NBER WORKING PAPER SERIES

CAPITAL BUDGETS, BORROWING RULES, AND STATE CAPITAL SPENDING

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Working Paper No. 4235

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
December 1992

This is a revised and shortened version of a paper with the same title dated March 1987. I am grateful to Alan Gerstein for research assistance, to Kim Rueben for assistance with the figures, to Robert Inman, Andrei Shleifer and Lawrence Summers for helpful discussions, and to the National Science Foundation, Batterymarch Financial Fellowship, and MIT UROP Office for research support. This paper is part of NBER's research program in Public Economics. Any opinions expressed are those of the author and not those of the National Bureau of Economic Research.

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ABSTRACT

This paper uses cross-section data on the U.S. states to test the hypothesis that budgeting and borrowing rules affect the level and composition of public spending. It employs a 1963 data set with detailed information on state capital budgeting practices to compare capital spending in states that maintain separate budgets for capital and operating expenditures and states that employ a unified budget. It also investigates the impact of financing rules, in particular pay-as-you-go rules for capital projects, on the level of spending. States with capital budgets tend to spend more on public capital, especially if they do not impose pay-as-you-go requirements for financing capital projects.

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The scope and structure of the government budget is a fundamental issue in public economics. Since World War II, three presidential commissions have evaluated the U.S. federal budget process, but there is still no concensus on the proper definition of government spending. One of the perennial issues in the budget debate concerns the appropriate treatment of capital expenditures. Proposals to exclude investment expenditures from the operating budget and to include depreciation on the government capital stock have been discussed for nearly fifty years.[1] Recent concern over the deterioration of the public capital stock has generated substantial interest in proposals for a national capital budget in the United States.

Both proponents and opponents of the capital budget argue that it would encourage government capital formation, although empirical evidence on this point is weak. The former contend that present budgeting practices are biased against inherently lumpy capital expenditures, causing too little public investment. The latter argue that adopting a capital budget would "distort federal expenditures ... result[ing] in a preference for expenditures on physical assets rather than greater spending for intangibles such as health and education." (Colm and Wagner (1962), p.125).

All of these arguments run counter to the notion that budgeting institutions are simply a veil that can be pierced by astute politicians and voters. This view implies that alternative accounting rules will not change the level or composition of spending. Although some models of bureaucratic behavior explicitly recognize that institutions may constrain the bargaining

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[1]The capital budget controversy can be traced at least to Musgrave (1939). Subsequent discussions have largely focused on the potential real effects of different budget concepts. For a summary of the debate, see the President's Commission on Budget Policy (1967) and the General Accounting Office (1983, 1986).

and monitoring options available to legislatures, there is little statistical evidence on the importance of these effects. In part, this is because there are few natural experiments in budget policy. Reforms in national budgetary practices are extremely rare, and international comparisons of budget rules and public spending are confounded by a wide range of non-budgetary differences between countries.

This paper provides some evidence on how two aspects of government budget policy, the separation of capital and current expenditures and the use of pay-as-you-go capital financing, affect government capital spending. In the early 1960s, Hillhouse and Howard (1963) conducted a comprehensive survey of state capital budgeting practices and found that nineteen states did not distinguish between operating and capital expenses in their budget documents, while thirty-one had separate procedures for current and capital budgeting. Several years later, a survey by the Council of State Governments found that twenty of the continental states relied primarily on pay-as-you-go financing for capital projects, while the remaining states borrowed for investment goods. The Council (1969) even described this budgetary heterogeneity as "experimentation in the science of government among the fifty states." This paper utilizes these data to investigate the effect of capital budgeting and financing practices on state spending decisions.

The paper is divided into five sections. The first provides background on state capital budgeting and financing rules, and describes the basic differences between states with and without capital budgets. Section two suggests channels through which budgeting institutions may affect spending. The third section describes the cross-state data that provide the basis for the study, and sketches the reduced form estimating equations for state

capital and non-capital outlays. Section four presents results suggesting that states with capital budgets and without pay-as-you-go financing policies have higher levels of capital spending than other states. A brief conclusion suggests a number of additional research issues.

1. State Budgeting Institutions

Budgeting practices for new capital expenditures vary substantially across states. Some state budgets do not distinguish between capital and operating expenditures, but aggregate funds by function. Appropriations to the various departments, such as health or corrections, are subsequently divided between construction projects and non-captial expenditures by department administrators. Other states separate capital from operating expenditures in their budget documents and hold distinct sets of hearings on the two budgets. Some states even develop multiyear capital plans that forecast future capital needs, investments, and financial decisions. None of the states include depreciation charges in their budgets, however.

Hillhouse and Howard (1963), in the most comprehensive study of state capital budgeting practices ever undertaken, group states into four categories based on their budgeting rules for non-highway expenditures[2]: (i) states that make no budgetary distinction between capital and operating expenditures; (ii) states that have separate budgets for capital and operating expenses, but do not engage in capital expenditure planning over horizons longer than the operating budget cycle; (iii) states that have separate capital and operating budgets as well as "capital programs" that extend beyond the operating budget

