AN ANALYSIS OF STATE AND LOCAL GOVERNMENT CAPITAL EXPENDITURE BEFORE AND DURING THE "GREAT RECESSION"

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INTRODUCTION

Over the previous decade, annual state and local public capital outlay in the United States has held relatively constant at between 11.3 and 12.5 percent of annual expenditure by these subnational governments (see figure 1). In addition, annual capital outlay has varied between 21.1 and 16.3 percent of outstanding long-term state-local public-purpose debt. Although stable over the longer period, capital expenditure clearly declined in a relative sense in 2010. Despite this relative importance, there is a dearth of recent academic research about subnational public capital expenditure. The intent of this paper is to offer an initial examination of recent state and local government public capital investment. Specifically, we examine: (1) trends in the magnitude of state and local government capital expenditure; (2) previous research findings about subnational government public investment; and (3) a statistical analysis of interstate differences in capital expenditure for 2007 and 2008.[1]

RECENT TRENDS IN STATE AND LOCAL CAPITAL EXPENDITURE

Table 1 indicates that the composition of state and local capital spending also has been relatively stable over time. For state governments, two categories – highways and higher education – consistently account for about 75 percent of capital spending. Among local governments, elementary education (about 30 percent) and utilities (about 16 percent) are the largest categories of capital spending.

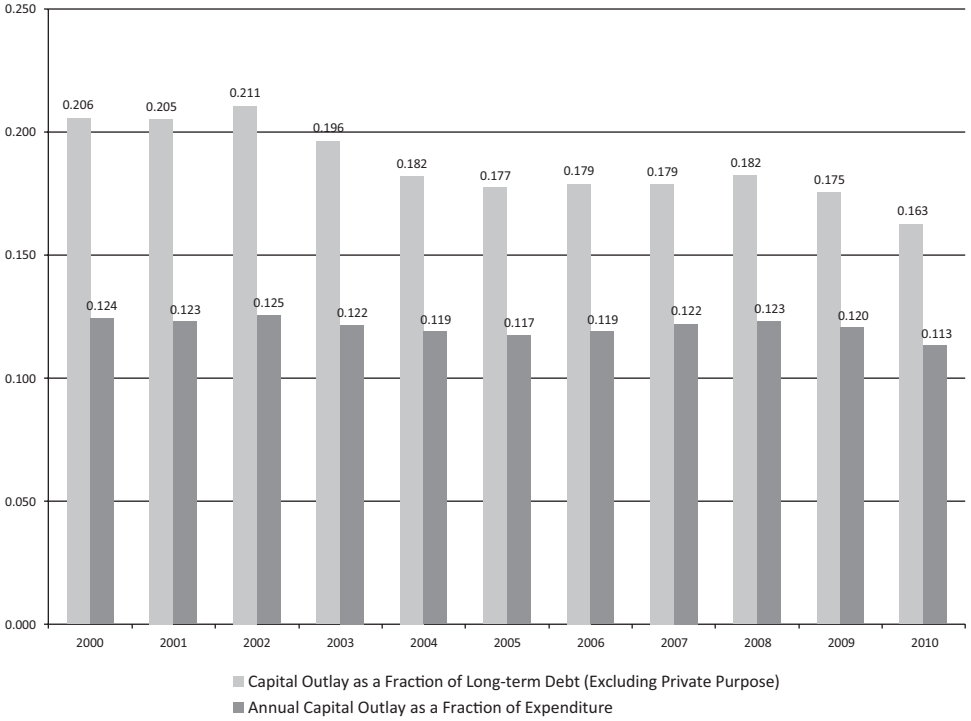
Although there is general stability over time in aggregate capital spending, the data in table 2 illustrate the major interstate differences in total subnational capital expenditure by state between 2005 and 2010. Per capita spending on capital varied from $20,546 in the District of Columbia to $3,484 in Maine, with an average of $6,528 for the . Therefore, it is important to understand better the reasons for the observed interstate variation in capital expenditure patterns. Before doing so, we briefly review the previous empirical research examining this issue.

