

Fractionalization and the municipal bond market

Daniel Bergstresser*
Randolph Cohen**
Siddharth Shenai***

(First version April 2010. Current draft September 2010. Comments welcome.)

Abstract

We study the impact of ethnic and religious fractionalization on the U.S. municipal debt market. Municipal issuers from more ethnically and religiously fractionalized counties pay higher yields on their municipal debt. The religious fractionalization effect is statistically significant and of moderate magnitude: a two standard deviation increase in religious fractionalization is associated with a 4 basis point increase in bond yields. There is evidence for an ethnic fractionalization effect, but it is difficult to disentangle this fractionalization effect from a very robust ‘white/nonwhite’ effect where more heavily white counties pay much less to borrow than other counties.

Keywords: Fractionalization, municipal bonds.

We are grateful for support from Harvard Business School and for excellent research assistance from Mei Zuo.

* Corresponding author. Harvard Business School. Tel.: 617-495-6169. E-mail: dbergstresser@hbs.edu

** Massachusetts Institute of Technology and Vision Capital.

*** Harvard Business School and Harvard Law School.

A variety of researchers have explored the impact of ethnolinguistic diversity on economic outcomes. Easterly and Levine (1997) propose that ethnolinguistic fractionalization can explain the poor growth observed in post-colonial Africa: borders left by the former colonial powers resulting in ethnically divided countries that make for challenging governance. In the American context, Glaeser, Scheinkman, and Shleifer (1995) find no effect of racial fragmentation on the growth rates of cities, but Alesina and La Ferrara (2000) find that more ethnically fragmented communities have lower participation in civic associations such as church groups, fraternities, and service groups. These social institutions contribute to social capital and can have positive economic effects, as discussed by Putnam (1993, 1995). Similar research on religious diversity, however, is lacking, though McCleary and Barro (2006b) examine the relationship between relationship between religious observance and economic growth.

In this paper, we explore the impact of ethno-religious diversity on municipal bond markets in the United States. Working at the county level, we construct fractionalization measures of ethnic diversity using data from the 2000 Census, and of religious diversity using the 2000 Religious Congregations and Membership Study, a survey of the major religious denominations conducted by the Association of Statisticians of American Religious Bodies (ASARB). In this context, fractionalization reflects the probability that two randomly selected members of a group will share a particular attribute. For example, in a society that is half White and half Hispanic, the ethnic fractionalization measure would be 0.5; there would be a 50 percent chance that any two randomly selected people would be of the same ethnicity. Fractionalization is the most common measure used to capture the extent to which a particular society is divided across a particular characteristic.

We find evidence that municipal issuers in religiously fractionalized counties pay more to borrow than those in other counties. The point estimates suggest that a one standard deviation increase in fractionalization (0.091) is associated with a 2 basis point ($=0.2144 * 0.091$) increase in the offering yield of debt issued by jurisdictions in the county. A change in religious fractionalization from the level observed in highly fractionalized Juneau, Alaska (where our fractionalization index is 0.1746, indicating a 17 percent chance that two randomly selected people reporting a religion are of the same religion) to highly homogenous Rich County, Utah (where the fractionalization index is 0.8365) would be associated with a 14 basis point reduction in municipal bond yield at offering. This effect is particularly strong for counties that are highly ethnically homogenous, and is robust to the inclusion of controls for the overall level of religious observance in a county.

Ethnic fractionalization is also associated with higher bond yields, although, in contrast to the religion result, the pure effect of ethnic fractionalization is difficult to disentangle from the phenomenon whereby more homogeneously white counties pay less to borrow. While the existence of religiously homogeneous communities of a variety of religious backgrounds does allow separate identification of the fractionalization effect, with the exception of some heavily Latino counties in South Texas, in the United States, the ethnically homogenous counties are almost exclusively ethnically white counties. In a specification including ethnic, but not religious, fractionalization, a one standard deviation increase in ethnic fractionalization is associated with a 3 basis point increase in bond yields. However, in a specification including both ethnic fractionalization and the share of the county population that is white, the fractionalization variable is statistically insignificant. The result for the white share of population variable suggests that going from 100 percent white to 100 percent nonwhite would

be associated with a 20 basis point increase in bond yields, holding constant county size, income, home value, government spending, and government debt. Additional evidence suggests that this relationship between religious and ethnic fractionalization and municipal bond yields holds, albeit somewhat attenuated, when controlling for the risk (with credit ratings serving as proxies) of the underlying bonds.

Additional evidence suggests that this relationship between religious and ethnic diversity and municipal bond yields holds, albeit in an attenuated form, when one controls for the risk of the bonds. Our proxy for risk in these tests is the credit rating assigned to the bond by Standard and Poor's to the bond. This suggests that the more fractionalized localities are somehow leaving some money on the table in the issuance process, issuing bonds at yields that are high controlling for their risk.

With respect to the ethnicity result, there is evidence based on data from post-issuance trades that the bonds of non-white and ethnically fractionalized counties are issued cheap and quickly trade up to higher prices in the 60 days post-issuance. Religious fractionalization appears to have either no effect or the opposite effect in the post-issuance market: the bonds issued by religiously homogeneous counties appear to be issued at prices slightly higher than the prices seen in the 60 days post issuance. This finding leads us to investigate more deeply the relationship between our ethnic and religious diversity measures and the underwriting process. For a sample of bonds whose underwriting discounts paid to the investment bankers we observe, there does not appear to be any relationship between fractionalization or diversity and the underwriting spreads charged by the investment banks.

Taken as a whole, our results suggest that religious and ethnic composition have an impact on municipal borrowing costs in the United States. Puzzles remain: for example, ethnically diverse counties appear to be leaving money on the table by issuing bonds cheap relative to their value.

The remainder of this paper is organized as follows: Section 1 presents a brief review of the relevant literature on the economic effects of ethno-religious fractionalization. In Section 2, we describe the empirical tests applied in this paper. Section 3 describes, in detail, the dataset and econometric methodology that we employ. Section 4 presents and interprets the results of our econometric analysis. A brief final section concludes.

1. Existing Literature

The economic consequences of ethnic and racial heterogeneity have long been a focus of academic research. Alesina and La Ferrara (2005) survey the economic impact of ethnic diversity in the international development and the public and urban economics literature, with a focus on cities in the United States. The empirical result they survey suggest that ethnic diversity slows economic growth at earlier stages of economic development, but not at later stages of development. This pattern of results suggests that richer societies have evolved more effective institutions for managing ethnic tensions.

Theoretical work by Alesina and Drazen (1991) and Velasco (1994) has influenced research on diversity and the economy. Both papers present models where sociopolitical fragmentation may lead to conflicts over the allocation of the tax burden and the consequent delay of deficit reduction policies. In these models, delayed stabilization is the result of a war of attrition game, where different groups try to force the other to bear the cost of the stabilization.

In the context of our research on municipal debt, this effect would make debt issued by fractionalized localities more risky than debt issued by more homogeneous localities because the more fractionalized localities would tend to delay (and possibly fail to enact) budget stabilization packages in the face of persistent deficits.

Our method of understanding the effects of racial and ethnic diversity on municipal borrowing builds on those employed in the literature. The measure of fractionalization used in this paper is based on the measure of ethnolinguistic fractionalization (ELF) developed by Soviet anthropologists in the 1960s and defined as one minus the Herfindahl index of ethnolinguistic shares. This measure represents the likelihood that two randomly chosen individuals in a given population belong to different subgroups. In an empirical paper, Easterly and Levine (1997) show that high ELF's in Sub-Saharan Africa explain characteristics associated with low economic growth, including political instability, underdeveloped financial systems, high government deficits, and distorted currencies. They conclude that ethnolinguistic fractionalization, caused in particular by the ad hoc nature of the national boundaries drawn by colonial powers, explains much of Africa's post-colonial failure to generate sustained economic growth.

Collier and Gunning (1999) confirm the explanatory power of ELF with respect to economic growth in African nations. Collier (2000) further finds that the impact of diversity on economic growth in a sample of countries between 1960 and 1990 was a function of the political context -- diverse dictatorships saw slow growth, while diverse democracies did not. Alesina, Glaeser, and Sacerdote (2001) construct a racial fractionalization measure and find, across an international sample, that welfare transfers are more strongly negatively related to racial fractionalization than ethnolinguistic fractionalization, though both are significant.

La Porta et al (1999) look at the determinants of the quality of government across countries. Among their findings, they find that nations that are ethnolinguistically heterogeneous have inferior government performance. The dimensions of government performance that they investigate include measures of corruption, bureaucratic delays, tax compliance and property rights. Alesina et al (2003) extend this work to include measures of linguistic and religious fractionalization. Their measure of religious diversity is the same as ours, and they point out that at least in the international context religious identity is often more reliably measured than linguistic or ethnic membership, making the religious fractionalization measure particularly useful for empirical research.

Several studies have focused on the economic and fiscal impacts of ethnolinguistic and racial fractionalization at the city, county, and state levels in the United States. Glaeser, Scheinkman, and Shleifer (1995) find look at the socioeconomic determinants of economic growth of US cities between 1960 and 1990. City growth is one reasonable measure of the success of different areas. The authors find that the non-white share exerts a minimal impact on subsequent city growth. Among cities with large non-white shares, they find that increased segregation is positively related to subsequent growth. One interpretation they offer is consistent with costs of fractionalization: they suggest that segregation in heavily non-white cities lessens ethnic conflict. Poterba (1997) shows a strongly negative relationship between state spending on K-12 education and the ratio of the proportion of individuals over the age of 65 who are white to the proportion of school-age children who are non-white. Alesina, Baqir, and Easterly (1999, 2000) develop a model connecting heterogeneity of preferences across ethnic groups in a political unit to the amount and type of public goods that the political unit supplies, and test the model on U.S. cities, urban counties and states. They find that the provision of productive public

goods (roads, hospitals, schools, etc.) in a cities and counties is inversely related to ethnic fragmentation, and suggest two reasons, which they reflect in the model: (1) different ethnic groups can have different preferences over which public goods to produce, and (2) different ethnic groups can have their marginal utility of the public good reduced by other groups' consumption. They find some empirical evidence that the fiscal balance before intergovernmental transfers tends to be worse in more ethnically fragmented cities.

A study by Vigdor (2004) looks at response rates to the 2000 Census questionnaire. Responding to the Census reflects individual provision of a local public good. Because federal grants to local areas are determined by Census counts, an uncouted individual costs his locality as much as \$500 per year. Vigdor shows that Census response rates are lower among counties that are more racially, generationally, and socioeconomically heterogeneous.

Ottaviano and Peri (2006), in contrast to the rest of the literature, explore potential benefits of diversity. Looking at a cross-section of US metropolitan areas, they find that increases in wages for US-born citizens were higher among metropolitan areas where the share of foreign-born residents rose the most. While there are obvious concerns with endogeneity here, with immigrants naturally being attracted to regions with faster wage growth, the authors make a reasonable effort to control for this endogeneity using an instrumental variables strategy that uses distance from immigration 'gateways' as the exogenous instrument for the change in foreign-born population.

McCleary and Barro (2003, 2006a, 2006b) have recently brought analytical rigor to long-standing lines of inquiry exploring the relationship between religion and economic outcomes. They present cross-country examination the two way interaction between economic growth and

religion. With religion as the dependent variable, McCleary and Barro (2006b) find that per capita GDP has a significant negative relationship with all religiosity indicators (e.g., monthly church attendance, belief in hell, etc.). With religion as an independent variable, they find that belief in hell has a strongly positive effect on economic growth, whereas monthly religious service attendance has a strongly negative effect. Hilary and Hui (2009) use one of the same data sources as our study to investigate the effect of individual religiosity on the risk-taking behavior of firms. Using the rate of religious adherence at the county level from the American Religion Data Archive (ARDA), they found that corporations located in highly religious counties take on less risk, measured by variance in returns on equity and assets, and have higher return on assets, and lower rates of investment.

2. Hypotheses

We investigate the relationship between religious and ethnic diversity and municipal bond yields. Municipal bond yields reflect the costs that municipalities face in borrowing. In credit markets generally, yields reflect a time premium, a risk premium, and a premium for the credit quality of the underlying issuer. Our empirical analysis controls for the time premium using fixed effects for the maturity of the instrument; because the risk-free yield curve fluctuates over time, we allow these fixed effects to be time-varying. With the time effect controlled, and with additional controls for the liquidity of the bond, the resulting coefficients reflect the combined premium for risk and default charged to the municipal borrowers.

Our central null hypothesis is that neither religious nor ethnic diversity (fractionalization), as measured by the Herfindahl Index, has an impact on this premium charged; the alternative hypotheses are that either religious or ethnic diversity could affect the premium.

The Herfindahl Index is just $1 -$ the ELF fractionalization measure, so our results can be thought of interchangeably in terms of concentration or diversity/fractionalization. This Herfindahl-based measure is not the only measure of diversity that one could choose: Alesina et al (2003) explore ‘polarization’ measures of diversity. These measures, however, involve explicitly or implicitly specifying a distance between different groups. While this is natural for measures of diversity in income or wealth, we do not know of any unambiguous one-dimensional measure of religious or ethnic identity, and thus use only the fractionalization measure that is more common in the literature.

The literature described above outlines several reasons why diversity could affect municipal bond yields. If, as in Alesina and Drazen (1991), more diverse regions postpone needed budget deficit reductions, then the resulting fiscal instability will be manifested in a higher risk premium for the bonds of an issuer. If households in fractionalized areas provide lower amounts of public goods, as in Vigdor (2004), then this could also be reflected in local credit ratings for municipal debt.

3. Data

Data on religious observance and fractionalization derive from the 2000 Religious Congregations and Membership Study, a survey conducted by the Association of Statisticians of American Religious bodies (ASARB). These data have also been used in Hilary and Hui (2009) and are available through the Association of Religion Data Archives (ARDA). The survey covered 149 Christian denominations, as well as Jewish and Islamic total adherents, by county. The survey also counted temples for six Eastern religions, but not members. A number of churches, disproportionately historically African-American religious bodies, declined to

participate in the survey in 2000; estimates of county-level membership counts described in Finke and Sheitle (2005) are used for these congregations.

