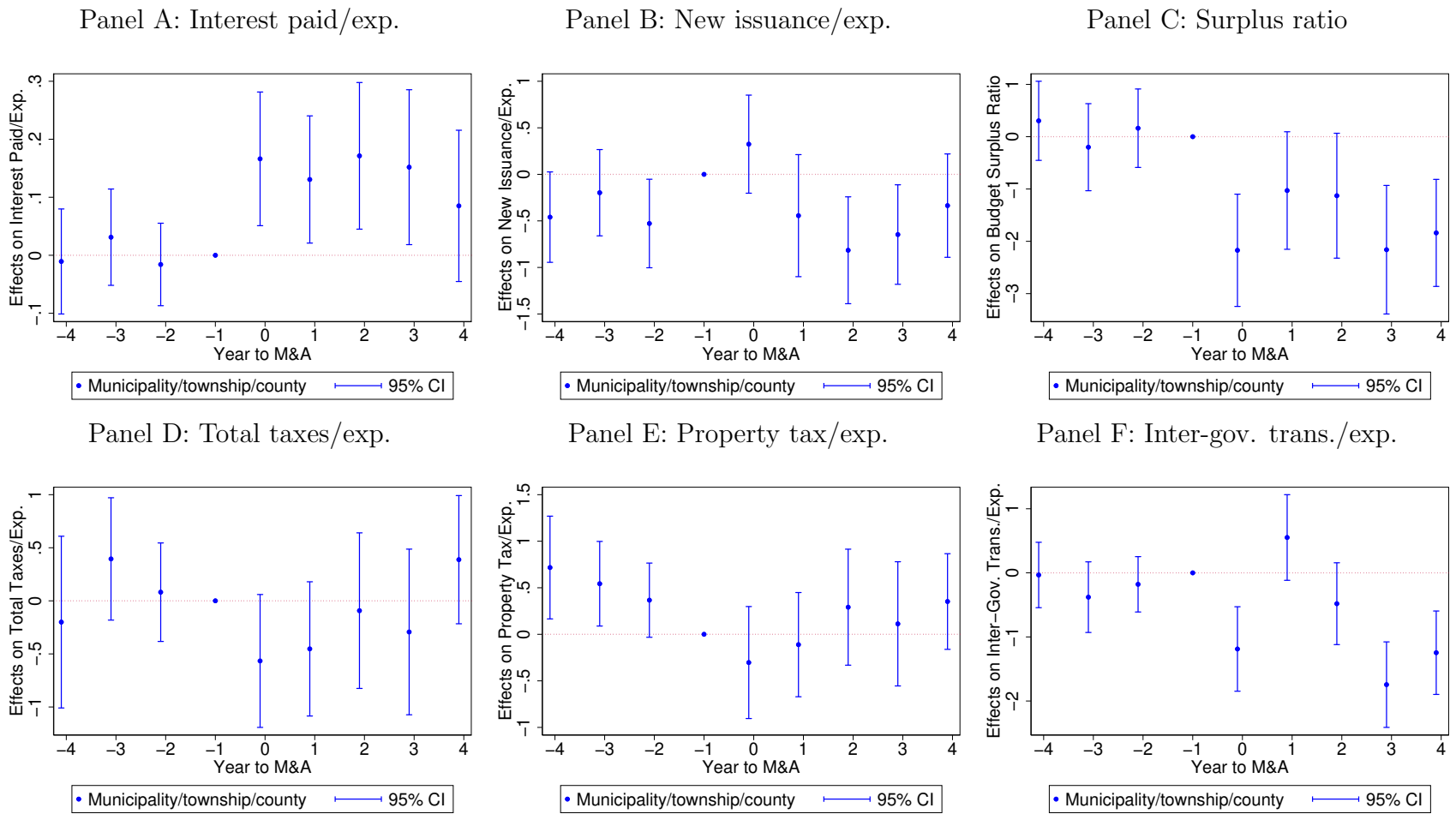
Here $TreatedLocalDominance$ equals one for issues in treated CSAs in a "local M&A episode" which involves an M&A that is driven by "acquiror's desire to gain local/regional dominance" according to the news reports. $TreatedNotLocalDominance$ equals one for issues in treated CSAs in a "local M&A episode" which does not involve an M&A that is driven by "acquiror's desire to gain local/regional dominance". I repeat the process for each category of driving reasons. I then plot each β_4, the estimated effects of M&As for which the driving reason falls into a certain category. Standard errors are clustered at the issuer level.

Figure A9: Effects of M&As on School District Finances



Note: This figure plots the evolvement of school district finances outcomes for school districts in treated CSAs relative to control CSAs. I estimate a version of Equation (7) for which the dynamic effects are estimated separately for school districts versus municipalities/townships/counties and I plot the estimates for each γ_s corresponding to school districts along with their 95% confidence intervals. Standard errors are clustered at the county level.

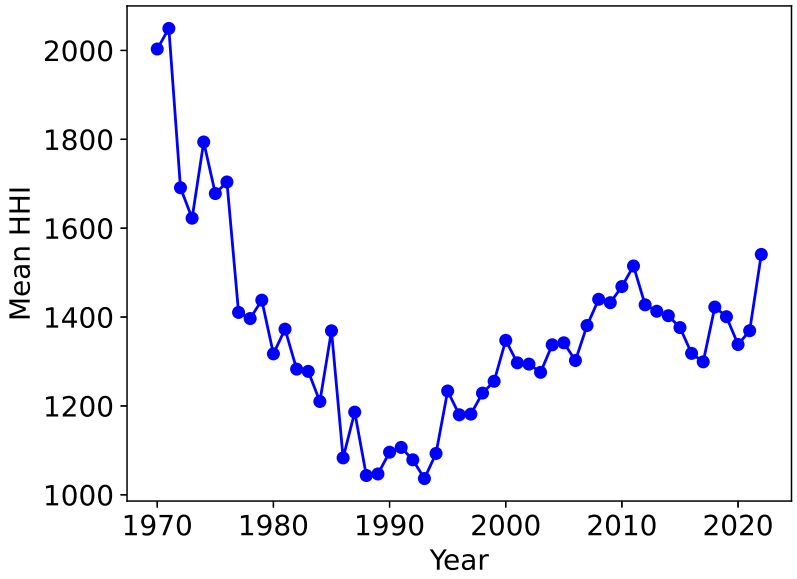
Figure A10: Effects of M&As on Municipality/Township/County Finances



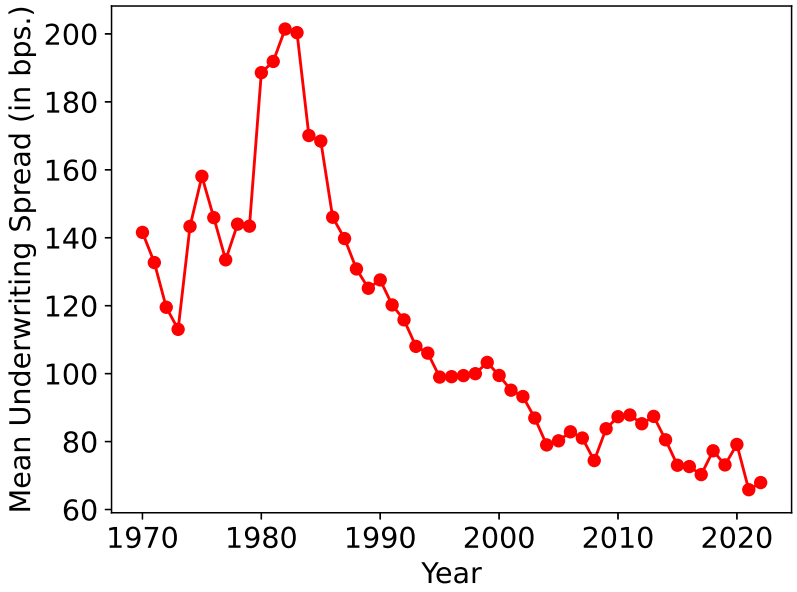
Note: This figure plots the evolvement of municipality/township/county finances outcomes for municipalities/townships/counties in treated CSAs relative to control CSAs. I estimate a version of Equation (7) for which the dynamic effects are estimated separately for school districts versus municipalities/townships/counties and I plot the estimates for each γ_s corresponding to municipalities/townships/counties along with their 95% confidence intervals. Standard errors are clustered at the county level.

