Municipal Borrowing Costs and State Policies for Distressed Municipalities*

Pengjie Gao
HKUST and University of Notre Dame

Chang Lee
University of Illinois at Chicago

Dermot Murphy
University of Illinois at Chicago

This Draft: June 9, 2016

Abstract

Policies on financially distressed municipalities differ significantly across states in the U.S. Some states unconditionally allow municipalities to file for Chapter 9 bankruptcy ("Chapter 9 states"), while others have strong policies in place to deal with distressed municipalities ("Proactive states"). Such policy differences significantly affect local municipal borrowing costs. Local municipal bond yields in Chapter 9 states are higher and more cyclical than those in Proactive states. Moreover, following a default event in Chapter 9 states, the average yield of defaulted bonds increases more than those in Proactive states. Default events have a contagion effect among no-default bonds in Chapter 9 states, but not in Proactive states. Lower borrowing costs for local governments come at the expense of higher borrowing costs for the state government through a channel of higher intergovernmental revenue transfers when economic conditions are weak. Proactive states bear more local credit risk than Chapter 9 states and as a result, their yields on state-issued general obligation bonds are higher.

*We thank Robert Battalio, Kevin Crotty, Tim Loughran, Steve Peterson, Paul Schultz, Jim Spiotto, Charles Trzcinka, and seminar participants at DePaul University, Northwestern University, University of Illinois at Chicago, and University of Notre Dame for helpful comments. We also thank Karl Kraus for excellent research assistance. All errors are our own.

1 Introduction

Sovereign credit risk-sharing between countries in Europe has become more prominent since the global financial crisis of 2008. Following the crisis, for example, the European Central Bank (ECB) administered assistance packages that provided elements of ex-post cross-country risk-sharing to Greece, Ireland, and Portugal. In March 2015, the ECB implemented a quantitative easing program in which the ECB and the European national central banks would purchase and hold sovereign bonds of distressed Eurozone states, sharing the risks of sovereign debt defaults (VoxEU (2015)). Given the brief history of these governmental risk sharing programs, the long-term implications of these risk reallocations on sovereign borrowing costs are still unclear.

The purpose of this paper is to examine the interactions between intergovernmental risk sharing and government borrowing costs. The U.S. municipal bond market provides an ideal setting for this investigation, as there is significant cross-sectional variation in U.S. state policies for distressed municipalities. Some states have policies that induce risk-sharing between the state and its local municipalities, while other states have policies that underscore the independence of their municipalities from the state. Studying the cross-state variation in risk-sharing policies at the U.S. state government level contributes to an understanding of the tradeoff of intergovernmental risk-sharing.

The risk-sharing policies of the ECB in many ways parallel those of U.S. states. One of the goals of the ECB is to promote financial stability by protecting the creditworthiness of its member countries. In 2012, the ECB promised to do "whatever it takes" to preserve the euro in the face of the sovereign debt crisis (ECB (2012)), which included emergency fund provisions for its distressed member countries. Similarly, U.S. states have policies in place to protect the creditworthiness of the state and its municipalities. For example, when Harrisburg, Pennsylvania was financially distressed in 2010, the state advanced $4 million in loans so that Harrisburg could avoid default. Then-Governor Edward Rendell stated that missing a bond payment "would devastate not only the city, but the school district, the county, and central Pennsylvania" (Singer (2010)). In addition, both policies are similar in that they require compliance with austerity measures as a condition for this assistance, with the ECB often requiring fiscal reforms and states requiring restructuring of taxes and pension obligations.

When a municipality is financially distressed and unable to meet its debt obligations, it may file for Chapter 9 bankruptcy in a federal court. Due to the constitutional protection of state sovereignty, Chapter 9 functions advantageously to debtors (Frost (2014)). For example, once a municipality files for Chapter 9 bankruptcy protection, creditors cannot enforce any collection efforts to the

debtor. Moreover, only the municipality has the right to submit debt adjustment plans to the court, and the creditors can only approve or disapprove the plans submitted by the municipality. As a result, creditor protections are much weaker under Chapter 9 than Chapters 7 and 11, the bankruptcy codes for corporations.

Each state has sovereignty over its municipalities and thus can determine whether a Chapter 9 bankruptcy filing is allowed. Some states unconditionally allow municipalities to file for Chapter 9 bankruptcy ("Chapter 9 states"), preferring to leave the municipalities to manage their own affairs. This policy of unconditional access to Chapter 9 underscores the independence of the municipalities from the state, and implies weaker creditor protections for those states.

In contrast, other states allow Chapter 9 access only as a last resort, preferring to deal with financially distressed municipalities directly via state assistance programs ("Proactive states"). These programs allow the state to restructure local finances of the distressed municipality and often feature emergency loan provisions and direct revenue transfers. This results in a higher degree of risk transfer from the local governments to the state government and stronger creditor protections in Proactive states compared to Chapter 9 states. Typically, these programs are motivated by a desire to preserve the state's ability to borrow, and a concern that a default could create a ripple effect beyond the individual municipality (Frost (2014)). That is, the programs are in place to minimize the negative externalities associated with a municipal default.[1]

We exploit these differences in state policies to examine how intergovernmental risk-sharing and the resulting creditor protections affect municipal borrowing costs at the local and state levels. In the too-big-to-fail literature, implicit government guarantees in the form of taxpayer bailouts to banks that are "too big to fail" indirectly lead to a lower cost of debt for these banks, but also to a higher burden on taxpayers that are indirectly financing these bailouts (see Admati and Hellwig (2013)). The assistance provided by state governments to distressed municipalities can similarly be seen as a "bailout" that must be financed by state taxpayer dollars. Motivated by this, we hypothesize that a higher degree of risk-sharing between the state and local governments will lead to lower borrowing costs for local municipalities, but at the cost of higher borrowing costs for bonds issued by the state.

We first examine yield increases following default events of local municipal bonds and find that

[1] Many of these Proactive state programs were put in place in response to a within-state crisis. For example, New York state originally implemented its proactive measures in response to the New York City fiscal crisis of 1975. Ohio's measures were introduced in response to the Cleveland crisis of 1978. Similarly, North Carolina originally developed many of its proactive programs in response to a slew of local township defaults during the Great Depression (Spiotto, Acker, and Appleby (2012)).

they are much higher in Chapter 9 states. In particular, when a local municipal bond experiences a default event, we find that the yield spread increases by 6.7 percentage points in Chapter 9 states.[2] On the other hand, the municipal bond yield only increases by 4.2 percentage points following a default event in Proactive states, for a difference of 2.5 percentage points (p-value=0.004). This indicates that the expected loss to municipal bond investors is higher following a default in a Chapter 9 state than a Proactive state. This is consistent with the interpretation that creditors under Chapter 9 receive weak creditor protections compared to creditors under the Proactive state programs.

State policies also have a significant ex-ante effect on yields—local municipal bond yields in Chapter 9 states are 3.9 basis points higher than those in Proactive states. That is, investors prefer to purchase local municipal bonds from states that proactively assist municipalities that exhibit signs of fiscal distress, all else being equal. If we restrict our attention to newly issued bonds, we find that offering yields are 1.4 basis points higher in Chapter 9 states than Proactive states. To put this perspective, in 2007, local governments issued an average of \$4.5 billion in long-term municipal bonds (par value) per state. Given that long-term municipal bonds have an average maturity of about 14 years, this implies that borrowing costs in Chapter 9 states are approximately \$4.5 billion $\times$ 14 years $\times$ 1.4 basis points = \$8.8 million higher per year. Over the course of our 12 year sample, this implies that aggregate local borrowing costs are approximately \$105 million higher for a Chapter 9 state compared to a Proactive state. This difference in offering yields is even higher for uninsured and unrated bonds with higher credit risk.

A potential concern in our analysis is that our results capture differences in unobserved state characteristics rather than differences in distress-related state policies, particularly because of the large geographic dispersions between many of these states. Holmes (1998) addresses a similar identification concern by comparing bordering counties in states with different right-to-work laws, and shows that counties in states with a right-to-work law are associated with higher manufacturing activity. Using a similar identification strategy, we examine municipal bonds issued in counties on the border of North Carolina and South Carolina. North Carolina is a Proactive state and South Carolina is a Chapter 9 state; because of the geographic proximity of these counties, any differences in yields can be more readily attributed to differences in these state policies.[3] We find that secondary yields in the South Carolina border counties are 7.65 basis points higher than those in the North Carolina border counties, while offering yields are 9.19 basis points higher. This supports our

[2]The municipal bond yield spread is defined as the difference between the municipal bond yield and the duration-matched U.S. Treasury bond yield. We will henceforth refer to the municipal bond yield spread as the yield.

[3]These are the only Proactive and Chapter 9 states that share a border and similar municipal bond taxation policies.

argument that the lower borrowing costs for municipalities in Proactive states are driven by their distress-related policies, and not by other unobserved state characteristics.

The divergence in borrowing costs between Proactive and Chapter 9 states becomes even more pronounced when local economic conditions worsen. Creditor protections are particularly important during these times due to the increased probability of municipal default. When state economic conditions are weak, we find that yields on municipal bonds in Chapter 9 states are 6.4 basis points higher than those in Proactive states. When state economic conditions are strong, however, there is no significant difference between those state types.

Another major concern in municipal bond markets is the contagion effect, in which a default event in one municipal bond causes investors to change their risk perceptions of other municipal bonds in that state, leading to higher yields for those bonds. Risk perceptions change because information is often limited for individual municipalities due to minimal disclosure requirements and infrequent trading, and a default event provides new information about local economic conditions (Kidwell and Trzcinka (1982)). However, we suspect that risk perceptions of municipal bonds in Proactive states following a default would remain largely unchanged because of the implicit insurance provided by the state.[4] There is no implicit insurance in Chapter 9 states, however, implying that a municipal bond default is more likely to affect risk perceptions about other bonds located in that state, leading to a contagion effect.

We examine whether a contagion effect exists, and if so, whether it is more pronounced in Chapter 9 or Proactive states and for what duration. First, within each state, we calculate the total par value of defaulted bonds in the previous quarter as a percentage of the total par value of municipal bonds outstanding. We then examine how this relates to municipal bond yields in that state. In Chapter 9 states, we find that a 0.1 percentage point increase in the percentage of defaulted bonds (by par value) in the previous quarter implies a 1.3 basis point increase in yields for other municipal bonds in that state. This contagion effect remains positive and significant for one year. However, there is no significant contagion effect in Proactive states at any horizon.

U.S. Census data suggest that Proactive states play an active role in assisting its municipalities, especially in times of distress. When state economic conditions are strong, the state-to-local intergovernmental revenue transfer as a percentage of total local government revenue is 2.2 percentage points higher in Proactive states compared to Chapter 9 states. However, when economic conditions are weak, this difference increases to 3.5 percentage points. This is consistent with our

[4]For example, during the New York City financial crisis of 1975, the governor stepped in to provide aid to the city, citing concerns that without this aid, borrowing costs would increase in surrounding municipalities.

evidence that local municipal bond yields in Proactive states are lower and less cyclical than those in Chapter 9 states.

The advantages that accrue to local municipalities in Proactive states come at a cost to their state governments. By providing assistance to a municipality when it is financially distressed, the Proactive state government bears some of the local credit risk. Reflecting this higher risk, we find that yields on state-issued general obligation bonds in the Proactive states are approximately 3.5 basis points higher than those in Chapter 9 states. For new issuances, offering yields in Proactive states are 11.4 basis points higher than those in Chapter 9 states.

