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Research Article

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Debt Burdens of California's State and Local Governments

Abstract: Concern over the amount of state and local government debt in California and other states has been somewhat widely expressed. The purpose of this paper is to consider how policymakers can best evaluate these concerns regarding the level of traditional public debt in California (or other states). We do this by examining how the debt of California's subnational (state and local) governments has changed between 1992 and 2007, and then compares these changes in debt held by California governments to changes in the national average, and to changes in other specific states. Since additional information on total subnational debt by state will not be reported until after 2012, we also examine the borrowing behavior of California's subnational governments during the *Great Recession* (2008–2010). Again, we contrast borrowing by California governments during this period to the past behavior of California governments and to the borrowing behavior of governments in other states. We conclude that through 2010, California's state and local government debt is not as bad as some have thought.

Keywords: California state local government debt

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1 Introduction

Concern over the amount of state and local government debt in California and other states has been somewhat widely expressed. This paper's intent is a consideration of how policymakers can best evaluate these concerns regarding the level of traditional public debt in California. For the purpose of comparison across states, we define traditional public debt here in only the manner used by the US Census

Bureau in its collection of *State and Local Government Finances* data.[1] We realize that this ignores other forms of short- and long-term obligations that the State of California – or for that matter any state – has taken on. Governor Jerry Brown has grouped these obligations together by labeling them California's *Wall of Debt*.[2] As more formally described by California's Legislative Analyst Mac Taylor (2009), this broader category includes not only the traditional debt discussed here for largely *infrastructure-related activities*, but also future obligations that the state has committed to in the form of *budget* and *retirement-related liabilities*.[3] Taylor reports that these liabilities totaled over $200 billion for California in mid-2009, while infrastructure-related liabilities accounted for only about one-third of these (or about $69 billion). We recognize the relevance of considering these nontraditional forms of debt, but unfortunately cannot make comparisons to other states in their regard because of a lack of a fully comparable, comprehensive data collection on each state.

In this paper, we examine how the Census of Governments' defined debt of California's subnational (state and local) governments changed between 1992 and 2007, and then compare these changes to changes in the national average for this specific definition of debt, and to changes in it for other states.[4] We also examine the borrowing behavior of California's subnational governments during the *Great Recession* (2008–2010).[5] Again, we contrast borrowing by California governments

1 The formal definition offered by the Census of Governments at http://www.census.gov/govs/state/definitions.html is: Debt: All long-term credit obligations of the government and its agencies whether backed by the governments' full faith and credit or nonguaranteed, and all interest-bearing short-term credit obligations. Includes judgments, mortgages and revenue bonds, as well as general obligations bonds, notes, and interest-bearing warrants. Excludes noninterest-bearing short-term obligations, interfund obligation, amounts owed in a trust or agency capacity, advances and contingent loans from other governments, and rights of individuals to benefits from government-administered employee retirement funds.

2 See the May 17, 2011 *Sacramento Bee* article "Jerry Brown recasts tax push, targeting California's 'wall of debt,'"
http://www.sacbee.com/2011/05/17/3631897/jerry-brown-recasts-tax-push-targeting.html.

3 The budget-related liabilities cited by Taylor (2009) include state government employee pay and benefit deferrals, Prop. 98 deferrals, Prop. 1A repayments, and mandated reimbursements. Retirement related liabilities include anticipated pension and health benefit payouts through CalPers, CalSters, and the University of California.

4 We utilize data from the decennial US Census of Governments on the nominal level of long-term state and local debt in the 50 states for the years 1992, 1997, 2002 and 2007. Compiled every 5 years, the Census of Governments does not report data values until 1–2 years after the year gathered for. These data are publicly available at
http://www.census.gov/govs/cog.

5 Data on 2009 and 2010 issues of Build American Bonds by state are taken from the Bond Buyer at http://www.bondbuyer.com, whereas data on 2008, 2009 and 2010 issues of

during this recessionary period to the past behavior of California governments, and to the borrowing behavior of governments in other states.

When making interstate comparisons, we believe it is appropriate to examine state and local government debt in a state added together, rather than the debt incurred by a state government alone. States differ dramatically in the degree to which the state or its local governments take responsibility for generating revenue, providing public services, and issuing debt. Examining only the state government component of the state and local fiscal system offers misleading comparisons across the states. Some state government authorities incur debt on behalf of their local governments. In other states, local governments are responsible for incurring debt directly. In every state, state governments generate revenue they then distribute to local governments in the form of intergovernmental grants that differ widely in magnitude. In some states, local governments can only incur debt after approval of the state government.

Conceptually, an assessment of the desirability of subnational debt levels is possible by examining *affordability, optimality* or *comparability*. Affordability involves comparing debt levels to the magnitude of the economy or to the size of the government budget, either currently or to a forecast of the future, and then judging whether it is affordable. Optimality recognizes the tie between debt and investment in public capital. The issue is whether government is investing in the quantity and quality of public capital desired by residents and financing the appropriate share of that cost with debt. This requires judging the uses of debt. Comparability involves evaluating debt by comparing the debt of other "*similar*" governments, after allowing for important differences in circumstances. We chose to use comparability here because of the difficulty (and controversy) of making the value judgments necessary to employ an affordability or optimality evaluation of a government's debt.

Measuring the magnitude of debt that a state or local government has incurred involves comparing aggregate debt (a *stock*) or components of that total debt (such as long-term debt) to various annual measures of fiscal and economic capacity (which are *flows*). Here, we use three measures of relative state and local debt burden: (1) real debt per person (that is, debt adjusted for inflation and divided by population); (2) debt as a percentage of gross domestic product (GDP) for the jurisdiction; and (3) debt as a percentage of the appropriate annual government revenue. We also examine the annual cost to the government from outstanding debt (that is, the annual interest payments on the debt as a percentage of annual revenue).

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traditional bonds are taken from The Bond Buyer Market Statistics at http://www.bondbuyer.com/marketstatistics/#SemiannualandAnnualStatistics.

2 State and Local Government Debt in the USA and California, 1992–2007

2.1 All State and Local Governments in the USA

In 2008, US subnational (state and local) governments had accumulated a total outstanding traditional debt of nearly $2.6 trillion, or about $8500 per person. This debt amounted to nearly 18% of GDP and 96% of the annual revenue for all state and local governments. State governments (or state government authorities) account for about 39% of that total subnational government debt, with the remainder the financial responsibility of the wide variety of local governments.

However, a snapshot of subnational government debt at any one time is not very informative, as debt is inherently a long-run phenomenon. Since 1992, more than 98% of state and local government debt has arisen from long-term bond issues of more than 1 year, with the funds used to invest usually in a variety of capital projects. Accordingly, the commitment to most of the current outstanding subnational government debt occurred in the past – some as much as 20 years ago or more – to fund facilities that will continue to provide services into the future. In addition, comparing aggregate debt to annual magnitudes, such as GDP or government revenue, provides a misleading indication if the year selected is not typical in an economic or fiscal sense (e.g., a recession year or a year with unusually high income or revenue). Therefore, it is more informative to examine trends in debt over a relatively long period.

Real per capita debt (in 2009 dollars) for all state and local governments increased from $5917 in 1992, to $8351 in 2007. Nationally, since 1992, state and local government debt increased in relative magnitude compared to both GDP and in real, per capita terms. Although debt rose faster than GDP, it did not increase faster than state and local government revenue. In 2007, before the consequences of the *Great Recession*, aggregate state and local government debt amounted to about 79% of state and local revenue, roughly the same level as in 1992 and 1997. The bulk of the increase in state and local debt since 1992 was long-term debt for traditional public purposes, and particularly long-term debt held by school districts. Nationally, school district long-term debt increased from 6% of total state and local long-term debt in 1992, to 13% in 2007. Because the overall local government share of long-term debt has not changed, school district debt must have replaced debt by counties, municipalities and special districts. The share of long-term debt for all three of the latter types of localities has declined. Thus, the national story is that state and local governments have borrowed more, but especially for investments in K-12 education.