Figure A11: Time Trends of HHI and Underwriting Spread

Panel A: Trend of HHI, 1970-2022



Panel B: Trend of underwriting spread, 1970-2022



Note: Panel A shows the average CSA-level HHI in each year from 1970 to 2022. Panel B shows the average underwriting spread in each year from 1970 to 2022.

II. Tables in the Online Appendix

Table A1: Literature on the Determinants of Underwriting Spread and Reoffering Yield

		Outcome Variable	Effects
Adelino et al. (2017)	Upward adjustment of ratings due to the recalibration of bond rating scale by Moody's	Reoffering yield	-14 bps.
Butler et al. (2009)	Whether corruption (proxied for using federal convictions per capita) is in the top quartile	Reoffering yield	7 to 10 bps.
	Being in the pay-for-play era and for negotiated sales	Underwriting spread	12 to 14 bps.
Butler and Yi (2022)	A one-standard-deviation increase in the population age	Reoffering yield	23 bps.
Cestau et al. (2020)	The use of negotiated sales	Reoffering yield	15 to 17 bps.
Cheng et al. (2023)	The passage of state medical marijuana laws	Reoffering yield	7 to 11 bps.
Cornaggia et al. (2017)	Upward adjustment of ratings due to the recalibration of bond rating scale by Moody's	Reoffering yield	-33 to -19 bps.
Cornaggia et al. (2021)	Counties highly affected relative to less affected by opioid crisis	Reoffering yield	17 bps.
Cornaggia and Iliev (2024)	An interquartile range increase in wind speed among states that produce or consume more than 20% of their energy from wind	Trading yield	-7 bps.
Dougal et al. (2019)	HBCU relative to non-HBCU	Trading yield	5 to 11 bps.
		Underwriting spread	11 bps.
Farrell et al. (2023)	A one-standard-deviation increase in official statement complexity	Reoffering yield	5 bps.
Gao et al. (2019a)	The existence of state assistance programs for municipalities in distress	Trading yield	-5 bps.

Table A1: Literature on the Determinants of Underwriting Spread and Reoffering Yield (continued)

		Outcome Variable	Effects
Gao et al. (2020)	The closure of local newspapers	Reoffering yield Trading yield	5 to 11 bps. 6 to 10 bps.
Gao et al. (2019b)	Political uncertainty around gubernatorial elections	Reoffering yield	7 bps.
Garrett et al. (2022)	A one p.p. increase in the personal income tax subsidy	Reoffering yield	-7 bps.
Garrett and Ivanov (2023)	A one-standard-deviation increase in reliance on banks targeted by Anti-ESG policies in Texas	Reoffering yield	10 bps.
Garrett (2023)	The ban of dual advisor-underwriters	Reoffering yield	-11 bps.
Goldsmith-Pinkham et al. (2023)	A one-standard-deviation (approximately 10 percentage points) increase in the fraction of properties exposed to six feet of sea-level rise	Trading yield	5 bps.
Gustafson et al. (2023)	A one-standard-deviation increase in COVID migration shock	Reoffering yield	-12 to -6 bps.
Han (2021)	A one-standard-deviation increase in public-sector union membership	Reoffering yield	3 bps.
	The passage of Right to Work	Reoffering yield	4 bps.
	Closely won union elections	Trading yield	50 bps.
Li and Zhu (2019)	A one-standard-deviation increase in drug (opioid) mortality rate	Reoffering yield	6 bps.
Lu and Ye (2023)	The passage of state "trigger" bans on abortion	Trading yield Reoffering yield	7 to 11 bps. 20 to 23 bps.
Painter (2020)	A one-standard-deviation increase in climate change risk	Reoffering yield	7 to 16 bps.
		Underwriting spread	0 to 10 bps.

Note: I list prior research on determinants of underwriting spread, reoffering yield, and trading yield of municipal bonds along with the magnitudes of the effects.

Table A2: Definition of Variables

Panel A: SDC Platinum Global Public Finance	
Underwriting Spread	The difference between the reoffering price to initial investors and the proceeds that the government receives, which is expressed as a fraction of the principal amount and constitutes a major source of revenue for the investment banks.
Reoffering Yield	The yield of the bond issue calculated based on the reoffering price that initial investors pay to underwriters. I outline the details in Section IV.I in the Online Appendix.
Reoffering Yield Spread	The spread between the yield of a municipal bond and its comparable U.S. treasury securities. I outline the details in Section IV.I in the Online Appendix.
Initial Underpricing	The average day-15-to-day-30 trading price minus the average initial trading price. I outline the details in Section IV.I in the Online Appendix.
Amount	The principal amount of the bond issue. It is inflation-adjusted and is in 2022 dollars.
Maturity	The maturity of the bond issue. If a bond issue contains multiple bonds, the maturity of the bond issue is the weighted average by the principal amounts.
Method of Sales	Whether the underwriting process is carried out through competitive bidding, negotiated sales, or private placement.
Tax Status	Whether the interest payments received by investors are exempt from federal taxation, taxable, or subject to the Alternative Minimum Tax.
Source of Repayment	Whether the source of funding for repayment comes from the overall revenue of a whole government (i.e., a General Obligation bond) or from the revenue of a specific project (i.e., a Revenue bond).
Has Credit Rating	Whether this bond issue has credit rating.
Insured Ratio	The fraction of the bond issue for which the repayment is guaranteed by an insurance company. Most of the time a bond issue is either fully insured, i.e., insured ratio = 1, or not insured, i.e., insured ratio = 0.
Has Advisor	Whether the issuer formally hires an advisor for this bond issue.
Has Dual Advisor	Whether the issuer formally hires an advisor that is also an underwriter for this bond issue.
If Callable	Whether the issuer can retire the bond issue prior to the maturity date by paying off the principal early.

Table A2: Definition of Variables (continued)

If Commercial Bank Eligible	Whether commercial banks are allowed to underwriter the bond issue by law.
HHI	The HHI of a CSA $\times$ year based on the market shares of municipal bond underwriters. The market share is based on the number of deals of each underwriter. For a bond issue underwritten by a syndicate of, for example, N underwriters, I add $1/N$ to the number of deals of each underwriter in the syndicate.
Panel B: Local M&A Episodes	
Acquiror Market Share	The market share of the acquiring underwriter in the M&A-affected CSA in the three-year period before the onset of the "local M&A episode". If a "local M&A episode" consists of multiple within-market M&As, I use the market share based on the largest M&A.
Target Market Share	The market share of the target underwriter in the M&A-affected CSA in the three-year period before the onset of the "local M&A episode". If a "local M&A episode" consists of multiple within-market M&As, I use the market share based on the largest M&A.
Predicted Δ_{HHI}	The *predicted* increase in HHI due to the M&As. Based on bond issues in the three-year period before the onset of the "local M&A episode", I calculate the would-be HHI if the acquiror and the target in a M&A become a single firm. I then obtain the difference between this *predicted* HHI and the actual HHI of the period.
Panel C: California Debt and Investment Advisory Commission	
Credit Rating Fee	The cost of obtaining credit ratings expressed as a fraction of the principal amount.
Insurance Fee	The cost of purchasing bond insurance expressed as a fraction of the principal amount.
Financial Advisor Fee	The cost of formally hiring a financial advisor expressed as a fraction of the principal amount.