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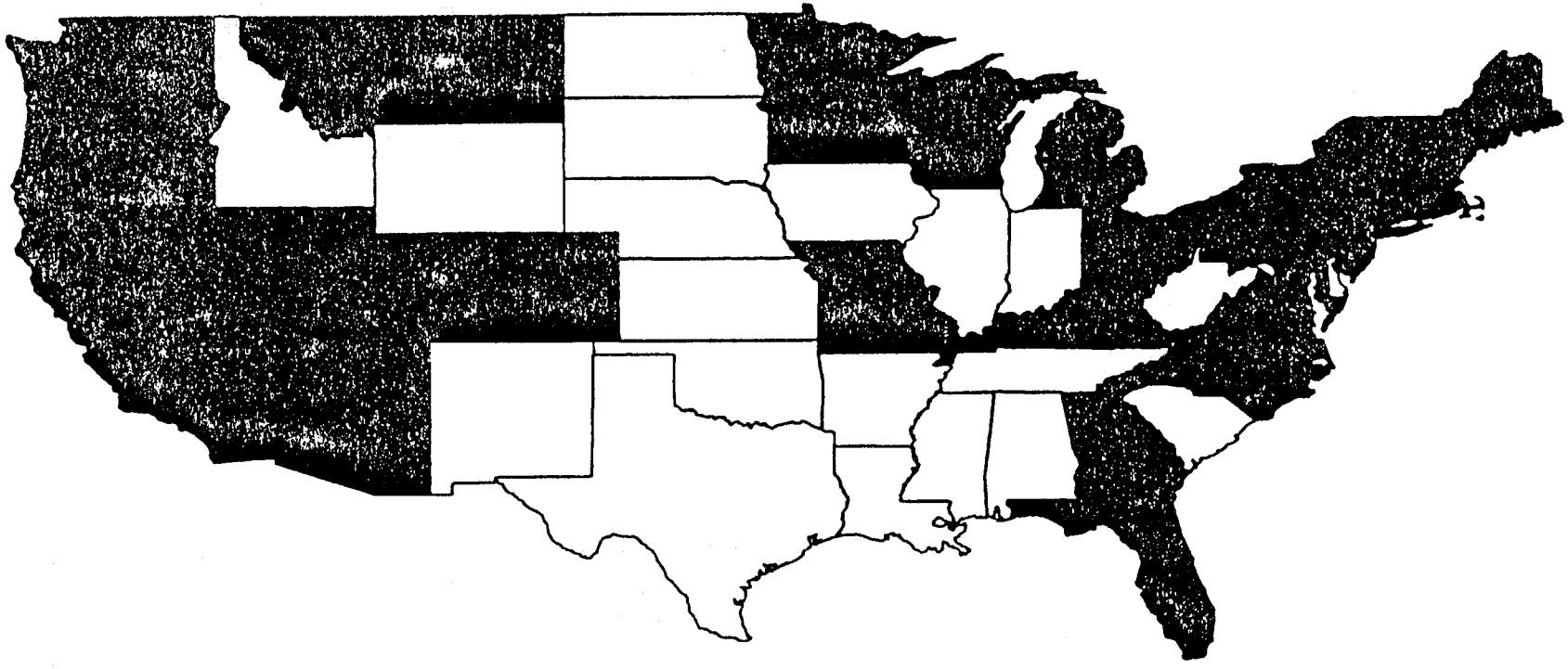
[2]The financial and administrative systems for highways are often separate from those for other capital projects.

horizon; and (iv) states that prepare separate capital and operating budgets, and also prepare multi-year capital budgets extending beyond the operating budget cycle. A "capital program" consists only of a schedule of physical projects. It differs from a capital budget in that the latter must present an integrated physical and financial plan for capital expenditures. Capital programs are thus an intermediate ground between the unified budget used in some states, and the multiyear capital budgets used in others.

The distribution of states by capital budgeting practices, circa 1962, is shown in Figure 1. The figure aggregates states with any form of capital budget, i.e. with or without the capital program, although in the empirical work reported below, I distinguish the various groups. Sixteen of the continental states used capital budgets and capital programs in 1962; an additional thirteen states had capital budgets but no capital program. The states with capital budgets are concentrated in the Northeast, Far West, and upper Midwest. States without capital budgets are concentrated on the Great Plains and along the Gulf Coast.

More recent studies of state budgeting practices, such as Hush and Peroff (1986) and the National Association of State Budget Officers (1992), provide evidence on the evolution of budgeting practices in the last three decades. The basic pattern is one of capital budget diffusion. Hush and Peroff (1986) found thirty-two continental states with capital budgets, compared with twenty-nine in 1962. Comparing the 1986 and 1962 data reveals more than three states adopting capital budgets during this period, since California, Maine, Virginia, New Jersey, were classified as having capital budgets by Hillhouse and Howard but not by Hush and Peroff. These apparent moves away from the

STATES WITH CAPITAL BUDGETS, 1963



No Capital Budget
Capital Budget

capital budget are more likely to reflect erroneous classification in the second survey, than actual changes in budget practice.

The central difference between the Hillhouse-Howard data and more recent studies is that the latter are based on questionnaires mailed to budget officers in each state, or on brief telephone interviews. These surveys are likely to yield less precise indicators of capital budgeting practices than the Hillhouse-Howard case-by-case analysis. For example, in the Hush and Peroff (1986) study, forty-two states answered affirmative to the question "Do you have a capital budget?" In eight of these states, however, capital appropriations are not distinguished as a separate appropriations bill or as a separate section of the overall appropriations bill. Hillhouse and Howard (1963) followed up on such inconsistencies by interviewing state officials.

Among states that distinguish capital from operating expenses, there are many idiosyncracies in the definition of capital goods. States typically use lower bounds on the useful life of new purchases, in some cases along with expenditure floors, to classify expenditures as capital projects. Hush and Peroff (1986) found that only three capital budget states treat vehicle purchases as capital, and just over half of these treat major equipment purchases after the initial construction of a building as capital spending. The majority of capital budget states treat major maintenance expenditures as capital, although the definition of "major" varies across states.