Figures 1–4 illustrate changes in the period since 1992. The bulk of the increase in state and local debt since 1992 was in long-term debt for traditional public purposes, and in particular, long-term debt held by school districts. Among these 4 years, fiscal years 1992 and 2002 came at the end of national recessions, whereas fiscal years 1997 and 2007 came after periods of economic growth.[6] Therefore, it makes most sense to compare 2007 with 1997. Comparing these 2 years suggests that total outstanding state and local government debt is about the same size relative to total state and local government revenue. Therefore, as of 2007, in a historical sense, it does not appear that state and local governments in the USA incurred outstanding debt disproportionate to their annual budgets.

Despite the increase in the relative magnitude of state and local government debt since 1992, annual interest paid on that debt by state and local governments in aggregate decreased substantially relative to annual revenue; the path of this decline being from 5.5% of revenue in 1992, to 4.5% in 1997, to 4.8% in 2002, and to 3.5% in 2007. This reduction in annual interest cost resulted from the combination of changes in debt relative to revenue, and changes in the interest rates that state and local governments face. Disaggregating by type of subnational government, annual interest paid on outstanding debt decreased as a share of revenue from 1992 to 2007 for all types of state and local governments, except for school districts, as shown in Figure 5. This result reinforces the point that much of the growth in this recent 15-year period has been in debt by or on behalf of schools.[7] However, even after accounting for this growth, school districts spent less than 3% of their overall revenue on interest payments in 2007. An even fuller discussion of the recent history of US state and local debt is in Wassmer and Fisher (2011).

2.2 California State and Local Governments

In 2008, outstanding state and local government debt in California was $345 billion or about $9310 per capita. This amounted to 18.5% of state GDP and

6 The official dates for US recessions in this period are July 1990 to March 1991, March 2001 to November 2001, and then the latest recession that began in December 2007 and ended in June 2009.

7 This may be because of the historic, heavy reliance of school districts on local property tax revenue for financing, the decline in the use of this revenue instrument through state-wide property tax reforms across the country, and the incomplete revenue replacement in many states (California included) by other state or local revenue sources.

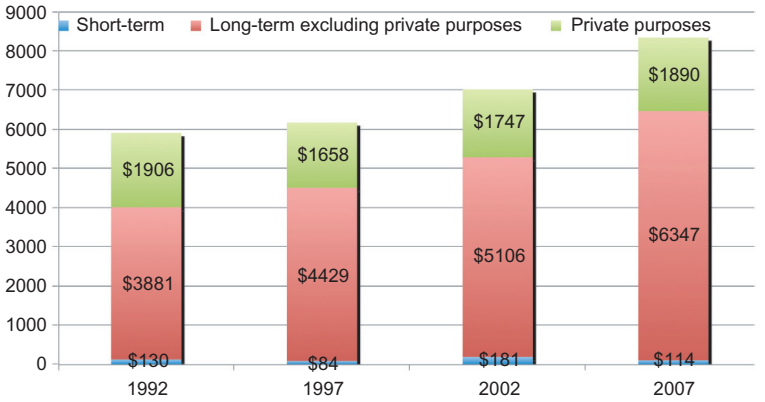

Figure 1: Real Per Capita Debt, US State and Local Governments, by Type (2009 dollars).

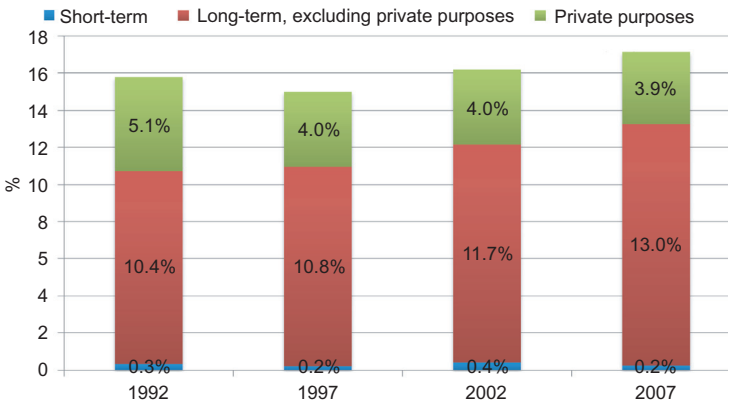

Figure 2: US State and Local Debt as a Percentage of GDP, by Type.

about 96% of state and local government revenue raised in California for that year. State government accounted for about 36% of that debt, and local governments about 64%. In 2008, annual interest payments on the outstanding debt required 3.8% of total state and local revenue. These figures indicate that subnational government debt in California is not substantially different from the aggregate observed for all states.

Changes in state and local government debt in California from 1992 to 2007 also roughly parallel the national situation. Comparing California to the national average, and to four other large, urban states (Florida, Illinois, New York and Texas) and another state (Arizona) that borders California, many similarities,

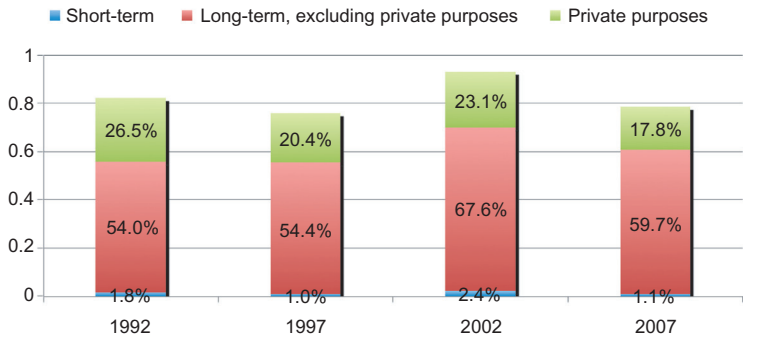

Figure 3: US State and Local Debt as a Percentage of State and Local Governmental Annual Revenue, by Type of Debt.

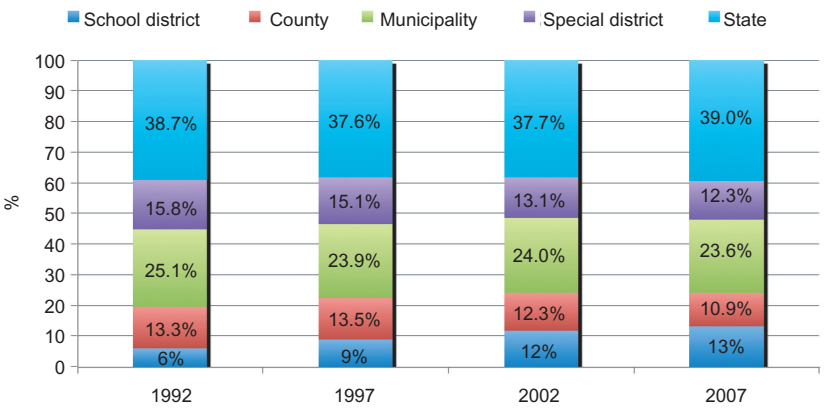

Figure 4: Share of Long-term US State and Local Government Debt, by Type of Government.

and a few key differences are immediately apparent from the summary data in Table 1. Compared to the US averages for debt measured in per capita terms and as a percentage of a state's GDP, California has issued less debt for short-term public purposes and for private purposes, but issued more for long-term public purposes. Since long-term public purposes makes up a greater share of state debt, outstanding long-term debt for traditional public purposes is a bit higher in California than other states.