Table A2: Definition of Variables (continued)

Panel D: Local Government Finances	
Revenue Per Student	Total revenues (in $) scaled by the number of students enrolled in a school district. For years piror to 2013, total revenues are obtained from the field "Total Revenue" in "Data Files on Historical Finances of Individual Governments: Fiscal Years 1967 and 1970 - 2012". For years 2013 and onwards, using the annually released "Annual Survey of State and Local Government Finances" and following the guidance in "Government Finance and Employment Classification Manual" (U.S. Census Bureau, 2006), total revenues is calculated as the aggregation of all items starting with "A" (various charges), "B" (inter-governmental transfer from the federal government to the local government), "C" (inter-governmental transfer from the state government to the local government), "D" (inter-governmental transfer from other local governments), "T" (various taxes flowing to local governments), "U" (miscellaneous revenues), along with "X01", "X02", "X05", "X08" (various contributions to employee retirement fund), "Y01", "Y02", "Y04" (various contributions to unemployment benefits), "Y11", "Y12" (various contributions to workers' compensation), "Y51", and "Y52" (various contributions to the insurance trust system). The amount is then inflation-adjusted into 2022 dollars.
Expenditure Per Student	Total expenditures (in $) scaled by the number of students enrolled in a school district. For years piror to 2013, total expenditures are obtained from the field "Total Expenditure" in "Data Files on Historical Finances of Individual Governments: Fiscal Years 1967 and 1970 - 2012". For years 2013 and onwards, total expenditures is calculated as the aggregation of all items starting with "E" (various expenditures for the current operation of public facilities), "F" (various expenditures for the construction of public facilities), "G" (various expenditures for other capital overlay of public facilities), "I" (interest on debt), "J" (subsidies), "L", "M", "Q", "S" (various inter-governmental transfers out from the local government), along with "X11", "X12" (various withdrawals of employee retirement fund), "Y05", "Y06" (various withdrawals of unemployment benefits), "Y14" (workers' benefit payments), "Y53" (benefit payments from the insurance trust system), and "Z00" (total salaries and wages). The amount is then inflation-adjusted into 2022 dollars.

Table A2: Definition of Variables (continued)

Panel D: Local Government Finances	
Revenue Per Capita	Total revenues (in $) scaled by the population in a municipality/-township/county. The amount is then inflation-adjusted into 2022 dollars.
Expenditure Per Capita	Total expenditures (in $) scaled by the population in a municipality/township/county. The amount is then inflation-adjusted into 2022 dollars.
Interest Paid/Exp.	Total interest paid on debt scaled by total expenditure.
New Issuance/Exp.	Total new issuance of debt scaled by total expenditure.
Budget Surplus Ratio	$\frac{\text{Total Revenue}}{\text{Total Expenditure}} - 1$.
Total Taxes/Exp.	Total taxes scaled by total expenditure.
Property Tax/Exp.	Property tax scaled by total expenditure.
Inter-Gov. Trans.	Total inter-governmental transfers to the local government scaled by total expenditure.

Table A3: M&As in the Sample

Acquiror	Target	Year
Rauscher Pierce Refsnes	First of Texas	1974
Blyth Eastman Dillon	Moore Leonard & Lynch	1978
Merrill Lynch	White Weld	1978
Paine Webber	Blyth Eastman Dillon	1979
E F Hutton	Carleton D Beh	1981
Shearson/American Express	Boston Safe Deposit & Trust	1981
Shearson/American Express	Loeb Rhoades Hornblower	1981
Shearson/American Express	Shearson Hayden Stone	1981
Shearson/American Express	American Express	1981
Paine Webber	Rotan Mosle	1983
Paine Webber	First Mid America	1983
Shearson/American Express	Chiles Heider	1983
BMO Bank	Harris Bank	1984
First Chicago Bank	American National Bank & Trust	1984
Lehman Brothers	Shearson/American Express	1984
Merrill Lynch	AG Becker	1984
Kemper Securities	Boettcher	1985
Lehman Brothers	E F Hutton	1987
Bank of New York Mellon	Irving Trust	1988
Fleet Bank	Adams McEntee	1988
Prudential Securities	Thomson Mckinnon Sec	1989
Banc One	MBank Capital Mkts Dallas NA	1990
Bank South	Lex Jolley	1990
Kemper Securities	Underwood Neuhaus	1990
Kemper Securities	Lovett Mitchell Webb	1990
Raymond James	Arch W Roberts	1990
Fifth Third Bank	The Ohio	1991
Fleet Bank	Bank of New England	1991
McDonald	Gradison	1991
Banc One	Team Bank	1992
Chemical Bank	Manufacturers Hanover Trust	1992
Piper Jaffray	Zahner	1992
PNC Bank	First Eastern	1993
Smith Barney	Shearson/American Express	1993
Dain Bosworth	Clayton Brown & Associates	1994
Mellon Bank	Dreyfus	1994
Mellon Bank	Scheetz Smith	1994
NatWest Bank	Citizens First National Bank	1994
CoreStates Bank	Meridian Bank	1995
First Chicago Bank	National Bank of Detroit	1995
Fleet Bank	Shawmut Bank	1995
National City Bank	Raffenspergerhughes & Coinc	1995
NationsBank	Bank South	1995
PNC Bank	Midlantic Bank	1995
Southwest Securities	Barre	1995

Table A3: M&As in the Sample (continued)

Acquiror	Target	Year
Chase Bank	Chemical Bank	1996
Firstsouthwest	Masterson Moreland Sauer	1996
Fleet Bank	NatWest Bank	1996
Siebert Cisneros Shank	Grigsby Brandford	1996
Southwest Securities	Masterson Moreland Sauer	1996
Summit Bank	United Jersey Bank	1996
US Bank	West One Bank Oregon	1996
Banc One	First National Bank of Commerce	1997
Banc One	First Commerce Capital	1997
First Union National Bank	Signet Bank Richmond	1997
First Union National Bank	Wheat First Butcher Singer	1997
M&T Securities	OnBank	1997
Miller Johnson & Kuehn	Juran & Moody	1997
Morgan Stanley	Dean Witter Reynolds	1997
National City Bank	First of America Bank	1997
Ross Sinclaire & Associates	Johnston Brown Barnett & Knight	1997
Banc One	First National Bank of Lafayette	1998
Banc One	First Chicago Bank	1998
Bank of America	NationsBank	1998
BB&T	Scott & Stringfellow	1998
BOK Financial	Leo Oppenheim	1998
Citigroup	Salomon Brothers	1998
Citigroup	Smith Barney	1998
Commerce Bank New Jersey	A H Williams	1998
First Union National Bank	CoreStates Bank	1998
Key Bank	McDonald	1998
Tucker Anthony Sutro	Hopper Soliday	1998
UBS Financial Services	Dillon Read	1998
US Bank	Northwest Bank	1998
US Bank	Piper Jaffray	1998
Wells Fargo	Norwest Investment Services	1998
Bank of America	Seafirst Bank	1999
First Union National Bank	Kemper Securities	1999
Fleet Bank	BankBoston	1999
US Bank	John Nuveen	1999
Wachovia Bank	Interstate/Johnson Lane	1999
JP Morgan	Chase Bank	2000
RBC Bank	Rauscher Pierce Refsnes	2000
RBC Bank	Dain Bosworth	2000
SunTrust Bank	Equitable Securities	2000
SunTrust Bank	Crestar Bank	2000
UBS Financial Services	J C Bradford	2000
UBS Financial Services	Paine Webber	2000
US Bank	Firstar Bank	2000
Wells Fargo	First Security	2000

Table A3: M&As in the Sample (continued)