Finally, we provide suggestive evidence that the risk-sharing mechanism in Proactive states also generates a moral hazard problem. Using the total local debt level as a proxy for the severity of this problem, we find that the ratio of total local debt to total local revenue is 11.9 percentage points higher in Proactive states than Chapter 9 states. This suggests that the downside protection provided by the state induces local municipalities to take on more risk in the form of higher levels of debt.

To the best of our knowledge, our study is the first to take a comprehensive look at borrowing costs under different regimes of intergovernmental risk sharing. Poterba (1994) finds that adjustment within a state to a fiscal crisis is faster when states have more restrictive fiscal rules and when state party control is not divided. The Proactive states identified in our sample have lower average local municipal bond yields, which ties into this story since Proactive states have mechanisms in place for dealing with municipalities that exhibit signs of fiscal distress. Kidwell and Trzcinka (1982) find that the New York fiscal crisis in 1975 was not associated with a contagion effect, in that other municipal bonds within the state of New York did not have significantly higher yields following the crisis. In a follow-up paper, Kidwell and Trzcinka (1983) find that yields on new issuances in New York state were also not affected by the New York City fiscal crisis. Our results are consistent with these findings, as New York is classified as a Proactive state based on the programs they implemented during the New York City fiscal crisis.

In addition, our paper contributes to the recent literature about the potential costs of sovereign bailouts. Using an event study approach, Kilponen, Laakkonen, and Vilmunen (2015) provide evidence that ECB announcements of financial assistance programs reduced government bond yields in recipient countries and increased government bond yields in guaranteeing countries during the European sovereign crisis. Ardagna and Caselli (2014) suggest that the potential moral hazard problem brought about by ECB sovereign bailouts would not be severe because the bailouts are funded with a combination of assistance from the ECB and austerity measures, and hence still very

costly for the recipient country. Using a rich cross-section of distress-related state policies over a long time period that contains a large sample of default events, we provide further evidence that financial assistance programs protect yields following default events, reduce cyclicality in yields, and prevent contagion, and we also document the tradeoffs of such programs.

This paper also relates to recent work that investigates the effect of creditor protections and rights on the terms and costs of private sector debt. Bae and Goyal (2009) examine how creditor rights and contract enforceability affect loan contracts in 48 countries and find that strong creditor rights and enforceability reduce loan spreads. Similarly, Qian and Strahan (2007) show that loans made in a country with strong creditor protections have more concentrated ownership, longer maturities, and lower interest rates. Davydenko and Franks (2008) show that bankruptcy codes in France, Germany, and the United Kingdom provide different creditor protections and induce banks to adjust their lending and reorganization practices accordingly. Our study extends the literature on creditor protections to the public sector, which provides novel implications about the tradeoffs between borrowing costs at the local and state level in the presence of creditor protections provided by state programs.

The importance of state policy is also stressed in the law and public economics literature. Spiotto (2014) emphasizes that Chapter 9 debt adjustments should be a last resort after all alternatives for remedying local fiscal distress have been exhausted. Frost (2014) proposes that states authorize Chapter 9 bankruptcy on a conditional basis, stating that the increased use of Chapter 9 could have a negative impact on municipal economics which can extend beyond the individual distressed municipality. Finally, Pew Charitable Trusts (2013) reviews state intervention programs for distressed municipalities and recommends a proactive, rather than reactive, approach to dealing with municipalities exhibiting signs of distress.

The rest of this paper is organized as follows. Section 2 outlines the methodology for classifying each state as Proactive, Chapter 9, or neither. Section 3 describes the data used in this paper, and the filters that we apply to the data. Section 4 presents summary statistics related to municipal bond defaults. Section 5 examines local municipal bond yields conditional on the type of state (Proactive, Chapter 9, Neither) that issued the bond. Section 6 examines potential contagion effects around municipal bond defaults. Section 7 examines the potential costs of being a Proactive state. Finally, Section 8 concludes.

2 State Policies for Distressed Municipalities

States have different mechanisms in place to deal with financially distressed municipalities. In this section, we categorize states into three mutually exclusive groups according to their policies for dealing with local distress. The three groups are Chapter 9 states, Proactive states, and Neither states.

Chapter 9 States

When a municipality is financially distressed and unable to meet its debt obligations, it may file for bankruptcy in a federal court under Chapter 9. State policies regarding Chapter 9 access can be classified into one of three types; blanket authorization, de-authorization, and conditional authorization (Frost (2014)). We denote the first group of states as Chapter 9 states, as those are the states that have the most lenient authorization policies.

Chapter 9 states allow financially distressed municipalities to file under Chapter 9 without further restriction. In contrast, de-authorization states prohibit access to Chapter 9 and conditional authorization states grant access to Chapter 9 only under certain conditions. In our sample period of 1999 to 2010, there are 13 Chapter 9 states: Alabama, Arkansas, Arizona, California, Idaho, Minnesota, Missouri, Montana, Nebraska, Oklahoma, South Carolina, Texas, and Washington (Spiotto, Acker, and Appleby (2012)).[5] These states have statutes in place that affirm unconditional Chapter 9 authorization for any qualifying governmental unit. For example, South Carolina statute reads "... all appropriate powers are hereby conferred upon any county, municipal corporation, township, school district, drainage district or other taxing or governmental unit ... to institute any appropriate action and in any other respect to proceed under ... any existing act of the Congress of the United States ... relating to bankruptcy ..."[6]

In these states, the policy of unconditional Chapter 9 authorization represents a relatively decentralized approach to local financial problems. Chapter 9 states typically do not have laws allowing states to intervene in municipal finances. By specifying unconditional authorization in their statutes, these states expressly leave it up to local governments to fix local financial problems.

Because Chapter 9 functions advantageously to debtors, the decentralized approach of blanket Chapter 9 authorization can be viewed unfavorably by bondholders. Specifically, once a municipality files for Chapter 9 bankruptcy protection, creditors cannot enforce any collection efforts to

[5] For further details on municipal bankruptcy authorization, see Appendix A.
[6] S.C. CODE ANN. §6-1-10.

the debtor. Moreover, only the municipality has the right to submit debt adjustment plans to the court, and the creditors can only approve or disapprove the plans submitted by the municipality. Therefore, the creditors' negotiation powers are much weaker under Chapter 9. The court's powers are also much more limited under Chapter 9. For example, the court cannot change the plan submitted by the municipality, nor can it instruct an order that interferes with local governmental matters, such as an increase in local taxes (Kimhi (2008)).

Proactive States

The second group of states we consider are Proactive states. Some states have statutes allowing them to provide assistance to a municipality and intervene in its finances in the event of local financial distress. This assistance can take the form of emergency loan provisions, revenue transfers, and technical support. In addition, the state will typically appoint a person or board that assesses the problem and makes recommendations to address the problem. Depending on the state, the appointee even has the authority to control municipal finances (Pew Charitable Trusts (2013)). For example, when Pittsburgh was facing serious financial problems as a result of decade-long budget deficits in 2003, it entered the state's Municipalities Financial Recovery Program, also known as Act 47 (City of Pittsburgh (2012)). The state appointed a coordinator who, after consulting with the city's creditors, came up with a multi-year financial recovery plan that was adopted by the city council in 2004. The state also charged the Intergovernmental Cooperation Authority (ICA), a state agency, with overseeing the city's finances to ensure that the city meets its financial obligations and improves spending practices. Later in 2004, the state approved tax revisions led by the ICA and based on the Act 47 recovery plan. As a result of the intervention, Pittsburgh achieved positive operating balances in 2005.

Some states have more systematic and aggressive programs than other states. Out of the twenty-two states which have some form of state program, we identify eight states whose municipal distress-related programs are stronger from the point of view of bondholders. By examining statutes on state policies regarding distressed municipalities, we determine a state to be "Proactive" if debt default triggers state intervention and if the state appointee has the authority to restructure municipal finances (Pew Charitable Trusts (2013) and Spiotto, Acker, and Appleby (2012)). The states classified as Proactive are Maine, Michigan, Nevada, New Jersey, New York, North Carolina, Ohio, and Pennsylvania. Table 1 summarizes the procedure for identifying the Proactive states. Because our sample period ends in 2010, changes in state programs after 2010 are not reflected in this table. For example, Rhode Island adopted a strong intervention program in June 2010 but is

not identified as a Proactive state in our sample. For convenience, Appendix A provides a table of statutes related to state policies about distressed municipalities.[7]

Proactive state policies represent a relatively centralized approach to local financial distress. Therefore, restructuring processes via state programs reflect not only the concerns of the local government but also of the state. In particular, one common motivation for state intervention is to preserve the creditworthiness of the overall state (Pew Charitable Trusts (2013)). As such, bondholders are likely to be better protected under these proactive programs than under Chapter 9. For example, when Harrisburg was on the verge of missing its $3.3 million in bond payments in 2010, Pennsylvania provided the city with state aid to avoid default.[8]

It is worth noting that the programs in Proactive states do not directly prevent defaults and bankruptcies. For example, Michigan, New Jersey, New York, North Carolina, Ohio, and Pennsylvania authorize Chapter 9 as a last resort if the state appointee determines that bankruptcy is unavoidable. As such, past intervention episodes indicate how much loss the state is willing to force on bondholders to resolve local insolvency.[9]

Neither States

The third group of states consists of twenty-nine states that are neither Chapter 9 states nor Proactive states. We call these states Neither states. This group does not have explicit state policies regarding local financial distress.

Comparison of the Three Groups

For convenience, Figure 1 provides a map of the United States that indicates the Chapter 9 states, Proactive states, and Neither states. Interestingly, Proactive states tend to be clustered in the northeast, which tends to be more Democratic, while Chapter 9 states are mostly clustered in the southern and western states, which tend to be more Republican. California and Washington are

[7] Interestingly, Proactive states tend to coincide with states that monitor local finances effectively. Kloha (2005) report that of the fifteen states which use indicators to monitor local financial conditions, only eight have indicators that are effective in detecting local distress. These eight states include Maryland, Nevada, New Hampshire, New Jersey, New York, North Carolina, Ohio, and Pennsylvania. Six of the eight states that are considered Proactive are also considered by Kloha (2005) as effective in detecting local distress.

[8] Harrisburg, Pennsylvania, Bond default averted with state aid, September 12, 2010, Bloomberg.

[9] "It remains to be seen whether the decision of Detroit's state-appointed emergency manager to file for bankruptcy, default on debt and propose deep losses to bondholders is because of Detroit's unique weaknesses or a harbinger of a policy change that will weaken its oversight program for other cities as well", September 16, 2013, Reuters.

exceptions to Chapter 9 states that are Republican; we suspect this is because these are "Frontier" states, in which the municipalities were established before becoming states and have a history of operating more independently from the state government.[10]

An examination of local government finances relative to state government finances further suggests that local governments in Chapter 9 states operate more independently from the state than Proactive states.[11] Figure 3 shows the average share of local government revenue that is made up of intergovernmental transfers from the state. This share is highest among Proactive states, suggesting that these local governments are more dependent on their state governments.

3 Data

We study yields around municipal bond default events by utilizing several data sources. Information on daily municipal bond prices and yields is provided by the Municipal Securities Rulemaking Board (MSRB), which is a self-regulatory organization that writes rules regulating broker-dealers and banks in the U.S. municipal securities market. The data consist of all broker-dealer municipal bond trades for the period 1999 to 2010. Each observation includes the bond price, yield, par value traded, and whether the trade was a customer purchase from a broker-dealer, customer sale to a broker-dealer, or an interdealer trade.

Our second source of data is the Mergent Municipal Bond Securities Database. This database is used to identify attributes of each bond contained in MSRB database. Specifically, for each bond, the Mergent database provides its issuer, state of issuance, issuance date, maturity date, coupon rate, issue size, sector, and bond ratings from Moody's and Standard & Poor's (conditional on the bond being rated). It also provides information about whether the bond is general obligation, insured, callable, and puttable.