States also differ in their capital financing policies. Some states have constitutional limitations on government indebtedness, others require popular referenda to approve new debt issues, and in others, the legislature is essentially unrestricted in its ability to borrow. Although in principle there is no association between the structure of the budget and the financing

rules, in practice the two are related. Hillhouse and Howard (1963) did not systematically survey financing practices, but a 1967 survey by the Council of State Governments (1969) provides information on this question. This survey shows that of the twenty-nine states with capital budgets in 1962, ten financed capital spending primarily from current revenues. Ten of the nineteen states without any capital budget used current finance. Figure 2 shows state capital financing rules in 1967. The states east of the Mississippi tend to borrow for capital purchases, while pay-as-you-go (PAYG) restrictions are found most often in the West. Hush and Peroff (1986) also investigated capital financing practices. Only three of the thirty-four states with capital budgets, and six of the sixteen without, reported that they generally did not borrow to finance capital spending.

2. Budgeting Procedures and the Composition of Government Spending

Capital budgeting and financing procedures can affect the level and composition of government spending through a number of channels.[3] The first part of this section considers the effects of separating capital and operating budgets, while the second analyzes how borrowing restrictions alter the optimal level of capital spending.

2.1 Allocative Effects of Capital Budgets

Capital budgets may affect spending levels through several channels. First, the presence of a capital budget may create a constituency for capital

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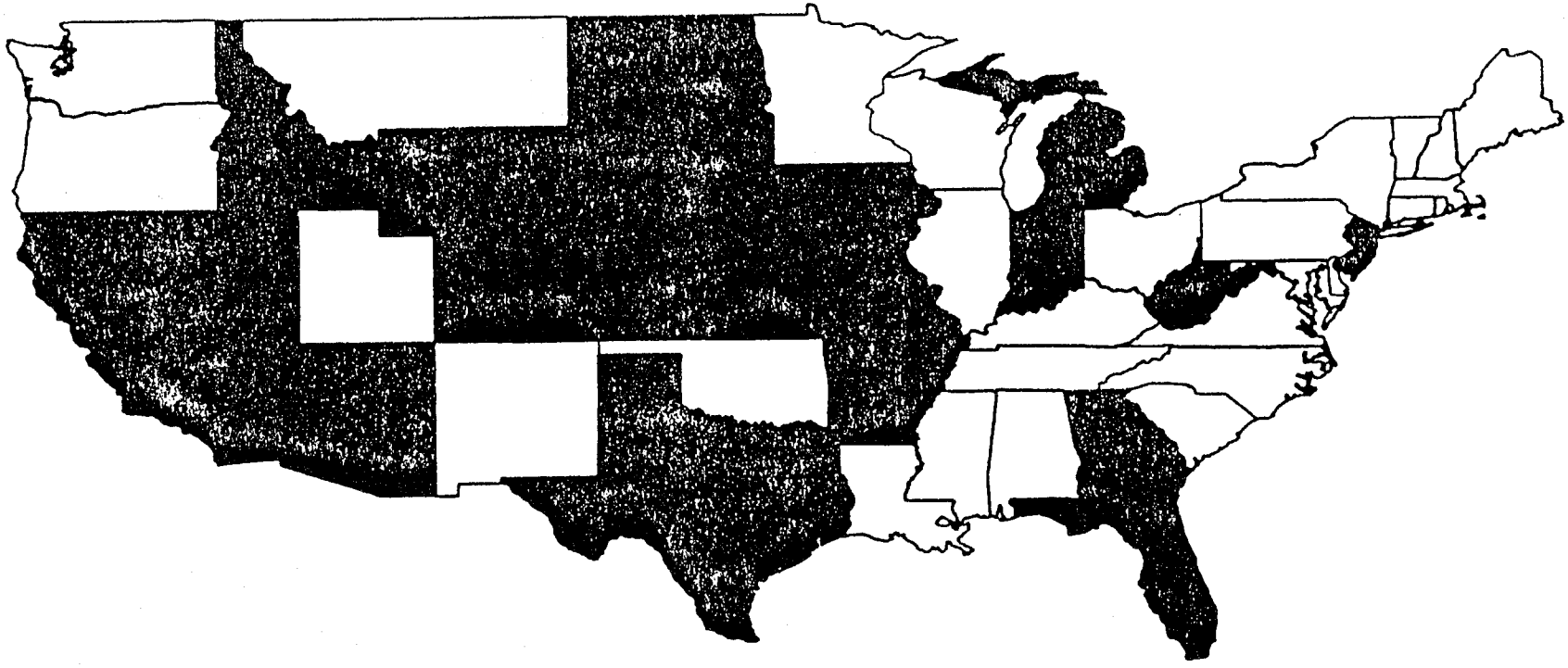
[3]This presumes that political and fiscal institutions can affect government behavior. In median voter style models, these effects would not operate.

STATES WITH PAY-AS-YOU-GO-FINANCING RULES
1967



No Pay-As-You-Go
Pay-As-You-Go

spending. Twelve of the states with capital budgets in 1962 had separate agencies for preparing the capital budget document. In models with budget-maximizing bureaucrats (see Coybeare (1983)) or political interest groups, the presence of a group whose budget is the capital budget may create lobbying pressures for capital spending.[4]

Second, capital budgets may affect capital spending by informing legislators that some projects yield multi-year benefits. The General Accounting Office's (1983) report argues that adopting a federal capital budget would "focus public attention on the government ownership and/or financing of assets that produce long-term benefits (p.6)." This may partly counterbalance the usual legislative bias against projects with long-horizon benefit streams, discussed for example in Cohen and Noll (1991).

Finally, the capital budget may provide a more powerful mechanism than a unified budget for legislative monitoring of bureaucrats. Miller and Moe (1983) emphasize that traditional models of legislative-bureaucratic interaction ignore the institutional and other factors that affect bargaining outcomes. Capital budgets are such an institution. They enable the legislature to separately debate and appropriate capital and operating expenditures for particular agencies. If unified budgets are organized by program area, giving certain amounts to health, education, and other programs, bureaucrats within each department may have substantial discretion concerning the allocation of funds between capital and current operating expenditures.

