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Prioritization in Private Activity Bond Volume Cap Allocation

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Abstract

I propose and test a simple structural model reflecting the process of authorizing private-activity municipal bond issuance. Private-activity municipal bonds offer tax-exempt financing for programs including industrial development, utilities, low-income housing, and student loans. The Federal tax code caps the total tax-exempt issuance for each state and year, so authorization becomes a scarce resource distributed via a political process. Interviews with program administrators in several states suggested the authorization process involves prioritizing categories of use, authorizing bonds for high priority uses first, and then authorizing bonds for lower priority uses until the cap is exhausted. A model representing this process fits the data better than a reduced form model. The structure can be improved further by adding measures of political influence. In general, industrial development and utilities appear to be the highest priority uses of private activity municipal bonds. Mortgage revenue bonds are the residual category most frequently. States with a higher share of wage earners in the real estate sector raise the priority of mortgage revenue bonds.

1 Introduction

The authority to issue private activity municipal bonds, and realize an effective interest rate subsidy, is a scarce resource in most states and years. The Federal tax code imposes a limit on the volume of private activity bonds that can be issued, so industries within a state must compete for the authorization. After forbidding or exempting various uses, the tax code steers almost all the cap authority to five uses: industrial development, utilities, mortgage revenue bonds, multifamily housing bonds, and student loan bonds. This paper proposes a model that reflects the public officials' prioritization of these uses. I find that the model fits the data better than models that do not incorporate the prioritization. Measures of latent and organized political strength appear to raise the priority of bond use categories in some cases.

The political economy literature of government resource allocation covers a wide spectrum, and this study offers an opportunity for an unusual insight. Elected officials at the state level have an opportunity to assists a diverse, yet limited and clearly defined, set of private interests. In this program, we can observe manufactures competing against affordable housing non-profits and universities. However, the scarce resource is not completely fungible, such that it could be reallocated to state employees' pensions, road construction, or other line items. State officials cannot return the resource to their voters in the form of tax breaks. While private activity debt burden can raise the interest rates on future public borrowing, public officials regard that as a small, heavily discounted cost. This leaves the public officials in a position to hand out something of value based on economic efficiency, purely political interests, or anything in between. The design of the program creates exogenous variation in the generosity of the cap, which allows us to investigate how the public officials behave when their endowment is more or less abundant. Likewise, part of the decision is made by the private partners, so this program allows us to see the extent of private demand for subsidized funding.

The opportunity to learn about this form of government intervention in credit markets is especially useful following the financial turmoil of recent years. Policy makers would like to know if lower interest rates would spur industrial development and lowering unemployment. They would like to know if private activity bonds could replace some of the lost volume in the mortgage backed securities market. Congress would benefit from knowing, if the private activity volume cap is raised, how are state officials likely to allocate the authority.

2 Background and Existing Literature

Municipal bonds are widely used to fund public infrastructure such as roads, schools, courthouses, etc. The practice of fiscal federalism in the U.S. dictates that the national government does not tax the activities of the states and the local entities they establish. The tax exemption extends to the interest paid on municipal bonds. During the era of high interest rates around 1980, many private entities discovered that they could realize an interest rate advantage by partnering with a state or local government. The local governments issued tax exempt municipal bonds and transferred the proceeds to a private entity. The company or non-profit repaid the bonds at the lower interest rate. While this made no direct claims on the local taxpayers, it did lead to lost income tax revenue for the Federal government. The volume of this type of borrowing grew rapidly until Congress set a limit in the Tax Reform Act of 1986.

Previous research has shown that the volume cap is binding in most states and years (Kenyon 1991, Whitaker 2009). For each additional dollar per capita of authorized borrowing, additional borrowing of $0.79 per capita is observed. Borrowing for mortgage revenue bonds and student loans exhibit the highest correlation with the volume cap.

States and municipalities can still issue bonds for any partnership they choose, but bonds for certain purposes cannot have tax-exempt status. Bonds that fund casinos, stadiums, and retail outlets, for example, cannot be federally tax exempt. Tax exemption is unlimited for partnerships with for-profit companies if they are providing a service that has a major public benefit, such as operating an airport. Likewise, states that assist 501(c)3 organizations, such as private universities, need not count those bonds toward their cap. When all these provisions are considered, there remain five purposes that utilize over 95 percent of cap-subject borrowing authority: industrial development, utilities, mortgage revenue bonds, multifamily housing bonds, and student loan bonds. The proceeds of mortgage revenue bonds must be directed to households with below-median incomes for the bonds to maintain their tax exempt status. Likewise, low-income renters must occupy at least 20 percent of the units in a multifamily building if it is funded with private activity bonds.

In what appears to be a concession to the small-population state senators, the private-activity volume cap was established as a two tier system. States with a population over three million were allowed to authorize borrowing up to \$50 per capita. State with populations below three million could authorize up to \$150 million, regardless of their population. The total volume cap of populous states was well above \$150 million, but relative to their economies, the cap was quite low. In contrast, the per capita cap was more generous for the small state the smaller they were. The value ranged to over \$400 per capita. In 2001 and 2002, Congress raised the caps, and thereafter, they have risen with inflation.

The codes governing the volume cap made provision for the time that passes between authorizing a project and issuing the bonds. If, by the end of the calendar year, a state has not exhausted its issue authority, it can file a notice with the IRS stating that it intends to issue tax-exempt bonds for a particular project. It has three years in which to use this "carryforward" authority. If a current year project is cancelled before 31 December, the state can reallocate the authority to another borrower, but carryforward authority cannot be reallocated. If the carryforward project is cancelled, or fails to issue the bonds within three years, then the authority is forfeited. These provisions create the possibility that a state could have intense competition for allocation authority, but three years later, have a total bonds issued below its cap.

The total volume of private activity borrowing is substantial, but still modest relative to the larger credit markets. Among state-year private activity volumes by category, 90 percent are below 12% of the GSP in their sector. Relative to the measures of purely private borrowing, private activity bond issues are below .06 for 95 percent of the observations in manufacturing and single and multifamily housing. In every case, the key question is whether this type of less-expensive funding caused the market to be at its observed size. If this funding were not available, presumably borrowers would switch to the next least expensive source of funding and borrow slightly less. The supply curve would be shifted up in the absence of the subsidy, but the demand would remain the same.

On the specific topic of private-activity bonds, the literature is remarkably limited. The Advisory Commission on Intergovernmental Relations (ACIR) sponsored a survey of the mechanisms state used to monitor their cap-subject borrowing (Zimmerman 1990). Zimmerman reported on the change in the levels of borrowing from before the cap was imposed to after. The total volume in 1989 was only 34 percent of the average volume during the years 1984-1986. Multifamily housing showed the largest decline, 88 percent, while student loans showed the smallest decline, 36 percent. Another paper from the same era regressed the borrowing volume on the cap and added controls. Kenyon found a significant coefficient of .77 (1991). Using data from after the volume cap was imposed, Temple attempted to refute the idea the issuing private activity bonds was costless to the state or locality (1993). She reasons that if the private-activity debt burden increases the cost of issuing private-activity bonds, heavily indebted states will substitute away from bonds, toward local tax breaks and other incentives in their efforts to lure plant locations. She finds evidence of the increased borrowing costs in the data. Finally, one study documented an increase in regional home prices following the issue of mortgage revenue bonds for Shreveport, LA (Clauretie, Sirmans, and Merkle 1986).

The political economy dimension of this analysis is situated in a much larger literature. Growing from Olson's theories of collective action, numerous authors have estimated the impact of interest groups on political allocations of resources (1965). Over the decades, research has demonstrated that public investments are not always made in a way that is rational from an intertemporal perspective (Holtz-Eakin and Rosen 1989). Public officials sometimes intentionally sacrifice economic efficiency to pursue geographic equality (Yamano and Ohkawara 2000) or win favor in competitive electoral districts (Castells and Solé-Ollé 2005). Cadot, Röller and Stephan show that concentrated interests, in the form of large corporations, can influence resource allocation to diverge from economic efficiency (2005). Another strain of the literature examines the channels of political influence specifically. Figueiredo and Edward offer evidence that campaign contributions from utilities companies do impact rates set by utilities regulations boards (De Figueiredo and Edwards 2007). A working paper by Bombardini and Trebbi shows that companies with large employment numbers make fewer contributions to elected officials representing those workers (2008).

3 Theories of Allocation of Private-Activity Borrowing Authority

This section will discuss theories of the allocation of the private-activity borrowing authority to various purposes. As discussed in the original theory of collective action, interest groups intervene in the allocation process according to their number of members, the value of the rents available to them, and their ability to organize (Olson 1965). The first question of this analysis is whether the private-activity volume cap influences the behavior of the participants in the borrowing process. If the cap is a potential constraint, we need to know if it binds. If it does not, it is not of any consequence. While it may be natural to assume the private-activity volume cap is a credit constraint, because it limits the quantity and purpose of tax-exempt borrowing, this is not appropriate. It is more useful to think of the regulation as a budget constraint. A private-activity borrowing authorization gives the recipient the right to access credit markets at a lower cost. One could calculate a subsidy that would make the borrowers indifferent between the tax exemption and the subsidy. The state has a budget, set by the cap, from which it can distribute this de-facto subsidy.[1]

Interested constituents face a price for borrowing funds, P_A, and an administrative cost of borrowing through municipal bonds. The application process can be expensive and time consuming, in addition to the extra reporting requirements needed to maintain the bonds' tax-exempt status. Let a designate a fixed administrative cost of using municipal funds beyond the administrative cost of private funds. Treating the borrowed capital as a factor of production, each third party borrower must select a quantity to demand.

[1] The concept of a credit constraint is often modeled as an intertemporal choice, where a consumer wishes to shift consumption from the future into the current period. For some reasons, credit may not be available to the individual at all. In other situations, credit is only available at very high interest rates, so the consumer opts to consume at his or her endowment point, or borrow very small amounts. These situations arise if there is no collateral, there is no authority to enforce a contract, or authorities specifically forbid a contract. Also, there may be rationed borrowing, where credit is available at a favorable rate, but laws or regulations limit the quantity a consumer can borrow. From this perspective, we cannot say that states are credit constrained. Because they are sovereign, they cannot declare bankruptcy or flee their jurisdiction. They are always available for lenders to seek the return of their principal, and they will have the tax base to provide those funds barring a complete economic collapse. Municipalities, on the other hand, are credit constrained very often, usually by state regulations. I am doing this analysis at the state level, so I will not consider the government credit constrained. The states could always approve taxable borrowing for the private-activity purposes. In reality, most of the funding for the private-activity projects will be in the private sector, where there is no tax exemption. The cap-subject private-activity funds bring subsidized capital to specific markets, as opposed to changing legal limits.

