Balanced Budget Requirements and State Spending: A Long–Panel Study

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This study tests the effects of balanced budget requirements on three measures of state expenditure using data on 48 states for the years 1950–2004. We find that the following rules are effective in constraining expenditures: (1) requiring that the governor submits a balanced budget; (2) placing controls on supplemental appropriations; and (3) prohibiting the carry-over of a deficit from one fiscal year or biennium into the next. The latter two rules exert larger individual effects than the first. All else equal, states can best improve their prospects of reigning in spending by instituting technical rules that govern budgetary outcomes, as opposed to political rules that dictate how the budget is assembled and approved.

INTRODUCTION

The balanced budget requirement (BBR) is a defining feature of state and local government budgeting and finance. Burkhead's (1954, 191) observation remains true that "there is remarkable persistence in the notion that government budgets ought to be balanced, even balanced annually." Empirical research on fiscal rules finds that the balanced budget requirement is an effective tool for fiscal restraint at the local and state levels (Briffault 1996; Gosling 2009; Lee, Johnson, and Joyce 2004; Lewis 1994; Rubin 1998, 2006). Fiscal restraint is generally equated with constraining expenditures; this reflects the political reality described by Gosling (2009, 5), who argues, "(…) in most state and local governments, the politics of public budgeting dictate that policy makers first turn to budget reductions and reallocations to balance revenues and expenditures."

Prior empirical studies have consistently found that balanced budget requirements have a statistically significant effect on (constraining) expenditures. This paper contributes to the

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literature by improving upon three important limitations of previous research. First, the data on balanced budget rules used in previous studies are not based on an examination of state statutes and constitutions. Rather, data on BBRs have been collected by surveys of state officials. In addition, because they rely almost exclusively on two stationary BBR measures, prior studies have not fully captured the variation in these provisions between the states and over time. Finally, previous studies do not employ panel datasets that span multiple economic cycles, which means that little of the variance in expenditures that is attributable to BBRs has been revealed.

The aim of this study is to employ a 55-year panel dataset that includes all of the key state balanced budget requirement provisions to test whether BBRs have effectively constrained three measures of state expenditure. It is the first study to estimate the effects of state BBR systems on governmental spending using more than one type of expenditure as the dependent variable.

PREVIOUS STUDIES

This section reviews previous studies that have tested the effect of balanced budget requirements on resource allocation in some form. First, relevant empirical studies are reviewed chronologically since they build upon one another. Then, findings and conclusions in the extant literature are summarized.

A study by the United States Advisory Commission on Intergovernmental Relations (ACIR 1987) estimates a series of single-equation, cross-sectional linear models using data for 1984 as well as averages calculated using data from 1980 to 1984. The models include state-level institutional, economic, and political controls. Arguing that "fiscal restraints (…) represent a potentially effective way to reduce the rate of growth in government spending" (42), ACIR employs state spending per capita minus federal aid as a dependent variable. Using its "degree of stringency scale"—a measure of the stringency of a state's balanced budget rules—as the primary independent variable, ACIR finds that higher budgetary balance stringency is effective in reducing "own-source" spending (42).

Poterba (1994) examines the relationship between state responses to fiscal shocks and budgetary institutions over the years 1988–1992. He estimates regressions using panel data on the 27 states he identifies as having annual budget cycles. The dependent variables include: (1) "spending cuts enacted after the initial budget but during fiscal year *t*," (805) and (2) "the change in next fiscal year's taxes that is attributable to tax legislation enacted during this fiscal year" (806). To measure balanced budget requirement stringency, Poterba employs a dummy variable indicating whether a state has a score of less than (or equal to) five on the ACIR stringency scale; he defines this as "weak deficit control" and interacts it with dummies indicating positive or negative deficit shock, with deficit shock defined as the difference between expenditure shock (actual outlays net of changes in spending, minus forecast outlays) and revenue shock (actual revenues net of changes in taxes, minus forecast revenues) (813). He concludes that "states with weak antideficit rules adjust spending less in response to positive deficit shocks than their counterparts with strict antideficit rules" and that "there is no evidence that antideficit rules affect tax changes" (815).

Alt and Lowry (1994) analyze the effects of partisan politics and budgetary institutions on state revenue and expenditures. They employ panel data on 48 states (excluding Alaska and Hawaii) for the years 1968–1987. They estimate simultaneous regressions separately for states with and without the balanced budget rule that deficits cannot be carried into subsequent fiscal years (hereafter the "no deficit carry-over" rule or provision); total state revenue and total state expenditures are the dependent variables, and regressions are further separately estimated for unified, split, and split-branch governments (816–818).[1] Deficit is measured using the difference between total state expenditures and total state revenues, and control variables include party of governor, total state revenue (lagged in revenue equation), state income (revenue equation only), federal contribution to state revenue (revenue equation only), state unemployment (expenditure equation only), and lagged budget surplus (817–819). The state unemployment rate measures changes in the business cycle. Alt and Lowry's results indicate that unified governments react to unexpected deficits by increasing revenues, while split governments react by decreasing expenditures. The "total response is much larger (at least under Republicans) where deficit carryover prohibitions exist" (821).

