Dividing the Pie: Parties, Institutional Limits, and State Budget Trade-Offs

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Abstract

Although many studies on budgetary outcomes of state politics focus on budget sizes, budget trade-off studies focus on budget composition. This study examines the role of state politics in explaining budget trade-offs. We apply Peterson's typology to analyze budget trade-offs among developmental, allocational, redistributive, and educational expenditures. We focus on the roles of partisan and ideological factors and their interactive effects with institutional limits. Results show that politics matters. The Democratic Party and liberal citizen ideology increase state spending in redistribution relative to other categories, while the Republican Party shifts state budgets toward developmental spending. Partisan effects increase when tax and expenditure limits become less restrictive. Using more recent data and improved measurements, this study explains trade-offs among theoretically meaningful expenditure categories with a comprehensive model while providing a test of Peterson's typology.

Keywords

budget trade-off, state spending, budget priority

Budget trade-offs are a critically important topic because they reflect the relative priority given to different areas of government activity (Jacoby and Schneider 2001). Within a fixed budget, committing more funding to education means less is available to fund health programs. Giving greater attention to parks might mean giving less attention to highways. As Aaron Wildavsky (1979, 2) put it, "Since funds are limited and have to be divided in one way or another, the budget becomes a mechanism for

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making choices among alternative expenditures." Although public policy certainly involves much more than spending, the priorities that are set in expenditures, reflected in budget shares, offer important insights into the importance of different governmental functions and services.

As budgetary resources are scarce relative to the demands for government expenditure, budget or expenditure trade-offs are common, if not universal, in the budget policymaking process. According to Garand and Hendrick (1991, 917),

> an expenditure tradeoff is defined as a systematic pattern of direct shifts in spending priorities from one spending category to another, implying a pattern of decisions to accept lower relative spending levels in one or more specific expenditure areas in order to fund higher relative spending levels in another expenditure area.

This pattern of trade-offs can result from either incremental or nonincremental processes. There also can be complementary change, which means the simultaneous increase or decrease in the expenditures of multiple categories. Nonetheless, scholars have given more attention to trade-offs than to complementary changes.

The existing literature on state budget trade-offs varies in the measurement of trade-offs and offers limited explanations for why trade-offs differ over time across states. Prior studies usually focus on four main categories of state expenditure as reported by the Census Bureau, including education, highways, welfare, and health (Hendrick and Garand 1991; Nicholson-Crotty, Theobald, and Wood 2006). As one exception, Lipsmeyer et al. (2017) focus on all state expenditure categories by reclassifying them into five groups partly based on relative sizes. Moreover, efforts to explain state budget trade-offs have generated limited success. For example, Hendrick and Garand (1991, 295) acknowledge that "a clear explanation of trade-off behavior across states is somewhat illusive." More recently, Lipsmeyer et al. (2017) focus more on methodological demonstrations than substantive explanations of state budget trade-offs.

In this study, we focus on all the categories of state expenditure. We examine budget trade-offs among theoretically meaningful categories instead of categories used for the purpose of financial reporting. Specifically, in categorizing state expenditures, we apply the theoretical framework of Peterson (1981) that government expenditure consists of developmental, allocational, redistributive, and educational spending. We measure budget trade-offs with log-ratio transformation as originated by Aitchison (1982) and demonstrated by Philips, Rutherford, and Whitten (2016) and Lipsmeyer et al. (2017). This measure has the advantage of capturing the correlations among multiple budget trade-offs. To explain budget trade-offs, we focus on partisan and ideological factors and how they interact with institutional limits. As a preview, we find that Republican Party control shifts budget trade-offs toward developmental spending, while Democratic Party control and liberal citizen ideology shift budget trade-offs toward redistributive spending. The partisan effects become stronger when tax and expenditure limits (TELs) become weaker.