PREVIOUS RESEARCH

Earlier research focused on: (1) factors that affect capital spending, including differential use of debt to fund that spending; (2) the effect of fiscal rules and procedures on capital spending; and (3) the effect of public capital on economic growth. As an example of the first focus, Temple (1994) models a median voter simultaneously making an annual choice regarding a state's capital spending and the share of capital spending financed by debt. The variables she uses in a regression to explain annual capital spending in the 48 contiguous United States for 1983 and 1984 are median income, federal grants, tax price, capital stock, share of capital expenditure financed by debt, population growth, population density, the percent elderly, and a location control. Temple finds that state income, federal grants, population change, and the existing capital stock have positive effects on capital spending, whereas density and the percent elderly have negative effects.

Regarding the first and second foci described above, Poterba (1995) analyzes differences in subnational per capita capital spending (excluding highways) for the 48 contiguous states in 1962. Regarding his findings for the economic, social, and political explanatory variables, Poterba reports federal grants have a strong positive effect, socio-economic measures show little significant effect, and the political measures have inconsistent results. On the issue of budgeting procedures, Poterba reports that states with public capital budgets spend more on public capital than states with unified budgets and that pay-as-you-go requirements reduce capital spending.

Figure 1: **Annual State and Local Capital Outlay Relative to Expenditure and Debt**



Munnell (1992), Gramlich (1994), and Fisher (1997) offer reviews of the literature regarding public capital investment and economic growth, the third foci of the previous literature.[2] All note the ambiguity in the results based on the type of analysis performed, the period examined, and the method of measuring public capital. Gramlich (1994) provides a thorough review of the research regarding the appropriateness of the amount of public capital investment up to the early 1990s. His review covers (1) engineering needs assessments, (2) political voting outcomes, (3) measures of economic rates of return, and (4) economic estimates of productivity. Although rates of return measures show some shortages in public capital, the other approaches do not provide clear results, partly because of econometric issues that arise when using time series. Gramlich argues that more important than examining the optimal public capital question is the reformation of policies regarding infrastructure investment. Along the same lines, Munnell (1992) concludes that the study of state and local government infrastructure investment is an area ripe for further research. Fisher (1997) notes the differential results found in the different studies of the effect of public capital on productivity and growth, including the debate about the appropriate econometric techniques to perform this type of analysis. Some argue that controlling for fixed effects is crucial, but has the effect of reducing the impact of public capital on growth in the empirical studies. The area of assessed impact is also crucial, as some types of public capital may have little local effect, but a greater national effect.

Although we earlier noted the absence of recent academic empirical analyses of subnational capital spending, a recent survey article suggests a possible resurgence. Marlowe (2012) specifically focuses on the effect of the recent Great Recession on capital spending and concludes that: (1) state and local

Table 1
Percentage Composition of State and Local Capital Expenditure

	State Government					
Category	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Higher Education	20.7%	19.0%	19.4%	20.1%	22.3%	22.0%
Elementary & secondary education	0.5%	2.0%	1.6%	1.4%	1.4%	0.9%
Hospitals	2.5%	2.5%	2.5%	2.9%	2.6%	2.3%
Highways	55.3%	55.6%	55.6%	55.2%	53.0%	55.1%
Correction	1.8%	1.4%	1.7%	1.7%	1.8%	1.2%
Natural resources	2.8%	2.5%	3.0%	2.7%	2.8%	2.0%
Parks & recreation	1.0%	1.1%	1.1%	1.1%	0.9%	0.8%
Sewerage	0.5%	0.6%	0.7%	0.5%	0.4%	0.4%
Solid waste management	0.3%	0.3%	0.2%	0.2%	0.3%	0.1%
Utility	4.5%	5.7%	4.4%	4.3%	5.3%	4.1%
Other	10.2%	9.3%	9.7%	9.8%	9.3%	11.1%
	Local Government					
	2005	*2006*	*2007*	*2008*	*2009*	*2010*
Higher Education	1.7%	1.7%	1.9%	1.9%	2.2%	2.1%
Elementary & secondary education	29.6%	30.3%	29.6%	29.0%	28.1%	25.2%
Hospitals	2.0%	2.1%	2.3%	2.4%	2.6%	2.5%
Highways	9.9%	10.0%	10.3%	11.2%	9.9%	10.8%
Correction	0.6%	0.5%	0.6%	0.7%	0.7%	0.8%
Natural resources	1.0%	1.0%	1.4%	1.6%	1.6%	1.2%
Parks & recreation	3.9%	4.2%	4.1%	4.4%	4.3%	4.1%
Sewerage	7.4%	7.6%	7.9%	7.7%	7.8%	8.8%
Solid waste management	0.9%	0.9%	1.0%	0.9%	0.9%	0.8%
Utility	16.7%	15.9%	15.9%	15.3%	17.5%	18.8%
Other	26.2%	25.8%	25.1%	24.9%	24.4%	25.0%