Bohn and Inman (1996) examine the implications of balanced budget rules in 47 states (excluding Alaska, Hawaii, and Wyoming) over the years 1970–1991. The authors rely on ACIR (1987) and the National Association of State Budget Officers (NASBO 1976) for data on balanced budget requirements in the states. Bohn and Inman (1996) conclude that end-of-the-year balance requirements have positive effects on state general fund surpluses, and that these surpluses are specifically accumulated through cuts in expenditures rather than increases in revenue (13–14).

Endersby and Towle (1997) examine data on all 50 states for the years 1988, 1990, and 1992 using both a pooled cross-sectional Ordinary Least Squares (OLS) and Generalized Least Squares model with state fixed effects (FEs). The observations are pooled due to the complexities of estimating panel models in the presence of heteroskedasticity and autocorrelation (87). The dependent variables are state expenditures per capita and state debt per capita, and the independent variable of interest is whether a state can carry over a deficit into the following fiscal year (1987–1988). Endersby and Towle obtained data on this balanced budget provision from *The Book of the States*, which is published by the Council of State Governments (CSG); CSG obtains its data from the *Budget Processes in the States* series published by NASBO. The authors incorporate numerous state-level political, institutional, and economic controls into the models. They find, contrary to expectations, that the "no deficit-carry over" rule has a statistically significant effect in increasing both state expenditures per capita and state debt per capita (93–96).

Chaney, Copley, and Stone (2002), meanwhile, study whether the "no deficit carry-over" provision has an effect on the "funded status" of state pension plans, as measured by "per capita excess (or deficit) of pension plan net assets available for pension benefits over pension benefit

1. Alt and Lowry (1994) obtained data on the "no deficit carry-over" provision from ACIR's (1989) publication, "Significant Features of Fiscal Federalism." They explicitly assume the presence of the law in each state to be fixed over time (817).

obligation (PBO)" (293–294). That is, the ratio of pension plans net assets to obligations on a per capita basis. Fund balance, long-term debt, bond rating, tax capacity, and employee characteristics serve as controls. Specifically, they analyze 48 states over the period 1994–1995 by way of a pooled cross-sectional OLS model, and they obtained data on whether each state has the requirement in place from Government Accountability Office's (GAO 1993) study. The authors find that state pension funding levels are inversely related with the presence of the "no deficit carry-over" rule (Chaney, Copley, and Stone 2002, 300).

Hou and Smith (2010) test the effects of the balanced budget rules identified by their (2006) content analysis of state statutes and constitutions on six measures of budgetary balance, ranging from broadest (total revenue minus total expenditures) to narrowest (general fund revenue minus general fund expenditures). They employ a probit estimator using data on the 50 states over time periods ranging from 1950–2004 to 1980–2004, depending on the availability of data on the dependent variable. Incorporating a wide array of political, institutional, demographic, and economic controls as well as unconditional state and year FEs, they find that balanced budget requirements exert a positive effect on the probability of achieving budgetary balance. They further find that technical rules, or those that that govern budgetary outcomes, exert a stronger and more highly statistically significant positive effect on the probability of a balanced budget than do political rules, or those that dictate the political process of assembling and approving the budget, and that more narrowly defined measures of balance are more likely affected by BBRs than are more broadly defined measures. They find no consistent statistically significant results that the distinction between constitutional and statutory rules offers explanatory power.

Finally, Mahdavi and Westerlund (2011) support the finding of Hou and Smith (2010) that BBRs exert their influence primarily on narrowly defined measures of budget balance, such as the difference between own-source general revenues and general direct expenditures. Further, they find that the "no deficit carry-over" rule as well as controls on supplementary appropriations are particularly effective (966).

In summary, prior empirical studies consistently find that balanced budget requirements reduce state expenditures and help balance the budget, whether at the beginning of the budget cycle or in the middle of the fiscal year. Another key finding is that more stringent rules (e.g., the "no deficit carry-over" rule) are more apt to constrain expenditures, and help in balancing budgets, than are other BBR provisions. Hou and Smith's (2006) classification of BBRs casts stringency as a distinction between whether a rule is technical in nature—that is, it governs budgetary outcomes—or political in nature—that is, it dictates the political process of assembling and approving the budget, and Calcagno and Escaleras (2007) and Hou and Smith (2010) find that technical rules are more likely to constrain spending than are political rules.

VARIABLES AND DATA

State Expenditures

Consistent with prior literature, we adopt a budgetary definition of balance to define expenditures: $B^* = R - E$, where B^* is balance, R is revenue, and E is expenditures. This approach is

also consistent with the legal language that governs balanced budget rules, which do not refer to the accounting basis of balance, where assets are equal to the sum of liabilities and fund balances or net position (Hou and Smith 2006). By this definition, balance requires that states constrain or reduce expenditures in order to avoid or reduce deficit. However, the *nature* of the spending restraint that is expected is not clear. This is especially true in light of the fact that state balanced budget requirements are largely silent or vague on what types and portions of state budgets are covered by these institutions (43), and there is direct evidence that numerous types of funds are bound by these provisions (GAO 1985, 1993). Notwithstanding the separate research question of precisely what must be balanced under a state's BBR system, it is widely accepted that these provisions bind current spending in some form, though there is no agreement on what form current spending takes. For example, Bohn and Inman (1996) frame their analysis around the assumption that BBRs apply only to state general funds, while von Hagen (1991) claims that BBRs exclusively bind operating budgets (200).