We also collect municipal bond default information from the Bloomberg Default Event Calendar for the period 1999 to 2010, which includes both monetary and technical defaults. For each bond that experienced a default, we obtain information on the date of the default event. Altogether, there are 2,063 municipal bonds that experienced at least one default event, where these bonds

[10] U.S. territories, including Puerto Rico, are excluded from our analysis, as Chapter 9 bankruptcy protection is not applicable to U.S. territories. Puerto Rico is currently experiencing a municipal debt crisis due to excessive issuance of municipal bonds. These bonds were popular among municipal bond investors because of their triple tax-exempt status (federal, state, and local). Congress is currently debating whether to extend Chapter 9 bankruptcy protection to U.S. territories.

[11] State and local government financial information for the Census years 1997 to 2012 was obtained from the U.S. Census Bureau website.

originated from 679 different issuers. This information is merged with the MSRB and Mergent databases.

We study municipal bond yields around default events at the monthly level. The MSRB database consists of intraday municipal bond transactions. To convert this database to a monthly frequency, we calculate the average yield of all "customer buy" transactions within each bond-month, weighted by the par value traded. We only use customer buy transactions, as this mitigates time series variation in municipal bond yields due to bid-ask bounce. In addition, the municipal bond market is often considered a buyers' market, meaning that the majority of transactions are customer purchases from broker-dealers. The exclusion of customer sell and interdealer transactions does not significantly reduce our sample.

If a municipal bond is contained in the MSRB database but not the Mergent database, it is excluded. We also exclude municipal bonds with fewer than ten transactions, a maturity of at least one hundred years, a variable coupon rate, or bonds that are federal taxable. We only include bonds that are issued in states, and not those issued in U.S. territories, as state-issued bonds are more likely to be subject to Proactive or Chapter 9 policies. To mitigate the effect of outliers, we exclude any transactions from the MSRB database that have non-positive yields or yields greater than 50 percentage points. We also exclude state-issued general obligation bonds from our main analysis, as state policies generally apply to municipal bonds issued at the local level. After applying these filters and aggregating trades into bond-month observations, we are left with a final sample of 5,307,584 bond-month observations.

4 Summary Statistics

Panel A of Table 2 contains summary statistics for the municipal bonds in our sample. There are 416,643 bonds (about 99.5 percent of all municipal bonds) that did not experience a default event; we will call these "non-default bonds." Within these bonds, there are 25,554 issuers. The average par value of these municipal bonds is \$6.69 million, with an average maturity of 13.82 years. About 10 percent of these bonds are considered "conduit" bonds, which are bonds sold by the local government on behalf of a non-governmental third party, where the funds generated by the third party are used to repay the bond.[12] 61 percent of non-default bonds are insured. 80 percent of these bonds are classified as investment grade and the remaining 20 percent are unrated.

[12] We collect issuer and ultimate borrower information from Bloomberg to identify conduit bonds. A bond is classified as conduit if its ultimate borrower is different from its issuer.

42 percent of these bonds are general obligation, meaning they are backed by the full faith and credit of the issuing municipality. Finally, 62 percent of these bonds are callable, meaning the municipality has the right to repurchase the bonds it issued at a pre-specified price, starting at a pre-specified date.

For comparison purposes, Panel A also reports summary statistics for municipal bonds that experienced at least one default event, which we will call "default bonds." Altogether, there are 2,063 default bonds, which comprises approximately 0.5 percent of all municipal bonds in our sample. Within these bonds, there are 679 issuers. In addition, the average par value of these bonds is \$9.82 million, which is about 47 percent higher than the average par value for non-default municipal bonds (\$6.69 million). That is, issuers of default bonds tend to issuer fewer bonds at higher par values. This is likely because these bonds have a higher tendency to be unrated (69 percent, versus 20 percent for non-default bonds), which implies that it is more difficult to attract many investors on a per-bond basis. Default bonds have a longer average time to maturity (18.98 years) and have a higher tendency to be callable (78 percent).

In addition, a higher percentage of these bonds are conduit (59 percent), meaning that conduit bonds default more often. This is unsurprising, as conduit bonds are backed by cash flows from a non-governmental third party entity, and not a municipality with a typically reliable tax base. 27 percent of default bonds are insured, 22 percent are investment grade, and 4 percent are general obligation. All of these numbers reflect the increased riskiness of these bonds, even before a default occurs. In our tests later in the paper, we make sure to control for these characteristics.

We also break down non-default and default municipal bonds by bond type. Altogether, there are nine bond type categories: Education, Healthcare, Housing, Improvement/Development, Public Service, Recreation, Transportation, Water/Sewer, and Other. Panel B of Table 2 reports statistics related to bond type. For non-default bonds, the three most frequently observed bond type categories are Education (31.8 percent), Improvement/Development (30.3 percent), and Water/Sewer (14.3 percent). In contrast, for default bonds, they are Improvement/Development (25.5 percent), Healthcare (19.8 percent), and Housing (18.7 percent).

Why are defaults more prevalent in these latter three categories? It is likely because bonds from these categories tend to be more speculative investments, backed by cash flows that have greater uncertainty. Improvement/Development bonds are typically used to develop residential and commercial zones in that municipality, where the cash flows are backed by tax revenues from residents and businesses that are expected to occupy those zones. Housing bonds are typically used to develop housing projects in lower-income areas, and these cash flows are subject to local economic

conditions, highly variable revenues and costs, and potential mismanagement. Similarly, healthcare bonds are used to develop local hospitals and assisted living facilities, which are also subject to the same uncertainties.

A potential selection bias concern is that municipal bond attributes will differ by state type. To address this concern, we report municipal bond summary statistics by state type in Table 3. For the most part, the differences in municipal bond attributes between Chapter 9 and Proactive states are minimal. Both states have a similar proportion of investment grade, unrated, and insured bonds, and the mean bond par value and maturity are also similar. The main differences are that Proactive states tend to have more bonds per issuer and a slightly higher proportion of general obligation bonds (51 percent in Proactive states versus 40 percent in Chapter 9 states). These results suggest different bond types will not be self-selected into different state types in equilibrium in a way that significantly affects our analysis.

The main purpose of our paper is to examine municipal bond yield spread changes around default events, and how these changes differ depending on whether the bond is located in a Proactive state, Chapter 9 state, or neither. Panel A of Table 4 contains information about the number of municipal bond defaults within each of these three state types. We separate municipal bonds into two categories: non-conduit and conduit. Non-conduit bonds, which are backed by their respective municipalities, are more likely to have the option to declare Chapter 9 bankruptcy and be subject to state intervention policies. On the other hand, conduit bonds, which are backed by non-governmental third parties, do not have the option to declare Chapter 9 bankruptcy and are unlikely to be subject to state intervention policies. Within Chapter 9 states, there are 443 non-conduit default events, while for Proactive states, there are 123 default events. On a default-per-state basis, this implies there are about 34 non-conduit default events per state for Chapter 9 states (443 default events divided by 13 states) and 15 default events per state for Proactive states (123 default events divided by 8 states). Panel B of Table 4 reports the average fraction of bonds that experienced a default event within each state type. In Chapter 9 states, 0.38 percent of bonds experienced a default event, while in Proactive states, only 0.16 percent of bonds experienced a default event. On a per-state basis, these numbers imply that defaults are less likely to occur in Proactive states, which makes sense, given that Proactive states are designed to intervene and assist a municipality when it is exhibiting signs of distress.

5 Municipal Bond Yields and State Policies

We first examine how a default event affects the yield of local municipal bonds, and condition this event on whether this bond was issued in a Chapter 9 state, Proactive state, or neither. The independent variable of interest is $Default$, which is an indicator variable that equals one if the bond previously experienced a default event and zero otherwise. The dependent variable we use throughout our analyses is the duration-matched yield spread (y), which is defined as the difference between the municipal bond yield and the same-duration U.S. treasury yield. We obtain U.S. treasury yields from the Federal Reserve Board website. Specifically, the Federal Reserve Board provides daily parameters with which to calculate the entire U.S. treasury yield curve, where the functional form for the curve, based on Nelson and Siegel (1987) and Svensson (1994), is as follows:

$$TYield(D) = \beta_0 + \beta_1\left(\frac{1-e^{-D/\tau_1}}{D/\tau_1}\right) + \beta_2\left(\frac{1-e^{-D/\tau_1}}{D/\tau_1} - e^{D/\tau_1}\right) + \beta_3\left(\frac{1-e^{-D/\tau_2}}{D/\tau_2} - e^{D/\tau_2}\right).$$

In this equation, $TYield(D)$ is the yield on a treasury bond with duration D and $(\beta_0, \beta_1, \beta_2, \beta_3, \tau_1, \tau_2)$ is the daily set of parameters provided by the Federal Reserve Board. For more details about the functional form and daily parameters, see Gürkaynak, Sack, and Wright (2007).

In addition to default indicators and state type indicators, we also control for bond characteristics and state economic conditions. Specifically, we include controls for whether the bond is general obligation, callable, puttable, rated (Rated), and the rating number conditional on being rated (Rated $\times$ Rating). Following Butler, Fauver, and Mortal (2009), the rating number is on a scale from one to twenty-two, with one being the highest rating from Moody's (we use the S&P rating when the Moody's rating is not available). We also include time to maturity and inverse time to maturity (Inverse TTM). Similar control variables are employed in Butler, Fauver, and Mortal (2009), Bergstresser, Cohen, and Shenai (2011), and Gao and Qi (2013). Based on Schultz (2013), we also control for states that tax in and out-of-state municipal bonds equally (Equal Tax). Finally, we include three-month growth in the state coincident index (Coincident Index), which is meant to control for economic conditions in that state. The state coincident index encompasses payroll employment, hours worked in manufacturing, unemployment, and wage and salary disbursements in that state.

To determine how default events affect municipal bond yields, we run the following regression:

$$\begin{aligned} y_{it} &= \beta_0 + \beta_1 \cdot Default_{it} + \beta_2 \cdot (Default_{it} \times Ch.9_i) + \\ &\quad \beta_3 \cdot (Default_{it} \times Proactive_i) + \beta_4 \cdot (Default_{it} \times Insured_i) + \\ &\quad \beta_5 \cdot Ch.9_i + \beta_6 \cdot Proactive_i + \beta_7 \cdot Insured_i + \\ &\quad \gamma' Y_{it} + \delta_t + \varepsilon_{it}, \end{aligned} \tag{1}$$

where i denotes the municipal bond, t denotes the year-month, and δ_t denotes year-month fixed-effects. We also double-cluster standard errors by issuer and year-month. β_2 and β_3 are meant to capture the incremental effect a municipal bond default has on the yield if the bond was issued in a Chapter 9 and Proactive state, respectively. β_5 and β_6 are meant to capture ex-ante effects on the yield, due to being located in one of these state types.

The results are reported in Table 5. According to the first column, a default event increases the municipal bond yield by 5.9 percentage points, unconditional on the state type. In the second column, we condition on state type. We find that, following a default event in a Chapter 9 state, the municipal bond yield increases by 6.7 percentage points, implying that investors expect higher losses due to the relative ease of declaring Chapter 9 bankruptcy in that state. In a Proactive state, however, a default event only increases the yield by 4.2 percentage points, which represents a statistically significant difference of about 2.5 percentage points between those two state types. Finally, if the bond is insured, the yield increases by 0.95 percentage points following a default event.

