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The "privatization" of Municipal Debt

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Abstract

We study the determinants of local governments' reliance on bank loans using granular data from the Federal Reserve. Governments that are larger, riskier, rely on historically stable revenue sources, or have higher spending relative to revenues are more likely to borrow from banks. Declines in revenues, reductions in bond market access, and relationships with financial advisers and underwriters all strongly predict higher bank loan reliance. While resemblance between bank loans and bonds is limited, loans afford governments significant financial flexibility not otherwise available in the municipal bond market. The frequent loan renegotiation and credit line use are both highly responsive to changes in credit quality, thereby tailoring debt contracts to changes in government fundamentals. The largest entities find this flexibility most useful with nearly 45% of entities in the top revenue quintile obtaining a bank loan by 2017.

Keywords: local government borrowing, debt heterogeneity, fiscal shocks

JEL Classification: H74; G21; G32

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1 Introduction

Although state and local governments in the U.S. have historically been regarded as some of the most financially sound entities, the Great Recession and the Covid crisis have cast doubt on this notion. For example, substantial losses in state pension funds, rising healthcare obligations, population aging have all put strain on governments' budgets at the same time as unmet needs for infrastructure investments have been growing and estimated to amount to approximately \$2 trillion in 2017 (Novy-Marx and Rauh, 2012, 2011; Lutz and Sheiner, 2014; Butler and Yi, 2019; ASCE, 2023). While the Covid fiscal stimulus has provided temporary reprieve from adverse fiscal trends, the recent monetary policy tightening may renew fiscal pressures. In the presence of these funding shortfalls, governments have rapidly increased their reliance on private bank loans from about \$30 billion before the Great Recession to over \$200 billion in 2023 (Figure 1).

We shed light on the importance of governments' financial positions for the increased reliance on bank borrowing using loan-level data on bank lending to state and local governments from the Federal Reserve's Y-14 Collection, which cover about 60% of outstanding municipal loans. We show that bank loans provide substantial advantages to governments such as contract renegotiation and access to credit lines, which are particularly relevant when fiscal conditions change.

Debt contract renegotiation, not available in arms-length municipal bonds financing, is frequent in the loan market and tailors loan terms to both improvement and deterioration in government fundamentals. In addition, access to bank lines of credit provides governments with liquidity or eases working capital rquirements following after credit quality deteriorates or improves, respectively. Governments facing revenue shortfalls, increases in borrowing costs, and reductions in bond market access, but that otherwise rely on historically stable revenue sources find bank loans most attractive. This financial flexibility is most important to the largest entities with 21-45% of entities in the top two quintiles of total revenues obtaining a bank loan by 2017. Finally, banks' credit assessments of governments are significantly more conservative than agency ratings, suggesting that municipal credit risk may be higher than previously thought.

What factors determine governments' reliance on bank borrowing in the cross-section of governments? We find that the share of governments in the Census universe with at least \$5 million in total revenues using loans increases monotonically with government size from less than 6% in the bottom quintile of total revenues to nearly 45% in the top quintile.[1] Conditional on obtaining a bank loan, loans account for a sizeable share of total debt—40%-50% in the bottom three size quintiles and for 15-30% in the top two quintiles. Multivariate tests reveal that larger governments, those with a larger share of historically stable revenue sources such as taxes and intergovernmental receipts, or with less access to the municipal bond market or the institutional segment of that market are more likely to have bank loans. These associations are dominated by the cross sectional differences between governments and are informative of the extensive margin of loan participation. Similar to the corporate debt market, bank lenders tend to work with governments able to maintain stable revenue levels (Sufi, 2009). Finally, financial intermediary identity predicts loan reliance of a significant share of governments even after conditioning on balance sheet characteristics.

In addition, changes in government fundamentals are strongly predictive of shifts in bank loan reliance. Reductions in revenues, increases in interest expenses, or changes in recent bond issuance characteristics consistent with lower bond market access predict a higher bank loan share, while increases in total spending relative to revenues predict tapping the loan market. Furthermore, governments are significantly less likely to issue municipal bonds for up to two years prior to loan market entry as well as for up to five years thereafter. These associations are suggestive of deterioration in credit quality contributing to increases in loan reliance similar to the dynamics observed in the corporate debt market (Rauh and Sufi, 2010). Our findings are therefore consistent with corporate finance theories of information asymmetry and access to arm's length debt (Diamond, 1991; Rajan, 1992). Specifically, borrowers lean heavily on private markets following increases in credit risk, at least in part due to lower bond market access due to the potentially high sensitivity of arms-length debt access to increases in credit risk. This analysis is particularly relevant for understanding the impact of fiscal crises on government borrowing and the reliance on private debt.

We find significant resemblance and differences between bank loans and bonds. Similar to municipal bonds, term loans tend to be fixed-rate, tax-exempt, secured, and have intermediate to long maturities. By contrast, credit lines are less likely to be fixed-rate, secured, or to have long maturities, but have substantiaal unitilized capacity providing municipalities with the option to increase future borrowing. Although most municipal loans are not bank-qualified, bonds and loans exhibit significant similarity in terms of amounts and maturities among governments with previous

[1]Entities with $5 million or more in total revenue account for nearly 99% of total government revenue in 2017.

bank-qualified bonds. Prior relationships with banks may therefore matter more for tapping the loan market than the direct resemblance between loans and bonds.

While these similarities appear important for about a quarter of government-bank pairs, the flexibility to renegotiate bank loan contracts or credit line access appear to be significantly more important for loan reliance. In fact, 27% of the loan-quarters in our sample are loan originations or originations, in which loan amount, maturity, interest rates, collateral, or guarantees change between quarters. Using banks' internal credit ratings of governments, we show that changes in credit risk predict renegotiation activity. Recent risk improvements are associated with both increases and decreases in loan amounts and interest rates, while deteriorations are positively correlated with amount or interest rate increasing renegotiation. Renegotiation activity also tends to be more sensitive to credit risk improvements than deterioration—banks may accommodate governments facing tighter financing conditions in public capital markets. Similar to the corporate finance setting, loan renegotiation in public finance is tightly linked to government fundamentals such as total revenues, revenue stability, leverage, and interest costs (Roberts and Sufi, 2009b; Roberts, 2015).

Access to credit lines can also help governments flexibly tailor borrowing to fundamentals. We show that credit line use increases after both credit quality improvements and deteriorations—municipalities are 3–5 percentage points (pp) more likely to draw on credit lines following credit quality deteriorations and about 2–3 pp more likely after improvements. Furthermore, lenders appear to accommodate general-purpose borrowers by increasing credit line limits after both increases and reductions in credit risk, suggesting a liquidity insurance role of credit lines (Brown et al., 2021; Ivashina and Scharfstein, 2010; Jimenez et al., 2009). By contrast, districts obtain credit line increases whenever revenues are high, from historically stable sources, or when leverage is low, suggestive of the importance of maintaining high cash flow for credit line access (Sufi, 2009; Acharya et al., 2014; Lins et al., 2010). Finally, much like in corporate finance settings, larger governments have greater access to credit lines—credit lines account for nearly 40% of total loan commitments in the top size quintile (Sufi, 2009; Chodorow-Reich et al., 2022; Greenwald et al., 2021).

While prior literature has empirically studied debt heterogeneity and debt structure of corporate borrowers and their implications for incentive conflicts between borrowers and lenders (Barclay and Smith, 1995b,a; Sufi, 2009; Rauh and Sufi, 2010; Colla et al., 2013), to our knowledge, no analogous evidence exists in public finance. Our database sheds light on the characteristics and interplay between municipal bank loan and bond financing, and on the determinants of governments' reliance on bank loans. Loans allow governments to quickly tailor debt contracts to both deterioration and improvement in credit quality. This evidence suggests a more dynamic nature of governments' bank loan contracts in the United States than internationally (Dal Borgo, 2021; Hoffmann et al., 2021).

We also contribute to the growing literature that explores the heterogeneity in revenue composition of state and local governments (Suárez Serrato and Zidar, 2018; Shoag et al., 2020; Fajgelbaum et al., 2018; Slattery and Zidar, 2020). Our results suggest that the debt structure of state and local governments may tilt significantly towards private debt both around revenue declines and increases.

Finally, our study contributes to the literature investigating the opaque nature of municipal lending markets and the impact of additional disclosures and third-party certification of issuers (Gore, 2004; Baber and Gore, 2008; Butler et al., 2009; Baber et al., 2013; Bergstresser and Orr, 2014; Cuny, 2016; Cornaggia et al., 2017, 2019; Adelino et al., 2017). The built-in flexibility of loan contracts allows governments to increase leverage after credit quality deterioration, which may adversely affect the value of previously-issued municipal bonds. This problem may be especially severe in light of the low rates of government private debt disclosures (Ivanov et al., 2022).

2 Examples of Loan Contracting and Borrower Financial Condition

This section provides two examples of how bank loan contracting mirrors both negative and positive changes in borrower financial health as discussed in Section 1.

The case of the Port of Everett, a seaport authority in the state of Washington, illustrates the flexibility of bank financing when borrower financial condition deteriorates. Specifically, the port's net operating income declined steeply in part due to reduction in exports volume—from over $6.2 million in 2016 to roughly $3 million in 2018.[2] The port obtained a $10 million credit line from U.S. Bank on October 27, 2017 with a one year maturity. The credit line was renegotiated six times between until April of 2022—reducing credit line commitment amounts, extending maturity, or amending interest rates.[3]

By contrast, Wright County in Iowa experienced considerable improvement in financial conditions between 2021 and 2022 with its net position growing by about 10% to $37 million. The fiscal health

[2] Publicly available here: Port of Everett, Budget Documents
[3] Publicly available here: `https://emma.msrb.org/P11587872-P11225553-.pdf`

improvement was largely a byproduct of higher proceeds from "Charges for Service." Concurrently, the county increased capital spending projects, among which were land and equipment acquisition as well as water quality improvements financed in part by bank loan financing from West Iowa Bank in West Bend (IA) dated April 1, 2022. The loan contract reveals that the loan is "fully negotiable", allowing the county significant flexibility to amend loan terms.

3 Institutional background

Debt issuance activity of state and local governments in the United States is dominated by tax-exempt obligations, where interest income to investors is exempt from federal and typically from state income tax (Babina et al., 2021). Data from the Mergent Municipal Bond Securities Database indicate that $74 billion out of the total $88 billion municipal bond issuance in the fourth quarter of 2022 was tax-exempt. Similarly, Tables 1 and F.3 show that the interest income from most municipal bank loans is tax-exempt. Governments must comply with registration, information reporting, yield restrictions, use of proceeds, and other requirements to designate obligations as tax-exempt.[4]

Although interest income from tax-exempt municipal obligations is also tax-free for commercial banks, the 1986 Tax Reform disallowed the deductibility of funding costs banks incur to purchase tax-free obligations. This rule applies to both municipal bank loans and bonds and is equivalent to reducing the tax benefit of the interest income exemption—the equivalent taxable yield is subject to a "TEFRA" haircut.[5] This haircut increases with bank funding costs and eliminates the tax benefits of holding tax-exempt bonds when funding costs are as high as tax-free yields. For example, assuming that a bank's marginal funding costs are 100bps, its marginal income tax rate is 39%, and a tax-exempt municipal bank loan yields 5% annually, the expression below details the TEFRA haircut and the equivalent annual taxable yield computation:

$$TEFRA\ haircut = 100bps \times 39\% = 39bps$$
$$Equivalent\ taxable\ yield = \frac{5\% - 39bps}{1 - 39\%} = 7.6\%$$

[4] See https://www.law.cornell.edu/uscode/text/26/103.
[5] https://www.rbcwm-usa.com/resources/file-687496.pdf

Intuitively, banks receive a larger share of the tax benefits from holding exempt municipal obligations when interest rates in the economy—and funding costs—are low. Therefore, banks have stronger incentives to hold tax-exempt municipal debt in low-interest rate environments such as the post-Great Recession period. Even in high-rate environments, however, banks receive most of the interest income tax-exemption because of low funding costs. Specifically, using a large sample of US banks between 1986 and 2007, Levine et al. (2021) shows that bank funding costs average about 100 bps.

The 1986 Tax Reform also allowed banks to deduct 80% of the funding costs to acquire "bank-qualified" tax-exempt municipal debt issues, which makes the TEFRA haircut on such issues substantially smaller. The issuer must comply with the provisions of Section 265 of the US Code Title 26 to be able to designate a municipal bond or a loan issue as "bank-qualified" such as raising less than $10 million in total debt in a calendar year.[6] The American Recovery and Reinvestment Act of 2009 (ARRA) temporarily raised this threshold to $30 million in 2009 and 2010, potentially increasing bank demand for municipal securities (Dagostino, 2022).[7]

In addition to the low policy rates after the Great Recession, recent banking and tax reform may have also affected the aggregate dynamics in municipal bank borrowing. The Federal Reserve amended its Liquidity Coverage Ratio rule in 2016, permitting banks under the Fed's jurisdiction to classify highly-rated general obligation bonds as High Quality Liquid Assets (HQLA). Similarly, the Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA) of 2018 allowed all banks to classify highly-rated municipal bonds as HQLA.[8,9] HQLA-designated municipal bonds are subject to lower capital charges, thereby increasing the attractiveness of municipal bonds relative to municipal bank loans and other risky assets for the banking sector. For example, Ott (2020) shows that the higher demand of banks for HQLA municipal bonds following these reforms led to lower yields and higher issuance volume of HQLA bonds. An analogous regulatory reform in 2014 excluded municipal bonds from the definition of HQLA (Yi, 2021).

Another regulatory change during our sample period is the Internal Revenue Service regulation on the definition of the issue price of tax-exempt obligations in late 2016.[10] This rule mandated that the issue price of tax-exempt public offering is the first price at which a substantial amount of the

[6] See `https://www.law.cornell.edu/uscode/text/26/265`.
[7] `https://www.congress.gov/bill/111th-congress/house-bill/1/text`
[8] Liquidity Coverage Ratio: Treatment of U.S. Municipal Securities as High-Quality Liquid Assets
[9] `https://www.fdic.gov/news/press-releases/2018/pr18049.html`.
[10] Issue Price Definition for Tax-Exempt Bonds

offering is sold to the public as opposed to using “reasonably expected prices,” which was previously permitted. The issue price of a private placement continued to be the price at which the purchaser (the bank) acquires the tax-exempt obligation.[11] Overall, the regulation may have decreased the tax-exempt yield of municipal bonds, thereby increasing banks’ incentives to hold municipal loans, all else equal. Specifically, by making the original issue discount of municipal discount bonds less generous, the rule incentivizes banks to hold municipal loans over public municipal bonds.

Kittain et al. (2020) credit the Tax Cuts and Jobs Act (TCJA) of 2017 as another major reason for the decline in banks’ incentives to hold municipal debt. The TCJA sharply reduced corporate income taxes starting in 2018, thereby lowering the taxable-equivalent yield of municipal debt for banks. Consequently, municipal debt became less attractive to banks relative to other types of non-exempt risky debt such as corporate loans, corporate bonds, and trading assets. Although Kittain et al. (2020) focuses on exempt municipal bonds, the same intuition applies to exempt municipal bank loans due to identical tax treatment. The TCJA is, therefore, likely to reduce the desirability of both types of municipal debt for the banking sector. Overall, both the HQLA rules and the TCJA are likely to slow the growth of outstanding municipal loans after 2017.

4 Measuring bank loan contracting

4.1 Data Sources

We obtain granular information on bank loans to governments from the quarterly Federal Reserve’s Y-14Q Collection, supporting the Dodd-Frank Act Stress Tests and the Comprehensive Capital Assessment and Review of large banks in the United States. The reporting panel starts in Q3 of 2011 and includes bank holding companies with at least $50 billion in total assets ($100 billion starting 2018Q2). These data contain detailed loan- and borrower-level information on all outstanding commercial and industrial bank loans with commitment amounts exceeding $1 million. In addition, banks provide their internal risk ratings of each borrower and the equivalent rating in a ten-grade S&P scale. We use a government’s most conservative bank internal risk rating whenever it works with multiple lenders in a given quarter. The data allow us to study individual loans and borrowers to better understand the factors underlying the rapid expansion of municipal bank borrowing.

[11]New Regulations on Issue Price of Tax-Exempt Bonds

Using Call Reports and FR Y-9C data, Figure 1 shows that banks with total assets exceeding $50 billion currently account for about 80% of all outstanding municipal loans extended by the universe of banks in the United States. Figure 2 shows that total outstanding municipal bank loans from the Y-14 Collection account for over 70% percent of loans extended by large US banks in Figure 1, with the remainder of large banks' municipal loan exposure likely falling below the Y-14 $1 million loan amount cutoff. Moreover, the dynamics in Figure 2 mirror the aggregate trends in large banks' municipal loan holdings in Figure 1. Therefore, our analysis is likely to be representative of the key characteristics of municipal loans and of the major drivers of governments' loan reliance.

We match governments in Y-14 to the Annual Survey of State and Local Government Finances to examine how governments' balance sheets are associated with bank loan reliance.[12] The Census surveys all state and local governments in years ending in "2" and "7" and samples governments with probabilities proportional to size (defined in terms of total expenditures, revenues, and debt) in all other years.[13] We match Y-14 borrowers to the list of governments from the last four full Censuses surveys since 2002 using string matching techniques as described in Appendix B. We manually verify each potential match to ensure its accuracy.

We also rely on the Census for annual income statement and balance sheet data on the matched entities from 2012 to 2020. We use government financials since 2012 because the Census changed its methodology between the 2011 and 2012 surveys, making it difficult to harmonize key financial variables before and after 2012. In some of our tests, we require that governments are surveyed every year to ensure that data sparsity in partial survey years does not affect our estimates.

We obtain municipal bond offerings since January 2000 from the Mergent Municipal Bond Securities Database. Mergent details offering amounts, yields, maturities, and a wide array of issuance characteristics at the bond level (a municipal offering typically includes multiple bonds). We also use Mergent to obtain the history of credit ratings for each bond from Standard & Poor's, Moody's, and Fitch. We similarly match Mergent to the Census of Governments using the string matching and manual verification described in Appendix B. We therefore use the unique Census identifier to link bank loans in Y-14 to bond issues in Mergent.

Finally, we use data on personal income per capita from the Bureau of Economic Analysis.

[12] https://www.census.gov/programs-surveys/gov-finances.html
[13] https://www2.census.gov/programs-surveys/gov-finances/tables/2020/2020_methodology.pdf

4.2 Loan Contract Characteristics

Most bank lending to states and local governments is done via lines of credit, term loans and, to a lesser extent, leases. Table 1 breaks down loan contract provisions of term loans and credit lines by borrower type.[14] Panel A shows that credit lines account for roughly a fifth of all loan-quarter observations. The average credit line size varies between $8 million among school districts and $36 million among special districts. Only a fraction of credit lines is drawn, ranging between 57% (special districts) and 81% of credit lines (school districts). Furthermore, the average utilization ratio of drawn credit lines ranges between 38% and 56%, leaving governments with substantial unutilized capacity and ability to tap bank financing in a short time frame.

The contract maturity of credit lines, defined as the difference between the maturity and origination dates, ranges between 20 and 27 quarters, which is substantially longer than that of corporate credit lines (see Roberts and Sufi (2009b)). The remaining maturity, defined as the difference between the maturity and the data observation date, is shorter than the contract maturity at between 10 and 14 quarters implying that lenders have low-duration exposure to credit lines. However, the effective maturities in the loan market are substantially shorter than both of these figures. Similar to the corporate loan market where the frequent renegotiation of commercial loans makes it infeasible to distinguish between renegotiation of existing loans and new loan contracts (see Roberts (2015)), 27% loan-quarters in our sample correspond to renegotiations or new originations (see also Section 7). In this setting, the contract maturity has a significant probability of extension every time a loan contract is renegotiated.

Term loans account for most municipal bank borrowing in terms of both total funded (outstanding) amount and loan count. Term loans represent approximately 59% of loan-quarter observations with average loan amounts varying between $5.8 million (cities) and $9.6 million (special districts). Term loans have longer maturities than credit lines with average remaining maturities of 28–33 quarters and original contract maturities of 46–48 quarters.

Panel B of Table 1 shows that bank loans are heavily collateralized—80% to 86% of terms loans and 42% to 61% of credit lines are secured. In addition, nearly all secured loans have first-lien priority on the assets or cash flows backing the loan. Most unsecured loans are senior in terms

[14] We describe leases in Table F.3. Other, less common, loan types include demand loans and commercial cards.

of contractual priority. Banks may also have additional tools to enhance contract seniority. For example, loans to special districts are also not unlikely to employ contractual guarantees by entities other than the borrower (15% of credit lines and 4% of term loans).

Notably, 59%–81% of credit lines and 90%–97% of term loans are fixed rate (Panel B of Table 1). This contrast with the corporate loan market where most loans are floating-rate. The prevalence of fixed rate provisions in municipal loans may make them similar to municipal bonds and potentially more attractive to governments. Unlike bonds, loans flexibly allow borrowers to prepay loans before the contract matures. Consequently, a significant share of loans contains prepayment penalties, which compensate lenders in fixed rate loans for the forgone interest in the event of prepayment. For example, 44%–51% of term loans and 15%–22% of credit lines have prepayment penalties.

Loans also frequently include federal and/or state interest income tax exemptions for bank lenders, further increasing the similarity between loans and municipal bonds. For example, banks' interest income is tax exempt in 34%–43% of credit lines and 58%–76% of term loans.[15] We also show that "bank-qualified" loans, in which the banks' interest income from the loan is exempt from federal or state income taxes and the associated government originates less than $10 million per year ($30 million in 2009 and 2010) of new bank loans, account for 13%–27% of credit lines and 42%–55% of term loans. In other words, non-qualified tax-exempt loans and non-exempt loans collectively account for most municipal bank loan exposure.

4.3 The credit risk of government borrowers

Loan monitoring and frequent renegotiation gives banks informational advantage over other market participants, which is likely larger in public finance than in corporate finance because government financial disclosure is limited (Ivanov et al., 2022). A convenient way to test for differences in the information set of banks and other market participants is to compare banks' internal risk assessments to external agency ratings. Credit rating agencies have less frequent interactions with governments than banks and, consequently, a potentially more limited information set. Indeed, anecdotes suggest a large information gap between banks and rating agencies (Cherney, 2014).[16]

Banks summarize governments' credit quality using bank-specific internal risk rating scales that

[15] Field #43 (Y14-Q) defines loans as tax-exempt if banks' interest income is exempt from federal/state income tax.
[16] See also proposed amendments to SEC Rule 15c2-12 `https://www.sec.gov/rules/proposed/2017/34-80130.pdf`.

may vary over time. Banks also convert internal ratings to a 10-grade S&P scale, which makes ratings comparable across banks and governments. In accordance with the U.S. implementation of the Basel II Capital Accord, these ratings reflect the expected "through-the-cycle" one-year borrower probability of default for each rating grade. This approach to credit risk incorporates both economic expansions and contractions and is also used by rating agencies (Adelino et al., 2020). A simple comparison shows that governments' average one-year default probabilities are substantially higher than those estimated by credit rating agencies over the entire rating distribution.[17]

Such simple comparison, however, may understate the differences between bank and agency ratings. Bank rating scales may not fully incorporate the "through the cycle" approach to assessing credit risk because the effective maturity of bank loans is short (Treacy and Carey, 2000). The one-year ahead bank ratings may represent a more favorable measurements of future credit risk than agency ratings, conditional on the same information set, because our sample period coincides with an economic expansion. Bank ratings may also be favorably biased because of their use in assessments of bank supervisors (Plosser and Santos, 2018).