As Lasswell (1936) defines, politics is about "who gets what, when, how." If budget trade-offs show "who gets what," examining the role of partisan factors and institutional

limits helps answer the question of "when" and "how" by showing the roles played by political elites and the conditions under which they make a difference. More specifically, we make three contributions to the literature on state budget trade-offs. First, only one study has examined budget trade-offs that cover 100% of state expenditures (Lipsmeyer et al. 2017). Excluding certain expenditure categories may lead to biased results because trade-offs among all expenditure categories are made simultaneously. Although Lipsmeyer et al. (2017) focus on all state expenditure categories, they reclassify them without theoretical motivation. In contrast, we apply Peterson's (1981) typology of public policy in the reclassification. Examining budget trade-offs among theoretically driven expenditure categories can generate better insights than focusing on accounting categories only. For example, while the extant literature has shown that the Democratic Party tends to increase welfare or redistributive spending, this study further shows that this effect holds in the budget trade-offs between redistributive spending and others. Second, we focus on the role of politics and its interactive effects with institutional limits in explaining budget trade-offs, generating results consistent with expectation. The model is more comprehensive than existing studies on budget trade-offs and provides a distinct test of budgetary impacts of state politics by focusing on budget trade-offs as an outcome variable. Third, in the empirical analysis, we utilize more recent data to examine state budget trade-offs in a substantively different period (1982–2010) than was used in prior studies. At a minimum, this enhances the external validity of previous findings on state budget trade-offs.

Characterizing State Budget Trade-Offs

Scholars have given considerable attention to budgetary trade-offs, typically framed as the trade-off between "guns" and "butter" (Mintz 1989; Mintz and Huang 1991) at the federal level. In contrast, researchers have given quite limited attention to the relationships among different expenditure categories of state governments. This is surprising as state governments generally face more constraints in the budgeting process than the federal government (Garand and Hendrick 1991) and thus budget trade-offs are more likely to be inevitable. For example, while the federal government can deficit spend and has increased the debt ceilings many times over the decades, state governments are constrained in their borrowing by balanced budget requirements (BBR), institutional debt limits, and the municipal bond market. On the contrary, the asymmetry of research efforts is understandable in that it is more challenging to model the expenditure trade-offs of multiple spending categories at the state level as compared with the trade-off between two broad categories like foreign and domestic spending at the federal level.

The existing studies of state expenditure trade-offs show a path of improvements in theory, modeling, and measurement. Garand and Hendrick (1991) conducted a longitudinal test of the expenditure trade-offs in the American states with data between 1948 and 1984. They construct a measure of expenditure trade-offs in three steps. First, they use the change of state expenditures divided by total state personal income to measure the change in the share of spending in a particular category. In other words,

they analyze the share of state economic output committed to public spending in a particular category. They focus on four spending categories, including highways, education, welfare, and health and hospitals. Second, they regress the change in the share of spending in one category on the other three measures and some exogenous control variables. They do this serially. If a coefficient is negative and statistically significant, then they infer that there is expenditure trade-off between the spending category measured by dependent variable and the spending category measured by the respective independent variable. For four categories and 50 states, there are 200 equations in total. Third, they show the distribution of the coefficients and take negative ones as evidence for the existence of expenditure trade-offs.

One drawback of this treatment of expenditure trade-offs is that researchers have to separate longitudinal analysis and pooled analysis because the regression coefficients themselves do not vary over time. Hendrick and Garand (1991) use the trade-off coefficients from Garand and Hendrick (1991) as dependent variables to conduct a pooled analysis. Although the longitudinal analysis characterizes the expenditure trade-offs over time, the focus of the cross-sectional analysis is to explain their patterns across states. Using the average of several explanatory variables in the cross-sectional analysis reduces the statistical power substantially and muddles the connections over time. For example, they use the mean of per capita income over the time period in their study to predict trade-offs that are estimated over time.

Berry and Lowery (1990) offer two major criticisms of the approach used by Garand and Hendrick's (1991) in conceptualizing and measuring expenditure trade-offs. Berry and Lowery identified it as "regressing one category on the other" and complained that, even when it works, it only describes the magnitude of an expenditure trade-off without showing the policymaking process generating it. Moreover, Berry (1986) shows that there is a structural relationship within the equation system which may lead to negative coefficients even when no trade-offs occur. Besides, it does not make theoretical sense to control for the exogenous variables when estimating the trade-off coefficients. In reality, state policy makers are engaged in budget trade-offs under the influence of both endogenous and exogenous variables. In other words, the factors they may or may not control can equally affect such decisions. When teasing out the exogenous variables, the equation system omits a significant aspect of expenditure trade-offs in policy making.