Our results also indicate that investors ex-ante prefer municipal bonds issued in Proactive states to those in Chapter 9 states, all else equal. According to the second column, municipal bond yields in Chapter 9 states are 3.9 basis points higher than those in Proactive states. That is, an investor requires a higher yield when purchasing a municipal bond in a state in which the borrower can unconditionally file for Chapter 9 bankruptcy. Proactive states, in contrast, have mechanisms in place to ensure its municipalities do not default on their debt obligations, and will typically only allow Chapter 9 filing as an absolute last resort.

The control variable coefficients are as expected. Callable bonds have higher yields to compensate for the valuable option embedded in the bond for the seller. Similarly, puttable bonds, which give the holder the right to sell his bond back to the issuer before the maturity date, have lower yields because of valuable option embedded in the bond for the buyer. High-rated bonds have lower yields than low-rated bonds. Bonds with a longer time to maturity have higher yields because they are

subject to higher interest rate risk and inflation risk. Yields are lower for general obligation bonds because they are backed by the full faith and credit of the issuing municipality; shortfalls can be covered, for example, by raising local taxes. Yields are 9.6 basis points lower for bonds that have insurance, indicating that bonds which issuers choose to insure benefit from having insurance.[13] Bonds in Equal Tax states have higher yields, which is consistent with Schultz (2013). Bonds with a larger issue sizes have lower yields. Finally, we include past three-month growth in the state coincident index and find that when it is one percentage point higher (lower), municipal bonds in that state have yields that are 4.6 basis points lower (higher).

As a falsification exercise, we run the same regressions for conduit municipal bonds only. These bonds are sold by the local government on behalf of a non-governmental third party, where the funds generated by the third party are used to repay the bond. Typically, in the event of default, the government is not held responsible. For example, K-Mart, a massive retail franchise, built approximately 96 stores in various locations and funded these by having the local government issue conduit bonds on their behalf. These bonds would be backed by revenues generated from those stores. When K-Mart filed for bankruptcy protection in 2002, it defaulted on many of these bonds. The local governments were not responsible for these defaults, although might have indirectly suffered negative consequences from being associated with the defaults. Therefore, while we anticipate a Chapter 9 or Proactive effect for non-conduit bonds, we do not anticipate any effect for conduit municipal bonds.

The results are reported in the last two columns of Table 5. The first of these two columns indicates that if a conduit bond experiences a default event and we do not condition on state type, then its yield spread increases by 4.2 percentage points. The last column conditions on state type and provides evidence that there is no significant incremental effect following default if the conduit bond is located in a Chapter 9 or Proactive state, which makes sense given that conduit bonds cannot file for Chapter 9 bankruptcy protection, and it is likely that intervention policies do not affect yields ex-post. Ex-ante, there is also no difference in yields for Chapter 9 states versus Proactive states. Therefore, we find that conduit bonds issued in any state do not have significantly different yields, unlike non-conduit bonds which do have higher yields in Chapter 9 states.

Next, we examine whether offering yields of newly issued municipal bonds are affected by being located in a Chapter 9 or Proactive states. To do this, we test the same regression model as above, except that we exclude the Default indicator and y_{it} is now defined as the difference between the offering yield and duration-matched Treasury bond yield for bond i in issuance month t. Table 6

[13] For related results on municipal bond insurance, see Nanda and Singh (2004) and Wilkoff (2013).

reports the results. The first column reports that offering yields in Chapter 9 states are 1.4 basis points higher than those in Proactive states. We also expect that newly-issued bonds with higher credit risk will have especially higher yields in Chapter 9 states than Proactive states because higher credit risk means a higher probability of default, and being located in a Chapter 9 state increases the probability of declaring Chapter 9 bankruptcy following default. The second column in Table 6 reports the results for unrated bonds, while the last column reports the results for uninsured bonds. We find that the offering yields of unrated bonds are 3.2 basis points higher in Chapter 9 states than Proactive states, while for uninsured bonds, offering yields are 10.4 basis points higher.

To further strengthen our identification, we examine yield differences between counties on the border of North Carolina and South Carolina. North Carolina is a Proactive state and South Carolina is a Chapter 9 state. Because of the close geographic proximity of these counties, any differences in yields between counties north and south of this border can be more readily attributed to their differences in policies regarding distressed municipalities.[14] Figure 2 provides a map of the North Carolina and South Carolina counties, with the border counties in South Carolina and North Carolina highlighted in orange and blue, respectively.

We test a similar regression model as before, except that we only include municipal bonds from these border counties. The results are report in Table 7. Column (2) reports results for secondary market yields and also includes county-level controls (population growth and real per capita income) and column (4) reports similar results for offering yields (columns (1) and (3) exclude county-level controls). The evidence suggests that secondary market yields in the border counties within South Carolina are 7.65 basis points higher than the yields in the border counties within North Carolina. Similarly, offering yields in the South Carolina border counties are 9.19 basis points higher.

We also expect that municipal bond yields in Chapter 9 states will vary more with local economic conditions. In general, if economic conditions are poor, then the likelihood of a municipal bond default in that state will be higher. In a Chapter 9 state, a municipal bond default is more likely to lead to Chapter 9 bankruptcy, since those states unconditionally allow a distressed municipality to file for Chapter 9 bankruptcy. Therefore, the yield reaction to economic conditions will be stronger in Chapter 9 states than in Proactive states due to the increased likelihood that a distressed municipality will file for Chapter 9 bankruptcy.

To examine whether yields are more sensitive to local economic conditions in Chapter 9 states, we regress municipal bond yields on the following interaction terms: $Coincident\ Index \times Ch.9$ and $Coincident\ Index \times Proactive$ (along with the control variables from before). If yields vary more

[14] Holmes (1998) implements a similar methodology when examining differences in right-to-work laws across states.

with local economic conditions in Chapter 9 states, then we should expect a negative and significant coefficient on the former interaction term.

The results are reported in Table 8. According to the first column, a one percentage point decrease in coincident index growth is associated with a 3.1 basis point increase in municipal bond yields in Proactive states. However, if the municipal bond was issued in a Chapter 9 state, then a one percentage point decrease in coincident index growth is associated with a 9.1 basis point increase in municipal bond yields in that state.

This increased sensitivity to economic conditions in Chapter 9 states primarily manifests in "bad times", which we define as an indicator variable that equals one if the coincident index is less than 0.5 percentage points and zero otherwise.[15] Similarly, "good times" is defined as indicator variable that equals one if the coincident index is greater than or equal to 0.5 percentage points and zero otherwise. According to the second column in Table 8, yields are 6.4 basis points higher in bad times in Chapter 9 states compared to Proactive states, but are not significantly different in good times. This evidence indicates that yields in Chapter 9 states are more sensitive to local economic conditions, particularly in bad times.

6 Contagion Effects

A major concern in municipal bond markets is the contagion effect, in which a default event in one municipality causes investors to change their risk perceptions of other municipalities in that state, leading to higher yields in those municipalities. Risk perceptions change because information is often limited for individual municipalities due to minimal disclosure requirements and infrequent trading, and a default event provides new information about local economic conditions (Kidwell and Trzcinka (1982)). While a default event in a Proactive state will lead to a change in the risk perceptions regarding the fundamentals of the local economy, the Proactive state measures mitigate creditors' concerns that these weak fundamentals will affect their repayments from other municipalities in that state.[16] No such measures exist in Chapter 9 states, however, increasing the likelihood of contagion.

Several high profile cases of municipal distress suggest that state policy can be influenced by contagion concerns. Harrisburg, PA was financially distressed in 2010, and the state advanced

[15] 0.5 percent represents the median coincident index growth across the entire sample.

[16] For example, during the New York City financial crisis of 1975, the governor stepped in to provide aid to the city, citing concerns that without this aid, borrowing costs would increase in surrounding municipalities.

$4 million in loans so that Harrisburg could avoid default. Then-Governor Edward Rendell cited contagion concerns, stating that missing a bond payment "would devastate not only the city, but the school district, the county, and central Pennsylvania" (Singer (2010)). During the New York City fiscal crisis of 1975, the governor stepped in to provide aid to the city, citing concerns that without this aid, borrowing costs would increase in surrounding municipalities. Yields in New Jersey municipalities increased in 2014 after Governor Chris Christie appointed Kevyn Orr as the emergency manager to Atlantic City, which was in economic distress and had $344 million in municipal debt outstanding. Previously, Orr was appointed as emergency manager to Detroit and ultimately filed for Chapter 9 bankruptcy. Moody's downgraded Atlantic City debt to "Caa1" in 2014, citing the appointment of Orr, and this in turn adversely affected yields in New Jersey's 565 municipalities. The precedent in New Jersey that the state was now more open to Chapter 9 bankruptcy filings was now set.

The purpose of this section is to examine whether a contagion effect exists in municipal markets and, if it does, to determine: (1) the duration of the contagion effect, and (2) whether it is more pronounced in Chapter 9 or Proactive states.

To examine potential contagion effects, we first calculate the total par value of defaulted bonds within each state-quarter, and divide this by the total par value of all bonds within that state-quarter. We denote this variable as $PCTDEF_{q-k}$ (percentage default), where $q-k$ denotes the lagged three-month period relative to the yield in month t. Bonds that have previously defaulted are excluded from this analysis. Then, for bonds within each state type (Chapter 9, Proactive, Neither), we run the following regression:

$$y_{it} \quad = \quad \beta_0 + \sum_{k=1}^{4} \beta_k \cdot PCTDEF_{i,q-k} + \gamma' Y_{it} + \delta_t + \varepsilon_{it},$$

where all other variables are defined as before.

The results are reported in Table 9. For each state type, we run the regression using only $PCTDEF$ from the previous quarter, and then again for the previous four quarters. We do find evidence of a contagion effect in Chapter 9 states, but not for Proactive states. Specifically, in Chapter 9 states, we find that a 0.1 percentage point increase in $PCTDEF$ in the previous quarter is associated with a 1.2 basis point increase in yields for other bonds in that state. According to column (2), this effect persists for one year. Neither states have a similar, but milder, contagion effect. Proactive states, in contrast, do not experience any contagion effect at any lag. Therefore, our evidence indicates that contagion is significant in Chapter 9 states, but not necessarily in Proactive states.

Our finding is consistent with Kidwell and Trzcinka (1982), who examine potential contagion effects in the New York municipal bond market following the fiscal crisis in New York City in 1975. They show that there were no significant increases in yields in New York municipal bonds following this crisis. At best, they find that if there was an effect, it was small and of short duration. Our evidence corroborates this finding, as New York is considered a Proactive state, and we find no evidence of a contagion effect in these states.

7 The Cost of Being a Proactive State

Proactive states implement measures to protect the creditworthiness of the state when its local municipalities are exhibiting signs of distress. As a result, local municipal bonds in these states have lower yields, both in the secondary market and at issuance, than those in Chapter 9 states. In addition, municipal bond yields in Proactive states are less sensitive to economic conditions and are not susceptible to contagion, unlike those in Chapter 9 states. However, we suspect that these benefits come at a cost. When a municipality in a Proactive state is distressed, the state government can provide emergency loans (at zero or low interest rates), grants, credit guarantees, and professional and technical assistance. By aiding local governments in times of distress, the state government bears some of the local credit risk. Ex-ante, Proactive states also have to allocate resources toward monitoring its municipalities for signs of distress.

Therefore, we expect that state-issued general obligation bonds in Proactive states will have higher yields than those issued in Chapter 9 states. To test this hypothesis, we examine yield spreads for state-issued general obligation bonds[17] in Proactive and Chapter 9 states, controlling for the same bond characteristics as before. The results are reported in Table 10. According to the first column, secondary market yields on state-issued general obligation bonds in Proactive states are approximately 3.5 basis points higher than those in Chapter 9 states. The second column reports the results for offering yields. We find offering yields in Proactive states are approximately 11.4 basis points higher than those in Chapter 9 states. These results confirm that the benefits local governments receive from being in a Proactive state come at a cost to the state itself.