All cap-subject private-activity borrowing, even that which directs money to individual homeowners and students, is handled at some point by for-profit firms or loss-minimizing non-profits. Let the profit function be represented by $\pi_i = p_y y_i - P_l L_i - P_A A_i - a$, where i indicates the firm, and L indicates a numeraire input (think of labor). The firm's production technology is $y = f(A, L)$. Firm i's demand for A is discontinuous at zero, because the administrative cost applies only with interior bundles. Alternately, a is a fixed cost of producing the interest-subsidized product. Consider N identical firms within a state, each demanding A_i. The private-activity volume cap is binding if $\sum_{i=1}^{N} A_i > V$.

The cap is more likely to be binding if N is high, corresponding to a more developed state economy, at least in the relevant industries. N will be positively correlated with V, as both are related to population. Binding is more likely when the price of the output p_y is higher, and when the quantity sold in the output market, y, is higher. Whether P_l is positively or negatively correlated with binding depends on the marginal rate of technical substitution between L and A.

Now let us relax the assumption that all firms are in the same industry. Different industries will have different levels of demand for the funding, corresponding to different levels of profit they could realize, and different interest rates they are willing to pay.[2] Let j indicate industry, and we will begin with two industries. I maintain the assumption that firms are identical within industries. Let P_{Aj} be the price a firm in industry j would pay for the factor without bond funding. If $P_{A1} > P_{A2}$, then firms in industry 1 stand to gain more by shifting to P_{Am}, the bond-funded cost. The profit functions for the firms become

$$\pi_{ij} = p_{yj} y_{ij} - P_{lj} L_{ij} - P_{Am} A_{ij} - a. \tag{1}$$

The administrative cost remains the same for firms in both industries. Aggregate demand becomes

$$A^* = \sum_{j=1,2} \sum_{i=1}^{N_j} A_{ij}. \tag{2}$$

For unconstrained states, this remains below V, and A^* depends only on A_j and N_j. For constrained

[2]This can be seen in two common uses of private-activity bond funding, namely mortgages and student loans. The private market interest rate for consumer loans to students is very high (think of credit cards at 18%). In contrast, a house was considered good collateral, so mortgage rates were much lower.

states, the story becomes considerably more complicated.

As specified in this model, aggregate demand would be a step function with a step down at $(\sum_{i=1}^{N_1} A_{i1}, P_{A1})$ if we arbitrarily label the industry with higher demand as industry 1. If the volume cap is binding, all firms in industry 1 would get A_{i1} and some industry 2 firms would get A_{i2}.[3]

Voters may have financial or ideological reasons for preferring allocation to one industry over another. Transfers from firms to state officials often take the form of campaign contributions, which are used to reach voters. It is possible, although unlikely, that the number of voters aligned with the constituent industries is proportional to the transfers an industry could provide. In that case, the allocations of borrowing authority would be the same as in a market.

When we consider the larger policy context, we realize that each one of the industries has many policies that it is seeking from the government in addition to private-activity borrowing authority. Perhaps each firm or industry seeks influence in general, and then all policies, including borrowing authority, are allocated in proportion to the influence obtained. This leads to an important assumption that may be necessary for the empirical analysis. The assumption is that bidding with B determines the allocation of A, and not the reverse.[4]

Having discussed the firms and voters, I will turn specifically to the state officials now. I am using the terms state officials, public officials, and state interchangeably, and treating them individually, or their aggregates, as rational actors. The state officials seek to maximize their state's welfare (if they are benevolent), or their personal welfare, subject to their cap-imposed budget constraint. The volume cap regulation gives them an endowment, V, of cap authority to distribute to constituents. If there are no direct costs borne by anyone in the state for allocating

[3]Which industry 2 firms? If they are identical, the allocation process could be purely random. It could be purely political if the firms have identical technology and scale, but different political influence.

[4]To test this assumption, I regressed the total and industry-specific campaign contributions on the ratio of the total allocation to the cap authority. If scarcity of private-activity funding was inducing campaign contributions, then there should be a positive relationship between the borrowing/cap ratio and the contributions. In fact, I find the opposite of this. The dependent variable is the log of the per capita contributions. The regressions include state and Year FE and the set of control variables. I divided the contributions by the population to scale them because more money is donated in more populous states. I took the log to reduce the increase in the variance of the residuals at higher levels of per capita contributions. The total contributions and most subcategories display a negative relationship between the ratio and logged per capita contributions. In the case of industrial development, the sign is positive, but it is not significant. Only contributions from education interests exhibit a significant small positive relationship with the borrowing ratio. These results suggest that scarcity of private-activity borrowing authority is not inducing additional campaign contributions. Just to confirm this model is plausible, I replace the borrowing/cap ratio with a measure of political competition. In this case, three of the coefficients are significant. This suggests that heated party competition does induce additional contributions from various interests. These models demonstrate that inducement could be identified if it existed in the borrowing ratio models.

the authority, the state officials maximize their utility by maximizing the authorization of private-activity borrowing.[5]

Following the standard political economy models summarized in Grossman and Helpman, the public official's utility is the expected return for a specific allocation (2001). This is the product of the probability of winning election (or re-election) and the utility of holding the office. The complementary term, the utility of losing weighted by its probability, is assumed to be zero and not written. In the Cadot, Röller, and Stephan version of the model, the public official a's utility is written (2005):

$$\max_{\mathbf{A^a}} \pi^a[\psi + R(\mathbf{A^a})] \tag{3}$$

The term π is the probability of election and depends on a platform promising an allocation of $\mathbf{A}$. ψ is an office rent that the public official receives if elected. R is a reward the constituencies give the elected official in response to $\mathbf{A}$.

The model could be rewritten to make the probability of election a linear function of the allocation vector. γ is a constant representing the public official's baseline likelihood of election, based on party, charisma, or name recognition. H is a vector of the measures of the voting constituency's size or strength. G is a vector of parameters that represents how the strength of the constituency translates into the probability of election (perhaps a measure of political organization or effectiveness). I impose a similar structure on the reward function. P is the industries' potential rents from a dollar of allocation, driven by the interest rate advantage it provides. W is a vector of parameters that translate the industry's rents into the public official's rents.

$$U(\mathbf{A}) = [\gamma + \sum_C G_c H_c A_c][\sum_C W_c P_c A_c + \psi] \tag{4}$$

$$\max_{\mathbf{A}} U(\mathbf{A}) \quad \text{s.t.} \quad \sum_C A_c \leq V \text{ and } A_c \leq f_c(D_c) \;\forall\; c \tag{5}$$

D_c is the relevant gross state product which, through the function f_c, specifies the maximum allocation the borrowers in the category would request. From this specification, it is evident that the political and economic gains from allocating a dollar to one category are made in the context

[5] There could be an indirect economic cost to the state in the form of higher borrowing costs on future municipal bond issues. At first, I will assume these are negligible. See Whitaker, for an investigation of this possibility (2009).

of the covariates and parameters in all categories. The model suggests that factors that increase a constituency's contribution to the official's election or contribution to the official's rents should be positively associated with allocations to that constituency. Although the relationship is highly complex and non-linear, a unique solutions does exist, given the assumptions.

In the first quarter of 2009, I conducted interviews with twelve state administrators.[6] I tried to contact the individuals in each state who were familiar with the private-activity volume cap allocation process. I asked each of them about how interested constituencies could intervene in the allocation process, and how elected officials responded to voter preferences regarding the allocations. Most of the respondents expressed the opinion that the process is not highly politicized. The main reason is that private-activity bonds are seen as having no direct cost to the state's taxpayers. Taxpayers do not pay the principal or interest on the bonds, and in most cases, they are not even responsible for the rare defaults. The borrowers are required to purchase credit enhancement if it is not provided already through another quasi-federal agency such as Sallie Mae or Fannie Mae.

The administrators perceived a hierarchy of priorities, with industrial development bonds (IDBs) at the top. IDBs are seen by public officials as creating or retaining jobs, which in turn provide tax revenue and economic demand for every other type of activity. States are eager to assist with any reasonable IDB request, and rarely receive as many proposals as they plan for. In Ohio, a lottery system was in place to decide which industrial projects received borrowing authority if requests exceeded the allocation. However, the lottery was only held twice in two decades because the requests were less than the allocation in all other years (Ohio has the lowest possible per capita cap, and is highly industrialized). IDB borrowing rarely exhausts the allocation it is given by the state's statutes or executive orders, and most states have a procedure for reallocation late in the year. When reallocation occurs, the remaining borrowing authority from IDBs is transferred to housing agencies and student loan programs. Utilities and multifamily housing fall somewhere in between.

With this qualitative data, I returned to the simple calculation of exhausting the cap, and

[6] The administrators I spoke to include: James W. Parks, CEO, Louisiana Public Facilities Authority; Steve Kitowicz, Principal Budget Specialist, Office of Policy and Management, State of Connecticut; Steven Greenfield, COO, Vermont Economic Development Authority; Gene Eagle, Finance Development Vice President, State of Arkansas; Mike Martin, Business Finance Program Manager, Wyoming Business Council; Gail Wagner, Manager, Pennsylvania Department of Community and Economic Development's Center for Private Financing; Candace Jones, Chief Legal Counsel, Department of Development, State of Ohio; Carolyn Seward, Loan Officer, Ohio Energy Office; Steven Brooks, Executive Director, State Education Assistance Authority, North Carolina.

restated it as follows. Let T be a value that represents the public officials' total gain from allocating cap authority to a category. R is a function that translates this into a rank. The public official maximizes her utility by fully funding the highest priority categories, giving the remaining authority to the marginal category, and possibly denying funding to the least beneficial category.

$$\max_{\mathbf{A}} U(\mathbf{A}) = \mathbf{TA} \text{ s.t. } \mathbf{A_c} \leq \mathbf{f_c}(\mathbf{D_c}) \; \forall \; \mathbf{c} \text{ and } \sum_{\mathbf{C}} \mathbf{A_c} \leq \mathbf{V} \quad (6)$$

$$R_c = R(\mathbf{T}) \quad (7)$$

$$A_c = \begin{cases} f_c(D_c) & \text{if } \sum_{R_j \leq R_c} f_j(D_j) < V \\ V - \sum_{R_j < R_c} f_j(D_j) & \text{if } \sum_{R_j \leq R_c} f_j(D_j) > V \\ 0 & \text{if } \sum_{R_j < R_c} f_j(D_j) > V \end{cases} \quad (8)$$

This concept can be illustrated graphically as in figure 1. The y-axis is the T value, and the public official sorts the categories from left to right. The width of the areas represents the allocation they receive, and the category that overlaps the cap is the marginal category. Categories to the right of the cap do not receive borrowing authority. The assumption that all projects in a category have equal T values is simplifying, but not necessary. It could be that each project has its own T value, and there is some overlap of the distributions. However, if all IDB projects can be covered by the cap, and they have the highest distribution of T values, then IDB is clearly not the marginal category. Categories that receive no funding are also clearly not the marginal category and not the highest priority category.