Berry and Lowery (1990) propose an alternative way to measure state expenditure trade-offs. They reconceptualize expenditure trade-offs by focusing on the budgeting process and distinguishing fixed-pool trade-offs and floating-pool trade-offs. Berry and Lowery (1990, 674) define the fixed pool as "an amount of money determined earlier in the process" and the floating pool as "decision makers determine the size of the overall pool at the same time that the pool is divided between categories A and B." Although Berry and Lowery demonstrate the application of their new measure of expenditure trade-offs with the case of federal budgeting, Nicholson-Crotty, Theobald, and Wood (2006) test this framework with state budgeting data. In both studies, they measure budget trade-offs with a formula to capture relative changes in two expenditure categories. One disadvantage of this measure is that, by focusing on budget

trade-offs between two categories at a time, it fails to account for potential budget trade-offs among other expenditure categories.

Framing budget trade-offs as "dynamic pie," Philips, Rutherford, and Whitten (2016) treat budget trade-offs as compositional dependent variables. State expenditures of multiple categories add up to 100% of total spending, and thus constitute one type of compositional data. Statistically, Aitchison (1982) proposes to use log-ratio transformations to analyze compositional data. Philips, Rutherford, and Whitten (2016) demonstrate the use of log-ratio transformations with federal budget trade-offs. Lipsmeyer et al. (2017) extends the same approach to state budget trade-offs. One advantage of this approach is that it allows researchers to model each pairwise budget trade-off between expenditure categories while accounting for the simultaneity of multiple trade-offs.

In addition, the studies on budget trade-offs differ on what trade-offs they explain. First, except for Lipsmeyer et al. (2017), previous studies have focused on trade-offs among several large state expenditure categories rather than all of them. This may be problematic because the budget trade-offs among the modeled expenditure categories may be correlated with those excluded from the model. Second, all the previous studies have focused on the functional areas as reported by the Census Bureau or lump small expenditure categories together. Nonetheless, the functional areas used for financial reporting do not necessarily overlap with the theoretically or practically relevant components of budget trade-offs. Moreover, Philips, Rutherford, and Whitten (2016) and Lipsmeyer et al. (2017) lump several expenditure categories together into a category of "other" because of their relatively small sizes. For example, the "other" category in Lipsmeyer et al. (2017) includes state interest payments on debts and expenditure on liquor stores. Although small, this "other" category can include distinct expenditure items. It is unclear how inferences can be drawn between such a coherent expenditure category as education and the potentially heterogeneous "other" category. Like improved measurements, using theoretical motivation to reclassify expenditure categories may improve the predictive power of models to explain budget trade-offs.

Following Philips, Rutherford, and Whitten (2016) and Lipsmeyer et al. (2017), we use the log-ratio method to measure budget trade-offs. We deviate from previous studies two ways. First, we focus on budget trade-offs among expenditure categories that are classified as motivated by Peterson's (1981) typology of public policy. Second, we explain budget trade-offs with more comprehensive independent variables based on more recent data. We focus on the role of politics and its interaction with institutional rules, in which extant studies have been limited.

Party, Ideology, and Budget Trade-Offs

Many studies on budgetary outcomes of state politics have focused on the size of government spending, revenue, or deficits as outcome variables (Alt and Lowry 1994; 2000; Krause and Melusky 2012; Poterba 1994). The focus shifts to the *composition* of state spending, however, in the studies of state budget priorities (e.g., Jacoby and Schneider 2001) and budget trade-offs. Changes in total budgets can differ from that

in the composition of budgets in many ways. Thus, it remains a theoretically and empirically distinct question whether politics would influence budget trade-offs the same way as it influences the size of budgets.

Specifically, the literature on budget trade-offs has shown mixed results for the impacts of politics. Although the earlier studies find little effects of partisan and ideological variables, more recent studies find some partisan effects consistent with expectation. On one hand, Berry and Lowery (1990) find that politics plays little role in the trade-off between domestic and defense spending at the federal level. Hendrick and Garand (1991, 308) conclude that "across-the-board ideological positions or party stability may not be as important to tradeoffs as the strategic positions of actors and environmental factors within each policy area." On the other hand, Nicholson-Crotty, Theobald, and Wood (2006) find that citizen liberalism increases state redistributive spending in welfare and health relative to highways and education. Lipsmeyer et al. (2017) find that Democratic governors shift state spending toward social services including welfare, heath, and hospital, while Republican governors shift state spending toward education. The differences in these findings might result from improved measurements of budget trade-offs in more recent studies.