The fractionalization measure (Herfindahl index) is based on a division of religious bodies into eight groups. These groups are Mainline Protestant, Evangelical Protestant, Catholic, Eastern Orthodox, Other participating Christian groups (predominantly LDS (Mormon) congregations), and Jewish and Muslim congregations. The ‘Other non-participating’ category captures the Finke and Sheitle (2005) county-level estimate of the count of adherents of denominations that did not participate. **Table 1** describes the different denomination measures. The summary statistics are presented both on a bond-weighted and a county-weighted basis. Based on the survey, religious membership amounts to 62.97 percent of the mean county population, with a standard deviation of 20.61 percent. The misnamed ‘Mainline Protestant’ denominations have now been eclipsed in membership by the Evangelical Protestant denominations and Catholic churches.

Table 2 describes the adherent and dispersion measures for a handful of counties. The counties presented are the largest counties, the most concentrated and fractionalized counties, and the most concentrated and fractionalized large counties. The most religiously homogeneous large county is Salt Lake County, Utah, where more than half of the population is in the ‘Other Participating Christian’ category, largely LDS congregations. El Paso, Texas, Bristol, Massachusetts, and Hidalgo, Texas are also highly homogeneous in terms of religion and predominantly Catholic. Highly religiously fractionalized counties include Montgomery County, Maryland, which has a relatively even split across Mainline Protestant, Evangelical Protestant, Catholic, Mormon, Jewish, and Other non-participating denominations.

Data on ethnicity were sourced from the 2000 Census. Ethnicity and Hispanic identity are overlapping: households can report being Hispanic alongside any ethnicity. For the purposes of our analysis, we create a non-overlapping ‘Hispanic’ category including all households that report Hispanic identity. Other categories, including Black, White, American Indian, Asian, and Pacific Islander, are based on households that do not also report being Hispanic.

Table 3 presents descriptive statistics for county ethnicity data, again weighted by bond and weighted by county. The difference between the bond-weighted and county-weighted results reflects the large number of sparsely-populated, heavily white counties and the large share of the population that lives in some very large counties with large Hispanic populations. **Table 4** presents ethnicity data and ethnic fractionalization for a handful of counties. The most ethnically fractionalized large counties include Alameda, California, Hudson, New Jersey, and San Francisco, California, which have Herfindahl indices below 3159. This measure reflects the fact that the odds that any two randomly selected citizens would be of the same ethnicity are less than 1/3. There are a number of highly concentrated small counties, in particular very white rural counties in South Dakota, North Dakota, Montana, and West Virginia. The ethnically homogeneous large counties include the heavily white Macomb, Michigan and Bucks, Pennsylvania. Hidalgo County in Texas is relatively unusual in being a large and highly concentrated county with a predominantly Hispanic population.

We also use additional demographic data from the Census (see **Table 5**). We control for wealth and income using the median house value and median income in the county. Weighted by bond, the mean of the median county household income measures is \$44,240; the mean of the median county home value measures is \$122,711. Data on government debt and spending come from the Census of Governments. The Census of Governments is conducted every five years by

the US Census, and covers municipal revenues, expenditures, debt, assets, and number of employees. These data include annual data on spending and receipts, at the county level, for all subunits within each county. We include total expenditure and total municipal indebtedness taken from the Census of Governments as controls in many of our empirical specifications. The average debt per capita is \$3,873; the average expenditures per capita is \$4,273.

Data on the municipal bond characteristics, issue date, and yield come from Mergent. Our sample includes all municipal bonds listed in Mergent that were issued between 1995 and 2009. Mergent also provides data capturing whether the municipal bonds are insured or uninsured. The underlying sample is reasonably comprehensive, with 2.5 million individual bonds. The mean bond offering yield is 4.12 percent, and the standard deviation is 1.10 percentage points. Credit rating data come from Standard and Poor's, and include both the rating for the instrument and the underlying rating for the issuer, in cases where bond insurance on the instrument creates a wedge between the issuer underlying rating and the instruments' rating. Data on bond liquidity come from Municipal Securities Rulemaking Board (MSRB) trades database; we calculate liquidity as the (log) number of interdealer trades during the 60 days after the bonds are issued. We use interdealer trades because the interdealer trades are the only trades available in the 1995-1997 subperiod, and we use the first 60 days post issuance in order to have a consistent window for all of the bonds issued in our sample. In our sample, the mean number of interdealer trades is 1, and the mean is 2.98. In calculating the log we first add one to the count of trades.

We also collect data on the underwriters' spread for the issuance of the bonds, which is not included among the variables in either the Mergent or Standard & Poor's (S & P) datasets. The underwriters' spread adds to the total cost of borrowing for the municipal borrowers. We collect the underwriters spread by collecting official statements for municipal bond issues in .pdf

format from the MSRB, converting the .pdf documents to .txt files, and extracting the underwriters' spread using software written in the Perl language. Each of these steps loses some observations. The .pdf files available with the MSRB are only reliably machine readable after 2005, and we only pulled them for this sub-period (2005-2009). In this sub-period, approximately 31 percent of municipal issues do not appear to have official statements available at the MSRB. Of the 69 percent that do, approximately 32 percent are not machine readable or convertible to text. Of the official statements that can be converted to .txt files, another 15 percent do not report the underwriting discount in a way that our software could recognize. The resulting sample of municipal bonds looks different from the population: it disproportionately includes the larger issues and appears to have lower offering yields than the rest of the sample.

4. Results

This section presents the empirical results of our analysis of both ethnic and religious fractionalization, as measured by the respective Herfindahl indices, and their effects on municipal credit markets. The first sub-section looks at the relationship between municipal bond yields and measures of fractionalization. The second sub-section looks into the relationship across different sub-samples of the data and finds that the fractionalization results are stronger among the smaller counties and smaller bond issues, and weaker or non-existent among the largest issues and counties. The third sub-section addresses the question of whether the higher bond yields at more fractionalized counties reflect underlying risk or something else. The final subsection investigates the relationship between fractionalization and the compensation paid to municipal underwriters.

4.1 Results: fractionalization and municipal bond yields

Our first specification (**Table 6**) fits the bond offering yield on measures of ethnic and religious fractionalization. Column (1) has no controls, with the only dependent variable being the religion Herfindahl index. Column (2) includes the religion Herfindahl index, as well a control that interacts the month of issuance and the maturity (by buckets: 0-1 year, 1-2 year, 2-3 year, 3-4 year, 4-5 year, 5-7 year, 7-10 year, 10-12 year, 12-15 year, 15-20 year, 20-25 year, and > 25 year). Inclusion of this maturity adjustment controls for the shape of the yield curve in each month. The magnitude of the coefficient in Column (2), with no controls other than for the yield curve, suggests that a two standard-deviation change in the religion fractionalization ($2 * 0.091 = 0.182$) would be associated with a 3.2 basis point change in the bond yields of instruments issued by municipal borrowers in the county.

Columns (3) and (4) of Table 6 repeat the analysis, using the ethnicity Herfindahl index as the measure of fractionalization. The coefficient in Column (4), which controls for the yield curve, suggests that a two standard-deviation change in ethnic fractionalization ($2 * 0.202 = 0.404$) would be associated with a 2.2 basis point change in municipal bond yields. Column (5) includes both religious and ethnic fractionalization as dependent variables; the coefficient on religious fractionalization is roughly unchanged while the ethnic fractionalization coefficient is now statistically insignificant. Columns (6) and (7) of Table 6 implement additional controls. Column (6) adds only the log of the county population. Larger counties appear to pay less to borrow, and adding this control increases the magnitude of the religious and ethnic fractionalization coefficients. This reflects the fact that larger counties tend to be more diverse than smaller counties. Column (7) controls for county wealth and income. The wealth and debt figures are measured in millions in the regression specifications. The county wealth variable is highly significant: a two standard deviation change in median home value ($2 * 0.065 = 0.13$)

reduces the measured bond yields by 10 basis points ($0.13 * -0.7669$). Controlling for wealth (as measured by home values), median income is not statistically significant in these regressions.

The specification also includes measures of government debt and expenditures, taken from the Census of Governments. The debt measure is not significant in these specifications, but the spending measure is highly significant. A two standard deviation change in spending ($2 * 0.004$) has a 5 basis point impact on measured bond yields. The bond liquidity variable is highly significant, with more liquid bonds being offered at lower yields. The coefficient suggests that a two standard deviation change in liquidity ($2 * 0.878$) is associated with a 7 basis point change in the bond offering yield.

Column (8) additionally controls for per capita participation across all religions and the measure of religious participation on the share of county population that is white (white share). In the specification, the coefficient on religious heterogeneity remains roughly unchanged. Religious participation has a statistically significant negative sign: a two standard deviation change in participation would be associated with a 2 basis point change in bond offering yields for the issuers in the county. Both fractionalization and total participation appear to be related to bond yields, with fractionalization having the stronger effect.

With respect to ethnicity, the opposite is true: the fractionalization measure is highly significant in Columns (6) and (7), without a control for the share of the county that reports white ethnicity. Because the highly homogeneous counties are overwhelmingly white, the ethnic fractionalization measure and white share are correlated. In Column (8) of Table 6, which includes the white share, the coefficient on the white share is large in magnitude: a two standard deviation increase in the white share would be associated with a 7 basis point reduction in

borrowing costs. Column (9) presents a specification without the Herfindahl measures of fractionalization, but with just religious participation and white share.

These estimated coefficients imply a moderate effect on county-level borrowing costs. For a modest-sized county (100,000 residents) with the mean amount of debt per capita (\$4,000), the 4 basis point change associated with a two standard deviation change in religious fractionalization would be associated with a \$160,000 change in annual borrowing costs. A two standard deviation change in the share of county population reporting white ancestry would be associated with a borrowing cost change of roughly \$320,000.

Table 7 repeats the analysis of Table 6 on a particular subset of municipal bonds -- tax-exempt General Obligation (GO) munis. These include revenue bonds, which are backed by specific projects such as sewers, hospitals, and roads. GO bonds are backed by the full faith and credit of the municipal issuer, while revenue bonds are backed by the credit quality of the project and, generally, do not enjoy recourse to a governmental authority with taxing power. There is some heterogeneity recognized in the credit quality of revenue bonds: bonds backed by sewer and water systems are viewed as being of relatively high credit quality, since the ability to meter and impose tolls for those utilities is high. Hospital-backed municipal revenue bonds are viewed as having relatively low credit quality. Restricting to GO bonds provides a sample that effectively reflects only the credit quality of the underlying governmental bodies.

The results in the more homogeneous GO sample are very similar, both qualitatively and quantitatively, to the results on the broader sample of Table 6. Focusing on Column (8), which includes the full set of controls, the coefficient on religious fractionalization changes from -0.2219 (Table 6) to -0.2049 (Table 7). The coefficient on the white share changes from -0.2063

to -0.1627. The only major change among the controls is somewhat puzzling: while the wealth effect becomes stronger (the coefficient on median home value changes from -0.7669 to minus 1.2643), the coefficient on household income goes from being insignificant to positive. The coefficient on income suggests that a two standard deviation increase in median income is associated with a 7 basis point increase in borrowing costs, controlling for wealth. The magnitude of the wealth effect is much larger: a two standard deviation increase in median home value is associated with a 17 basis point reduction in borrowing costs. The puzzling coefficient on the income variable may reflect that fact that municipalities very rarely tax income: they much more often tax housing wealth.

Table 8 restricts the sample in a different way, focusing only on bonds that are sold without credit insurance. Approximately half of municipal bonds are sold with credit insurance provided by outside financial guarantors: in these cases, the credit quality of the instrument reflects both the credit quality of the issuer and the credit quality of the guarantor. Restricting the sample in this way gives a set of instruments that more precisely reflect the credit quality of the underlying bodies. This restriction has an impact on the estimated coefficients. The coefficient on the religious fractionalization measure changes from -0.2219 (Table 6) to -0.2488 (Table 8). The coefficient on religious observance is now not only independently statistically significant, but has a much larger economic magnitude in this sample. The coefficient value, minus 0.2539, indicates that a two standard deviation increase in religious observance would be associated with a 9.1 basis point reduction in borrowing costs. The coefficients on the variables capturing ethnic fractionalization are almost exactly unchanged between Table 6 (including all bonds) and Table 8 (just the uninsured bonds).

The coefficients on the controls also change in the restricted sample in Table 8. Potentially reflecting simultaneity, the coefficient on government debt is negative, suggesting that counties with lower borrowing costs borrow more. The coefficient on spending per capita is positive and three times as large as the coefficient on debt amounts: counties with more spending pay much more to borrow. Bond liquidity is again negatively associated with bond yields, and the coefficient is about 50 percent larger in the restricted sample than in the comprehensive one.

4.2. Fractionalization and bond yields by sub-sample

Table 9 describes the relationship between fractionalization and municipal bond yields by the size of the bond issue. The sample of municipal bond issues is separated by size into deciles. Specification (8) from Table 6 is then re-estimated in each of the sub-samples. The columns in Table 9 correspond to the deciles, from low (1) to high (10). The varying size of the subsamples is driven by the different likelihood of having dependent and independent variables available. The largest issues are disproportionately state-level and supra-county-level issues that are not included in our analysis.

A clear pattern emerges: the fractionalization and ethnicity effects are particularly strong among the smaller issues, but minimal among larger issues. For the smallest issues, the religion Herfindahl coefficient is -0.4108, roughly twice the coefficient for the entire sample. For these issues, the white share variable is -0.8022, four times the coefficient in the entire sample. Among the largest issues, there does not appear to be an effect of fractionalization.

With respect to the control variables, interesting patterns emerge as well. The liquidity of the bond, in particular, appears strongly negatively correlated with offering yields in the entire sample. But this effect disappears among the largest bonds, where there is no relationship

between liquidity and yield. The relationship between income, wealth, and bond yields appears to differ by the size of the issue as well: for most of the bonds the wealth variable appears to dominate the relationship, but for the largest issues the yield appears to be negatively correlated with income and unrelated to wealth.