Acquiror	Target	Year
Wells Fargo	National Bank of Commerce	2000
Citigroup	European American Bank	2001
Fleet Bank	Summit Bank	2001
Regions Bank	Morgan Keegan	2001
SunTrust Bank	The Robinson Humphrey	2001
Wachovia Bank	Central Fidelity Bank	2001
Wachovia Bank	First Union National Bank	2001
RBC Bank	Tucker Anthony Sutro	2002
JP Morgan	RRZ Public Markets	2003
RBC Bank	William R Hough	2003
Wachovia Bank	Prudential Securities	2003
Bank of America	Fleet Bank	2004
Citizens Bank	TGH Securities	2004
JP Morgan	Banc One	2004
SunTrust Bank	NBC Capital Markets Group	2004
TD Bank	Cape Cod Bank	2004
Wachovia Bank	SouthTrust Securities	2004
Janney Montgomery Scott	Parker Hunter	2005
Merrill Lynch	Advest	2005
Ferris Baker Watts	Arthurs Lestrange	2006
Regions Bank	Amsouth Bank	2006
Morgan Keegan	Shattuck Hammond Partners	2007
RBC Bank	Seasongood & Mayer	2007
RBC Bank	J B Hanauer	2007
TD Bank	Commerce Bank New Jersey	2007
UBS Financial Services	McDonald	2007
Wachovia Bank	A G Edwards & Sons	2007
Bank of America	Merrill Lynch	2008
Capital One Financial	North Fork Bank	2008
Huntington National Bank	Sky Bank	2008
JP Morgan	Bear Stearns	2008
Park National Bank	First Knox National Bank	2008
PNC Bank	Red Capital Markets	2008
PNC Bank	National City Bank	2008
RBC Bank	Ferris Baker Watts	2008
Southwest Securities	M L Stern Investments Sec	2008
Stifel Nicolaus	Butler Wick	2008
Wells Fargo	Wachovia Bank	2008
D A Davidson	Ruan Securities	2009
US Bank	Park National Bank	2009
BMO Bank	M & I Bank	2010
Stifel Nicolaus	Stone & Youngberg	2011
Raymond James	Morgan Keegan	2012
Piper Jaffray	Seattle Northwest Securities	2013
Sterne Agee & Leach	Merchant Capital	2014

Table A3: M&As in the Sample (continued)

Acquiror	Target	Year
Hilltop Securities	Southwest Securities	2015
Piper Jaffray	BMO Bank	2015
D A Davidson	Smith Hayes Financial Services	2016
Huntington National Bank	First Merit Bank	2016
Stifel Nicolaus	City Securities	2016
StoneX Group	Sterne Agee & Leach	2017
NBH Bank	People's National Bank	2018
Robert W Baird	JJB Hilliard WL Lyons	2019
Stifel Nicolaus	George K Baum	2019
Eastern Bank	Century Bank	2021
PNC Bank	BBVA Compass	2021
M&T Securities	People's United Bank	2022
Commerce Bank of Kansas City	LJ Hart	2023

Note: This table lists the M&As among municipal bond underwriters that are used in the main results of Section 3.1.1. Due to copyright restrictions, M&As obtained from SDC Platinum or S&P are omitted. Only M&As obtained via hand-collection from public records, i.e., Wikipedia, national and local newspapers, firm websites, corporate filings, and other public information sources, are listed.

Table A4: Reasons Behind M&As According to News Reports

Reason for M&A	Count
Acquiror's desire to gain local/regional dominance	24
Acquiror's desire to expand geographically	19
Acquiror's desire to gain industry-wide dominance	15
Synergy from combining different lines of business	14
Synergy from cost management	12
Acquiror's desire to diversify its revenue sources	12
Financial stress of the target (exposure to subprime mortgage)	5
Financial stress of the target (inadequate capital)	1
Financial stress of the target (high inventory)	1
Financial stress of the target (unsuccessful prior M&As)	1
Financial stress of the target (the sharp volatility in prices of fixed-income securities and the slump in trading volume of stocks)	1
Financial stress of the target (bad loans)	1
Financial stress of the target (vulnerability to the rate environment)	1
Financial stress of the target (general reasons)	1
Financial stress of the target (pressure to repay TARP funds)	1
Acquiror or target's desire to fend off a hostile takeover	1

Note: This table summarizes the rationales for the M&A deals mentioned in the news reports for the M&As among municipal bond underwriters that are used in the main results of Section 3.1.1.

Table A5: Examples of Rationales for M&As Deals According to News Reports

Acquiror	Target	Source	Reason	Summary
PNC Bank	Midlantic Bank	The Morning Call	"The move, along with PNC Bank's pending acquisition of 84 branches of Chemical Bank New Jersey, will strengthen PNC Bank's position in the New Jersey and Philadelphia markets, placing it second in those areas."	Acquiror's desire to gain local/regional dominance
RBC Bank	Dain Bosworth	The Wall Street Journal	"The acquisition, which is subject to approval by regulators and Dain Rauscher shareholders, would give Royal Bank the toehold it has long sought in the U.S. wealth-management market."	Acquiror's desire to expand geographically
JP Morgan	Banc One	The New York Times	"The merger would create a financial behemoth and a true rival to the world's largest banking company, Citigroup , with $1.1 trillion in assets and 2,300 branches in 17 states."	Acquiror's desire to gain industry-wide dominance
Morgan Stanley	Dean Witter Reynolds	The New York Times	"In recent years, as the securities markets have changed, however, both firms started to covet what the other had. Dean Witter's 9,300 brokers needed more products to sell to the firm's Main Street customers, specifically the initial public offering stocks and municipal bonds that Morgan Stanley frequently underwrites. Morgan Stanley, meanwhile, wanted to broaden its customer base beyond its corporate clients and large institutions to the individual investors who have been flocking to the market."	Synergy from combining different lines of business
Stifel Nicolaus	City Securities	Indianapolis Business Journal	"'Post Dodd-Frank, one of the effects that it had on the entire industry was to lay a lot of additional regulatory costs on everybody—probably disproportionately on smaller firms,' Bosway (City Securities CEO Mike Bosway) said. 'So that was clearly a factor in considering this more so than we had in the past. The need for scale today, because of that, is greater than it ever had been.'"	Synergy from cost management

Note: This table gives some examples on the top rationales for the M&A deals among municipal bond underwriters as mentioned in the news reports.

Table A6: Top Underwriters in California and Massachusetts

Panel A: Top ten municipal bond underwriters

Underwriter in CA	Market Share in CA	Underwriter in MA	Market Share in MA
Stifel Nicolaus	14.9%	Eastern Bank	15.4%
Piper Sandler	11.8%	Century Bank	7.2%
Citigroup	7.1%	TD Bank	7.1%
RBC Bank	6.6%	Robert W Baird	5.9%
Morgan Stanley	5.6%	Jefferies	5.1%
Raymond James	5.4%	JP Morgan	4.6%
Stone & Youngberg	5.3%	Morgan Stanley	4.4%
Bank of America	4.8%	Bank of America	4.2%
De La Rosa	3.6%	Fidelity Capital Markets	3.9%
JP Morgan	3.4%	Janney Montgomery Scott	3.6%

Panel B: Top ten corporate bond underwriters

Underwriter in CA	Market Share in CA	Underwriter in MA	Market Share in MA
Bank of America Merrill Lynch	6.8%	JP Morgan	8.1%
JP Morgan	6.7%	Bank of America Merrill Lynch	6.3%
Morgan Stanley	4.8%	Barclays	4.5%
Citigroup	4.6%	Morgan Stanley	4.3%
Goldman Sachs	4.4%	Goldman Sachs	3.5%
Barclays	3.9%	Citigroup	3.1%
Deutsche Bank	3.2%	RBC Bank	2.3%
Wells Fargo Bank	2.8%	US Bank	1.7%
RBC Bank	2.4%	Deutsche Bank	1.7%
US Bank	2.2%	Wells Fargo Bank	1.6%

Panel C: Top ten corporate equity underwriters

Underwriter in CA	Market Share in CA	Underwriter in MA	Market Share in MA
Cowen	2.7%	JP Morgan	3.8%
JP Morgan	2.6%	Cowen	3.8%
Morgan Stanley	2.0%	Jefferies	3.1%
Jefferies	2.0%	HC Wainwright	2.9%
Roth Capital Partners	2.0%	Goldman Sachs	2.8%
Goldman Sachs	1.7%	Morgan Stanley	2.8%
HC Wainwright	1.7%	Canaccord Genuity	2.6%
Citigroup	1.7%	Barclays	2.0%
William Blair	1.5%	Oppenheimer	1.9%
Stifel Nicolaus	1.5%	Citigroup	1.8%

Note: This table lists the top ten underwriters with the highest market shares during 2010-2020 in the states of California and Massachusetts. Panel A examines municipal bond underwriters. Panel B examines corporate bond underwriters. Panel C examines corporate equity underwriters.