Source: U.S. Census Bureau

capital spending declined during this recession, (2) capital spending declines would likely have been greater without the federal stimulus, (3) the decrease in capital spending was more intense than in past recessions, and (4) the federal stimulus brought changes to capital budgeting practices. Based on surveys and the National Association of State Budget Officers (NASBO) data, Marlowe concludes that capital spending would fall substantially in 2010 after the end of the federal stimulus – a supposition now confirmed with the recent release of Census data for 2010 (see figure 1).

REGRESSION ANALYSIS OF INTERSTATE DIFFERENCES IN PUBLIC CAPITAL EXPENDITURE

Purposefully using data from fiscal years 2007 (the year before the Great Recession) and 2008 (the first year of the Great Recession), we next offer an empirical analysis of what determines interstate differences in the amount of general (excluding utility) public capital spending per capita.[3] The explanatory variables included in our model follow the examples of those previously included in both Temple (1994) and Poterba (1995), with a few additional explanatory variables added.

Table 2

Per Capita Public Capital Outlay (nominal), 2005-2010

State & Local	*State & Local*	*State Only*	*State Only*	*Local Only*	*Local Only*
District of Columbia	$20,546	Alaska	$9,477	District of Columbia	$20,546
Alaska	$16,475	Wyoming	$5,469	Wyoming	$9,234
Wyoming	$14,703	Delaware	$4,584	Alaska	$6,998
New York	$9,738	North Dakota	$3,951	Washington	$6,910
Washington	$9,694	Montana	$3,950	New York	$6,619
Nebraska	$8,898	South Dakota	$3,853	Nebraska	$6,320
Utah	$7,987	Hawaii	$3,174	Arizona	$5,934
Nevada	$7,742	New York	$3,119	Nevada	$5,809
North Dakota	$7,552	Utah	$3,115	California	$5,782
Delaware	$7,546	West Virginia	$3,110	Colorado	$5,754
Arizona	$7,483	Louisiana	$3,104	Florida	$5,207
South Dakota	$7,317	New Jersey	$2,928	Texas	$5,068
California	$7,311	Washington	$2,783	Minnesota	$4,996
Colorado	$7,271	Oklahoma	$2,781	Utah	$4,873
Florida	$7,170	Pennsylvania	$2,774	Georgia	$4,825
Texas	$7,164	South Carolina	$2,744	Iowa	$4,428
Iowa	$7,154	Iowa	$2,726	Illinois	$4,346
New Mexico	$6,911	Idaho	$2,693	**United States Total**	**$4,345**
Georgia	$6,868	Mississippi	$2,668	New Mexico	$4,247
Minnesota	$6,754	New Mexico	$2,663	Oregon	$4,177
Louisiana	$6,650	Kentucky	$2,612	Kansas	$3,974
Montana	$6,546	Alabama	$2,588	North Dakota	$3,601
United States Total	**$6,528**	Nebraska	$2,577	Ohio	$3,587
Oregon	$6,444	Kansas	$2,344	Louisiana	$3,546
Kansas	$6,318	Massachusetts	$2,303	South Dakota	$3,464
South Carolina	$6,173	Maryland	$2,284	Virginia	$3,445
New Jersey	$6,038	Vermont	$2,270	South Carolina	$3,428
Illinois	$5,992	Oregon	$2,266	Missouri	$3,324
Hawaii	$5,822	Rhode Island	$2,211	North Carolina	$3,267
Ohio	$5,575	**United States Total**	**$2,182**	Indiana	$3,205
Oklahoma	$5,560	Wisconsin	$2,175	New Jersey	$3,110
Pennsylvania	$5,552	Connecticut	$2,143	Delaware	$2,961