Table 10 examines the relationship between ethnicity, fractionalization, and borrowing costs by the income level of the county. The religious fractionalization result does not have a clear pattern, with negative coefficients in each decile of income and particularly strong negative coefficients in deciles 3, 4, and 9. With respect to religious participation, the results in Table 10 suggest that the earlier results reflect a balance between competing effects. Among the poorer counties, religious participation appears positively correlated with bond yields: counties with higher religious participation are paying more to borrow. The negative coefficient for the entire sample is driven by counties in the top three deciles of income, where the relationship between religious participation and bond yields is strong and negative. Running separate regressions by income leads to a potentially puzzling result with respect to the ethnic measures. The ‘white share’ effect is stronger in this subsample analysis, with the whiter counties paying less to borrow. Controlling for the white share of population, however, counties where the minority groups are more split appear to borrow at lower yields. In additional specifications with just the ethnic and religious Herfindahl concentration measures (available from the authors upon request) the coefficients on both religious and ethnic concentration are negative, consistent with the results in Table 6.

Table 11 shows the results by the size of the county: the bonds are divided into deciles based on the size of the county, leading to subsamples that are roughly equal in size in terms of the number of bonds. The largest subsample has an average size of 4.3 million people: this

subsample includes a handful of the very largest counties in Texas and California. A clear pattern of results emerges: the religious fractionalization result is driven by the counties outside of these extremely large counties. **Table 12** shows results by subsamples created on the basis of the share of county population that is white. **Table 13** shows results by subsamples created on the basis of the share of county population that is counted as religious participants. The religious fractionalization result is particularly strong among the whitest counties, and among the counties that have the highest religious participation rates.

Table 14 and **Table 15** show the results by year, with Table 14 showing 1995-2002 and Table 15 showing 2002-2009. The magnitude of the religion Herfindahl coefficient varies somewhat over time, but is always negative and generally statistically significant in subsamples. The coefficient on the white share variable is also always negative, but is particularly high in the recent period.

Table 16 shows the results for different subsamples, excluding each state, state-by-state. The regression specification of Table 6, column 8 is re-estimated for 50 different samples, excluding each state one by one. The goal of this exercise is to illustrate the sensitivity of the results to the inclusion of particular states in the sample. On the whole, the results are not driven by the inclusion of particular states, although a couple of interesting results emerge. The religious fractionalization effect is much stronger when California is excluded: California's counties are relatively religiously concentrated (Catholic) and pay a lot to borrow. The white share result is particularly strong

4.4. Fractionalization, credit ratings, and bond insurance

The data suggests that more religiously fractionalized and non-white counties pay more to borrow. This subsection presents the results of an investigation into the credit ratings that the bonds and issuers from these counties get. **Table 17** shows the results of the analysis of credit ratings and fractionalization. Columns (1)-(3) use as a dependent variable the long-term (LT) credit rating assigned to the instrument. Columns (4)-(6) use, where available, the credit rating assigned by S&P to the issuer. This rating is known as the SPUR, or S&P underlying rating. For issues that are insured by third-party financial guarantors, the SPUR and the LT credit rating will not necessarily coincide. Columns (7)-(9) employ a dependent dummy variable capturing whether the particular bond was sold with bond insurance, as roughly half of municipal debt is.

Long-term credit ratings for issuers for more religious counties are significantly higher. This is true both for the credit ratings of the instruments and for the credit ratings assigned to the underlying issuers. Fractionalization, controlling for religious participation, has the opposite effect: S&P appears to assign lower credit ratings to more homogeneous counties, controlling for county and bond characteristics. More ethnically homogeneous and ethnically white counties appear to receive higher credit ratings, although the effect is less statistically significant for the SPUR regressions than for the LT credit rating regressions. More religious counties are much less likely to purchase bond insurance, as are higher-income counties and counties with higher levels of debt outstanding.

4.5 Are investors or issuers leaving money on the table?

We have found that more religiously fractionalized and non-white counties pay more to borrow. Is this because they are more likely to default? Or do the investors who purchase the bonds issued by non-white counties at issuance appear to leave money on the table?

We first look at the relationship between fractionalization, ethnicity, and bond offering yields using a specification that is similar to Table 6, but modifies the control variable specification: dummies are included for month of issuance by maturity bucket and credit rating, where the credit rating is based on S&P data at the issuance of the bond. **Table 18** presents the results of this exercise. The credit rating variable has a bucket for each notch of credit rating.

Column (8) presents some evidence that the religious fractionalization and white share results hold controlling for the S&P assessment of the credit quality of the instrument. The coefficients on religious diversity and the white share remain statistically significant and are about half the magnitude of the earlier specifications. If the S&P credit rating is an unbiased estimate of the probability of default, then the coefficients on religious dispersion and the white share should reflect extra yield paid by fractionalized and non-white counties that is not reflected in those bonds' probabilities of default. **Table 19** investigates further, using trading data from the MSRB to look at the change in the price of the bonds in the period immediately after issuance. The sample of bonds here includes only the bonds that have at least one trade reported by the MSRB after issuance. The 60-day window reflects the fact that most trading in municipal debt happens in a period soon after the debt is issued; thereafter, municipal bonds are typically held by long-term funds and investors. The coefficients of the white share and ethnic fractionalization variables indicate that the bonds issued by non-white counties that are issued at par immediately trade up, and the effect is both statistically and economically significant.

This presents another puzzle – non-white counties are paying more to borrow without additional default risk (as measured by S&P) and the bonds issued by these non-white counties immediately trade up after issuance.

4.5 Do more fractionalized counties pay more in issuance expenses?

We extracted underwriting information for a subsample of bonds that have machine-readable official statements available on the MSRB's Electronic Municipal Market Access (EMMA) system (emma.msrb.org). Because the bonds with machine-readable official statements are disproportionately the larger issues, our results for this subsample are different from the results in the broader sample. **Table 20** shows our results. On net, it does not appear that there is any relationship between ethnic and religious fractionalization and the underwriting spread. It does appear that larger issues have lower underwriting fees (as a share of their value). More liquid issues are cheaper to issue, as are the issues from issuers with higher amounts of government debt outstanding, perhaps because of familiarity among the borrowing base (e.g., large municipalities in California).

5 Conclusion

Taken as a whole, these results suggest that ethnic and religious fractionalization play a role in determining municipal issuers' borrowing costs. Issuers in more fractionalized counties appear to pay more to borrow. The effect is statistically significant, robust across samples, and large in economic magnitude: for a very large county such as Los Angeles County, a two standard deviation increase in religious fractionalization would be associated with annual increase in borrowing costs of about \$24 million.

References

- Alesina, Alberto, Reza Baqir, and William Easterly, 1999, 'Public goods and ethnic divisions,' *Quarterly Journal of Economics*, pp. 1243-1283
- Alesina, Alberto, Arnaud Devleeschwauwer, William Easterly, Sergio Kurlat, and Romain Wacziarg, 2004, 'Fractionalization,' *Journal of Economic Growth*, 8:2, pp: 155-194.
- Alesina, Alberto, and Allan Drazen, 1991, 'Why are stabilizations delayed,' *American Economic Review*, 81:5, pp. 1170-1188.
- Alesina, Alberto, Edward Glaeser, and Bruce Sacerdote, 2001, 'Why doesn't the United States have a European-style welfare state?' *Brookings Papers on Economic Activity*, 2001:2, pp. 187-254.
- Alesina, Alberto, and Eliana La Ferrara, 2000, 'Participation in heterogeneous communities,' *Quarterly Journal of Economics* 115:3, pp. 847-904.
- Alesina, Alberto, and Eliana La Ferrara, 2005, 'Ethnic diversity and economic performance,' *Journal of Economic Literature* 43, pp. 762-800.
- Alesina, Alberto and Enrico Spolaore, 1997, 'On the number and size of nations,' *Quarterly Journal of Economics*, 112:4, pp. 1027-1056.
- Butler, Alexander, Larry Fauver, and Sandra Mortal, 2009, 'Corruption, political connections, and municipal finance,' *Review of Financial Studies*, 22:7, pp. 2873-2905.
- Collier, Paul, 2000, 'Ethnicity, politics, and economic performance,' *Economics and Politics*, 12:3, pp. 225-245.
- Collier, Paul, and Jan Willem Gunning, 1999, 'Explaining African economic performance,' *Journal of Economic Literature*, 37, pp. 64-111.
- Costa, Dora, and Matthew Kahn, 2003, 'Cowards and heroes: Group loyalty in the American Civil War,' *Quarterly Journal of Economics* 118:2, pp. 519-548.
- Costa, Dora, and Matthew Kahn, 2003, 'Understanding the American decline in social capital, 1952-1998,' *Kyklos*, 56:1, pp. 17-46.
- Cutler, David, Douglas Elmendorf, and Richard Zeckhauser, 1993, 'Demographic characteristics and the public bundle,' *Public Finance/Finances Publiques* 48, pp. 178-198.
- Easterly, William, and Ross Levine, 1997, 'Africa's growth tragedy: Politics and ethnic divisions,' *Quarterly Journal of Economics*, 112:4, pp. 1203-1250.
- Greif, Avner, 1993, 'Contract enforceability and economic institutions in early trade: The Maghiribi traders' coalition,' *American Economic Review*, 83:3, pp. 525-548.
- Glaeser, Ed, Jose Scheinkman, and Andrei Shleifer, 1995, 'Economic growth in a cross-section of cities,' *Journal of Monetary Economics*, 36:1, pp. 117-143.

- Glaeser, Ed, Jose Scheinkman, and Andrei Shleifer, 2003, 'The injustice of inequality,' *Journal of Monetary Economics*, 50:1, pp. 199-222.
- Hilary, Gilles, and Kai Wai Hui, 2009, 'Does religion matter in corporate decision making in America?' *Journal of Financial Economics*, 93, pp. 455-473.
- Karlan, Dean, 2007 'Social connections and group banking,' *Economic Journal*, 117, p. F52-F84.
- La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny, 1999, 'The quality of government,' *Journal of Law, Economics, and Organizations*, 15:1, pp. 222-279.
- Majumder, Sreenath, 2008, 'The dynamic response of fractionalization to public policy in U.S. cities,' Working paper, University of Houston.
- McCleary, Rachel and Robert Barro, 2003, 'Religion and economic growth,' *American Sociological Review*, 68, pp. 760-781.
- McCleary, Rachel and Robert Barro, 2006a, 'Religion and political economy in an international panel,' *Journal for the Scientific Study of Religion*, 45:2, pp. 149-175.
- McCleary, Rachel and Robert Barro, 2006b, 'Religion and Economy,' *Journal of Economic Perspectives*, 20:2, pp. 49-72.
- Ottaviano, Gianmarco and Giovanni Peri, 2006, 'The economic value of cultural diversity: Evidence from US cities,' *Journal of Economic Geography*,
- Poterba, 1997, 'Demographic structure and the political economy of public education,' *Journal of Policy Analysis and Management*, 16:1, 48-66.
- Prat, Andrea, 2002, 'Should a team be homogeneous?' *European Economic Review*, 46, pp. 1187-1207.
- Putnam, R., *Making Democracy Work* (Princeton, NJ: Princeton University Press, 1993).
- Putnam, R., "Bowling Alone: America's Declining Social Capital," *Journal of Democracy*, VI(1995), 65-78.
- Tiebout, Charles, 1956, 'A pure theory of local expenditures,' *Journal of Political Economy*, 64:5, pp. 416-424.
- Vigdor, Jacob, 2004, 'Community composition and collective action: Analyzing initial mail response to the 2000 Census,' *Review of Economics and Statistics*, 86:1 pp. 303-312.

Table 1. Descriptive statistics for county religion data

Table shows descriptive statistics based on 2000 Religious Congregations and Membership Study by the Association of Statisticians of American Religious Bodies (ASARB). Survey covered 149 religious bodies. Data were accessed from the Association of Religion Data Archives and are described at <http://www.thearda.com/Archive/Files/Descriptions/RCMSCY.asp>.

		Count	Mean	25th percentile	50th percentile	75th percentile	Standard Deviation
Total members/1000 population	Bond	1285656	620.8	502.1	619.9	722.6	165.0
	County	2844	629.7	477.2	623.2	772.9	206.1
Mainline Protestant	Bond	1285656	112.8	60.8	88.9	137.3	84.0
	County	2844	143.8	69.8	109.7	184.6	114.6
Evangelical Protestant	Bond	1285656	151.1	61.8	106.9	204.8	128.8
	County	2844	228.2	97.4	179.2	344.2	165.5
Catholic	Bond	1285656	221.9	102.5	201.3	318.9	147.9
	County	2844	136.9	23.2	90.3	204.3	145.2
Orthodox	Bond	1285656	2.5	0.0	0.9	3.3	3.8
	County	2844	0.7	0.0	0.0	0.0	2.7
Other participating Christian*	Bond	1285656	33.9	7.4	18.3	41.0	60.1
	County	2844	22.5	0.2	6.1	15.3	81.1
Jewish	Bond	1285656	16.5	0.0	2.9	18.7	32.6
	County	2844	2.8	0.0	0.0	0.0	12.7
Muslim	Bond	1285656	4.2	0.0	1.4	6.2	6.3
	County	2844	0.8	0.0	0.0	0.0	3.1
Other non-participating Christian**	Bond	1285656	98.7	59.2	77.7	116.4	64.2
	County	2844	97.5	51.9	72.2	104.6	80.0
Religion Herfindahl	Bond	1285656	3306	2655	3142	3680	913
	County	2844	3837	3022	3574	4389	1127

* Other participating congregations are predominantly LDS (Mormon) congregations.

** Other non-participating congregations include religious congregations that did not choose to participate in the 2000 survey. Count based on adjustments described in Finke and Sheitle 2005 ('Accounting for the uncounted: Computing correctives for the 2000 RCMS data') to correct for non-participation of religious bodies that did not participate in the 2000 Survey. The bulk of the non-participating bodies (estimated at 25.10 million out of the 29.05 million non-participants are historically African-American congregations. The remainder include the Baptist Bible Fellowship (1.2 million estimated members), the Jehovah's Witnesses (1.04 million estimated members) and other smaller groups.