Table A7: State-Pair Cosine Similarities of Underwriters by Security Type

	(1) Cosine Similarity	(2) Cosine Similarity
Corporate Bond Over Municipal Bond	0.42***	
	(109.32)	
Corporate Equity Over Municipal Bond	0.32***	
	(84.59)	
Geographic Distance, in 1,000 Miles		-0.03***
		(-4.82)
Observations	97,242	32,414
State-Pair FE	Yes	No
Year FE	Yes	Yes
Clustering	State-Pair	State-Pair
Adjusted R-squared	0.644	0.285

Note: This table examines the cosine similarity of underwriters' market shares for pairs of states. Column (1) examines how the similarity differ by the type of securities, for which I use municipal bonds as the left-out group. Column (2) examines how geographic distance affects the cosine similarity in terms of municipal bond underwriters. For corporate securities, the issuer and underwriter data are obtained from the Global New Issuance Database by SDC Platinum. The geographic distance of two states are defined as the distance between each state-pair's geographic centers. T-stats are in parentheses. Standard errors are clustered at the state-pair level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A8: Estimating the Elasticity of Underwriting Spread to HHI

	(1) Underwriting Spread (bps.)	(2) Underwriting Spread (bps.)	(3) HHI	(4) Underwriting Spread (bps.)
HHI	-0.00	-0.00		0.04***
	(-1.60)	(-1.53)		(4.60)
Treated × Post			139.34***	
			(3.10)	
Observations	89,636	154,609	89,636	89,636
Year FE	Yes	Yes	Yes	Yes
Issuer FE	Yes	Yes	Yes	Yes
Clustering	Issuer	Issuer	CSA	Issuer
Adjusted R-squared	0.546	0.465	0.785	

Note: This table shows the elasticity of the underwriting spread with respect to the HHI of the local market. Column (1) reports estimates from an OLS regression of the underwriting spread on HHI using the sample as in Table 3. Column (2) reports estimates from an OLS regression of the underwriting spread on HHI using the sample of all issues in SDC's Global Public Finance Database. Column (3) reports estimates from a double-differences specification using HHI as the outcome variable. Column (4) reports estimates of the elasticity of the underwriting spread to HHI using an IV regression with M&A as the instrument for HHI. T-stats are in parentheses. Standard errors are clustered at the issuer level for columns (1), (2), and (4) and at the CSA level for column (3). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A9: Robustness of Effects of M&As on Underwriting Spread to Alternative Choices in Matching

	(1) Underwriting Spread (bps.)	(2) Underwriting Spread (bps.)	(3) Underwriting Spread (bps.)	(4) Underwriting Spread (bps.)
Treated × Post	4.41***	4.31***	4.59***	3.94***
	(4.24)	(4.49)	(4.29)	(3.72)
Observations	119,482	142,715	86,167	90,974
Year FE	Yes	Yes	Yes	Yes
Issuer FE	Yes	Yes	Yes	Yes
Clustering	Issuer	Issuer	Issuer	Issuer
Market Definition	CSA	CSA	CSA	CSA
Number of Matches	2	3	1	1
Matching Co-variates	Local Income and Population	Local Income and Population	Local Income and Population plus Demographics Dynamics	Local Income and Population plus Issuance Outcomes
Adjusted R-squared	0.532	0.539	0.541	0.547

Note: This table reports estimates from double-differences specifications using M&As with *predicted* $\Delta_{HHI} >= 100$ and the underwriting spread as the outcome variable. Column (1) uses two matched control CSAs for each treated CSA. Column (2) uses three matched control CSAs for each treated CSA. T-stats are in parentheses. Columns (3) and (4) use one matched control CSAs for each treated CSA. The matching uses local income and population at the CSA-level in columns (1) and (2), local income, population, and growth rates of local income and population relative to the prior year in column (3), and local income, population, and average gross spread and reoffering yield at the CSA-level in column (4). T-stats are in parentheses. Standard errors are clustered at the issuer level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A10: Can Having an Advisor Undo the Effects of M&A?

	(1) Underwriting Spread (bps.)	(2) Underwriting Spread (bps.)	(3) Underwriting Spread (bps.)
Treated × Post × Has Advisor	2.65*	0.80	
	(1.87)	(0.49)	
Treated × Post × Has Advisor × *predicted* Δ_{HHI} in [0.02,0.03)	2.59		
	(1.55)		
Treated × Post × Has Advisor × *predicted* $\Delta_{HHI} \geq 0.03$	3.02		
	(1.28)		
Treated × Post × Has Advisor × HHI in [1000,2500)		4.63***	
		(2.59)	
Treated × Post × Has Advisor × HHI $\geq$ 2500		7.80*	
		(1.65)	
Treated × Post × Has Independent Advisor			3.03**
			(2.26)
Treated × Post × Has Dual Advisor			15.41***
			(3.86)
Treated × Post × No Advisor	6.59***	6.58***	6.58***
	(4.05)	(4.07)	(4.04)
Observations	89,636	89,636	89,636
Year FE	Yes	Yes	Yes
Issuer FE	Yes	Yes	Yes
Clustering	Issuer	Issuer	Issuer
Adjusted R-squared	0.550	0.550	0.550

Note: This table investigates whether having an advisor can undo the effects of M&As on the underwriting spread. Column (1) reports estimates from a triple-differences specification by a dummy variable for whether the issuer is using a financial advisor, a dummy variable for whether the issuer is not using a financial advisor, and the latter interacted with dummy variables for the significance of merging entities in the treated CSA. Column (2) reports estimates from a triple-differences specification by a dummy variable for whether the issuer is using a financial advisor, a dummy variable for whether the issuer is not using a financial advisor, and the latter interacted with dummy variables for the HHI of the CSA. Column (3) reports estimates from a triple-differences specification by whether the issuer is using an independent advisor, a dual advisor (Garrett, 2023), or no advisor. T-stats are in parentheses. Standard errors are clustered at the issuer level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A11: Effects of M&As on Reoffering Yield Spread

	(1) Yield Spread (bps.)	(2) Yield Spread (bps.)	(3) Yield Spread (bps.)	(4) Yield Spread (bps.)	(5) Yield Spread (bps.)
Treated × Post	-0.31				
	(-0.33)				
Treated × Post × *predicted* Δ_{HHI} in [100,200)		-0.68			
		(-0.66)			
Treated × Post × *predicted* $\Delta_{HHI} \geq 200$		0.53			
		(0.34)			
Treated × Post × HHI < 1000			-1.07		
			(-0.69)		
Treated × Post × HHI ≥ 1000			0.40		
			(0.38)		
Treated × Post × Has Advisor				-0.59	
				(-0.50)	
Treated × Post × No Advisor				-0.54	
				(-0.39)	
Treated × Post × Competitive Bidding					-2.36**
					(-2.00)
Treated × Post × Negotiated Sales					0.31
					(0.25)
Observations	157,873	157,873	157,873	157,873	157,873
Year FE	Yes	Yes	Yes	Yes	Yes
Issuer FE	Yes	Yes	Yes	Yes	Yes
Clustering	Issuer	Issuer	Issuer	Issuer	Issuer
Adjusted R-squared	0.464	0.464	0.464	0.466	0.476