This study is the first to examine the effects of BBRs on three measures of expenditure to capture the comprehensiveness of state spending: dependent variables include total expenditures, "general" expenditures, and current operating expenditures, as defined below. One of the contributions of this paper is that it is the first to test the effects of BBR provisions on different categories of expenditure.[2]

The financial data used in this paper are published by the US Bureau of the Census. "General" expenditures include "all expenditure except that classified as utility, liquor store, or social insurance trust expenditure." Current operating expenditure is a much narrower classification, including "direct expenditure for compensation of own officers and employees and for supplies, materials, and contractual services except any amounts for capital outlay" (US Bureau of the Census 2007). Spending and other financial data are published annually as part of the *State Government Finances* series. Collected from government publications rather than by surveys of state officials, the Census Bureau's data on state government finances are the best available. The state expenditure data have been converted into constant 2005 dollars using the Implicit Price Deflator for state and local governments, which is published by the Bureau of Economic Analysis (BEA). To further facilitate statistical and substantive interpretation, expenditures are expressed in per-capita terms.

Balanced Budget Requirements

The measures of BBR provisions used in this paper are those developed by Hou and Smith (2006). They collected data for each of the 50 states on adoption and amendment years for all BBR provisions directly from state codes and constitutions. The Hou and Smith framework is the most comprehensive and systematic available, and one of the key contributions of this paper is that it is the first to use these measures to evaluate the impact of balanced budget rules on spending. The provisions are measured as a series of dummy variables, with "1" indicating that a

2. Bohn and Inman (1996) explore the effects of state balanced budget requirements on capital spending, but they do not report their preliminary results (48).

TABLE 1
State Balanced Budget Requirement Systems Provisions

1. The governor must submit a balanced budget.
2. Own-source revenue must match (meet or exceed) expenditures.
3. Own-source revenue and (unspecified) debt (or debt in anticipation of revenue) must match (meet or exceed) expenditures.
4. The legislature must pass a balanced budget.
5. A limit is in place on the amount of debt that may be assumed for the purpose of deficit reduction.
6. The governor must sign a balanced budget.
7. Controls are in place on supplementary appropriations.
8. Within-fiscal-year controls are in place to avoid deficit.
9. No deficit may be carried over into the next fiscal year (or biennium).

particular provision is in effect in a given state in a given year, and "0" denoting otherwise. The provisions that constitute states' balanced budget requirement systems are given in Table 1.

One of the provisions in the Hou and Smith framework, "Governor Must Sign a Balanced Budget," is dropped from this empirical analysis because it is rare and is embedded within the "Governor Must Submit a Balanced Budget" provision.[3] Table 2 gives the BBR provisions in place in each of the contiguous states as of 2004, as well as the year in which each state first adopted a constitutional or statutory rule.

There is no adoption pattern that we can discern, beyond that statutory provisions were largely adopted in the early- to mid-1900s, while constitutional provisions were mostly adopted in the late 1800s to the early 1900s. Additional descriptive statistics are given in Table 3.

We hypothesize that the following provisions identified by Hou and Smith[4] will have the effect of reducing state expenditures if statistically significant:

- The governor must submit a balanced budget (BBR 1).
- Own-source revenue must match (meet or exceed) expenditures (BBR 2).
- The legislature must pass a balanced budget (BBR 4).
- Controls are in place on supplementary appropriations (BBR 7).
- Within-fiscal-year controls are in place to avoid deficit (BBR 8).
- No deficit may be carried over into the next fiscal year (or biennium) (BBR 9).

3. This provision explicitly appears in the laws of just two states. The State of California adopted the provision as part of comprehensive, constitutional budgetary reform in 2004, while it was enacted into law in Massachusetts in 1998.

4. The provisions are numbered from BBR 1 to BBR 9 in order of where in the budget cycle they apply, from submission to implementation.