Table 2. Religious fractionalization for particular counties.

Table shows descriptive statistics based on 2000 Religious Congregations and Membership Study.

	Congregants/1000 population										
	Pop	Total	Mainline	Evang.	Catholic	Orth.	Other (participating)	Jewish	Muslim	Other (not participating)	Herf. index
Large counties											
Los Angeles, CA	9519338	771.5	35.6	61.8	399.9	3.3	80.3	59.3	9.8	121.5	3190
Cook, IL	5376741	852.2	53.4	50.2	399.3	9.4	64.0	43.6	17.8	214.5	2991
Harris, TX	3400578	672.6	81.9	204.8	181.9	2.4	32.8	10.6	14.0	144.2	2298
Maricopa, AZ	3072149	475.7	48.3	99.9	172.6	2.3	74.4	19.5	3.3	55.4	2259
Concentrated counties											
Rich, UT	1961	932.9	0.0	0.0	0.0	0.0	849.1	0.0	0.0	83.8	8365
Arthur, NE	444	795.0	723.0	0.0	0.0	0.0	0.0	0.0	0.0	72.0	8352
Banner, NE	819	139.8	127.0	0.0	0.0	0.0	0.0	0.0	0.0	12.8	8335
Van Buren, TN	5508	376.1	0.0	341.5	0.7	0.0	0.0	0.0	0.0	33.9	8323
Concentrated counties > 500000 population											
Salt Lake, UT	898387	760.1	20.6	20.6	59.6	4.1	570.2	4.7	3.9	76.4	5807
Bristol, MA	534678	696.0	40.4	25.8	502.0	2.6	29.1	21.7	3.5	70.9	5381
El Paso, TX	679622	728.9	25.6	75.3	514.8	1.3	17.3	7.4	0.9	86.3	5254
Hidalgo, TX	569463	563.1	28.2	73.4	390.1	0.2	11.9	0.9	1.1	57.3	5105
Fractionalized counties											
Montgomery, MD	873341	774.6	100.8	78.8	212.0	6.1	128.9	96.0	21.1	130.9	1746
Alexandria, VA	128283	730.3	127.3	85.4	188.3	16.3	78.5	42.1	29.5	162.9	1773
Juneau, AK	30711	345.1	71.7	81.9	71.6	31.7	43.5	9.3	0.0	35.4	1781
Washtenaw, MI	322895	442.1	92.3	64.9	129.3	2.7	44.9	21.7	15.1	71.2	1905
Fractionalized counties > 500000 population											
Montgomery, MD	873341	774.6	100.8	78.8	212.0	6.1	128.9	96.0	21.1	130.9	1746
Pinellas, FL	921482	445.5	86.3	99.1	121.6	10.5	34.5	26.3	4.6	62.6	1914
Broward, FL	1623018	730.7	27.0	77.9	210.6	3.9	139.1	131.2	4.1	136.9	1994
Palm Beach, FL	1131184	833.8	47.1	91.5	265.6	1.7	153.3	147.6	0.7	126.3	2048

* Adjustment made by Finke and Sheitle 2005 ('Accounting for the uncounted: Computing correctives for the 2000 RCMS data') to correct for non-participation of religious bodies that did not participate in the 2000 Survey. The bulk of the non-participating bodies (estimated at 25.10 million out of the 29.05 million non-participants) are historically African-American congregations. The remainder include the Baptist Bible Fellowship (1.2 million estimated members), the Jehovah's Witnesses (1.04 million estimated members) and other smaller groups.

** Includes LDS (Mormon) congregations.

Table 3. Descriptive statistics for county ethnicity data

Table shows descriptive statistics based on 2000 Census.

		Count	Mean	25th percentile	50th percentile	75th percentile	Standard Deviation
Race Herfindahl	Bond	1284617	6542	4827	6578	8382	2020
	County	2396	7607	5990	8164	9235	1805
Hispanic*	Bond	1284617	112.9	18.7	50.6	156.1	144.4
	County	2396	62.2	9.3	18.2	52.2	120.9
White*	Bond	1284617	748.3	619.2	797.2	912.7	197.0
	County	2396	826.5	739.7	899.9	960.7	178.6
Black	Bond	1284617	87.5	13.1	51.7	121.6	106.0
	County	2396	78.5	2.6	15.0	87.2	134.4
American Indian	Bond	1284617	7.1	1.8	2.8	5.2	25.6
	County	2396	12.9	1.8	3.0	6.2	47.6
Asian	Bond	1284617	28.0	5.4	15.5	36.3	36.0
	County	2396	8.0	1.8	3.2	6.8	18.0
Pacific Islander	Bond	1284617	0.8	0.2	0.3	0.5	2.8
	County	2396	0.4	0.1	0.2	0.4	3.1
Other	Bond	1284617	1.3	0.6	1.1	1.6	1.5
	County	2396	0.7	0.2	0.5	0.9	1.0
Two or more races	Bond	1284617	14.2	8.6	12.6	16.6	9.3
	County	2396	10.6	5.9	8.3	12.1	10.4

* Hispanic category includes all Census respondents who identify themselves as 'Hispanic.' 'Hispanic ancestry' and ethnicity are separate questions; many respondents reporting Hispanic ancestry also report White (or Black) ancestry. Remaining categories include only households that do not identify themselves in the Census as Hispanic; thus 'White' households include the White, non-Hispanic households.

Table 4. Ethnicity mix for large counties

Table shows descriptive statistics based on 2000 Census.

	Population	Hispanic	White	Black	American Indian	Asian	Pacific Islander	Other	Two or more races	Herf. Index
Large counties										
Los Angeles, CA	9519338	445.6	310.9	94.7	2.7	118.1	2.4	2.1	23.4	3187
Cook, IL	5376741	199.3	475.9	258.6	1.3	48	0.3	1.4	15.3	3356
Harris, TX	3400578	329.3	421.2	182.2	2.1	50.9	0.4	1.3	12.6	3218
Maricopa, AZ	3072149	248.5	662.2	35.3	14.9	21	1.2	1.3	15.5	5025
Concentrated counties										
Hand, SD	3741	2.9	991.4	0.3	1.3	0.8	0	0	3.2	9830
Griggs, ND	2754	4	990.9	0	2.2	1.5	0	0	1.5	9820
Liberty, MT	2158	1.9	990.7	0	0.9	3.2	0	0.5	2.8	9816
Burke, ND	2242	3.6	990.2	1.3	2.2	1.3	0	0	1.3	9805
Concentrated counties > 500000										
Macomb, MI	788149	15.8	915.9	26.8	2.9	21.2	0.2	0.9	16.3	8406
Bucks, PA	597635	23.4	911.5	31.7	1	22.7	0.1	0.8	8.4	8329
Ocean, NJ	510916	50	898.7	28.2	1	12.6	0.1	0.8	8.4	8113
Bristol, MA	534678	36	893.9	18.3	1.9	12.5	0.2	17	20.2	8015
Hidalgo, TX	569463	883.5	104.3	3.4	0.8	5.6	0	0.3	2	7914
Fractionalized counties										
Hawaii, HI	148677	94.9	297.4	4	3.2	258.1	105.5	1.8	234.9	2305
Maui, HI	128094	78.5	319.4	3.8	2.7	302.9	102.8	1.6	188.2	2460
Kauai, HI	58463	82.2	278.5	2.8	2.4	349.1	86.8	1.4	196.8	2525
Alameda, CA	1443741	189.7	409.4	146.2	3.7	202.7	5.9	3.2	39.1	2677
Robeson, NC	123339	48.6	308.1	249.9	376.7	3.1	0.4	1.6	11.6	3018
Fractionalized counties > 500000										
Alameda, CA	1443741	189.7	409.4	146.2	3.7	202.7	5.9	3.2	39.1	2677
Hudson, NJ	608975	397.6	353.4	121.6	1.5	92.6	0.3	6	27	3071
San Francisco, CA	776733	141	436.3	75.7	2.6	306.6	4.6	3.3	29.8	3109
New York, NY	1537195	271.8	457.9	152.7	1.6	93.2	0.4	3.6	18.8	3159

Table 5. Summary statistics,all variables (weighted by bond)

Variable	Source	Count	Mean	Standard Deviation	Percentile		
					25th	50th	75th
Bond offering yield	Mergent	1731073	4.12	1.10	3.58	4.19	4.80
Bond insurance dummy	Mergent	2045492	0.52	0.50	0.00	1.00	1.00
Competitive bidding	Mergent	2045492	0.15	0.36	0.00	0.00	0.00
Negotiated offer	Mergent	2045492	0.22	0.42	0.00	0.00	0.00
Bond size (\$ 000)	Mergent	1988814	888	72300	160	415	1275
Issue size (\$ 000)	Mergent	2045492	40400	304000	3200	8300	25000
Count of inter-dealer trades in first 60 days	MSRB	2048693	2.98	11.66	0.00	1.00	3.00
LTCR	S&P	1087861	3.55	2.35	1.00	3.00	5.00
SPUR	S&P	853615	4.24	2.24	3.00	4.00	6.00
Religion Herfindahl	ARDA	1285689	3307	913	2655	3142	3680
Religion - member households/1000	ARDA	1285689	642	180	515	635	753
Ethnicity Herfindahl	Census	1284650	6542	2020	4827	6578	8382
Ethnicity - White households/1000	Census	1284650	748	197	619	797	913
Med. house val (\$ 000)	Census	1284650	122	65	82	103	147
Median income (\$ 000)	Census	1284650	44	11	37	43	49
Log total population	Census	1284650	12.31	1.65	11.07	12.38	13.53
LTD per capita (\$000)	Census of gvts, Census	1284650	3.87	5.26	1.87	2.93	4.51
Exp per capita (\$ 000)	Census of gvts, Census	1284650	4.27	4.37	3.02	3.72	4.57
Bond offering yield (among sample with underwriting data)	Mergent	191320	3.86	1.01	3.43	3.94	4.40
Bond total yield	Hand collected	191326	4.06	0.97	3.63	4.1	4.54
Underwriting expense as share of value	Hand collected	196099	0.85	0.65	0.50	0.68	1.00

Table 6. Regressions of bond offering yield on fractionalization, all municipal bonds

Dependent variable is bond offering yield. Sample includes all municipal debt issues that can be mapped to county data. Excluded would be state and supra-county bonds. Cities that cross county boundaries are assigned to the county with the largest number of zip codes. Standard errors clustered by county.

Independent Variable	Mean/SD	Bond offering yield								
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Religion Herfindahl (/10000)	0.331/0.091	-0.4929*** (0.1098)	-0.2169*** (0.0564)			-0.1606*** (0.0604)	-0.2176*** (0.0653)	-0.2319*** (0.0529)	-0.2144*** (0.0588)	
Religion total members per capita	0.642/0.180								-0.1060*** (0.0344)	-0.1387*** (0.0315)
Race Herfindahl (/10000)	0.654/0.202			-0.5141*** (0.0474)	-0.1007*** (0.0314)	-0.0772** (0.0341)	-0.1812*** (0.0362)	-0.1724*** (0.0325)	-0.0156 (0.0549)	
Race Share white	0.748/0.197								-0.2123*** (0.0535)	-0.2261*** (0.0344)
Log county size	12.31/1.65						-0.0201*** (0.0049)	0.0109** (0.0051)	0.0094* (0.0053)	0.0136*** (0.0052)
Log issue size (\$)	15.93/2.07							-0.0528*** (0.0031)	-0.0555*** (0.0030)	-0.0556*** (0.0030)
Log bond size (\$)	13.08/1.67							0.0074* (0.0042)	0.0089** (0.0040)	0.0092** (0.0040)
Bond liquidity	0.76/0.91							-0.0394*** (0.0029)	-0.0395*** (0.0028)	-0.0399*** (0.0028)
Median home value (\$ Millions)	0.122/0.065							-0.4379*** (0.1587)	-0.5405*** (0.1505)	-0.6318*** (0.1540)
Median household income (\$Millions)	0.044/0.011							-1.9238*** (0.7105)	-0.8392 (0.6835)	-0.2514 (0.6873)
Government Debt/Pop (\$Millions)	0.004/0.005							0.0506 (1.4209)	-0.1348 (1.4513)	0.2813 (1.5138)
Spending/Pop (\$Millions)	0.004/0.004							9.5172*** (1.9342)	11.4888*** (2.1261)	12.5989*** (2.1965)
Constant		4.2545*** (0.0419)	4.1634*** (0.0215)	4.4274*** (0.0370)	4.1577*** (0.0245)	4.1953*** (0.0262)	4.5295*** (0.0787)	5.0028*** (0.0728)	5.1188*** (0.0792)	4.9945*** (0.0751)
Control for Month-by-Maturity		N	Y	N	Y	Y	Y	Y	Y	Y
N		1089055	1089055	1088120	1088120	1088120	1088120	1069994	1069994	1069994

Table 7. Regressions of bond offering yield on fractionalization, tax exempt GO municipal bonds

Dependent variable is bond offering yield. Sample includes all municipal debt issues that can be mapped to county data. Excluded would be state and supra-county bonds. Cities that cross county boundaries are assigned to the county with the largest number of zip codes.