Note: In this table, I use M&As with *predicted* $\Delta_{HHI} >= 100$ and the tax-adjusted reoffering yield spread over treasury securities as the outcome variable. Column (1) reports estimates from a double-differences specification. Column (2) uses a triple-differences specification by the significance of merging underwriters in the treated CSA. Column (3) uses a triple-differences specification by whether the HHI of the CSA is above $1,000$. Column (4) reports estimates from a triple-differences specification by whether the issuer is using a financial advisor. Column (5) uses a triple-differences specification by whether the method of sales is negotiated sales or competitive bidding. Columns (2), (3), (4), and (5) use the specification of Equation (4). T-stats are in parentheses. Standard errors are clustered at the issuer level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A12: Probit Models for Effects of M&As on Use of Credit Rating, Bond Insurance, and Financial Advisor

	(1) Has Rating	(2) Is Insured	(3) Has Advisor
Treated × Post	-0.13***	-0.08***	-0.11***
	(-6.00)	(-3.93)	(-5.47)
Observations	262,674	262,674	262,674
Year FE	Yes	Yes	Yes
Issuer FE	No	No	No
Clustering	Issuer	Issuer	Issuer

Note: This table reports estimates from a Probit model using dummy variables for whether the issuer is using credit ratings, bond insurance, or financial advisors as the outcome variable. Probit coefficients are reported in the table. T-stats are in parentheses. Standard errors are clustered at the issuer level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A13: Statistical Models of Determinants of Other Fees

	(1) Credit Rating Fee (bps.)	(2) Insurance Fee (bps.)	(3) Financial Advisor Fee (bps.)
Income	-0.12	-8.13***	-7.09***
	(-0.81)	(-3.50)	(-9.74)
Population	-0.01***	0.08***	-0.12***
	(-5.15)	(3.30)	(-11.35)
Maturity in [2y, 5y)	7.22***	11.05	33.19***
	(16.96)	(1.28)	(17.00)
Maturity in [5y, 10y)	10.42***	25.06***	29.78***
	(34.33)	(4.08)	(19.08)
Maturity in [10y, 20y)	10.28***	37.83***	34.94***
	(48.69)	(7.21)	(29.33)
Maturity in [20y, 30y)	10.55***	50.85***	43.95***
	(54.33)	(9.88)	(38.78)
Maturity in [30y, 40y)	10.05***	97.93***	40.79***
	(29.37)	(16.55)	(23.72)
Maturity $\geq$ 40y	8.88***	2.57	32.64***
	(4.06)	(0.07)	(4.00)
Amount in [1M, 5M)	-1.73***	-9.94	13.16***
	(-3.45)	(-1.02)	(7.36)
Amount in [5M, 10M)	-7.95***	-15.62	-36.88***
	(-15.88)	(-1.61)	(-20.48)
Amount in [10M, 50M)	-14.33***	-19.21**	-74.31***
	(-29.39)	(-2.00)	(-43.40)
Amount in [50M, 100M)	-17.92***	-31.05***	-93.98***
	(-34.90)	(-3.15)	(-48.62)
Amount $\geq$ 100M	-18.82***	-45.13***	-96.86***
	(-36.56)	(-4.52)	(-49.46)
Is Negotiated Sales	-0.69***	13.33***	-3.11***
	(-3.66)	(5.73)	(-3.09)
Is Taxable	-1.19***	19.53***	-14.01***
	(-6.04)	(7.30)	(-14.66)
Is Alternative Minimum Tax	0.16	22.08***	-1.55
	(0.27)	(3.10)	(-0.58)
Is REV	0.97***	21.51***	-4.55***
	(6.60)	(12.30)	(-6.30)
Constant	17.33***	40.01***	89.68***
	(32.08)	(3.63)	(39.90)
Observations	12,480	5,965	14,537
R-squared	0.411	0.127	0.512

Note: This table reports estimates from a statistical model of the determinants of the credit rating fee, the bond insurance fee, and the financial advisor fee based on the California sample using OLS. The explanatory variables include the population size and income of the county, dummy variables for brackets of the average maturity of the bond issue, dummy variables for brackets of the principal amount of the bond issue in 2022 dollars, dummy variables for the method of sales, dummy variables for the taxable status of the bond issue, and dummy variables for the source of repayment. T-stats are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A14: Effects of M&As on Inter-Government Transfer to Local Governments

	(1) Inter-Gov. Trans. from Federal/ Exp. (in %)	(2) Inter-Gov. Trans. from State/ Exp. (in %)	(3) Inter-Gov. Trans. from Local/ Exp. (in %)
Treated × Post × Is School Dist.	-0.10	-3.92***	-0.20*
	(-1.60)	(-4.78)	(-1.76)
Treated × Post × Is Other Gov.	0.09	-0.93***	0.22**
	(1.26)	(-4.12)	(2.41)
Observations	342,378	342,378	342,378
Year FE	Yes	Yes	Yes
Government FE	Yes	Yes	Yes
Clustering	County	County	County
Adjusted R-squared	0.536	0.851	0.713

Note: This table uses a triple-differences specification by whether the type of the local government is a school district or a municipality/township/-county. The outcome variables are the inter-governmental transfers from the federal, state, or other local governments scaled by total expenditures of the local government itself. Standard errors are clustered at the county level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A15: Effects of M&As on State Government Finances

	(1) Total Trans. to Local/Exp. (%)	(2) Total Construction /Exp. (%)	(3) Total Capital Outlay/Exp. (%)	(4) Total Current Operation/Exp. (%)	(5) Interest Paid /Exp. (%)	(6) New Issuance /Exp. (%)
Treated × Post	-0.95**	0.42*	0.30	-0.42	0.57	0.17
	(-2.05)	(1.86)	(1.14)	(-0.74)	(1.41)	(1.48)
Observations	1,079	1,079	1,079	1,079	1,079	1,079
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustering	State	State	State	State	State	State
Adjusted R-squared	0.883	0.831	0.830	0.905	0.587	0.867

Note: This table investigates the effects of M&As on state government finances. For each state in each year, I calculate the *predicted* Δ_{HHI} of each CBSA in this state using bond issues in the prior three years and M&As in this year and the next three years. I aggregate CBSA-level Δ_{HHI} to state-level Δ_{HHI} using CBSA population as the weight and construct "state M&A episodes" in a similar manner as in Section 2 with a threshold of 100 on the Δ_{HHI}. I use CBSA here as there are counties that are covered by a CBSA but not by a CSA. I construct a matched sample with treated and control states using data on state government revenues and expenditures which also come from the Annual Survey of State and Local Government Finances. I report estimates from a double-differences specification. Column (1) uses total transfer from the state government to local governments scaled by the total expenditures of the state government as the outcome variable. Columns (2), (3), and (4) use total expenditures on new construction by the state government, total capital outlay by the state government, and total current operational costs by the state government, respectively and all scaled by the total expenditures of the state government. Column (5) uses interest paid by the state government scaled by its total expenditures. Column (6) uses new debt issuance by the state government scaled by its total expenditures. Standard errors are clustered at the state level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A16: Effects of M&As on Local Government Finances, Using Alternative Specifications of Outcome Variables

Panel A: School districts, using per student variable

	(1) Interest Paid Per Student	(2) New Issuance Per Student	(3) Inter-Gov. Trans. Per Student	(4) Total Taxes Per Student	(5) Property Taxes Per Student	(6) Surplus Per Student	(7) Rev. Per Student	(8) Exp. Per Student
Treated × Post	0.81	-174.17***	-746.61***	631.28***	638.78***	65.28	-72.97	-137.88
	(0.13)	(-3.94)	(-5.40)	(5.85)	(5.95)	(1.50)	(-0.91)	(-1.42)
Observations	155,848	155,848	155,848	155,848	155,848	155,848	155,848	155,848
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Government FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustering	County	County	County	County	County	County	County	County
Adjusted R-squared	0.585	0.110	0.817	0.914	0.916	0.578	0.853	0.834