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[4]A standard argument for budgeting capital spending separately from operating expenditures is to reduce political opposition to the high but transitory tax burdens associated with capital projects. This may make it difficult to separate the effects of capital budgets from those of debt finance.

With a capital budget, however, the agency receives separate appropriations for the two classes of expenditures and the bureaucrats therefore have less control over the spending mix. When bureaucrats and legislators have different tastes, the presence of a capital budget may have allocative effects.[5]

Capital budgets may also have cosmetic as well as real effects on reported spending. For example, if voters and legislatures are more favorably inclined toward capital than operating appropriations, then bureaucrats may try to embed some operating expenses in requests for capital. In states with minimum expenditure requirements for classification as capital, administrators may try to combine small maintenance or alteration projects and make larger requests for capital funds. This behavior should be less attractive in states with capital budgets and pay-as-you-go financing, suggesting interactions between financing and budget rules.

2.2 Borrowing versus Current Financing

Pay-as-you-go requirements may also affect the level of capital spending. A traditional argument for this view (see Buchanan (1967)) holds that voters perceive debt-financed projects as less costly than tax-financed ones. In simple models of the legislative process, such as Weingast, Shepsle, and Johnsen (1981) and Becker (1983), reductions in the perceived cost of spending lead to increased outlays. In these models, if the perception argument is

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[5]The direction of these effects is ambiguous. The standard argument suggests that bureaucrats will prefer capital to operating spending because conditional on a given output flow, capital yields greater current outlays. The opposing view is that the greater opportunity for targetting capital spending and providing patronage may bias legislatures toward capital intensity.

correct, states that employ pay-as-you-go rules should exhibit lower levels of capital investment than debt-finance states.[6]

A similar conclusion can be derived from models of intertemporal fiscal policy, such as Barro (1979). Consider a two-period median voter model, where $v(g,k)$ indicates the voter's per period utility, g denotes current expenditure, and k is the stock of government capital. Assume that preferences are additively separable over time. The function $v(g,k)$ could be the utility function of the median voter. The government is required to purchase its capital in the first period. Capital does not depreciate between periods one and two, but depreciates fully at the end of the second period.

Revenue to finance a capital expenditure may be raised in either, or both, periods. The utility cost of raising revenue each period is $f(r)$, with $f_r > 0$ and $f_{rr} < 0$. This revenue cost derives from the deadweight loss of distortionary taxes; with lump sum taxes, the effects described here would vanish unless the government and the consumers had access to different capital market opportunities. For simplicity, assume that both the interest rate on government borrowing, and the time preference rate, are zero.

The net benefits from the spending program (g_1, g_2, k) are therefore:

(1) $W = v(g_1,k) + v(g_2,k) - f(g_1 + \theta*k) - f(g_2 + (1-\theta)*k)$.

The parameter θ denotes the fraction of capital expenditures that are financed in the first period. States that use the "pay-as-you-go" approach to finance capital spending in effect set $\theta = 1$. If there are no restrictions on θ, the government divides its revenue requirements between the two periods to

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[6]This argument applies to capital spending on any given project, but it may not survive aggregation to the level of a capital spending program. Even if each individual project exhibits a lumpy stream of costs, when all projects are added together, the stream of costs may be smooth.

minimize the total revenue-raising cost. In this case, the fraction of capital spending that will be financed in the first period is the θ^* that solves:

(2) $\quad f_r(g_1 + \theta^* k) = f_r(g_2 + (1-\theta^*)k).$

If preferences are identical in the two periods, then $g_1 = g_2$ and $\theta^* = 1/2$.

Since a pay-as-you-go (PAYG) requirement is a constraint on θ, analyzing it requires information on how capital and non-capital spending respond to shifts in θ. For arbitrary θ, the first order conditions describing the optimal choices of g_1, g_2, and k are:

(3) $\quad v_g(g_1,k) - f_r(g_1 + \theta^* k) = 0$

(4) $\quad v_g(g_2,k) - f_r(g_2 + (1-\theta)^* k) = 0$

(5) $\quad v_k(g_1,k) + v_k(g_2,k) - \theta^* f_r(g_1 + \theta^* k) - (1-\theta)^* f_r(g_2 + (1-\theta)^* k) = 0.$

Tedious manipulation yields expressions for the responses of g_1, g_2, and k to changes in θ. Evaluating these derivatives at $\theta = 1$ indicates the effect of relaxing the pay-as-you-go rule. In the simplifying case where $v(g,k)$ is additively separable, so $v_{gk} = 0$, these expressions are:

(6) $$\frac{dk}{d\theta} = [(v^1_{gg} - f^1_{rr})(f^1_r - f^2_r) + v^1_{gg} f^1_{rr} k]/\Delta$$

(7) $$\frac{dg_1}{d\theta} = f^1_{rr} * [k^*(v^1_{kk} + v^2_{kk}) + f^1_r - f^2_r]/\Delta$$

(8) $$\frac{dg_2}{d\theta} = - k^* f^2_{rr}/(v^2_{gg} - f^2_{rr})$$

and

(9) $$\Delta = (v^1_{kk} + v^2_{kk})(v^1_{gg} - f^1_{rr}) - v^1_{gg} * f^1_{rr}.$$

Allowing for a more general set of preferences, with arbitrary v_{gk}, would make it more difficult to sign the effects of changing θ. In equations (6) - (9), superscripts denote time periods. Provided $g_1 + k > g_2$, so the marginal cost

of additional revenue, f_r, is greater in period one than in period two, $dk/d\theta$ is unambiguously negative. Reducing the fraction of capital spending that must be financed in period one will raise the level of government capital spending. The effect on second period non-capital spending, g_2, is negative. A reduction in θ shifts a greater revenue burden to period two, raising the marginal cost of government funds in that period and thereby lowering the optimal level of non-capital spending.