Alabama	$5,457	Texas	$2,096	Massachusetts	$2,939
North Carolina	$5,342	North Carolina	$2,074	Wisconsin	$2,923
Virginia	$5,318	Georgia	$2,043	Connecticut	$2,895
Mississippi	$5,250	Ohio	$1,988	Alabama	$2,869
Massachusetts	$5,243	Florida	$1,963	Tennessee	$2,810
Kentucky	$5,223	New Hampshire	$1,941	Oklahoma	$2,778
Wisconsin	$5,099	Nevada	$1,933	Pennsylvania	$2,778
Indiana	$5,093	Indiana	$1,888	Michigan	$2,685
Idaho	$5,070	Virginia	$1,872	Hawaii	$2,649
Missouri	$5,056	Arkansas	$1,837	Maryland	$2,619
Connecticut	$5,039	Minnesota	$1,758	Kentucky	$2,611
Maryland	$4,904	Missouri	$1,732	Montana	$2,596
West Virginia	$4,642	Illinois	$1,646	Mississippi	$2,582
Tennessee	$4,432	Tennessee	$1,621	Arkansas	$2,446
Arkansas	$4,283	Maine	$1,619	Idaho	$2,377
Vermont	$4,250	Arizona	$1,549	New Hampshire	$2,046
New Hampshire	$3,987	California	$1,529	Vermont	$1,980
Michigan	$3,944	Colorado	$1,518	Maine	$1,866
Rhode Island	$3,827	Michigan	$1,259	Rhode Island	$1,616
Maine	$3,484	District of Columbia	NA	West Virginia	$1,532

Source: U.S. Census Bureau

State and local general public capital spending per capita$_{i,t}$ =

> f(2008 Dummy$_{i,t}$, Population$_{i,t}$, Square land miles$_{i,t}$, Previous decade % population growth$_{i,t}$, Population % attending K-12 public schools$_{i,t}$, Population % > age 65$_{i,t}$, Population % homeowners$_{i,t}$, Per capita state GSP$_{i,t}$, Unemployment rate$_{i,t}$, Federal grants per capita$_{i,t}$, State expenditure % state/local expenditure$_{i,t}$, Liberal citizen political ideology, Poor urban interstate road %$_{i,t}$, No capital budget dummy$_{i,t}$, Tax limitation dummy$_{i,t}$, Expenditure limitation dummy$_{i,t}$, Debt service limit dummy$_{i,t}$, Debt authorization dummy$_{i,t}$);[4]
>
> i = 1,2,3, …50 states;
> t = 2007 and 2008 years.

Like Temple, we chose as our dependent variable the real per capita amount of state and local general capital spending, excluding capital investment by utilities. We exclude utility investment, because utility provision by the public and private sector varies widely across the states and, therefore, would make the inclusion of this form of capital spending inconsistent. All dollar values used in our analysis are in 2007 real dollars.

Unlike Temple, but like Poterba, we do not include an estimated measure of the previous year's capital stock. The inclusion of previous year public capital stock would require the use of Holtz-Eakin's (1993) method of very roughly approximating this value by starting with the Bureau of Economic Analysis' estimate of nationwide government fixed assets and then allocating it to each state by its share of state and local government current expenditure relative to all expenditure in the country. However, doing such creates a variable perfectly correlated with subnational expenditure in a state and, thus, an endogenous explanatory variable whose regression coefficient is biased.