If we define $P[M_c]$ as the probability that category c is marginal, then we can define the conditional expectation of A_c. If we observe that $A_c = 0$, we know that it is not the marginal category. Given that some borrowing occurs in category c, the probability that the category is marginal is the complement of the probability that it is not marginal. The expected allocation, given that anything is allocated, is the probability that the category is marginal, times the remainder of the cap, plus the probability that it was fully funded multiplied by the market's demand in that category. To estimate this, there must be an assumption about the functional form of the relationship between the economic activity in the industry, and the demand for private-activity borrowing that it creates. I proceed with a simple linear model in equation 10.

Equation 14 shows an equation that can be estimated from the data. From the regression estimates, a few calculations (equations 15 and 16) return the parameters of the simple model. These estimates are based on two relationships between variables: namely the relationship between the remainder and the allocation, and the relationship between the relevant GSP and the allocation.

$$\begin{aligned}
E[A_c|A_c > 0] &= P[M_c][V - \sum_{j \neq c} A_j] + [1 - P[M_c]][f_c(D_c)] && (9)\\
f(D) &= m + dD + \epsilon_f && (10)\\
R_c &= V - \sum_{j \neq c} A_j && (11)\\
E[A_c|A_c > 0] &= P[M_c][R_c] + [1 - P[M_c]][m_c + d_c D_c] && (12)\\
E[A_c|A_c > 0] &= [1 - P[M_c]]m_c + P[M_c]R_c + ([1 - P[M_c]]d_c)D_c && (13)\\
A_{c|A_c>0} &= \alpha + \beta_1 R_c + \beta_2 D_c + \epsilon && (14)\\
d_c &= \frac{[1 - P[M_c]]d_c}{1 - P[M_c]} = \frac{\beta_2}{1 - \beta_1} && (15)\\
m_c &= \frac{[1 - P[M_c]]m_c}{1 - P[M_c]} = \frac{\alpha}{1 - \beta_1} && (16)
\end{aligned}$$

It is also possible to extend this model to estimate the impact of other covariates on the probability of a category being marginal. In the Lindbeck-Wiebull models, several possible factors were suggested. The potential profit for firms from getting the allocation should matter, either because the public official wants to create rents in his district, or because part of the rents will be transferred to the public official. A direct measure of part of the transfers can be used in the form of campaign contribution data. Also, the priority of a category can be related to measures of constituencies, as defined by voters involved in the industries. Additionally, a measure of how well a broad constituency has overcome its collection action problem will be of interest. In this case, I will use unionization data. In equation 17, I specify a linear probability model, where each covariate is an X variable, indexed by i. After making the substitution and arranging, the model that can be estimated is given in 18.

$$\begin{aligned}
P[M_c] &= a_c + \sum_i B_{ic} X_{ic} && (17)\\
E[A_c|A_c > 0] &= [1 - a_c - \sum_i B_{ic} X_{ic}]m_c + [a_c + \sum_i B_{ic} X_{ic}]R_c\\
&\quad + [1 - a_c - \sum_i B_{ic} X_{ic}]d_c D_c && (18)
\end{aligned}$$

$$
\begin{aligned}
A_{c|A_c>0} &= \tau_c + (\alpha_c)R_c + \sum_i (\gamma_{ic})X_{ic} \\
&\quad + (\phi_{ic})D_c + \sum_i (\beta_{ic})X_{ic}R_c + \sum_i (\theta_i)X_{ic}D_c + \epsilon_c \qquad (19)
\end{aligned}
$$

Unlike the simpler model, these parameters must be estimated with a technique that allows for these constraints to be imposed:

$$
m = \frac{\tau}{1-\alpha} = \frac{\gamma_i}{\beta_i} \qquad (20)
$$

$$
d = \frac{\phi}{1-\alpha} = \frac{\theta_i}{\beta_i}. \qquad (21)
$$

I will attempt to fit the structural models to the data, and evaluate their ability to explain the observations. In the process I will confirm the prioritization hypothesis, but will find only mixed support for the impact of political variables on a category's probability of being marginal.

4 Data

Data on cap-subject private-activities bond issues is collected each year by the *Bond Buyer*. All states except Illinois participate. Prior to the year 2000, bonds issued with carry forward authority were not included in this data. After 2000, carryforward issues were included with the current year total. Unfortunately, there is no way to disaggregate the figures and assign them to their authorization year. This introduces a measurement error. I perform the analysis with the more complete post-2000 data and add the 1990's data to one set of estimates for comparison. The *Bond Buyer* reports volumes for each state in eight categories.[7] Figure 2 illustrates the volume totals reported in the survey.

The Campaign contribution data used in this analysis was collected and processed by the National Institute on Money in State Politics [8]. The data are collected from state disclosures and coded by the Standard Industrial Code of the donor. Election cycles and contribution reporting are biennial in most states. To ensure that every year has observations, I average over the two most recent cycles. This also reflects some durability of political influence gained through contributions.

[7] I combined the figures for mortgage credit certificates into the much larger mortgage revenue bond figures. The "Other Housing" figures are included with multifamily housing. The "Other" category is included in the total borrowing figures, but not in any of the categories.

[8] National Institute on Money in State Politics. http://www.followthemoney.org/.

The unionization and employment data are based on calculations from the Current Population Survey.[9]

Throughout the empirical work, I convert dollar figures to year 2000 dollars using the Consumer Price Index.[10] State-population totals are used to change figures into per capita terms and to categorize states into high-, middle- and low-population categories. The population data are from the Census Bureau estimates.[11] The estimates are based on the decennial census and updated with data from the Current Population Survey (CPS), the Vital Statistics reports (births and deaths), and the American Community Surveys. The regional designations assigned to the states are according to the Census Bureau's four region definitions.

The other control variables originate from a variety of sources. I use the CPS data to estimate urbanization, college attainment, and low-income status for each state and year. The data on state and local taxes are from the Census Bureau's *Quarterly Summary of State and Local Government Tax Revenue*. I accessed the tax data through the Haver Analytics system, which reflects all revisions. From the total taxes I subtracted severance taxes because the incidence of that type of tax falls primarily on non-residents. Bed and other taxes that fall heavily on tourists are not tracked separately; They are included. I use unemployment estimates that the Bureau of Labor Statistics calculates from the CPS data.[12]

5 Empirical Analysis

5.1 Descriptive Statistics

As a first contact with the data, I present how much of the volume cap the states use, and how they allocate it. In the *Bond Buyer* data, we can observe considerable variety in the percentages of the volume cap that were used each year. Table 1 summarizes the ratios of borrowing to the cap, and how often these ratios are above certain thresholds. The fact that 57% of states were observed borrowing an amount over 85% of their cap value suggests that most states are using most of their

[9] Miriam King, Steven Ruggles, Trent Alexander, Donna Leicach, and Matthew Sobek. Integrated Public Use Microdata Series, Current Population Survey: Version 2.0. [Machine-readable database]. Minneapolis, MN: Minnesota Population Center [producer and distributor], 2009. http://cps.ipums.org

[10] http://www.bls.gov/cpi/ (Accessed August 30, 2010)

[11] http://www.census.gov/popest/states/ (Accessed August 30, 2010)

[12] http://www.bls.gov/lau/ (Accessed August 24, 2010)

cap. The cap is more likely to be binding when the ratio is high. In cases when states do not borrow as much as their full volume cap, they may still behave as if they were constrained. The main reason is the cancellation of authorized projects or bond issues. Many projects have various sources of funding, and if one of the other sources is lost, or some other change cancels the project, there may not be time to reallocate the authority. Also, some requestors of funding may decide to issue at an amount below their authorization due to changes in market condition or the scope of their projects.

Table 2 shows the summary statistics for the state-year observation on per capita borrowing. The averages are over the state-year observations, so the numerous small states have a lot of representation in the data. We see that mortgage revenue borrowing has the largest per capita average at $44 per capita per year. Student loans and multifamily housing figures averaged under half the mortgage revenue figure at just under $20 per capita per person. The averages for industrial development and utilities are lower at $7.50 to $8 per capita. Figure 2 gives a graphic representation of the national totals by category. The national totals appear to have a moderate upward trend with student loans expanding until 2004 and mortgage revenue bonds increasing in 2005 and 2006.

To begin thinking about how the per capita cap relates to borrowing, I average the per capita cap over the study period and assign the states to low and high categories. Table 3 shows how the categories of states differ in their use of the borrowing authority. States with more generous per capita caps borrow more for every purpose. The most pronounced differences are observed in the mortgage revenue and student loan categories, where states with generous caps allocate three times as much authority per capita as is allocated in tight-cap states.

While very few states opt for no private-activity borrowing in any given year (2.2% of all annual totals are zero), many states opt for no borrowing within specific categories for a year. Table 4 shows what percentage of the state-year observations show no borrowing in each category.

Table 5 presents descriptive statistics for a set of controls used in the analysis. These controls measure general demographic and economic conditions in the states. They could have predictive power in modeling the level of borrowing for each purpose. College graduates may favor making student loans available while a growing low income population seeks assistance with multi-family housing. The population categories are included to represent economies of scale. The total gross state product per capita measures if the state is wealthy while the tax measure indicates more or less active governments in the states. Table 6 lists the descriptive statistics for the industry specific per capita gross state products and the measures of political influence. The highest means and variances of per capita GSP appear in the manufacturing and real estate sectors. The political variables are expressed as shares because the theoretical model suggests the relative strength of the competing interests is more important than the levels. Manufacturing and construction have the highest representation both among the households and among unionized workers. Real estate and construction interests are the largest contributors to state and local political campaigns.

In the analysis, I include state fixed effects in one specification, to demonstrate their effect, but I do not include state indicators in the other models. It is common in literature that uses state panels to include a state fixed effect to capture unobserved characteristics of the states. However, while there is variation in the per capita volume cap within states, there is much more variation between states. Including state and Year FE does not leave much variation for identification of the parameters. For the per capita cap, the between standard deviation is more than five times the magnitude of the within standard deviation. Several of the control variables also have much more between variation than within variation, including urbanization, per capita GSP, per capita taxes, college attainment, and percentage of households that are low income. Obviously, the regional indicators and the population categories (defined over the whole period) have no within variation. All of the estimates in the analysis recognize that the observations are not strictly independent. In considering which type of model is a truer representation of reality, the stable nature of the volume caps should be taken into consideration.

5.2 Structural Model Estimates

In this section, I will attempt to fit the models outlined in section 3. The models treat the allocation process as a prioritization process. If a sector is a high priority, it receives all the borrowing authority it requests. The request is larger if the sector has more economic activity. The lowest priority category often receives no allocation. If the cap is exhausted, there is a marginal category that is allocated whatever remains under the cap, after the high priority projects are funded. This remainder is calculated:

$$R_c = V - \sum_{j \neq c} A_j. \tag{22}$$

For comparison, I first attempt an OLS model using the same observations and variables as will be used in the structural estimation. The sample is limited to the state-year-category cells with non-zero borrowing observed. The dependent variable is the per capita borrowing for the sector. In table 7, the results indicate a strong, positive relationship between the per capita cap and borrowing for mortgage revenue bonds and student loans. The sector GSP per capita is predictive in the utilities model, as is the share of households with a wage earner in utilities.