A substantial portion of the increase in long-term debt in California since 1992 has arisen from growing school district borrowing. As shown in Figure 6, between 1992 and 2007, school district debt increased from 1.4% to 15.1% of

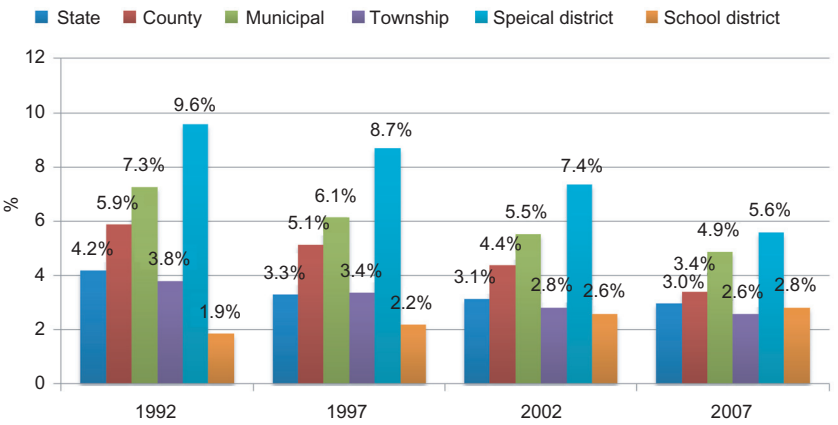

Figure 5: Interest on US State and Local Government Debt as a Percentage of Annual General Revenue, by Type of Government and Year.

outstanding long-term debt. The state government's share of long-term debt remained at about 34% of the total, whereas the shares for other types of local governments (counties, municipalities and special districts) declined. Thus, over this 15-year period, long-term school district debt essentially replaced long-term debt by other local governments.

The annual interest payments on debt remain a relatively low fraction of subnational government budgets in the California. For state and local governments in 2007, interest paid on debt took 3.2% of revenue in California and 3.5% nationally. California's relative interest payments are the same as in Arizona and Florida, and less than in Illinois, New York, and Texas. For school districts, interest payments take 2.6% of revenue in California and 2.8% nationally.

In summary, the debt of state and local governments in California in 2007 was not substantially different relative to the size of a state's economy, or to subnational government budgets in comparison to other large, urban states. California has issued less short-term debt than other states and has used public debt for private purposes to a smaller degree than other states. Consequently, outstanding long-term debt for traditional public purposes is only a bit higher in California than the average observed for all states. A substantial portion of the increase in long-term debt in California since 1992 has arisen from growing school district borrowing. The outstanding debt and the annual interest payments on debt remain a relatively low fraction of subnational government budgets in the state.

Debt measure	California	Arizona	Florida	Illinois	New York	Texas	USA
Per Capita Total State and Local Real* Debt	$9495	$6572	$7663	$9482	$13,873	$8386	$8351
Per Capita Short-Term Real Debt	$27	$23	$22	$17	$294	$214	$114
Per Capita Long-Term Real Debt	$9468	$6550	$7641	$9464	$13,579	$8172	$8237
Per Capita Public Real Debt for Private Purposes	$1091	$1659	$1222	$2348	$2743	$1871	$1890
Total State and Local Debt as % of GSP	18.3%	16.0%	18.1%	18.9%	23.5%	16.5%	17.6%
Short-term Debt as % of GSP	0.1%	0.1%	0.1%	0.0%	0.5%	0.4%	0.2%
Long-term Debt as % of GSP	18.3%	15.9%	18.0%	18.8%	23.0%	16.1%	17.3%
Public Debt for Private Purposes as % of GSP	2.1%	4.0%	2.9%	4.7%	4.6%	2.5%	4.0%
Total State and Local Debt as % Annual Revenue	70.6%	76.5%	77.5%	97.5%	88.6%	96.6%	78.6%
Short-Term Debt as % of Annual Revenue	0.2%	0.3%	0.2%	0.2%	1.9%	2.5%	1.1%
Long-Term Debt as % of Annual Revenue	70.4%	76.3%	77.3%	97.4%	86.8%	94.2%	77.5%
Public Debt for Private Purposes as % Annual Revenue	8.1%	19.3%	12.4%	24.2%	17.5%	21.6%	17.8%
Annual State and local Interest Paid as % of Revenue	3.2%	3.2%	3.2%	4.5%	4.0%	4.4%	3.5%
Characteristics							
Population (thousands)	35,979.2	6192.1	18,088.5	12,718.0	19,356.4	23,369.0	298,593.2
2009 Population Rank for 50 States (1 Highest)	1	16	4	5	3	2	
Real Per Capita GSP	$50,078	$39,720	$41,013	$48,546	$57,088	$49,148	$47,094
2009 Real Per Capita GSP Rank for 50 States (1 Highest)	10	43	24	14	5	29	

Table 1: Comparison of Debt in California and Selected States in 2007.
Sources: U.S. Census Bureau; U.S. Department of Commerce, Bureau of Economic Analysis.
*In 2009 dollars using the CPI Deflator available at <http://www.measuringworth.com/uscompare>.

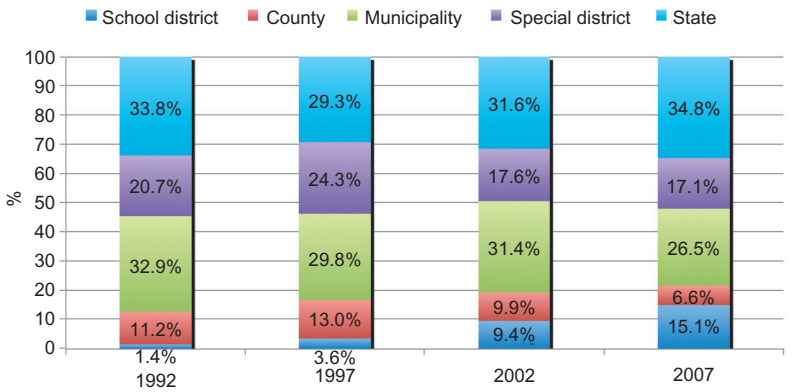

Figure 6: Share of Long-Term Debt by Type of Government in California.

2.3 Regression Analysis of Interstate Differences in Debt, 1992–2007

We use a statistical regression analysis of the level of state and local government debt of the 50 states between 1992 and 2007 to quantify the factors that have influenced differences in debt among the states over the time period observed and to determine if state-specific trends (after adjusting for expected causal factors) caused California's debt to be above or below that observed in other states. After adjusting for economic and fiscal differences among the states, such a regression-based comparison offers one way of determining whether California is out of line with other states regarding its degree of state and local debt activity.

Before we undertook the desired statistical analyses of total debt and debt issues, we reviewed the following relevant previous research on this topic. Bahl and Duncombe (1993) were one of the first studies to use regression analysis to determine the factors that influence differences in debt burdens across states.[8] They hypothesized that differences in these values were caused by four general factors: (1) service demand differences accounted for by population and income differences; (2) expansionary government differences

8 Regression analysis requires a model where the value of one dependent variable changes based on multiple other independent (or explanatory) variables (http://en.wikipedia.org/wiki/Regression_analysis). Regression analysis then allows the calculation of how a one-unit change in one of the explanatory variables influences a change in the dependent variable, holding the other explanatory variables constant.

controlled for with per capita spending in different expenditure categories and state debt limitations; (3) debt mix as measured by private or public non-guaranteed debt as a fraction of total debt; and (4) the historic debt burden from 1977. Bahl and Duncombe found that population, population density, historic debt burden, and current government expenditure exert a positive influence on most of the measures of current debt used in their analysis. Trautman (1995) was interested in finding the effect of debt limitation rules on the issuance of debt, but included other political and institutional factors expected to influence state debt activity. Her findings supported the notion that debt management and strong executive control reduce the amount of debt activity exhibited by a state.