Reducing θ, at $\theta = 1$, has an ambiguous effect on period one non-capital spending. By lowering the marginal cost of government spending in period 1, lowering θ encourages both capital and non-capital spending. If the total amount of revenue needed to finance capital in period 1, θk, declines as θ falls, then $dg_1/d\theta < 0$. If the elasticity of k with respect to θ is smaller than minus one, however, then g_1 will fall as θ declines. Of course, if v_{gk} does not equal 0, then substitution effects would also complicate these conclusions.

Pay-as-you-go financing restrictions may undermine the effects of a capital budget. When bureaucrats cannot reduce the perceived cost of a project by allocating it to the capital as opposed to the operating budget, then the distinction between the two budgets may have no effect. This argues for allowing interaction between the financing and capital budget variables. The ultimate effect of these institutions on capital spending is clearly an empirical matter.

3. Data Description and Econometric Specification

To study the effect of fiscal institutions on spending, I analyze data on non-highway capital spending in the forty-eight continental states in 1962.

Alaska and Hawaii are outliers with respect to capital spending. In 1962, Alaska had non-highway non-highway capital expenditures of $50.5 per capita, and Hawaii $58.4 per capita, compared to the national average of $10.2. Geographical differences presumably contribute to these differences.[7] I focus on a single cross-section, rather than a panel data set, because there is relatively little short-term change in state budgeting techniques.[8]

Non-highway capital expenditures are primarily for state institutions of higher education, health and hospital facilities including state mental institutions, natural resource projects such as parks, and state correctional institutions. In 1962, non-highway capital spending accounted for about one quarter of total state capital spending, of $6.8 billion ($1982). This was divided as follows: $3.7 billion for education, $.7 billion for hospitals, $.6 billion for natural resources, $.3 billion each for corrections and general public buildings, and $1.2 billion for "other."

This study uses reduced-form models to relate capital expenditures to a variety of demographic, economic, and geographic variables. While numerous studies have estimated the demand for state and local expenditures (see Inman's (1979) survey), there is little concensus on the variables that affect state demand for public spending. The spirit of my analysis, if anything,

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[7] Both states have capital budgets. Since I estimate a positive effect of capital budgets on capital spending, including Alaska and Hawaii would strengthen the conclusion.

[8] A central question about my empirical analysis concerns the exogeneity of budget institutions. If institutions reflect interstate differences in voter sentiment or other factors that could affect spending levels, then the reduced form coefficient on the fiscal institution variables will not measure the impact of these institutions on spending. Much of the cross-sectional variation in capital budgeting rules is the result of "historical accident," decisions about state budget rules that were made long before the data sample.

complicates matters since it suggests that standard models based on the median voter framework (for example, Borcherding and Deaton (1972) or Bergstrom and Goodman (1973)) neglect potentially important fiscal institutions.

My approach is therefore to estimate reduced form equations including a core set of variables from previous studies of state or local spending:

$$(10) \quad CAP_i = \beta_0 + \beta_1 * Y_i + \beta_2 * Y_i^2 + \beta_3 * CAPBUD_i + \beta_4 * PAYG_i + \beta_5 * FRAC18_i + \beta_6 * FRAC65_i + \beta_7 * URBAN_i + \beta_8 * DENS_i + \beta_9 * GROW_i + \beta_{10} * HOWN_i + \epsilon_i.$$

In this equation, CAP is the level of per-capita state non-highway capital expenditure, Y is per capita income, CAPBUD is the indicator variable for the presence of a state capital budget or capital program, PAYG indicates a pay-as-you-go capital funding rule, FRAC18 is the share of the population aged less than 18, FRAC65 the population share aged 65 and over, URBAN is the fraction of the state's population classified as urban in the 1962 Census of Governments, DENS the state's population density, GROW the state's population growth rate in the ten years preceding the estimation year, and HOWN the proportion of homeowners in the state. The last variable proxies for the fraction of income tax itemizers, which determines the after-federal-tax cost of state and local taxes.[9] The demographic variables are constructed from the Statistical Abstract and the Census of Governments.

CAP, state capital expenditures, is measured in two ways. The first variable is the level of per capita state capital outlay, exclusive of highway spending and that by liquor stores or state public utilities, as reported in

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[9]The individual micro-data that are used to construct state-level estimates of the tax price of government spending, for example in Feldstein and Metcalf (1987), are not available for this time period.

the Compendium of State Government Finances. Capital outlay is defined as expenditure for construction of buildings or other improvements, and for purchase of land, equipment, and existing structures. It does not include repair expenditures, but does include additions, alterations, and replacements to fixed works and structures. The Census Bureau attempts to classify expenditures on a consistent basis across states regardless of the state's budget classification. This reduces, but probably does not eliminate, the effect of bureaucratic attempts to reclassify projects in response to various budget systems.

One potential difficulty with this measure of capital spending arises from the substantial interstate variation in the division of responsibilities between states and localities. If this division is correlated with state capital budgeting practices, there could be a spurious link between state expenditure patterns and capital budgets. To address this possibility, I also use a second measure of capital spending that combines state and local non-highway capital spending. While this variable is in many respects inferior to the state-level spending measure since it includes many capital expenditures that are undertaken by localities in virtually all states, it provides a check on the basic results.