Panel A of Figure 3 compares the internal ratings of the banks with those of rating agencies for governments with both bank and agency ratings. Although there is substantial overlap between the two distributions, the bank rating distribution is significantly more conservative with less distribution mass in the AAA or AA rating categories and more distribution mass in the BBB and BB categories. For example, more than 30 percent of bank-quarters are rated in the lowest investment-grade category ('BBB') and about 12% of observations are rated below investment-grade. A large share of borrowers is either of low credit quality or at risk of falling into the low quality categories if faced with fiscal shocks. Furthermore, Panel B of Figure 3 shows that banks assess governments without agency ratings to be of significantly lower credit quality than rated ones.

Panel C zooms in further on the distribution of government-level differences between bank and agency ratings for governments with both types of ratings. Bank and agency ratings overlap only in under 30% of government-quarters. In about 60% of observations bank ratings are more conservative, with this difference exceeding two notches for a quarter of the sample. Figure F.2 in Appendix F shows that this distribution is similar across government type. Overall, these results suggest that there may be hidden risks in the municipal debt market not incorporated in agency ratings.

[17] See Table F.2 relative to Moody's US municipal bond defaults and recoveries, 1970-2022.

5 Determinants of bank loan reliance

5.1 Loan reliance across the size and risk distributions

We first study how bank loan reliance varies with government size and risk in Table 2. We examine government i's propensity of having a bank loan in year t, $Loans_{it}$, and bank debt as a share of total outstanding debt, conditional on bank loans, $Loan\ Share_{it}$. We compute bank loan share using either outstanding loan amount, which includes term loans, leases, and the used portion of credit lines, or committed loan amount, which also includes the unused portion of credit lines. The former measure is directly comparable with outstanding debt from the Census, while the latter statistic may also incorporate future borrowing capacity. We limit the sample to either the 2017 Census to examine loan reliance across all governments, or to the less comprehensive 2020 Census to assess loan reliance most recently among larger entities. We also restrict the sample to entities with revenue of above \$5 million to ensure the \$1 million loan size threshold in the Y-14 does not significantly bias our loan reliance estimates in the lowest quintile of government revenues. Excluding smaller entities drop about 1% of total government revenue in the 2017 Census. That said, we acknowledge that our results are not applicable to the smallest governments that account for 1% of total governments' revenues

Column 1 shows a monotonic relation between accessing the bank loan market and government size in 2017— 6%–14% of governments in the bottom three quintiles of total revenues have bank loans compared to 21–45% in the top two quintiles. Conditional bank loans, loans accounts for 13–27% of total outstanding debt for governments in the top 2 quintiles, and for 35–53% in the bottom three quintiles. Columns 4–6 further limit the sample to governments that issue municipal bonds at least once since 2000, to understand whether capital markets access may be related to loan reliance. We find slightly larger propensities to use the loan market in the top 2 quintiles of 12%–35% with average loan shares similar to those in columns 1–3. Thus, governments with prior activity in capital markets are more likely to obtain bank loans. Columns 7–9 show a similarly monotonic relations across government size quintiles in the most recent 2020 Census survey.

One caveat with the generalizability of these results is that small governments may be underrepresented in our sample. Specifically, large entities are more likely to match with the large banks in our data, while small governments with small banks that are not in the Y-14 data. To alleviate these concerns, we focus on urban areas where lending is dominated by large banks. Replicating Table 2 for the subset of governments in counties where at least 50% of the population as of 2020 is in urban blocks, shows largely comparable results (Internet Appendix Table F.1).

In addition, due to the Y-14 inclusion criteria, we can only examine observations with loans amount exceeding $1 million. Limiting the sample to governments with revenues above $5 million alleviates these concerns as we will only be unable to observe entities in the bottom quintile with less than 10% in bank loans relative to total revenue based on the average entity size in Panel A of Appendix Table F.5. For entities in the remaining quintiles, the potentially unobserved loan amounts is likely negligible.

In Panel B we examine governments' loan reliance across the credit risk spectrum. We measure credit risk using the most conservative long-term issuer credit rating of government-years across S&P, Moody's, and Fitch. Riskier governments are more likely to have a bank loan. Over 40% of BBB-rated governments obtain loans by 2017 as compared to 24-28% of entities rated A or better (column 1). Column 4 shows similar results in 2020.

5.2 The determinants of bank borrowing

We examine the determinants of governments' loan market reliance more rigorously in a multivariate regression setting using data on government balance sheet, credit risk, and bond issuance characteristics:

$$y_{it} = \alpha_{st} + \alpha_m + \alpha_i + \sum_{j=1}^{J} \beta^j x^j_{it-1} + \epsilon_{it} \tag{1}$$

where i, t, m, and s denote governments, years, government types, and states. y_{it} is the outcome of interest—$\textit{Loans}_{it}$ or $\textit{Loan Share}_{it}$. x^j_{it-1} is the j^{th} determinant of loan reliance lagged by one year and β^j is the corresponding estimate. α_m, α_{st}, α_i are government type, state-by-year, and government fixed effects. We double cluster the standard errors at the county and state-by-year level. We require that the Census financials are available annually and that governments have at least one municipal bond issue since 2000. Our baseline specifications include government type and state-year fixed effects to account for differences between cities, counties, schools, and special districts and to control for time-varying shocks at the state level, respectively.

Column 1 of Table 3 shows that large governments, or with higher spending relative to revenue, or higher taxes and intergovernmental receipts as share of total revenue are more likely to have bank loans. In other words, bank lenders tend to work with governments with more historically stable revenue streams such as taxes and intergovernmental transfers as compared to governments reliant on charge/fee revenue (the base group).[18]

Property tax revenues are likely to be less sensitive to economic fluctuations than charges and intergovernmental transfers for several reasons. Prior literature characterizes property taxes as slow-moving, inelastic, and stable relative to economic fluctuations such as changes in state Gross Domestic Product or local house prices (Lutz, 2008; Lutz et al., 2011; Alm, 2013; Anderson and Shimul, 2018). Similarly, a substantial share of intergovernmental receipts of local governments come directly or indirectly (through states) from federal sources. Although some federal grants underlying transfer revenue may be short-term, federal funding has a strong countercyclical component and may offer "insurance" against revenue declines. Finally, while governments have become more reliant on fees and charges in recent years (Ahern, 2022), this income source is more important in cities with poor financial health, tends to be regressive and may decline in periods of financial stress (Lutz, 2019). Overall, the reliance of bank loan contracting on stable revenues in the public finance setting bears a close resemblance to the corporate loan market (Sufi, 2009; Roberts and Sufi, 2009a).

In column 2 we also include characteristics of governments' most recent bond issuance activity. While the inclusion of bond issuance characteristics has little effect on the relation between the incidence of bank loans and government balance sheet characteristics, the estimates indicate that the incidence of bank loans declines with institutional bond market reliance. For example, governments raising all previous bond financing from institutional investors are 1.6 percentage points less likely to have bank loans.

Columns 3 and 4 show that loan share is similarly positively correlated with taxes as a share of revenue, providing additional support for the idea that revenue stability is an important determinant of bank loan reliance. In contrast to the previous results, total revenues are uncorrelated with loan share, while leverage and interest expense are both strongly predictive of bank loan share. Interest expense is positively correlated with loan share, suggesting that, keeping leverage constant,

[18]These three sources collectively account for over 80% of local government revenues between 1977 and 2020: State and Local Tax Policies.

governments find it advantageous to borrow from banks whenever debt interest costs are high. Thus, bank loans may be the least expensive financing option as borrowing costs increase. Additionally, lower leverage translates to higher bank loan share, consistent with the negative relation between recent bond market activity and loan share.

In columns 5–8 we use a government fixed effects specification to zoom in on the importance of deviations of balance sheet and bond issuance characteristics from their averages for loan reliance. Columns 5 and 6 details the instances in which issuers enter or exit the loan market, a significantly narrower set of outcomes than examining shocks to loan share in columns 7 and 8. Similar to the previous results, increases in expenditures relative to revenues translate to a higher likelihood of entering the loan market (columns 5 and 6). We find that reductions in revenues and leverage and increases in interest expenses predict higher bank loan shares (columns 7 and 8). These effects are economically large given the large standard deviation of government revenues (see Table F.4). A one standard deviation increase in interest expense also translates to a higher loan share of about 75 bps ($\approx 0.25 \times 0.03$, Tables 3 and F.4). This effect occurs despite the negative relation between loan market entry and interest expense from columns 5 and 6.

The estimates of the bond issuance characteristics highlight that time-varying bond market access may be relevant for the reliance on the bank loan market. For example, a recent 1 percentage point increase in reliance on the institutional bond markets is associated with a roughly 60 basis points reduction in bank loan share. Additionally, issuing municipal bonds in the previous year translates to about one percentage points lower probability of tapping the municipal bank loan market and about 40 basis points reduction in loan share, corroborating our earlier results. Finally, raising more financing through tax-exempt municipal bonds translates (weakly) to higher loan shares, in line with the dominance of tax-exempt obligations in the municipal loan market.

Finally, our results lend some support to the idea that local municipal bond market saturation may drive governments to the bank loan market. A similar idea has been previously explored in corporate finance by Newman and Rierson (2004), showing that corporate bond issuers get worse terms on new issuance when a similar issuer has just saturated the market. Specifically, total municipal bond issuance in the county of a given government as of the previous year is positively correlated with current-year loan market entry, after controlling for government and state-year fixed effects. For example, a one percentage point increase in total county issuance translates to a 70 basis points increase in the probability of a general government accessing the loan market (see Table C.4). This result is consistent with the local nature of the municipal bond market and the high importance of retail investors (Babina et al., 2021). Appendix C and Table C.5 show that there is also a statistically noisy positive association between loan shares and local bond issuance among districts, even after the inclusion of government fixed effects.

Prior research finds that financial intermediaries are important for issuer financial decisions in the municipal market (Butler, 2008; Cestau et al., 2019; Bergstresser and Luby, 2018; Garrett, 2021). To this end, we augment the specifications from columns 2 and 4 of Table 3 with intermediary fixed effects. Our results in Table C.6 indicate that, while there is little impact on the previously documented associations, underwriter and financial adviser fixed effects are important determinants of bank loan reliance.

Figure 4 shows the distributions of the estimated fixed effects from the bank loan incidence and loan share specifications. Even though most estimates cluster around zero, a significant share imply at least 5 percentage points change in having a bank loan, especially within the distribution of financial adviser fixed effects (Panels a and b). Similarly, a significant share of financial adviser and underwriter fixed effects imply changes in loan share of at least 1 percentage point. While we cannot rule out that underwriter- or financial adviser-government sorting drives these associations, financial intermediaries may be important for governments' reliance on the municipal loan market.

Appendix C shows that there are significant differences between general and special purpose government in how fundamentals are related to bank loan reliance. Similar to the results in Table 3, Tables C.1 and C.2 show that potential revenue stability such as higher share of taxes or government transfers in total revenues continues to collectively predict higher incidence of bank borrowing and loan share among general governments. By contrast, within the subset of districts potential revenue stability is not associated with bank loan reliance, while interest expense is negatively correlated with bank loan incidence and uncorrelated with loan share. The correlations between bank loan reliance and measures of government revenue stability or high credit risk are therefore driven by the subset of general governments. These results suggest that districts facing high financing costs may not be able to fully access the bank loan market.

5.3 Bond issuance activity around loan market entry

We examine the governments' propensity to issue municipal bonds, "new-money" bonds, or refinancings around bank loan market entry. The data panel is at the government-year level. These tests shed light on whether governments substitute bond for loan financing or tap both markets simultaneously. A contemporaneous spike in bond issuance would suggest that bank loans are not as prominent in governments' debt structure as implied by Table **??** alone. We estimate the evolution of bond issuance around loan market entry using a dynamic difference-in-differences specification:

$$y_{it} = \alpha_i + \alpha_{st} + \sum_{j=-2}^{5+} \beta_j \mathbb{1}\{J_{it} = j\} + \delta \mathbf{X} + \epsilon_{it} \tag{2}$$

where i, s, t, r, and j denote governments, states, years, and years relative to the year of loan market entry. $j < 0$ and $j \geq 0$, denote years prior to and after entry, respectively. We assume a constant treatment effect five or more years (5+) after a entry following Schmidheiny and Siegloch (2023). $\mathbb{1}\{J_{it} = j\}$ are indicator variables for entry j years relative to the current year, so β_j are estimates of pre-trends and dynamic treatment effects. y_{it} is the outcome of interest for government i in year t—$Loans_{it}$. α_i and α_{st} are government and state-by-year fixed effects. Because of the inclusion of government fixed effects, our estimates have the interpretation of entering or exiting the bank loan market. We double cluster the standard errors at the state-by-year and county level.

Columns 1 and 2 of Table 4 show that both general and district governments are 3–5 percentage points less likely to issue municipal bonds in the year of entry into the bank loan market. These effects are driven by both "new money" and refinancings among general and district governments. Furthermore, bank loan entry translates into a persistently lower probability of refinancing for both types of governments of about 2-3 percentage points.

Given the above event study specifications exhibit variation in treatment timing, early-treated units may serve as controls to later-treated ones and thereby bias the estimates. To alleviate these concerns, we use the estimator of Borusyak et al. (2024). Table 5 paints a similar picture of bond financing around loan market entry, but also shows that bond issuance results among general governments are driven by new issuances, while those for special districts are driven by refundings. Finally, districts exhibit negative anticipation effects in the refinancing specification two and one years prior to loan market entry, suggesting that accessing the loan market may be a byproduct of poor access to the municipal bond market. This result suggests that the entry of districts into the loan market in anticipation of agency rating downgrades may be a byproduct of reduced access to the bond market.

6 Similarity between bank loans and bonds

Section 4 shows that high collateralization rates, bank-qualification exemptions in some cases, and high incidence of fixed interest rates may make bank loans similar to a commonly used financing tool in the municipal bond market—bank-qualified revenue bonds. Unlike municipal bonds, bank loans give governments the ability to renegotiate frequently and access to credit lines, which represents substantial flexibility to tailor loan contracts to changes in fundamentals. Also, unlike municipal bonds, loans are commonly held by a single lender and do not trigger regulatory compliance requirements for lenders, which is likely to translate into lower transaction costs at origination. Municipal bond underwriters are required to ensure issuer compliance with continuing disclosure regulation, SEC Rule 15c2-12, or file a notice of issuer non-compliance (Ivanov et al., 2022).

In this section, we assess the similarity in financing amount and maturity between municipal loans and bonds. Given lower bond issuance around loan market entry in Tables 4 and 5, a high co-movement in amount and maturity between loans and previous bond issues may suggest material substitutability between these financing options. To do so, we construct the revenue quintiles based on the sample of governments that are in the 2012 Census and have at least one bank loan between 2011 and 2022. Most governments fall into the top three quintiles with only 20% of the sample in the remaining size quintiles (see Table F.5).

Panel A of Table 6 correlates bond and loan amounts. Specifically, we compare a government's loan commitment amounts at origination or renegotiation with the issuance amount of their most recently issued municipal bond across total revenues quintiles. Columns 1 and 2 compare all newly originated/renegotiated loans with all prior bond issues and prior general obligation (GO) issues, respectively. With the exception of the smallest size quintile, the correlations between loan and bond amounts tend to be low, ranging between 1% and 18%. Requiring prior issuance of GO bonds cuts the sample in half and does not significantly increase correlations in the top three quintiles.

By contrast, in the bottom two size quintiles, a dollar increase in GO bond issuance translates to roughly 23-40 cents of additional bank loans. Column 3 shows that, despite losing an additional 15% of the sample, the correlations between loan and bond amounts remain similar when comparing GO bonds to term loans. These results imply very limited similarity between loan and bond amounts for the top three quintiles, which represent approximately 90% of the sample.

In column 4, we compare loan amounts to those of bank-qualified bonds within the subset of entities with previous bank-qualified bonds ($< \frac{1}{4}$ of the sample). Loan and bond amounts are significantly more comparable in this subset of the data—one dollar of previous bank-qualified municipal bonds translates to 50 cents of additional bank loans in the bottom size quintile and 50–60 cents in the top four quintiles. Columns 5 and 6 show similar correlations within the subset of term loans and credit lines. Column 7 shows substantially lower correlations between bank-qualified loans and bank-qualified bonds, which suggests that the bank qualification itself may not be what drives governments to choose loans. Instead, banking relationships that arise from bank-qualified bond issuance may generate these associations, complementing the results in Section 5.2.

In Panel B we also compare loan and bond maturities with the caveat that contractual loan maturity significantly overstates effective loan maturity because of frequent loan renegotiation. We find that the correlations between bond and loan maturities are larger than those between loan and bond issuance amounts. An additional year in bond maturity translates to about 8-10 months in loan maturity even when comparing the full samples of loans and bonds. Limiting the sample to prior GO bond issues or term loans increases the correlations to 85-90%, still implying slightly shorter loan maturities. Columns 4–6 show that maturities are slightly more comparable among governments with term loans and previous bank-qualified municipal bond issues.

Appendix D presents additional tests for the similarity between bonds and loans. Table D.1 corroborates the low co-movement between loan amounts and prior bond issuance across risk rating categories and shows that, conditional on loan market entry, credit risk does not appear to be a major determinant of bond-loan similarity. Finally, reproducing the results at the bank relationship level after collapsing the data to bank-borrower-quarters results in comparable similarity in financing amount and maturity (see Tables D.3 and D.4).

Finally, Table D.2 shows that replacing the bond maturity date with the earliest call date results in bank loans having longer contractual maturities than bonds by up to 40–50%. Focusing on certain subsets of municipal bank loans or bonds further amplifies these differences. A countervailing force to municipal bond optionality is the frequent renegotiation of loan contracts. In the next section, Section 7.1, we show that about a fifth of loan-quarters in our sample are loan renegotiations that substantially change loan amounts, maturity, interest rates, or collateral. This may imply substantially shorter bank loan maturities.

7 The flexibility of bank financing

7.1 Loan renegotiation

Our results so far show that contract amounts and maturities of loans and bonds are only closely comparable in limited segments of the bank finance market, such as governments with previous bank-qualified bonds. The rapid increase in loan reliance may, therefore, be a byproduct of other characteristics of bank financing. Specifically, bank loans afford borrowers other benefits such as financial flexibility to renegotiate loan contracts at any point during the life of the loan. In fact, 27% of loan-quarters in our sample correspond to loan originations or renegotiations in which loan amount, maturity, interest rate, collateral, or third-party guarantees exhibit quarter-over-quarter changes. We require that the quarterly change in loan amount is at least 5% to be considered a renegotiation or that loans are not floating rate, thereby ensuring we capture material renegotiation.

We examine the frequency of renegotiation and changes in loan contracts conditional on renegotiation across the government size and risk rating distributions in the full Y-14 loan-quarter panel. Panel A of Table 7 shows that renegotiation activity is frequent and happens more often among the largest governments—accounting for 16% of loan-quarters in the bottom size quintile as compared to 20–21% of loan-quarters in the top two quintiles (column 1). Column 2 shows that renegotiation changes loan amount, interest rate, and maturity in about 74–88%, 5–19%, 5–16% of renegotiation loan-quarters, respectively. Both maturity and interest rate renegotiation is more frequent in the top two size quintiles. Renegotiation that changes loan collateral and guarantees occurs less frequently in about 5% and under 1% of cases, respectively. Bank loans, therefore, afford governments significant flexibility that is typically not available in the municipal bond market. Such flexibility does not appear to be evenly distributed, as the largest governments renegotiate loan amounts, maturities, and interest rates more frequently than smaller ones.

By contrast, renegotiation is more evenly distributed across banks' internal credit ratings. Conditional on renegotiation, changes in loan amount occur more frequently among lower credit quality borrowers. Zooming in on ratings between BB and AA, which represent nearly the entirety of our sample, governments rated A or worse renegotiate loan amounts in about 80% of renegotiation loan-quarters as compared to 76% for borrowers rated AA. Low credit quality borrowers have higher incidence of interest rate and maturity renegotiation than high quality borrowers. Overall, analogous to the renegotiation of corporate loans, about 80% of the renegotiation of government loans is related to loan amounts (Roberts and Sufi, 2009b). Unlike corporate loans, however, government loan renegotiation of interest rates or maturities is substantially less frequent. The low incidence of interest rate renegotiation may be a byproduct of the low-interest rate environment during most of our sample period, while limited maturity renegotiation may be due to the longer maturity of government contracts as compared to corporate loans (Roberts and Sufi, 2009b; Roberts, 2015).

We next relate renegotiation to changes in borrower credit quality. The corporate finance literature shows that the financial flexibility of renegotiation is most useful when borrower or economic fundamentals change (Smith Jr. and Warner, 1979; Chemmanur and Fulghieri, 1994; Gorton and Kahn, 2000; Chemmanur and Fulghieri, 2007; Roberts and Sufi, 2009b; Roberts, 2015; Black et al., 2017). Borrower credit risk closely mirrors such changes in fundamentals, and therefore we examine renegotiation activity in response to recent bank internal rating changes.

Following the empirical approach in Roberts and Sufi (2009b) that examines corporate loan renegotiation, we assess whether renegotiation affords governments significant flexibility when credit risk changes using a multinomial logit specification (see Maddala (1983)). The probability of renegotiation outcome j for loan l in quarter t is given by:

$$P_{ltj} = \frac{exp(\boldsymbol{\beta_j x_{gt}})}{\sum_{k=1}^{m} exp(\boldsymbol{\beta_k x_{gt}})} \tag{3}$$

where m and g denote the number of possible renegotiation outcomes and governments, respectively. We study six mutually exclusive outcomes in terms of changes in loan amounts and interest rates ($m = 6$): 1) loan amount increases and interest rate does not increase, 2) loan amount does not decrease and interest rate decreases, 3) loan amount decreases and interest rate does not decrease, 4) loan amount does not increase and interest rate increases, 5) loan amount increases and interest rate increases, and 6) loan amount decreases and interest rate decreases. The base case in the estimation comprises all loan-quarter observations that are not renegotiated. Our renegotiation classification is, therefore, close in spirit to the one in Roberts and Sufi (2009b)—outcomes 1) and 2) roughly correspond to borrower favorable, outcomes 3) and 4) to borrower unfavorable, and outcomes 5) and 6) to ambiguous renegotiation outcomes in their paper. Finally, $\boldsymbol{x_{gt}}$ are characteristics of government g in quarter t and $\boldsymbol{\beta_j}$ is the vector of associated coefficients for outcome j.

We require the availability of loan amounts and rates in the current and the previous quarters and internal ratings for the two consecutive previous quarters to measure changes in credit quality. We present specifications with and without Census variables as of the previous year (in Panels A and B of Table 8). The financial variables proxy for major cross-sectional determinants of renegotiation, but reduce the sample size by about 10%. To maximize sample size, the financials corresponding to years 2013–2017 come from the 2012 Census, while those since 2018 come from the 2017 Census.

Table 8 shows estimated average marginal effects of Equation 3. Renegotiations are highly responsive to both deterioration and improvement in government credit quality, even when accounting for key lagged government characteristics such as size, the stability of revenue sources, leverage, and interest costs. Credit quality improvement is associated with both increases and decreases in loan amounts and interest rates. For example, receiving an internal rating upgrade in the previous quarter translates to 1–2.6 percentage points higher probability of renegotiation increasing loan amounts but not raising rates, up to 5.3 percentage points lower probability of renegotiation decreasing loan amounts but not decreasing rates, and 20–30 basis points higher probability of renegotiation increasing both loan amounts and interest rates in the current quarter (column 5). Similarly, internal rating upgrades are associated with a 10–20 basis points higher probability of renegotiation activity decreasing loan interest rates but not decreasing amounts (column 2).

In contrast, renegotiation activity is less responsive to deterioration in credit quality. Specifically, internal rating downgrades are only positively associated with 2.1–2.5 percentage points higher probability of renegotiation increasing loan amounts and not increasing interest rates (column 1 of Panels A and B). Rating downgrades are also associated with rate increasing renegotiations that do not increase loan amounts. This result, while mixed, suggests that banks accommodate governments following increases in credit risk—whenever governments may be less able to obtain financing from public capital markets. Overall, loan renegotiation activity is significantly higher following credit quality improvement than after deterioration, further corroborating the idea that the flexibility of bank financing may be especially beneficial to governments when credit conditions improve.