Clingermayer and Wood (1995) hypothesized that the observed differences in debt levels are the result of economic, political and institutional factors. All of the economic factors included as explanatory variables in their regression study were statistically relevant and exhibit the expected direction of effect. A more liberal and electorally competitive state exhibited greater debt, whereas a state with a Democrat as governor and a Republican legislature exhibited relatively less debt. Surprisingly, they found that the presence of tax and spending limits in a state was associated with greater per capita debt levels.

Finally, Ellis and Schansberg (1999) examined the reasons why the change in real long-term debt levels varied across states by designing a regression study that weighed this measure by either a state's population or its total state and local government spending. They found that a higher percentage of young people in the population (old) exerted a positive (negative) influence on both measures of a state's change in debt level, whereas per capita income exerted a positive influence on change in debt per capita and a negative influence on change in debt per government spending. Only a few of the included political and institutional explanatory variables exerted a statistically significant influence on either debt measure.

Based on this earlier research, a consensus emerges on the general casual factors that influence differences in long-term debt across the states. Broadly defined, the categories are economics, politics, institutions and demographics. Understanding this, we begin our regression analysis with the simple relationship that debt in period t (D_t), is equivalent to debt in the previous period t-1 (D_{t-1}), plus new bond issues in period t (B_t), less bond retirement in period *t* (R_t):

$$D_{t,i}=D_{t-1,i}+B_{t,i}-R_{t,i}$$

where,

i=1, 2, 3, ... 50 states,
t=1997, 2002 and 2007 years, and
t–1=1992, 1997 and 2002 years.

For the period between 1992 and 2007, we do not have data on $B_{t,i}–R_{t,i}$ and instead assume that differences in this can be accounted for by the four general causal factors discovered through a review of the literature, plus a proxy for Borrowing Costs.

$$B_{t,i}–R_{t,i}=f(\textbf{Demographics}_{t,i}, \textbf{Politics}_{t,i}, \textbf{Economics}_{t,i}, \textbf{Institutions}_{t,i}, \textbf{Borrowing Costs}_{t,i})$$

where,

$$\textbf{Demographics}_{t,i}=f(\%\ \text{Pop Public K-12 Enroll}_{t,i}, \text{Previous 10-year Population Growth}_{t,i}), \quad (1)$$

$$\textbf{Politics}_{t,i}=f(\text{BRH}[9]\ \text{Liberal Citizen Ideology}_{t,i}). \quad (2)$$

$$\textbf{Economics}_{t,i}=f(\text{Real Gross State Product Per Capita}_{t,i}, \text{Real Federal Intergov Revenue Per Capita}_{t,i}, \text{State Fiscal Balance as \% of Expenditure}_{t,i}, \text{Unemployment Rate}_{t,i}), \quad (3)$$

$$\textbf{Institutions}_{t,i}=f(\text{No Debt Limits}_{t,i}, \text{No Mandatory Rev or Spend Limits}_{t,i}, \text{No State Income Tax}_{t,i}, \%\ \text{State/Loc Expend Local}_{t,i}), \quad (4)$$

$$\textbf{Borrowing Costs}_{t,i}=f(\text{Real Total 2007 Debt 1000\$s PC}_{t,i}, \text{Set of Year Dummy Variables}_{t,i}). \quad (5)$$

The key results from this analysis are as follows:

1. Our regression analysis confirms the continuing growth in state and local government debt over this period, even after allowing for the effects of the economic and social variables affecting debt. State and local governments increased debt more than might be expected based on the included explanatory variables.
2. For public purpose debt outstanding by all types of state and local governments and for debt outstanding by school districts, debt is persistent. That is, the amount of outstanding debt in 1 year correlates positively to debt in past years. This is perhaps not surprising because only a relatively small fraction of total debt observed in a given year, is incurred or retired in that

9 See Berry et al. (1998 and 2010).

year. Therefore, state and local governments with high debt in the past are more likely to have high debt in a current period.

3. The one socioeconomic factor that exerts a persistent positive effect on state and local government debt (after controlling for other demographic, economic, political, institutional, and borrowing cost factors) is the percentage of a state's population that attends K-12 public schools. A 1% difference in the share of a state's population in public schools is associated with higher real per capita debt of $117 (given an average real per capita debt over the observed period of $6711). This suggests that public school enrollment significantly influenced outstanding state and local government debt during this period, perhaps representing borrowing to build or maintain schools. This is consistent with the aggregate perspective discussed previously showing that debt held by school districts had become a much larger share of total state and local government debt.
4. There is some evidence, although not as strong as for the other findings noted above, that state and local government debt serves as a substitute for federal aid. Some of the results suggest that outstanding debt is lower in states that receive higher federal grants per capita (after controlling for other demographics, economics, politics, institutions, and borrowing cost factors).
5. Compared to other states, there is evidence that governments in California made relatively greater use of debt in total. Based on our regression estimation, after controlling for demographic, economic, political, institutional and borrowing cost factors expected to influence debt issue, total outstanding traditional debt held by California governments over this period was greater than expected in comparison to 20 other states. Compared to only four other states, outstanding traditional debt held by California governments over this period was less than would be expected. When disaggregating by type of debt, governments in California made relatively greater use of debt for public purposes, and relatively less use of debt for private purposes. Confirming the casual perspective from the overall trends, school districts in California also incurred relatively high levels of debt compared to many states.

The application of this statistical method to analyzing state and local government debt and comparing governments in California to those in other states suggests that governments in California relied relatively more on debt for public purposes than one might expect compared to other states. However, much of the growth in debt over the 15 years from 1992 to 2007 seems related to growth in enrollment in public primary and secondary schools, suggesting that the increased debt corresponds to increased investment in public education facilities. Moreover, even with these levels of outstanding debt, the annual interest cost of the debt represented a declining share of subnational government budgets in California.

3 State and Local Borrowing during the *Great Recession*

The period since 2007 is also worth examining for several reasons. First, policymakers are likely to be most interested in this period because it represents the current behavior of state and local governments. Second, the most recent national recession ran officially from December 2007 to June 2009, and had dramatic fiscal effects on state and local government budgets. Indeed, the effects of this *Great Recession* continued to be important in the 2011–2012 fiscal year. Third, during this period the federal government pursued an aggressive fiscal stimulus response to the recession that particularly targeted state and local governments. Included in this fiscal stimulus were increased federal financial support for some state and local services (Medicaid, education and infrastructure projects especially) and the creation of a federally subsidized, taxable bond option for state and local governments (Build America Bonds, BABs). Therefore, using data collected by Thomson Reuters, we next focus on new bond issues by state and local governments in California and other states during 2008, 2009 and 2010.[10]

Figure 7 shows real total bond issues by year, for all state and local governments in the USA, separated into sales of long-term and short-term bonds. For both short-term and long-term issues, new debt undertaken by states and localities was low in 2008 (the first full year of the recession, and when the most uncertainty existed in the US financial markets). The volume of bonds issued by state and local governments increased in 2009 and 2010. In aggregate, 2010 was similar to 2007, the year prior to the financial market crisis and recession.