Each of the equations also includes a set of regional dummy variables, based on the four major Census regions (West, South, North Central, and East). These regional variables do not significantly affect the results, and the coefficients of the other variables were affected very little when these dummies were excluded from the equations or replaced with more detailed regional variables based on the nine Census regions.

I also estimate a second specification that included a measure of federal grants-in-aid to each state, as well as indicator variables for the state's political ideology:

$$(11)\ CAP_i = \beta_0 + \beta_1*Y_i + \beta_2*Y_i^2 + \beta_3*CAPBUD_i + \beta_4*PAYG_i + \beta_5*FRAC18_i + \beta_6*FRAC65_i + \beta_7*URBAN_i + \beta_8*DENS_i + \beta_9*GROW_i + \beta_{10}*HOWN_i + \beta_{11}*FEDGRANT_i + \beta_{12}*REPHOUSE_i + \beta_{13}*REPSEN_i + \beta_{14}*REPGOV_i + \beta_{15}*REPVOTE_i + \epsilon_i$$

where the variables not included in (10) are: FEDGRANT, per capital federal non-highway grants; REPHOUSE, REPSEN, and REPGOV, indicator variables for Republican-controlled state House of Representatives, state Senate, and state governorship, respectively; and REPVOTE, the fraction of the state's vote that was cast for the Republican candidate in the 1960 presidential election.[10]

One serious criticism of both reduced form equations concerns the potential endogeneity of the capital budget variable. The sign of any resulting bias is not clear on a priori grounds. States whose voters have a high preference for capital spending, or which for other reasons (i.e. geography) are inclined to undertake substantial capital projects, may adopt capital budgets to facilitate these expenditures. This could lead to a positive association between capital spending and the presence of a capital budget. Alternatively, however, one of the reasons for adopting a capital budget may be a perceived failure of the state to provide an adequate level of public capital. In this case, the induced capital spending-budgeting correlation could be negative.

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[10]FEDGRANT is an endogenous variable, since at least some federal grants are contingent on state spending. This problem is less severe for non-highway than for highway spending, and less severe in the early 1960s than in later time periods after the rise of revenue sharing.

To address potential endogeneity problems I report instrumental variable estimates based on (10) and (11). The instrument for the capital budget is an indicator variable for the presence or absence of a capital budget in the period prior to 1945. If there is substantial change over time in voter tastes for government spending, but if institutions such as capital budgeting rules are difficult to change, then institutions that were adopted well in advance of the sample period will be "quasi-experiments" in budget policy.

4. Estimation Results

The results of estimating equation (10) using data on state capital expenditures are presented in Table 1. In processing the Hillhouse-Howard data to construct CAPBUD for columns one and two, I set CAPBUD equal to unity for all states with capital budgets, regardless of their capital program status. The results generally suggest that state capital budgets are associated with higher levels of state non-highway capital spending. The estimates in the first column indicate that a state with a capital budget spends an average of $9.4 per capita-year more than a similar state without one. This is roughly a twenty percent increase in capital spending, and the hypothesis that capital budgets have no effect on capital spending can be rejected at standard significance levels. The coefficient becomes somewhat smaller when estimated by instrumental variables, as in column two, but it still suggests an important budgeting effect on capital outlays.[11]

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[11] I have also estimated similar equations, not reported here, using the 1986 data on capital budgeting rules reported in Hush and Peroff (1986) and the associated data on state capital spending. The ordinary least squares results are similar to those presented in Table 1, and show an important association between capital budgets and spending levels. The instrumental variable results, however, suggest a weaker association.

The presence of a pay-as-you-go capital finance rule appears to reduce the level of capital spending, although these effects are estimated less precisely than those for capital budgets. The presence of a PAYG rule lowers per capita capital spending by six dollars, or about fifteen percent. When interaction terms are included along with the level of each variable, the coefficients on each of the level variables change very little and the interactions are statistically insignificant. If the basic model is re-specified with "capital budget and PAYG" and "capital budget, no PAYG" variables, states with capital budgets and PAYG rules have slightly higher capital outlays, and those with capital budgets but no PAYG rules much higher capital outlays, than states without capital budgets. This suggests important interaction effects between budgeting and financing rules.

The other exogenous variables in the reduced form are also of some interest. The per capita income variable and its square have statistically strong effects, and the point estimate for d(State Capital Spending)/ d(Personal Income), evaluated at the sample mean of per capita income, is about .0015. This is smaller than the average ratio of state non-highway capital spending to personal income (.0045). Most of the other variables — demographics, growth rates, urbanization rates, and the population density — have small and statistically insignificant effects. They appear to have little effect on capital spending, and their exclusion from the regression equations has little impact on the capital budget coefficient.

The results in the first two columns of Table 1 do not allow either federal grants or state political factors to affect the level of capital spending. The equations in columns three and four introduce these variables. The results suggest two conclusions. First, although political ideology and

grants variables improve the fit of the capital spending equations, they do not have much impact on the estimated capital budget or PAYG coefficients. Second, when the state Senate and House of Representatives are controlled by different political parties, the level of capital spending appears to be lower than when either the Republicans or Democrats control both.

One potential difficulty with the results in Table 1 is their exclusive focus on state capital spending. Table 2 reports equations analogous to those in Table 1 for the aggregate of state and local capital spending. The results again suggest a substantial positive relationship between state capital budgeting practices and state capital spending. The CAPBUD coefficients are positive and somewhat larger than those in Table 1, but they imply a smaller percentage increase in total state-local than in state-only capital spending for states with capital budgets. The absolute increase in state and local spending is larger, however, than the absolute increase in state spending alone. This may be due to correlation between the capital budgeting practices used at the state and local level, and the same forces that raise state capital spending may also raise county, city, and municipal spending.