Independent Variable	Mean/SD	Bond offering yield								
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Religion Herfindahl (/10000)	0.331/0.091	-0.6853*** (0.2064)	-0.3321*** (0.1129)			-0.2889*** (0.1019)	-0.3400*** (0.0989)	-0.2243*** (0.0720)	-0.1873*** (0.0637)	
Religion total members per capita	0.642/0.180								-0.1058*** (0.0320)	-0.1346*** (0.0333)
Race Herfindahl (/10000)	0.654/0.202			-0.5437*** (0.0994)	-0.1010* (0.0614)	-0.0576 (0.0555)	-0.1491*** (0.0546)	-0.1431*** (0.0390)	-0.0214 (0.0449)	
Race Share white	0.748/0.197								-0.1716*** (0.0542)	-0.1954*** (0.0402)
Log county size	12.31/1.65						-0.0192*** (0.0056)	0.0069 (0.0074)	0.0064 (0.0075)	0.0097 (0.0086)
Log issue size (\$)	15.93/2.07							-0.0170*** (0.0042)	-0.0200*** (0.0040)	-0.0205*** (0.0042)
Log bond size (\$)	13.08/1.67							-0.0343*** (0.0051)	-0.0330*** (0.0050)	-0.0327*** (0.0049)
Bond liquidity	0.76/0.91							-0.0102** (0.0048)	-0.0096** (0.0049)	-0.0102** (0.0051)
Median home value (\$ Millions)	0.122/0.065							-1.1289*** (0.2289)	-1.1983*** (0.2151)	-1.2624*** (0.2278)
Median household income (\$Millions)	0.044/0.011							1.7718 (1.1446)	2.7364** (1.1447)	3.2140*** (1.1740)
Government Debt/Pop (\$Millions)	0.004/0.005							4.1466 (2.9328)	3.5086 (2.8022)	4.2507 (2.8136)
Spending/Pop (\$Millions)	0.004/0.004							11.3777*** (4.0606)	13.7533*** (3.9769)	14.2585*** (4.1678)
Constant		4.1970*** (0.0829)	4.0796*** (0.0476)	4.3273*** (0.0780)	4.0359*** (0.0480)	4.1034*** (0.0593)	4.4162*** (0.0839)	4.7464*** (0.0949)	4.8461*** (0.0973)	4.7517*** (0.0852)
Control for Month-by-Maturity		N	Y	N	Y	Y	Y	Y	Y	Y
		504126	504126	503405	503405	503405	503405	492867	492867	492867

Table 8. Regressions of bond offering yield on fractionalization, uninsured municipal bonds

Dependent variable is bond offering yield. Sample includes all municipal debt issues that can be mapped to county data. Excluded would be state and supra-county bonds. Cities that cross county boundaries are assigned to the county with the largest number of zip codes.

Independent Variable	Mean/SD	Bond offering yield								
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Religion Herfindahl (/10000)	0.331/0.091	-0.5545*** (0.1401)	-0.2638*** (0.0822)			-0.2113** (0.0974)	-0.2900*** (0.1105)	-0.3535*** (0.0849)	-0.2220** (0.0894)	
Religion total members per capita	0.642/0.180								-0.3252*** (0.0575)	-0.3539*** (0.0537)
Race Herfindahl (/10000)	0.654/0.202			-0.6265*** (0.0802)	-0.1043* (0.0629)	-0.0698 (0.0707)	-0.1845*** (0.0663)	-0.1794*** (0.0651)	-0.0428 (0.1025)	
Race Share white	0.748/0.197								-0.2475** (0.1009)	-0.2852*** (0.0658)
Log county size	12.31/1.65						-0.0216** (0.0088)	0.0264*** (0.0102)	0.0228** (0.0095)	0.0278*** (0.0093)
Log issue size (\$)	15.93/2.07							-0.0559*** (0.0055)	-0.0631*** (0.0050)	-0.0635*** (0.0049)
Log bond size (\$)	13.08/1.67							-0.0060 (0.0069)	-0.0012 (0.0063)	-0.0010 (0.0063)
Bond liquidity	0.76/0.91							-0.0532*** (0.0050)	-0.0531*** (0.0049)	-0.0534*** (0.0049)
Median home value (\$ Millions)	0.122/0.065							-0.2264 (0.3300)	-0.4599 (0.2907)	-0.5792* (0.2962)
Median household income (\$Millions)	0.044/0.011							-4.4711*** (1.3723)	-2.7141** (1.3082)	-1.8980 (1.3313)
Government Debt/Pop (\$Millions)	0.004/0.005							-4.4131** (1.7523)	-5.2436*** (1.8276)	-5.1817*** (1.7858)
Spending/Pop (\$Millions)	0.004/0.004							12.8579*** (2.8913)	19.1106*** (3.2454)	20.6771*** (3.2206)
Constant		4.3235*** (0.0549)	4.2269*** (0.0329)	4.5617*** (0.0646)	4.2098*** (0.0508)	4.2568*** (0.0492)	4.6199*** (0.1363)	5.2021*** (0.1186)	5.4897*** (0.1344)	5.3501*** (0.1307)
Control for Month-by-Maturity		N	Y	N	Y	Y	Y	Y	Y	Y
N		498584	498584	498087	498087	498087	498087	488135	488135	488135

Table 9. Regressions of bond offering yield on fractionalization, all municipal bonds - by issue size

Dependent variable is bond offering yield. Sample includes all municipal debt issues that can be mapped to county data. Excluded would be state and supra-county bonds. Cities that cross county boundaries are assigned to the county with the largest number of zip codes. All specifications include month-by-maturity controls. Standard errors clustered by county.

Independent Variable	Bond offering yield									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Religion Herfindahl (/10000)	-0.2768*** (0.0954)	-0.3440*** (0.0910)	-0.2126*** (0.0812)	-0.1802* (0.1005)	-0.0702 (0.0756)	-0.0720 (0.0760)	-0.0630 (0.0878)	0.0713 (0.0962)	0.0660 (0.1001)	0.2974* (0.1718)
Religion total members per capita	-0.0950* (0.0492)	-0.1547*** (0.0551)	-0.1660*** (0.0479)	-0.1768*** (0.0602)	-0.1968*** (0.0465)	-0.0947** (0.0455)	-0.1026** (0.0433)	-0.0501 (0.0477)	-0.0180 (0.0436)	-0.0557 (0.0609)
Race Herfindahl (/10000)	0.4620*** (0.1430)	-0.1140 (0.0861)	-0.1215 (0.0741)	-0.0307 (0.0852)	-0.0360 (0.0929)	0.0176 (0.0667)	-0.0071 (0.0672)	-0.1016* (0.0576)	-0.0129 (0.0863)	0.0061 (0.1502)
Race Share white	-0.8745*** (0.1529)	-0.2031* (0.1074)	-0.1732** (0.0794)	-0.2257*** (0.0788)	-0.1956** (0.0910)	-0.2326*** (0.0623)	-0.1509** (0.0594)	-0.0006 (0.0490)	-0.0958 (0.0832)	0.0679 (0.1132)
Log county size	0.0260*** (0.0099)	0.0072 (0.0102)	0.0139* (0.0080)	0.0110 (0.0086)	0.0171** (0.0075)	0.0187*** (0.0066)	0.0099 (0.0066)	-0.0021 (0.0062)	-0.0083 (0.0067)	-0.0186 (0.0121)
Log issue size (\$)	-0.2263*** (0.0182)	-0.1402*** (0.0312)	-0.0760* (0.0448)	-0.0151 (0.0415)	-0.0154 (0.0398)	0.2393*** (0.0519)	-0.0697** (0.0309)	-0.0283 (0.0256)	-0.0233 (0.0214)	0.0402*** (0.0114)
Log bond size (\$)	0.0676*** (0.0123)	0.0102 (0.0107)	-0.0056 (0.0077)	-0.0121 (0.0086)	0.0048 (0.0057)	-0.0041 (0.0043)	0.0065 (0.0058)	0.0058 (0.0041)	0.0049 (0.0045)	0.0158*** (0.0044)
Bond liquidity	-0.0869*** (0.0155)	-0.1078*** (0.0149)	-0.0932*** (0.0097)	-0.0669*** (0.0060)	-0.0452*** (0.0062)	-0.0336*** (0.0050)	-0.0562*** (0.0043)	-0.0361*** (0.0036)	-0.0179*** (0.0031)	-0.0096* (0.0054)
Median home value (\$ Millions)	0.0533 (0.4014)	-1.0869*** (0.3856)	-1.1042*** (0.2943)	-0.7870*** (0.1951)	-0.6492*** (0.2079)	-0.3070** (0.1562)	-0.5372*** (0.1683)	-0.2236 (0.1791)	-0.0530 (0.1556)	0.0877 (0.2704)
Median household income (\$Millions)	-1.6565 (1.8928)	1.0580 (1.5333)	1.0378 (1.1967)	0.0751 (0.9453)	-0.2050 (1.0441)	-1.5863* (0.8115)	-0.7417 (1.0018)	-2.6960*** (0.9252)	-2.4567*** (0.9266)	-5.5576*** (1.3501)
Government Debt/Pop (\$Millions)	-1.9956 (1.7643)	-1.9408 (1.7802)	-2.7921 (1.9764)	0.2151 (1.9427)	-0.2919 (3.0301)	2.1552 (1.7702)	5.1706 (3.5324)	4.1008 (3.2622)	4.3920 (3.9952)	5.0906 (4.8071)
Spending/Pop (\$Millions)	11.3599 (7.6947)	22.6626** (10.7089)	23.4972*** (6.4261)	15.9509*** (5.0024)	16.8181*** (4.4088)	9.0795*** (3.1191)	1.1625 (3.9295)	4.3197 (3.7963)	0.7814 (4.2893)	-0.9930 (5.3266)
Constant	6.7052*** (0.2209)	6.3779*** (0.4526)	5.5298*** (0.6566)	4.7015*** (0.6287)	4.3688*** (0.6284)	0.3433 (0.8330)	5.3557*** (0.5008)	4.7865*** (0.4404)	4.7669*** (0.3680)	3.6513*** (0.2798)
Avg. issue size (\$M)	0.788	1.989	3.296	4.893	7.112	10.063	15.882	26.881	53.094	315.800
N	108978	119783	121090	117565	115848	113162	112998	102870	93306	64394

Table 10. Regressions of bond offering yield on fractionalization, all municipal bonds - by county average income

Dependent variable is bond offering yield. Sample includes all municipal debt issues that can be mapped to county data. Excluded would be state and supra-county bonds. Cities that cross county boundaries are assigned to the county with the largest number of zip codes. All specifications include month-by-maturity controls. Standard errors clustered by county.

Independent Variable	Bond offering yield									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Religion Herfindahl (/10000)	-0.1942** (0.0755)	-0.1257 (0.0897)	-0.3060*** (0.0930)	-0.2884** (0.1440)	-0.2169 (0.1978)	0.1853 (0.3264)	-0.1655 (0.1477)	-0.1721 (0.1636)	-0.9009*** (0.3021)	-0.3572 (0.2235)
Religion total members per capita	0.0090 (0.0498)	0.1431*** (0.0466)	0.1395*** (0.0472)	0.0304 (0.0703)	-0.0046 (0.1067)	-0.1792 (0.1749)	0.0565 (0.0623)	-0.1989** (0.0907)	-0.3175*** (0.0843)	-0.4337*** (0.0856)
Race Herfindahl (/10000)	0.0459 (0.0726)	0.3214*** (0.0989)	0.2117* (0.1231)	0.4505*** (0.1720)	-0.0508 (0.2295)	-0.6538 (0.5190)	0.3384 (0.3574)	0.1377 (0.3131)	1.4195*** (0.3500)	-0.0055 (0.4058)
Race Share white	-0.0544 (0.0552)	-0.3582*** (0.1086)	-0.4147*** (0.1286)	-0.6106*** (0.1747)	-0.5032* (0.2746)	0.3068 (0.6000)	-0.5669 (0.4087)	-0.5686 (0.3484)	-2.0747*** (0.4596)	-0.3639 (0.4687)
Log county size	0.0198 (0.0136)	0.0158 (0.0101)	0.0130 (0.0083)	0.0237** (0.0109)	-0.0234* (0.0124)	-0.0126 (0.0269)	0.0092 (0.0083)	-0.0023 (0.0154)	-0.0070 (0.0167)	-0.0004 (0.0156)
Log issue size (\$)	-0.0855*** (0.0094)	-0.0680*** (0.0071)	-0.0565*** (0.0081)	-0.0685*** (0.0100)	-0.0712*** (0.0097)	-0.0496*** (0.0132)	-0.0513*** (0.0059)	-0.0475*** (0.0095)	-0.0388*** (0.0082)	-0.0467*** (0.0098)
Log bond size (\$)	0.0504*** (0.0070)	0.0242*** (0.0051)	0.0110* (0.0060)	0.0202** (0.0083)	0.0177** (0.0083)	-0.0250** (0.0109)	0.0246*** (0.0083)	0.0007 (0.0078)	-0.0090 (0.0073)	0.0227* (0.0115)
Bond liquidity	-0.0130** (0.0066)	-0.0251*** (0.0061)	-0.0436*** (0.0073)	-0.0260*** (0.0054)	-0.0394*** (0.0077)	-0.0536*** (0.0098)	-0.0314*** (0.0078)	-0.0397*** (0.0079)	-0.0423*** (0.0065)	-0.0399*** (0.0061)
Median home value (\$ Millions)	-1.3213* (0.7190)	0.4955 (0.5894)	0.5703 (0.5301)	-0.2571 (0.4685)	-0.5422 (0.6578)	0.6426 (0.8106)	-0.9654* (0.4907)	-0.9842** (0.4756)	-0.4959** (0.2456)	-0.6085*** (0.2000)
Median household income (\$Millions)	1.2705 (3.3118)	6.2673 (7.2282)	-5.5365 (10.2616)	-0.2198 (11.2440)	3.2462 (17.8846)	-23.0380 (25.7607)	-6.2949 (11.6347)	-8.5788 (12.0809)	-0.8695 (3.8295)	-7.1589*** (2.5371)
Government Debt/Pop (\$Millions)	-1.1434 (2.4538)	-0.3661 (2.8584)	-1.6946** (0.8060)	11.9112* (6.9048)	2.3775 (5.6277)	2.7771 (12.2069)	-5.1078 (7.0723)	-5.0736* (2.8689)	-10.3220 (10.2400)	-6.9611 (13.4129)
Spending/Pop (\$Millions)	26.6098*** (9.4911)	8.2231 (7.8949)	3.4630 (5.5327)	-21.7992* (12.8629)	1.6347 (15.9088)	50.2393* (28.3723)	15.9807* (8.3510)	48.2958** (19.6085)	-16.3024 (23.9313)	12.0401 (17.6064)
Constant	4.6271*** (0.1567)	4.3710*** (0.2639)	5.0306*** (0.4021)	4.9289*** (0.4630)	5.7286*** (0.7853)	6.4351*** (1.1915)	5.0910*** (0.5603)	5.7695*** (0.5373)	6.3024*** (0.6183)	5.7852*** (0.2447)
Median income (\$K)	28.4	33.6	36.5	39.0	41.5	43.3	45.9	49.1	57.0	67.3
N	106019	105945	106968	105885	111742	107040	112503	97431	113087	103374

Table 11. Regressions of bond offering yield on fractionalization, all municipal bonds - by county size

Dependent variable is bond offering yield. Sample includes all municipal debt issues that can be mapped to county data. Excluded would be state and supra-county bonds. Cities that cross county boundaries are assigned to the county with the largest number of zip codes. All specifications include month-by-maturity controls. Standard errors clustered by county.