By sheer magnitude, California had the largest amount of long-term bond sales among all states in every year (2008, 2009 and 2010). Nevertheless, this absolute dollar amount of bond sales reflects California's size compared to other states. A simple way to adjust for the difference in state magnitudes is to examine bond issues and debt relative to population. Table 2 and Figures 7–9, provide a basic perspective on the per capita amounts of new bond issues undertaken by state and local governments in the various states during the last recession. The first set applies only to Build America Bonds. The second set covers all bond issues. Note that these tables and charts represent real (2009 dollars) per capita amounts of bond issues in each year.

10 See http://thomsonreuters.com/products_services/financial.

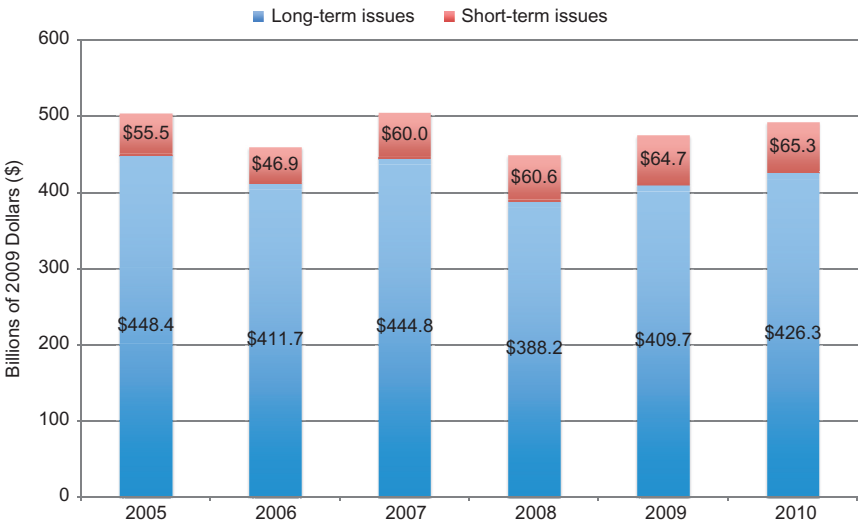

Figure 7: Real US State and Local Bond Issues, by Length and Year.

Issued between April 2009 and December 2010, as part of the federal government stimulus response to the recession, interest paid on Build America Bonds enjoyed a direct federal government subsidy of 35%.[11] For Build America Bonds, state and local governments in California issued the third largest amount of bonds relative to population in the limited time BABS were allowed. Only state and local governments in Utah and New York issued more Build America Bond volume in per capita terms than did California. For traditional nontaxable bonds, state and local governments in California issued the fourth largest amount of bonds relative to population during 2008–2010. Governments in New York, Connecticut and Massachusetts borrowed more in per capita terms during these 3 years than did governments in California.

The information regarding long-term bond issues in the 2008 to 2010 period supports the notion that 2009 was an unusual year for government borrowing in California. Indeed, only in 2009 were per capita bond issues larger than in 2007, before the effects of the recession and financial market crisis. Per capita nontaxable bond issues by subnational governments in California were smaller in

11 See "Build America Bonds: A Preliminary Assessment" a report by the American Association of State Highway and Transportation Officials for further background on BABs. This is available at http://www.transportation-finance.org/pdf/funding_financing/financing/build_america_bonds_prelim_assessment.pdf.

	2007	2008	2009	2010	2008–2010 Total	2008–2010 Yearly Average
Alabama	$1505	$470	$877	$821	$2169	$723
Alaska	$2352	$1174	$1555	$1348	$4077	$1359
Arizona	$1430	$1454	$1006	$943	$3403	$1134
Arkansas	$604	$402	$555	$833	$1790	$597
California	*$1886*	*$1427*	*$1968*	*$1635*	*$5030*	*$1677*
Colorado	$1736	$1592	$1344	$1470	$4407	$1469
Connecticut	$1411	$2055	$1877	$1718	$5650	$1883
Delaware	$1334	$952	$1519	$1770	$4241	$1414
Florida	$1580	$978	$807	$1041	$2827	$942
Georgia	$1119	$875	$1075	$970	$2921	$974
Hawaii	$1121	$787	$1967	$2239	$4994	$1665
Idaho	$860	$711	$474	$482	$1667	$556
Illinois	$1289	$1230	$1159	$1994	$4383	$1461
Indiana	$1133	$971	$1027	$760	$2758	$919
Iowa	$917	$728	$1308	$1027	$3063	$1021
Kansas	$1022	$768	$1362	$1200	$3329	$1110
Kentucky	$1208	$943	$1216	$1244	$3403	$1134
Louisiana	$1427	$1068	$799	$1446	$3313	$1104
Maine	$867	$942	$929	$715	$2586	$862
Maryland	$1164	$1183	$1124	$986	$3292	$1097
Massachusetts	$1909	$1892	$1511	$2029	$5432	$1811
Michigan	$975	$916	$650	$821	$2388	$796
Minnesota	$1319	$1298	$1297	$1418	$4013	$1338
Mississippi	$1307	$616	$928	$1034	$2578	$859
Missouri	$1101	$810	$864	$1241	$2915	$972
Montana	$897	$259	$159	$711	$1128	$376
Nebraska	$2240	$1307	$1532	$1637	$4475	$1492
Nevada	$1669	$1556	$1255	$1425	$4235	$1412
New Hampshire	$970	$737	$1094	$844	$2674	$891
New Jersey	$1590	$1338	$1245	$1683	$4266	$1422
New Mexico	$1156	$1602	$1694	$1433	$4729	$1576
New York	$1701	$2043	$2248	$2041	$6331	$2110
North Carolina	$889	$813	$1087	$832	$2732	$911
North Dakota	$1136	$817	$829	$870	$2515	$838
Ohio	$1413	$997	$995	$1349	$3341	$1114
Oklahoma	$696	$701	$665	$913	$2279	$760
Oregon	$1178	$1025	$1140	$973	$3139	$1046
Pennsylvania	$1475	$1238	$1547	$1471	$4255	$1418
Rhode Island	$1342	$1220	$947	$678	$2846	$949
South Carolina	$883	$878	$812	$1128	$2818	$939
South Dakota	$1066	$1056	$742	$779	$2578	$859
Tennessee	$1057	$928	$766	$950	$2644	$881
Texas	$1668	$1689	$1339	$1497	$4525	$1508
Utah	$963	$1134	$1553	$1238	$3925	$1308

	2007	2008	2009	2010	2008–2010 Total	2008–2010 Yearly Average
Vermont	$1439	$1488	$505	$1008	$3001	$1000
Virginia	$1089	$948	$1183	$1085	$3215	$1072
Washington	$1514	$1318	$1534	$1857	$4709	$1570
West Virginia	$1119	$719	$446	$545	$1710	$570
Wisconsin	$903	$1059	$1169	$1009	$3237	$1079
Wyoming	$1666	$1230	$602	$651	$2483	$828

Table 2: Real Per Capita* Long-term State and Local Bond Issues, by State.**

*2007 population for all years. **2007 data from the *Bond Buyer*; 2008–2010 data from Thomson Reuters. All amounts in 2009 real dollars.