TABLE 2
Balanced Budget Requirements in the States as of 2004

State	Provisions	Constitutional adoption	Statutory adoption
Alabama	1, 3–5, 8, 9	1933	1932
Arizona	1, 3–5, 7–9	1911	1966
Arkansas	1, 4, 8	–	1955
California	1, 4, 6, 8	1966	1983
Colorado	1–5, 8	1876	1941
Connecticut	1, 3, 4, 7, 8	1992	1949
Delaware	3, 4, 7	1897	1935
Florida	1, 4, 8	1994	1969
Georgia	1–5, 7	1877	1962
Idaho	1, 2, 4, 8	1889	1929
Illinois	1, 3–5, 7	1970	1991
Indiana	3	1851	1979
Iowa	1, 3, 5	1846	1984
Kansas	3–5, 8	1859	1953
Kentucky	1–4, 7, 8	1891	1982
Louisiana	1, 4, 8	1974	1989
Maine	1, 3	1848	1954
Maryland	1, 4, 7	1916	–
Massachusetts	1, 3, 4, 6–8	1978	1941
Michigan	1, 3–5, 7, 8	1908	–
Minnesota	1, 3, 8	–	1939
Mississippi	1, 3–5, 8, 9	1890	1966
Missouri	1, 3, 5, 8	1875	–
Montana	1, 2, 4, 7–9	1889	1919
Nebraska	1, 3, 5, 8	1875	1921
Nevada	1, 3–5, 7	1864	1949
New Hampshire	1, 4, 7, 8	–	1957
New Jersey	1, 4, 7, 8	1844	1944
New Mexico	1, 3, 5	1978	1955
New York	1–4	1894	1992
North Carolina	1, 3, 4, 8, 9	1969	1929
Ohio	1, 3–5, 8	1851	1953
Oklahoma	1, 4, 7, 8	1907	1947
Oregon	1, 3, 4, 8	1859	1955
Pennsylvania	1, 4	1968	1991
Rhode Island	1, 3–5, 7, 8	1986	1935
South Carolina	1, 3–5, 9	1985	1932
South Dakota	1–5, 8	1889	1963
Tennessee	3, 5, 8	1870	1993
Texas	2–5, 8, 9	1876	1995
Utah	1–5, 8	1896	1969
Vermont	3	–	1993
Virginia	1, 3	1971	–
Washington	1, 8	–	1959
West Virginia	3, 4, 7	1872	–
Wisconsin	3–5, 7–9	1848	1971
Wyoming	5	–	1919

TABLE 3
Descriptive Statistics

	Mean	SD	Min.	Max.
Dependent variables				
Total expenditures (per capita)[a]	2,832.13	1,341.60	683.54	7,547.83
General expenditures (per capita)[a]	2,516.57	1,184.38	517.27	6,685.89
Operating expenditures (per capita)[a]	1,279.30	763.94	180.20	4,233.52
Balanced budget requirements				
Governor must submit a balanced budget	0.6	–	0	1
Own-source revenue must meet or exceed expenditures	0.132	–	0	1
Own-source revenue plus debt must meet or exceed expenditures	0.622	–	0	1
Legislature must pass a balanced budget	0.539	–	0	1
Limit on debt that may be assumed for deficit reduction	0.416	–	0	1
Controls on supplemental appropriations	0.269	–	0	1
Within-fiscal-year controls	0.409	–	0	1
No deficit carry-over	0.115	–	0	1
Political controls				
Governor is a republican	0.44	–	0	1
Republican majority in house	0.362	–	0	1
Republican majority in senate	0.389	–	0	1
Gubernatorial election year	0.298	–	0	1
Institutional controls				
Biennial budget cycle	0.484	–	0	1
Budget stabilization fund	0.317	–	0	1
Expenditure limitation	0.183	–	0	1
Revenue limitation	0.152	–	0	1
Education mandate	0.059	–	0	1
Fiscal controls				
Pct. own-source revenue from individual income tax	0.13	0.1	0	0.427
Pct. own-source revenue from corporate net income tax	0.039	0.028	0	0.186
Pct. own-source revenue from general sales tax	0.183	0.1	0	0.455
Pct. total revenue from federal government	0.221	0.058	0.074	0.508
Debt burden	0.073	0.052	0	0.290
Demographic and economic controls				
Population (in thousands)	4,561.729	4,879.104	162	35,893.8
Personal income (per capita)[a]	19,446.84	7,813.67	5,219.71	47,306.75

[a]In constant 2005 dollars.

Meanwhile, we hypothesize that the following will have zero or even a positive effect:

- Own-source revenue and (unspecified) debt (or debt in anticipation of revenue) must match (meet or exceed) expenditures (BBR 3).
- A limit is in place on the amount of debt that may be assumed for the purpose of deficit reduction (BBR 5).

The third provision (BBR 3), which allows for the use of debt in "balancing" the budget, effectively softens a state's budget constraint by increasing available resources and may encourage an increase in spending. The fifth provision (BBR 5), which places a limit on the amount of debt that may be assumed for the purpose of deficit reduction, may have the same effect, or at least may fail to constrain spending. One reason this may be the case is that these limitations can be so unrealistically low as not to be constraints at all. For instance, the limit in the State of Iowa is $250,000, $150,000 in Nebraska, and $200,000 in New Mexico. Another is that these limitations often define the debt limitation as a proportion of revenues or expenditures, which means the bigger the budget, the more debt allowable under the limit, and therefore the more fiscal slack available to increase spending (Hou and Smith 2006, 39–40). A third reason is that the debt instruments often used to finance deficits—such as tax anticipation notes—are contingent upon future tax collections, again creating current fiscal slack that may encourage an increase in spending.