In this study, we classify state expenditure categories based on the typology developed by Paul Peterson (1981) in *City Limits*. In his seminal work, Peterson (1981) divides city policy into three arenas, including developmental policies, redistributive policies, and allocational policies. Developmental policies enhance the economy, while redistributive policies benefits the low income, occasionally at the expense of economic growth. Allocational policies are in the middle with neutral economic effects. Although Peterson's (1981) typology of public policy has been tested at the state level (Hwang and Gray 1991), it has not yet been applied to state budget trade-offs.[1]

Per Peterson (1981), each policy arena corresponds to government expenditures in the functional areas as defined by the Census Bureau. Developmental policies correspond to government spending in highways, and parks and natural resources. These public services are usually funded with user charges or fees. Redistributive policies correspond to government spending in welfare, health, and hospital. These expenditures represent redistribution from the wealthy to the poor. Allocational policies correspond to government spending in government administration, law enforcement, and corrections. They represent the "housekeeping" services of governments, without benefiting particularly the wealthy or the poor. One exception is education, which is more redistributive than allocational policies but less so than redistributive policies. Peterson (1981) acknowledges that education may fit none of these three policy arenas and treats it as an independent category.

Governmental spending in each policy arena is subject to different dynamics of politics. As Peterson (1981, 41) puts it, "just as policies have varying economic consequences, so they are produced by different economic and political conditions." Particularly, parties have differential preferences over government expenditures in each policy arena. In general, Republicans prefer developmental spending because it is pro-business and promotes economic development. Democrats prefer redistributive spending because it benefits the poor, or its core constituencies.

For partisan preferences to translate into concrete policy choices, it must influence state expenditures in those policy areas. Indeed, existing studies show that Democratic Party spends more on redistributive programs (Barrilleaux, Holbrook, and Langer 2002; Nicholson-Crotty, Theobald, and Wood 2006). Although this tests the budgetary outcomes of partisan preferences, focusing on budget trade-offs as outcome variables can provide a stronger test. For example, the money spent on redistributive policies may come from increases in total revenues or reductions of spending in other expenditure categories while holding revenues constant. Partisan effects are stronger in the latter case because it represents an explicit trade-off between two competing spending categories.

This study examines whether partisan factors influence state budget trade-offs as the sizes of budgets. Based on Peterson's (1981) typology and previous empirical findings, one may predict the partisan effects on budget trade-offs among government expenditures of different categories. Specifically, the Republican Party prefers developmental spending over other spending categories; the Democratic Party prefers redistributive spending over other spending categories. Although these partisan preferences are generally unobservable, they should manifest themselves in the budget trade-offs when a party has unified control of state governments. Thus, the first hypothesis follows:

> **Hypothesis 1 (Party Hypothesis):** Republican Party drives budget trade-offs to developmental spending from redistributive, allocational, and educational spending. Democratic Party shifts budget trade-offs to redistributive spending from developmental, allocational, and educational spending.

Similar to the partisan effects, ideology of government (office holder) and citizens can have differential impacts on budget trade-offs. Assuming that state governments are response to citizen policy preferences, impacts of citizen ideology on policy choices should be reflected in budget trade-offs. Indeed, Nicholson-Crotty, Theobald, and Wood (2006) find that citizen liberalism increases state redistributive spending relative to other expenditures. Specifically, compared with government spending in other areas, liberal ideology may increase redistributive spending and conservative ideology may increase developmental spending (Nicholson-Crotty 2015).The second hypothesis follows:

> **Hypothesis 2 (Ideology Hypothesis):** Conservative ideology moves budget trade-offs to developmental spending from redistributive, allocational, and educational spending. Liberal ideology moves budget trade-offs to redistributive spending from developmental, allocational, and educational spending.

Partisan effects on budget trade-offs may not be unconditional. Partisan factors influence budget trade-offs to the extent that parties have certain leeway in allocating budget resources. When the leeway of budget allocation varies, the partisan effects on budget trade-offs can change. When the leeway of budget allocation is high, it is more likely for parties to make budget trade-offs as they prefer. When the leeway of budget allocation decreases, they may suppress their own preferences to make "hard"

choices. For example, budgeting incrementalism (Davis et al. 1966) suggests that decision makers are much constrained by choices made in the past budgeting periods and can only make incremental changes at a time. Consequently, partisan effects on budget trade-offs should become larger when parties have more freedom to make budget allocations.