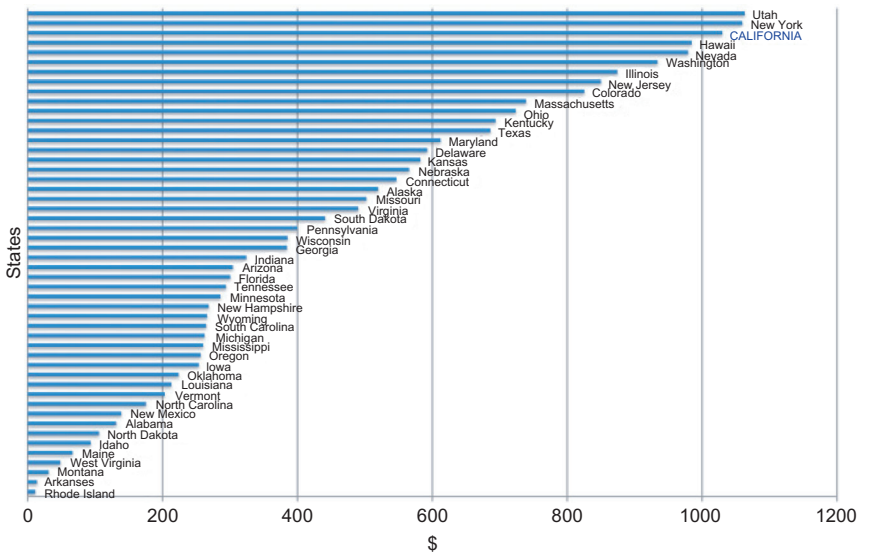

Figure 8: Real Per Capita Amount of Build America Bond Issues, by State, 2009–2010.

2008 and 2010, than in 2007. However, because Build America Bonds were issued between April 2009 and the end of December 2010, and California governments were relatively large sellers of Build America Bonds, a more accurate picture of government borrowing is provided by combining both types of bonds in Figure 10. Two facts stand out when examining this figure. First, aggregate borrowing by the state and local governments in California was indeed substantially higher in 2009 than in 2007, the year before the financial crisis and recession. Second, aggregate

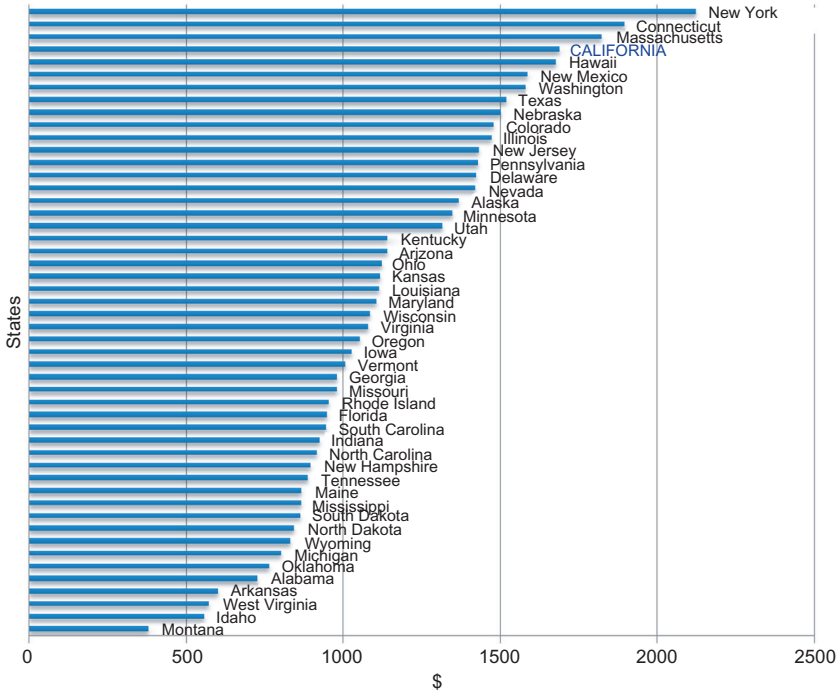

Figure 9: Real Per Capita Long-Term State and Local Bond Issues, 2008–2010.

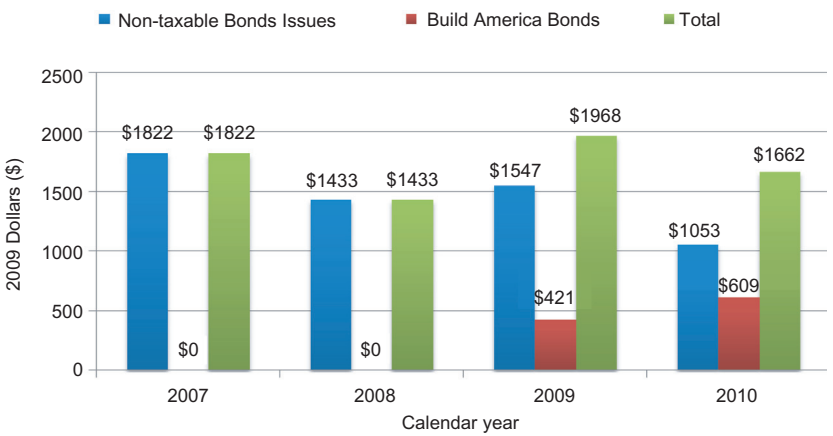

Figure 10: Real Per Capita Bond Issues by California State and Local Governments, Nontaxable Bond Issues and Build America Bonds Compared.

borrowing by California governments was lower in 2010 than 2009. Nontaxable bond issues decreased from 2009 to 2010, whereas Build America Bond issues increased in those years. However, the increase in Build America Bond volume in 2010 was not large enough to offset completely the decrease in nontaxable bond issues that year.

3.1 Borrowing in 2008–2010 Compared to Past Outstanding Debt

The per capita bond issue data permits comparison among states of bond issues during the *Great Recession* and permits comparison of debt issues during this recession to issues in 2007 (the year immediately before the recession). However, such comparisons do not provide information showing whether the borrowing behavior of state and local governments during this recessionary period was substantially different from the historical borrowing of these governments. To provide a longer-term perspective, one can compare bond issues during the recession period to total outstanding debt during 2007. The outstanding debt in 2007 was not determined solely during 2007, but is the cumulative effect of many years of previous borrowing and thus reflective of the long-run borrowing behavior of state and local governments.

The information in Tables 3 and 4 is based on the ratio of the percentage of new issues in the 2008 to 2010 period divided by the percentage of outstanding debt in 2007 (this is done separately for all bonds and for Build America Bonds). A ratio of greater than one indicates that governments in that state made relatively more use of borrowing during the 2008 to 2010 period than they had in the previous long-run period (measured by the aggregate outstanding debt in 2007).

For all bonds, California did relatively more borrowing during the 2008 to 2010 period than it had previously. In 2007, California's outstanding debt was 13.7% of all state and local government outstanding debt, but governments in California issued 15.65% of all long-term bond issues during 2008 to 2010. Thus, borrowing by California governments during 2008 to 2010 was 14% greater than expected by the debt share (that is, the long-run borrowing behavior). However, by this measure, 10 other states were even heavier borrowers than California during the 2008 to 2010 period compared to their historical borrowing patterns. These states were New Mexico, Nevada, Utah, Hawaii, Iowa, Connecticut, Mississippi, Wyoming, Georgia and Texas.

For Build America Bonds, California stands out as one of the most substantial relative users among all states. The outstanding debt of California state and local governments represented 13.7% of all state and local outstanding debt in 2007.