Table 8 also indicates that renegotiation is closely related to governments' balance sheet characteristics. For example, amount increasing (decreasing) renegotiation outcomes are more (less) likely among governments with high levels of revenues, larger share of potentially stable revenue sources such as government transfers and taxes, and better credit quality. Furthermore, previous increases in borrowing costs in terms of interest expense translate to renegotiation decreasing loan interest rates but not decreasing amounts, decreasing amounts but not decreasing rates, and increasing both amounts and rates (columns 2, 3, and 5). This evidence is broadly consistent with governments that face high borrowing costs in public markets receiving accommodations by banks in some scenarios, but also paying higher loan rates for such flexibility.

In Appendix E we find similar associations between renegotiation outcomes and rating changes within the subset of general governments and districts (see Tables E.1 and E.2). We also show that the sensitivity of renegotiation outcomes to rating changes is higher for districts, which is consistent with the potentially higher levels of financial constraints among districts than among general governments. We also show significantly lower sensitivity of renegotiation outcomes to changes in internal risk ratings within term loans than within credit lines (see Tables E.3 and E.4), a likely byproduct of the amortization structure of term loans reducing the frequency of loan amount renegotiation. In addition, term loans may attract governments that value the similarity of some term loans to municipal bonds and, thereby, prefer to renegotiate less.

7.2 Access to credit lines

Another benefit of bank financing is that it provides access to credit lines. Table 1 shows that roughly a fifth of municipal loans are in the form of credit lines with average utilization ratios ranging between 39% and 56%, leaving borrowers with substantial capacity to increase future borrowing.

In Table 9 we examine how the reliance on credit lines varies over the government risk and size distributions for government-years with bank loans. Panel A shows the average credit line share across quintiles of total revenue from the 2012 Census, while Panel B presents credit line shares across bank internal rating categories.

Column 1 of Panel A shows that the smallest governments have low reliance on credit lines. For example, governments in the bottom three revenue quintiles have 10%–15% credit line share. Credit lines represent a larger share of bank financing for governments in the top two size quintiles at 21% and 39%, respectively. Credit line shares also vary substantially across government type, with cities and special districts exhibiting the highest reliance in the top two size quintiles. Overall, the largest general and district governments are most reliant on credit lines.

Panel B shows that higher-credit quality governments tend to be more reliant on credit lines. Specifically, column 1 shows that the share of credit lines ranges between 29% and 43% among AAA and AA-rated governments as compared to 17%–21% among borrowers of lower credit quality. Columns 2–6 show that these patterns are similar across government types. Higher credit quality borrowers appear to have greater access to lines of credit than lower quality ones. Thus, similar to the corporate finance setting, the availability of credit lines to governments may be contingent on maintaining sufficient profitability and larger governments have greater access to credit lines (Sufi, 2009; Chodorow-Reich et al., 2022; Greenwald et al., 2021).

The finance literature shows that corporate borrowers use credit lines to buffer idiosyncratic or aggregate shocks, invest, or manage working capital needs (Brown et al., 2021; Ivashina and Scharfstein, 2010; Lins et al., 2010). On the other hand, Sufi (2009) shows that the availability of corporate credit lines is contingent on firms maintaining sufficient cash flow.

We explore the relative importance of these ideas for government borrowers by relating credit line use to key government financials and changes in borrower credit quality. To the extent that credit quality deterioration is accompanied by credit line limit increases and drawdowns, credit lines are likely to serve a liquidity insurance role for government borrowers. Table 10 relates internal rating downgrades and upgrades as of the previous quarter to credit line use. Downgrades and upgrades are improvements and declines of one or more notches of a government's most conservative credit rating across all of its lenders.

Column 1 shows that governments' credit quality deterioration is accompanied by a significant increase in the likelihood of credit line drawdowns. Columns 2 and 3 show that these results are driven by both general and district governments. For example, a one notch reduction in a general government's internal rating translates to 3.2-4.7 percentage points higher probability of credit line drawdowns. Districts are also 3.2 percentage points more likely to draw on credit lines following credit quality improvement. The estimates in columns 4–6 present qualitatively similar responses of the credit line size to improvement and deterioration in credit quality, but these are driven by general governments. Specifically, a one-notch downgrade translates to roughly 2.3 percentage points higher probability of credit line limit increase for general governments and no change in credit line size for districts. In addition, upgrades are associated with a 1.6 percentage points increase in the probability of credit line size increase for general governments.

Our estimates also indicate that higher revenues, greater reliance on stable revenue sources such as taxes and intergovernmental revenues, and lower leverage are associated with higher probability of credit line draws and limit increases for districts. Most of these factors are uncorrelated with credit line drawdowns or line size increases among general governments, with only lower leverage ratios and lower interest expense predicting a higher likelihood of drawdowns and limit increases among general governments.

Maintaining sufficient and stable revenues appears especially important for the ability to maintain credit line use among districts as these governments do not appear to use credit lines to buffer adverse revenue shocks. In other words, districts appear to rely on credit line for working capital purposes, instead of for liquidity insurance. By contrast, we find that general governments rely more on credit lines whenever credit risk increases and that lenders tend to accommodate these borrowers by increasing credit line limits.

Overall, the marked flexibility of bank financing is especially useful to borrowers undergoing changes in credit quality, swiftly tailoring debt contracts to government fundamentals. We acknowledge that while bank financing is likely to provide significant benefits to borrowers undergoing change in fundamentals as may have been typical during the post-Great Recession recovery period, bank financing may be costlier than municipal bonds for some governments. Specifically, governments incur commitment fees to maintain access to credit lines or bank monitoring costs in anticipation of future renegotiation (Gustafson et al., 2021). Finally, similar to corporate loans, municipal loan contracts may have financial covenants that force renegotiation (Gilson and Warner, 1998). Unfortunately, loan covenants data are unavailable in FR Y-14, precluding us from empirically investigating this possibility.

8 Conclusion

State and local governments have substantially increased their reliance on private bank loans in recent years. Using confidential supervisory loan-level data on bank lending to local governments in the United States, we show that bank financing provides significant flexibility to governments in the form of frequent renegotiation and ability to quickly tap bank credit lines. Loan renegotiation and credit line dynamics are both highly sensitive to changes in credit risk, allowing continued availability of debt financing when governments are less able to access public capital markets.

The recent increase in interest rates has led to steep declines in municipal bond issuance, not seen in the two previous monetary policy tightening cycles (Lerner, 2023). At the same time, governments are likely to see revenue declines as personal income and sales tax receipts decline (Barnett, 2023). Our analysis suggests bank loans may be a useful financing tool in this environment. While turning to the bank loan market may be largely beneficial to governments faced with higher borrowing costs and lower bond market access, it may also pose additional risks to bond holders as highlighted in (Ivanov et al., 2022).

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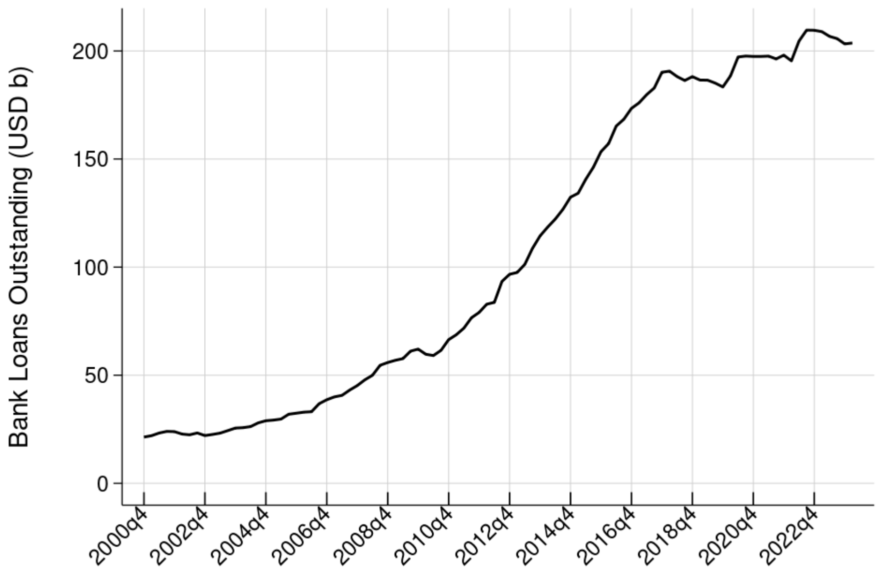
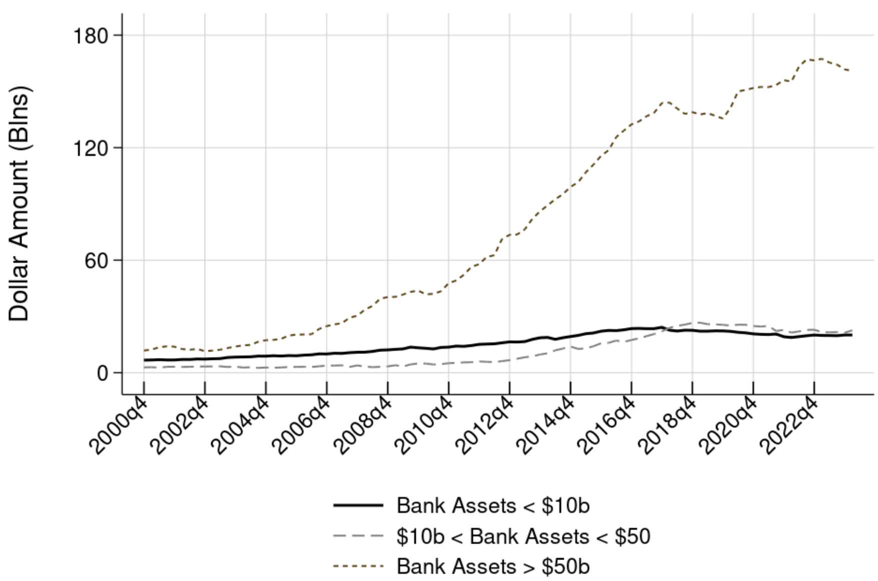
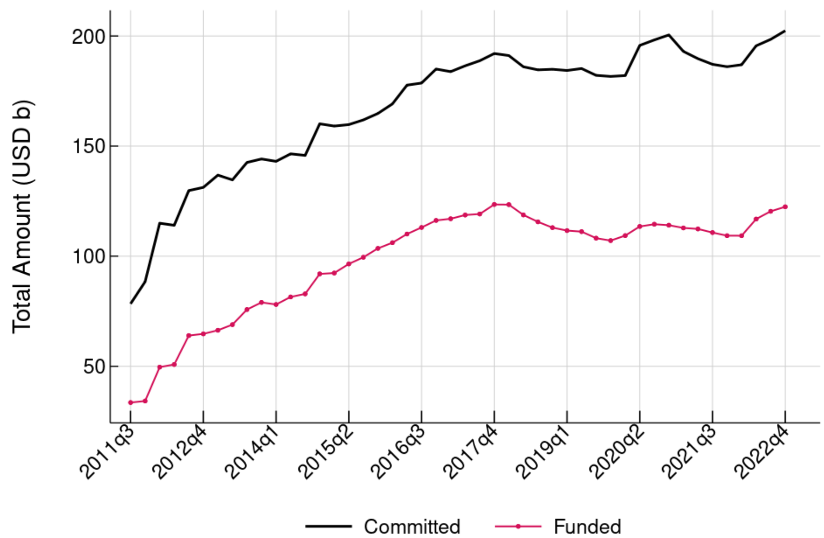


(a) Total Municipal Bank Loans

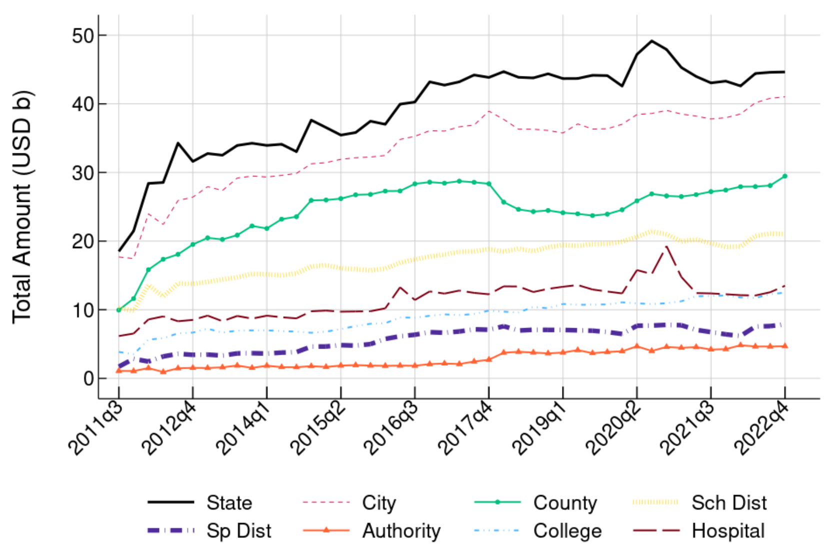


(b) Municipal Loan Exposure by Bank Size

Figure 1: Municipal Bank Loan Exposure. Panel A of this figure presents the total dollar amount of municipal bank loans outstanding over time, while panel B decomposes the total municipal into exposure held by banks with less than \$10 billion, between \$10 and \$50 billion, and more than \$50 billion in total assets. Source: Call Reports and FR-Y9C.

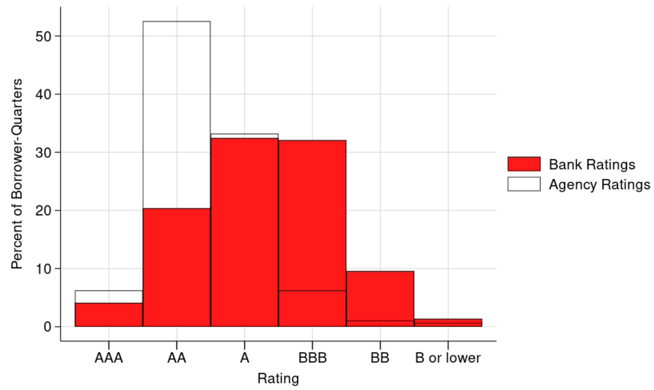


(a) Total Municipal Loans

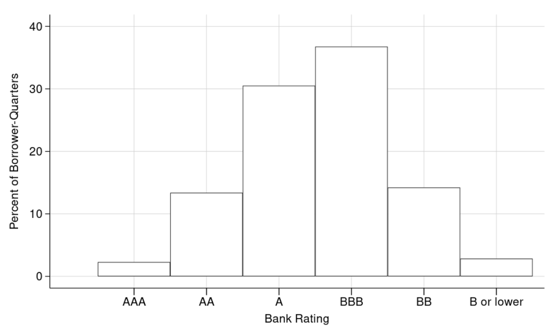


(b) Municipal Loans by Subdivision

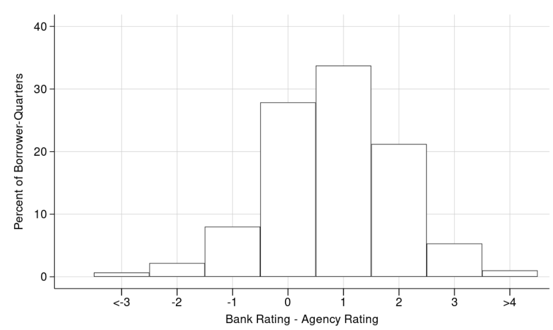
Figure 2: Municipal Bank Debt. Panel A of this figure presents the total dollar amount of utilized and committed loan exposure of Y-14 banks to municipalities during our sample period. Panel B presents the total dollar amount of commitments to different groups of municipal issuers over the sample period (states, counties, cities, school districts, special districts, authorities, colleges, and hospitals).



(a) Agency vs Bank Ratings

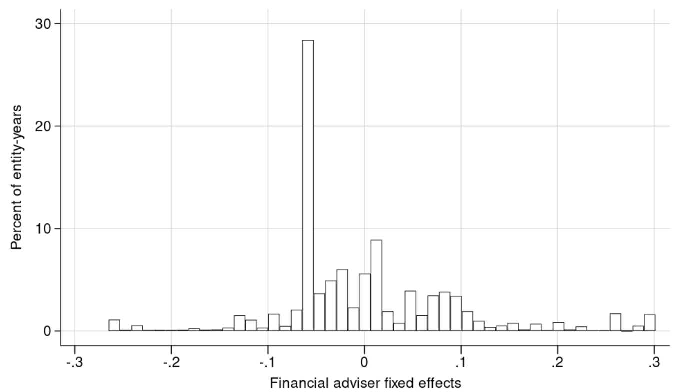


(b) No Agency Rating

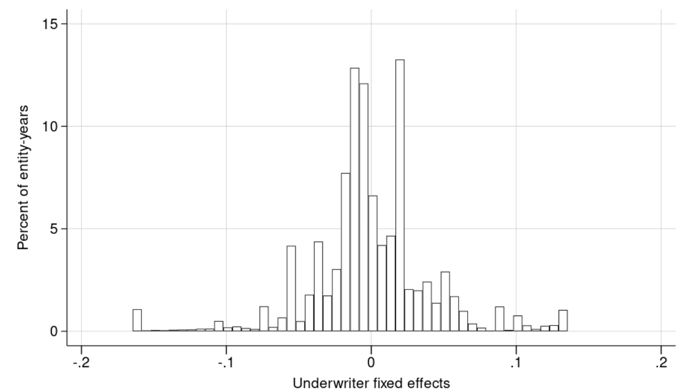


(c) Rating Gap

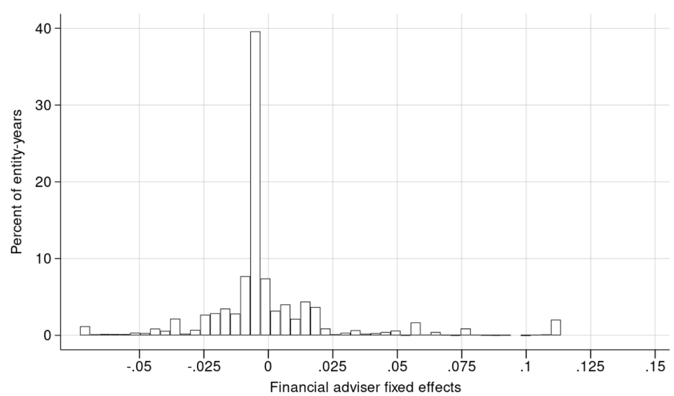
Figure 3: Credit Risk Distribution. Panel A overlays the ratings distributions of government-quarters that are rated by both banks (the red bars) and credit ratings agencies (the white bars). Panel B presents the distribution of banks' credit risk assessment of government-quarters without an agency rating (in a 10-grade S&P scale). Panel C presents the distributions of the difference between the ratings of banks and those of rating agencies for each local government rated by both banks and rating agencies (in rating notches). Whenever governments have loans with multiple banks in a quarter, we take the most conservative rating across these banks.



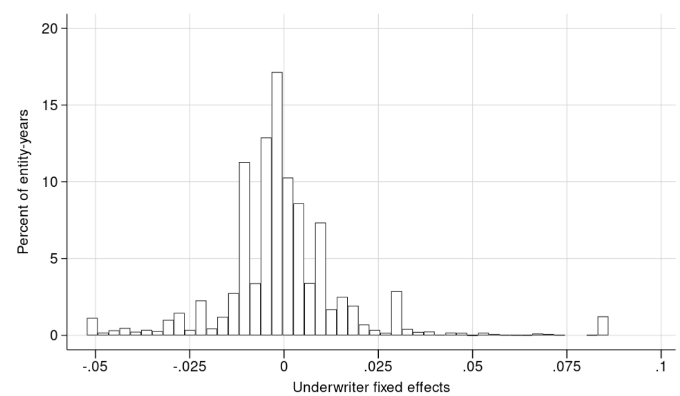
(a) Loans



(b) Loans



(c) Loan Share



(d) Loan Share

Figure 4: Bank Reliance and Financial Advisers and Underwriters. This figure presents the distributions of the financial advisors and underwriters fixed effects estimates from regressions of *Loan Reliance* and *Loan Share* on government characteristics and government type and state-year fixed effects (see Equation 1).

Table 1: Loan Characteristics. This table presents summary statistics (means) for key characteristics of bank loans to state, county, city, and special district governments. Committed and drawn amounts are expressed in million of US dollars, while remaining and original contract maturities are expressed in quarters. All other variables in this table are defined as in Appendix B.

	Counties	**Cities**	**Sch Dist**	**Sp Dist**
Panel A: Major Loan Terms				
Credit Lines				
Fraction of all loans	0.190	0.190	0.166	0.256
Committed Amount	23.533	22.506	8.120	36.058
Drawn Amount	4.889	4.956	3.342	8.067
Utilization	0.377	0.498	0.564	0.404
Fraction Drawn	0.689	0.720	0.807	0.571
Interest Rate	0.031	0.028	0.028	0.028
Remaining Maturity	9.812	13.996	12.718	13.600
Original Maturity	20.364	24.795	23.691	27.443
N	12,016	28,655	15,240	12,873
Term Loans				
Fraction of all loans	0.571	0.632	0.606	0.589
Committed Amount	8.170	5.805	6.999	9.648
Interest Rate	0.029	0.028	0.027	0.029
Remaining Maturity	29.480	31.463	28.282	32.916
Original Maturity	45.761	46.994	45.590	47.928
N	36,131	95,589	55,711	29,643
Panel B: Collateral and Contractual Provisions				
Credit Lines				
Secured	0.422	0.532	0.522	0.607
Senior Secured	0.399	0.487	0.454	0.548
Guaranteed	0.004	0.006	0.145	0.033
Fixed Rate	0.588	0.657	0.806	0.510
Prepayment Penalty	0.150	0.219	0.151	0.224
Tax Exempt	0.336	0.430	0.384	0.402
Bank Qualified	0.130	0.201	0.265	0.163
Syndicated	0.009	0.012	0.004	0.054
N	11,999	28,522	15,228	12,830
Term Loans				
Secured	0.863	0.798	0.820	0.862
Senior Secured	0.828	0.744	0.762	0.788
Guaranteed	0.003	0.003	0.042	0.022
Fixed Rate	0.945	0.953	0.974	0.902
Prepayment Penalty	0.514	0.480	0.435	0.492
Tax Exempt	0.690	0.757	0.575	0.753
Bank Qualified	0.416	0.546	0.418	0.537
Syndicated	0.009	0.011	0.005	0.016
N	36,131	95,578	55,711	29,643

Table 2: Bank loan reliance across the government size and risk distribution. This table presents the incidence of bank loan reliance across government size and credit rating categories. The sample in columns 1-3 is limited to governments that are surveyed in 2017—the last full Census year—and that have nonzero debt. Columns 4-6 further limit the sample to governments that have issued municipal bonds since 2000. The sample in columns 7-9 is limited to governments that appear in the 2020 Census survey—the final year in our sample—and to governments that have nonzero debt.