Empirical Controls

State Politics. We include a number of political controls in the empirical model. Data on governors' political affiliation, state legislatures' partisan composition, and gubernatorial election years were obtained from the *The Book of the States* series, published by the CSG, for all 50 states over the time period 1950–2004. The data on state legislatures include those made available by Carl Klarner at the *State Politics and Policy Quarterly* Data Resource website,[5] while the data on gubernatorial partisanship and election years were verified using the National Governors' Association online database of the state governors.[6]

Prevailing theory (see Wildavsky 1985), empirical evidence (see Alt and Lowry 1994; Nice 1986) and common sense suggest that states governed by conservative policymakers tend toward lower expenditures as compared to those led by liberal policymakers. The omitted category or base group for the gubernatorial partisan affiliation variable is "Governor is Democratic." Likewise, "Democratic Majority in House" and "Democratic Majority in Senate" are the base groups for the legislative partisanship controls. Each of the political controls is measured as a dummy variable, with "1" indicating "yes" for Republican affiliation or majority and "0" denoting "no." In keeping with the theory of political business cycles (see Nordhaus 1975), we include a dummy indicating whether a gubernatorial election takes place in a given state at time t. It is hypothesized that state governors, controlling for partisan affiliation, have an incentive to increase expenditures during election years in an effort to achieve electoral victory for the party (whether or not he or she is a candidate).[7]

5. See http://www.ipsr.ku.edu/SPPQ/journal_datasets/klarner.shtml.

6. See http://www.nga.org/.

7. We tested multiple lags and leads for gubernatorial election year, but none yielded statistically significant or substantive results.

Institutions. Given that the aim of this study is to empirically estimate the independent effects of state balanced budget requirement systems provisions on fiscal outcomes, much attention was given to incorporating adequate controls for relevant budgetary and legal institutions. All of the data on institutional controls were collected for the years 1950–2004, and all institutional controls are dummies taking the value of "1" when a particular policy is in place in state *i* at time *t* and "0" otherwise.

Data on whether a state has a revenue or expenditure limitation (or both) in place in a given year were collected from Mullins and Wallin's (2004) study on tax and expenditure limitations (TELs). Their study offers an inventory of TELs in the states, including years of adoption. The adoption years were used to construct dummies indicating whether state *i* has a revenue or expenditure limitation in place at time *t*.

We include a dummy variable for whether a state's budgetary process is biennial or annual as a control for budget cycle periodicity. One empirical study (Kearns 1994) finds that "biennial budgeting exhibits a positive and statistically significant effect on state spending" (331). Data on whether a state has a biennial budgetary process were obtained from The National Conference of State Legislatures, which provides a database of adoption and re-adoption years we used to construct a dummy variable indicating whether state *i* has a biennial budget cycle in place at time *t*.[8]

Information on another fiscal institution, the budget stabilization fund, are available in Hou (2003), which reports years of adoption.[9] It is important to control for the presence of a BSF because Hou's empirical work demonstrates that they may have statistically significant and practically substantive empirical implications for state budgeting and finance. Specifically, Hou (2003) finds that the BSF "bolsters spending in lean years" (64), while Hou (2005) concludes that BSFs are states' primary countercyclical stabilizing tools and that they "exert positive effects on state own-source expenditure in downturn years" (117). The adoption years reported by Hou were used to construct a dummy variable indicating whether state *i* has a budget stabilization fund in place at time *t* (a BSF is not coded as existing until it has first achieved positive balance).

Finally, we control for court-mandated education finance reform at the state level, as this is a potentially important determinant of state expenditures. Specifically, we incorporate a measure of whether a state was mandated by the court to reform its education financing system to improve funding adequacy. Springer, Liu, and Guthrie (2009) report the years in which each state's education financing system was overturned on adequacy grounds, and these years were used to construct a dummy variable. This variable takes the value of "1" for state *i* in the year in which the court mandate was made, and all subsequent years, and "0" for each year prior to the mandate or if no mandate has been made.

8. The database is available online at: http://www.ncsl.org/programs/fiscal/annlbien.htm.

9. Because Hou's study was completed in the year 2002, the data were verified for the years 2003 and 2004.

State Fiscal Structure and Demographic/Economic Characteristics. Because the structure of a state's tax system could have important effects on state budgets and state economies, and each is unique in terms of its implications for spending, we control for the share of a state's own-source revenue from an individual income tax, a corporate net income tax, and a general sales tax. Data on states' primary revenue-raising mechanisms were collected from the *State Government Finances* series as well as the *State Government Tax Collections* series published by the US Bureau of the Census. We also control for state debt burden, measured as outstanding per-capita debt in state i and year t as a percentage of per-capita personal income. To capture intergovernmental revenue, we control for the share of state i's total revenue from the federal government in year t. Both debt and intergovernmental aid have the effect of enhancing the fiscal capacity of state governments and, therefore, both have the potential to increase expenditures. Debt further has potential to affect state expenditures because it entails repayment. The data on both of these variables were collected from the *State Government Finances* series.