To estimate the parameters in the non-linear specifications, such as equation 19, I used the non-linear regression algorithm. Written in general form, the procedure selects β to satisfy $\mathbf{X^T}(\beta)(\mathbf{y} - \mathbf{x}(\beta)) = \mathbf{0}$ and minimize the sum of squared residuals, $SSR(\beta) = (\mathbf{y} - \mathbf{x}(\beta))^{\mathbf{T}}(\mathbf{y} - \mathbf{x}(\beta))$. The algorithm available for use in Stata is based on the text of Davidson and MacKinnon, and it employs Newton's minimization method (2004). Fortunately, the models suggested by the theory are simple enough that there is no danger of failure to converge or of convergence on a local minimum. In the models attempted here, there are no higher orders of the parameters beyond squares, and parameter interactions are pair wise only. The first order conditions have a unique solution given the data.

As discussed in section 3, the model that is estimated is

$$E[A_c|A_c > 0] = P[M_c][R_c] + [1 - P[M_c]][m_c + d_c D_c + g_c Z_c] \tag{23}$$

$$A_{c|A_c>0} = \widehat{P[M_c]}[R_c] + [1 - \widehat{P[M_c]}][\hat{m}_c + \hat{d}_c D_c + g_c \mathbf{Z_c}] + \epsilon. \tag{24}$$

$\mathbf{Z_c}$ is a vector of control variables that improve the model of the demand for private-activity bond funding.

The next specification, which I refer to as the political model, takes the additional step of including three political factors that could contribute to a category being higher priority. These are the share of household with wage earners in the relevant industries, the share of campaign contributions from relevant industries, and the share of union members among the relevant industries.

Recall from the theory that higher priority purposes are less likely to be marginal. Having political influence through votes, money, or organization, makes an interest group higher priority. Therefore I hypothesize that higher relative levels of households, contributions, and union members will be associated with lower probabilities of the category being marginal. The model is unranked, so the remainder is again the difference between the cap and the borrowing for all other purposes. The model that is estimated is:

$$\begin{aligned} E[A_c|A_c > 0] &= [1 - a_c - \sum_i B_{ic}X_{ic}]m_c + [a_c + \sum_i B_{ic}X_{ic}]R_c \\ &\quad + [1 - a_c - \sum_i B_{ic}X_{ic}]d_c D_c + [1 - a_c - \sum_i B_{ic}X_{ic}]g_c \mathbf{Z_c} \qquad (25) \\ A_c|A_c > 0 &= [1 - \hat{a}_c - \sum_i \hat{B}_{ic}X_{ic}][\hat{m}_c + \hat{d}_c D_c + \hat{g}_c \mathbf{Z_c}] + [\mathbf{\hat{a}_c} + \sum_{\mathbf{i}} \mathbf{\hat{B}_{ic}X_{ic}}]\mathbf{R_c} + \epsilon_{\mathbf{c}} \qquad (26) \end{aligned}$$

Where A_c is per capita borrowing, D_c is per capita GSP, c indexes the industry, and the X values are share covariates for households, campaign contributions, and unionization.

The results of the main models, presented in tables 8 and 9, are in line with the qualitative information gained from the interviews. Conditional on having any allocation, it appears that industrial revenue and utilities bonds are the least likely to be the marginal category. $P[M]$ for utilities is estimated to be .15. There is only a small relationship between the remainder of the cap and the allocation IDBs receive. Multifamily housing and student loans are the marginal categories somewhat more often. The models suggests that in one out of five occasions in which multifamily housing receives an allocation, it is the marginal category. The residual category appears to be mortgage revenue bonds. It displays a strong relationship between the remainders and its allocation. Mortgage revenue borrowing is the most likely to be the marginal category ($P[M] = .35$), while student loans are the second most likely ($P[M] = .28$). In the control variable coefficients, only one is strongly significant. Demand for mortgage revenue bonds is higher in per capita terms in the states with populations below 1.9 million.

When the probability parameter is replaced with a linear probability model, two coefficients are significant and in keeping with the theory. Higher relative values in the measures of political influence should decrease the probability that the category is the marginal category. Therefore the coefficients on the measures should be negative. Higher shares of wage earners in the real estate industry are associated with mortgage revenue bonds being less likely to be marginal. Higher contributions from manufacturing interests are associated with industrial development bonds being less likely to be the marginal category. Running counter to the theory, the political measures are associated with a higher probability of being the marginal category in the utilities and multifamily models. However, both linear probability models have a large negative constant, which the variable coefficients are offsetting. Several more coefficients on the control variables are significant in the model with political covariates. The small population indicator is now significant in the utilities, mortgage and student loan models. A higher total GSP per capita is associated with more mortgage revenue borrowing while higher taxes are associated with more multifamily borrowing.

If the models are run without controls, the probability of be a marginal category is much higher for mortgage revenue bonds, multifamily housing and student loan bonds. The results appear in tables 10 and 11. Without controls, the only political variable that displays a coefficient in keeping with the theory is the household measure in the mortgage model.

With the counter intuitive results for the political covariates, and the stronger results without the controls, it is questionable whether these variables are improving the model. To confirm their joint significance, F tests are presented in table 12. Despite the small number of observations, and the sensitivity to the degrees of freedom, the additional variables are improving the fit of the model enough to justify their inclusion.

Shifting focus to table 13, I now investigate whether imposing a rank order can improve the model. I am using the priority order suggested by the interviews and the previous model: (1) Industrial Development (2) Utilities (3) Multifamily Housing (4) Student Loans (5) Mortgage Revenue Bonds. The major change is that the remainder is now defined as:

$$R_c = V - \sum_{r_j < r_c} A_j \tag{27}$$

where r is the priority rank of the category. For example, $R_{multifamily} = V - A_{industrial} - A_{utilities}$.

The shift to this calculation of the remainder reduces the simple model's estimate of the probability of being marginal for the multifamily category. The other notable changes are in the utilities model. The probability estimate for utilities increases to .35 from .15 in the unranked model, and becomes significant. The coefficient relating per capita GSP to per capita borrowing also increases in the utilities model. The R^2 suggests the ranked model seems to be a better fit for the utilities data. These results would support the assertion that utilities is the marginal category often, roughly a third of the occasions in which utilities borrowing is observed. However, subtracting the mortgage, multifamily and student loan figures from the cap introduces enough noise to attentuate the estimate.

Table 14 presents the results of the two models when state fixed effects are included. The results in the simpler model are eliminated. In the political covariates model, the coefficients display a similar pattern of direction, magnitude and significance, but they are attenuated. Another alternate specification, taking the logs of the dependent variable and the independent variable in levels (sector GSP per capita), changes the results somewhat. In the simple model, the probabilities of the categories being marginal are reduced by about half. All values are at least marginally significant except the utilities estimate. In the political covariate models, the negative, significant coefficients on the contributions measure in the industrial development model remains. The coefficients on the sector GSP in the utilities and multifamily housing models, which were not significant in the levels estimates, are positive and significant.

In the descriptive statistics, it was evident that states with generous per capita volume caps allocate borrowing in a different way than states with low per capita caps. The models in presented in table 16 investigate the difference in the political processes with the data set split. Estimating the model for the states with low caps shows only that a high share of households with wage earners in higher education corresponds to student loans being the marginal category less frequently. In high cap states, both the predicted relationships from table 9 show through. Contributions from manufacturing interests and employment in real estate are associated with higher priority for their sectors. In fact, the coefficients in the models on the data of the high cap states are almost identical to the pooled estimates, suggesting the results for the generous cap states are driving the results.

Tables 17 and 18 present the results of the models estimated on two other subsets of the data. The first is a trimmed set. I calculated the cooks distance for each observation, drop those with the 20 largest values, and re-estimate the model. All the probability estimates decline, but those in the mortgage revenue and multifamily models remain significant. Among the political covariates, the coefficient on households in mortgage model loses its significance. The coefficient on contributions in the industrial model remains significant in the trimmed data. The second variation of the data set involves removing the states with the five largest and five smallest populations in the year 2000. This change reveals that the states with extreme population levels are not creating the results by themselves. The probability estimates are significant in the mortgage, multifamily and student models. The significant coefficients in the industrial and mortgage political covariates remain significant.

Raising the household, contribution and union shares to the second power appears to improve the fit of the model for the relationship between contributions and industrial borrowing and unions and utilities (see table 19). In both cases, a diminishing returns shape appears. The direct effect of additional contribution or union shares decreases the sector's probability of being marginal, but the square's coefficient has the opposite sign. In the same table, a categorical estimate is presented. Here, high contribution shares, high household shares, or both should increase the category's priority relative to observations with lower than median values of both. The results are mixed.

Finally, I attempt the two main models with the 1990s data included. The results are similar for the simple model. In the estimates with the political covariates, the two significant negative coefficients in the 2000 only estimates lose their significance. When the 1990s observations are included, it appears that a higher share of contributions for utilities interests is associated with utilities borrowing being less likely to be the marginal category.

6 Policy Implications

I investigated the implications of a 10% increase in the volume cap.[13] The results are presented in table 21. The predicted increases in per capita borrowing in the average state and year range from \$2.28 for industrial development and \$1.67 for utilities up to \$6.40 for mortgage revenue bonds. This difference reflects the model's implication that industrial projects already receive most of the allocations they request, and are not absorbing the residual of the cap, as mortgage revenue bonds do. The predicted results from a 10% increase in the volume cap are much higher in the model with political variables. For example, in industrial development, the per capita-predicted increase in borrowing is \$4.87.

7 Conclusion

The allocation of private-activity borrowing authority can be successfully modeled with the concept that the activities are prioritized. The empirical models support the qualitative data which suggests that industrial development is the highest priority use of funding, followed by utilities and multifamily housing. Student loans and mortgage revenue bonds are evidently the residual categories that receive the authority to borrow that remains after all economically feasible industrial, utility, and multifamily housing projects have been funded. I define the marginal activity as the lowest priority activity that receives a non-zero allocation. The model suggests that, conditional on receiving any allocation, the probability that mortgage revenue bonds are the marginal category is .35. The probabilities for student loans and multifamily housing are .28 and .21 respectively. This paper also presented the results of an attempt to use political factors to predict the likelihood that

[13] The calculations for the predicted values are as follows. C_{it} is the value of the per capita volume cap for state i in year t. F is the non-linear function of the cap and other covariates that predicts a per capita borrowing value. P is population. $\mathbf{B}$ is the vector of other parameter estimates. $\mathbf{X}$ is the vector of other variables.

$$Mean\_PC\_Borrow = \frac{1}{N}\sum_{IT} F(1.1C_{it}, \mathbf{X}_{it}, \mathbf{B}) \quad (28)$$

$$Mean\_Borrow = \frac{1}{N}\sum_{IT} P_{it}F(1.1C_{it}, \mathbf{X}_{it}, \mathbf{B}) \quad (29)$$

$$Annual\_Total\_Borrow = \frac{1}{T}\sum_{IT} P_{it}F(1.1C_{it}, \mathbf{X}_{it}, \mathbf{B}) \quad (30)$$

The changes in the mean borrowing and annual total borrowing are a smaller percentage of the actual that the predicted changes in mean per capita borrowing because the smallest changes in the per capita measure C are weighted by the largest populations, P. Likewise, the largest values of C are weighted by the smallest P values.

a category is the marginal category. These results are mixed, but generally do achieve a better fit to the data than the simpler model.