A *2008 dummy* is included as an explanatory variable to assess whether capital spending differs in this recessionary year. Instead of population density, we include separate measures of *Population* and *Square land miles* to see if independent changes in these measures of size influence capital spending. Different from Temple, who includes percentage population less than age 18, we include the *Population % attending K-12 public schools* as a likely more direct measure of greater demand for capital in this sector. Also different from the Temple and Poterba analyses is our inclusion of the state's average *Unemployment rate* to control for differences in the severity of the recession across the states. Furthermore, we include *State expenditure % state/local expenditure* as a control for the wide variation among the states in the divisions of subnational activity between these sectors. This variable suggests whether a greater concentration of subnational activity at the state government level influences state and local capital expenditure in a given year.

Instead of relying on measures of political party affiliation in a state to account for possible political influences on the amount of public capital investment in a year (as in Poterba), we instead use a citizen political ideology measure widely favored by political scientists and developed by Berry et al (1998). *Liberal citizen political ideology* takes on a value from zero to 100 with the upper end representing the most politically liberal states. Furthermore, we thought it would be informative to include values from the "Annual Report on the Performance of State Highway System"[5] on the *Poor urban interstate road %* as gathered by the Reason Foundation (2010). Thus, we are able to estimate whether state-local capital spending responded to this measure of deficiency in public infrastructure.

Like Poterba (1995), we include a measure of states that in 1999 (the most recent year for which we could find information available) used a separate capital budget.[6] Unlike Poterba, we could find no recent information on the pay-as-you-go practices of states in their public capital expenditure, and thus it is not included. Finally, we tried accounting for the presence of a statewide tax expenditure limit, a statewide expenditure limit, and limits on the amount of debt service or authorized debt [7] to see if these general fiscal constraints influenced state and local capital expenditure.[8]

Temple and Poterba both used data from only the 48 contiguous states. We report the 50 state results for two separate regression models, as the results were not significantly different for only 48 states. Model 1 pools both the 2007 and 2008 samples together and utilizes a set of eight location dummy variables representing the nine Census designated regions of the United States (Pacific Region excluded). We purposefully did this to ascertain the influence of some explanatory factors that did not change over the two years and

would be lost in fixed effect estimation. Model 2 is a fixed effects pooled regression estimation, which is preferable to a random effects estimation based on the appropriate Lagrange Multiplier Test. We found that taking the natural log of the dependent variable and all possible explanatory variables yielded the strongest empirical results.[9]

In discussing the regression results recorded in table 3, we first describe the findings from model 1 that did not account for state-specific fixed effects (but did include a set of eight dummy variables to account for the country's nine Census designated regions). The regression coefficient on *2008 dummy* indicates that subnational public capital spending was about 9 percent greater in 2008 (start of recession) than 2007. Consistent with previous research, our results show a 10 percent increase in a state's square miles yielded about a 0.5 per-

Table 3

Regression Analysis Ln State and Local Capital Per Capita, 2007 and 2008

Explanatory variable	*Model I*	*Model II (Fixed Effects)*
Constant	-6.925*** (2.009)	33.810*** (-2.23)
2008 dummy	0.093*** (0.024)	0.025 (0.020)
Ln Population	0.022 (0.028)	4.514** (2.051)
Ln Square land miles	0.051** (0.023)	omitted
Previous decade % population growth rate	0.009*** (0.003)	-0.012 (0.012)
Ln Population % attending K-12 public schools	-0.269 (0.270)	-0.511 (1.038)
Ln Population % > age 65	0.020 (0.122)	-0.211 (0.656)
Ln Population % homeowners	0.454 (0.233)	0.080 (0.232)
Ln Per Capita GSP	0.868*** (0.096)	1.149*** (0.596)
Ln Unemployment rate	-0.171 (0.099)	0.087 (0.088)
Ln Federal grants per capita	0.469*** (0.087)	-0.053 (0.266)
Ln State expenditure % state/local expenditure	-0.003 (0.167)	1.180* (0.705)
Ln Liberal citizen ideology (0 - 100 most Liberal)	-0.160*** (0.058)	-0.236*** (0.093)
Ln Poor urban interstate road %	-0.006** (0.003)	0.002 (0.005)
No Capital Budget Dummy	-0.102** (0.043)	omitted
Expenditure limit dummy	-0.050 (0.040)	omitted
Tax limit dummy	-0.075 (0.080)	omitted
Debt service limit dummy	0.0381 (0.044)	omitted
Debt authorization limit dummy	-0.122* (0.064)	omitted
Mountain Dummy	-0.168* (0.098)	omitted
West North Central Dummy	-0.101 (0.113)	omitted
West South Central Dummy	-0.278*** (0.089)	omitted
East North Central Dummy	-0.047 (0.121)	omitted
East South Central Dummy	-0.219 (0.178)	omitted
New England Dummy	-0.330*** (0.115)	omitted
Mid Atlantic Dummy	-0.108 (0.105)	omitted
South Atlantic Dummy	-0.090 (0.129)	omitted
R^2	0.882	0.526