Independent Variable	Bond offering yield									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Religion Herfindahl (/10000)	-0.1812*** (0.0687)	-0.1341 (0.0866)	-0.1478* (0.0780)	-0.3575*** (0.1197)	-0.3091* (0.1682)	0.0310 (0.1697)	-0.1518 (0.3672)	-0.1507 (0.2108)	0.4276 (0.4104)	2.2384*** (0.2644)
Religion total members per capita	0.0183 (0.0339)	-0.0093 (0.0443)	0.0141 (0.0487)	-0.0033 (0.0848)	-0.0041 (0.0719)	-0.0972 (0.0687)	-0.2090 (0.1392)	-0.1825*** (0.0670)	-0.4293*** (0.1390)	-0.1351 (0.0907)
Race Herfindahl (/10000)	0.2858*** (0.0856)	0.1199 (0.0794)	-0.0782 (0.1159)	-0.1772 (0.1908)	0.0893 (0.1118)	-0.2222* (0.1150)	-0.2171 (0.1600)	-0.3090* (0.1697)	0.1814 (0.5339)	0.4135* (0.1935)
Race Share white	-0.3067*** (0.0911)	-0.0650 (0.0723)	-0.0627 (0.0923)	0.0404 (0.2079)	-0.2937*** (0.0866)	-0.0370 (0.0822)	-0.0717 (0.1225)	-0.2688** (0.1212)	-0.5954 (0.5250)	-0.2863 (0.1617)
Log county size	0.0098 (0.0134)	0.0172 (0.0405)	0.0283 (0.0429)	0.0577 (0.0832)	0.0098 (0.0525)	0.1165 (0.0839)	0.0279 (0.1198)	-0.1123 (0.1256)	0.0387 (0.1263)	-0.0369** (0.0148)
Log issue size (\$)	-0.0779*** (0.0072)	-0.0666*** (0.0070)	-0.0503*** (0.0079)	-0.0499*** (0.0080)	-0.0444*** (0.0078)	-0.0501*** (0.0078)	-0.0538*** (0.0077)	-0.0601*** (0.0092)	-0.0745*** (0.0117)	-0.0551*** (0.0123)
Log bond size (\$)	0.0293*** (0.0071)	0.0194*** (0.0056)	0.0066 (0.0063)	-0.0019 (0.0082)	0.0139** (0.0054)	0.0076 (0.0087)	-0.0029 (0.0109)	0.0278*** (0.0062)	0.0321** (0.0139)	0.0020 (0.0105)
Bond liquidity	-0.0444*** (0.0084)	-0.0396*** (0.0071)	-0.0296*** (0.0059)	-0.0376*** (0.0076)	-0.0371*** (0.0060)	-0.0393*** (0.0063)	-0.0367*** (0.0081)	-0.0388*** (0.0048)	-0.0442*** (0.0063)	-0.0228** (0.0084)
Median home value (\$ Millions)	-0.7561*** (0.1981)	-0.4738 (0.4179)	-0.2441 (0.4814)	-0.8662 (0.6909)	-1.3682* (0.7485)	-0.1265 (0.2271)	-1.0933** (0.5417)	-0.5680* (0.3196)	-0.6535 (0.5445)	-0.1305 (0.5980)
Median household income (\$Millions)	2.6625* (1.4606)	1.5714 (1.7629)	2.1619 (1.5656)	2.1150 (3.0605)	2.2690 (2.2311)	-2.5363* (1.4334)	-0.3816 (2.3004)	-0.4022 (2.6380)	-2.0020 (3.0856)	-3.0027 (5.5237)
Government Debt/Pop (\$Millions)	-1.6167** (0.7897)	-3.9506 (2.7460)	0.3844 (3.3565)	-0.0151 (5.7952)	-2.0081 (1.3922)	23.3307*** (7.7699)	10.8029 (12.7793)	3.5339 (9.3522)	16.5778 (20.0691)	20.8830* (9.8261)
Spending/Pop (\$Millions)	8.1275 (5.7496)	5.3972 (6.5613)	3.2800 (7.3623)	-20.0958 (14.2931)	8.1365 (10.4788)	-1.5317 (21.7481)	52.6838* (29.6775)	-3.9596 (22.8842)	-1.9056 (21.3594)	-82.2262** (27.2563)
Constant	4.7670*** (0.1628)	4.6170*** (0.4419)	4.4874*** (0.4566)	4.4722*** (0.8406)	4.7947*** (0.6763)	3.6373*** (1.0277)	4.9450*** (1.5602)	6.8419*** (1.6766)	5.0948*** (1.6339)	5.6158*** (0.3340)
Average size (K)	15.6	37.6	68.5	115.4	190.8	315.1	504.4	783.1	1322.4	4306.5
N	106659	106132	106076	106217	109415	107885	108243	107618	104865	106884

Table 12. Regressions of bond offering yield on fractionalization, all municipal bonds - by share white

Dependent variable is bond offering yield. Sample includes all municipal debt issues that can be mapped to county data. Excluded would be state and supra-county bonds. Cities that cross county boundaries are assigned to the county with the largest number of zip codes. Standard errors clustered by county.

Independent Variable	Bond offering yield									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Religion Herfindahl (/10000)	0.2118 (0.2188)	0.8360* (0.4904)	-0.1913 (0.2488)	0.2196 (0.2104)	-0.1364 (0.2215)	-0.1770 (0.1413)	-0.2878 (0.1959)	-0.3450*** (0.0774)	-0.3940*** (0.0920)	-0.3169*** (0.0764)
Religion total members per capita	-0.0509 (0.0827)	-0.4163*** (0.1225)	-0.2501*** (0.0603)	-0.2372*** (0.0655)	-0.1030 (0.1006)	-0.1312 (0.0813)	-0.2257** (0.0871)	0.0248 (0.0496)	0.1425*** (0.0522)	0.0858** (0.0385)
Race Herfindahl (/10000)	-0.1786 (0.2208)	-0.1055 (0.5270)	-0.4231 (0.5776)	-0.7578 (0.6967)	-2.0170 (1.6231)	4.9209* (2.7267)	-0.9932 (8.1085)	9.2443 (8.3147)	32.9886 (21.3667)	10.9639 (63.7146)
Race Share white	0.0739 (0.3749)	-0.2336 (0.4239)	-0.9746 (0.6895)	-0.0189 (0.8804)	3.8815* (2.2069)	-6.6063* (3.8292)	1.5184 (13.0481)	-15.4826 (14.5493)	-60.8640 (39.2080)	-20.2057 (122.9543)
Log county size	0.0110 (0.0139)	0.0471*** (0.0159)	0.0308*** (0.0098)	0.0041 (0.0142)	0.0147 (0.0140)	0.0131 (0.0136)	-0.0157 (0.0176)	0.0098 (0.0098)	-0.0065 (0.0123)	-0.0286*** (0.0096)
Log issue size (\$)	-0.0764*** (0.0167)	-0.0618*** (0.0089)	-0.0719*** (0.0093)	-0.0360*** (0.0069)	-0.0566*** (0.0082)	-0.0288*** (0.0071)	-0.0521*** (0.0072)	-0.0481*** (0.0069)	-0.0504*** (0.0072)	-0.0558*** (0.0064)
Log bond size (\$)	0.0215* (0.0129)	0.0032 (0.0159)	0.0138** (0.0070)	0.0163** (0.0068)	0.0010 (0.0162)	0.0117 (0.0077)	0.0081 (0.0084)	0.0205*** (0.0052)	0.0186*** (0.0049)	0.0173*** (0.0043)
Bond liquidity	-0.0258*** (0.0056)	-0.0305*** (0.0067)	-0.0319*** (0.0070)	-0.0278*** (0.0058)	-0.0461*** (0.0116)	-0.0268*** (0.0050)	-0.0387*** (0.0076)	-0.0457*** (0.0055)	-0.0518*** (0.0075)	-0.0680*** (0.0059)
Median home value (\$ Millions)	-0.3294 (0.3080)	-0.5375 (0.3309)	-0.4738 (0.2936)	-0.9936*** (0.3305)	-0.6334 (0.4177)	-1.6496*** (0.4007)	-1.5246*** (0.5668)	-0.4337* (0.2421)	-1.8011*** (0.4660)	-1.0780 (0.6983)
Median household income (\$Millions)	-2.4706 (3.2791)	0.7792 (2.1160)	-2.7700 (1.7269)	0.5324 (1.7339)	-1.4729 (1.3713)	2.7492* (1.5115)	3.8367 (3.6146)	-1.1914 (1.0915)	4.7882*** (1.7624)	4.0819* (2.0907)
Government Debt/Pop (\$Millions)	1.9148 (7.1348)	-1.8308 (7.2776)	-1.6881 (3.5501)	-1.6993 (9.7012)	8.2009 (6.8872)	-0.5475 (3.4928)	5.9354 (5.5724)	-0.9580 (2.5880)	0.4775 (1.3349)	1.1756 (1.6940)
Spending/Pop (\$Millions)	33.9664*** (12.6544)	17.5645** (8.0815)	7.0422 (6.9294)	29.7701** (14.4680)	15.7721 (26.8825)	24.0504 (17.9312)	-17.5641 (15.6200)	0.2155 (6.8176)	-15.2546 (9.3589)	-12.2672* (7.0797)
Constant	5.1150*** (0.3566)	4.7115*** (0.3030)	5.9402*** (0.3220)	4.8876*** (0.4416)	3.2723*** (0.7709)	6.3955*** (1.3248)	4.6324 (4.9694)	11.0035* (6.3116)	32.6927* (17.9160)	14.2336 (59.2788)
Average share white	0.354	0.498	0.614	0.707	0.767	0.819	0.869	0.91	0.944	0.971
N	108089	106209	115348	97746	107902	108662	106900	106553	105635	106950

Table 13. Regressions of bond offering yield on fractionalization, all municipal bonds - by share that are religious participants

Dependent variable is bond offering yield. Sample includes all municipal debt issues that can be mapped to county data. Excluded would be state and supra-county bonds. Cities that cross county boundaries are assigned to the county with the largest number of zip codes. Standard errors clustered by county.

Independent Variable	Bond offering yield									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Religion Herfindahl (/10000)	0.0157 (0.0994)	-0.1554 (0.2158)	-0.0408 (0.1879)	-0.2085* (0.1180)	-0.3655*** (0.1273)	0.0464 (0.1964)	-0.4687*** (0.1070)	-0.3011** (0.1247)	-0.3307*** (0.1071)	-0.3646** (0.1500)
Religion total members per capita	-0.2244 (0.1781)	-0.7685 (0.7851)	-0.9212 (0.8257)	-0.7554 (0.7982)	-0.1475 (0.6296)	3.0134*** (1.1547)	-0.0148 (0.6692)	0.1489 (0.8113)	-0.1416 (0.3754)	0.3111*** (0.1049)
Race Herfindahl (/10000)	-0.2453** (0.1138)	-0.3470* (0.1856)	0.1233 (0.2355)	-0.1315 (0.1097)	-0.0173 (0.0753)	0.0510 (0.1583)	0.1800 (0.1292)	0.1380 (0.1142)	0.1157* (0.0694)	0.4017*** (0.1235)
Race Share white	-0.1005 (0.1254)	-0.0351 (0.1880)	-0.5846** (0.2566)	-0.1523 (0.1032)	-0.1493*** (0.0558)	0.0521 (0.1563)	-0.1529 (0.1362)	-0.2590** (0.1008)	-0.1960*** (0.0617)	-0.2427* (0.1263)
Log county size	0.0077 (0.0092)	-0.0012 (0.0090)	0.0482*** (0.0175)	0.0226* (0.0118)	-0.0005 (0.0104)	0.0090 (0.0101)	0.0047 (0.0115)	0.0008 (0.0125)	0.0032 (0.0112)	0.0289* (0.0156)
Log issue size (\$)	-0.0676*** (0.0080)	-0.0528*** (0.0077)	-0.0740*** (0.0104)	-0.0643*** (0.0057)	-0.0406*** (0.0066)	-0.0509*** (0.0101)	-0.0609*** (0.0082)	-0.0509*** (0.0162)	-0.0597*** (0.0073)	-0.0574*** (0.0097)
Log bond size (\$)	0.0166** (0.0080)	0.0028 (0.0076)	-0.0006 (0.0104)	0.0045 (0.0066)	0.0046 (0.0091)	-0.0045 (0.0131)	0.0240*** (0.0048)	0.0098 (0.0075)	0.0315*** (0.0076)	0.0471*** (0.0074)
Bond liquidity	-0.0245*** (0.0063)	-0.0447*** (0.0057)	-0.0513*** (0.0063)	-0.0304*** (0.0061)	-0.0318*** (0.0066)	-0.0362*** (0.0079)	-0.0399*** (0.0081)	-0.0351*** (0.0074)	-0.0339*** (0.0088)	-0.0240*** (0.0057)
Median home value (\$ Millions)	-0.5233*** (0.1812)	-0.7766*** (0.2551)	-0.3500 (0.3296)	-0.2087 (0.2690)	-1.2829*** (0.4623)	-0.8839*** (0.3333)	-2.1657*** (0.6724)	-0.3958 (0.4185)	0.5510 (0.7896)	-0.6870* (0.4154)
Median household income (\$Millions)	1.3688 (1.0355)	5.2574** (2.4056)	-0.8171 (1.5495)	-1.2152 (1.8209)	1.0698 (1.7257)	0.5541 (1.9448)	4.3978* (2.6414)	-1.9169 (1.7932)	-4.1238 (3.1011)	-6.3825*** (2.3969)
Government Debt/Pop (\$Millions)	1.2686 (7.0505)	-2.3070 (1.5588)	5.6320 (4.9853)	-3.2163 (2.4745)	0.1121 (5.5740)	12.9011* (6.9528)	11.1695** (4.8291)	0.8488 (5.0714)	-0.3454 (1.8121)	3.1042 (4.9962)
Spending/Pop (\$Millions)	7.5492 (10.4009)	-3.4939 (13.8887)	1.4732 (7.6636)	-0.8624 (11.9734)	7.5636 (10.4180)	49.1159** (21.5871)	4.4439 (10.0000)	26.7944*** (9.8270)	-8.2634 (9.9740)	6.3544 (5.1686)
Constant	5.2016*** (0.1908)	5.4987*** (0.5175)	5.6747*** (0.4234)	5.5863*** (0.4926)	5.0541*** (0.4377)	2.6740*** (0.7215)	4.7786*** (0.4461)	4.8705*** (0.6492)	5.0172*** (0.3651)	4.0804*** (0.2181)
Average relig. partic.	0.355	0.455	0.511	0.559	0.61	0.655	0.698	0.755	0.836	0.990
N	108951	108807	109715	108145	108203	109354	102527	106125	104693	103474

Table 14. Regressions of bond offering yield on fractionalization, all municipal bonds - by year, 1995-2002.