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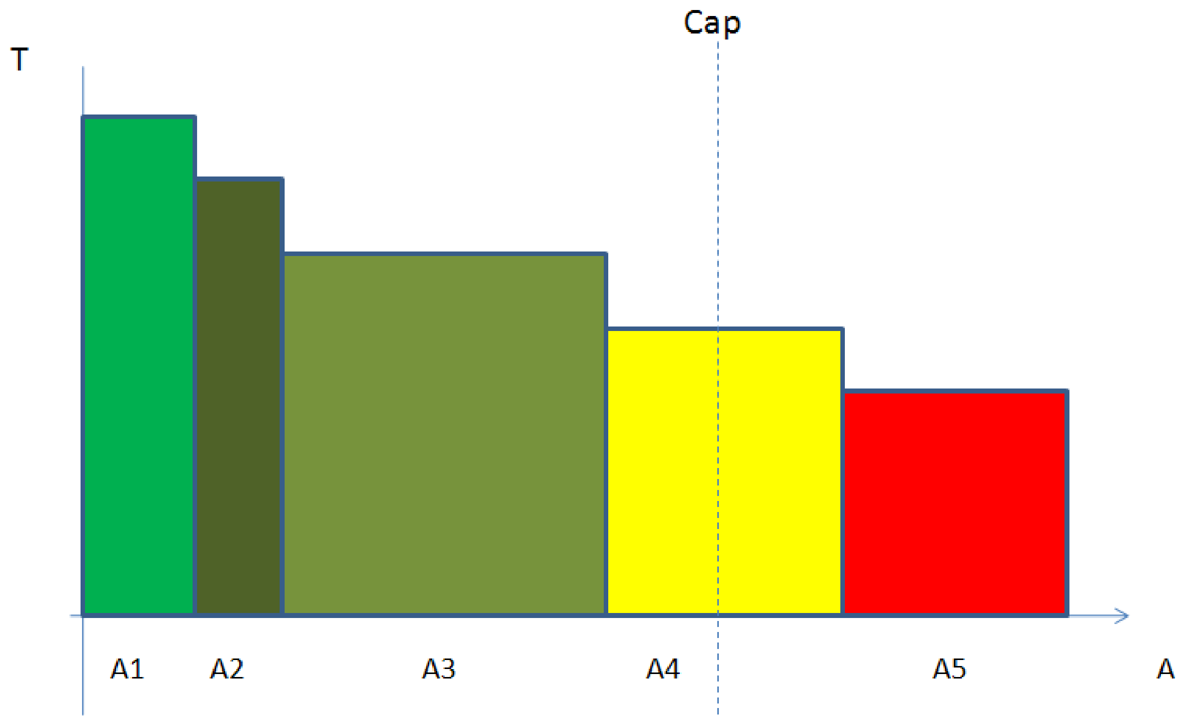

Figure 1: Prioritization in the Allocation of Private-Activity Borrowing Authority. T is the value the public official obtains from allocating a dollar of private-activity borrowing authority. The width of the rectangles is determined by the requests made by the private-activity borrowers. The public official funds the highest priority (highest T) purposes first, placing them to the left. Category 4 is the marginal category, which receives an allocation of the difference between the volume cap and the higher priority requests. Uses 4 and 5 receive no borrowing authority. The volume cap is exhausted in this state and year.

Variable	Median	Mean	SD	Minimum	Maximum
Ratio	0.90	0.86	0.37	0.00	2.38
Ratio > .85	1.00	0.57	0.50	0.00	1.00
Ratio > 1	0.00	0.30	0.46	0.00	1.00

Table 1: Descriptive Statistics: Private-Activity Borrowing/Cap Ratios. The calculations are based on the *Bond Buyer* data.

Per Capita Borrowing	N	Mean	SD	Min	Max
Total	400	99.672	94.205	0.000	613.794
Industrial	400	7.580	26.384	0.000	427.359
Utilities	400	7.935	22.217	0.000	357.526
Mortgage	400	43.892	64.954	0.000	526.724
Multifamily	400	19.880	34.636	0.000	291.207
Student	400	19.657	38.196	0.000	307.650
Other	400	1.340	5.051	0.000	52.216
Log Per Capita Borrowing	**N**	**Mean**	**SD**	**Min**	**Max**
Total	400	4.304	0.807	0.000	6.421
Industrial	400	1.340	1.124	0.000	6.060
Utilities	400	1.276	1.267	0.000	5.882
Mortgage	400	2.856	1.617	0.000	6.269
Multifamily	400	2.226	1.350	0.000	5.677
Student	400	1.737	1.647	0.000	5.745

Table 2: Descriptive Statistics: Private-Activity Borrowing by Purpose. The units for the first seven rows are year 2000 dollars per capita. The units for the middle seven rows are the logs of year 2000 dollars per capita (I add one to all observations before taking the log to retain the zero observations). The units for the last seven rows are the ratios of the observed borrowing to the current year cap, times 100. The *Bond Buyer* data are used. Borrowing with carryforward authorization is included after 1999.

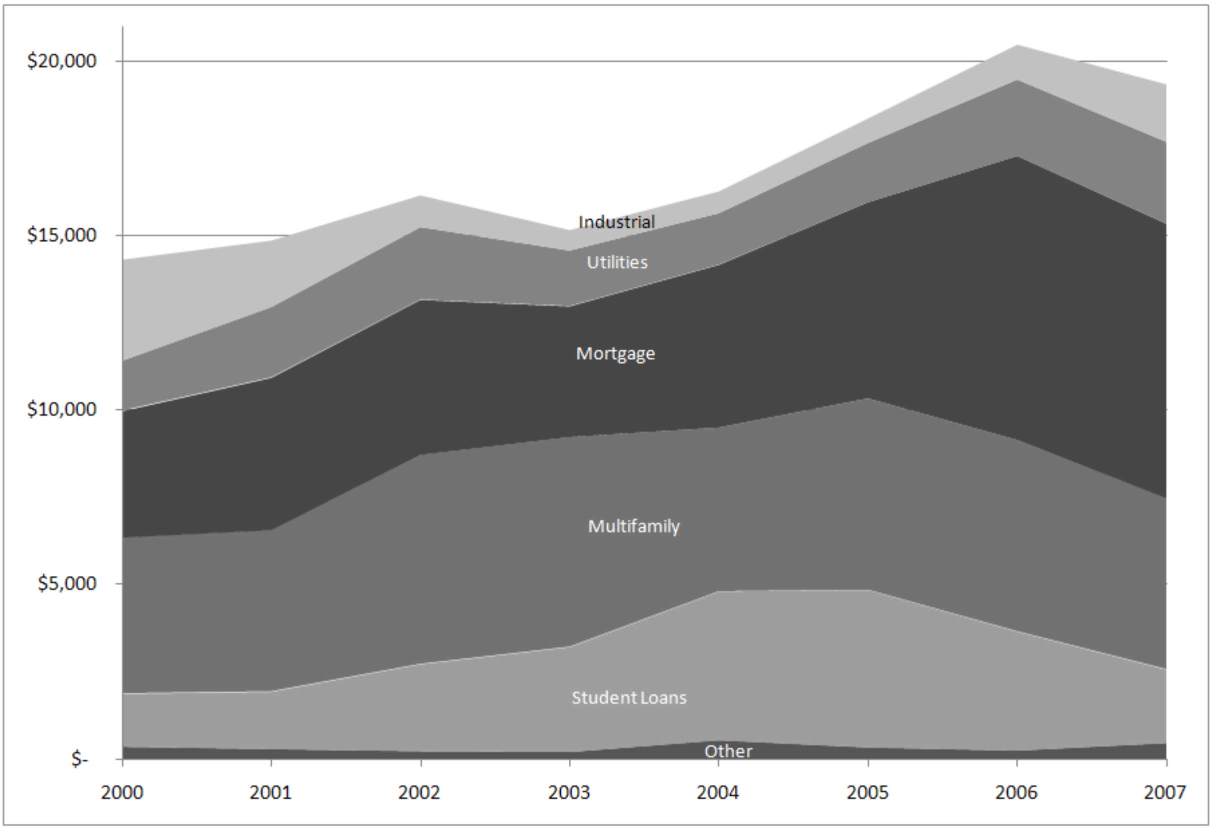

Figure 2: Total Allocation of Private-Activity Borrowing. Figures are in millions of 2000 dollars.

	Per Capita Borrowing				
Per Capita Volume Cap Level	Industrial	Utilities	Mortgage	Multifamily	Student
Below Median	5.474	6.305	21.614	15.725	9.135
	(8.690)	(6.745)	(20.478)	(13.725)	(11.032)
Above Median	9.685	9.566	66.171	24.034	28.954
	(36.212)	(30.640)	(83.918)	(46.714)	(51.904)

Table 3: Private-Activity Borrowing by Purpose and Volume Cap Level. The states were divided into three categories based on their average per capita volume cap between 1992 and 2007. All figures are the means of the borrowing observed for the purpose (column) by states in the volume cap category (row). Standard deviations appear in parentheses below. The units in the top three rows are per capita year 2000 dollars. The units in the bottom three rows are the ratios of the borrowing to the current year private-activity cap.

Category	Percent Zeros
Industrial	27
Utilities	39
Mortgage	16
Multifamily	17
Student Loans	41

Table 4: Percent Zero Observations: Private-Activity Borrowing by Purpose. The figures are the percentage of all state-year observations that have observations equal to zero for the specified purpose in the *Bond Buyer* data.

Variable	N	Mean	SD	Min	Max
Northeast	400	0.180	0.385	0	1
South	400	0.340	0.474	0	1
West	400	0.260	0.439	0	1
Urbanization	400	71.159	20.995	22.575	100.000
Per Capita Gross State Product	400	37.273	14.423	22.356	138.884
Per Capita State and Local Taxes	400	3.074	0.783	2.056	6.967
Unemployment	400	4.759	1.135	2.258	8.142
College Attainment	400	26.742	5.606	14.649	49.949
College Attainment Growth	400	0.430	1.009	-1.928	3.874
Low Income	400	20.830	4.761	10.553	35.487
Low Income Growth	400	-0.095	1.214	-5.378	3.042
Population <1.9 M	400	0.340	0.474	0	1
Population >5.3 M	400	0.320	0.467	0	1

Table 5: Descriptive Statistics: Control Variables. The regional variables and population groups are binary indicators. The GSP and tax units are logged per capita year 2000 dollars. All other units are percentages or differences in percentages. See section 4 for the various sources of the data.