Statistical significance in two-tailed test: *** = 99% or greater, ** = 95 - 99%, * = 90 - 95%.
All standard errors robust for heteroskedasticity based on 50 state cluster.

cent increase in public capital spending. State per capita income has a significant positive effect on state and local capital spending. With an elasticity of about 0.9, the calculated influence is similar to the income elasticity of aggregate state and local spending. States with higher *Federal Grants per capita* and *Previous decade % population growth rate* spend more on public capital. A respective 1 percent increase in both of these, holding other explanatory factors in the regression constant, results in about 0.5 and 0.1 increases in state and local public capital spending in a state (although a strict interpretation of the *Grants per capita* regression coefficient may be problematic given its likely endogeneity).

We also find, contrary to Poterba (1995), that politics matter for capital spending, although perhaps in an unexpected way. States whose citizenry are more politically liberal, based on the Berry et al. (1998), measure spend less on public capital per resident. A 10 percent increase in this measure yields about a 1.6 percent decrease in this infrastructure spending. A plausible explanation might involve preferences about the composition of public spending. Residents of a state who are more liberal in their political views may prefer current spending, especially on health and human service programs rather than capital spending. Alternatively, political conservatives may prefer public capital spending as a means to improve the state's business climate. An additional confounding result is that states with a greater percentage of urban highway infrastructure deemed in poor condition spend less on public capital. This finding is likely indicative of states that have ignored these needs in the past, continuing to do so.

Like Poterba, we also find that if a state does not have a specific capital budget, its state and local governments are likely to spend about 10 percent less on public capital. The only tax, expenditure, debt service, or debt authorization limit in a state found to exert a statistically significant influence on public capital spending was the presence of a debt authorization limit. These limits restrict the amount of debt a state can offer and consist of statutes like that in Nevada where state debt can never exceed more than 2 percent of the assessed value of property in the state. States with some limit of this type spent about 12 percent less on average on public capital stock.

Unlike previous researchers, we detect no statistically significant influence of an older population, younger population, or homeownership on per-capita state and local capital spending in 2007 and 2008. Furthermore, our addition of *Unemployment rate* or *State expenditure % state/local expenditure* yielded only statistically insignificant influences. Variance inflation factors calculated for all explanatory variables were less than five, and thus these statistically insignificant findings are not likely due to positively biased standard errors caused by multicollinearity.

Comparing the fixed effects regression results from model II with those just described shows that once we account for the fixed influence of a state (including its area), a state's population becomes a major driver of interstate differences in per capita public spending. A 1 percent increase in population results in approximately a 4.5 increase in this form of spending. The explanatory factors of *Per capita GSP and Liberal citizen ideology* maintain their direction of influence, but their magnitudes of influence increase by nearly 50 percent each. Interestingly, once state fixed effects are accounted for, the greater the percentage of subnational spending in a state accounted for by the state government, the greater the amount of total state and local public capital issued in that state. The effects of federal grants and poor urban roads are no longer significant in the fixed effects estimation.