Local government finance data from the U.S. Census are also consistent with this result. One way in which state governments support their municipalities is through intergovernmental revenue transfers. Distress-related policies in Proactive states are reflective of their overall willingness to aid their municipalities, particularly in bad times. Therefore, we expect that intergovernmental

[17] MSRB provides information regarding whether the issuer is a state or local government.

transfers in Proactive states will be higher than those in Chapter 9 states, and will be even higher when state economic conditions are poor.

To test this, we calculate state-to-local intergovernmental transfers as a percentage of total local government revenue for each state-year ($Transfer_{it}$) for the fiscal years 2000 to 2012 (excluding 2001 and 2003, when state-level census data were not available). Then, we examine how these transfers vary with state economic conditions in Proactive and Chapter 9 states. Specifically, we run the following regression:

$$\begin{aligned} Transfer_{it} &= \beta_0 + \beta_1 \cdot Proactive_i + \beta_2 \cdot Proactive_i \times \Delta GSP_{it} + \\ &\quad \beta_3 \cdot Ch.9_i + \beta_4 \cdot Ch.9_i \times \Delta GSP_{it} + \beta_5 \cdot \Delta GSP_{it} + \\ &\quad \gamma' Z_{it} + \delta_t + \varepsilon_{it}, \end{aligned} \tag{2}$$

where ΔGSP is the annual log growth of real state GDP per capita. Z is a vector of control variables that includes federal-to-local intergovernmental transfers as a percentage of total local government revenue, the maximum state income tax rate, the percentage of the state population that is over the age of sixty-five, the state S&P credit rating (which is on a numerical scale from one to twenty-two, which one being the highest rating), and the log of state income per capita. These control variables are similar to the ones used in Matsusaka (2000) and Butler, Fauver, and Mortal (2009).

The results are reported in Table 11. According to the second regression column, the proportion of total local government revenue that comes from the state government in Proactive states is 2.5 percentage points higher than Chapter 9 states. In addition, the transfer in Proactive states is more countercyclical than in Chapter 9 states, as indicated by the significantly negative coefficient term on the interaction between state GDP growth and the Proactive state indicator variable.

According to regression column (3) in Table 11, intergovernmental revenue transfers in Proactive states are more countercyclical than transfers in Chapter 9 states because revenue transfers in Proactive states are particularly high when economic conditions are weak. In this regression, "bad times" ("good times") is defined as an indicator variable that equals one if State GDP growth is less than (greater than or equal to) 2.0 percentage points and zero otherwise.[18] We find that revenue transfers in Proactive states are 3.5 percentage points higher than transfers in Chapter 9 states during bad times and 2.2 percentage points higher during good times. This suggests that Proactive state governments play an active role in assisting its municipalities in times of distress, and is consistent with our evidence that local municipal bond yields are lower at the cost of higher

[18] 2.0 percentage points is the median of State GDP growth in the full sample.

yields for state-issued municipal bonds.

The risk-sharing mechanism in Proactive states potentially generates a moral hazard problem (Persson and Tabellini (1996)), in that it discourages fiscal discipline of local governments because of the downside protection provided by the state. To deter local officials from exploiting this downside protection ex-ante, the Proactive state policies often give the state government authority to control local finances in times of distress, although this is likely to be ineffective because of the short-term incentives of local politicians.

Using U.S. Census data, we calculate the ratio of total local debt outstanding to total local government revenue for each state-year ($Localdebt_{it}$) for the fiscal years 2000 to 2012 (again excluding 2001 and 2003, when state-level census data were not available). If there is a moral hazard problem in the Proactive states, then we expect this variable to be higher in Proactive states compared to Chapter 9 states. We test the same regression model as above, except that we use *Localdebt* as the dependent variable.

The results are reported in Table 12. According to the second regression column, *Localdebt* in Proactive states is 11.9 percentage points higher than in Chapter 9 states, indicating that local governments in Proactive states take on higher levels of debt. In addition, while we find that there is cyclicality in the debt level in the unconditional case, there is no significant difference in this cyclicality between Proactive and Chapter 9 states. Therefore, our evidence suggests a moral hazard problem in Proactive states. However, its severity does not vary with state economic conditions, likely because debt levels are slow to adjust in the short term.

8 Conclusion

Following the European sovereign debt crisis, the ECB enacted policies that promoted intergovernmental risk sharing between its member countries. Motivated by this, we examine the implications of intergovernmental risk sharing on government borrowing costs using U.S. municipal bond markets. We find that intergovernmental risk sharing between local governments and the state government reduces borrowing costs for local municipalities and promotes economic stability. On the other hand, this leads to higher borrowing costs for the state government and presents a moral hazard problem.

Proactive states have programs that allow the state to restructure local finances of the distressed municipality and provide emergency loans and revenue transfers, while Chapter 9 states uncondi-

tionally allow their distressed municipalities to file for Chapter 9 bankruptcy. This state policy difference leads to increased risk sharing between the state and local governments and stronger creditor protections in Proactive states. We find that yield changes of local municipal bonds following default events are lower in Proactive states. Specifically, in Proactive states, municipal bond yield spreads increase by 4.2 percentage points, while in Chapter 9 states, they increase by 6.7 percentage points.

This difference in state policies also affects local municipal bond yields in general; average yields in Chapter 9 states are 3.9 basis points higher than yields in Proactive states. That is, investors anticipate that if a bond were to default, it could follow through with a Chapter 9 bankruptcy declaration in a Chapter 9 state. Within Proactive states, investors anticipate that the state will step in when a municipality is exhibiting signs of financial distress, and thus are willing to pay a higher price for bonds with this implicit state insurance.

Additional results emphasize the advantages that local municipalities have in Proactive states compared to those in Chapter 9 states. For example, municipal bond yields in Chapter 9 states are more sensitive to state economic conditions, especially when those conditions are poor. In particular, during these times, the yields on local municipal bonds in Chapter 9 states are 6.4 basis points higher than those in Proactive states. We also find evidence of a contagion effect in Chapter 9 states, but not in Proactive states. Specifically, a 0.1 percentage point increase in the percentage of defaulted bonds (by par value) within a Chapter 9 state leads to a 1.3 basis point increase in other municipal bonds within that state. This contagion effect lasts about one year.

However, these advantages that accrue to local municipalities in Proactive states come at a cost to their state governments. By providing emergency assistance to a municipality when it is distressed, the Proactive state government bears some of the local credit risk. Reflecting this higher risk, we find that yields on state-issued general obligation bonds in these states are approximately 3.5 basis points higher than those in Chapter 9 states. U.S. Census data also suggest that Proactive states play an active role in assisting its municipalities in times of distress; we find that state governments transfers are always higher in Proactive states compared to other states, and are even higher when state economic conditions are weak. In addition, we also provide evidence of a moral hazard problem in Proactive states because of the downside protection provided by the state.

In the context of the European sovereign debt crisis, our results suggest that the implementation of ECB policies promoting cross-country risk sharing decreased the borrowing costs of the peripheral countries and increased the borrowing costs of the core countries in the European Monetary Union, all else equal. Furthermore, our results suggest that these policies would reduce the cyclicality

of borrowing costs in the peripheral countries and also minimize contagion effects in which fiscal distress in one country has negative effects on the borrowing costs of other countries in the European Monetary Union. A tradeoff is that the risk-sharing mechanism will induce a moral hazard problem, encouraging peripheral countries to take on more debt.

References

Admati, A., and M. Hellwig, 2013, *The Bankers' New Clothes: What's Wrong with Banking and What to Do about It* (Princeton University Press).

Ardagna, S., and F. Caselli, 2014, The political economy of the Greek debt crisis: A tale of two bailouts, *American Economic Journal: Macroeconomics* 6, 291–323.

Bae, Kee Hong, and Vidhan K. Goyal, 2009, Creditor rights, enforcement, and bank loans, *Journal of Finance* 64, 823–860.

Bergstresser, Daniel B, Randolph B. Cohen, and Siddharth Bhaskar Shenai, 2011, Fractionalization and the Municipal Bond Market, *SSRN Electronic Journal* pp. 1–44.

Butler, Alexander W., Larry Fauver, and Sandra Mortal, 2009, Corruption, political connections, and municipal finance, *Review of Financial Studies* 22, 2673–2705.

City of Pittsburgh, 2012, Act 47 Rescission Report, *Pennsylvania Department of Community and Economic Development*.

Davydenko, Sergei A., and Julian R. Franks, 2008, Do bankruptcy codes matter? A study of defaults in France, Germany, and the U.K., *Journal of Finance* 63, 565–608.

ECB, 2012, Verbatim of the remarks made by Mario Draghi at the global investment conference in London, https://www.ecb.europa.eu/press/key/date/2012/html/sp120726.en.html.

Frost, Michael H, 2014, States as Chapter 9 Bankruptcy Gatekeepers: Federalism, Specific Authorization, and Protection of Municipal Economic Health, *SSRN Electronic Journal*.

Gao, Pengjie, and Yaxuan Qi, 2013, Political Uncertainty and Public Financing Costs: Evidence from U.S. Municipal Bond Markets, *SSRN Electronic Journal*.

Gürkaynak, Refet S., Brian Sack, and Jonathan H. Wright, 2007, The U.S. Treasury yield curve: 1961 to the present, *Journal of Monetary Economics* 54, 2291–2304.

Holmes, T. J., 1998, The effect of state policies on the location of manufacturing: Evidence from state borders, *Journal of Political Economy* 106, 667–705.

Kidwell, David S, and Charles A Trzcinka, 1982, Municipal Bond Pricing and the New York City Fiscal Crisis, *Journal of Finance* 37, 1239–1246.

Kidwell, David S., and Charles A. Trzcinka, 1983, The Impact of the New York City Fiscal Crisis on the Interest Cost of New Issue Municipal Bonds, *The Journal of Financial and Quantitative Analysis* 18, 381.

Kilponen, J., H. Laakkonen, and J. Vilmunen, 2015, Sovereign risk, European crisis-resolution policies, and bond spreads, *International Journal of Central Banking* 11, 285–323.

Kimhi, Omer, 2008, Reviving Cities - Legal Remedies to Municipal Financial Crises, *Boston University Law Review* pp. 88 B.U.L. Rev. 633 – 684.

Kloha, P., 2005, Someone to Watch Over me: State Monitoring of Local Fiscal Conditions, *The American Review of Public Administration* 35, 236–255.

Matsusaka, John G., 2000, Fiscal Effects of the Voter Initiative in the First Half of the Twentieth Century, *The Journal of Law and Economics* 43, 619–650.

Nanda, Vikram, and Rajdeep Singh, 2004, Bond insurance: What is special about munis?, *Journal of Finance* 59, 2253–2279.

Nelson, Charles R., and Andrew F. Siegel, 1987, Parsimonious Modeling of Yield Curves, *The Journal of Business* 60, 473.

Persson, T., and G. Tabellini, 1996, Federal fiscal constitutions: Risk-sharing and moral hazard, *Econometria* 64, 623–646.

Pew Charitable Trusts, 2013, The State Role in Local Government Financial Distress, *The Pew Charitable Trusts Report*.

Poterba, James M., 1994, State Responses to Fiscal Crises: The Effects of Budgetary Institutions and Politics, *Journal of Political Economy* 102, 799.

Qian, Jun, and Philip E. Strahan, 2007, How laws and institutions shape financial contracts: The case of bank loans, *Journal of Finance* 62, 2803–2834.