Panel A: Government Size

	2017 Census Survey						2020 Census Survey		
Measure:	Loans	Loan Share		Loans	Loan Share		Loans	Loan Share	
		Drawn	Committed		Drawn	Committed		Drawn	Committed
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Quintile= +1	0.055***	0.533***	0.543***	0.060***	0.472***	0.482***	0.044***	0.983***	0.987***
	[0.005]	[0.016]	[0.017]	[0.008]	[0.020]	[0.020]	[0.006]	[0.104]	[0.107]
Quintile= +2	0.098***	0.437***	0.448***	0.119***	0.416***	0.424***	0.101***	0.758***	0.766***
	[0.005]	[0.012]	[0.013]	[0.007]	[0.013]	[0.013]	[0.006]	[0.069]	[0.071]
Quintile= +3	0.140***	0.351***	0.365***	0.156***	0.323***	0.333***	0.161***	0.338***	0.348***
	[0.005]	[0.010]	[0.010]	[0.007]	[0.011]	[0.011]	[0.006]	[0.054]	[0.056]
Quintile= +4	0.212***	0.269***	0.282***	0.234***	0.240***	0.252***	0.258***	0.226***	0.267***
	[0.005]	[0.008]	[0.009]	[0.006]	[0.008]	[0.009]	[0.006]	[0.043]	[0.044]
Quintile= +5	0.449***	0.127***	0.146***	0.492***	0.120***	0.139***	0.512***	0.113***	0.134***
	[0.005]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]	[0.031]	[0.031]
Observations	24455	4665	4665	16792	3893	3893	17996	3874	3874

Panel B: Government Risk

	2017 Census Survey			2020 Census Survey		
Measure:	Loans	Loan Share		Loans	Loan Share	
		Drawn	Committed		Drawn	Committed
	(1)	(2)	(3)	(4)	(5)	(6)
Rating= AAA	0.244***	0.137***	0.155***	0.239***	0.104***	0.119***
	[0.019]	[0.019]	[0.019]	[0.017]	[0.022]	[0.035]
Rating= AA	0.283***	0.152***	0.166***	0.288***	0.166***	0.180***
	[0.006]	[0.006]	[0.006]	[0.007]	[0.008]	[0.012]
Rating= A	0.252***	0.170***	0.183***	0.264***	0.179***	0.212***
	[0.008]	[0.007]	[0.007]	[0.008]	[0.009]	[0.015]
Rating= BBB	0.414***	0.116***	0.136***	0.420***	0.132***	0.149***
	[0.026]	[0.020]	[0.020]	[0.020]	[0.019]	[0.030]
Rating= BB	0.483***	0.111***	0.127***	0.569***	0.055	0.083
	[0.057]	[0.040]	[0.041]	[0.056]	[0.046]	[0.074]
Rating= B	0.625***	0.062	0.075	0.643***	0.053	0.057
	[0.091]	[0.056]	[0.058]	[0.085]	[0.066]	[0.106]
Observations	9791	2699	2699	9301	2659	2659

Table 3: Determinants of bank loan reliance. This table presents the relation between measures of governments' reliance on the bank loan market and financial characteristics. We use two such measures—an indicator for whether government i has bank loans in year t, $Loans_{it}$, and, conditional on having loans, total bank loan commitments as a share of total outstanding debt, $Loan\ Share_{it}$. We limit the sample to all school and special district governments in the Census of Government Finances that are surveyed every year between 2012 and 2020. The independent variables are defined in the Internet Appendix. The standard errors are double clustered at the state-year and county level.

Dependent variable:	Loans		Loan Share		Loans		Loan Share	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln(1+Tot Revenue)	0.110***	0.105***	-0.000	0.002*	0.003	0.003	-0.007***	-0.007***
	[0.004]	[0.004]	[0.001]	[0.001]	[0.005]	[0.005]	[0.003]	[0.003]
Tot Expenditures	0.024*	0.023*	0.003	0.005	0.022***	0.023***	0.001	0.002
	[0.013]	[0.013]	[0.004]	[0.004]	[0.007]	[0.007]	[0.002]	[0.002]
Tot IG Revenue	0.141***	0.131***	-0.005	-0.003	0.002	0.002	-0.017	-0.018
	[0.027]	[0.027]	[0.008]	[0.009]	[0.027]	[0.027]	[0.015]	[0.015]
Tot Taxes	0.198***	0.187***	0.015*	0.019**	0.017	0.016	0.006	0.005
	[0.028]	[0.028]	[0.008]	[0.008]	[0.032]	[0.032]	[0.015]	[0.015]
PCPI	-0.040	-0.279	0.065	-0.009	0.221	0.205	0.125	0.113
	[0.463]	[0.462]	[0.204]	[0.193]	[1.137]	[1.138]	[0.307]	[0.308]
Leverage	0.009**	0.007	-0.019***	-0.017***	-0.006	-0.005	-0.020***	-0.020***
	[0.004]	[0.004]	[0.002]	[0.002]	[0.004]	[0.004]	[0.002]	[0.002]
Interest Expense	-0.228**	-0.251***	0.229***	0.209***	-0.232***	-0.244***	0.254***	0.249***
	[0.096]	[0.097]	[0.052]	[0.053]	[0.064]	[0.064]	[0.048]	[0.048]
Inst Reliance		-0.016*		-0.017***		-0.004		-0.006**
		[0.009]		[0.004]		[0.006]		[0.002]
Bank Qualified		-0.020**		0.006*		0.002		0.002
		[0.008]		[0.003]		[0.005]		[0.002]
Exempt Issuance		0.008		0.004		-0.001		0.005*
		[0.012]		[0.005]		[0.009]		[0.003]
Bond Issuance		-0.008		-0.014***		-0.010***		-0.004***
		[0.005]		[0.002]		[0.002]		[0.001]
Log(Area Issuance)		0.004		0.001		0.002		0.001*
		[0.003]		[0.001]		[0.001]		[0.001]
Observations	78986	78986	78986	78986	78588	78588	78588	78588
Government Type FE	Yes	Yes	Yes	Yes	No	No	No	No
State × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Government FE	No	No	No	No	Yes	Yes	Yes	Yes

Table 4: Bonds issuance activity around loan market entry. This table presents the relation between local governments' bonds issuance activity and loan market entry in event time. Our measure of bonds issuance activity, *All Issuance*, *New Issuance*, and *Refunding* are indicator variables that take the value of one whenever a government has any type of bond offering, at least some "new-money" bond offerings, or refunding offerings in a given year, and zero otherwise. We define new-money offerings as those with a capital purpose of "NEW" in Mergent and refundings as those with a capital purpose of "REF" and "XOR." We exclude private placements in Mergent—where the offering type takes the values of "PPLC", "PLLC", or "GPPI." We define entry in the bank loan market as the first year a government has credit commitments in the Y-14 Collection, excluding the quarters lenders enter the Y-14 Collection. All specifications include government, government type and state-year fixed effects. The standard errors are double clustered at the state-year and county level.

Dependent variable:	All Issuance		New Issuance		Refunding	
	General (1)	Districts (2)	General (3)	Districts (4)	General (5)	Districts (6)
Event Year= −2	0.006	-0.000	0.005	0.008	-0.005	-0.008
	(0.011)	(0.009)	(0.010)	(0.008)	(0.011)	(0.007)
Event Year= −1	-0.010	0.001	-0.001	0.002	-0.020	-0.004
	(0.011)	(0.010)	(0.011)	(0.008)	(0.013)	(0.009)
Event Year= 0	-0.033**	-0.052***	-0.027**	-0.032***	-0.029**	-0.033***
	(0.013)	(0.010)	(0.012)	(0.008)	(0.012)	(0.008)
Event Year= +1	-0.014	0.006	-0.012	0.013*	-0.012	0.002
	(0.013)	(0.009)	(0.012)	(0.007)	(0.013)	(0.009)
Event Year= +2	-0.010	-0.010	0.002	0.001	-0.013	-0.013*
	(0.013)	(0.008)	(0.013)	(0.007)	(0.013)	(0.007)
Event Year= +3	-0.009	0.008	0.001	0.016*	-0.018	-0.008
	(0.013)	(0.008)	(0.012)	(0.008)	(0.014)	(0.007)
Event Year= +4	0.005	-0.000	0.009	0.010	-0.021	-0.006
	(0.013)	(0.008)	(0.013)	(0.008)	(0.014)	(0.007)
Event Year≥ +5	-0.019	-0.007	0.001	0.009	-0.028*	-0.023***
	(0.014)	(0.009)	(0.013)	(0.008)	(0.015)	(0.007)
R^2	.382	.273	.345	.247	.277	.202
N	42395	181024	42395	181024	42395	181024
Govt FE	Yes	Yes	Yes	Yes	Yes	Yes
StateXQuarter FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 5: Bonds issuance activity around loan market entry: Borusyak et al. (2024) Estimator. This table presents the relation between local governments' bonds issuance activity and loan market entry in event time. Our measure of bonds issuance activity, *All Issuance*, *New Issuance*, and *Refunding* are indicator variables that take the value of one whenever a government has any type of bond offering, at least some "new-money" bond offerings, or refunding offerings in a given year, and zero otherwise. We define new-money offerings as those with a capital purpose of "NEW" in Mergent and refundings as those with a capital purpose of "REF" and "XOR." We exclude private placements in Mergent—where the offering type takes the values of "PPLC", "PLLC", or "GPPI." We define entry in the bank loan market as the first year a government has credit commitments in the Y-14 Collection, excluding the quarters lenders enter the Y-14 Collection. All specifications include government and state-year fixed effects. The standard errors are double clustered at the state-year and county level.

Dependent variable:	All Issuance		New Issuance		Refunding	
	General (1)	Districts (2)	General (3)	Districts (4)	General (5)	Districts (6)
Event Year= -2	0.007	-0.012	-0.004	0.009	0.008	-0.020*
	(0.013)	(0.013)	(0.011)	(0.011)	(0.015)	(0.011)
Event Year= -1	-0.005	-0.013	-0.008	0.005	-0.009	-0.022*
	(0.013)	(0.014)	(0.016)	(0.010)	(0.018)	(0.012)
Event Year= 0	-0.043*	-0.058***	-0.054**	-0.032	-0.010	-0.035***
	(0.023)	(0.021)	(0.023)	(0.020)	(0.015)	(0.012)
Event Year= $+1$	0.001	0.009	-0.027	0.009	0.017	0.009
	(0.017)	(0.017)	(0.018)	(0.015)	(0.019)	(0.009)
Event Year= $+2$	0.011	-0.016	-0.016	0.004	0.028	-0.020**
	(0.019)	(0.012)	(0.016)	(0.008)	(0.018)	(0.010)
Event Year= $+3$	0.009	0.011	-0.018	0.026*	0.013	-0.014
	(0.021)	(0.014)	(0.021)	(0.013)	(0.018)	(0.014)
Event Year= $+4$	0.046**	0.007	0.008	0.013	0.027	0.002
	(0.020)	(0.015)	(0.018)	(0.013)	(0.022)	(0.011)
Observations	37,082	162,103	37,082	162,103	37,082	162,103
Government FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 6: Similarity between bank loans and bonds: government size. This table presents the correlation between bonds and loans in terms of debt issuance amount and maturity across local government size. We construct government size quintiles annually based on all governments in the Census of Government Finances that have at least some outstanding debt or have municipal bond market access. The size quintiles are lagged by one year. GO Bonds and Qualified loans indicators take the value of one whenever the most recent municipal bond issue of a given government is in the form of general obligation bonds or bank-qualified bank loans. Term Loans, Credit Lines, and Qualified Loans take the value of one whenever a given bank loan is a term loan, credit line, or a qualified bank loan. We limit the sample to originations or renegotiations—loan-quarter observations with any changes in loan commitments, maturities, interest rates, security, and guarantee provisions. Originations are any observations with new loan IDs or where the origination quarter is the same as the observation quarter. The standard errors are clustered at the state level.

Panel A: Similarity in Issuance Amount

Dependent variable:	Committed Amount						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Quintile=1 × Issuance Amt	0.226**	0.397***	0.396***	0.495***	0.520***	0.371***	0.468***
	[0.085]	[0.034]	[0.044]	[0.035]	[0.039]	[0.083]	[0.023]
Quintile=2 × Issuance Amt	0.103***	0.182***	0.224***	0.500***	0.503***	0.530***	0.441***
	[0.025]	[0.037]	[0.032]	[0.035]	[0.025]	[0.148]	[0.028]
Quintile=3 × Issuance Amt	0.178***	0.182***	0.185***	0.611***	0.525***	0.895*	0.374***
	[0.026]	[0.026]	[0.030]	[0.117]	[0.045]	[0.451]	[0.040]
Quintile=4 × Issuance Amt	0.109***	0.113***	0.125***	0.513***	0.531***	0.507***	0.398***
	[0.016]	[0.011]	[0.015]	[0.032]	[0.035]	[0.056]	[0.031]
Quintile=5 × Issuance Amt	0.011***	0.012	0.004*	0.579***	0.595***	0.596***	0.293***
	[0.003]	[0.008]	[0.002]	[0.095]	[0.121]	[0.174]	[0.040]
Observations	83186	44873	26403	20999	14012	4652	11255
Adjusted R^2	0.060	0.041	0.044	0.244	0.325	0.177	0.493

Panel B: Similarity in Issuance Maturities

Dependent variable:	Loan Maturity (Quarters)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Quintile=1 × Bond Maturity	0.829***	0.912***	0.973***	0.929***	0.978***	0.640***	0.944***
	[0.060]	[0.070]	[0.071]	[0.066]	[0.065]	[0.096]	[0.062]
Quintile=2 × Bond Maturity	0.752***	0.856***	0.911***	0.920***	0.967***	0.591***	0.902***
	[0.070]	[0.074]	[0.076]	[0.063]	[0.067]	[0.060]	[0.059]
Quintile=3 × Bond Maturity	0.735***	0.792***	0.870***	0.881***	0.958***	0.670***	0.812***
	[0.045]	[0.056]	[0.045]	[0.064]	[0.048]	[0.114]	[0.082]
Quintile=4 × Bond Maturity	0.691***	0.757***	0.814***	0.885***	0.916***	0.741***	0.880***
	[0.029]	[0.047]	[0.037]	[0.067]	[0.054]	[0.170]	[0.081]
Quintile=5 × Bond Maturity	0.558***	0.695***	0.796***	0.870***	0.946***	0.703***	0.786***
	[0.018]	[0.042]	[0.046]	[0.089]	[0.089]	[0.143]	[0.118]
Observations	79137	42868	26389	20484	14009	4225	11251
Adjusted R^2	0.586	0.580	0.640	0.610	0.663	0.432	0.628
GO Bonds	–	X	X	–	–	–	–
Term Loans	–	–	X	–	X	–	–
Qualified Bonds	–	–	–	X	X	X	X
Credit Lines	–	–	–	–	–	X	–
Qualified Loans	–	–	–	–	–	–	X

Table 7: Loan renegotiation and borrower size and risk. This table presents incidence of renegotiation in government size and risk buckets. Column 1 in both panels shows the incidence of renegotiation as a share of all loan-quarter obvservations—we compare renegotiations to originations and loan-quarters in which there is no observed renegotiation activity. Columns 2-6 compare the incidence of renegotiation changing loan amount, interest rate, maturity, collateral, and guarantees to all other renegotiations. For example, column 2 shows the incidence of renegotiation in size quintiles (Panel A) or internal risk rating categories (Panel B) as a share of all other renegotiation activity. We construct the size quintiles in Panel A annually based on all governments in the Census of Government Finances that have at least some outstanding debt or have municipal bond market access. The credit rating categories represent the most conservative bank internal rating assigned to a given government-quarter. The size quintiles and credit ratings are lagged one year and one quarter, respectively. We cluster the standard errors at the state level.

Panel A: Government Size

Dependent variable:	Renegotiation (1)	Amount (2)	Rate (3)	Maturity (4)	Collateral (5)	Guarantees (6)
Quintile=1	0.164***	0.871***	0.056***	0.058***	0.050***	0.003*
	[0.006]	[0.016]	[0.011]	[0.010]	[0.008]	[0.002]
Quintile=2	0.176***	0.877***	0.054***	0.052***	0.047***	0.003***
	[0.008]	[0.014]	[0.006]	[0.006]	[0.009]	[0.001]
Quintile=3	0.188***	0.845***	0.066***	0.088***	0.051***	0.003***
	[0.008]	[0.013]	[0.006]	[0.010]	[0.011]	[0.001]
Quintile=4	0.196***	0.820***	0.098***	0.090***	0.046***	0.003***
	[0.010]	[0.016]	[0.009]	[0.011]	[0.007]	[0.001]
Quintile=5	0.213***	0.743***	0.188***	0.156***	0.052***	0.004**
	[0.006]	[0.016]	[0.020]	[0.012]	[0.005]	[0.001]
Observations	348788	69189	69189	69189	69189	69189
Adjusted R^2	0.200	0.796	0.159	0.133	0.050	0.003

Panel B: Credit Risk

Dependent variable:	Renegotiation (1)	Amount (2)	Rate (3)	Maturity (4)	Collateral (5)	Guarantees (6)
Rating=AAA	0.195***	0.743***	0.083***	0.111***	0.159***	0.001
	[0.011]	[0.021]	[0.017]	[0.019]	[0.016]	[0.001]
Rating=AA	0.209***	0.758***	0.165***	0.138***	0.062***	0.008*
	[0.015]	[0.020]	[0.026]	[0.013]	[0.009]	[0.005]
Rating=A	0.203***	0.808***	0.118***	0.111***	0.048***	0.003***
	[0.008]	[0.014]	[0.014]	[0.009]	[0.008]	[0.001]
Rating=BBB	0.205***	0.814***	0.131***	0.104***	0.037***	0.003***
	[0.009]	[0.014]	[0.015]	[0.008]	[0.004]	[0.001]
Rating=BB	0.190***	0.801***	0.097***	0.102***	0.061***	0.004***
	[0.006]	[0.015]	[0.009]	[0.012]	[0.006]	[0.001]
Rating≤B	0.206***	0.721***	0.131***	0.175***	0.065***	0.009***
	[0.008]	[0.027]	[0.022]	[0.024]	[0.011]	[0.003]
Observations	360786	73297	73297	73297	73297	73297
Adjusted R^2	0.203	0.800	0.131	0.115	0.057	0.005

Table 8: Loan renegotiation and credit quality. This table presents marginal effects estimates of the multinomial logit specification in Equation 3 relating governments' loan renegotiation outcomes to balance sheet characteristics and changes in credit risk. We study six mutually exclusive outcomes: 1) loan amount increases and interest rate does not increase, 2) loan amount does not decrease and interest rate decreases, 3) loan amount decreases and interest rate does not decrease, 4) loan amount does not increase and interest rate increases, 5) loan amount increases and interest rate increases, and 6) loan amount decreases and interest rate decreases. The base case in the estimation comprises of all loan-quarters that are not renegotiated. *Downgrades* and *Upgrades* denote improvements and declines of one or more notches in a government's most conservative credit rating across all of its lenders as of the previous quarter. All specifications include a non-investment grade rating indicator and balance sheet characteristics lagged one quarter. The financial variables for observations from 2013 to 2017 come from the 2012 Census, while the variables for observations since 2018 come from the 2017 Census. The standard errors are computed using the delta method.

Panel A: Full Sample

Renegotiation outcomes:	(1)	(2)	(3)	(4)	(5)	(6)
Amount ↑	Yes	–	–	No	Yes	–
Amount ↓	–	No	Yes	–	–	Yes
Interest rate ↑	No	–	–	Yes	Yes	–
Interest rate ↓	–	Yes	No	–	–	Yes
			Base case = no renegotiation			
Upgrade	0.010***	0.002***	-0.049***	0.003***	0.003***	0.002***
	[0.002]	[0.000]	[0.003]	[0.001]	[0.000]	[0.000]
Downgrade	0.025***	0.001	-0.007*	0.003***	0.001**	0.001**
	[0.003]	[0.001]	[0.004]	[0.001]	[0.001]	[0.001]
nonIG	-0.038***	-0.001*	0.023***	-0.006***	-0.001***	-0.001**
	[0.002]	[0.000]	[0.002]	[0.001]	[0.000]	[0.000]
Observations	353643	353643	353643	353643	353643	353643

Panel B: Available Financials

Renegotiation outcomes:	(1)	(2)	(3)	(4)	(5)	(6)
Upgrade	0.026***	0.001**	-0.053***	0.000	0.002***	-0.001**
	[0.002]	[0.000]	[0.004]	[0.001]	[0.000]	[0.001]
Downgrade	0.021***	0.000	-0.005	0.002**	0.001*	0.001
	[0.003]	[0.000]	[0.004]	[0.001]	[0.001]	[0.001]
nonIG	-0.027***	-0.001**	0.024***	-0.010***	-0.002***	-0.002***
	[0.002]	[0.000]	[0.003]	[0.001]	[0.000]	[0.000]
Ln(1+Tot Revenue)	0.012***	0.001***	-0.011***	0.004***	0.001***	0.001***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Tot Expenditures	0.004	0.001	0.041***	-0.006***	-0.000	0.000
	[0.005]	[0.001]	[0.006]	[0.002]	[0.001]	[0.001]
Tot IG Revenue	0.110***	-0.001	-0.093***	-0.005***	-0.000	-0.001
	[0.003]	[0.001]	[0.004]	[0.001]	[0.001]	[0.001]
Tot Taxes	0.171***	0.001**	-0.077***	-0.003**	0.001*	-0.000
	[0.004]	[0.001]	[0.004]	[0.001]	[0.001]	[0.001]
Leverage	-0.006***	0.001***	-0.024***	0.002***	0.000*	-0.001***
	[0.001]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]
Interest Expense	0.023	0.021***	0.088**	0.034***	0.027***	0.001
	[0.033]	[0.005]	[0.044]	[0.013]	[0.007]	[0.007]
Observations	299096	299096	299096	299096	299096	299096

Table 9: Credit Line Reliance Across Size and Credit Risk. This table presents the relation between credit line reliance and local government size or credit risk. We measure a local government's credit line reliance using the share of credit line commitments relative to the sum of term loan and credit line commitments at the government-quarter level. We proxy for size using indicator variables for the quintiles of total revenue and we use indicators for the most conservative credit risk rating assigned to each government by its lenders (in a 10-grade S&P scale) to measure credit risk. The independent variables are defined in the Internet Appendix. The standard errors are clustered at the state level.

Panel A: Government Size

Dependent variable:	Credit Line Share					
	All	County	City	Twp	Sp Dist	Sch Dist
	(1)	(2)	(3)	(4)	(5)	(6)
Quintile=1	0.098***	0.138***	0.099***	0.084*	0.130***	0.064***
	[0.013]	[0.046]	[0.019]	[0.045]	[0.031]	[0.020]
Quintile=2	0.100***	0.122***	0.085***	0.110***	0.208***	0.074***
	[0.012]	[0.039]	[0.015]	[0.028]	[0.041]	[0.018]
Quintile=3	0.150***	0.110***	0.152***	0.109**	0.298***	0.131***
	[0.018]	[0.032]	[0.025]	[0.042]	[0.039]	[0.027]
Quintile=4	0.206***	0.169***	0.191***	0.153**	0.423***	0.200***
	[0.021]	[0.034]	[0.028]	[0.064]	[0.055]	[0.041]
Quintile=5	0.388***	0.315***	0.412***	0.122**	0.634***	0.341***
	[0.026]	[0.049]	[0.040]	[0.041]	[0.039]	[0.050]
Observations	150258	22104	55210	5510	16045	49372
Adjusted R^2	0.309	0.301	0.320	0.122	0.479	0.261

Panel B: Credit Risk

Dependent variable:	Credit Line Share					
	All	County	City	Twp	Sp Dist	Sch Dist
	(1)	(2)	(3)	(4)	(5)	(6)
Rating=AAA	0.425***	0.424***	0.332***	0.387***	0.592***	0.526***
	[0.047]	[0.089]	[0.036]	[0.074]	[0.136]	[0.088]
Rating=AA	0.292***	0.312***	0.254***	0.101***	0.469***	0.314***
	[0.026]	[0.040]	[0.031]	[0.031]	[0.089]	[0.062]
Rating=A	0.183***	0.177***	0.187***	0.068***	0.296***	0.172***
	[0.018]	[0.026]	[0.030]	[0.014]	[0.039]	[0.032]
Rating=BBB	0.194***	0.215***	0.187***	0.171**	0.313***	0.137***
	[0.019]	[0.047]	[0.026]	[0.072]	[0.041]	[0.026]
Rating=BB	0.166***	0.234***	0.192***	0.140*	0.287***	0.096***
	[0.015]	[0.046]	[0.029]	[0.066]	[0.042]	[0.016]
Rating$\leq$B	0.206***	0.267***	0.232***	0.154	0.363***	0.138***
	[0.028]	[0.093]	[0.046]	[0.097]	[0.045]	[0.039]
Observations	160487	21206	54027	5101	16326	46976
Adjusted R^2	0.242	0.281	0.234	0.147	0.352	0.242

Table 10: Credit line analysis. This table examines how credit line use is related to government financials and credit quality changes. The outcome variable in column 1-3, *Credit Line Drawdown* takes the value of one whenever a credit line's drawn amount in the current quarter exceeds the drawn amount in the previous quarter, and zero otherwise. The dependent variable in columns 4-6, *Credit Line Size Increase* takes the value of one whenever a credit line's size in the current quarter exceeds that of the previous quarter. *Downgrade* correspond to loan observations for which the borrower's most conservative credit rating across all banks the borrower works with worsens by at least one notch as of the previous quarter. Analogously, *Upgrade* corresponds to loan observations for which the borrower's most conservative credit rating across all banks the borrower works with improves by at least one notch as of the previous quarter. The financial variables for observations from 2013 to 2017 come from the 2017 Census, while the variables for observations since 2018 come from the 2017 Census. All specifications include lagged (as of the previous quarter) bank internal credit rating indicators and state×quarter fixed effects. The standard errors are double clustered at the state×quarter and county level.