Finally, we control for economic and demographic variables that have the potential to affect state-level expenditures. First, the population of each state (in thousands) in year t serves as a measure of the demand for government services as well as the size of its tax base. Negative coefficients on the population variable may indicate economies of scale. Second, real personal income per capita (base year 2005) for each state and year is a measure of fiscal capacity and economic output; it is expected that higher average income in a state is associated with higher expenditures, all else equal. The data on both population and real personal income were collected from the web site of the BEA. Time dummies control for additional exogenous events related to economic cycles (see Methodology Section below). Descriptive statistics for all variables, 1950–2004, are given in Table 3.

METHODOLOGY

This study employs an OLS fixed effects estimator with year dummies to control for both state- and year-invariant unobserved heterogeneity. This approach is common in the empirical literature on state budgetary institutions. Also in keeping with the empirical literature on state budgetary institutions, observations for the states of Alaska and Hawaii are dropped from the specifications due to their unique fiscal structures and historical contexts.

When using panel data, both heteroskedasticity and serial correlation are potential threats to estimating unbiased standard errors, thereby potentially rendering hypothesis tests invalid. The Breusch–Pagan/Cook–Weisberg test for both linear and nonlinear heteroskedasticity confirms that the estimated residuals are heteroskedastic, while results of the Wooldridge (2002) test confirm that they also are serially correlated.[10]

10. This test was conducted by regressing the residuals of each model on lagged residuals. A statistically significant p-value for the lagged residuals indicates the presence of an autoregressive process. This test is further described in Jeffrey M. Wooldridge's *Econometric Analysis of Cross Section and Panel Data* (2002), pp. 274–6.

OLS standard errors are biased *downward* in the presence of both heteroskedasticity and serial correlation.[11] The approach used in this study to address heteroskedasticity and serial correlation is to estimate the model using clustered robust standard errors. It has been shown in Monte Carlo simulations to yield standard errors that are fully robust to both heteroskedasticity and serial correlation (Bertrand, Duflo, and Mullainathan 2004; Petersen 2007). By clustering the standard errors on the panel identifier—states in this case—all forms of dependence among the disturbances are removed.

The empirical strategy in this study yields the following specification:

$$y_{it} = \alpha + \beta \mathbf{BBR}_{it} + \pi \mathbf{P}_{it} + \varphi \mathbf{I}_{it} + \gamma \mathbf{F}_{it} + \lambda \mathbf{E}_{it} + \delta_i + \tau_t + \varepsilon_{it}, t = 1, 2, \ldots, 55$$

where y_{it} is per capita total, general, or operating expenditures by state i at time t (in constant 2005 dollars); α is the constant; $\mathbf{BBR}_{it}$ is a vector of BBR provisions in place in state i at time t; $\mathbf{P}_{it}$ is a vector of political controls for state i at time t; $\mathbf{I}_{it}$ is a vector of institutional controls for state i at time t; $\mathbf{F}_{it}$ is a vector of fiscal controls for state i at time t; $\mathbf{E}_{it}$ is a vector of economic controls for state i at time t; δ_i are state fixed effects; τ_t are year dummies; and ε_{it} is the stochastic error term.

While we express the model above using state dummies, we actually estimate the model using the within transformation, whereby all the independent variables are time-demeaned. Tests for multicollinearity using time-demeaned data reveal a mean variance inflation factor (VIF) of just 4.35 for each of the specifications, with a maximum VIF of just 1.64 among the variables of interest. The higher average is driven by a high correlation between the real personal income variable and the time dummies, which is to be expected. Personal income has both a theoretical and statistically significant empirical relationship with all three measures of spending, and multicollinearity poses no threat of bias in the estimates of interest. Therefore, we retain personal income in the model.

RESULTS

The empirical results are presented in Tables 4 and 5. The coefficients on the BBR measures, where statistically significant, have the hypothesized relationship with spending. We also find, as expected, that the narrower the spending measure, the larger the influence of BBR provisions. Results for the balanced budget rules are first discussed, followed by those for the empirical controls.

11. One approach, proposed by Newey and West (1987) and later modified for easier computation by Wooldridge (1989), is especially well-suited for estimating standard errors that are robust to both heteroskedasticity and serial correlation when using time series data. Newey–West standard errors are the ideal solution when estimating single-cross-sectional time series models, especially since the Newey–West model is an OLS estimator, in that it models the disturbances with a specified maximum lag. However, Monte Carlo simulations have demonstrated that, when using panel data, Newey–West standard errors are slightly biased downward because the estimator does not completely account for the multiple cross-sections by which the data are structured (see Petersen 2007).