Dependent variable is bond offering yield. Sample includes all municipal debt issues that can be mapped to county data. Excluded would be state and supra-county bonds. Cities that cross county boundaries are assigned to the county with the largest number of zip codes. Standard errors clustered by county.

Independent Variable	Bond offering yield								
	All years	1995	1996	1997	1998	1999	2000	2001	2002
Religion Herfindahl (/10000)	-0.2144*** (0.0588)	0.0094 (0.1864)	-0.0836 (0.1227)	-0.2402** (0.1023)	-0.1727** (0.0758)	-0.2658*** (0.0928)	-0.2426*** (0.0849)	-0.3358*** (0.0903)	-0.2814*** (0.0918)
Religion total members per capita	-0.1060*** (0.0344)	-0.2318** (0.1029)	-0.0761 (0.0675)	-0.0376 (0.0619)	-0.0146 (0.0420)	-0.0201 (0.0448)	0.0678 (0.0460)	-0.0196 (0.0462)	-0.0648 (0.0512)
Race Herfindahl (/10000)	-0.0156 (0.0549)	0.4804 (0.3566)	-0.0092 (0.1310)	-0.1724 (0.1247)	-0.0161 (0.0628)	-0.0808 (0.0833)	0.0214 (0.0745)	0.0606 (0.0741)	-0.0108 (0.0790)
Race Share white	-0.2123*** (0.0535)	-0.9165** (0.3934)	-0.1242 (0.1285)	-0.0345 (0.1135)	-0.0139 (0.0606)	-0.0293 (0.0710)	-0.0764 (0.0716)	-0.1731** (0.0683)	-0.1850*** (0.0704)
Log county size	0.0094* (0.0053)	0.0276* (0.0151)	0.0233** (0.0102)	-0.0095 (0.0099)	0.0245*** (0.0069)	0.0077 (0.0072)	0.0077 (0.0086)	0.0011 (0.0075)	-0.0080 (0.0069)
Log issue size (\$)	-0.0555*** (0.0030)	-0.0938*** (0.0163)	-0.0974*** (0.0126)	-0.0819*** (0.0099)	-0.0455*** (0.0074)	-0.0590*** (0.0082)	-0.0754*** (0.0081)	-0.0786*** (0.0082)	-0.0542*** (0.0069)
Log bond size (\$)	0.0089** (0.0040)	0.0289** (0.0112)	0.0386*** (0.0089)	0.0348*** (0.0067)	0.0250*** (0.0067)	0.0394*** (0.0068)	0.0352*** (0.0082)	0.0187*** (0.0071)	0.0062 (0.0062)
Bond liquidity	-0.0395*** (0.0028)	-0.0590*** (0.0116)	-0.0379*** (0.0093)	-0.0559*** (0.0078)	-0.0338*** (0.0048)	-0.0567*** (0.0064)	-0.0799*** (0.0070)	-0.0558*** (0.0066)	-0.0629*** (0.0061)
Median home value (\$ Millions)	-0.5405*** (0.1505)	0.4758 (0.5226)	-0.3399 (0.2908)	-0.1056 (0.2134)	-0.6031*** (0.1649)	-0.4177** (0.1862)	-1.4096*** (0.2003)	-0.4923** (0.2272)	-0.3699 (0.2251)
Median household income (\$Millions)	-0.8392 (0.6835)	-5.8835*** (2.0451)	-3.9593*** (1.4765)	-2.7756* (1.4926)	-1.1489 (0.8761)	-1.3172 (0.9355)	3.4102*** (1.2086)	-0.8365 (1.0645)	-0.4675 (1.2618)
Government Debt/Pop (\$Millions)	-0.1348 (1.4513)	-1.7329 (3.6471)	4.6342 (4.5186)	-0.1915 (2.0002)	-0.9730 (1.2291)	2.4057 (2.2448)	4.8163 (3.3553)	12.0141*** (3.4109)	2.5087 (2.8608)
Spending/Pop (\$Millions)	11.4888*** (2.1261)	16.7259*** (5.7759)	17.0469*** (5.1652)	10.0080*** (3.0765)	10.8973*** (2.0275)	7.6482** (3.0124)	9.4434** (4.2908)	-2.6308 (4.0291)	6.6909* (3.6803)
Constant	5.1188*** (0.0792)	6.7247*** (0.2784)	6.1945*** (0.1949)	6.2971*** (0.2046)	4.8345*** (0.1220)	5.3849*** (0.1490)	5.9365*** (0.1514)	5.6273*** (0.1505)	5.1127*** (0.1382)
Control for YYYYMM X Maturity by Y		Y	Y	Y	Y	Y	Y	Y	Y
N	1069994	30184	44198	45973	66547	55770	55782	77900	81736

Table 15. Regressions of bond offering yield on fractionalization, all municipal bonds - by year, 2002-2009.

Dependent variable is bond offering yield. Sample includes all municipal debt issues that can be mapped to county data. Excluded would be state and supra-county bonds. Cities that cross county boundaries are assigned to the county with the largest number of zip codes. Standard errors clustered by county.

Independent Variable	Bond offering yield								
	All years	2002	2003	2004	2005	2006	2007	2008	2009
Religion Herfindahl (/10000)	-0.2144*** (0.0588)	-0.2814*** (0.0918)	-0.2428*** (0.0887)	-0.0288 (0.0987)	-0.1013 (0.0785)	-0.2496*** (0.0825)	-0.1642* (0.0842)	-0.2500** (0.1085)	-0.3947** (0.1558)
Religion total members per capita	-0.1060*** (0.0344)	-0.0648 (0.0512)	-0.0671 (0.0531)	-0.1560*** (0.0547)	-0.1081*** (0.0412)	-0.0784 (0.0507)	-0.1017** (0.0403)	-0.3113*** (0.0564)	-0.3797*** (0.0902)
Race Herfindahl (/10000)	-0.0156 (0.0549)	-0.0108 (0.0790)	-0.0257 (0.0815)	-0.0911 (0.0995)	-0.0611 (0.0508)	-0.0941 (0.0595)	0.0455 (0.0754)	-0.1314 (0.1104)	0.3803* (0.2277)
Race Share white	-0.2123*** (0.0535)	-0.1850*** (0.0704)	-0.3017*** (0.0791)	-0.1805* (0.0932)	-0.1800*** (0.0425)	-0.0968* (0.0555)	-0.2100*** (0.0774)	-0.2965*** (0.1133)	-0.8611*** (0.2440)
Log county size	0.0094* (0.0053)	-0.0080 (0.0069)	-0.0010 (0.0082)	0.0107 (0.0082)	0.0102 (0.0068)	0.0047 (0.0068)	0.0103 (0.0075)	0.0254** (0.0102)	0.0270** (0.0137)
Log issue size (\$)	-0.0555*** (0.0030)	-0.0542*** (0.0069)	-0.0426*** (0.0062)	-0.0524*** (0.0052)	-0.0550*** (0.0056)	-0.0568*** (0.0051)	-0.0422*** (0.0059)	-0.0433*** (0.0080)	-0.0354*** (0.0102)
Log bond size (\$)	0.0089** (0.0040)	0.0062 (0.0062)	-0.0136** (0.0067)	-0.0066 (0.0071)	0.0081 (0.0053)	0.0216*** (0.0055)	0.0243*** (0.0056)	-0.0140* (0.0077)	-0.0307*** (0.0103)
Bond liquidity	-0.0395*** (0.0028)	-0.0629*** (0.0061)	-0.0485*** (0.0061)	-0.0536*** (0.0048)	-0.0318*** (0.0039)	-0.0385*** (0.0042)	-0.0324*** (0.0042)	-0.0152*** (0.0058)	0.0040 (0.0090)
Median home value (\$ Millions)	-0.5405*** (0.1505)	-0.3699 (0.2251)	-0.3325 (0.2288)	-0.5000** (0.1963)	-0.4198*** (0.1438)	-0.1579 (0.1925)	-0.4564** (0.2154)	-1.1568*** (0.3384)	-1.3553*** (0.4891)
Median household income (\$Millions)	-0.8392 (0.6835)	-0.4675 (1.2618)	-0.0281 (1.0823)	-0.4656 (0.9852)	-0.1180 (0.7537)	-0.8220 (0.8291)	-0.0037 (0.9022)	0.8559 (1.7236)	-3.3102 (2.3598)
Government Debt/Pop (\$Millions)	-0.1348 (1.4513)	2.5087 (2.8608)	-3.9552* (2.2058)	-1.7196 (1.5048)	-1.7527 (1.3927)	-1.7877 (2.6050)	1.4763 (2.0532)	-4.0550* (2.4282)	-2.8823 (3.8969)
Spending/Pop (\$Millions)	11.4888*** (2.1261)	6.6909* (3.6803)	16.2041*** (3.3398)	13.1771*** (2.7009)	9.9600*** (2.2700)	6.7979** (3.3561)	5.4376* (3.0293)	20.4906*** (3.7057)	18.0588*** (5.8126)
Constant	5.1188*** (0.0792)	5.1127*** (0.1382)	4.5384*** (0.1198)	4.6314*** (0.1178)	4.7057*** (0.1095)	4.9618*** (0.1134)	4.6008*** (0.1202)	4.9860*** (0.1739)	4.9426*** (0.2554)
Control for YYYYMM X Maturity by Y		Y	Y	Y	Y	Y	Y	Y	Y
N		81736	103464	93755	102441	85439	82057	66713	78035

Table 16. Main coefficients for different subsamples, excluding each state (state by state).

State	Observations	Regression coefficients excluding state's observations			
		Religion herfindahl	Religiousness	Race herfindahl	Share white
ALL		-0.2144	-0.106	-0.0156	-0.2123
AK	1317	-0.2145	-0.106	-0.0158	-0.2122
AL	20370	-0.2311	-0.1084	-0.009	-0.2118
AR	17193	-0.196	-0.106	-0.0267	-0.2051
AZ	16553	-0.2161	-0.1046	-0.0109	-0.2143
CA	95696	-0.3121	-0.0053	0.0629	-0.1756
CO	12314	-0.2188	-0.1042	-0.0144	-0.212
CT	14102	-0.1979	-0.1014	-0.0241	-0.1996
DE	760	-0.2145	-0.1059	-0.0157	-0.2122
FL	28469	-0.2137	-0.1048	-0.024	-0.2046
GA	12533	-0.2109	-0.1083	-0.0129	-0.2127
HI	638	-0.2145	-0.1059	-0.0151	-0.2116
IA	27715	-0.1944	-0.1168	-0.0287	-0.2087
ID	2461	-0.2181	-0.1067	-0.0164	-0.212
IL	52792	-0.2306	-0.1073	-0.0162	-0.2123
IN	27377	-0.1988	-0.0951	-0.0328	-0.2049
KS	29558	-0.2221	-0.1099	-0.0183	-0.2132
KY	22235	-0.1745	-0.1108	-0.0235	-0.1976
LA	3959	-0.2129	-0.1096	-0.0191	-0.2076
MA	24578	-0.1641	-0.09	-0.0078	-0.1833
MD	7417	-0.2176	-0.1052	-0.0172	-0.2112
ME	3104	-0.215	-0.1088	-0.0092	-0.2129
MI	44868	-0.2315	-0.1194	-0.0125	-0.2099
MN	49708	-0.195	-0.1237	-0.0354	-0.2065
MO	20710	-0.2282	-0.1038	-0.0172	-0.2199
MS	11052	-0.2152	-0.103	-0.0225	-0.215
MT	4472	-0.2257	-0.1065	-0.0114	-0.2148
NC	15386	-0.2179	-0.1093	-0.0335	-0.2078
ND	6479	-0.2107	-0.1108	-0.0181	-0.2121
NE	32758	-0.1774	-0.1052	-0.0163	-0.2185
NH	2258	-0.2087	-0.1088	-0.0114	-0.2131
NJ	36212	-0.2042	-0.0994	-0.0353	-0.2039
NM	6753	-0.2096	-0.1083	-0.0183	-0.2222
NV	5837	-0.2154	-0.0993	-0.0084	-0.2174
NY	61127	-0.1549	-0.1037	-0.0169	-0.1737
OH	31927	-0.2313	-0.1086	-0.0062	-0.2078
OK	10141	-0.2212	-0.106	-0.01	-0.2175
OR	10926	-0.2228	-0.1125	-0.0137	-0.2113
PA	41516	-0.2145	-0.1258	-0.0257	-0.2266
RI	2665	-0.2133	-0.1059	-0.0133	-0.2141
SC	10218	-0.2163	-0.105	-0.02	-0.2137
SD	3835	-0.2069	-0.1102	-0.0194	-0.2103
TN	16484	-0.2006	-0.1101	-0.0189	-0.2112
TX	133000	-0.244	-0.1076	0.1418	-0.4153
UT	4924	-0.2503	-0.107	-0.0077	-0.2233
VA	13012	-0.2151	-0.1054	-0.0124	-0.2153
VT	503	-0.2142	-0.1063	-0.0149	-0.2125
WA	26105	-0.2271	-0.1158	-0.0176	-0.2102
WI	43439	-0.2038	-0.1154	-0.0346	-0.2048
WV	1711	-0.2114	-0.1009	-0.0183	-0.2146
WY	827	-0.2133	-0.1056	-0.016	-0.2119

Table 17. Regressions of bond credit rating and bond insurance on fractionalization, all municipal bonds

Dependent variable is numerical S&P LT credit rating for bond at issuance. Scale runs 1 (AAA) to 20 (D). Sample includes all municipal debt issues that can be mapped to county data. Excluded would be state and supra-county bonds. Cities that cross county boundaries are assigned to the county with the largest number of zip codes.