	Per Capita Gross State Product			
Category	Mean	SD	Min	Max
Manufacturing (Industrial)	4.269	1.924	0.289	9.815
Utilities	0.764	0.293	0.126	2.316
Real Estate (Mortgage)	4.300	1.717	2.064	14.256
Construction (Multifamily)	1.677	0.437	0.951	3.954
Education (Student Loan)	0.359	0.475	0.062	3.650
	Share of Households			
Category	Mean	SD	Min	Max
Manufacturing (Industrial)	42.592	9.510	19.475	67.876
Utilities	3.669	1.899	1.057	12.725
Real Estate (Mortgage)	5.942	3.168	0.831	26.558
Construction (Multifamily)	32.781	9.170	8.906	53.458
Education (Student Loan)	15.017	4.920	4.141	41.090
	Share of Contributions			
Category	Mean	SD	Min	Max
Manufacturing (Industrial)	11.694	7.896	0.541	46.601
Utilities	16.842	9.747	2.557	77.848
Real Estate (Mortgage)	32.781	11.644	6.917	78.810
Construction (Multifamily)	32.319	10.536	3.720	68.533
Education (Student)	5.232	3.961	.070	21.128
	Share of Union Members			
Category	Mean	SD	Min	Max
Manufacturing (Industrial)	31.826	27.611	0.000	100.000
Utilities	10.042	14.325	0.000	100.000
Real Estate (Mortgage)	1.399	4.573	0.000	33.936
Construction (Multifamily)	39.778	28.425	0.000	100.000
Education (Student)	14.705	19.404	0.000	100.000

Table 6: Descriptive Statistics: GSP and Households by Industry. The GSP data are from the Bureau of Economic Analysis calculations based on the Survey of Current Business. The household data are estimated using the Current Population Survey and weights provided by the Minnesota Population Data Center. Households are counted if they have any wage earner employed in the indicated industry. Households can have wage earners in multiple industries. The shares figures are the percentage of GSP or households for the row's industry within the five industries.

	Industry	Utilities	Mortgage	Multifamily	Student
Per Capita Cap	0.269	0.188*	0.411***	0.193	0.376***
	(0.152)	(0.077)	(0.075)	(0.099)	(0.103)
Sector GSP PC	−3.469	32.991***	1.853	4.235	30.169
	(2.296)	(7.048)	(6.300)	(6.418)	(17.680)
Household Share	0.131	2.327*	−2.545	0.768	−0.458
	(0.168)	(1.091)	(1.418)	(0.616)	(0.896)
Contribution Share	−0.044	−0.158	0.076	0.001	0.352
	(0.242)	(0.183)	(0.286)	(0.226)	(0.749)
Union Share	−0.003	0.021	0.772	0.095	0.065
	(0.056)	(0.091)	(0.922)	(0.125)	(0.086)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Constant	−26.233	−31.764 * *	4.113	−18.095	−17.476
	(19.984)	(11.491)	(10.257)	(26.626)	(9.343)
R^2	0.524	0.497	0.559	0.496	0.609
N	292	243	335	333	236

Table 7: Political Allocation Models: Non-Zero Allocations Only. The dependent variable is the ratio of the observed private-activity borrowing, for the indicated purpose, to the volume cap. This is the extended table note. All of the following statements in this note apply to all the regression results unless otherwise noted. All dollar values used in the calculations are adjusted to year 2000 real dollars using the Consumer Price Index. All standard errors are corrected for heteroskedasticity using a Huber-White procedure. All private-activity borrowing data are from the *Bond Buyer* survey. "Control Variables" refers to a standard set of variables including region indicators, urbanization, GSP per capita, state and local taxes per capita, unemployment, college attainment, college attainment growth, low income percentage, low income percentage growth, and population category indicators. See section 4 for a complete description of the control variables. "Quality Controls" refers to indicators for each observation and each variable that was imputed. All variables with labels "share" are the percentage of the five-industry total that corresponds to the individual industry indicated in the column heading. Robust standard errors appear below in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

	Industry	Utilities	Mortgage	Multifamily	Student
$P[M]$	0.175	0.154	0.346***	0.205*	0.283*
	(0.093)	(0.141)	(0.058)	(0.089)	(0.115)
m	189.477	42.721*	94.300	−86.479*	36.582
	(117.704)	(19.136)	(48.043)	(33.899)	(46.913)
d	−4.674	49.774*	−9.389	2.652	49.316
	(3.446)	(22.086)	(7.540)	(7.541)	(29.208)
Northeast	18.965	0.432	12.158	6.009	7.678
	(12.169)	(4.577)	(11.210)	(7.547)	(14.966)
South	3.027	3.620	1.512	5.171	7.402
	(7.241)	(4.756)	(12.228)	(8.515)	(12.720)
West	19.491	24.091*	13.015	10.413	8.756
	(16.286)	(11.181)	(13.869)	(11.065)	(13.258)
Urbanization	−0.671	−0.566	−0.713*	−0.326	−0.780
	(0.425)	(0.339)	(0.291)	(0.371)	(0.481)
GSP PC	1.421	0.620	1.083*	0.325	−1.326
	(0.807)	(0.485)	(0.484)	(0.419)	(0.916)
Taxes PC	0.484	0.715	−5.466	8.243	−6.326
	(5.142)	(4.145)	(11.822)	(4.889)	(13.263)
Unemployment	−1.270	−1.373	−0.875	10.963*	−2.330
	(2.892)	(1.703)	(3.784)	(5.180)	(4.657)
College	−3.838	−1.184	1.686	1.454	2.732
	(2.513)	(0.660)	(1.387)	(0.963)	(2.118)
College Growth	1.164	4.722	−0.854	−4.757	−0.997
	(1.485)	(2.772)	(3.419)	(2.863)	(2.645)
Low Income	−2.727	−1.090	−1.823*	0.171	0.711
	(1.784)	(0.559)	(0.900)	(1.235)	(1.808)
Low Income Growth	1.282	0.915	4.230	−4.425	−0.549
	(1.510)	(1.088)	(3.572)	(3.603)	(2.006)
Population < 1.9M	−28.382	3.370	45.317***	18.547	39.090*
	(19.752)	(10.495)	(12.201)	(11.945)	(15.168)
Population > 3.8M	3.371	5.337	−2.839	4.299	7.698
	(5.310)	(3.401)	(7.406)	(5.940)	(7.518)
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.522	0.474	0.559	0.501	0.591
N	292	243	335	333	236

Table 8: Simple Structural Models. The dependent variable is the observed per capita borrowing for the indicated purpose. Additional notes relevant to all regression tables appear below table 7. Standard errors appear below in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	Industry	Utilities	Mortgage	Multifamily	Student
a	0.231	−0.984***	0.240	−0.508*	0.014
	(0.290)	(0.171)	(0.242)	(0.202)	(0.254)
$B_{household}$	0.005	0.048	−0.047 **	0.017 **	−0.007
	(0.004)	(0.030)	(0.016)	(0.006)	(0.014)
$B_{contribution}$	−0.020*	0.041***	0.011	0.007	0.043 **
	(0.009)	(0.009)	(0.007)	(0.005)	(0.014)
B_{union}	−0.003	0.019***	−0.005	−0.001	0.005
	(0.002)	(0.004)	(0.013)	(0.003)	(0.004)
m	96.128	−4.235	62.906	−108.979 **	43.210
	(60.051)	(24.418)	(46.376)	(36.963)	(40.503)
d	−1.462	−13.162	−10.443	1.547	66.950
	(1.559)	(15.472)	(8.830)	(6.456)	(46.761)
Northeast	11.030	−3.708	11.783	1.950	15.034
	(6.119)	(5.603)	(11.866)	(6.737)	(13.912)
South	0.750	0.759	3.969	0.751	17.847
	(4.394)	(4.296)	(11.681)	(7.937)	(10.906)
West	6.927	−6.362	18.292	6.156	13.586
	(8.354)	(9.509)	(15.849)	(10.825)	(12.402)
Urbanization	−0.373	0.232	−0.943 **	−0.234	−0.738
	(0.198)	(0.202)	(0.274)	(0.326)	(0.412)
GSP PC	0.911	−0.446	1.847 **	0.402	−0.667
	(0.464)	(0.414)	(0.550)	(0.418)	(0.777)
Taxes PC	−0.444	1.146	−2.150	10.913 **	−7.066
	(2.908)	(3.399)	(12.255)	(3.612)	(8.382)
Unemployment	0.246	2.092	−0.287	6.139*	−2.184
	(1.642)	(1.691)	(4.020)	(2.922)	(3.032)
College	−2.011	0.158	1.677	1.574	1.881
	(1.354)	(0.768)	(1.273)	(0.962)	(1.796)
College Growth	1.562	1.615	−0.563	−3.863	−0.446
	(1.209)	(1.683)	(2.997)	(2.201)	(2.515)
Low Income	−1.393	0.033	−1.334	1.307	−0.092
	(0.990)	(0.585)	(1.010)	(0.988)	(1.194)
Low Income Growth	1.677	0.170	4.705*	−5.700*	1.678
	(1.227)	(0.987)	(2.061)	(2.452)	(2.219)
Population $<$ 1.9M	−8.334	31.777 **	38.399 **	18.385	32.004 **
	(6.554)	(10.814)	(11.692)	(12.362)	(11.118)
Population $>$ 3.8M	−0.130	1.332	−0.934	4.310	7.517
	(2.923)	(2.761)	(8.562)	(5.356)	(7.672)
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.652	0.656	0.747	0.722	0.749
N	292	243	335	333	236

Table 9: Political Structure Models. The dependent variable is the observed per capita borrowing for the indicated purpose. Additional notes relevant to all regression tables appear below table 7. State-clustered standard errors appear below in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	Industry	Utilities	Mortgage	Multifamily	Student
$P[M]$	0.223	0.190	0.546***	0.319***	0.449 **
	(0.159)	(0.129)	(0.030)	(0.081)	(0.152)
m	12.376	−30.084	45.953***	11.656	13.267
	(7.046)	(24.080)	(12.635)	(11.256)	(11.105)
d	−1.524	56.044	−2.702	3.402	46.925
	(1.771)	(32.788)	(2.399)	(6.023)	(40.147)
R^2	0.212	0.290	0.392	0.322	0.375
N	292	243	335	333	236

Table 10: Simple Structural Models. The dependent variable is the observed per capita borrowing for the indicated purpose. Additional notes relevant to all regression tables appear below table 7. Standard errors appear below in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	Industry	Utilities	Mortgage	Multifamily	Student
a	0.046	−0.751 **	0.473	−0.072	0.130
	(0.346)	(0.235)	(0.282)	(0.314)	(0.189)
$B_{household}$	0.011 **	0.053*	−0.025 **	0.009*	−0.010
	(0.004)	(0.025)	(0.008)	(0.004)	(0.014)
$B_{contribution}$	−0.024	0.028 **	0.006	0.006	0.053 **
	(0.012)	(0.010)	(0.009)	(0.007)	(0.015)
B_{union}	−0.003	0.017***	0.033***	−0.001	0.006
	(0.002)	(0.005)	(0.005)	(0.003)	(0.003)
m	11.822*	6.407	67.293 **	16.078	6.292
	(5.561)	(6.673)	(19.651)	(11.058)	(16.959)
d	−0.695	5.491	−7.918	0.762	63.633
	(0.965)	(9.306)	(4.338)	(5.820)	(69.793)
R^2	0.516	0.582	0.653	0.565	0.652
N	292	243	335	333	236