CONCLUSION AND THE NEED FOR FURTHER RESEARCH

Interstate differences in state and local government capital spending per capita over the last decade are sizeable, varying by a factor of five from the highest state to the lowest. Such variation is substantially greater than for total state and local expenditure for all functions, which varies by about a factor of two. Our preliminary analysis regarding these interstate differences in capital spending suggests three tentative conclusions. First, the fundamental economic factors influencing subnational public capital spending in 2007 and 2008 are essentially the same as those found in analyses for capital spending in the 1960s and 1980s. Particularly, population, per capita income, and more politically liberal citizen ideology have consistent significant effects on per capita capital spending. Second, subnational public capital spending held up well in the initial period of the recession, as shown by the statistical results for 2008 and the aggregate evidence for 2008 and 2009. However,

capital spending declined sharply in 2010 (pending further analysis). Third, institutional factors can be important. A limit on the amount of debt a state can authorize, the lack of a capital budget, and the relative role of the state government explain why some states spent less on subnational public capital over this period than others.

Nevertheless, we must stress that our conclusions from this preliminary study await further analysis. Perhaps the most fundamental addition to the research will come from analyzing a longer period. Through the use of a data set from a longer period, we could better account for both the lumpy nature of capital investment and a broader range of economic conditions. Our intent is to expand the analysis to cover the period fiscal years 2000-2010, which will provide more information about the capital spending effects of the Great Recession and permit comparison to the milder national recession in 2000-2001.

Three topics deserve particularly close attention. First, it seems important to test whether there are differences in the factors affecting capital spending for different types of capital investment. The model in this paper can be applied to subcategories of capital spending, especially the larger categories of highways, K-12 education, and higher education. One might expect, for instance, that federal grants could be an important factor for highway spending, even if not for other categories. Second, the interstate differences in the composition of capital spending (rather than level) are also of separate, but related, interest. For instance, in 2009 highway spending by state governments varied from 20 percent of total state capital spending (South Carolina) to 84 percent (Illinois). Third, the relationship between capital spending and borrowing, which also varies substantially among the states, deserves further inquiry.

In view of the relative importance of state and local capital expenditure, both relative to the magnitude of budgets and its potential impact on productivity and economic growth, it is surprising that public finance scholars have not given more attention to the topic recently. This paper and any subsequent research is a start in addressing this oversight.

Notes

[1] In a series of recent papers (Wassmer & Fisher, 2011; Wassmer & Fisher, 2012a; Wassmer & Fisher, 2012b) we have carefully explored the magnitudes of state and local debt as well as the factors influencing individual state's decisions. The results reported here represent our initial analysis of capital spending. We are working to extend the analysis to additional years and other issues, including capital expenditure composition.

[2] Relevant articles in this literature include Bumgartner et al. (1991), Eberts & Fox (1992), Garcia-Mila & McGuire (1992), Garcia-Mila et al. (1996), Holtz-Eakin (1991, 1994), Tatom (1991a,1991b).

[3] Fiscal year (FY) 2007 covers the period July 2006 through June 2007, and FY 2008 covers July 2007 through June 2008. The Great Recession began officially in December 2007 and ended in June 2009.

[4] The underlying theory is that capital expenditure results from the demand for state-local government services. As in Temple (1994), the explanatory variables included in our regression result from the standard median-voter model of demand for subnational government services and thus commonly used in empirical studies of state and local government spending.

[5] Available at http://reason.org/files/19th_annual_highway_report.pdf .

[6] Available at http://www.nasbo.org/sites/default/files/CapitalBudgeting1999.pdf .

[7] Available at http://www.nasbo.org/sites/default/files/BP_2008.pdf .

[8] Available at http://www.taxpolicycenter.org/taxfacts/displayafact.cfm?Docid=495 .

[9] Using this regression form, a regression coefficient on a logged explanatory variable represents the percentage change in the dependent variable given a 1 percent change in the explanatory (elasticity). A regression coefficient on a non-logged explanatory variable represents the percentage in the dependent variable given a one-unit change in the explanatory variable.

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