Note: Panel A reports estimates from double-differences specifications for the effects of M&As on school district finances outcomes constructed on a per-student basis. T-stats are in parentheses. The definitions of the varibles are provided in Table A2 in the Online Appendix. Standard errors are clustered at the county level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Panel B: Municipality/township/county, using per capita variable

	(1) Interest Paid Per Capita	(2) New Issuance Per Capita	(3) Inter-Gov. Trans. Per Capita	(4) Total Taxes Per Capita	(5) Property Taxes Per Capita	(6) Surplus Per Capita	(7) Rev. Per Capita	(8) Exp. Per Capita
Treated × Post	2.94***	-3.16	-7.67***	20.81***	23.52***	-18.64***	21.61*	39.06***
	(2.90)	(-0.74)	(-2.59)	(3.09)	(4.44)	(-4.53)	(1.86)	(3.44)
Observations	186,530	186,530	186,530	186,530	186,530	186,530	186,530	186,530
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Government FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustering	County	County	County	County	County	County	County	County
Adjusted R-squared	0.753	0.255	0.747	0.908	0.920	0.274	0.893	0.880

Note: Panel B reports estimates from double-differences specifications for the effects of M&As on municipality/township/county finances outcomes constructed on a per-capita basis. The definitions of the varibles are provided in Table A2 in the Online Appendix. T-stats are in parentheses. Standard errors are clustered at the county level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Panel C: School districts, using logged variable

	(1) log Interest Paid + 1	(2) log New Issuance + 1	(3) log Inter-Gov. Trans. + 1	(4) log Total Taxes + 1	(5) log Property Taxes + 1	(6) log Rev. + 1	(7) log Exp. + 1
Treated × Post	-0.17**	-0.28***	-0.13***	0.13***	0.13***	-0.01*	-0.01*
	(-2.19)	(-2.98)	(-4.84)	(5.51)	(5.29)	(-1.84)	(-1.74)
Observations	155,848	155,848	155,848	155,848	155,848	155,848	155,848
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Government FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustering	County	County	County	County	County	County	County
Adjusted R-squared	0.713	0.253	0.967	0.926	0.923	0.987	0.984

Note: Panel C reports estimates from double-differences specifications for the effects of M&As on logged school district finances outcomes. The definitions of the varibles are provided in Table A2 in the Online Appendix. I exclude budget surplus as an outcome variable as its logged value can be undefined. T-stats are in parentheses. Standard errors are clustered at the county level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Panel D: Municipality/township/county, using logged variable

	(1) log Interest Paid + 1	(2) log New Issuance + 1	(3) log Inter-Gov. Trans. + 1	(4) log Total Taxes + 1	(5) log Property Taxes + 1	(6) log Rev. + 1	(7) log Exp. + 1
Treated × Post	0.08***	-0.04	-0.03**	-0.01	-0.01	0.01	0.03***
	(3.43)	(-0.85)	(-2.29)	(-0.53)	(-0.67)	(0.89)	(2.59)
Observations	186,530	186,530	186,530	186,530	186,530	186,530	186,530
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Government FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustering	County	County	County	County	County	County	County
Adjusted R-squared	0.899	0.477	0.936	0.950	0.945	0.982	0.978

Note: Panel D reports estimates from double-differences specifications for the effects of M&As on logged municipality/township/county finances outcomes. The definitions of the varibles are provided in Table A2 in the Online Appendix. I exclude budget surplus as an outcome variable as its logged value can be undefined. T-stats are in parentheses. Standard errors are clustered at the county level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A17: Effects of M&As on Local Government Finances, Using Select Sample of M&As

Panel A: CSA makes up a small fraction of the total businesses of the merging underwriters

	(1) Interest Paid/ Exp. (in %)	(2) New Issuance/ Exp. (in %)	(3) Inter-Gov. Trans./ Exp. (in %)	(4) Total Taxes/ Exp. (in %)	(5) Property Tax/ Exp. (in %)	(6) Budget Surplus Ratio (in %)
Treated × Post	0.13***	-0.88***	-1.38***	1.08***	1.02***	-0.90**
	(2.80)	(-3.84)	(-4.55)	(2.74)	(2.72)	(-2.27)
Observations	141,174	141,174	141,174	141,174	141,174	141,174
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Government FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustering	County	County	County	County	County	County
Adjusted R-squared	0.660	0.128	0.806	0.748	0.826	0.293

Panel B: M&As are driven by factors likely orthogonal to local economic dynamics according to news reports

	(1) Interest Paid/ Exp. (in %)	(2) New Issuance/ Exp. (in %)	(3) Inter-Gov. Trans./ Exp. (in %)	(4) Total Taxes/ Exp. (in %)	(5) Property Tax/ Exp. (in %)	(6) Budget Surplus Ratio (in %)
Treated × Post	0.07	-0.78**	-1.62***	1.48***	1.48***	-0.15
	(1.23)	(-2.56)	(-4.76)	(4.10)	(4.58)	(-0.42)
Observations	95,515	95,515	95,515	95,515	95,515	95,515
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Government FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustering	County	County	County	County	County	County
Adjusted R-squared	0.662	0.110	0.839	0.785	0.845	0.355

Note: In this table, I report estimates from a double-differences specification as in Equation (5) and using various local government finances outcomes as the outcome variable. The definitions of the varibles are provided in Table A2 in the Online Appendix. In Panel A, I use the subsample where the treated CSAs account for less than 10% of the underwriter's total businesses. In Panel B, I use the subsample where the M&As are not driven by factors that could potentially correlate with local economic dynamics according to the news reports. Standard errors are clustered at the county level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A18: Predictive Factors of Local Market Consolidation

	(1) *Predicted* Δ_{HHI}	(2) $1_{Predicted\ \Delta_{\text{HHI}} \geq 100}$ $\times 100$	(3) Underwriting Spread (bps.)	(4) Underwriting Spread (bps.)
Treated × Post			5.28***	4.84***
			(4.72)	(4.27)
Prior HHI	-0.0019	-0.0013***	-0.00	-0.00
	(-1.03)	(-5.45)	(-0.81)	(-0.71)
Population	-0.0000	-0.0001		-0.01***
	(-0.02)	(-0.31)		(-5.48)
Population Growth Rate	308.5525*	65.9807*	1.47	28.09
	(1.75)	(1.90)	(0.02)	(0.47)
Income	-0.0884	0.0723		0.04
	(-0.08)	(0.47)		(0.14)
Income Growth Rate	-55.3453	-10.0402		-55.02**
	(-0.85)	(-0.81)		(-2.18)
Age	2.1051	-0.1056		0.29
	(1.35)	(-0.41)		(0.20)
Minority Ratio	86.0204*	6.3499	-224.39***	-59.22
	(1.97)	(0.99)	(-4.40)	(-1.06)
Past Issuance Per Capita	-0.0026**	-0.0001	0.00***	0.00**
	(-2.01)	(-0.34)	(3.04)	(2.09)
Constant	-36.0212	13.6077	84.67	138.46***
	(-0.61)	(1.39)	(1.63)	(2.65)
Observations	8,357	8,357	89,062	89,062
Year FE	Yes	Yes	Yes	Yes
Issuer FE			Yes	Yes
Clustering	CSA	CSA	Issuer	Issuer
Adjusted R-squared	0.062	0.079	0.547	0.548