	Credit Line Drawdown			Credit Line Size Increase		
	All (1)	General (2)	Special (3)	All (4)	General (5)	Special (6)
Upgrade	0.020**	0.004	0.032**	0.021**	0.016**	0.016
	[0.010]	[0.011]	[0.014]	[0.009]	[0.007]	[0.012]
Downgrade	0.039***	0.032***	0.047**	0.018*	0.023***	0.011
	[0.011]	[0.012]	[0.021]	[0.009]	[0.008]	[0.016]
Ln(1+Tot Revenue)	0.004	0.000	0.009**	-0.002	0.003	-0.003
	[0.003]	[0.004]	[0.004]	[0.002]	[0.002]	[0.003]
Tot Expenditures	-0.037	0.001	-0.050	-0.039	-0.020	0.002
	[0.029]	[0.040]	[0.040]	[0.026]	[0.021]	[0.032]
Tot IG Revenue	0.148***	0.057	0.169***	0.050***	-0.007	0.047**
	[0.022]	[0.051]	[0.028]	[0.014]	[0.024]	[0.018]
Tot Taxes	0.096***	-0.037	0.153***	0.061***	0.001	0.090***
	[0.030]	[0.048]	[0.041]	[0.020]	[0.021]	[0.026]
Leverage	-0.016***	-0.020***	-0.007	-0.005**	-0.003	-0.006*
	[0.003]	[0.005]	[0.005]	[0.002]	[0.003]	[0.003]
Interest Expense	0.157	0.017	0.801**	-0.191	-0.332**	0.269
	[0.259]	[0.316]	[0.372]	[0.169]	[0.153]	[0.290]
Observations	63444	35967	27115	63444	35967	27115
Adjusted R^2	0.130	0.097	0.215	0.212	0.112	0.360

Internet Appendix: Not For Publication

This appendix includes several sections of supplemental information. Appendix A contains definitions of all variables used in the paper. Appendix B details the name matching algorithm linking the FR Y-14, Mergent, and the Census of Governments data. Appendices C through E include robustness and specification checks of the analysis in the paper. Appendix C addresses determinants of bank borrowing across the type of government, Appendix D further examines the similarity of bank loan and municipal bond borrowing, and Appendix E studies bank loan renegotiation across the type of government. Appendix F contains additional figures and tables.

A Variable Definitions

A.1 Loan-level variables

Below we present variable definitions for the municipal loan data coming from the FR-Y-14Q Collection. The item numbers of the data fields refer to Schedule H1 of the Y-14Q data on the Federal Reserve's website: `https://www.federalreserve.gov/apps/reportingforms/Download/DownloadAttachment?guid=eba56271-9025-4e55-ae9c-7e0059a92f2a`

Committed Amount – The commitment amount of a given municipal bank loan in millions of U.S. dollars (field #24 in Schedule H1).

Drawn Amount – The drawn (funded) amount under a given municipal bank credit line in million US dollars (field #25 in Schedule H1).

Utilization – The drawn amount divided by the commitment amount of a given municipal bank credit line.

Fraction Drawn – The fraction of credit lines in our loan-quarter panel that have been at least partially drawn .

Interest Rate – The interest rate of a given municipal bank loan (field #38 in Schedule H1).

Remaining Maturity – The difference between the maturity date of a given municipal bank loan (based on the maturity date field #19 in Schedule H1) and the current observation date, expressed in quarters.

Original Maturity – The difference between the maturity date of a given municipal bank loan (field #19 in Schedule H1) and its origination date (field #18 in Schedule H1), expressed in quarters.

Secured – We define a municipal bank loan to be secured if the bank has first-lien or second-lien security on the borrower's assets or cash flows (based on fields #35 and #36 in Schedule H1).

Senior Secured – We define a municipal bank loan to be senior secured if the bank has first-lien security on the borrower's assets or cash flows (field #35 in Schedule H1 takes the value of 1).

Guaranteed – A municipal bank loan is guaranteed if the loan has a third-party guarantee (field #44 in Schedule H1 takes the value of 1, 2, or 3).

Fixed Rate – A municipal bank loan is fixed rate if the loan interest rate does not vary with base rate indexes such as the LIBOR or prime rates (field #37 in Schedule H1 takes the value of 1).

Prepayment Penalty – A municipal bank loan has a prepayment penalty if it has either current or expired prepayment penalties (field #94 in Schedule H1 takes the value of 1 or 2).

Tax-Exempt – A municipal bank loan is tax-exempt if the interest income the bank receives from the loan is tax-exempt from federal or state income taxes (field #43 in Schedule H1 takes the value of 2).

Bank Qualified – A municipal bank loan, in which total loan origination amount of the underlying government is less than $10 million per year ($30 million in 2009 and 2010) and the interest income the bank receives from the loan is tax-exempt from federal or state income taxes (field #43 in Schedule H1 takes the value of 2).

Syndicated – A municipal bank loan is syndicated if it is syndicated or participated among financial institutions or it is part of the Shared National Credit Program (field #34 in Schedule H1 takes the value of 2, 3, 4, or 5 or field #100 takes the value of 1, 2, 3, or 4).

Credit Line Drawdown – takes the value of one whenever a credit line's drawn amount in the current quarter exceeds the drawn amount in the previous quarter, and zero otherwise.

Credit Line Size Increase – takes the value of one whenever a credit line's size in the current quarter exceeds that of the previous quarter.

A.2 Borrower-level variables

Bank internal credit rating – Government i most conservative risk rating across all of its lenders in quarter t. We construct this variable using the internal credit rating assigned by the bank to the borrower of each loan (field #10) converted to a 10-grade S&P ratings scale, with 1 denoting AAA and 10 denoting D. Source: FR-Y-14Q Collection, the Annual Survey of State and Local

Government Finances, and computations of the authors.

Loans – An indicator that takes the value of one whenever government i has bank loans in the Y-14 data in year t, and zero otherwise. Source: FR-Y-14Q Collection and computations of the authors.

Loan Share – Total bank loan commitments of government i in year t as a share of total outstanding debt (the sum of items 64V, 44T, and 49U) from the Census of governments in year t, conditional on government i having at least some bank loans in year t. We compute total loan commitments of government i in year t by first summing up government i's commitments in each calendar quarter and then selecting the quarter with the maximum commitments. Source: FR Y-14Q Collection, the Annual Survey of State and Local Government Finances, and computations of the authors.

Tot Revenue – The total revenue from all sources of government i in year t (the sum of all items in categories A, B, C, D, T, U, X01, X02, X05, X08, Y01, Y02, Y04, Y11, Y12, Y51, Y52). Source: The Annual Survey of State and Local Government Finances and computations of the authors.

Tot Expenditures – The total expenditures across all categories of government i in year t (the sum of all items in categories E, I, J, X11, X12, Y05, Y06, Y14, Y53, F, G, L, M, Q, S) scaled by $Tot\ Revenue$. Source: The Annual Survey of State and Local Government Finances and computations of the authors.

Tot IG Revenue – The total intergovernmental revenue of government i in year t (the sum of all items in categories B, C, and D), scaled by $Tot\ Revenue$. Source: The Annual Survey of State and Local Government Finances and computations of the authors.

Tot Taxes – The total tax revenue of government i in year t (the sum of all items in category T), scaled by $Tot\ Revenue$. Source: The Annual Survey of State and Local Government Finances and computations of the authors.

PCPI – Per capita personal income at the county-year level. Source: Bureau of Economic Analysis and computations of the authors.

Leverage – The total outstanding debt of government i in year t (the sum of items 64V, 44T, and 49U), scaled by $Tot\ Revenue$. Source: The Annual Survey of State and Local Government Finances and computations of the authors.

Interest Expense – The total interest expense (the sum of all items in category I), scaled by total outstanding debt (the sum of items 64V, 44T, and 49U) of government i in year t. Source: The Annual Survey of State and Local Government Finances and computations of the authors.

Inst Reliance – The share of government i's most recent municipal bonds up to year t placed at prices above par value. Source: Mergent Municipal Securities Database, The Annual Survey of State and Local Government Finances, and computations of the authors.

Bank Qualified – The share of government i's most recent municipal bonds up to year t that are "bank-qualified." Source: Mergent Municipal Securities Database, The Annual Survey of State and Local Government Finances, and computations of the authors.

Exempt Issuance – The share of government i's most recent municipal bonds up to year t that are tax-exempt. Source: Mergent Municipal Securities Database, The Annual Survey of State and Local Government Finances, and computations of the authors. Source: Mergent Municipal Securities Database, The Annual Survey of State and Local Government Finances, and computations of the authors.

Bond Issuance – An indicator variable that takes the value of one whenever government i issues municipal bonds in year t, and zero otherwise. Source: Mergent Municipal Securities Database, The Annual Survey of State and Local Government Finances, and computations of the authors.

Area Issuance – Total municipal bond issuance in the county where government i is located in year t. Source: Mergent Municipal Securities Database, The Annual Survey of State and Local Government Finances, and computations of the authors.

Upgrade – An indicator variable that denotes improvements of one or more notches of government i's most conservative rating across all of its lenders as of the previous quarter $t-1$. Source: FR Y-14Q Collection, The Annual Survey of State and Local Government Finances, and computations of the authors.

Downgrade – An indicator variable that denotes deterioration of one or more notches of government i's most conservative rating across all of its lenders as of the previous quarter $t-1$. Source: FR Y-14Q Collection, The Annual Survey of State and Local Government Finances, and computations of the authors.

NonIG – An indicator variable that takes the value of one whenever government i's most conservative rating across all of its lenders as of the previous quarter $t-1$ is below BBB. Source: FR Y-14Q Collection, The Annual Survey of State and Local Government Finances, and computations of the authors.

Credit Line Share – Credit line commitments divided by the sum of term loan and credit line commitments of government i in quarter t. Source: FR Y-14Q Collection, The Annual Survey of State and Local Government Finances, and computations of the authors.

B Name Matching Algorithm

Municipal Entity Name Matching Procedure

Since municipal bond issuers in Mergent and municipal entities with bank loans in the FR Y-14 data collection do not share a common identifier (CUSIP is available for a small subset of observations in the Y-14 data), we rely on a name matching algorithm to identify entities across datasets.

We first match each data set to the Census of Governments which provides a near-complete universe of state and local governments. Our matching strategy proceeds in a series of steps, outlined below for each of the two datasets.

Matching Municipal Bond Issuers from Mergent to the Census of Governments

The Mergent data set provides two types of names for each issuer: the "issuer_long_name" and the "issuer_short_name". We use the "issuer_long_name" as this field is more likely to include district numbers (for school and special districts) and details the the type of bond obligation, which we employ in some of the manual verification processes. Our sample includes all issuers that have at least one municipal bond offering in Mergent from January 2000 through present.

In the initial stage of the algorithm, we remove any suffixes from the issuer name that mainly detail the type of the municipal bond obligation ("GO", "REV", ...) from a list of approximately 300 suffixes. We then identify the government type of each issuer based on different sets of keywords and the following multistep process:

1. Check for keywords identifying school districts ("sch dist", "school district", "schools", "pub sch", "schs", ...). If any of these keywords is present in the issuer name, classify the issuer as a school district. If no keyword is present, proceed to the next step.

2. Check for keywords identifying special districts ("district", "dist", "dists", ...). If any of these keywords is present, classify the issuer as a special district. If not, proceed to the next step.

3. Check for keywords identifying authorities (" auth", ...) or corporations ("corp", "corpus", "ltd"). If any of these phrases is present in the issuer name, classify the isuer as an authority or a corporation. If not, proceed to the next step.

4. Check for keywords identifying townships ("twp", "vlg", "township", ...). If any of these keywords is present, classify the issuer as a township. If not, proceed to the next step.

5. Check for keywords identifying cities ("city of", " city", "town of", "town" ...). If any of these phrases is present in the issuer name, classify the isuer as a city. If not, proceed to the next step.

6. Check for keywords identifying counties ("county", "parish", "cnty", ...). If any of these phrases is present in the issuer name, classify the isuer as a county. If not, proceed to the next step.

7. Check for keywords identifying state governments (" state ", " st "). If any of these phrases is present in the issuer name, classify the isuer as a state. If not, proceed to the next step.

8. Check if city or township names from all names in the Census of Governments shows up in the Mergent issuer name. If so, classify the issuer as a city or a township. If not, assign entity to the "unclear" category.

In the second step, we match the Mergent issuers within each government type to the municipal entities that appear in at least one Census of Governments in full census year (2002, 2007, 2012, and 2017) within the same government type. The government type of each entity is readily available in the Census of Governments. The exact name matching algorithm depends on the government type as follows:

- School Districts: For all steps below, if we arrive at multiple matches for each issuer name, we keep the match with the lowest associated Jaro-Winkler string distance score.

    1. We require an exact match on state, the first word in the issuer/Census names, and district number.

    2. If the previous step produces no match for a given issuer name, we then require an exact match on state and district number.

3. If the previous step produces no match, we require an exact match on state, the first word of the issuer and Census names, and county name (only if the county name is present in the Mergent issuer name).
4. If the previous step produces no match, we then require an exact match on state and the first word of the issuer and Census names.
5. If the previous step produces no match, we then require an exact match on state and require the first word of the Census name to appear anywhere in the issuer string.
6. We then manually check each potential match produced by the string matching algorithm above. We verify, correct, or discard each potential match produced by the algorithm.

- Special Districts: Nearly identical to the matching algorithm for school districts with one modification due to the institutional specifics of special district names. We augment the second step to require exact match on state and the first word of the issuer and Census names, and also require at least half of all words in both strings to overlap.

- General purpose entities: We consider county, state, township and city governments jointly. We again match in a series of steps and in the case of multiple matches for each issuer name we keep the match with the lowest Jaro-Winkler string distance score.

  1. We first require an exact match on state, the first word of the issuer and Census names, and government type.
  2. If the previous step produces no match, we attempt to match exactly on state and first word.
  3. If there is no match in the previous step, we require an exact match on state and that the first word of the Census name appears anywhere in the issuer string.
  4. We then manually verify, correct, or discard each potential match produced by the algorithm.

- Authorities: For all steps below, if we arrive at multiple matches for each issuer name, we keep the match with the lowest associated Jaro-Winkler string distance score.

1. We require an exact match on state, the first word in the issuer/Census names, and the two words preceding the word "authority" in the census name.

2. If the previous step produces no match for a given issuer name, we then require an exact match on state, the first word in the issuer/Census names, and one word preceding the word "authority".

3. If the previous step produces no match, we require an exact match on state, the first word of the issuer and Census names, and we require the *three* words preceding "authority" to show up in the issuer string.

4. If the previous step produces no match, we require an exact match on state, the first word of the issuer and Census names, and we require the *two* words preceding "authority" to show up in the issuer string.

5. If the previous step produces no match, we then require an exact match on state and require the first word of the Census name and the two words preceding the word "authority" to appear anywhere in the issuer string.

6. We then manually check each potential match produced by the string matching algorithm above. We verify, correct, or discard each potential match produced by the algorithm.

Matching Y-14 Borrowers to the Census of Governments

The Y-14 Collection provides the name of each borrower in the "obligor_name" field. We first clean this field by removing punctuation, non-letter characters, and extra spaces between words. We require that all borrowers are domiciled in the United States. We remove all borrower name entries in which the borrower name is not available or unknown; whenever the borrower receives guarantees from the Small Business Administration as those borrowers are unlikely to be state and local government borrowers; or whenever the borrower is a U.S. government entity. Finally, we standardize borrower names by expanding common abbreviations such as "INC", "CORP", "CO", and "LTD" and abbreviating phrases such as "LIMITED LIABILITY COMPANY" or "LIMITED PARTNERSHIP."

In the initial stage of the algorithm, we identify the government type of each Y-14 borrower based on different sets of keywords. We first identify private corporations using keywords such as:

"INCORPORATED", " LLP", " LLC", " COMPANY", " CORPORATION", ...; hospitals as all entities with three-digit NAICS 2007 codes of "622"; colleges as all entities with three-digit NAICS 2007 codes of "611". We then classify the remaining entities using the following sequence of steps:

1. Check for keywords identifying municipal corporations, authorities, or agencies ("commission", "agency", "auth", "redevelopment", "agy", "port of", "", "economic development", "industrial development", "public facilities corp", "building corporation", ...). For positive keyword hits such as "industrial development", we require that we have not classified the entity as a private corporation. Overall, if any of these keywords is present in the issuer name, classify the issuer as a muunicipal corporation. If no keyword is present, proceed to the next step.

2. Check for keywords identifying school districts ("sch dist", "school district", "schools", "pub sch", "schs", " isd", " csd", " psd", " usd", " hsd", ...). If any of these keywords is present in the issuer name, classify the issuer as a school district. If no keyword is present, proceed to the next step.

3. Check for keywords identifying special districts ("district", "dist", " wcid", " mud ", "municipal wd", ...). If any of these keywords is present, classify the issuer as a special district. If not, proceed to the next step.

4. Check for keywords identifying cities/towns/townships ("twp", "township", "city of", " city", "town of", "village of", " borough" ...), while requiring that the entity is not an authority, college, or a corporation. If any of these keywords is present, classify the issuer as a township. If not, proceed to the next step.

5. Check for keywords identifying counties ("county", "parish", "cnty", "cty", "prsh"), while requiring that the entity is not an authority or a college. If any of these phrases is present in the issuer name, classify the isuer as a county. If not, proceed to the next step.

6. Check for keywords identifying state governments ("state of", "commonwealth of", ...). If any of these phrases is present in the issuer name, classify the isuer as a state. If not, proceed to the next step.

7. Assign all other entities to the "unclear" category.

We also drop federal government entities, which we identify using keywords such as "united states", "federal", "us governm", ... In addition, we select entities that remain unmatch in the keysearch algorithm above, but that we are able to match to Mergent via the 6-digit CUSIP, or to the set of municipal entities in the S&P cross reference data set via the 6-digit CUSIP, tax identification number, or the legal entity identifier (LEI). Finally, we manually inspect the entities identified as governments and manually remove entities that are private corporations.

In the second step, we match the Y-14 borrowers within each government type to the municipal entities that appear in at least one Census of Governments in full census year (2002, 2007, 2012, and 2017) within the same government type. The advantage of the Y-14 data relative to Mergent is that each borrower has an associated 5-digit zip code, which we could use to identify the county of the borrower. We could then use the county to make the pool of potential matches between the Y-14 and the Census more similar. The exact name matching algorithm depends on the government type as follows:

- School Districts: For all steps below, if we arrive at multiple matches for each borrower name, we keep the match with the lowest associated Jaro-Winkler string distance score.

  1. We require an exact match on state, county, the first word in the issuer/Census names, and district number.
  2. If the previous step produces no match for a given borrower name, we then require an exact match on state, the first word in the issuer/Census names, and district number.
  3. If the previous step produces no match for a given borrower name, we then require an exact match on state, county, and district number.
  4. If the previous step produces no match for a given borrower name, we then require an exact match on state, county, and the first word in the issuer/Census names.
  5. If the previous step produces no match for a given borrower name, we then require an exact match on state and county, and that the first word of the Census name appears anywhere in the borrower name.
  6. We then manually check each potential match produced by the string matching algorithm above. We verify, correct, or discard each potential match produced by the algorithm.

- Special Districts: Similar to the matching algorithm for school districts with a few modifications due to the institutional specifics of special district names:
  1. We require an exact match on state, the first word in the issuer/Census names, and district number.
  2. If the previous step produces no match for a given borrower name, we then require an exact match on state, county, and the first word in the issuer/Census names. Here, we also require at least half of all words in both strings to overlap.
  3. If the previous step produces no match for a given borrower name, we then require an exact match on state and the first word in the issuer/Census names and that at least half of all words in both strings to overlap.
  4. If the previous step produces no match for a given borrower name, we then require an exact match on state, county, and the first and the second words in the issuer/Census names.
  5. If the previous step produces no match for a given borrower name, we then require an exact match on state, county, and the first and the third words in the issuer/Census names.
  6. If the previous step produces no match for a given borrower name, we then require an exact match on state and the first word in the issuer/Census names, and that the first word of the Census district type appears anywhere in the borrower name.
  7. We then manually check each potential match produced by the string matching algorithm above. We verify, correct, or discard each potential match produced by the algorithm.
- Authorities, Agencies, Commissions, and Public Corporations. For all steps below, if we arrive at multiple matches for each borrower name, we keep the match with the lowest associated Jaro-Winkler string distance score.
  1. We require an exact match on state, the first word in the issuer/Census names, and the two words preceding the keyword “authority”.
  2. If the previous step produces no match for a given borrower name, we then require an

exact match on state, the first word in the issuer/Census names, and the two words preceding the keyword "agency".

3. If the previous step produces no match for a given borrower name, we then require an exact match on state, the first word in the issuer/Census names, and the two words preceding the keyword "commission".
4. If the previous step produces no match for a given borrower name, we then require an exact match on state, the first word in the issuer/Census names, and the two words preceding the keyword "corporation".
5. If the previous step produces no match for a given borrower name, we then require an exact match on state, county, the first word in the issuer/Census names, and the two words preceding the keyword "district".
6. If the previous step produces no match for a given borrower name, we then require an exact match on state, the first word in the issuer/Census names, and the two words preceding the keyword "district".

- General purpose entities: We consider county, township and city governments jointly. We again match in a series of steps and in the case of multiple matches for each issuer name we keep the match with the lowest Jaro-Winkler string distance score.

  1. We require an exact match on state, county, the first word in the issuer/Census names, and entity type (city/township/village or county).
  2. If the previous step produces no match for a given borrower name, we then require an exact match on state, the first word in the issuer/Census names, and entity type.
  3. We then manually check each potential match produced by the string matching algorithm above. We verify, correct, or discard each potential match produced by the algorithm.

C Bank borrowing determinants and government type

There is substantial heterogeneity in revenue sources among different types of governments, which is also likely to lead to differential debt structure choices.[19] Tables C.1 and C.2 expand on Table

[19] `https://www.urban.org/policy-centers/cross-center-initiatives/state-and-local-finance-initiative/state-and-local-backgrounders/state-and-local-revenues#local`

3 for the subsets of general governments (counties and cities) and special-purpose governments (school and special districts), respectively. These results show that among general governments, revenue stability such as high tax and government transfers as a share of total revenues continues to collectively predict the incidence of bank borrowing and loan share. Higher leverage ratios translate to greater incidence of bank borrowing and lower bank loan share, consistent with banks extending loans to risky governments, but exercising caution with the highest-risk borrowers. Higher interest expense also translates to higher bank loan share, corroborating the results in Table 3 that governments borrow more from the loan market when borrowing costs are high.