Schultz, Paul, 2013, State Taxes, Limits to Arbitrage, and Differences in Municipal Bond Yields Across States, *SSRN Electronic Journal*.

Singer, N., 2010, Pennsylvania speeds aid to its struggling capital, The New York Times.

Spiotto, J., A. Acker, and L. Appleby, 2012, Municipalities in Distress?: How States and Investors Deal with Local Government Financial Emergencies (Volume 1), *Chapman & Cutler LLP*.

Spiotto, James E., 2014, Is Chapter 9 Bankrupcy the Ultimate Remedy for Financially Distressed Municipalities: Are There Better Resolution Mechanisms?, *Working Paper*.

Svensson, Lars E. O., 1994, Estimating and Interpreting Forward Interest Rates, *IMF Working Paper* 94, 1–29.

VoxEU, 2015, The ECB's bond purchase programmes and the limits of national risk-sharing, http://www.voxeu.org/article/limits-eurozone-national-risk-sharing.

Wilkoff, Sean, 2013, The Effect of Insurance on Municipal Bond Yields, *Working Paper*.

Appendix A

The following table summarizes statutes in each state related to Chapter 9 authorization and intervention policies for distressed municipalities. Empty cells in the "Bankruptcy Authorization" or "Intervention Statute" columns indicate that no statute exists for that category. Empty cells in the "Intervention Strength" column indicate no explicit intervention statutes.

State	Bankruptcy Authorization	Intervention Statute	Intervention Strength
Alabama	Blanket		
Alaska			
Arizona	Blanket		
Arkansas	Blanket		
California	Blanket		
Colorado	Limited to Special Districts		
Connecticut	Conditional	The state deals with fiscal distress in an ad hoc manner. See LCO 4532 (Waterbury); SA 92-5 (West Haven); SA 88-80, 89-23, 89-47, 90-31, 91-40 (Bridgeport); and SA 93-4 (Jewett City).	Weak
Delaware			
Florida	Conditional	See F.S.A. 163.05, 163.055, and 218.50-218.504	Weak
Georgia	Prohibited		
Hawaii			
Idaho	Blanket	IDAHO CODE ANN. 43-2101 et seq.	Weak
Illinois	Limited to Illinois Power Agency	See 65 ILCS 5/8-12-1 through 65 ILCS 5/8-12-24 (Financially Distressed City Law) and 50 ILCS 320/1 through 50 ILCS 320/14 (Local Government Financial Planning and Supervision Act)	Weak
Indiana		See IC 6-1.1-20.3-1 through 6-1.1-20.3-13 (Distressed Unit Appeal Board)	Weak
Iowa	No Statute with Exceptions		
Kansas			
Kentucky	Conditional	See KY. REV. STAT. ANN. 66.320	Weak

State	Bankruptcy Authorization	Intervention Statute	Intervention Strength
Louisiana	Conditional		
Maine		See 30-A M.R.S.A. 6101-6113 (Municipal Finance Board)	Strong
Maryland			
Massachusetts		The state deals with fiscal distress in an ad hoc manner. See MA Session Laws: Chapter 58 of the Acts of 2010 and Chapter 169 of the Acts of 2004.	Weak
Michigan	Conditional	See M.C.L.A. 141.1541 et al. (Local Financial Stability and Choice Act). Act 436 of 2012 took effect on March 28, 2013	Strong
Minnesota	Blanket		
Mississippi			
Missouri	Blanket		
Montana	Blanket, Except Counties		
Nebraska	Blanket		
Nevada		See N.R.S. 354.655 through 354.725	Strong
New Hampshire		See N.H. Rev. Stat. 13:1 through 13:7	Weak
New Jersey	Conditional	See Special Municipal Aid Act N.J.S.A. 52:27D-118.24 to 118.31; Local Government Supervision Act N.J.S.A. 52:27BB- 1 et seq.; Municipal Finance Commission R.S. 52:27-1 to R.S. 52:27-66; Municipal Rehabilitation and Economic Recovery Act N.J.S.A. 52:27BBB-1 et seq., and 18A:7A et seq.	Strong
New Mexico		See N.M.S.A. 1978, 12-6-1 through 12-6-14 (Audit Act), N.M.S.A. 1978, 6-1-1 through 6-1-13, 10-5-2, and 10-5-8.	Weak
New York	Conditional	The state deals with fiscal distress in an ad hoc manner. New legislation is passed for each municipality.	Strong

State	Bankruptcy Authorization	Intervention Statute	Intervention Strength
North Carolina	Conditional	See N.C.G.S.A. 159-1 through 159-180; N.C.G.S.A. 63A; and 159D.	Strong
North Dakota			
Ohio	Conditional	See Ohios R.C. 118, 133.34, and 3735.49.	Strong
Oklahoma	Blanket		
Oregon	Limited to Irrigation and Drainage Districts	See O.R.S. 203.095-100 and 287A.630.	Weak
Pennsylvania	Conditional	See PA ST 53 P.S. 11701.101-712 (Municipalities Financial Recovery Act and Intergovernmental Cooperation Authority Act)	Strong
Rhode Island	Conditional	See RI GEN LAWS 45-9-1 through 45-9-14, enacted in June 2010	None during the sample period
South Carolina	Blanket		
South Dakota			
Tennessee		See T.C.A. 9-13-201 to 212 (Emergency Financial Aid to Local Government Law of 1995), T.C.A. 9-13-301 to 302 (Financially Distressed Municipalities, Counties, Utility Districts and Education Agencies Act of 1993), and T.C.A. 9-21-403 (Local Government Public Obligations Act).	Weak
Texas	Blanket	See T.C.A., Local Government Code 101.006.	Weak
Utah			
Vermont			
Virginia			
Washington	Blanket		
West Virginia			
Wisconsin			
Wyoming			

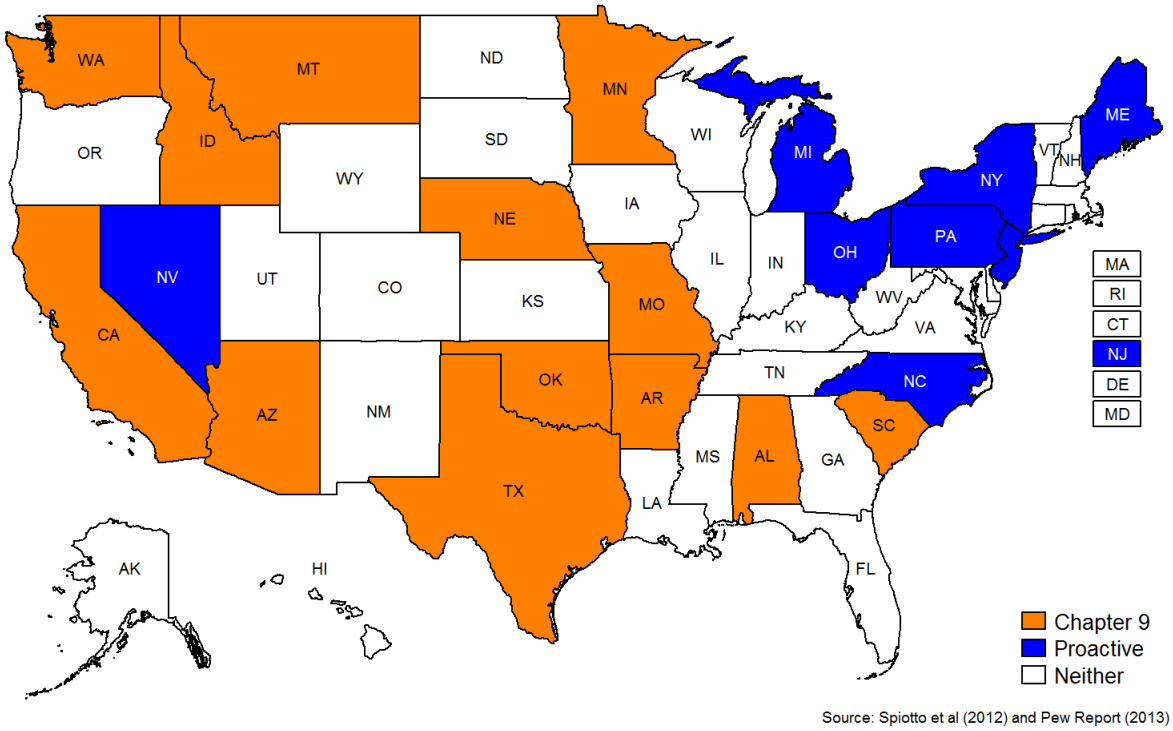

Figure 1: **Map of United States with State Type.** This map of the United States indicates state type: Proactive (blue), Chapter 9 (red), or Neither (white).

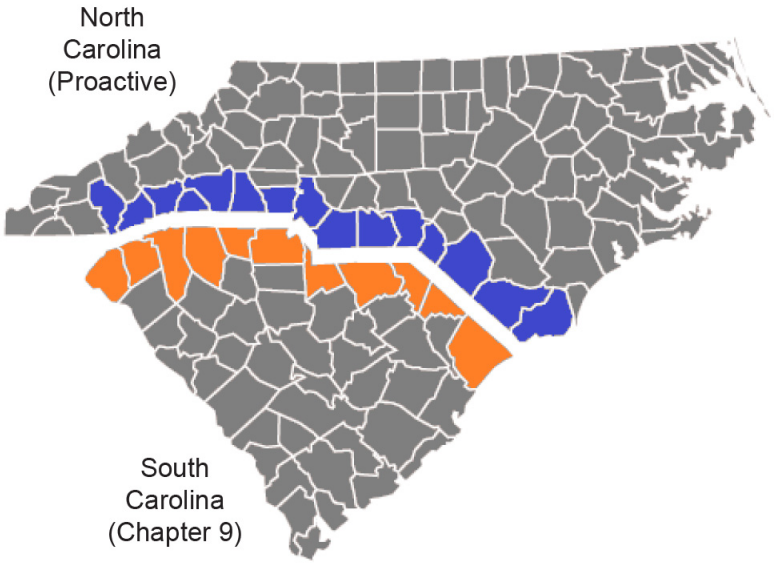

Figure 2: **County Map of North Carolina and South Carolina.** North Carolina is a Proactive state and South Carolina is a Chapter 9 state. The counties highlighted blue are those from North Carolina that border South Carolina. The counties highlighted orange are those from South Carolina that border North Carolina.