Many factors, especially institutional limits, can determine the degree of freedom of budget allocation. TELs are a key institutional factor. By limiting policy options on the revenue and expenditure sides, TELs reduce the leeway that parties may have in allocating budgets. When TELs are less stringent, parties should have more resources in control to allocate to their favored policy areas. When parties are constrained by more stringent TELs, however, they may have little to no "free" resources to allocate to their desired budget priorities but must do whatever feasible to balance the budgets. In one extreme, TELs may trump partisan preferences in shaping budget trade-offs. Thus, the third hypothesis follows:

> **Hypothesis 3 (Conditional Party Hypothesis):** Impacts of government partisan control on budget trade-offs are larger when TEL restrictiveness is low and are smaller when TEL restrictiveness is high.

Method and Model

Econometric Method

The empirical analysis focuses on state spending in development, allocation, redistribution, and education, which represent all government expenditures in a year. We model the budget trade-offs for each pair of the four categories, resulting in six pairs. Budget trade-offs for each pair can be correlated with those for others because the budgeting decisions are likely to be made simultaneously. Consistent with Philips, Rutherford, and Whitten (2016) and Lipsmeyer et al. (2017), we construct log ratios of state expenditure categories to measure budget trade-offs. As Philips, Rutherford, and Whitten (2016) show, this method is invariant with the choices of base categories. It takes two steps to construct the measure. First, we take the ratio between state expenditure in two categories, for example, education and development. Second, we take the natural log of that ratio. We do so for each of the six pairs of budget trade-offs.

For compositional data with log-ratio transformation, Tomz, Tucker, and Wittenberg (2002) demonstrate that seemingly unrelated regression (SUR) is "an easy and accurate regression model." Philips, Rutherford, and Whitten (2016) and Lipsmeyer et al. (2017) estimate the equations for budget trade-offs using SUR. Consistent with these studies, we use the SUR as the method of estimation. The benefit of the SUR is that it accounts for the residual correlation across equations by estimating a system of equations simultaneously. There are six equations in that system, each representing budget trade-offs for a pair of spending categories.

We take a one-year lag for each independent variable in the model for two considerations. One is that the dependent variable is constructed from fiscal variables, which are measured for the fiscal year, while the nonfiscal independent variables are

measured for the calendar year. A one-year lag exists between calendar year and fiscal year. Another is that this can partly address the endogeneity concern of fiscal independent variables when they are also measured in the fiscal year. Assuming that causality moves forward in time, taking one-year lag reduces the concerns of reverse causality between such independent variables as own source revenue and the dependent variable of budget trade-offs.

Furthermore, we include both state and year fixed effects in each equation. The state fixed effects are to account for time-invariant, unobservable factors that may influence budget trade-offs. For example, southern and nonsouthern states may have different dynamics of party politics and thus heterogeneous impacts on budget trade-offs. As states did not change their status of being southern or not in the period of study, this heterogeneity can be controlled by state fixed effects. The year fixed effects can account for unmeasured factors that influence all the states in a year. Inclusion of state and year fixed effects make the estimates more precise.

Model Specification

Conceptually, we can divide all the potential factors affecting state budget trade-offs in three broad groups: preferences, resources, and constraints. First, preferences are what budget decision-makers and citizens subjectively prefer to do when allocating budgets to competing expenditure categories. We measure preferences indirectly by controlling for the party affiliations and ideology of budget decision-makers and/or citizens.

Second, resources are the budget pool that state budget decision-makers can allocate to multiple expenditure categories. Generally, states have full decision control of their own source revenues and usually receive federal grants as a supplement. Both the size and composition of the resources can affect state budget trade-offs. A larger budget resource can leave more room for state budget decision-makers to spend in the direction that their preferences dictate. A smaller size of budget resources, however, is more likely to lead to hard budget trade-offs. When the proportion of state own revenue in the total budget pool increases, policy makers have more discretion to spend on whatever they prefer. In addition to the uncertainty embedded in the grants from another level of government, this is particularly true as there are generally conditions on spending categories associated with federal grants (U.S. General Accounting Office 1996).