By contrast, revenue stability is not associated with bank loan reliance among districts. While total revenues, leverage, and interest expenses remain important in explaining governments' reliance on bank loans, interest expense is negatively correlated with the incidence of bank loans and uncorrelated with loan share. These results suggest that districts facing high financing costs may not be able to fully access the bank loan market. Overall, the correlations between bank loan reliance and measures of government revenue stability or credit risk appear to be driven by the subset of general governments.

Bank loan reliance is correlated with bond issuance outcomes among both general and district governments. Governments that are less reliant on the institutional bond market or have issued municipal bonds in the previous year have lower bank loan reliance. In addition, previous bank-qualified issuance translates to lower bank loan incidence or is unrelated to loan share among general governments but to higher loan share among special districts. To the extent that districts raise a larger share of financing via bank-qualified bonds than general governments, banking relationships of districts may be stronger. For example, general governments offer a wider array of services to citizens than districts and, consequently, a more heterogeneous debt structure than districts. Finally, the previous issuance of tax-exempt bonds is associated with a higher incidence of bank borrowing only among districts.

In columns 4 and 8 of Tables C.1 and C.2 we limit the sample to governments rated by rating agencies and examine how ratings are related to the propensity to use the loan market. These estimates indicate that credit risk is a significant predictor of having bank loans for general governments. For example, general governments with agency ratings of AA, A, and BBB or lower are 7, 10, and nearly 15 percentage points more likely to have a bank loan than AAA-rated issuers.

This empirical pattern is consistent with corporate finance theory and bears resemblance to those documented in the corporate loan market, in which the highest quality borrowers rely primarily on public debt markets, and lower quality borrowers obtain bank loans (Diamond, 1991; Rauh and Sufi, 2010). The relation between loan share and credit risk is weaker but shows that general governments rated A or worse have about 1 percentage point higher loan share than AAA-rated governments.

By contrast, credit ratings are unrelated to the incidence of bank loans or loan share among districts. In other words, conditional on risk proxies such as leverage and interest expense, agency ratings are unrelated to bank loan reliance. Overall, general governments also drive the associations between ratings and bank loan incidence/loan share in the full sample in columns 4 and 8 of Table C.3. Ratings of AA, A, and BBB or worse translate to 4, 6, and 9 percentage points higher loan incidence and 1-1.5 percentage points higher loan share.

Tables C.4 and C.5 illustrate that shocks to bond market activity have important implications for the reliance on bank loans for both types of governments. For example, within-issuer decreases in institutional placement or recent issuance and increases bank-qualification or tax-exemption translate to increases in loan share. Similar to the earlier results, increases in recent bank-qualified municipal bond issuance translate to higher loan shares among districts, but are uncorrelated with loan shares among general governments. Furthermore, the role of local bond market activity appears to be more important for districts than for general governments. This may be because districts tend to be smaller and more financially constrained. Given the highly local nature of investors in the municipal bond market, higher issuance activity at the local level leads to saturation of the market and, consequently, to higher municipal bond issuance costs.

Finally, we examine whether underwriters or financial advisers predict bank loan reliance in Appendix Table C.6 by augmenting the specifications in columns (2) and (4) of Table 3 by including underwriter and financial adviser fixed effects, respectively. These results are qualitatively similar to our earlier findings.

Table C.1: Determinants of loan reliance: general governments. This table presents the relation between measures of governments' reliance on the bank loan market and financial characteristics. We use two such measures—an indicator for whether government i has bank loans in year t, $Loans_{it}$, and, conditional on having loans, total bank loan commitments as a share of total outstanding debt, $Loan\ Share_{it}$. We limit the sample to all general governments in the Census of Government Finances that are surveyed every year between 2012 and 2020. The independent variables are defined in the Internet Appendix. The standard errors are double clustered at the state-year and county level.

Dependent variable:	Loans				Loan Share			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln(1+Tot Revenue)	0.109***	0.106***	0.097***	0.103***	-0.003*	-0.004**	-0.002	-0.003
	[0.005]	[0.006]	[0.006]	[0.007]	[0.002]	[0.002]	[0.002]	[0.002]
Tot Expenditures	0.050***	0.051***	0.047***	0.047**	0.005	0.003	0.005	0.007
	[0.015]	[0.018]	[0.018]	[0.020]	[0.005]	[0.005]	[0.005]	[0.006]
Tot IG Revenue	0.325***	0.382***	0.363***	0.413***	0.035**	0.044***	0.047***	0.058***
	[0.041]	[0.050]	[0.050]	[0.057]	[0.015]	[0.016]	[0.016]	[0.018]
Tot Taxes	0.286***	0.249***	0.219***	0.272***	0.038***	0.027**	0.035**	0.037**
	[0.034]	[0.040]	[0.041]	[0.050]	[0.013]	[0.013]	[0.015]	[0.017]
PCPI	-0.322	-0.743	-0.869	-0.126	-0.333*	-0.305	-0.277	0.019
	[0.628]	[0.723]	[0.751]	[0.856]	[0.197]	[0.199]	[0.205]	[0.214]
Leverage	0.026***	0.028***	0.024***	0.021***	-0.020***	-0.019***	-0.019***	-0.019***
	[0.006]	[0.007]	[0.007]	[0.008]	[0.002]	[0.002]	[0.002]	[0.003]
Interest Expense	0.133	0.325	0.321	0.147	0.495***	0.744***	0.737***	0.712***
	[0.149]	[0.204]	[0.203]	[0.243]	[0.103]	[0.129]	[0.129]	[0.154]
Inst Reliance			-0.009	-0.004			-0.024***	-0.023***
			[0.018]	[0.021]			[0.007]	[0.008]
Bank Qualified			-0.051***	-0.053***			-0.000	0.004
			[0.013]	[0.015]			[0.005]	[0.005]
Exempt Issuance			-0.014	-0.029			-0.004	-0.003
			[0.026]	[0.030]			[0.009]	[0.010]
Bond Issuance			0.010	0.006			-0.014***	-0.007**
			[0.010]	[0.011]			[0.003]	[0.003]
Log(Area Issuance)			0.003	-0.000			0.000	-0.000
			[0.004]	[0.005]			[0.001]	[0.002]
AA				0.065**				0.012*
				[0.030]				[0.006]
A				0.090***				0.016**
				[0.034]				[0.008]
BBB or lower				0.131***				0.026**
				[0.040]				[0.011]
Observations	27980	20894	20894	14599	27980	20894	20894	14599
Government Type FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table C.2: Determinants of loan reliance: school and special districts. This table presents the relation between measures of governments' reliance on the bank loan market and financial characteristics. We use two such measures—an indicator for whether government i has bank loans in year t, $Loans_{it}$, and, conditional on having loans, total bank loan commitments as a share of total outstanding debt, $Loan\ Share_{it}$. We limit the sample to all school and special district governments in the Census of Government Finances that are surveyed every year between 2012 and 2020. The independent variables are defined in the Internet Appendix. The standard errors are double clustered at the state-year and county level.

Dependent variable:	Loans				Loan Share			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln(1+Tot Revenue)	0.108***	0.122***	0.122***	0.131***	0.006***	0.005***	0.008***	0.007***
	[0.004]	[0.004]	[0.004]	[0.005]	[0.001]	[0.002]	[0.002]	[0.002]
Tot Expenditures	-0.019*	0.011	0.011	0.004	-0.004	0.004	0.005	0.002
	[0.011]	[0.015]	[0.015]	[0.017]	[0.004]	[0.005]	[0.005]	[0.004]
Tot IG Revenue	0.062***	-0.037	-0.043	-0.046	0.000	-0.038***	-0.041***	-0.027**
	[0.023]	[0.033]	[0.032]	[0.040]	[0.010]	[0.014]	[0.014]	[0.012]
Tot Taxes	0.129***	-0.010	-0.013	-0.004	0.016	-0.026*	-0.025*	-0.013
	[0.026]	[0.034]	[0.034]	[0.041]	[0.010]	[0.014]	[0.014]	[0.013]
PCPI	-0.183	0.188	0.059	-0.372	-0.064	0.172	0.112	0.050
	[0.485]	[0.632]	[0.640]	[0.691]	[0.213]	[0.275]	[0.263]	[0.204]
Leverage	0.002	-0.001	-0.001	0.002	-0.017***	-0.018***	-0.016***	-0.012***
	[0.004]	[0.005]	[0.005]	[0.006]	[0.002]	[0.002]	[0.002]	[0.002]
Interest Expense	-0.194**	-0.432***	-0.446***	-0.512***	0.054	0.054	0.031	0.069
	[0.076]	[0.110]	[0.110]	[0.151]	[0.041]	[0.054]	[0.054]	[0.071]
Inst Reliance			-0.020**	-0.011			-0.015***	-0.010**
			[0.010]	[0.013]			[0.004]	[0.005]
Bank Qualified			-0.000	0.009			0.011***	0.008***
			[0.010]	[0.010]			[0.004]	[0.003]
Exempt Issuance			0.014	0.015			0.006	0.008
			[0.013]	[0.017]			[0.006]	[0.006]
Bond Issuance			-0.005	-0.009			-0.012***	-0.009***
			[0.005]	[0.006]			[0.002]	[0.002]
Log(Area Issuance)			0.002	0.003			0.001	0.000
			[0.003]	[0.004]			[0.001]	[0.001]
AA				-0.003				0.008*
				[0.020]				[0.005]
A				0.007				0.009**
				[0.018]				[0.005]
BBB or lower				0.028				0.010
				[0.029]				[0.008]
Observations	90822	58073	58073	36695	90822	58073	58073	36695
Government Type FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table C.3: Determinants of loan reliance: all governments. This table presents the relation between measures of governments' reliance on the bank loan market and financial characteristics. We use two such measures—an indicator for whether government i has bank loans in year t, $Loans_{it}$, and, conditional on having loans, total bank loan commitments as a share of total outstanding debt, $Loan\ Share_{it}$. We limit the sample to all governments in the Census of Government Finances that are surveyed every year between 2012 and 2020. The independent variables are defined in the Internet Appendix. The standard errors are double clustered at the state-year and county level.

Dependent variable:	Loans				Loan Share			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln(1+Tot Revenue)	0.104***	0.110***	0.105***	0.115***	0.002*	-0.000	0.002*	0.002
	[0.003]	[0.004]	[0.004]	[0.004]	[0.001]	[0.001]	[0.001]	[0.001]
Tot Expenditures	0.007	0.024*	0.023*	0.015	-0.000	0.003	0.005	0.004
	[0.010]	[0.013]	[0.013]	[0.015]	[0.003]	[0.004]	[0.004]	[0.004]
Tot IG Revenue	0.141***	0.141***	0.131***	0.159***	0.008	-0.005	-0.003	0.009
	[0.020]	[0.027]	[0.027]	[0.032]	[0.007]	[0.008]	[0.009]	[0.009]
Tot Taxes	0.223***	0.198***	0.187***	0.228***	0.031***	0.015*	0.019**	0.028***
	[0.022]	[0.028]	[0.028]	[0.032]	[0.007]	[0.008]	[0.008]	[0.009]
PCPI	-0.214	-0.040	-0.279	-0.422	-0.118	0.065	-0.009	0.014
	[0.372]	[0.463]	[0.462]	[0.516]	[0.166]	[0.204]	[0.193]	[0.150]
Leverage	0.008**	0.009**	0.007	0.009*	-0.018***	-0.019***	-0.017***	-0.014***
	[0.004]	[0.004]	[0.004]	[0.005]	[0.001]	[0.002]	[0.002]	[0.002]
Interest Expense	-0.145**	-0.228**	-0.251***	-0.257*	0.153***	0.229***	0.209***	0.286***
	[0.069]	[0.096]	[0.097]	[0.132]	[0.040]	[0.052]	[0.053]	[0.069]
Inst Reliance			-0.016*	-0.007			-0.017***	-0.012***
			[0.009]	[0.011]			[0.004]	[0.004]
Bank Qualified			-0.020**	-0.013			0.006*	0.006**
			[0.008]	[0.009]			[0.003]	[0.003]
Exempt Issuance			0.008	0.005			0.004	0.006
			[0.012]	[0.015]			[0.005]	[0.005]
Bond Issuance			-0.008	-0.014**			-0.014***	-0.010***
			[0.005]	[0.006]			[0.002]	[0.002]
Log(Area Issuance)			0.004	0.005			0.001	0.001
			[0.003]	[0.003]			[0.001]	[0.001]
AA				0.036**				0.014***
				[0.015]				[0.004]
A				0.051***				0.016***
				[0.016]				[0.004]
BBB or lower				0.085***				0.019***
				[0.023]				[0.007]
Observations	118826	78986	78986	51329	118826	78986	78986	51329
Government Type FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table C.4: Determinants of loan reliance: general governments. This table presents the relation between measures of governments' reliance on the bank loan market and financial characteristics. We use two such measures—an indicator for whether government i has bank loans in year t, $Loans_{it}$, and, conditional on having loans, total bank loan commitments as a share of total outstanding debt, $Loan\ Share_{it}$. We limit the sample to all general governments in the Census of Government Finances that are surveyed every year between 2012 and 2020. The independent variables are defined in the Internet Appendix. The standard errors are double clustered at the state-year and county level.

Dependent variable:	Loans			Loan Share		
	(1)	(2)	(3)	(4)	(5)	(6)
Ln(1+Tot Revenue)	0.001	0.001	0.001	-0.005*	-0.003	-0.004
	[0.006]	[0.007]	[0.007]	[0.003]	[0.003]	[0.003]
Tot Expenditures	0.010	0.009	0.010	-0.006*	-0.007*	-0.007*
	[0.009]	[0.011]	[0.011]	[0.004]	[0.004]	[0.004]
Tot IG Revenue	0.056	0.013	0.012	0.020	0.010	0.009
	[0.038]	[0.047]	[0.047]	[0.013]	[0.014]	[0.014]
Tot Taxes	-0.030	-0.021	-0.021	0.013	0.022	0.022
	[0.037]	[0.047]	[0.047]	[0.016]	[0.018]	[0.018]
PCPI	0.121	-0.404	-0.438	0.080	-0.273	-0.282
	[1.327]	[1.517]	[1.515]	[0.519]	[0.578]	[0.581]
Leverage	0.004	0.004	0.004	-0.023***	-0.019***	-0.019***
	[0.006]	[0.007]	[0.007]	[0.003]	[0.003]	[0.003]
Interest Expense	-0.033	0.011	0.002	0.533***	0.733***	0.733***
	[0.091]	[0.131]	[0.131]	[0.082]	[0.110]	[0.110]
Inst Reliance			-0.015			-0.007
			[0.013]			[0.004]
Bank Qualified			0.018*			-0.004
			[0.010]			[0.003]
Exempt Issuance			-0.001			0.011**
			[0.017]			[0.005]
Bond Issuance			-0.020***			-0.006***
			[0.006]			[0.002]
Log(Area Issuance)			0.007**			0.000
			[0.003]			[0.001]
Observations	27944	20820	20820	27944	20820	20820
State × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Government FE	Yes	Yes	Yes	Yes	Yes	Yes

Table C.5: Determinants of loan reliance: school and special districts. This table presents the relation between measures of governments' reliance on the bank loan market and financial characteristics. We use two such measures—an indicator for whether government i has bank loans in year t, $Loans_{it}$, and, conditional on having loans, total bank loan commitments as a share of total outstanding debt, $Loan\ Share_{it}$. We limit the sample to all school and special district governments in the Census of Government Finances that are surveyed every year between 2012 and 2020. The independent variables are defined in the Internet Appendix. The standard errors are double clustered at the state-year and county level.

Dependent variable:	Loans			Loan Share		
	(1)	(2)	(3)	(4)	(5)	(6)
Ln(1+Tot Revenue)	0.011*	0.015	0.015	-0.017***	-0.014***	-0.014***
	[0.007]	[0.009]	[0.009]	[0.004]	[0.005]	[0.005]
Tot Expenditures	0.026***	0.031***	0.031***	0.007**	0.006*	0.006*
	[0.007]	[0.009]	[0.009]	[0.003]	[0.003]	[0.003]
Tot IG Revenue	-0.020	-0.012	-0.012	-0.034**	-0.035	-0.035
	[0.023]	[0.036]	[0.036]	[0.015]	[0.023]	[0.023]
Tot Taxes	0.004	0.054	0.053	-0.022	-0.005	-0.005
	[0.032]	[0.046]	[0.046]	[0.019]	[0.027]	[0.027]
PCPI	1.080	0.365	0.369	0.258	0.236	0.223
	[0.966]	[1.370]	[1.370]	[0.317]	[0.347]	[0.348]
Leverage	-0.008**	-0.008*	-0.008*	-0.021***	-0.019***	-0.019***
	[0.004]	[0.004]	[0.005]	[0.002]	[0.002]	[0.002]
Interest Expense	-0.199***	-0.312***	-0.318***	0.130***	0.109**	0.102**
	[0.050]	[0.075]	[0.076]	[0.036]	[0.049]	[0.049]
Inst Reliance			0.002			-0.005*
			[0.007]			[0.003]
Bank Qualified			-0.005			0.004**
			[0.006]			[0.002]
Exempt Issuance			-0.001			0.001
			[0.010]			[0.003]
Bond Issuance			-0.007***			-0.003***
			[0.003]			[0.001]
Log(Area Issuance)			-0.000			0.001*
			[0.002]			[0.001]
Observations	90521	57749	57749	90521	57749	57749
State × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Government FE	Yes	Yes	Yes	Yes	Yes	Yes

Table C.6: Determinants of loan reliance: the role of underwriters and financial advisers. This table presents the relation between measures of governments' reliance on the bank loan market and financial characteristics. We use two such measures—an indicator for whether government i has bank loans in year t, $Loans_{it}$, and, conditional on having loans, total bank loan commitments as a share of total outstanding debt, $Loan\ Share_{it}$. We limit the sample to all school and special district governments in the Census of Government Finances that are surveyed every year between 2012 and 2020. The specifications in columns (2) and (4) include financial adviser and underwriter fixed effects. The independent variables are defined in the Internet Appendix. The standard errors are double clustered at the state-year and county level.

Dependent variable:	Loans		Loan Share	
	(1)	(2)	(3)	(4)
Ln(1+Tot Revenue)	0.105***	0.103***	0.002*	0.004***
	[0.004]	[0.004]	[0.001]	[0.001]
Tot Expenditures	0.023*	0.023*	0.005	0.005
	[0.013]	[0.012]	[0.004]	[0.004]
Tot IG Revenue	0.131***	0.159***	-0.003	0.010
	[0.027]	[0.027]	[0.009]	[0.008]
Tot Taxes	0.187***	0.194***	0.019**	0.028***
	[0.028]	[0.027]	[0.008]	[0.008]
PCPI	-0.279	-0.325	-0.009	-0.074
	[0.462]	[0.401]	[0.193]	[0.136]
Leverage	0.007	0.007*	-0.017***	-0.016***
	[0.004]	[0.004]	[0.002]	[0.001]
Interest Expense	-0.251***	-0.233**	0.209***	0.195***
	[0.097]	[0.095]	[0.053]	[0.050]
Inst Reliance	-0.016*	-0.034***	-0.017***	-0.019***
	[0.009]	[0.009]	[0.004]	[0.004]
Bank Qualified	-0.020**	-0.007	0.006*	0.010***
	[0.008]	[0.008]	[0.003]	[0.003]
Exempt Issuance	0.008	0.004	0.004	0.001
	[0.012]	[0.013]	[0.005]	[0.005]
Bond Issuance	-0.008	-0.012**	-0.014***	-0.011***
	[0.005]	[0.005]	[0.002]	[0.002]
Log(Area Issuance)	0.004	0.003	0.001	0.001*
	[0.003]	[0.002]	[0.001]	[0.001]
Observations	78986	78679	78986	78679
R^2	0.238	0.292	0.086	0.158
Government Type FE	Yes	Yes	Yes	Yes
State × Year FE	Yes	Yes	Yes	Yes
Financial Adviser FE	No	Yes	No	Yes
Underwriter FE	No	Yes	No	Yes

D Similarity between bank loans and bonds

We also examine the similarity of loan and bond financing amounts across banks' internal risk rating categories. Panel A of Table D.1 confirms the low general co-movement between loan amounts and bond issuance, which does not appear to vary significantly across ratings. This suggests that, conditional on obtaining a bank loan, credit risk is not a major determinant of the similarity between loans and bonds. Once again, bank-qualified municipal bond amounts are highly correlated with term loan commitment amounts across the entire credit rating distribution. Similar to Table 6, Panel B shows significant resemblance in contract maturity between bonds and loans, albeit loans tend to be shorter-term.

We also explore the importance of bond call features in the loan–bond maturity comparison. We assume that each municipal bond will be called by the issuer at the earliest call date so that the maturity date of callable bonds is the earliest call date. Table D.2 shows that loan maturities are now substantially longer than bond maturities by about 6-30% even within the full sample of loans and bonds. Further comparisons with GO or qualified bonds amplifies these differences. In the absence of renegotiation, bank loans may provide a longer-term financing alternative to municipal bonds. However, renegotiation in our sample is frequent and likely to reverse these associations.

The total amount of loans at the relationship level may be more closely comparable to municipal bonds as some borrowers have multiple loans with the same bank in a quarter. Different loans in a bank-borrower-quarter are thereby akin to the individual series in a bond offering. Loan renegotiation may also change multiple loans in a bank-borrower-quarter, rendering loan-level analysis less appropriate. Tables D.3 and D.4 present loan-bond similarity after collapsing the initial loan-quarter data to the borrower-bank-quarter level.

Table D.3 shows bond–loan amount similarities at the bank-borrower relationship level that are comparable to those at the loan level. For example, a dollar in bond issuance translates to 13–37 cents in loan financing. In line with the loan-level results, loan-bond similarity does not vary with credit risk and increases substantially to 57–84% only after we condition on previous bank-qualified bond issues. Table D.4 also shows a loan-bond maturity similarity of 80-90% before conditioning on previous bank-qualified bonds, which is comparable to the estimates in our baseline specifications. Requiring prior bank-qualified bonds results in nearly identical loan and bond maturities.

Table D.1: Similarity between bank loans and bonds: government risk. This table presents the correlation between bonds and loans in terms of debt issuance amount and maturity across local government risk. We measure government risk using lenders' internal risk ratings converted to a 10-grade S&P scale. The credit rating categories represent the most conservative bank internal rating assigned to a given government-quarter by its lenders. These rating are lagged one quarter. GO Bonds and Qualified loans indicators take the value of one whenever the most recent municipal bond issue of a given government is in the form of general obligation bonds or bank-qualified bank loans. Term Loans, Credit Lines, and Qualified Loans take the value of one whenever a given bank loan is a term loan, credit line, or a qualified bank loan. We limit the sample to originations or renegotiations—loan-quarter observations with any changes in loan commitments, maturities, interest rates, security, and guarantee provisions. Originations are any observations with new loan IDs or where the origination quarter is the same as the observation quarter. Standard errors are clustered at the state level.