Note: This table investigates what local economic and demographic characteristics predict future within-market consolidation. Column (1) uses the *predicted* ΔHHI over the next three years as the outcome variable. Column (2) uses a dummy variable for whether the *predicted* ΔHHI exceeds 100. Column (3) and (4) use the underwriting spread as the outcome variable. In columns (1) and (2), I investigate the factors that predict within-market consolidation. In Column (3), I estimate the regression in Table 3 while controlling for factors that statistically significantly predict within-market consolidation. In Column (4), I estimate the regression in Table 3 while controlling for all local economic and demographic characteristics. In columns (1) and (2), the explanatory variables are lagged by one period, while in columns (3) and (4) the variables are contempraneous. Prior HHI is the HHI calculated based on the market shares of municipal bond underwriters in the three years prior, population is in thousands, population growth rate is calculated as $\frac{\text{Population}_t - \text{Population}_{t-1}}{\text{Population}_{t-1}}$, income is in thousands of dollars, income growth rate is calculated as $\frac{\text{Income}_t - \text{Income}_{t-1}}{\text{Income}_{t-1}}$, and past issuance per capita uses past three years' data and is in dollars. T-stats are in parentheses. Standard errors are clustered at the CSA level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

III. Introduction to the Issuing Process

Negotiated sales and competitive bidding are the two most commonly used methods of sales for municipal bonds in the primary market. I illustrate the two methods in Figure A3 in the Online Appendix. Specifically,

- Under negotiated sales, the underwriter is selected via a "request for proposals" process, where governments interested in new issuance review proposals from potential underwriters. The criteria for selecting an underwriter can include both the proposed underwriting spread and subjective factors such as the quality of proposals, credentials of the underwriter, and their experience. After that, there is a process known as a "presale" in which underwriters seek customer indications of interest in the issue. The final bond pricing is agreed upon and established by the issuer, their financial advisor (if any), and the underwriter together.

- Under competitive bidding, the issuer and its financial advisor decides on the amount, maturity, coupon rate, and other features of the bond issue (but not the underwriting spread or the reoffering yield). A public bidding process is then set up where underwriters bid for the bonds and the issuer sells the bond to the underwriter with the highest bid. The underwriter then resells the bonds to investors at an reoffering price. The profit, i.e., the underwriting spread, equals the reoffering price minus the winning bid (U.S. Securities and Exchange Commission, 2012).

Generally, negotiated sales are more common for larger, lower-rated, and more customized bonds, while competitive sales are more common for smaller, higher-rated, and more standardized bonds

There is scope for M&As affecting the underwriting spread under either negotiated sales or competitive bidding.

- Under negotiated sales, the underwriting spread is largely agreed upon when the underwriter is selected, and naturally less competition could lead to a higher underwriting spread.

- Under competitive bidding, the underwriting spread equals the reoffering price minus the widding bid. The reoffering price is mostly driven by investor demand and should not be affected by competition on the underwriters' side. Suppose the reoffering price is relatively fixed, when there are less underwriters and the competitive bidding is less competitive, the winning bid would lower, then the underwriting spread would widen.

IV. Variable Construction

In this Section, I provide further details on the variable construction in addition to Table A2.

IV.I. Reoffering yield and yield spread

A bond issue can have multiple bonds, which usually have different maturities. I take the following steps to calculate the reoffering yield of each individual bond, if there is enough data that allows the calculation. I use the fields "Sale Date", "Maturity Date", "Maturity Amount", "Coupon Type", "Coupon of Maturity", and "Price/Yield of Maturity" in the Global Public Finance (GPF) database provided by SDC.

1. I calculate the reoffering yield if the type of coupon payment is "fixed rate" or "zero coupon". I do not calculate the reoffering yield if a bond issue contains a bond with variable rate coupon payments, for which the dollar amount of coupon depends on the general interest rate and other contingent factors.

2. I code the coupon rate as 0 for bonds with the type of coupon payment "zero coupon". In the raw data, the coupon rate of such bonds is null.

3. I assume that the coupon rate applies to all bonds within an issue if an issue contains multiple bonds but only one coupon rate is given.

4. I do not calculate the reoffering yield for a bond issue if there is missing value for the maturity date of any bond within the bond issue.

5. I do not calculate the reoffering yield for a bond issue if there is a discrepancy in the number of entries for maturity, coupon rate, and price/yield. In these cases, it is unclear how many bonds are there in the bond issue.

6. For a bond within a bond issue,

   (a) If the "price/yield" field is less than 20, I assume it is the reoffering yield of the bond.

   (b) If the "price/yield" is in between 80 and 120, I assume it is the reoffering price of the bond. I assume that there are $M = \text{round}(\frac{m}{365/2})$ biannual coupon payments on the bond where m is the number of days from the sale date to the maturity date, and the principal amount is repaid at the end. I calculate the reoffering yield as $(1+r)^2 - 1$ where r solves

   $$0 = -P + \sum_{\tau=1}^{M} (\frac{C/2}{(1+r)^{\tau}}) + \frac{100}{(1+r)^{M}},$$

   P is the reoffering price quoted in reference to face or par value of \$100, and C is the coupon rate.

   (c) If the "price/yield" is any value other than those, I am not certain if the value corresponds to a reoffering price or a reoffering yield. I do not calculate the reoffering yield for this bond.

7. If a bond issue contains multiple bonds, the reoffering yield of the bond issue is the weighted average by the principal amount of each bond.

To calculate the tax-adjusted reoffering yield spread, i.e., the spread between the yield of a municipal bond and its comparable U.S. treasury securities, I take the following steps following Schwert (2017) and Li and Zhu (2019).

1. I obtain the interpolated U.S. treasury yield curve provided by Gürkaynak et al. (2007) at `https://www.federalreserve.gov/econres/feds/the-us-treasury-yield-curve-1961-to-the-present.htm`.

2. I match each bond to a synthetic risk-free bond that has the same payoff structure.

3. I calculate the price of the synthetic bond by discounting its future cash flows using the treasury yield curve piece by piece. The maximum treasury yield is for 30 years and data for such long maturity are only available in recent decades. I set the reoffering yield spread to missing if the corresponding treasury yield is unavailable.

4. Using the price and maturity of the synthetic bond, I compute its risk-free yield to maturity.

5. I take the difference between a municipal bond's tax-adjusted yield and the yield of its matched synthetic risk-free bond to obtain the yield spread. Specifically, for a bond exempt from federal taxation, i.e., the vast majority,

$$s_i = r_i - r_i^{\text{risk-free}} \times (1 - \tau_t^{fed}),$$

where s_i is the reoffering yield spread for bond i, r_i is the reoffering yield for bond i, $r_i^{\text{risk-free}}$ is the yield of the synthetic risk-free bond, and τ_t^{fed} is the top-bracket federal income tax rate in year t, the year of the bond sale. The downward adjustment $(1-\tau_t^{fed})$ on the yield of the synthetic risk-free bond accounts for the fact that treasury securities are subject to federal taxation. For a bond not exempt from federal taxation, the spread is

$$s_i = r_i \times (1 - \tau_t^{fed}) - r_i^{\text{risk-free}} \times (1 - \tau_t^{fed}).$$

6. If a bond issue contains multiple bonds, the reoffering yield of the bond issue is the weighted average by the principal amount of each bond.

IV.II. Initial underpricing

A common measure of the quality of security underwriting is the initial underpricing that reflects in the secondary market trading prices. A high quality underwriter is able to price a security close to the actual market value, which keeps interest costs low for issuers. To calculate initial underpricing, I follow Garrett (2023) and use the Municipal Securities Trans-

action Data provided by Municipal Securities Rulemaking Board (MSRB). The data contain detailed trade-level information on the security identifier (CUSIP), timestamp of the trade, and the execution price of the trade among others. Prices are quoted in reference to face or par value of $100. I calculate the initial price of a CUSIP as the trade-size-weighted dollar price on the first day of trading, and the day-15-to-day-30 price as the trade-size-weighted dollar price in a $[+15, +30]$ days window post the initial trading date. I calculate the initial underpricing as the day-15-to-day-30 price minus the initial price. The data are available from 2006 to 2023.