TABLE 4
Empirical Results: Balanced Budget Rules

Rule	(1) Total expenditures	(2) General expenditures	(3) Operating expenditures
BBR 1: Governor must submit a balanced budget	−165.1**	−129.3*	−93.74*
	(67.67)	(64.65)	(48.25)
BBR 2: Own-source revenue must meet or exceed expenditures	193.5	120.7	176.5
	(159.5)	(110.6)	(107.0)
BBR 3: Own-source revenue plus debt must meet or exceed expenditures	−6.273	131.1	−31.88
	(186.2)	(163.4)	(142.9)
BBR 4: Legislature must pass a balanced budget	33.34	21.00	26.07
	(86.91)	(75.53)	(63.63)
BBR 5: Limit on debt that may be assumed for deficit reduction	451.8**	239.0	274.5
	(209.3)	(190.0)	(165.8)
BBR 7: Controls on supplemental appropriations	−200.2**	−179.8*	−107.9*
	(98.49)	(89.50)	(63.47)
BBR 8: Within-fiscal-year controls	16.40	36.45	−8.958
	(80.30)	(67.22)	(50.59)
BBR 9: No deficit carry-over	−222.9*	−210.2*	−186.5**
	(128.3)	(110.6)	(82.75)
n	2,640	2,640	2,640
R^2	0.956	0.956	0.953
Number of states	48	48	48
Number of years	55	55	55
State fixed effects	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes

Note: Robust standard errors in parentheses.
*$p < 0.1$.
**$p < 0.05$.

Balanced Budget Requirements

The coefficient on the first provision, requiring that a governor submit a balanced budget, is statistically significant in all three specifications at the 10 percent level or better. Results indicate that in states with the requirement that a governor submit a balanced budget, total, general, and operating expenditures are on average $165.10, $129.30, and $93.74 per capita lower than in states without this rule in place. The coefficients are large enough to be of practical significance but not so large as to be unrealistic. In addition, they comport with the extant literature in that, as a fraction of the mean for each measure of spending, the magnitude is largest for operating expenditures, the most narrowly defined of the dependent variables. As a fraction of the mean,

TABLE 5
Empirical Results: Controls

Variable	(1) Total expenditures	(2) General expenditures	(3) Operating expenditures
Governor is a republican	−50.31**	−46.21**	−15.44
	(23.10)	(21.15)	(11.97)
Republican majority in house	23.21	26.28	14.20
	(46.22)	(38.40)	(27.55)
Republican majority in senate	−121.2***	−111.0***	−78.93***
	(38.72)	(36.53)	(27.70)
Gubernatorial election year	7.585	4.639	0.452
	(9.770)	(8.747)	(5.799)
Biennial budget cycle	212.7***	147.6**	57.75
	(67.76)	(62.92)	(44.71)
Budget stabilization fund	16.62	35.32	26.90
	(79.58)	(68.92)	(42.24)
Expenditure limitation	−71.02	−131.7*	−10.01
	(83.06)	(70.71)	(54.18)
Revenue limitation	−83.88	−76.38	−22.79
	(102.1)	(86.14)	(63.21)
Education mandate	70.57	63.72	−21.77
	(108.2)	(85.06)	(64.13)
Pct. own-source revenue from individual income tax	267.3	283.1	−154.3
	(654.1)	(566.0)	(434.9)
Pct. own-source revenue from corporate net income tax	−3,602**	−2,390**	−1,981**
	(1,485)	(1,171)	(838.6)
Pct. own-source revenue from general sales tax	−307.8	−81.30	−272.3
	(520.1)	(448.3)	(278.5)
Pct. total revenue from federal government	2,599***	2,458***	1,847***
	(747.7)	(677.5)	(388.8)
Debt burden	2,109**	2,015***	248.3
	(862.2)	(717.5)	(454.4)
Population (in thousands)	−0.0170	−0.0169	−0.0317**
	(0.0239)	(0.0226)	(0.0138)
Real personal income (per capita)	0.0521**	0.0421**	0.0341**
	(0.0236)	(0.0197)	(0.0135)
Constant	2,763***	2,438***	1,396***
	(895.7)	(735.4)	(503.0)
n	2,640	2,640	2,640
R^2	0.956	0.956	0.953
Number of states	48	48	48
Number of years	55	55	55
State fixed effects	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes

Note: Robust standard errors in parentheses.
*p < 0.1.
**p < 0.05.
***p < 0.01.

there is not a substantive difference in the effect on total and general expenditures, as the coefficients are just over $35 apart while the difference in means for these measures is just over $300.

The fifth provision, which institutes a limit on the amount of debt that may be assumed for deficit reduction, has a statistically significant and positive coefficient in the total expenditures specification. As discussed in a previous section on balanced budget requirements, this seemingly counterintuitive result can be anticipated. The coefficient on this provision indicates that states with it in place spend an average of $451.80 per capita more than those without it, suggesting that it is not a budget constraint. This finding is consistent with Hou and Smith (2010).