Panel A: Similarity in Issuance Amount

Dependent variable:	Committed Amount						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rating=AAA × Issuance Amt	0.129***	0.049**	0.120***	0.729***	0.650***	0.890***	0.435***
	[0.047]	[0.024]	[0.027]	[0.100]	[0.172]	[0.148]	[0.029]
Rating=AA × Issuance Amt	0.009***	0.064***	0.056***	0.499***	0.465***	0.593***	0.398***
	[0.003]	[0.007]	[0.008]	[0.041]	[0.046]	[0.080]	[0.025]
Rating=A × Issuance Amt	0.017	0.005	0.003	0.555***	0.554***	0.575***	0.409***
	[0.012]	[0.004]	[0.002]	[0.033]	[0.038]	[0.125]	[0.023]
Rating=BBB × Issuance Amt	0.010***	0.010	0.003**	0.562***	0.487***	0.768*	0.337***
	[0.003]	[0.008]	[0.001]	[0.114]	[0.043]	[0.446]	[0.049]
Rating=BB × Issuance Amt	0.024***	0.026**	0.011**	0.501***	0.546***	0.491***	0.394***
	[0.006]	[0.010]	[0.005]	[0.035]	[0.041]	[0.073]	[0.030]
Rating≤B × Issuance Amt	0.012***	0.042***	0.007	0.589***	0.517***	0.845**	0.464***
	[0.004]	[0.005]	[0.005]	[0.107]	[0.059]	[0.396]	[0.040]
Observations	78199	40535	24500	18812	13095	4379	10582
Adjusted R^2	0.063	0.059	0.050	0.233	0.320	0.171	0.490

Panel B: Similarity in Maturity

Dependent variable:	Loan Maturity						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rating=AAA × Bond Maturity	0.609***	0.658***	0.740***	0.778***	0.844***	0.669***	0.784***
	[0.027]	[0.025]	[0.057]	[0.067]	[0.064]	[0.117]	[0.088]
Rating=AA × Bond Maturity	0.676***	0.856***	0.922***	1.091***	1.054***	1.232***	1.021***
	[0.040]	[0.060]	[0.037]	[0.079]	[0.099]	[0.288]	[0.084]
Rating=A × Bond Maturity	0.639***	0.778***	0.856***	0.954***	0.990***	0.787***	0.945***
	[0.016]	[0.036]	[0.051]	[0.047]	[0.053]	[0.068]	[0.047]
Rating=BBB × Bond Maturity	0.618***	0.741***	0.849***	0.847***	0.938***	0.581***	0.838***
	[0.020]	[0.054]	[0.048]	[0.063]	[0.047]	[0.102]	[0.071]
Rating=BB × Bond Maturity	0.615***	0.722***	0.835***	0.802***	0.881***	0.547***	0.803***
	[0.032]	[0.039]	[0.042]	[0.043]	[0.037]	[0.067]	[0.039]
Rating≤B × Bond Maturity	0.535***	0.626***	0.735***	0.893***	0.947***	0.706***	0.943***
	[0.044]	[0.039]	[0.050]	[0.047]	[0.049]	[0.153]	[0.051]
Observations	74688	38982	24489	18501	13094	4136	10578
Adjusted R^2	0.583	0.588	0.651	0.632	0.681	0.497	0.653
GO Bonds	–	X	X	–	–	–	–
Term Loans	–	–	X	–	X	–	–
Qualified Bonds	–	–	–	X	X	X	X
Credit Lines	–	–	–	–	–	X	–
Qualified Loans	–	–	–	–	–	–	X

Table D.2: Maturity similarity between bank loans and bonds: bond call features. This table presents the correlation between bonds and loans in terms of debt maturity across local government size and risk categories. We define bond maturity as the difference between the earlier of the bond's maturity or the first bond call date and the bond's issuance date. We construct government size quintiles annually based on all governments in the Census of Government Finances that have at least some outstanding debt or have municipal bond market access. The size quintiles are lagged by one year. We measure government risk using lenders' internal risk ratings converted to a 10-grade S&P scale. The credit rating categories represent the most conservative bank internal rating assigned to a given government-quarter by its lenders as of the previous quarter. GO Bonds and Qualified loans indicators take the value of one whenever the most recent municipal bond issue of a given government is in the form of general obligation bonds or bank-qualified bank loans. Term Loans, Credit Lines, and Qualified Loans take the value of one whenever a given bank loan is a term loan, credit line, or a qualified bank loan. We limit the sample to originations or renegotiations—loan-quarter observations with any changes in loan commitments, maturities, interest rates, security, and guarantee provisions. Originations are any observations with new loan IDs or where the origination quarter is the same as the observation quarter. Standard errors are clustered at the state level.

Panel A: Similarity in Maturity

Dependent variable:	Loan Maturity						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Quintile=1 × Bond Maturity	1.300***	1.402***	1.493***	1.441***	1.530***	0.875***	1.428***
	[0.104]	[0.114]	[0.114]	[0.114]	[0.102]	[0.173]	[0.109]
Quintile=2 × Bond Maturity	1.258***	1.352***	1.390***	1.426***	1.464***	0.989***	1.399***
	[0.102]	[0.123]	[0.126]	[0.099]	[0.105]	[0.105]	[0.083]
Quintile=3 × Bond Maturity	1.168***	1.317***	1.409***	1.420***	1.510***	1.138***	1.317***
	[0.091]	[0.089]	[0.064]	[0.091]	[0.052]	[0.245]	[0.129]
Quintile=4 × Bond Maturity	1.193***	1.221***	1.298***	1.394***	1.429***	1.217***	1.383***
	[0.053]	[0.078]	[0.064]	[0.095]	[0.072]	[0.285]	[0.110]
Quintile=5 × Bond Maturity	0.996***	1.085***	1.244***	1.277***	1.499***	0.909***	1.070***
	[0.038]	[0.055]	[0.045]	[0.180]	[0.132]	[0.262]	[0.237]
Observations	79137	42868	26389	20484	14009	4225	11251
Adjusted R^2	0.628	0.631	0.688	0.662	0.714	0.474	0.670

Panel B: Similarity in Maturity

Dependent variable:	Loan Maturity						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rating=AAA × Bond Maturity	0.986***	1.051***	1.161***	1.164***	1.234***	1.019***	1.111***
	[0.055]	[0.057]	[0.072]	[0.119]	[0.100]	[0.210]	[0.151]
Rating=AA × Bond Maturity	1.162***	1.336***	1.458***	1.613***	1.610***	1.628***	1.536***
	[0.074]	[0.091]	[0.060]	[0.122]	[0.140]	[0.392]	[0.131]
Rating=A × Bond Maturity	1.103***	1.254***	1.354***	1.532***	1.561***	1.365***	1.487***
	[0.033]	[0.042]	[0.062]	[0.065]	[0.077]	[0.105]	[0.060]
Rating=BBB × Bond Maturity	1.094***	1.185***	1.329***	1.394***	1.538***	0.945***	1.372***
	[0.042]	[0.088]	[0.063]	[0.139]	[0.076]	[0.270]	[0.170]
Rating=BB × Bond Maturity	1.083***	1.178***	1.340***	1.328***	1.438***	0.933***	1.300***
	[0.051]	[0.067]	[0.066]	[0.084]	[0.078]	[0.152]	[0.106]
Rating≤B × Bond Maturity	0.963***	0.977***	1.187***	1.331***	1.403***	1.149***	1.417***
	[0.064]	[0.091]	[0.092]	[0.129]	[0.187]	[0.217]	[0.209]
Observations	74688	38982	24489	18501	13094	4136	10578
Adjusted R^2	0.629	0.639	0.700	0.685	0.736	0.523	0.694
GO Bonds	–	X	X	–	–	–	–
Term Loans	–	–	X	–	X	–	–
Qualified Bonds	–	–	–	X	X	X	X
Credit Lines	–	–	–	–	–	X	–
Qualified Loans	–	–	–	–	–	–	X

Table D.3: Issuance amount similarity between bank loans and bonds: bank relationship level. This table presents the correlation between loan commitment amount and the amount of the most recent municipal bonds issuance across local government size or credit risk. We construct the size quintiles in Panel A annually based on all governments in the Census of Government Finances that have at least some outstanding debt or have municipal bond market access. The credit rating categories represent the most conservative bank internal rating assigned to a given government-quarter in a 10-grade S&P scale. The size quintiles and credit ratings are lagged one year and one quarter, respectively. GO Bonds and Qualified loans indicators take the value of one whenever the most recent municipal bond issue of a given government is in the form of general obligation bonds or bank-qualified bank loans. Term Loans, Credit Lines, and Qualified Loans take the value of one whenever a given bank loan is a term loan, credit line, or a qualified bank loan. We collapse the loan-quarter panel (originations, renegotiations, and loan-quarters with no associated changes in loan terms) to the bank-borrower-quarter level to capture all loans in a given bank-borrower relationship. Originations are any observations with new loan IDs or where the origination quarter is the same as the observation quarter, while renegotiations are loan-quarter observations with any changes in loan commitments, maturities, interest rates, security, and guarantee provisions. Standard errors are clustered at the state level.

Panel A: Government Size

Dependent variable:	Committed Amount					
	(1)	(2)	(3)	(4)	(5)	(6)
Quintile=1 × Issuance Amt	0.226**	0.227***	0.225	0.091*	0.357***	0.565***
	[0.106]	[0.042]	[0.171]	[0.048]	[0.064]	[0.035]
Quintile=2 × Issuance Amt	0.147***	0.165***	0.111*	0.145*	0.148***	0.587***
	[0.033]	[0.029]	[0.061]	[0.073]	[0.034]	[0.027]
Quintile=3 × Issuance Amt	0.248***	0.284***	0.184***	0.207***	0.284***	0.748***
	[0.034]	[0.033]	[0.046]	[0.044]	[0.033]	[0.094]
Quintile=4 × Issuance Amt	0.173***	0.153***	0.252***	0.150***	0.188***	0.658***
	[0.028]	[0.022]	[0.066]	[0.020]	[0.034]	[0.052]
Quintile=5 × Issuance Amt	0.038***	0.012***	0.082***	0.032***	0.049***	0.894***
	[0.012]	[0.004]	[0.022]	[0.012]	[0.011]	[0.137]
Observations	220948	171542	49406	88144	132804	66773
Adjusted R^2	0.113	0.055	0.233	0.100	0.136	0.271

Panel B: Credit Risk

Dependent variable:	Committed Amount					
	(1)	(2)	(3)	(4)	(5)	(6)
Rating=AAA × Issuance Amt	0.105**	0.080***	0.115	0.046**	0.435***	0.727***
	[0.050]	[0.028]	[0.074]	[0.022]	[0.154]	[0.085]
Rating=AA × Issuance Amt	0.050***	0.022*	0.068***	0.053***	0.044**	0.646***
	[0.012]	[0.013]	[0.012]	[0.009]	[0.019]	[0.039]
Rating=A × Issuance Amt	0.050*	0.020	0.133***	0.038	0.070**	0.727***
	[0.027]	[0.013]	[0.033]	[0.024]	[0.032]	[0.055]
Rating=BBB × Issuance Amt	0.030**	0.009**	0.069***	0.024**	0.042***	0.749***
	[0.013]	[0.003]	[0.025]	[0.012]	[0.012]	[0.075]
Rating=BB × Issuance Amt	0.078***	0.028**	0.149***	0.081***	0.076***	0.600***
	[0.022]	[0.012]	[0.029]	[0.027]	[0.015]	[0.036]
Rating≤B × Issuance Amt	0.052***	0.009	0.114***	0.046***	0.061***	0.650***
	[0.012]	[0.006]	[0.012]	[0.014]	[0.009]	[0.076]
Observations	223931	174202	49729	86628	137303	70462
Adjusted R^2	0.125	0.047	0.257	0.123	0.143	0.268
No Credit Lines	–	X	–	–	–	–
Credit Lines	–	–	X	–	–	–
No Exempt Loans	–	–	–	X	–	–
Exempt Loans	–	–	–	–	X	–
Qualified Bonds	–		–	–	–	X

Table D.4: Maturity similarity between bank loans and bonds: bank relationship level. This table presents the correlation between loan maturity and that of the most recent municipal bonds issuance across local government size or credit risk. We construct the size quintiles in Panel A annually based on all governments in the Census of Government Finances that have at least some outstanding debt or have municipal bond market access. The credit rating categories represent the most conservative bank internal rating assigned to a given government-quarter in a 10-grade S&P scale. The size quintiles and credit ratings are lagged one year and one quarter, respectively. GO Bonds and Qualified loans indicators take the value of one whenever the most recent municipal bond issue of a given government is in the form of general obligation bonds or bank-qualified bank loans. Term Loans, Credit Lines, and Qualified Loans take the value of one whenever a given bank loan is a term loan, credit line, or a qualified bank loan. We collapse the loan-quarter panel (originations, renegotiations, and loan-quarters with no associated changes in loan terms) to the bank-borrower-quarter level to capture all loans in a given bank-borrower relationship. Originations are any observations with new loan IDs or where the origination quarter is the same as the observation quarter, while renegotiations are loan-quarter observations with any changes in loan commitments, maturities, interest rates, security, and guarantee provisions. Standard errors are clustered at the state level.

Panel A: Government Size

Dependent variable:	Loan Maturity					
	(1)	(2)	(3)	(4)	(5)	(6)
Quintile=1 × Bond Maturity	0.886***	0.926***	0.569***	0.920***	0.874***	0.999***
	[0.045]	[0.039]	[0.117]	[0.075]	[0.042]	[0.056]
Quintile=2 × Bond Maturity	0.854***	0.892***	0.513***	0.904***	0.834***	1.002***
	[0.052]	[0.051]	[0.093]	[0.065]	[0.050]	[0.054]
Quintile=3 × Bond Maturity	0.801***	0.840***	0.595***	0.809***	0.797***	0.981***
	[0.040]	[0.037]	[0.052]	[0.062]	[0.033]	[0.054]
Quintile=4 × Bond Maturity	0.771***	0.807***	0.563***	0.751***	0.781***	0.963***
	[0.026]	[0.026]	[0.044]	[0.037]	[0.024]	[0.053]
Quintile=5 × Bond Maturity	0.616***	0.684***	0.473***	0.571***	0.647***	1.005***
	[0.019]	[0.021]	[0.019]	[0.020]	[0.019]	[0.072]
Observations	203858	165674	38184	71846	132012	64852
Adjusted R^2	0.608	0.638	0.499	0.550	0.642	0.658

Panel B: Credit Risk

Dependent variable:	Loan Maturity					
	(1)	(2)	(3)	(4)	(5)	(6)
Rating=AAA × Bond Maturity	0.655***	0.748***	0.498***	0.610***	0.676***	0.808***
	[0.024]	[0.033]	[0.037]	[0.041]	[0.029]	[0.049]
Rating=AA × Bond Maturity	0.769***	0.841***	0.540***	0.766***	0.773***	1.137***
	[0.044]	[0.039]	[0.062]	[0.058]	[0.038]	[0.061]
Rating=A × Bond Maturity	0.715***	0.775***	0.510***	0.680***	0.731***	0.994***
	[0.020]	[0.023]	[0.017]	[0.023]	[0.022]	[0.042]
Rating=BBB × Bond Maturity	0.710***	0.771***	0.497***	0.644***	0.740***	0.945***
	[0.021]	[0.026]	[0.025]	[0.022]	[0.024]	[0.035]
Rating=BB × Bond Maturity	0.729***	0.793***	0.481***	0.694***	0.749***	0.886***
	[0.021]	[0.019]	[0.040]	[0.025]	[0.026]	[0.033]
Rating≤B × Bond Maturity	0.621***	0.714***	0.405***	0.541***	0.678***	0.916***
	[0.043]	[0.036]	[0.059]	[0.075]	[0.027]	[0.054]
Observations	207242	168461	38781	70849	136393	68671
Adjusted R^2	0.608	0.643	0.503	0.545	0.643	0.676
No Credit Lines	–	X	–	–	–	–
Credit Lines	–	–	X	–	–	–
No Exempt Loans	–	–	–	X	–	–
Exempt Loans	–	–	–	–	X	–
Qualified Bonds	–	–	–	–	–	X

E Bank loan renegotiation

In Tables E.1 and E.2, we also estimate Equation 3 within the subsets of general and special-purpose governments, respectively. The estimates indicate similar associations between renegotiation outcomes and rating changes within these subsets to those in Table 8 in the main text. Moreover, the sensitivity of renegotiation outcomes to rating changes is higher for districts, which is consistent with higher levels of financial constraints among districts than among general governments. For example, internal rating upgrades of general governments translate to 2 pp increase and 6 pp decrease in the probability of amount-increasing and amount-decreasing renegotiation outcomes, respectively. The analogous estimates for special districts are a 4 percentage point increase and a 7 percentage point decrease in renegotiation probability. Districts also exhibit roughly 50% higher sensitivity of renegotiation to internal rating downgrades.

The associations between renegotiation outcomes and government financials in Tables E.1 and E.2 are overall similar to those in Table 8 with two notable exceptions. Combing the results in Tables E.1 and E.2 shows that the positive relation between amount-decreasing renegotiation and non-investment grade ratings is driven by districts, while the negative relation between rate-increasing outcomes and non-investment grade ratings—by general governments. Additionally, amount-increasing renegotiation and interest expense are negatively correlated among general governments, but positively correlated among districts. These results suggest that upon renegotiation banks are less likely to increase loan rates of low-credit quality general governments, but also less likely to increase loan amounts of these entities relative to higher credit quality borrowers. Within the subset of districts, banks are more likely to cut loan commitments of low-quality borrowers in some cases, but less likely to do so when districts face high borrowing costs.

Tables E.3 and E.4 examine whether the associations between renegotiation outcomes and government fundamentals differ between credit lines and term loans. Most term loans are amortizing, making it more difficult to renegotiate loan amounts. In addition, term loans may attract governments that value the similarity of some term loans to municipal bonds and, thereby, prefer to renegotiate less. Consistent with these ideas, we find significantly lower sensitivity of renegotiation outcomes to changes in internal risk ratings for term loans than for credit lines. For example, among credit lines, borrower upgrades and downgrades translate to 3.3 pp and 2.3 pp higher probabilities of amount-increasing renegotiation, respectively. The analogous estimates within the subset of term loans are only 1.4 pp and 1.1 pp. Renegotiation of credit line interest rates is also strongly responsive to internal rating changes, while renegotiation of term loan rates is fairly unresponsive to changes in ratings. Finally, borrower interest expense is negatively correlated with amount-increasing renegotiation within the subset of credit lines, but is uncorrelated with amount-increasing renegotiation among term loans. High interest expense also translates to amount-decreasing renegotiations for term loans, likely due to repayments.

Table E.1: Loan renegotiation and credit quality: general governments. This table presents marginal effects estimates of the multinomial logit specification in Equation 3 relating governments' loan renegotiation outcomes to balance sheet characteristics and changes in credit risk. We study six mutually exclusive outcomes: 1) loan amount increases and interest rate does not increase, 2) loan amount does not decrease and interest rate decreases, 3) loan amount decreases and interest rate does not decrease, 4) loan amount does not increase and interest rate increases, 5) loan amount increases and interest rate increases, and 6) loan amount decreases and interest rate decreases. The base case in the estimation comprises all loan-quarters that are not renegotiated. The sample is limited to general purpose governments: counties, cities, and townships. *Downgrades* and *Upgrades* denote improvements and declines of one or more notches in a government's most conservative credit rating across all of its lenders as of the previous quarter. All specifications include a non-investment grade rating indicator and financial characteristics lagged one quarter. The financial variables for observations from 2013 to 2017 come from the 2012 Census, while the variables for observations since 2018 come from the 2017 Census. Standard errors are computed using the delta method.

Renegotiation outcomes:	(1)	(2)	(3)	(4)	(5)	(6)
Amount ↑	Yes	–	–	No	Yes	–
Amount ↓	–	No	Yes	–	–	Yes
Interest rate ↑	No	–	–	Yes	Yes	–
Interest rate ↓	–	Yes	No	–	–	Yes
Renegotiation outcomes:	(1)	(2)	(3)	(4)	(5)	(6)
Upgrade	0.023***	0.000	-0.054***	0.001	0.001	-0.002**
	[0.003]	[0.001]	[0.005]	[0.001]	[0.001]	[0.001]
Downgrade	0.021***	-0.000	-0.003	0.002	0.001	0.001*
	[0.004]	[0.001]	[0.005]	[0.001]	[0.001]	[0.001]
nonIG	-0.023***	-0.001***	0.011***	-0.014***	-0.003***	-0.004***
	[0.003]	[0.000]	[0.003]	[0.001]	[0.001]	[0.001]
Ln(1+Tot Revenue)	0.019***	0.001***	-0.014***	0.005***	0.001***	0.001***
	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]
Tot Expenditures	0.009	-0.002*	0.044***	-0.013***	0.001	-0.004***
	[0.006]	[0.001]	[0.008]	[0.002]	[0.001]	[0.001]
Tot IG Revenue	0.030***	-0.001	-0.006	-0.010***	-0.002**	0.000
	[0.005]	[0.001]	[0.007]	[0.002]	[0.001]	[0.001]
Tot Taxes	0.081***	0.000	-0.019***	-0.001	-0.005***	-0.001
	[0.005]	[0.001]	[0.007]	[0.002]	[0.001]	[0.001]
Leverage	-0.005***	0.000***	-0.009***	0.000	0.001***	-0.001***
	[0.001]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]
Interest Expense	-0.421***	0.010	-0.013	-0.000	0.033***	-0.010
	[0.043]	[0.007]	[0.057]	[0.016]	[0.009]	[0.008]
Observations	177416	177416	177416	177416	177416	177416

Table E.2: Loan renegotiation and credit quality: special districts. This table presents marginal effects estimates of the multinomial logit specification in Equation 3 relating governments' loan renegotiation outcomes to balance sheet characteristics and changes in credit risk. We study six mutually exclusive outcomes: 1) loan amount increases and interest rate does not increase, 2) loan amount does not decrease and interest rate decreases, 3) loan amount decreases and interest rate does not decrease, 4) loan amount does not increase and interest rate increases, 5) loan amount increases and interest rate increases, and 6) loan amount decreases and interest rate decreases. The base case in the estimation comprises all loan-quarters that are not renegotiated. The sample is limited to special purpose governments: school and special districts. *Downgrades* and *Upgrades* denote improvements and declines of one or more notches in a government's most conservative credit rating across all of its lenders as of the previous quarter. All specifications include a non-investment grade rating indicator and financial characteristics lagged one quarter. The financial variables for observations from 2013 to 2017 come from the 2012 Census, while the variables for observations since 2018 come from the 2017 Census. Standard errors are computed using the delta method.

Renegotiation outcomes:	(1)	(2)	(3)	(4)	(5)	(6)
Amount ↑	Yes	–	–	No	Yes	–
Amount ↓	–	No	Yes	–	–	Yes
Interest rate ↑	No	–	–	Yes	Yes	–
Interest rate ↓	–	Yes	No	–	–	Yes
Renegotiation outcomes:	(1)	(2)	(3)	(4)	(5)	(6)
Upgrade	0.028***	0.001**	-0.054***	0.000	0.003***	-0.001
	[0.004]	[0.001]	[0.005]	[0.001]	[0.001]	[0.001]
Downgrade	0.024***	0.001	-0.009	0.002*	0.001	-0.000
	[0.005]	[0.001]	[0.006]	[0.001]	[0.001]	[0.001]
nonIG	-0.040***	-0.000	0.037***	-0.006***	-0.001	-0.001
	[0.003]	[0.001]	[0.004]	[0.001]	[0.001]	[0.001]
Ln(1+Tot Revenue)	0.003***	0.001***	-0.012***	0.004***	0.001***	0.001***
	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]
Tot Expenditures	0.017**	0.003***	0.039***	0.002	-0.001	0.006***
	[0.008]	[0.001]	[0.009]	[0.002]	[0.002]	[0.002]
Tot IG Revenue	0.072***	0.000	-0.145***	0.007***	0.001	-0.003***
	[0.005]	[0.001]	[0.005]	[0.002]	[0.001]	[0.001]
Tot Taxes	0.212***	0.003***	-0.132***	-0.004*	0.007***	0.000
	[0.005]	[0.001]	[0.006]	[0.002]	[0.001]	[0.001]
Leverage	-0.021***	0.001***	-0.038***	0.004***	-0.001***	-0.001**
	[0.001]	[0.000]	[0.002]	[0.000]	[0.000]	[0.000]
Interest Expense	0.624***	0.044***	0.435***	0.074***	0.017	0.020
	[0.056]	[0.009]	[0.070]	[0.020]	[0.012]	[0.012]
Observations	121680	121680	121680	121680	121680	121680

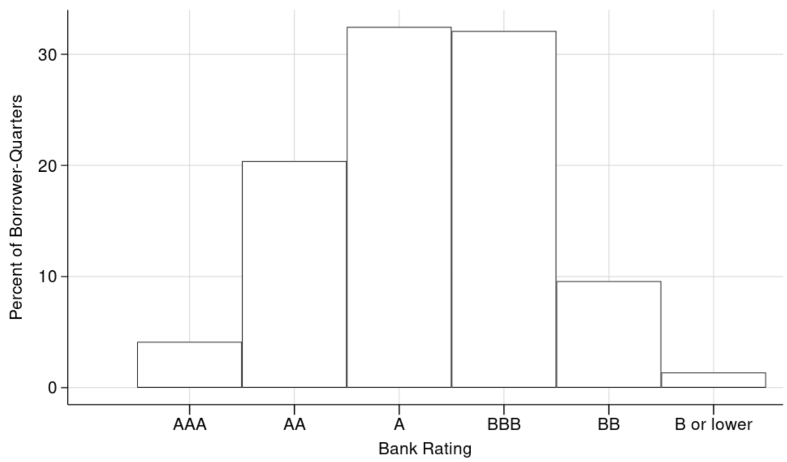
Table E.3: Loan renegotiation and credit quality: credit lines. This table presents marginal effects estimates of the multinomial logit specification in Equation 3 relating governments' loan renegotiation outcomes to balance sheet characteristics and changes in credit risk. We study six mutually exclusive outcomes: 1) loan amount increases and interest rate does not increase, 2) loan amount does not decrease and interest rate decreases, 3) loan amount decreases and interest rate does not decrease, 4) loan amount does not increase and interest rate increases, 5) loan amount increases and interest rate increases, and 6) loan amount decreases and interest rate decreases. The base case in the estimation comprises all loan-quarters that are not renegotiated. The sample is limited to credit lines. *Downgrades* and *Upgrades* denote improvements and declines of one or more notches in a government's most conservative credit rating across all of its lenders as of the previous quarter. All specifications include a non-investment grade rating indicator and financial characteristics lagged one quarter. The financial variables for observations from 2013 to 2017 come from the 2012 Census, while the variables for observations since 2018 come from the 2017 Census. Standard errors are computed using the delta method.