Third, constraints consist of three subcategories: institutional, fiscal, and demand for government expenditure. Institutional constraints are formal or informal rules that may determine the capacity or necessity for state policy-makers to make budget trade-offs. Fiscal constraints show the boundary of budget resources that state policy-makers may draw on. For example, the total private wealth is the broad base from which a state may extract its own source revenues. Economic conditions, such as booms and recessions, can affect either the spending or the revenue side of the state budget. Demand for state government expenditures is naturally a constraint factor that state budget decision-makers have to meet. In one sense, state governments are created to meet citizen demands for public goods and services in multiple functional areas. Budget trade-offs are inevitable when the citizen demand exceeds the budgetary resources.

Consistent with our conceptual framework of preferences, resources, and constraints, we have three groups of explanatory variables in our model. First, we include a set of political factors as proxies for policy preference of stakeholders in the state budget process. The key independent variables of interests include those that measure party affiliations and ideologies of various stakeholders. To test the first hypothesis, we include two dummy variables indicating unified partisan control of state governments by Democratic Party and Republican Party. We also include a dummy indicating party affiliations of governors. To test the second hypothesis, we include indexes of both citizen and government ideology.

Furthermore, we control for several more variables to model the dynamic environments in which political preferences influence budget trade-offs. According to Hendrick and Garand (1991), the power of governors in the budgeting process may matter for expenditure trade-offs. This can be framed as the level of centralization of power in budget decision-making. The more centralized it is, the more likely it is for hard budget trade-offs to happen because it is easier to coordinate competing demands from multiple directions. As gubernatorial power alone may not lead to expenditure trade-offs in one direction or another, we interact it with the party of governors to account for the policy preference of governors when exercising their power. We include a dummy indicating the existence of gubernatorial term limits in a state. Alt, Bueno de Mesquita, and Rose (2011) find both accountability and competence effects of gubernatorial term limits. Term-limited yet reelection-eligible governors have stronger incentives to make costly efforts on behalf of voters, while term-limited reelection-ineligible governors show higher levels of competence. This implies that term limits may induce governors to shift budget trade-offs in the way to maximize electoral successes or as a manifestation of their improved competence.

Legislative professionalism measures the capacity of state legislatures to process information in making budgeting decisions, and thus may render difficult budget trade-offs more manageable. Given that it takes more budgetary resources to finance a more professional legislature, legislative professionalism may shift budget trade-offs toward allocational spending which includes expenditures on government administration. In the same spirit, we account for two distinct types of political competition, including government competition and electoral competition (Shufeldt and Flavin 2012). Government competition refers to interparty competition of government partisan control; electoral competition captures competition in district-level state legislative elections. Previous studies suggest that government competition increases welfare spending by driving both Democratic and Republican politicians to reach out to otherwise excluded voters who would come from disadvantaged segments of society (Dawson and Robinson 1963). This implies that government competition should increase redistributive spending relative to other expenditures. Moreover, Barrilleaux, Holbrook, and Langer (2002) find that Democratic Party increases state welfare spending more when electoral competition becomes stronger. They argue that more closely contested legislative elections make parties more responsive to the demands of their core constituencies. This suggests that stronger electoral competition may shift budget trade-offs to the spending categories where parties are most likely to

maximize likelihood of electoral successes. These can be either redistributive spending for the Democratic Party or developmental spending for the Republican Party.

Second, we control for both state own source revenues and federal grants by expenditure category to capture the total size of budget resource state budget decision-makers have. Although states are more constrained in spending than the federal government, they can increase the size of the budget. In fact, if we look at state budgets over time, we can see that they have grown substantially. State government revenues increased from $1.26 trillion in 2000 to $1.71 trillion in 2013. State revenues grow in response to economic growth, inflation, tax and fee increases, and increases in federal grants. Also, states can circumvent the balanced budget constraints by increasing capital spending. The decisions to transfer funds and increase debt can happen at the same time that state policy makers decide how to divide money across different categories. For example, in response to the onset of the Great Recession, 30 states increased taxes in the first six months of 2009 (Johnson, Nicholas, and Pennington 2009). According to the Campaign for Tobacco Free Kids, 48 states passed 135 cigarette tax increases from 2000 to 2017 (Boonn 2017).

Specifically, we include the total annual state own source revenues. Moreover, as shown by Nicholson-Crotty, Theobald, and Wood (2006), federal grants matter for state budget trade-offs. Hence, the amount of federal dollars going to each of the four categories is included. Nicholson-Crotty, Theobald, and Wood (2006, 315) expect that "for any two program categories A and B, an increase in federal grant support for A relative to B will result in an increase in a state's (own-source) spending for A relative to B." Not surprisingly, they base this argument on the so-called flypaper effect, meaning that federal money sticks to where it hits—state governments increase their spending because the relative price is reduced by federal dollars. Although the evidence for the flypaper effect is strong in the literature (Hines and Thaler 1995), the case is different here since the expenditure categories are highly aggregated. It could be that, for some proportion of the spending in a given category, the crowding out of state money by federal money overwhelms the flypaper effect. Therefore, the expected signs of the federal grant variables are ambiguous.