Results for the seventh rule, which applies controls on supplementary appropriations, follow a pattern that is similar to that for the first provision. The coefficient in the total spending model is statistically significant at the 5 percent level, while coefficients in the general and operating expenditures model are significant at the 10 percent level. This provision limits states' ability to "re-budget" and therefore places a strict constraint on spending. We find that the effects on expenditures are moderately larger (as a fraction of the dependent variable's mean), the more narrowly defined the measure of spending. The coefficients on this provision are slightly larger in magnitude in both absolute and relative terms as compared to BBR 1, in support of Hou and Smith's (2006) hypothesis and empirical evidence that technical requirements are more stringent than political constraints (see Calcagno and Escaleras 2007; Hou and Smith 2010; Mahdavi and Westerlund 2011). That is, rules that govern budgetary outcomes per se are more stringent than rules that dictate the political process of assembling and approving the budget. Results indicate that states with controls on supplementary appropriations in place reduce total, general, and operating per capita expenditures by an average of $200.20, $179.80, and $107.90, respectively.

Finally, the rule that traditionally has been considered the most stringent balanced budget provision—no deficit carry-over into the next fiscal year or biennium—has statistically significant and negative coefficients across the three specifications. Again, the coefficients follow the pattern of increasing relative magnitude as the dependent variable is more narrowly defined. The coefficients are statistically significant at the 10 percent level in the total and general expenditures models, while the coefficient in the operating expenditures model is significant at the 5 percent level. This finding is consistent with expectations since cutting operating expenditures is the most direct way a state can adhere to this rule. The average effect of this provision on per capita total, general, and operating state expenditures is a reduction of $222.90, $210.20, and $186.50, respectively.

To evaluate the robustness of our model and specifications, we interacted the political rule that we find to have a statistically significant effect on spending—the requirement that a governor submit a balanced budget—with other political and technical provisions that may intervene in a way that changes the provisions' effect(s) on spending. The unreported results of these interaction tests support the sign, significance, and magnitude of our estimates and, in keeping with our results and prior research, they follow the predicted pattern.[12]

12. These results are available upon request from the corresponding author.

Empirical Controls

The coefficients on the empirical control variables did not yield any surprising or counter-intuitive statistically significant results. Republican governors had the effect of reducing total and general expenditures over the sample period, as compared to Democratic governors, by an average of $50.31 and $46.21 per capita, respectively, while republican majorities in state senates had the effect of reducing total, general, and operating expenditures by an average of $121.20, $111, and $78.93 per capita, respectively.

States with a biennial budget cycle spent an average of $212.70 per capita more in total expenditures, and $147.60 in general expenditures. This finding is consistent with the findings by Kearns (1994). After controlling for other fiscal institutions, the expenditure limitation control has a coefficient that is negative and statistically significant (at the 10 percent level) for only general expenditures. The coefficients on the variables expected to increase states' fiscal capacity and spending—percent total revenue from the federal government and debt burden—are highly significant with large positive magnitudes for all spending measures. The only exception is the coefficient on debt burden in the operating expenditures specification, which is reasonable given that general debt is not expected to enhance operating funds. Finally, the coefficient on real per capita personal income is statistically significant in all specifications and has the expected positive sign.

CONCLUSION

This study provides the most comprehensive assessment to date on the effects of state balance budget requirement provisions on state spending. We have made four contributions to prior research. First, we use more detailed and accurate measures of BBRs developed by Hou and Smith (2006). Second, we include a comprehensive set of political, institutional, fiscal, and economic control variables in our specifications. Third, we employ three different measures of spending as dependent variables using more than a half-century of data (1950–2004). Finally, this study is the first in the relevant literature to use an econometric method that systematically mitigates heteroskedasticity and serial correlation.

We find that the following rules are effective in constraining state expenditures: (1) requiring that the governor submit a balanced budget (a political rule); (2) placing controls on supplemental appropriations (a technical rule); and (3) disallowing the carry-over of a deficit from one fiscal year or biennium into the next (a technical rule). The technical rules exert larger individual effects than the political rule. In addition, reductions in spending are greater, in relative terms, where expenditure is more narrowly defined.

These findings are quite relevant to the contemporary debate on state deficits and debt, particularly given that substantially reducing deficits through revenue increases is an unsuccessful strategy in a political environment in which there is no appetite for new or increased taxes. As states search for policy solutions for closing budget gaps, they can constrain expenditures by applying rules to the beginning, middle, and end of the budget cycle, which

coincide with the rules that we find to be effective. All else equal, they can best improve their prospects of reigning in spending by instituting technical rules that govern budgetary outcomes, as opposed to political rules that dictate how the budget is assembled and approved. Stringency is not defined by the extent to which a balanced budget requirement is insulated from future amendment, but rather by the extent to which it dictates the end result. By disallowing "re-budgeting" and the carry-over of deficits, states can curtail spending to a degree that is not only statistically significant but also is practically significant.

Balanced budget requirements are not without their unintended consequences, however. For instance, placing a limit on the amount of debt that may be assumed for deficit reduction can increase expenditures, all else equal. We sketch out three reasons this unintended consequence may obtain. Moreover, instrumental policy goals do not necessarily align with substantive policy goals. While balanced budget requirements can be effective tools for fiscal restraint, cutting expenditures (an instrumental goal) may be at odds with substantive goals, such as educating children or insuring the poor. Policymakers must carefully weigh these tradeoffs when deciding whether to implement balanced budget requirements.

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