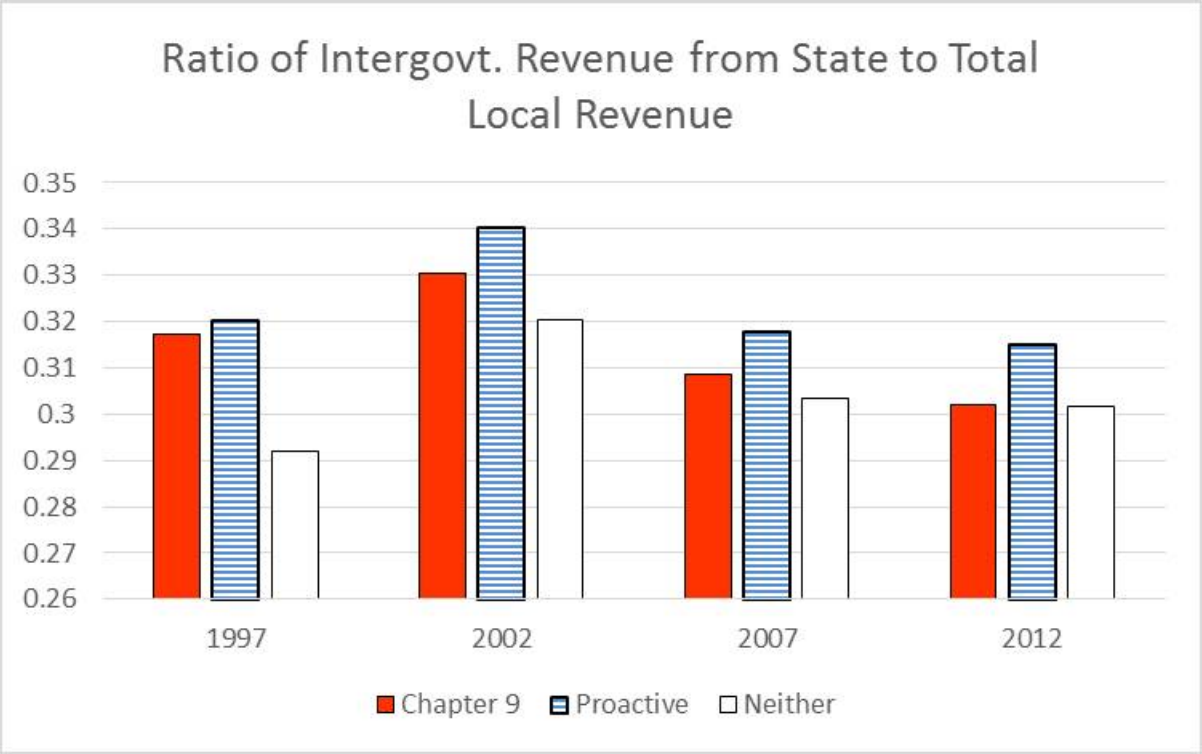

Figure 3: **Ratio of Local Revenue from State to Total Local Revenue.** Graph of cross-sectional average ratio of local revenue from state to total local revenue. Averages are separated by those in Chapter 9 states, Proactive states, and those in neither of these state types.

Table 1: Conditions for Proactive State Classification. Conditions are as follows. C1: state program triggered by debt default. C2: state can restructure the debt contract. C3: state can restructure labor contracts. C4: state can restructure taxes and fees. A state is defined as a Proactive state if C1 holds and at least one of C2, C3, or C4 holds. Eight states are classified as Proactive states. The states missing from this table are those that do not satisfy any of these four conditions.

	State can restructure:				
	C1	C2	C3	C4	Proactive?
CT	0	1	1	1	
DC	1	0	0	0	
FL	1	0	0	0	
ID	1	0	0	0	
IL	0	1	1	1	
IN	0	0	1	0	
KY	0	1	0	0	
ME	1	1	0	1	Yes
MA	0	1	0	1	
MI	1	1	1	0	Yes
NV	1	1	1	1	Yes
NH	0	0	0	0	
NJ	1	1	0	1	Yes
NM	0	0	0	0	
NY	1	1	1	0	Yes
NC	1	1	0	1	Yes
OH	1	1	0	0	Yes
OR	0	1	0	0	
PA	1	1	1	1	Yes
RI	0	1	0	1	
TN	0	1	0	1	

Table 2: Municipal Bond Attributes. Panel A reports summary statistics for municipal bonds that have never experienced a default event and those that have experienced at least one default event. Panel B reports the breakdown of municipal bonds by sector.

Panel A: Bond Sample Statistics		
	Non-Defaulted	**Defaulted**
N(bonds)	416,643	2,063
N(issuers)	25,554	679
Avg. Bond Par Value ($M)	6.69	9.82
Avg. Bond Maturity (years)	13.82	18.98
Conduit (%)	10	59
Insured (%)	61	27
Inv. Grade (%)	80	22
Non-Inv. Grade (%)	0	9
Unrated (%)	20	69
Gen. Obligation (%)	42	4
Callable (%)	62	78
Puttable (%)	0	1

Panel B: Sector Breakdown (%)		
	Non-Defaulted	**Defaulted**
Education	31.8	8.2
Healthcare	6.4	19.8
Housing	2.5	18.7
Improvement/Development	30.3	25.5
Public Service	4.2	1.3
Recreation	2.5	3.9
Transportation	5.4	3.5
Water-Sewer	14.3	6.3
Others	2.6	12.9

Table 3: Summary Statistics by State Type. This table reports summary statistics for municipal bonds by the following state types: Chapter 9, Proactive, and Neither.

	Chapter 9	Proactive	Neither
N(bonds)	143364	124691	150651
N(issuers)	10064	6317	9568
Avg. Bond Par Value ($M)	7.1	7.1	6.1
Avg. Bond Maturity (years)	14.5	13.5	13.5
Conduit (%)	8	12	12
Insured (%)	61	64	59
Inv. Grade (%)	79	81	79
Non-Inv. Grade (%)	0	1	0
Unrated (%)	21	19	21
Gen. Obligation (%)	40	51	37
Callable (%)	66	60	59

Table 4: Default Policies by State. Panel A reports the number of defaulted bonds and total par value of defaulted bonds within three state types: Chapter 9, Proactive, and Neither. Panel B reports the number of defaulted bonds as a percentage of all bonds in that state type and the total par value of defaulted bonds as a percentage of total par value of all bonds in that state type. "Chapter 9" states are those that allow for unconditional Chapter 9 bankruptcy authorization. "Proactive" states are those that have proactive measures in place for municipal bonds that show signs of distress. "Neither" defines the remaining states. Bonds are also separated into non-conduit and conduit.

		N(Defaulted Bonds)		Off. Amt. Defaulted ($M)	
Panel A		Non-conduit	Conduit	Non-conduit	Conduit
Chapter 9	AL, AR, AZ, CA, ID, MN, MO, MT, NE, OK, SC, TX, WA	443	415	2658.2	3121.39
Proactive	ME, MI, NC, NJ, NV, NY, OH, PA	123	250	2158.82	2548.65
Neither	The Rest	275	557	4100.26	4723.58

		Defaulted Bonds (%)		Off. Amt. Defaulted (%)	
Panel B		Non-conduit	Conduit	Non-conduit	Conduit
Chapter 9	AL, AR, AZ, CA, ID, MN, MO, MT, NE, OK, SC, TX, WA	0.379%	3.491%	0.710%	2.747%
Proactive	ME, MI, NC, NJ, NV, NY, OH, PA	0.164%	1.778%	0.331%	4.570%
Neither	The Rest	0.173%	2.727%	0.436%	2.581%

Table 5: Local Municipal Bond Yield Spreads and Default. Regression of monthly municipal bond yields on default indicator and indicator variables that interact with default indicator, including whether the state allows for unconditional Chapter 9 bankruptcy (Chapter 9), whether the state has proactive measures in place in the event that the municipality becomes distressed (Proactive), and whether the bond is insured (Insured). The first two columns report results for local municipal bonds. The last two columns are a falsification exercise that report results for conduit municipal bonds. Standard errors are double-clustered by issuer and year-month. t-statistics are reported below the regression coefficients.

	Regular		Conduit	
Default	5.861***	5.437***	4.206***	4.285***
	(8.83)	(6.50)	(10.13)	(8.90)
Default x Chapter 9		1.295		-0.511
		(1.42)		(-0.73)
Chapter 9		0.0189*		0.0298
		(1.68)		(0.83)
Default x Proactive		-1.267		0.604
		(-1.13)		(0.65)
Proactive		-0.0199**		-0.0278
		(-2.30)		(-0.82)
Default x Insured	-4.663***	-4.486***	-3.169***	-3.375***
	(-6.34)	(-5.57)	(-5.73)	(-5.17)
Insured	-0.109***	-0.109***	-0.613***	-0.610***
	(-12.27)	(-12.37)	(-16.70)	(-16.56)
General Obligation	-0.0832***	-0.0790***		
	(-7.69)	(-7.72)		
Callable	0.00616	0.00581	0.192***	0.190***
	(0.71)	(0.67)	(8.66)	(8.57)
Puttable	-0.803***	-0.799***	-0.730***	-0.733***
	(-6.33)	(-6.30)	(-7.57)	(-7.76)
Time to Maturity	0.0187***	0.0184***	0.00596**	0.00590**
	(11.33)	(10.94)	(2.34)	(2.30)
Inverse TTM	0.0935***	0.0934***	0.133***	0.133***
	(7.47)	(7.47)	(10.63)	(10.62)
Rated	-0.304***	-0.301***	-1.107***	-1.107***
	(-7.26)	(-7.32)	(-12.75)	(-12.78)

Rated x Rating	0.0470***	0.0471***	0.0963***	0.0961***
	(6.83)	(6.86)	(10.06)	(10.04)
Equal Tax	0.0544***	0.0440***	0.248***	0.237***
	(5.98)	(3.93)	(5.71)	(5.32)
Coincident Index	-0.0390***	-0.0435***	-0.0585***	-0.0606***
	(-7.12)	(-8.03)	(-2.71)	(-2.77)
Log(Size)	-0.0317***	-0.0304***	-0.0334***	-0.0336***
	(-8.86)	(-8.74)	(-2.85)	(-2.88)
Intercept	-0.220***	-0.221***	0.728***	0.734***
	(-6.13)	(-6.37)	(13.14)	(12.47)
Ch. 9 - Proactive		0.0388***		0.0576
p-value		0.006		0.133
Def x Ch. 9 - Def x Pro		2.562***		-1.115
p-value		0.004		0.261
SE Clustering	Issuer-YM	Issuer-YM	Issuer-YM	Issuer-YM
Fixed Effects	YM	YM	YM	YM
N	5080589	5080589	827987	827987
R-Squared	0.487	0.488	0.389	0.390

Table 6: Offering Yields on Newly Issued Municipal Bonds. Regression of municipal bond offering yields on Chapter 9 and Proactive state indicators. Standard errors are double-clustered by issuer and year-month. Columns two and three report results for unrated and uninsured bonds, respectively, which represent a higher credit risk for the municipality. t-statistics are reported in parentheses below the regression coefficients.

	All	Unrated	Uninsured
Chapter 9	0.0457***	0.0836***	0.140***
	(6.55)	(5.88)	(10.39)
Proactive	0.0320***	0.0521***	0.0359***
	(4.74)	(3.74)	(2.64)
Insured	-0.112***	-0.290***	
	(-14.31)	(-20.32)	
General Obligation	-0.0636***	-0.151***	-0.137***
	(-10.92)	(-14.27)	(-13.38)
Callable	0.113***	0.237***	0.155***
	(17.22)	(12.17)	(12.40)
Puttable	-0.928***	-1.019**	-1.012***
	(-6.56)	(-2.40)	(-5.56)
Time to Maturity	0.0248***	0.0386***	0.0296***
	(23.96)	(20.93)	(20.56)
Inverse TTM	0.0484	-0.191***	0.0497
	(0.56)	(-3.59)	(0.59)
Rated	-0.200***		-0.468***
	(-14.61)		(-18.88)
Rated x Rating	0.0227***		0.0679***
	(8.42)		(10.96)
Equal Tax	0.0867***	0.0864***	0.0651***
	(13.75)	(6.21)	(4.63)
Coincident Index	-0.0332***	-0.00273	-0.0137
	(-5.93)	(-0.18)	(-1.55)
Log(Size)	0.0117***	0.00407	0.0107**
	(3.92)	(0.90)	(2.14)
Intercept	-0.598***	-0.690***	-0.488***
	(-23.58)	(-25.39)	(-14.74)
Ch. 9 - Proactive	0.0137*	0.0315**	0.1041***
p-value	0.054	0.049	0.000
SE Clustering	Issuer-YM	Issuer-YM	Issuer-YM
Fixed Effects	YM	YM	YM
N	244258	35559	80314
R-Squared	0.651	0.661	0.669

Table 7: Carolina Border County Regression. Regression of municipal bond secondary market yields (columns (1) and (2)) and offering yields (columns (3) and (4)) on bond and county characteristics using municipal bonds from the counties on the border of North Carolina and South Carolina. North Carolina is a Proactive state and South Carolina is a Chapter 9 state. "Pop. Growth" is the annual population growth from the previous year for the county in which the municipal bond was issued. "Per Capita Income" is the real per capita income from the previous year from the county in which the municipal bond was issued. All other variables are defined as before. t-statistics are reported in parentheses below the regression coefficients.