Table 11: Political Structure Models. The dependent variable is the observed per capita borrowing for the indicated purpose. Additional notes relevant to all regression tables appear below table 7. State-clustered standard errors appear below in parentheses. *** p<0.01, ** p<0.05, * p<0.1

SSR	Industrial	Utilities	Mortgage	Multifamily	Student
Simple, reduced form, with controls	150,671	100,931	771,388	244,870	246,205
Political, reduced form, with contols	150,364	96,628	760,951	234,768	243,719
Simple, no controls	212,143	128,325	933,062	303,029	311,566
Political, no controls	145,675	92,860	851,190	277,116	259,142
Simple with controls	128,579	95,045	676,782	223,028	203,767
Political with controls	104,745	76,459	621,509	176,820	186,590
Simple ranked, with controls	128,457	70,463	678,368	241,120	208,538
Political ranked, with controls	125,534	49,523	623,561	200,469	185,190
F-tests	Industrial	Utilities	Mortgage	Multifamily	Student
Political nc v simple nc F	43.50	30.17	10.55	10.19	15.51
p	0.000	0.000	0.000	0.000	0.000
Simple wc v simple nc F	8.74	3.85	5.91	5.56	5.63
p	0.000	0.000	0.000	0.000	0.000
Political wc v political nc F	5.20	2.33	5.71	8.71	4.08
p	0.000	0.002	0.000	0.000	0.000
Political wc v simple wc F	20.18	17.58	9.16	26.74	6.44
p	0.000	0.000	0.000	0.000	0.000

Table 12: Sum of Squared Residuals and F-tests: Simple, Ranked, and Political Structural Models. The dependent variable for each model is the per capita borrowing for the indicated purpose in state-year observations. The parameter estimates can be found in tables 8, 9, 10 and 11.

	Industry	Utilities	Mortgage	Multifamily	Student
$P[M]$	0.268	0.346*	0.345***	0.150	0.271 **
	(0.151)	(0.160)	(0.058)	(0.078)	(0.097)
m	212.137	80.572	92.250	−93.609 **	27.637
	(143.869)	(47.959)	(49.210)	(34.035)	(45.046)
d	−4.688	60.256*	−9.914	2.833	48.118
	(3.831)	(28.470)	(7.619)	(7.328)	(26.469)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.523	0.610	0.558	0.460	0.582
N	292	243	335	333	236
	Industry	Utilities	Mortgage	Multifamily	Student
a	0.217	−0.177	0.234	−0.235	0.129
	(0.142)	(0.132)	(0.249)	(0.186)	(0.172)
$B_{household}$	0.001	0.034***	−0.047 **	0.010	−0.001
	(0.002)	(0.009)	(0.016)	(0.006)	(0.006)
$B_{contribution}$	−0.003	0.003	0.011	0.002	0.016
	(0.002)	(0.003)	(0.008)	(0.002)	(0.013)
B_{union}	−0.000	0.001	−0.003	0.002	0.004***
	(0.001)	(0.003)	(0.013)	(0.002)	(0.001)
m	191.148	20.489	60.692	−134.789 **	55.408
	(127.459)	(14.082)	(47.902)	(42.606)	(37.135)
d	−4.186	24.882 **	−10.469	4.737	23.704
	(3.513)	(7.209)	(9.248)	(7.991)	(24.890)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.583	0.777	0.746	0.685	0.751
N	292	243	335	333	236

Table 13: Simple Structural Models: Forced Rank. The dependent variable is the observed per capita borrowing for the indicated purpose. Only observations with non-zero outcomes were used. Additional notes relevant to all regression tables appear below table 7. State-clustered standard errors appear below in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	Industry	Utilities	Mortgage	Multifamily	Student
$P[M]$	0.054	0.289	0.120	0.110	0.052
	(0.042)	(0.167)	(0.109)	(0.092)	(0.061)
m	−2277.319	−0.000	11.065	242.124	−131.774
	(0.000)	(12.965)	.	.	(95.531)
d	−2.708	−3.749	16.486	−7.206	−47.723
	(5.678)	(60.590)	(21.468)	(21.767)	(100.791)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes
R^2	0.860	0.600	0.610	0.739	0.810
N	292	243	335	333	236
	Industry	**Utilities**	**Mortgage**	**Multifamily**	**Student**
a	0.463	−0.793***	−0.231	−0.311	−0.529
	(0.272)	(0.119)	(0.252)	(0.271)	(0.499)
$B_{household}$	−0.009	0.054	−0.048*	0.018 **	0.023
	(0.006)	(0.037)	(0.019)	(0.006)	(0.032)
$B_{contribution}$	−0.004	0.039***	0.019	0.002	0.011
	(0.002)	(0.011)	(0.010)	(0.006)	(0.030)
B_{union}	0.001	0.005*	−0.016	−0.003	0.006
	(0.001)	(0.002)	(0.014)	(0.002)	(0.005)
m	112.031	37.324	−0.839	−89.783	−988.956
	(105.575)	(39.527)	(117.881)	(90.209)	(0.000)
d	−1.859	−31.437	7.841	−49.900	−29.210
	(3.141)	(19.540)	(9.339)	(25.224)	(96.569)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes
R^2	0.881	0.865	0.780	0.815	0.825
N	292	243	335	333	236

Table 14: Simple and Political Structural Models: State FE. The dependent variable is the observed per capita borrowing for the indicated purpose. Additional notes relevant to all regression tables appear below table 7. State-clustered standard errors appear below in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	Industry	Utilities	Mortgage	Multifamily	Student
$P[M]$	0.062*	0.039	0.161 **	0.098***	0.085*
	(0.024)	(0.030)	(0.047)	(0.024)	(0.041)
m	4.722 **	3.755***	5.177***	−2.174*	4.283***
	(1.723)	(0.822)	(0.591)	(0.962)	(1.190)
d	0.034	0.517***	−0.616	1.036*	0.349
	(0.255)	(0.138)	(0.505)	(0.471)	(0.258)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.518	0.381	0.582	0.391	0.583
N	292	243	335	333	236
	Industry	**Utilities**	**Mortgage**	**Multifamily**	**Student**
a	0.051	−0.076	0.010	−0.093	0.254
	(0.120)	(0.063)	(0.135)	(0.121)	(0.141)
$B_{household}$	0.001	0.003	−0.018	0.001	−0.015
	(0.003)	(0.011)	(0.016)	(0.003)	(0.011)
$B_{contribution}$	−0.005 **	0.005	0.008***	0.004*	0.010
	(0.002)	(0.004)	(0.002)	(0.002)	(0.006)
B_{union}	0.001	0.003	−0.014*	0.001	0.001
	(0.001)	(0.002)	(0.006)	(0.001)	(0.002)
m	4.518 **	4.110***	5.225***	−2.123*	5.172***
	(1.681)	(1.014)	(0.617)	(0.980)	(1.196)
d	0.069	0.565 **	−0.817	0.890*	0.362
	(0.256)	(0.192)	(0.550)	(0.432)	(0.277)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.904	0.898	0.962	0.928	0.958
N	292	243	335	333	236

Table 15: Simple Structural Models: Logs. The dependent variable is the log of the observed per capita borrowing for the indicated purpose. The log of the per capita industry GSPs also is used. Additional notes relevant to all regression tables appear below table 7. State-clustered standard errors appear below in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	Industry	Utilities	Mortgage	Multifamily	Student
a	−0.191∗	−0.132	−0.166	0.273	0.386 ∗ ∗
	(0.093)	(0.077)	(0.253)	(0.196)	(0.131)
$B_{household}$	0.007 ∗ ∗	0.026	0.026	−0.007	−0.036∗∗∗
	(0.002)	(0.019)	(0.023)	(0.005)	(0.009)
$B_{contribution}$	−0.001	0.003	0.010∗	0.004	0.054∗∗∗
	(0.003)	(0.006)	(0.004)	(0.005)	(0.011)
B_{union}	−0.001	0.002	−0.036∗	−0.000	0.005 ∗ ∗
	(0.001)	(0.003)	(0.015)	(0.002)	(0.001)
m	32.488∗	27.761 ∗ ∗	37.440	−102.904∗∗∗	45.963∗
	(11.653)	(7.560)	(26.829)	(19.232)	(16.863)
d	0.486	11.848∗∗∗	−6.667	1.269	−8.456
	(0.676)	(2.415)	(6.566)	(3.608)	(6.681)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.739	0.273	0.485	0.539	0.578
N	167	160	176	189	125

	Industry	Utilities	Mortgage	Multifamily	Student
a	0.413	−1.352∗∗∗	0.222	−0.536∗	−0.485
	(0.364)	(0.230)	(0.245)	(0.200)	(0.238)
$B_{household}$	0.000	0.058	−0.050 ∗ ∗	0.018 ∗ ∗	0.015
	(0.006)	(0.040)	(0.015)	(0.005)	(0.013)
$B_{contribution}$	−0.019∗	0.067∗∗∗	0.011	0.007	0.047 ∗ ∗
	(0.008)	(0.016)	(0.008)	(0.005)	(0.016)
B_{union}	−0.002	0.011	−0.002	−0.001	0.006
	(0.002)	(0.007)	(0.018)	(0.003)	(0.004)
m	179.161	−41.063	79.214	−57.092	−13.591
	(119.719)	(57.869)	(68.477)	(62.830)	(139.190)
d	−1.869	−79.607 ∗ ∗	−11.496	−11.789	214.215∗
	(2.652)	(26.496)	(10.127)	(11.072)	(96.471)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.688	0.841	0.774	0.758	0.801
N	125	83	159	144	111

Table 16: Political Structural Models: Below/Above Median Per Capita Cap. The dependent variable is the observed per capita borrowing for the indicated purpose. The top set of parameters are estimated on states that had below-median average per capita caps during the study period. The bottom set of parameters were estimated on states that had above-median average per capita caps during the study period. Additional notes relevant to all regression tables appear below table 7. State-clustered standard errors appear below in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	Industry	Utilities	Mortgage	Multifamily	Student
$P[M]$	−0.003	0.012	0.180*	0.074***	0.049
	(0.005)	(0.014)	(0.071)	(0.017)	(0.047)
m	9.881	17.598*	61.499 **	−53.021 **	46.489 **
	(6.406)	(8.333)	(19.085)	(15.346)	(15.176)
d	0.550	4.923*	−5.806	5.281	16.431
	(0.335)	(2.344)	(2.931)	(2.972)	(10.627)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.420	0.251	0.588	0.277	0.542
N	272	223	315	313	216