Independent Variable	Specification	Bond LT Credit Rating			Bond SPUR rating			Bond insurance dummy		
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Religion Herfindahl (/10000)	0.331/0.091	0.4642 (0.4300)	1.3358*** (0.4257)		0.8485 (0.6359)	2.4248*** (0.6989)		0.0582 (0.0773)	0.2174*** (0.0831)	
Religion total members per capita	0.642/0.180		-1.5298*** (0.2211)	-1.3158*** (0.2100)		-2.0047*** (0.3342)	-1.6156*** (0.3091)		-0.2201*** (0.0460)	-0.1867*** (0.0427)
Race Herfindahl (/10000)	0.654/0.202	-1.0138*** (0.3223)	-0.7230* (0.4005)		-0.7964 (0.5653)	-1.2618** (0.6360)		0.1128** (0.0550)	0.0483 (0.0679)	
Race Share white	0.748/0.197		-0.6651* (0.3926)	-1.2160*** (0.2971)		0.0889 (0.6145)	-0.8389 (0.5450)		0.0280 (0.0703)	0.0682 (0.0558)
Log county size	12.31/1.65	0.0707* (0.0373)	0.0940*** (0.0345)	0.0831** (0.0335)	0.0385 (0.0567)	0.0875 (0.0573)	0.0669 (0.0574)	0.0346*** (0.0067)	0.0377*** (0.0072)	0.0327*** (0.0072)
Log issue size (\$)	15.93/2.07	-0.1143*** (0.0347)	-0.1281*** (0.0342)	-0.1286*** (0.0338)	-0.1718*** (0.0456)	-0.1892*** (0.0457)	-0.1898*** (0.0448)	0.0977*** (0.0068)	0.0934*** (0.0067)	0.0934*** (0.0067)
Log bond size (\$)	13.08/1.67	-0.1025*** (0.0157)	-0.0895*** (0.0152)	-0.0922*** (0.0152)	-0.1692*** (0.0243)	-0.1520*** (0.0231)	-0.1576*** (0.0232)	-0.0423*** (0.0040)	-0.0401*** (0.0040)	-0.0404*** (0.0040)
Bond liquidity	0.76/0.91	0.0656*** (0.0133)	0.0686*** (0.0123)	0.0682*** (0.0122)	0.0392*** (0.0136)	0.0446*** (0.0128)	0.0438*** (0.0127)	0.0673*** (0.0041)	0.0676*** (0.0041)	0.0681*** (0.0042)
Median home value (\$ Millions)	0.122/0.065	1.7698* (1.0624)	0.4580 (0.9896)	1.0078 (0.9977)	4.2752** (1.7549)	2.6798 (1.6991)	3.6682** (1.7451)	0.5310** (0.2239)	0.3545 (0.2261)	0.4483** (0.2256)
Median household income (\$Millions)	0.044/0.011	-22.3706** (7.2008)	-16.6775** (7.1103)	-18.4158** (7.2657)	-45.6369*** (11.2294)	-41.3384*** (11.8112)	-44.6025*** (12.3785)	-3.3899** (1.3524)	-2.6516* (1.4333)	-3.2991** (1.4523)
Government Debt/Pop (\$Millions)	0.004/0.005	-6.2281 (13.1879)	-4.3735 (11.6048)	-7.4165 (12.0317)	-0.7120 (21.8611)	0.0013 (20.5562)	-5.4057 (21.1122)	-4.6617 (3.2786)	-5.2185 (3.2253)	-5.6409* (3.3012)
Spending/Pop (\$Millions)	0.004/0.004	-12.8563 (26.1857)	5.6645 (22.9418)	-1.7887 (21.9221)	-25.7895 (36.7625)	3.0332 (34.3894)	-8.8578 (32.4886)	-11.2645*** (4.2841)	-6.7846 (4.4174)	-7.9643* (4.3398)
Constant		7.1706*** (0.7064)	7.6386*** (0.6997)	8.1853*** (0.6970)	10.7134*** (1.0990)	10.9812*** (1.1937)	11.8363*** (1.1128)	-0.8868*** (0.1282)	-0.8028*** (0.1365)	-0.6632*** (0.1322)
Control for Month-by-Maturity		Y	Y	Y	Y	Y	Y	Y	Y	Y
N		631242	631242	632178	487181	487181	488099	1253012	1253012	1254809

Table 18. Regressions of bond offering yield on fractionalization, all municipal bonds, controlling for S&P credit rating.

Dependent variable is bond offering yield. Sample includes all municipal debt issues that can be mapped to county data. Excluded would be state and supra-county bonds. Cities that cross county boundaries are assigned to the county with the largest number of zip codes. Standard errors clustered by county.

Independent Variable	Mean/SD	Bond offering yield								
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Religion Herfindahl (/10000)	0.331/0.091	-0.4929*** (0.1098)	-0.1728*** (0.0465)			-0.0969** (0.0441)	-0.0792* (0.0477)	-0.0595 (0.0423)	-0.0866** (0.0436)	
Religion total members per capita	0.642/0.180								-0.0244 (0.0242)	-0.0388 (0.0245)
Race Herfindahl (/10000)	0.654/0.202			-0.5141*** (0.0474)	-0.1244*** (0.0196)	-0.1107*** (0.0194)	-0.0749*** (0.0253)	-0.0596*** (0.0218)	0.0216 (0.0294)	
Race Share white	0.748/0.197								-0.1041*** (0.0279)	-0.0868*** (0.0214)
Log county size	12.31/1.65						0.0073** (0.0035)	0.0149*** (0.0033)	0.0133*** (0.0034)	0.0146*** (0.0032)
Log issue size (\$)	15.93/2.07							-0.0088** (0.0035)	-0.0093*** (0.0035)	-0.0092*** (0.0034)
Log bond size (\$)	13.08/1.67							0.0104*** (0.0027)	0.0106*** (0.0027)	0.0108*** (0.0027)
Bond liquidity	0.76/0.91							-0.0140*** (0.0019)	-0.0140*** (0.0019)	-0.0140*** (0.0019)
Median home value (\$ Millions)	0.122/0.065							-0.4545*** (0.0971)	-0.4792*** (0.1001)	-0.5156*** (0.1015)
Median household income (\$Millions)	0.044/0.011							-0.1905 (0.5082)	0.2263 (0.5276)	0.3868 (0.5178)
Government Debt/Pop (\$Millions)	0.004/0.005							1.8130 (1.4900)	1.8961 (1.5333)	2.1424 (1.5879)
Spending/Pop (\$Millions)	0.004/0.004							5.5260** (2.7327)	5.3252** (2.6309)	5.9486** (2.7402)
Constant		4.2545*** (0.0419)	4.1426*** (0.0153)	4.4274*** (0.0370)	4.1624*** (0.0130)	4.1850*** (0.0172)	4.0645*** (0.0628)	4.0005*** (0.0585)	4.0572*** (0.0634)	4.0145*** (0.0530)
Control for Month-by-Maturity-by-Rating		N	Y	N	Y	Y	Y	Y	Y	Y
N		1089055	558956	1088120	558477	558477	558477	552401	552401	552401

Table 19. Regressions of 60-day post-issue price change on fractionalization, all municipal bonds

Dependent variable is bond return over first 60 trading days. Standard errors clustered by county.

Independent Variable	Mean/SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Religion Herfindahl (/10000)	0.331/0.091	-0.0029 (0.0428)	-0.0168 (0.0416)			0.0151 (0.0398)	-0.0104 (0.0367)	-0.0470 (0.0345)	-0.0081 (0.0367)	
Religion total members per capita	0.642/0.180								-0.0792*** (0.0178)	-0.0811*** (0.0169)
Race Herfindahl (/10000)	0.654/0.202			-0.0260 (0.0267)	-0.0412 (0.0255)	-0.0434* (0.0249)	-0.1376*** (0.0225)	-0.0962*** (0.0198)	-0.0606* (0.0310)	
Race Share white	0.748/0.197								-0.0606* (0.0329)	-0.1078*** (0.0216)
Offering price - 100	0.084/8.301						-0.0698*** (0.0014)	-0.0742*** (0.0013)	-0.0743*** (0.0013)	-0.0742*** (0.0013)
Log county size	12.31/1.65						0.0081*** (0.0027)	0.0036 (0.0032)	0.0037 (0.0032)	0.0052 (0.0033)
Log issue size (\$)	15.93/2.07							0.0166*** (0.0028)	0.0147*** (0.0028)	0.0149*** (0.0028)
Log bond size (\$)	13.08/1.67							0.0269*** (0.0022)	0.0280*** (0.0022)	0.0280*** (0.0022)
Bond liquidity	0.76/0.91							-0.0170*** (0.0034)	-0.0169*** (0.0034)	-0.0170*** (0.0034)
Median home value (\$ Millions)	0.122/0.065							0.1913** (0.0886)	0.1256 (0.0918)	0.1240 (0.0916)
Median household income (\$Millions)	0.044/0.011							-1.5801*** (0.4045)	-1.0907** (0.4321)	-0.9842** (0.4156)
Government Debt/Pop (\$Millions)	0.004/0.005							-2.9335** (1.4628)	-3.1309** (1.4558)	-3.0448** (1.4434)
Spending/Pop (\$Millions)	0.004/0.004							-1.4480 (1.6305)	0.1294 (1.6839)	0.1976 (1.6396)
Constant		-0.0984*** (0.0160)	-0.0938*** (0.0155)	-0.0822*** (0.0207)	-0.0722*** (0.0197)	-0.0757*** (0.0232)	-0.0247 (0.0412)	-0.5146*** (0.0460)	-0.4590*** (0.0493)	-0.4914*** (0.0464)
Control for Month-by-Maturity		N	Y	N	Y	Y	Y	Y	Y	Y
N		952230	952230	951339	951339	951339	951339	949372	949372	949372

Table 20. Underwriting and fractionalization

Sample includes all municipal debt issues that can be mapped to county data. All specifications include month-by-maturity controls. Standard

Independent Variable	Total sample		Sample with underwriting information				
	Mean/SD	Offering yield*	Mean/SD	Offering yield*	Total yield*	Difference	Spread/Face
Religion Herfindahl (/10000)	0.331/0.091	-0.2144*** (0.0588)	0.325/0.091	0.0900 (0.1248)	0.0352 (0.1527)	-0.0547 (0.0442)	-0.0009 (0.0021)
Religion total members per capita	0.642/0.180	-0.1060*** (0.0344)	0.617/0.169	-0.2028*** (0.0693)	-0.1931** (0.0843)	0.0097 (0.0224)	-0.0002 (0.0011)
Race Herfindahl (/10000)	0.654/0.202	-0.0156 (0.0549)	0.599/0.193	-0.1033 (0.0927)	-0.1246 (0.1118)	-0.0214 (0.0298)	-0.0015 (0.0015)
Race Share white	0.748/0.197	-0.2123*** (0.0535)	0.693/0.203	-0.0397 (0.0670)	-0.0393 (0.0789)	0.0004 (0.0219)	0.0005 (0.0011)
Log county size	12.31/1.65	0.0094* (0.0053)	12.55/1.64	0.0321*** (0.0099)	0.0346*** (0.0122)	0.0025 (0.0034)	0.0002 (0.0002)
Log issue size (\$)	15.93/2.07	-0.0555*** (0.0030)	16.74/1.43	-0.0275*** (0.0080)	-0.0545*** (0.0089)	-0.0270*** (0.0027)	-0.0017*** (0.0001)
Log bond size (\$)	13.08/1.67	0.0089** (0.0040)	13.59/1.62	-0.0177** (0.0082)	-0.0429*** (0.0103)	-0.0252*** (0.0031)	-0.0005*** (0.0001)
Bond liquidity	0.76/0.91	-0.0395*** (0.0028)	0.94/1.05	-0.0045 (0.0046)	-0.0079 (0.0049)	-0.0034*** (0.0011)	-0.0002*** (0.0001)
Median home value (\$ Millions)	0.122/0.065	-0.5405*** (0.1505)	0.122/0.065	0.0757 (0.2118)	0.1162 (0.2514)	0.0404 (0.0820)	0.0039 (0.0039)
Median household income (\$Millions)	0.044/0.011	-0.8392 (0.6835)	0.044/0.011	-4.7182*** (1.1630)	-6.0396*** (1.2836)	-1.3214*** (0.3557)	-0.0640*** (0.0145)
Government Debt/Pop (\$Millions)	0.004/0.005	-0.1348 (1.4513)	0.004/0.004	-5.9193 (3.9151)	-8.0945* (4.4794)	-2.1757 (1.3641)	-0.1805*** (0.0646)
Spending/Pop (\$Millions)	0.004/0.004	11.4888*** (2.1261)	0.004/0.003	11.9019** (5.9840)	15.4264** (7.1049)	3.5250* (1.8625)	0.2744** (0.1065)
Constant		5.1188*** (0.0792)		4.4835*** (0.1625)	5.5186*** (0.1851)	1.0351*** (0.0561)	0.0439*** (0.0025)
N		106994		113691	113691	113691	113691

Note. Bond offering yield comes from Mergent, and does not include the fee paid to the underwriter. The Bond total yield is calculated by recalculating the offering yield after subtracting the underwriters' compensation from the face value of the bonds.