The results in Table 2 also consider the differences between states with only capital budgets and those with both capital budgets and capital programs. The CAPBUD variable in the first two columns is set equal to unity only for the sixteen states with capital budgets and capital programs, while in the last two columns it equals one for all states with any type of capital budget. The two sets of states yield remarkably similar point estimates for both the CAPBUD and PAYG variables. In parallel equations for only state capital spending, I found that states with capital programs appear to spend somewhat less than states with only capital budgets. This is somewhat surprising, since

the foregoing myopia and imperfect information arguments would suggest that states with more sophisticated planning systems would spend more. Finally, the results in Table 2 show that the PAYG variable continues to have a negative coefficient, but the statistical significance is much lower than in Table 1.

The foregoing results suggest that states with capital budgets spend more on public capital goods, but they do not indicate which types of capital goods are the recipients of this higher spending. Table 3 therefore disaggregates state capital spending and presents results parallel to those in the first column of Table 1. The CAPBUD variable is set equal to unity for states with capital budgets. Educational institutions, which account for the largest part of non-highway capital expenditure by the states, are shown in the first column of Table 3. States with capital budgets spend an average of $5.20 per capita more on educational institutions, about twenty five percent more than states without capital budgets. PAYG financing policies also have a substantial effect in reducing educational capital spending.

The next three capital expenditure items, hospitals, natural resources, and correctional institutions, also appear to respond to the presence of a capital budget. States with capital budgets spend about two dollars per capita more on each of these items. These estimates are large relative to the level of capital spending for these categories, but for such low spending levels, percentage calculations are likely to be unreliable. In all cases, however, the results are highly statistically significant. The PAYG variable has mixed effects at this level of capital disaggregation, and it is not statistically significant in any of the disaggregated equations.

As a final check for the impact of capital budgets, I estimated equations similar to those in Table 1 with the dependent variable replaced by non-capital state expenditures from the 1962 Compendium of Government Finances. The findings are not reported, but they failed to yield any evidence that capital budgets reduce the level of non-capital spending. The t-statistics for the capital budget variable were never above .50 in absolute value. These results suggest that the presence of a capital budget may raise total state spending, since there is some evidence of a positive effect on the capital spending component.

5. Conclusions

This paper suggests that states with capital budgets, especially those that do not require pay-as-you-go financing of capital projects, undertake more public capital investment than other states. These findings refute the view that public accounting practices are simply a veil that has no impact on policy outcomes. They support the empirical evidence presented, for example, by Abrams and Dougan (1986) and Holtz-Eakin (1988), that fiscal institutions affect spending outcomes.

There is a strong, but possibly inappropriate, temptation to extrapolate these findings to the debate concerning a national capital budget for the United States. There are several reasons for caution in this regard. First, the federal budget already provides a wealth of information on capital outlays, even though the budget follows unified accounting principles. Special Analysis D in the current federal budget delineates federal investment expenditures. Against this background, it is difficult to evaluate the additional informational role that an explicit capital budget might play.

Second, my findings could be spurious if states with capital budgets and capital programs are more successful in applying for and receiving federal grants to undertake capital projects. This problem is likely to be small for the early-1960s period, but further work on this issue is needed.

This paper raises a number of questions about the political economy of state spending. If capital budgets help state legislatures monitor bureaucrats, then why don't all states have capital budgets? The answer may be that dual budgeting systems are more complex than unified budgets. Further research should concentrate on explaining the observed pattern of state budgeting practices, as well as the effects of these policies. This will help to resolve the question of whether budget rules are best modelled as endogenous responses to current policy needs, or as accidents of history, and may provide new insights on the possible effects of altering either federal or state budget processes.

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Table 1: State Financing Practices and State Spending

Dependent Variable: State Per Capital Non-Highway Capital Spending, 1962

Independent Variable	OLS Estimates	IV Estimates	OLS Estimates	IV Estimates
Constant	171.585 (87.295)	173.405 (88.369)	113.429 (96.201)	111.336 (96.511)
Per Capita Income	-0.033 (0.011)	-0.033 (0.011)	-0.031 (0.011)	-0.032 (0.012)
(Per Capita Income)**2($\times 10^{-4}$)	0.078 (0.022)	0.077 (0.022)	0.075 (0.022)	0.076 (0.024)
Capital Budget (1-Yes)	9.361 (4.502)	8.445 (6.128)	11.647 (4.987)	12.205 (5.989)
PAYG Financing (1-Yes)	-5.753 (3.718)	-5.975 (3.984)	-8.068 (4.049)	-7.957 (4.274)
Population Share < 18	0.662 (1.322)	0.559 (1.505)	1.554 (1.551)	1.634 (1.646)
Population Share > 65	-0.134 (1.524)	-0.214 (1.572)	0.896 (1.573)	0.952 (1.547)
Percent Urban	-0.227 (0.181)	-0.233 (0.181)	-0.175 (0.179)	-0.168 (0.188)
Population Density	-0.011 (0.014)	-0.010 (0.015)	-0.012 (0.014)	-0.012 (0.014)
Decade Population Growth Rate	-5.794 (11.505)	-4.660 (11.681)	-12.442 (12.975)	-13.236 (12.466)
Percent Homeowners	-0.062 (0.280)	-0.062 (0.282)	-0.147 (0.264)	-0.152 (0.273)
Federal Grants per Capita			0.072 (0.063)	0.074 (0.066)
South	-4.831 (7.233)	-5.229 (6.917)	-1.541 (8.168)	-1.145 (7.761)
North Central	-2.615 (7.751)	-2.782 (7.597)	-2.448 (7.555)	-2.317 (7.369)
West	12.054 (9.682)	11.851 (9.233)	10.785 (10.404)	10.898 (9.899)
Republican House			-13.834 (5.097)	-13.832 (5.115)
Republican Senate			13.026 (5.614)	13.085 (5.587)
Republican Governor			0.019 (4.287)	0.055 (4.329)
Republican Pres. Vote			0.196 (0.428)	0.215 (0.448)
Mean of Dependent Variable	39.974	39.974	39.974	39.974
R^2	0.536	.536	.595	.595
SSR	5621.5	5626.5	4910.7	4912.2

Notes: Values in parentheses are heteroscedastic-consistent standard errors calculated as in White (1980).