	Regular		New Issue	
	(1)	(2)	(3)	(4)
Chapter 9 (SC)	0.0867***	0.0765***	0.0914**	0.0919**
	(2.94)	(3.30)	(2.02)	(2.29)
Insured	-0.0210	-0.0311	0.00224	-0.00105
	(-0.44)	(-0.40)	(0.06)	(-0.02)
General Obligation	-0.0239	-0.0261	-0.106***	-0.113***
	(-0.74)	(-0.66)	(-4.44)	(-3.78)
Callable	0.0727***	0.0739***	0.0885***	0.0879***
	(2.67)	(2.64)	(3.47)	(3.50)
Time to Maturity	0.0109**	0.0109**	0.0125***	0.0126***
	(2.17)	(2.16)	(2.80)	(2.83)
Inverse TTM	0.128***	0.128***	-0.346	-0.336
	(8.22)	(8.28)	(-1.63)	(-1.64)
Rated	-0.0164	-0.0164	0.0253	0.0241
	(-0.31)	(-0.31)	(0.96)	(0.95)
Rated x Rating	0.0373***	0.0368***	0.00913	0.00949
	(2.82)	(2.76)	(1.14)	(1.20)
Log(Size)	-0.0309	-0.0301	0.0286**	0.0288**
	(-1.08)	(-1.01)	(2.17)	(2.17)
Pop. Growth		-0.184		0.886
		(-0.35)		(0.46)
Log(Per Capita Income)		-0.0512		-0.0392
		(-0.29)		(-0.48)
Intercept	-0.601***	-0.0489	-0.675***	-0.283
	(-10.45)	(-0.03)	(-8.18)	(-0.33)
SE Clustering	County	County	County	County
Fixed Effects	YM	YM	YM	YM
N	39069	39069	1905	1905
R-Squared	0.541	0.541	0.828	0.828

Table 8: Municipal Bond Yield Spreads and State Economic Conditions. This table examines municipal bond yield spreads, conditional on local economic conditions in that state, and conditional on whether the bond is located in a Chapter 9 state or Proactive state. Bad Times (Good Times) is an indicator variable that equals one if Coincident Index is less than (greater than or equal to) 0.5 percent and zero otherwise; this cutoff represents the median Coincident Index. Standard errors are double-clustered by issuer and year-month.

	(1)		(2)
Coincident Index	-0.0359***	Bad Times	0.0142*
	(-5.93)		(1.86)
Coincident Index x Chapter 9	-0.0546***	Bad Times x Chapter 9	0.0377**
	(-5.52)		(2.36)
Coincident Index x Proactive	0.00468	Bad Times x Proactive	-0.0261**
	(0.79)		(-2.44)
Chapter 9	0.0306***	Good Times x Chapter 9	-0.00998
	(2.91)		(-0.98)
Intervention	-0.0218**	Good Times x Proactive	-0.0117
	(-2.46)		(-1.36)
Insured	-0.124***	Insured	-0.123***
	(-13.33)		(-13.10)
Intercept	-0.199***	Intercept	-0.211***
	(-5.46)		(-5.73)
Index x Ch. 9 - Index x Pro	-0.0593***	Bad x Ch. 9 - Bad x Pro	0.0638***
	0.000		0.001
		Good x Ch. 9 - Good x Pro	0.0017
			0.892
SE Clustering	Issuer-YM	SE Clustering	Issuer-YM
Fixed Effects	YM	Fixed Effects	YM
Controls	Yes	Controls	Yes
N	5080589	N	5080589
R-Squared	0.467	R-Squared	0.467

Table 9: Contagion Effects. This table examines whether recent defaults affect yields of other bonds in that state. The dependent variable is the bond-month yield spread. Pctdef_{q-k} is the total par value of defaulted bonds in a state, as a percentage of the total par value of all bonds within that state, in quarter $q-k$. Standard errors are double-clustered by issuer and year-month.

	Chapter 9		Proactive		Neither	
Pctdef_{q-1}	0.123***	0.131***	0.0008	0.0007	0.0233**	0.0238**
	(4.51)	(4.51)	(0.09)	(0.08)	(2.05)	(2.07)
Pctdef_{q-2}		0.123***		-0.0102		0.0252**
		(4.17)		(-1.48)		(2.15)
Pctdef_{q-3}		0.140***		-0.0106		0.0262***
		(3.93)		(-1.39)		(2.59)
Pctdef_{q-4}		0.132***		0.0008		0.0199**
		(5.06)		(0.12)		(2.03)
SE Clustering	Issuer-YM	Issuer-YM	Issuer-YM	Issuer-YM	Issuer-YM	Issuer-YM
Fixed Effects	YM	YM	YM	YM	YM	YM
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	1718422	1688362	1374025	1346899	1689350	1655254
R-Squared	0.484	0.479	0.509	0.504	0.495	0.489

Table 10: State-Issued General Obligation Bonds. This table compares the yields of state-issued general obligation bonds in Proactive states to those in Chapter 9 states.

	Regular	New Issue
Chapter 9	0.0218	0.0298
	(0.79)	(1.28)
Proactive	0.0572**	0.144***
	(2.00)	(3.01)
Insured	0.00495	-0.0207
	(0.25)	(-1.08)
Callable	0.0129	0.123***
	(0.84)	(8.54)
Puttable	-0.863*	
	(-1.75)	
Time to Maturity	0.0162***	0.0254***
	(5.28)	(10.01)
Inverse TTM	0.0844***	0.187*
	(8.75)	(1.65)
Rated	-0.108***	-0.0797***
	(-3.78)	(-2.74)
Rated x Rating	0.0424***	0.0349***
	(6.47)	(3.53)
Equal Tax	0.0457**	0.0569***
	(2.09)	(2.84)
Coincident Index	0.00530	-0.0451**
	(0.29)	(-2.44)
Log(Size)	-0.0169***	0.0241***
	(-2.96)	(3.18)
Intercept	-0.561***	-1.002***
	(-15.15)	(-24.81)
Ch. 9 - Proactive	-0.0354**	-0.1142**
p-value	0.035	0.012
SE Clustering	State-YM	State-YM
Fixed Effects	YM	YM
N	508305	18153
R-Squared	0.602	0.807

Table 11: State-to-Local Transfers and Economic Conditions. The dependent variable is the annual total dollars transferred from the state to its municipalities as a percentage of total municipality revenue. ΔGSP is the annual growth in gross state product. % Fed Revenue is the annual total dollars transferred from the federal government to the municipalities as a percentage of total municipality revenue in that state. State Tax Rate is the top marginal state tax rate. % Pop > 65 is the percentage of the population for that state-year that is greater than 65 years of age. State Rating is the state-year S&P rating, where State Rating can take on a value from one to twenty-two (where a value of one corresponds to the highest credit rating. Bad (Good) is an indicator variable that equals one is ΔGSP is at least (less than) 2 percent for that state-year. Standard errors are clustered by year-month.

	(1)	(2)	(3)
Proactive	0.0192***	0.0251***	
	(13.44)	(10.96)	
Chapter 9	-0.0102***	-0.00788**	
	(-8.05)	(-2.79)	
Proactive x Delta GSP		-0.552**	
		(-2.67)	
Chapter 9 x Delta GSP		-0.222	
		(-0.90)	
Delta GSP		0.498**	
		(2.99)	
Proactive x Good			0.0130
			(1.52)
Chapter 9 x Good			-0.00906
			(-0.81)
Proactive x Bad			0.0239***
			(4.93)
Chapter 9 x Bad			-0.0111
			(-1.54)
Bad			-0.0134
			(-1.23)
% Fed Revenue	-1.079***	-1.160***	-1.087***
	(-7.49)	(-8.05)	(-7.68)
State Tax Rate	0.00638***	0.00629***	0.00638***
	(14.64)	(11.42)	(13.66)

% Population > 65	-0.0499	-0.0576	-0.0589
	(-1.33)	(-1.13)	(-1.13)
State Rating	-0.00228	-0.00230	-0.00239
	(-1.78)	(-1.78)	(-1.72)
Log(Per Capita Income)	-0.165***	-0.169***	-0.166***
	(-17.99)	(-15.40)	(-18.20)
Intercept	2.071***	2.118***	2.092***
	(21.55)	(18.34)	(22.29)
Proactive - Ch. 9	0.0294***	0.0330***	
p-value	0.000	0.000	
Pro x Good - Ch. 9 x Good			0.0221*
p-value			0.061
Pro x Bad - Ch. 9 x Bad			0.0350***
p-value			0.000
SE Clustering	Year	Year	Year
Fixed Effects	Year	Year	Year
N	521	521	521
R-Squared	0.145	0.152	0.145

Table 12: Moral Hazard. The dependent variable is total local debt divided by total local revenue by state-year. ΔGSP is the annual growth in gross state product. % Fed Revenue is the annual total dollars transferred from the federal government to the municipalities as a percentage of total municipality revenue in that state. State Tax Rate is the top marginal state tax rate. % Pop > 65 is the percentage of the population for that state-year that is greater than 65 years of age. State Rating is the state-year S&P rating, where State Rating can take on a value from one to twenty-two (where a value of one corresponds to the highest credit rating. Bad (Good) is an indicator variable that equals one is ΔGSP is at least (less than) 2 percent for that state-year. Standard errors are clustered by year-month.

	(1)	(2)	(3)
Proactive	0.189***	0.175***	
	(14.16)	(9.42)	
Chapter 9	0.0593***	0.0559***	
	(7.74)	(4.47)	
Proactive x Delta GSP		0.0470	
		(0.05)	
Chapter 9 x Delta GSP		0.354	
		(0.48)	
Delta GSP		-1.861*	
		(-1.99)	
Proactive x Good			0.174***
			(6.13)
Chapter 9 x Good			0.0724
			(1.81)
Proactive x Bad			0.181***
			(5.78)
Chapter 9 x Bad			0.0518*
			(1.83)
Bad			0.0716
			(1.29)
% Fed Revenue	3.210***	3.540***	3.258***
	(5.96)	(6.41)	(6.40)
State Tax Rate	-0.0188***	-0.0181***	-0.0188***
	(-8.26)	(-7.60)	(-8.01)
% Population > 65	-3.542***	-3.449***	-3.515***

	(-10.18)	(-8.99)	(-9.19)
State Rating	0.0226***	0.0222***	0.0228***
	(6.06)	(4.92)	(5.12)
Log(Per Capita Income)	-0.267***	-0.235***	-0.258***
	(-5.62)	(-4.46)	(-5.17)
Intercept	4.042***	3.706***	3.903***
	(7.58)	(6.40)	(6.89)
Proactive - Ch. 9	0.130***	0.119***	
p-value	0.000	0.000	
Pro x Good - Ch. 9 x Good			0.102***
p-value			0.001
Pro x Bad - Ch. 9 x Bad			0.129**
p-value			0.024
SE Clustering	Year	Year	Year
Fixed Effects	Year	Year	Year
N	521	521	521
R-Squared	0.099	0.105	0.101