State	(1) Share of Long-term Issue Volume 2008–2010	(2) Share of Outstanding Debt 2007	Ratio of (1) to (2)
New Mexico	0.79%	0.51%	1.56
Nebraska	0.67%	0.48%	1.41
Utah	0.91%	0.66%	1.38
Hawaii	0.55%	0.43%	1.28
Iowa	0.78%	0.61%	1.27
Connecticut	1.68%	1.36%	1.24
Mississippi	0.65%	0.52%	1.24
Wyoming	0.11%	0.09%	1.21
Georgia	2.40%	2.01%	1.19
Texas	9.25%	7.86%	1.18
California	*15.65%*	*13.70%*	*1.14*
Arizona	1.86%	1.63%	1.14
Minnesota	1.79%	1.61%	1.11
Maryland	1.59%	1.43%	1.11
Louisiana	1.26%	1.17%	1.08
North Carolina	2.15%	2.08%	1.03
Oklahoma	0.71%	0.69%	1.03
Nevada	0.94%	0.92%	1.03
Ohio	2.90%	2.83%	1.03
Idaho	0.22%	0.22%	1.00
Tennessee	1.41%	1.41%	1.00
Illinois	4.80%	4.84%	0.99
Pennsylvania	4.55%	4.64%	0.98
New York	10.48%	10.77%	0.97
Kansas	0.79%	0.82%	0.97
Virginia	2.03%	2.12%	0.96
Colorado	1.84%	1.92%	0.96
Vermont	0.16%	0.17%	0.95
Missouri	1.48%	1.61%	0.92
Washington	2.36%	2.56%	0.91
North Dakota	0.14%	0.15%	0.91
Wisconsin	1.55%	1.74%	0.89
New Jersey	3.15%	3.56%	0.89
South Dakota	0.18%	0.20%	0.88
Maine	0.29%	0.33%	0.88
Arkansas	0.44%	0.51%	0.86
Indiana	1.49%	1.72%	0.86
Delaware	0.32%	0.37%	0.86
Alabama	0.86%	1.02%	0.85
Oregon	1.00%	1.20%	0.84
Massachusetts	3.02%	3.72%	0.81
Kentucky	1.23%	1.53%	0.80
Florida	4.44%	5.56%	0.80
South Carolina	1.08%	1.49%	0.72

State	(1) Share of Long-term Issue Volume 2008–2010	(2) Share of Outstanding Debt 2007	Ratio of (1) to (2)
New Hampshire	0.30%	0.43%	0.71
West Virginia	0.26%	0.36%	0.70
Michigan	1.99%	3.03%	0.65
Rhode Island	0.25%	0.44%	0.59
Alaska	0.24%	0.41%	0.58
Montana	0.09%	0.26%	0.37

Table 3: Long-Term Bond Issue Volume during 2008–2010 Relative to Historic Use of Debt.

Nevertheless, governments in California issued 20.9% of all Build America Bond issue volume. Thus, California's use of Build America Bonds was 53% greater than its share of state and local borrowing historically. California was not the greatest user of Build America Bonds relative to historical borrowing patterns. The share of Build America Bond volume relative to historical debt amounts was even greater for Utah, Hawaii, Iowa and Nevada.

It is important to note that in addition to the availability of Build America Bonds in 2009, municipal bond interest rates declined almost continuously during that year. According to the Bond Buyer Index, average municipal bond interest rates (20-year, general obligation debt), declined from 5.07% in January 2009 to 4.21% in December of that year. In contrast, rates had risen substantially in 2008, the first year of the recession. It is feasible that the decline in nontaxable interest rates during 2009 induced new bond issuance by a number of states and localities.

3.2 Regression Analysis of Interstate Borrowing Differences, 2008–2010

Just as we earlier offered an interstate analysis of debt by regression analysis, it is also appropriate to do the same to examine annual bond issue volume by states. The analytical approach is a bit different, because the question here is annual borrowing by state and local governments rather than total outstanding debt, which is the cumulative result of past borrowing. However, as before, this regression approach permits statistical adjustment for a wide variety of demographic, economic, political, institutional and borrowing cost factors that may differ among the states and may influence annual borrowing. We use the same explanatory variables noted earlier in functional relationships (1) through (5), but also include the percentage of a state's roads deemed in "poor or mediocre"

State	(1) Share of BAB Issue Volume 2009 to 2010	(2) Share of Outstanding Debt 2007	Ratio of (1) to (2)
Utah	1.61%	0.66%	2.44
Hawaii	0.70%	0.43%	1,64
Ohio	4.63%	2.83%	1.64
Nevada	1.42%	0.92%	1.555
California	*20.91%*	*13.70%*	*1.53*
Maryland	1.92%	1.43%	1.34
Washington	3.40%	2.58%	1.32
Illinois	6,23%	4.84%	1.29
Colorado	2.26%	1.92%	1.18
Texas	9.25%	7.86%	1.18
Nebraska	0.56%	0.48%	1.17
New Jersey	4.09%	3.56%	1.15
Kansas	0.90%	0.82%	1.11
Kentucky	1.65%	1.53%	1.08
New York	11,45%	10.77%	1.06
Missouri	1.66%	1.61	1.03
Georgia	2.07%	2.01%	1.03
Virginia	2.12%	2.12%	1.00
South Dakota	0.20%	0.20%	1.00
Wyoming	0.08%	0.09%	0.85
Mississippi	0.42%	0.52%	0.81
Connecticut	1.06%	1.36%	0.78
Delaware	0.29%	0.37%	0.78
Tennessee	1.02%	1.421%	0.72
Massachusetts	2.68%	3.72%	0.72
Wisconsin	1.20%	1.74%	0.69
Iowa	0.42%	0.61%	0.69
Arizona	1.10%	1.63%	0.67
Indiana	1.15%	1.72%	0.67
Oklahoma	0.45%	0.69%	0.66
Pennsylvania	2.79%	4.64%	0.60
Florida	3.07%	5.56%	0.55
Minnesota	0.83%	1.61%	0.52
Michigan	1.46%	3.03%	0.48
Alaska	0.20%	0.41%	0.48
New Hampshire	0.20%	0.43%	0.46
Louisiana	0.53%	1.17%	0.45
Oregon	0.54%	1.20%	0.45
South Carolina	0.665	1.49%	0.44
North Carolina	0.90%	2.08%	0.43
Vermont	0.07%	0.17%	0.42
Idaho	0.08%	0.22%	0.37
Alabama	0.34%	1.02%	0.33
New Mexico	0.15%	0.51%	0.30

State	(1) Share of BAB Issue Volume 2009 to 2010	(2) Share of Outstanding Debt 2007	Ratio of (1) to (2)
North Dakota	0.04%	0.15%	0.25
Maine	0.05%	0.33%	0.15
West Virginia	0.05%	0.38%	0.13
Montana	0.02%	0.26%	0.07
Arkansas	0.02%	0.51%	0.04
Rhode Island	0.01%	0.44%	0.02

Table 4: Build America Bond Issue Volume during 2009–2010 Relative to Historic Use of Debt.

shape.[12] This was not included earlier because a consistent assessment of it was not available for all the years examined in the traditional debt regressions.

The statistical approach that follows examines: (1) aggregate state and local government issues of all long-term bonds for 2008, 2009 and 2010 for all 50 states; and (2) state and local government issues of Build America Bonds (which are taxable with a direct federal subsidy) from April 2009 through December 2010 for all 50 states. In addition, a dummy variable set equal to 1 for California was included to see if there is any evidence that borrowing by governments in California was substantially different from that expected after controlling for the above factors.

We summarize the results in Table 5 that show the statistically significant effects for a 1% increase (or from going from 0 to 1 for a dummy variable) in a given causal factor on the two types of bond issues. For example, a 1% increase in the starting period's (2007) real long-term debt per capita is associated with greater use of traditional long-term bonds per capita in 2008 to 2010 by 0.42%. The same 1% increase in long-term debt is associated with greater Build America Bond use (April 2009–December 2010) by 1.58%.