	Industry	Utilities	Mortgage	Multifamily	Student
a	−0.060	−0.020	0.025	−0.098	0.356
	(0.041)	(0.058)	(0.170)	(0.081)	(0.193)
$B_{household}$	0.002	−0.005	−0.014	0.002	−0.024
	(0.001)	(0.005)	(0.008)	(0.002)	(0.014)
$B_{contribution}$	−0.001 **	0.002	0.007*	0.003	0.008
	(0.000)	(0.003)	(0.003)	(0.002)	(0.013)
B_{union}	0.000	0.002	0.009*	0.000	0.002
	(0.000)	(0.001)	(0.004)	(0.001)	(0.002)
m	9.769	18.743*	46.988*	−56.881 **	62.192***
	(6.157)	(8.347)	(20.979)	(16.911)	(15.767)
d	0.525	5.976*	−5.054	4.817	10.638
	(0.331)	(2.728)	(3.272)	(2.888)	(11.862)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.752	0.713	0.825	0.709	0.823
N	272	223	315	313	216

Table 17: Simple and Political Structural Models: Trimmed Data. The dependent variable is the observed per capita borrowing for the indicated purpose. In each case, the twenty observations with the largest dependent variable values were removed before the model was estimated. Additional notes relevant to all regression tables appear below table 7. State-clustered standard errors appear below in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	Industry	Utilities	Mortgage	Multifamily	Student
$P[M]$	0.017	0.016	0.330***	0.147 **	0.358 **
	(0.013)	(0.028)	(0.079)	(0.048)	(0.108)
m	8.526	18.642	66.133	−33.943	46.772
	(13.737)	(12.907)	(46.840)	(33.188)	(53.915)
d	1.199	12.574	−12.302	8.731	25.895
	(0.714)	(7.118)	(6.288)	(5.946)	(24.083)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.492	0.449	0.489	0.285	0.601
N	241	197	267	270	184
	Industry	**Utilities**	**Mortgage**	**Multifamily**	**Student**
a	−0.161*	0.069	−0.350	0.342	−0.115
	(0.067)	(0.131)	(0.289)	(0.343)	(0.211)
$B_{household}$	0.005*	−0.014	−0.065*	−0.006	0.025
	(0.002)	(0.019)	(0.025)	(0.009)	(0.018)
$B_{contribution}$	−0.003 **	−0.001	0.033***	−0.003	0.017
	(0.001)	(0.004)	(0.006)	(0.006)	(0.011)
B_{union}	−0.000	0.001	−0.020	0.003	0.001
	(0.000)	(0.003)	(0.013)	(0.003)	(0.006)
m	10.365	20.296	89.580	−34.488	24.355
	(13.501)	(14.621)	(46.042)	(32.521)	(40.184)
d	1.150	12.942	−18.767*	7.929	22.276
	(0.718)	(7.656)	(8.912)	(5.598)	(28.152)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.709	0.670	0.732	0.601	0.779
N	241	197	267	270	184

Table 18: Simple and Political Structural Models: Middle-Population States. The dependent variable is the observed per capita borrowing for the indicated purpose. The five most populous and five least populous states were removed from the data before the models were estimated. Additional notes relevant to all regression tables appear below table 7. State-clustered standard errors appear below in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	Industry	Utilities	Mortgage	Multifamily	Student
a	2.667***	−0.700	0.252	−0.108	−0.269
	(0.617)	(0.536)	(0.450)	(0.469)	(0.536)
$B_{household}$	−0.083*	0.120	−0.018	0.000	0.044
	(0.037)	(0.078)	(0.033)	(0.028)	(0.055)
Bh2	0.001	−0.007	0.000	0.000	−0.001
	(0.000)	(0.007)	(0.001)	(0.000)	(0.001)
$B_{contribution}$	−0.082***	0.098	0.003	−0.006	−0.008
	(0.021)	(0.079)	(0.026)	(0.023)	(0.055)
Bc2	0.002 **	−0.003	0.000	0.000	0.003
	(0.000)	(0.003)	(0.000)	(0.000)	(0.003)
B_{union}	−0.006	−0.052*	−0.054*	0.002	−0.006
	(0.004)	(0.021)	(0.025)	(0.007)	(0.006)
Bu2	0.000	0.002 **	0.003 **	−0.000	0.000*
	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
m	34.583	14.892	91.902	−108.004 **	20.725
	(26.093)	(10.635)	(50.186)	(33.545)	(40.635)
d	0.501	19.929***	−25.543***	0.748	63.874
	(0.891)	(5.314)	(6.331)	(6.160)	(34.252)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.756	0.769	0.755	0.726	0.759
N	292	243	335	333	236

	Industry	Utilities	Mortgage	Multifamily	Student
a	0.181	−0.214	0.484***	0.082	0.204
	(0.127)	(0.140)	(0.057)	(0.075)	(0.146)
$C_{High} - H_{High}$	−0.126	0.301	−0.099	0.392	−0.088
	(0.081)	(0.170)	(0.096)	(0.210)	(0.154)
$C_{High} - H_{Low}$	−0.041	0.190	−0.007	0.067	0.313
	(0.088)	(0.154)	(0.103)	(0.083)	(0.164)
$C_{Low} - H_{High}$	0.230*	0.009	−0.367 **	0.054	−0.083
	(0.093)	(0.138)	(0.127)	(0.123)	(0.258)
B_{union}	−0.003	0.013	0.030***	−0.000	0.006
	(0.002)	(0.007)	(0.005)	(0.003)	(0.004)
m	99.075	35.594	126.310*	−97.707 **	61.342
	(59.799)	(21.537)	(49.609)	(29.465)	(40.540)
d	−1.593	33.356	−28.518 **	1.883	61.271
	(1.694)	(20.122)	(9.893)	(5.708)	(40.637)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.638	0.630	0.742	0.686	0.745
N	292	243	335	333	236

Table 19: Political Structural Models: Higher Order and Categorical Specifications. The dependent variable is the observed per capita borrowing for the indicated purpose. Additional notes relevant to all regression tables appear below table 7. State-clustered standard errors appear below in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	Industry	Utilities	Mortgage	Multifamily	Student
$P[M]$	0.115	0.180	0.369***	0.167*	0.255 **
	(0.066)	(0.091)	(0.052)	(0.076)	(0.080)
m	85.428	22.009	9.152	−45.505*	31.856
	(57.164)	(14.946)	(31.070)	(20.944)	(33.443)
d	−1.315	36.364*	−9.936	3.816	43.572
	(1.836)	(15.984)	(5.373)	(5.945)	(25.725)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.131	0.324	0.421	0.292	0.375
N	628	490	552	589	392
	Industry	Utilities	Mortgage	Multifamily	Student
a	0.006	0.053	0.202	−0.407*	−0.167
	(0.075)	(0.078)	(0.226)	(0.200)	(0.169)
$B_{household}$	0.005	0.035 **	−0.019	0.014*	0.011
	(0.004)	(0.013)	(0.011)	(0.007)	(0.012)
$B_{contribution}$	−0.008	−0.004***	0.009	0.005	0.041 **
	(0.005)	(0.001)	(0.006)	(0.004)	(0.014)
B_{union}	−0.002	0.002	−0.007	−0.001	0.000
	(0.002)	(0.003)	(0.015)	(0.002)	(0.002)
m	61.977	22.287	−20.983	−48.614 **	17.742
	(39.803)	(12.692)	(33.415)	(17.393)	(34.079)
d	−0.326	29.276*	−13.517*	−2.509	59.462
	(1.257)	(14.140)	(5.085)	(4.499)	(40.472)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.529	0.629	0.720	0.617	0.713
N	628	490	552	589	392

Table 20: Simple and Political Structural Models: including 1992-1999. The dependent variable is the observed per capita borrowing for the indicated purpose. Only observations from the years 2000 to 2007 were used. Additional notes relevant to all regression tables appear below table 7. State-clustered standard errors appear below in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Industrial	Actual	Predicted	Difference
Mean Per Capita Borrowing	10.383	12.663	2.280
Mean Borrowing	35.271	58.217	22.946
Annual Total Borrowing	643.691	1062.454	418.763
Utilities	Actual	Predicted	Difference
Mean Per Capita Borrowing	13.062	14.730	1.667
Mean Borrowing	61.560	103.729	42.169
Annual Total Borrowing	934.946	1575.392	640.446
Mortgage	Actual	Predicted	Difference
Mean Per Capita Borrowing	52.409	58.812	6.403
Mean Borrowing	147.318	218.860	71.543
Annual Total Borrowing	3084.467	4582.391	1497.924
Multifamily	Actual	Predicted	Difference
Mean Per Capita Borrowing	23.880	27.233	3.354
Mean Borrowing	126.204	146.296	20.092
Annual Total Borrowing	2626.621	3044.784	418.164
Student Loans	Actual	Predicted	Difference
Mean Per Capita Borrowing	32.279	37.320	5.040
Mean Borrowing	97.714	177.363	79.649
Annual Total Borrowing	1441.286	2616.106	1174.819

Table 21: Simple Structural Models: Private-Activity Borrowing with a 10% Increase in the Volume Cap. After running the OLS models displayed in table 8, I replace the actual volume caps with 110% of their values, and predicted borrowing with full set of covariates. The means are across all state-year observations. The annual national borrowing is the sum over all states and years with the predicted per capita values multiplied by the population in the state-year. All dollars figures are adjusted for inflation using the consumer price index.

Industrial	Actual	Predicted	Difference
Mean Per Capita Borrowing	7.580	12.451	4.871
Mean Borrowing	25.748	56.385	30.637
Annual Total Borrowing	643.691	1409.616	765.925
Utilities	**Actual**	**Predicted**	**Difference**
Mean Per Capita Borrowing	7.935	16.945	9.009
Mean Borrowing	37.398	61.193	23.795
Annual Total Borrowing	934.946	1529.821	594.875
Mortgage	**Actual**	**Predicted**	**Difference**
Mean Per Capita Borrowing	43.892	57.914	14.022
Mean Borrowing	123.379	202.026	78.648
Annual Total Borrowing	3084.467	5050.662	1966.195
Multifamily	**Actual**	**Predicted**	**Difference**
Mean Per Capita Borrowing	19.880	29.136	9.257
Mean Borrowing	105.065	132.140	27.075
Annual Total Borrowing	2626.621	3303.491	676.870
Student Loans	**Actual**	**Predicted**	**Difference**
Mean Per Capita Borrowing	19.045	37.397	18.352
Mean Borrowing	57.651	152.993	95.341
Annual Total Borrowing	1441.286	3824.819	2383.533

Table 22: Political Structural Models: Private-Activity Borrowing with a 10% Increase in the Volume Cap. After running the models displayed in table 9, I replace the actual volume caps with 110% of their values, and predicted borrowing with full set of covariates. The means are across all state-year observations. The annual national borrowing is the sum over all states and years with the predicted per capita values multiplied by the population in the state-year. All dollars figures are adjusted for inflation using the consumer price index.