Renegotiation outcomes:	(1)	(2)	(3)	(4)	(5)	(6)
Amount ↑	Yes	–	–	No	Yes	–
Amount ↓	–	No	Yes	–	–	Yes
Interest rate ↑	No	–	–	Yes	Yes	–
Interest rate ↓	–	Yes	No	–	–	Yes
Renegotiation outcomes:	(1)	(2)	(3)	(4)	(5)	(6)
Upgrade	0.030***	0.001	-0.053***	-0.004**	0.001**	-0.002
	[0.004]	[0.001]	[0.007]	[0.002]	[0.001]	[0.001]
Downgrade	0.021***	0.000	-0.019**	0.002	0.001	0.001
	[0.005]	[0.001]	[0.008]	[0.002]	[0.001]	[0.001]
nonIG	-0.000	-0.000	0.019***	-0.009***	0.000	-0.003***
	[0.004]	[0.001]	[0.005]	[0.002]	[0.001]	[0.001]
Ln(1+Tot Revenue)	-0.002***	0.000**	-0.017***	0.001***	0.000**	0.001***
	[0.001]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]
Tot Expenditures	0.019**	-0.002	0.021*	0.004	0.003**	0.005***
	[0.008]	[0.002]	[0.011]	[0.003]	[0.001]	[0.002]
Tot IG Revenue	0.119***	-0.002	-0.095***	-0.008***	0.000	-0.006***
	[0.006]	[0.002]	[0.008]	[0.002]	[0.001]	[0.001]
Tot Taxes	0.194***	0.004***	0.071***	0.004**	0.002**	0.001
	[0.007]	[0.001]	[0.008]	[0.002]	[0.001]	[0.001]
Leverage	-0.001	0.000	-0.006***	-0.001***	0.000	-0.000
	[0.001]	[0.000]	[0.002]	[0.001]	[0.000]	[0.000]
Interest Expense	0.063	0.010	-0.015	0.032	-0.007	0.007
	[0.057]	[0.013]	[0.091]	[0.023]	[0.015]	[0.015]
Observations	60836	60836	60836	60836	60836	60836

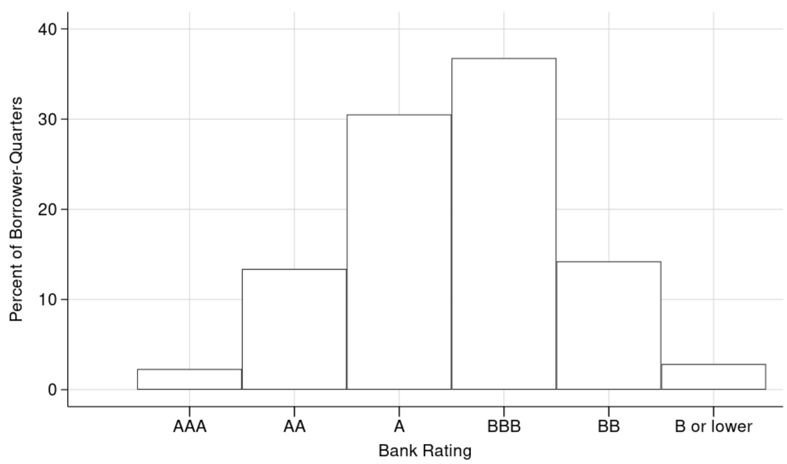
Table E.4: Loan renegotiation and credit quality: term loans. This table presents marginal effects estimates of the multinomial logit specification in Equation 3 relating governments' loan renegotiation outcomes to balance sheet characteristics and changes in credit risk. We study six mutually exclusive outcomes: 1) loan amount increases and interest rate does not increase, 2) loan amount does not decrease and interest rate decreases, 3) loan amount decreases and interest rate does not decrease, 4) loan amount does not increase and interest rate increases, 5) loan amount increases and interest rate increases, and 6) loan amount decreases and interest rate decreases. The base case in the estimation comprises all loan-quarters that are not renegotiated. The sample is limited to credit lines. *Downgrades* and *Upgrades* denote improvements and declines of one or more notches in a government's most conservative credit rating across all of its lenders as of the previous quarter. All specifications include a non-investment grade rating indicator and financial characteristics lagged one quarter. The financial variables for observations from 2013 to 2017 come from the 2012 Census, while the variables for observations since 2018 come from the 2017 Census. Standard errors are computed using the delta method.

Renegotiation outcomes:	(1)	(2)	(3)	(4)	(5)	(6)
Amount ↑	Yes	–	–	No	Yes	–
Amount ↓	–	No	Yes	–	–	Yes
Interest rate ↑	No	–	–	Yes	Yes	–
Interest rate ↓	–	Yes	No	–	–	Yes
Renegotiation outcomes:	(1)	(2)	(3)	(4)	(5)	(6)
Upgrade	0.014***	0.001	-0.050***	0.002*	0.001**	-0.002**
	[0.003]	[0.000]	[0.005]	[0.001]	[0.000]	[0.001]
Downgrade	0.008***	0.001	-0.005	0.002	0.001*	-0.000
	[0.003]	[0.001]	[0.005]	[0.001]	[0.001]	[0.001]
nonIG	-0.017***	-0.001***	0.027***	-0.010***	-0.003***	-0.002***
	[0.002]	[0.000]	[0.003]	[0.001]	[0.001]	[0.001]
Ln(1+Tot Revenue)	0.015***	0.001***	0.000	0.005***	0.001***	0.002***
	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]
Tot Expenditures	-0.009*	0.002**	0.039***	-0.007***	0.001	-0.003*
	[0.005]	[0.001]	[0.008]	[0.002]	[0.001]	[0.002]
Tot IG Revenue	0.067***	0.000	-0.125***	-0.003**	-0.001	0.000
	[0.003]	[0.001]	[0.005]	[0.001]	[0.001]	[0.001]
Tot Taxes	0.086***	0.001	-0.120***	-0.010***	0.001	0.001
	[0.004]	[0.001]	[0.006]	[0.002]	[0.001]	[0.001]
Leverage	-0.001	0.001***	-0.019***	0.003***	0.000	-0.001***
	[0.001]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]
Interest Expense	-0.059*	0.019***	0.153***	0.075***	0.014*	-0.005
	[0.035]	[0.006]	[0.055]	[0.014]	[0.008]	[0.007]
Observations	181486	181486	181486	181486	181486	181486

F Additional Figures and Tables

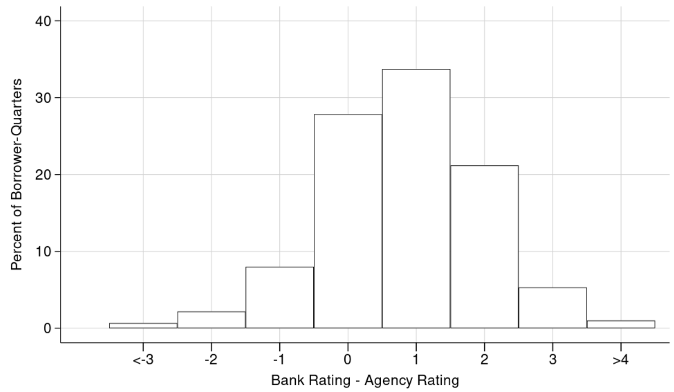


(a) Agency-rated

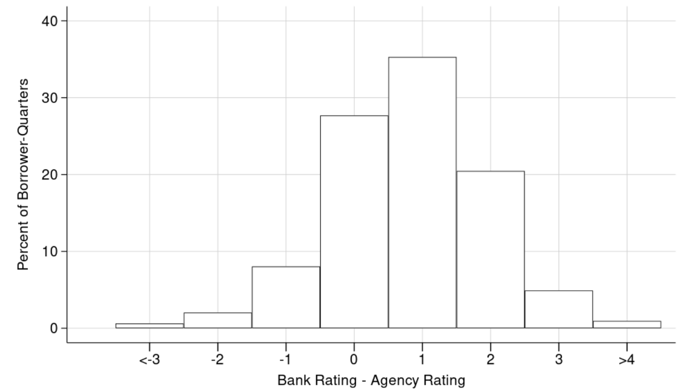


(b) Non-rated

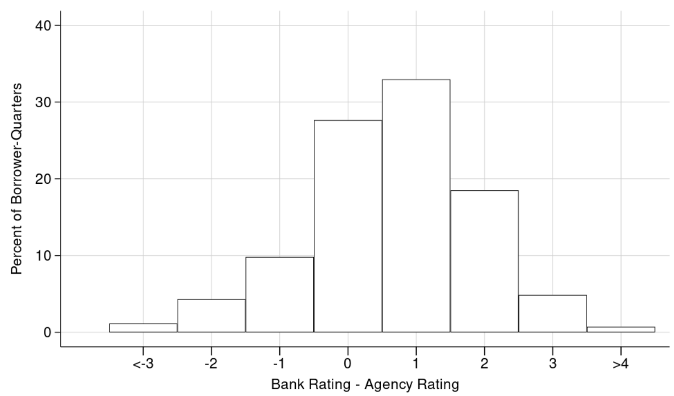
Figure F.1: Bank Rating Distributions. This figure presents the distribution of governments' internal risk ratings assigned by their lenders in a common 10-grade S&P scale. Panel A presents the bank internal risk rating distribution for municipalities that also have an agency rating, while panel B presents the bank rating distribution for non-rated municipalities. Whenever municipal borrowers have loan commitments with multiple banks in a given quarter, we take the most conservative rating across these banks. All ratings below 'B' are aggregated in one bucket in light of the few observations in these rating categories.



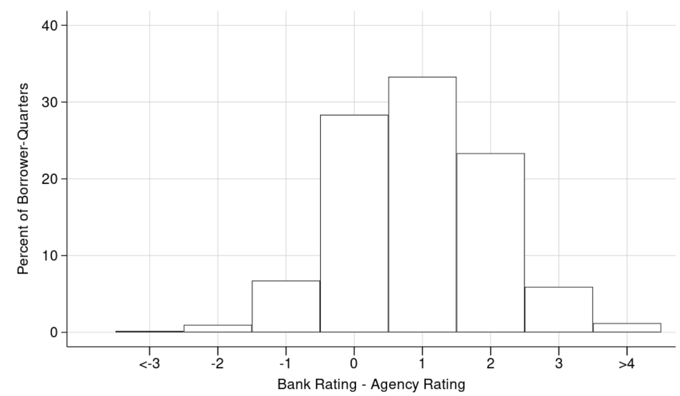
(a) All Governments



(b) Cities/Towns/Twps



(c) Counties



(d) Districts

Figure F.2: Rating Differences between Banks and Ratings Agencies. This figure presents the distributions of the difference between the ratings of banks and those of ratings agencies for each local government rated by both banks and rating agencies. The distributions are presented in terms of the number of rating notches. A negative rating difference for a given local governments means that rating agencies rate the government more conservatively than banks. A positive difference indicates that banks are more conservative raters than rating agencies. Whenever municipal borrowers have loan commitments with multiple banks in a given quarter, we take the most conservative rating across these banks.

Table F.1: Bank loan reliance across the government size and risk distribution: Urban counties. This table presents the incidence of bank loan reliance across government size and credit rating categories, limiting the sample to governments in counties where at least 50% of the population as of the 2020 Census is in urban blocks. The sample in columns 1-3 is limited to governments that are surveyed in 2017—the last full Census year—and that have nonzero debt. Columns 4-6 further limit the sample to governments that have issued municipal bonds since 2000. The sample in columns 7-9 is limited to governments that appear in the 2020 Census survey—the final year in our sample—and to governments that have nonzero debt.

Panel A: Government Size

	2017 Census Survey						2020 Census Survey		
Measure:	Loans	Loan Share		Loans	Loan Share		Loans	Loan Share	
		Drawn	Committed		Drawn	Committed		Drawn	Committed
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Quintile= +1	0.072***	0.509***	0.518***	0.084***	0.436***	0.446***	0.058***	1.323***	1.328***
	[0.008]	[0.018]	[0.019]	[0.012]	[0.022]	[0.023]	[0.011]	[0.151]	[0.155]
Quintile= +2	0.118***	0.440***	0.447***	0.141***	0.413***	0.419***	0.125***	0.878***	0.887***
	[0.008]	[0.014]	[0.015]	[0.010]	[0.015]	[0.016]	[0.010]	[0.094]	[0.097]
Quintile= +3	0.161***	0.327***	0.344***	0.179***	0.295***	0.306***	0.178***	0.322***	0.332***
	[0.007]	[0.011]	[0.012]	[0.009]	[0.012]	[0.013]	[0.009]	[0.071]	[0.073]
Quintile= +4	0.218***	0.262***	0.274***	0.245***	0.235***	0.247***	0.266***	0.216***	0.261***
	[0.007]	[0.009]	[0.009]	[0.008]	[0.009]	[0.009]	[0.008]	[0.052]	[0.053]
Quintile= +5	0.449***	0.122***	0.141***	0.494***	0.117***	0.136***	0.514***	0.109***	0.130***
	[0.006]	[0.006]	[0.006]	[0.007]	[0.006]	[0.006]	[0.007]	[0.034]	[0.035]
Observations	16330	3755	3755	11506	3203	3203	11745	3173	3173

Panel B: Government Risk

	2017 Census Survey			2020 Census Survey		
Measure:	Loans	Loan Share		Loans	Loan Share	
		Drawn	Committed		Drawn	Committed
	(1)	(2)	(3)	(4)	(5)	(6)
Rating= AAA	0.268***	0.129***	0.146***	0.292***	0.103***	0.118***
	[0.021]	[0.018]	[0.019]	[0.020]	[0.023]	[0.038]
Rating= AA	0.317***	0.146***	0.160***	0.331***	0.159***	0.174***
	[0.007]	[0.006]	[0.006]	[0.008]	[0.008]	[0.014]
Rating= A	0.306***	0.150***	0.165***	0.334***	0.156***	0.195***
	[0.010]	[0.008]	[0.008]	[0.010]	[0.010]	[0.018]
Rating= BBB	0.445***	0.103***	0.128***	0.444***	0.126***	0.146***
	[0.031]	[0.021]	[0.022]	[0.023]	[0.020]	[0.034]
Rating= BB	0.489***	0.104**	0.123***	0.531***	0.069	0.105
	[0.068]	[0.043]	[0.044]	[0.067]	[0.055]	[0.093]
Rating= B	0.562***	0.055	0.071	0.562***	0.065	0.069
	[0.116]	[0.069]	[0.071]	[0.118]	[0.094]	[0.158]
Observations	7300	2308	2308	6784	2292	2292

Table F.2: Bank ratings and internal risk metrics. This table presents averages of banks' internal probability of default and loss given default estimates across across banks' internal ratings (converted to a 10-grade S&P scale). The probability of default estimates reflect banks' assessment of the borrower's one-year "through the cycle" default estimate in accordance with Basel II capital requirements.

Rating	**PD**	**LGD**	**N**
AAA	0.00048	0.37676	14,609
AA	0.00074	0.29657	71,174
A	0.00152	0.31358	77,731
BBB	0.00221	0.29422	57,996
BB	0.00815	0.26768	16,490
B	0.03825	0.27692	1,941
CCC	0.14722	0.30748	352
CC	0.18824	0.41341	50
C/D	0.89198	0.33935	66

Table F.3: Characteristics of Leases. This table presents summary statistics (means) for key characteristics of bank-originated leases to state, county, city, and special district governments. Committed and drawn amounts are expressed in millions of US dollars, while remaining and original contract maturities are expressed in quarters. All other variables in this table are defined as in Appendix B.

	Counties	**Cities**	**Sch Dist**	**Sp Dist**
Major Loan Terms				
Fraction of all loans	0.166	0.115	0.160	0.103
Committed Amount	4.926	4.171	3.613	10.148
Interest Rate	0.028	0.028	0.030	0.032
Remaining Maturity	25.905	29.090	30.906	30.768
Original Maturity	36.686	39.804	42.099	41.038
N	10,514	17,431	14,733	5,202
Collateral and Contractual Provisions				
Secured	0.992	0.986	0.989	0.968
Senior Secured	0.989	0.986	0.986	0.957
Guaranteed	0.011	0.013	0.002	0.061
Fixed Rate	0.979	0.991	0.998	0.969
Prepayment Penalty	0.388	0.407	0.462	0.345
Tax Exempt	0.715	0.712	0.747	0.516
Bank Qualified	0.443	0.500	0.644	0.397
Syndicated	0.003	0.003	0.002	0.011
N	10,514	17,423	14,733	5,205

Table F.4: Bond market access and government characteristics. This table presents summary statistics for major characteristics of local governments. Panel A splits the sample based on whether governments have access to the municipal bonds market. Panel B restricts the sample to governments with bond market access and presents summary statistics on bond issuance characteristics from Mergent. Only 53,243 of these observations correspond to issuers rated by S&P, Moody's, or Fitch. All variables are defined in Appendix A.

A. Bonds Market Access and Government Characteristics

	No Bond Market Access (N=39,840)		Bond Market Access (N=78,986)	
	Mean	*St. Dev.*	*Mean*	*St. Dev.*
Bank Loan Reliance	0.15	0.35	0.26	0.44
Committed-to-Debt	0.05	0.17	0.05	0.14
Tot Revenue ($m)	402	16,031	2,689	127,954
Tot Expenditures	1.00	0.19	0.99	0.19
Tot IG Revenue	0.48	0.29	0.42	0.28
Tot Taxes	0.30	0.23	0.37	0.23
PCPI	0.04	0.01	0.05	0.01
Debt-to-Revenue	0.68	0.89	0.91	0.97
Interest Expense	0.04	0.03	0.04	0.02

B. Bond Issuance Characteristics (N=78,986)

	Mean	*St. Dev.*
Agency Rating	2.40	0.75
Rating = AA	0.51	0.50
Rating = A	0.37	0.48
Rating = BBB or lower	0.05	0.21
Inst Reliance	0.66	0.37
Bank Qualified	0.55	0.49
Exempt Issuance	0.93	0.23
Bond Issuance	0.44	0.50
Log(Area Issuance)	18.25	2.11

C. Bond Issuance Characteristics (N=81,751)
Quarterly Bank-Borrower Panel

	Mean	*St. Dev.*
Credit Line Share	0.25	0.41
Sch Fund	0.20	0.40
Insured	0.21	0.41
Taxable	0.07	0.25
Senior	0.52	0.42
Bank-Qualified	0.36	0.48
Revenue	0.32	0.46
Yield	2.54	1.27
Maturity	42.93	26.17
Negotiated	0.45	0.50

Table F.5: Descriptive statistics for size and rating categories. This table presents averages and standard errors for key balance sheet characteristics of governments that gained access to the municipal loan market between 2011 and 2022. The sample is limited to loan originations and renegotiations from the first quarter of 2013 through the fourth quarter of 2022. The size quintiles are formed based on total revenue information from the 2012 Census of Governments that surveys the universe of state and local governments in the United States. The balance sheet variable corresponding to years 2013-2017 come from the 2012 Census and those corresponding to years 2018-2022 come from the 2017 Census. The standard errors are clustered at the state level.

Panel A: Size Quintiles

Dependent variable:	Tot Revenue ($m) (1)	Tot Exp (2)	Tot IG Rev (3)	Tot Taxes (4)	Leverage (5)	Int Expense (6)	N (7)
Quintile=1	8.921***	0.954***	0.208***	0.431***	1.172***	0.040***	
	[0.104]	[0.007]	[0.029]	[0.022]	[0.111]	[0.001]	
Quintile=2	17.954***	0.968***	0.258***	0.420***	1.150***	0.039***	
	[0.157]	[0.006]	[0.030]	[0.020]	[0.103]	[0.001]	
Quintile=3	34.956***	0.993***	0.244***	0.425***	0.998***	0.040***	
	[0.346]	[0.010]	[0.023]	[0.024]	[0.078]	[0.001]	
Quintile=4	75.225***	0.989***	0.253***	0.413***	1.041***	0.041***	
	[0.965]	[0.009]	[0.023]	[0.026]	[0.076]	[0.001]	
Quintile=5	7853.062***	0.995***	0.237***	0.366***	1.043***	0.043***	
	[1115.397]	[0.004]	[0.016]	[0.015]	[0.072]	[0.002]	
Observations	73810	73493	73493	73493	73493	72682	
Adjusted R^2	0.138	0.980	0.520	0.803	0.536	0.831	

Panel B: Risk Categories

Dependent variable:	Tot Revenue ($m) (1)	Tot Exp (2)	Tot IG Rev (3)	Tot Taxes (4)	Leverage (5)	Int Expense (6)	N (7)
Rating=AAA	1002.673**	0.992***	0.229***	0.436***	1.091***	0.038***	
	[475.538]	[0.012]	[0.027]	[0.039]	[0.091]	[0.001]	
Rating=AA	5442.360***	0.984***	0.226***	0.461***	0.913***	0.041***	
	[1831.708]	[0.006]	[0.010]	[0.030]	[0.092]	[0.001]	
Rating=A	2105.498***	0.981***	0.225***	0.381***	1.071***	0.041***	
	[449.807]	[0.005]	[0.017]	[0.014]	[0.072]	[0.002]	
Rating=BBB	5558.883***	0.994***	0.237***	0.370***	1.093***	0.043***	
	[1205.449]	[0.006]	[0.021]	[0.018]	[0.074]	[0.001]	
Rating=BB	8167.855***	0.999***	0.282***	0.338***	1.140***	0.042***	
	[2659.566]	[0.010]	[0.017]	[0.019]	[0.085]	[0.002]	
Rating≤B	10167.615***	1.002***	0.224***	0.356***	1.118***	0.042***	
	[3460.161]	[0.011]	[0.027]	[0.018]	[0.127]	[0.002]	
Observations	67717	67622	67622	67622	67622	66962	
Adjusted R^2	0.100	0.980	0.516	0.808	0.540	0.831	

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