Several results in Table 5 stand out. First, although the direction of influence for each explanatory variable is the same for each type of bond where it is statistically significant, the magnitude of influence (in percentage terms for a 1% change in the respective explanatory variable) is double or more for BABs than for traditional bonds. Within a state, state and local governments issued fewer overall bonds (BABs included) if the state's fiscal and economic conditions were stronger. Checking for only the negative influences on BAB issues, state and local governments issued fewer BABs if state and local governments in the

12 As determined by the American Society of Civil Engineers and reported at www.infrastructurereportcard.org/states

Cell Values Represent Respective Statistically Significant^ Elasticities [Except for dummy variables where represents (respective regression coefficient/mean of respective dependent variable)×100]	Real State/ Local Debt Issues Per Capita	Real BAB Debt Issues Per Capita
Year 2009 Dummy	0.25	Not used
Year 2010 Dummy	0.18	Not used
Real Traditional Debt Issues PC	Not used	−1.11
% Pop Public K-12 Enroll	0.88	3.03
BRH Liberal Citizen Ideology 2008	0.48	
Real Gross State Product PC	0.59	1.81
State Fiscal Balance as % of Expend	−0.06	−0.12
Unemployment Rate	−0.31	
% Poor Roads		0.38
No Debt Limits Dummy		−0.25
No Mandatory Rev or Spend Limits Dummy		0.35
No State Income Tax Dummy		0.33
% State/Loc Expend Local		−0.91
Real Total 2007 Debt 1000$s PC_i	0.42	1.58

Table 5: Statistically Significant Elasticities* from Bond Issue Regression Analyses.

*Elasticity measures the expected percentage change in the respective dependent variable given a 1% change in the given explanatory variable.

^Statistical significance is identified here as 90% confidence that the expected effect is nonzero in a two-tailed test.

state issued more non-BABs, if the state's fiscal condition was stronger, if they placed no limits on debt issue, and if expenditure by local governments in the state was a greater percentage of overall subnational expenditure.

Alternatively, these regressions show that a state is more likely to have issued overall state and local debt (including BABs) the greater the percentage of its population enrolled in K-12 public schools, the more liberal its citizens in political ideology, the greater its gross state product per capita, and the greater its starting debt in 2007. The results also show that more debt of this overall type was issued in 2009 than 2008. This trend toward greater debt issue than in 2008 continued in 2010, but not to the same degree as in 2009. Checking for only the positive influences on BAB issues, state and local governments issued greater BABs the greater the percentage of its population enrolled in K-12 public schools, the greater its gross state product per capita, and the greater its starting debt in 2007. Unlike overall debt issue, BAB issues were also influenced positively by states having roads in poor or mediocre condition, a mandatory revenue or spending limit in place, and if they had no state-wide income tax.

Table 5 reflects the finding in the earlier debt regressions that the percentage of a state's population enrolled in K-12 public education exerts a positive influence. For both total debt issues and BABs considered separately, the greatest influences detected were because of this youth-based variable. A 1% increase in Percentage Pop Public K-12 Enroll yielded nearly the same percentage increase in yearly bond issues between 2008 and 2010, and just over a 3% increase in BAB issues by state in 2009 and 2010. Noteworthy is this influence of children being greater than the overall influence of the state's affluence as measured by Real Gross State Product Per Capita.

Most important to a consideration of how California compares to other states regarding the recent issuance of debt, we found that the California dummy variable in the regressions never exerted a statistically significant influence. Governments in California issued overall debt during 2008 to 2010, and Build America debt during 2009 and 2010, no more than would be expected based on the state's economic, social, and political characteristics. Recall from Figures 8 and 9 that California respectively ranks fourth and third from the top for per capita amount of Build America Bond issues and per capita amount of yearly long-term bond issues. We have shown through regression analysis that this is the result of economic, political and social characteristics in the state that drive greater bond issues and not an independent *California Effect*.

Our direct statistical test of the possibility that Build America Bonds served as substitutes for traditional nontaxable bonds among states during 2009 and 2010 confirms this idea. The regression approach we used (two-stage least squares) assumes that the volume of one type of bond sold influences the other, with the decision about both bond offerings being made concurrently. As necessary to implement a two-stage least squares analysis, we note that a state's personal marginal income tax rates and the percentage of the population that pay the higher rates are expected to influence nontaxable bond sales in a state, but not Build America Bonds. If the upper marginal income tax rates in a state are relatively high, and there are more state residents paying these higher rates, a state's residents may be especially interested in buying nontaxable bonds issued in their state, which permits that state to offer lower rates of return on them. A lower rate of return lowers a state's borrowing cost and encourages it to offer more debt.

The results from our two-stage least squares estimation shows that traditional nontaxable bonds and Build America Bonds are imperfect substitutes. Across all states, an additional 1% increase in traditional nontaxable bonds sold results in about a 1.11% decrease in issues in Build America Bonds. The two types of borrowing are imperfect substitutes because the substitution is not one-for-one. The regression results show that BABs offered over 2009–2010 would decrease

by about 11.1% if a state decided instead to increase traditional debt by 10%. If BAB issues were perfect substitutes for non-BAB issues, the decrease would only be 10%. Understanding this, the creation of Build America Bonds served their desired purpose and acted as a stimulus measure in 2009 and 2010 that increased total subnational borrowing. Indeed, as shown in Figure 10, this is precisely the situation in California when comparing 2009 to 2008.

4 Summary of Findings

The results just described offer a clearer picture of state and local debt before the *Great Recession* (during the period from 1992 to 2007) and state and local government borrowing during it (2008 to 2010). We have also shown the ways in which behavior of state and local governments in California toward traditional debt accumulation and issuance sometimes is similar, and sometimes differs from other states.

From 1992 to 2007, state and local government debt clearly increased compared to population and GDP. This was true nationally, as well as in California. Indeed, governments in California seem to have used debt relatively more than expected compared to other states, at least debt for public purposes. However, the amount of debt outstanding did not increase compared to the amount of state and local government revenue, and even more importantly, the annual interest payments on the outstanding debt declined compared to state and local budgets. Again, this was the case nationally and in California.

In addition, most of the increase in state and local debt during this period was long-term debt for public purposes, especially debt incurred by school districts for K-12 education. Even more pronounced in California than nationally was the dominance of increased school district debt. All of this suggests that states, California included, acted appropriately up to 2007 in incurring debt for traditional public purposes at an interest cost that was declining.

Following the start of the *Great Recession*, governments in California increased their borrowing in 2009 and 2010 compared to the historical pattern and relative to most other states. A combination of traditional nontaxable bonds and Build America Bonds accomplished this increase. Although many subnational governments increased borrowing during these years, California's state and local governments were particularly aggressive, especially with Build America Bonds. Governments in California took advantage of the low cost of borrowing during those years and the incentive provided by the relatively large federal government subsidy with Build America Bonds. However, aggregate borrowing by the state

and local governments in California decreased in 2010 compared to 2009. Perhaps most important to an assessment of debt issues in California between 2008 and 2010 is our regression-based finding that after controlling for economic, political and social conditions expected to influence debt issuance across the states, California offered no more than other states. **Therefore, we find no evidence that California was out of line with other states in its recent debt issuance practices.**

This research also demonstrates how a policymaker can use statistical regression analysis to evaluate any given state's debt and borrowing behavior by controlling for economic, social and political factors that influence borrowing and that vary among the states. For instance, the results reveal that states with greater affluence, less unemployment, greater debt accumulation, less end-of-year state fiscal balances as a percentage of state government expenditure, a greater "Liberal" political ideology, and a greater percentage of population enrolled in K-12 public education; exhibited greater per capita, real annual borrowing during the *Great Recession*.

Given the modest cost of debt as measured by the relatively low annual interest costs in subnational budgets in California in 2007, the higher borrowing during 2008 and 2009 may not be a long-term concern if borrowing returns to its traditional, long-term pattern. The decrease in borrowing in 2010, and the end of the Build America Bond program, suggests that this may be the case. Even so, continued monitoring by California policymakers seems prudent.

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