Third, we include the institutional limits, fiscal constraints, and citizen demand for service to model the constraints faced by state budget decision-makers. We control for several variables measuring the institutional features of state government that are relevant to budget trade-offs. We include an index measuring the restrictiveness of state TEL. Poterba (1994) finds that stricter state TELs are associated with faster fiscal adjustments to unexpected budget deficits. More generally, TELs can increase the necessity of hard budget trade-offs and reduce the room for discretion by decision makers. To test the third hypothesis that partisan effects on budget trade-offs depend on TEL restrictiveness, we interact the two dummies of government partisan control with the variable of TEL.

Similarly, we control for an index of state BBR. Like TEL, BBR may make budget trade-offs more likely to happen. In addition, we account for a critical feature of state budgeting processes, an index of fiscal transparency developed by Alt, Lassen, and Rose (2006). Alt, Lassen, and Skilling (2002) find that state fiscal transparency increases

government sizes. They suggest that fiscal transparency induces greater efforts by policy makers and higher levels of voter approval. If so, fiscal transparency may also influence budget trade-offs as an alternative outcome of increasing policymaking efforts. Moreover, we account for whether a state passes an annual or biennial budget. States with annual budgeting are more flexible and responsive to economic and political fluctuations. Kearns (1994) finds that states with biennial budgeting spend more than those with annual budgeting. Whether budgeting periodicity influences the composition of state spending remains to be empirically tested.

For the variables in the group of fiscal constraints, we include state gross domestic product (GDP) per capita, unemployment rate, and state grants to local government. State GDP per capita indicates the level of resources available for state government to extract. Compared with wealthier states, the states with lower level of GDP may often face harder budget trade-offs. Unemployment rate captures how economic cycles affect state budgets. States have to cut spending on one category or another when the total size of budget resource shrinks when the unemployment rate is high. Moreover, citizen demand for such government services as welfare may increase at the same time. State grants to local governments may influence state budget trade-offs in different ways. On one hand, more intergovernmental payments mean tighter budget constraints for state governments, and thus harder trade-offs must be made. On the other hand, more grants to local governments may reduce pressure for states to spend more directly in the same policy area, as it effectively represents spending in that area. In addition, state grants to local governments may come from federal grants to states, which do not necessarily reduce state budget sizes. Therefore, it is not clear to what extent state grants to local governments constrain state budgets.

Last but not least, we control for the variables that indicate citizen demand for state expenditure by category. The rationale is that a higher level of demand will increase government spending in that category and produce a trade-off with other spending categories, assuming state government is responsive. We first find a proxy for the level of citizen demand for government spending in each of the nine functional areas as reported by Census Bureau. We then aggregate them up to indicate citizen demand for developmental spending, redistributive spending, allocational spending, and educational spending. We use a sample of state expenditure between 1982 and 2010. We provide a detailed description of variable measurements and data sources in the Supplemental Appendix 1.

Results

The results for the six equations are shown in Table 1. In each column, the dependent variable is budget trade-off between two categories of government expenditures measured as log ratios. For each independent variable, a positive coefficient means that one unit change increases government expenditures in the category denoted in the numerator relative to that in the denominator; a negative coefficient means that one unit change increases government expenditures in the category denoted in the denominator relative to that in the numerator.

Table 1. Factors Explaining State Budget Trade-Offs (1982–2010).