Table 2: State Capital Budgeting and State-Local Capital Spending

Dependent Variable: State and Local Per Capita Non-Highway Capital Spending

	CAPBUD = 1 if Capital Budget and Program (16 States)		CAPBUD = 1 if Capital Budget (29 States)	
Independent Variable	OLS Estimates	IV Estimates	OLS Estimates	IV Estimates
Constant	244.510 (125.616)	311.562 (124.651)	278.147 (135.904)	406.469 (127.306)
Per Capita Income	-0.070 (0.029)	-0.076 (0.029)	-0.083 (0.030)	-0.108 (0.028)
(Per Capita Income)**2 ($\times 10^{-4}$)	0.049 (0.010)	0.052 (0.020)	0.060 (0.020)	0.070 (0.062)
Capital Budget (1-Yes)	18.204 (10.908)	43.061 (19.690)	18.657 (14.630)	47.595 (19.809)
Pay-As-You-Go (1-Yes)	-7.034 (10.772)	0.288 (12.358)	-7.794 (11.081)	-0.656 (12.069)
Population Share < 18	-0.029 (1.294)	-0.271 (1.366)	-0.415 (1.258)	-1.398 (1.450)
Population Share > 65	2.554 (2.766)	1.708 (2.903)	3.698 (2.653)	4.511 (2.958)
Percent Urban	1.085 (0.582)	0.844 (0.628)	1.235 (0.611)	1.195 (0.658)
Population Density	-0.099 (0.045)	-0.104 (0.052)	-0.095 (0.041)	-0.095 (0.042)
Population Growth Rate, 1953-63	67.170 (33.423)	63.366 (34.846)	47.362 (41.503)	12.231 (40.131)
Percent Homeowners	-0.243 (1.394)	-0.444 (1.541)	0.146 (1.334)	0.522 (1.359)
South	17.581 (20.611)	15.516 (21.582)	27.635 (21.089)	40.884 (22.604)
North Central	26.748 (18.455)	22.211 (20.663)	35.606 (18.480)	44.192 (18.771)
West	49.753 (25.149)	44.050 (25.369)	61.172 (26.790)	72.403 (28.049)
R^2	.748	.726	.746	.722
SSR	51819.5	56406.7	52234.5	57153.7

Notes: The mean of the dependent variable is 189.026. Numbers in parentheses are heteroscedastic-consistent standard errors calculated as in White (1980).

Table 3: State Capital Budgeting and State Capital Spending by Type

Dependent Variable: State Per Capita Capital Spending On:

Independent Variable	Education	Hospitals	Natural Resources	Correctional Institutions	General Public Buildings
Constant	110.648 (40.126)	22.216 (10.193)	30.245 (7.290)	20.373 (10.762)	-9.358 (7.226)
Per Capita Income	-0.023 (0.010)	-0.003 (0.002)	-0.008 (0.002)	-0.007 (0.002)	0.0005 (0.0015)
(Per Capita Income)**2($\times 10^{-4}$)	0.014 (0.005)	0.002 (0.001)	0.004 (0.001)	0.004 (0.001)	0.0001 (0.0008)
Capital Budget (1-Yes)	5.210 (3.570)	1.969 (0.579)	2.203 (1.104)	1.591 (0.720)	-0.450 (0.809)
Pay-As-You-Go (1-Yes)	-3.746 (2.733)	-0.094 (0.553)	1.105 (0.751)	-0.017 (0.753)	-0.220 (0.603)
Population Share < 8	-0.519 (0.303)	-0.070 (0.050)	-0.109 (0.099)	0.156 (0.062)	0.068 (0.040)
Population Share > 65	0.914 (0.739)	-0.184 (1.076)	0.274 (0.220)	0.080 (0.117)	-0.017 (0.086)
Percent Urban	-0.334 (0.173)	-0.019 (0.025)	0.020 (0.043)	-0.036 (0.039)	0.034 (0.031)
Population Density	-0.002 (0.014)	0.003 (0.003)	0.004 (0.005)	-0.005 (0.003)	0.002 (0.003)
Population Growth Rate, 1953-63	0.460 (9.358)	-2.335 (1.756)	-4.191 (2.486)	6.416 (3.401)	-0.576 (1.192)
Percent Homeowners	0.611 (0.279)	-0.025 (0.054)	0.189 (0.101)	-0.078 (0.097)	0.058 (0.066)
South	-0.278 (6.196)	-0.184 (1.076)	-0.848 (1.498)	-1.313 (1.148)	0.650 (0.836)
North Central	-0.181 (6.027)	-0.064 (1.219)	-1.233 (0.912)	1.693 (1.287)	-0.665 (1.102)
West	14.743 (7.548)	-0.591 (1.273)	2.570 (1.476)	0.029 (1.218)	0.459 (0.903)
Mean of Dependent Variable	25.081	3.413	3.042	1.953	1.473
R^2	0.449	0.397	0.421	0.634	0.265

Notes: Each variable is measured in 1982 dollars per capita. Numbers in the parentheses are heteroscedastic-consistent standard errors as in White (1980). See text for further details.