Variables	(1) Education development	(2) Education allocation	(3) Education redistribution	(4) Development allocation	(5) Development redistribution	(6) Allocation redistribution
Preferences						
Democratic governor	0.032	0.011	0.007	−0.021	−0.025	−0.004
	(0.038)	(0.031)	(0.028)	(0.039)	(0.039)	(0.031)
Democratic Governor × Gubernatorial Power	−0.017*	−0.008	−0.007	0.009	0.010	0.002
	(0.010)	(0.008)	(0.007)	(0.010)	(0.010)	(0.008)
Democratic control	0.059***	0.066***	0.000	0.008	−0.058**	−0.066***
	(0.022)	(0.018)	(0.017)	(0.023)	(0.023)	(0.018)
Democratic Control × TEL	−0.001	−0.003**	0.000	−0.002	0.001	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Republican control	−0.045*	−0.114***	−0.068***	−0.069***	−0.023	0.047**
	(0.024)	(0.020)	(0.018)	(0.025)	(0.025)	(0.020)
Republican Control × TEL	−0.001	0.005***	0.000	0.006***	0.001	−0.005***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
Government liberalism	−0.000	−0.001	−0.001	−0.001	−0.001	0.000
	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)
Citizen liberalism	0.001	0.002***	−0.001	0.001	−0.002*	−0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Gubernatorial power	0.006	0.014*	0.037***	0.009	0.031***	0.022***
	(0.009)	(0.008)	(0.007)	(0.009)	(0.010)	(0.008)
Term limit	0.026	−0.028*	0.063***	−0.054***	0.036*	0.090***
	(0.019)	(0.016)	(0.015)	(0.020)	(0.020)	(0.016)
Legislative professionalism	0.165	−0.302***	0.088	−0.467***	−0.077	0.390***
	(0.109)	(0.091)	(0.082)	(0.114)	(0.114)	(0.091)
Government competition	0.203**	0.178**	−0.079	−0.026	−0.282***	−0.255***
	(0.095)	(0.080)	(0.072)	(0.099)	(0.099)	(0.079)
Electoral competition	0.002**	0.004***	0.002***	0.002*	0.000	−0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Resources						
Own source revenue	0.049	−0.024	0.026	−0.072**	−0.023	0.049*
	(0.031)	(0.026)	(0.024)	(0.032)	(0.032)	(0.026)
Education grant	−0.002	−0.002	−0.002			
	(0.007)	(0.007)	(0.007)			
Development grant	−0.110***			0.110***	0.110***	
	(0.016)			(0.016)	(0.016)	
Allocation grant		−0.004		−0.004		0.004
		(0.011)		(0.011)		(0.011)
Redistribution grant			−0.610***		−0.609***	−0.608***
			(0.021)		(0.021)	(0.021)
Constraints						
TEL	−0.003**	−0.004***	0.001	−0.001	0.004***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
BBR	−0.092***	−0.044***	−0.026*	0.048**	0.066***	0.019
	(0.019)	(0.015)	(0.014)	(0.020)	(0.020)	(0.015)
Fiscal transparency	−0.166**	0.030	−0.086*	0.196***	0.080	−0.117**
	(0.068)	(0.056)	(0.051)	(0.070)	(0.071)	(0.056)
Biennial budget	0.100***	0.024	0.014	−0.076***	−0.086***	−0.010
	(0.025)	(0.021)	(0.019)	(0.026)	(0.026)	(0.021)

(continued)

Table 1. (continued)

Variables	(1) Education development	(2) Education allocation	(3) Education redistribution	(4) Development allocation	(5) Development redistribution	(6) Allocation redistribution
Grants to local governments	0.085***	0.073***	0.093***	−0.012	0.008	0.020
	(0.015)	(0.013)	(0.012)	(0.016)	(0.016)	(0.013)
GDP per capita	−0.150**	−0.203***	0.060	−0.054	0.211***	0.265***
	(0.061)	(0.051)	(0.048)	(0.063)	(0.065)	(0.052)
Unemployment rate	0.001	0.009***	−0.008***	0.009**	−0.009**	−0.017***
	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)
Education demand	0.199***	0.203***	0.200***			
	(0.036)	(0.036)	(0.035)			
Development demand	−0.032***			0.033***	0.033***	
	(0.013)			(0.013)	(0.013)	
Allocation demand		−0.041***		−0.041***		0.041***
Redistribution demand		(0.006)	−0.003	(0.006)	−0.003	(0.006)
						−0.003
Constant	0.253	0.778	(0.004)	0.576	(0.004)	(0.004)
			4.126***		3.866***	3.272***
	(0.770)	(0.664)	(0.661)	(0.676)	(0.737)	(0.603)
Observations	1,372	1,372	1,372	1,372	1,372	1,372
R^2	.835	.872	.905	.874	.923	.892

Note. Standard errors in parentheses, State and year fixed effects are included but not shown. TEL = tax and expenditure limit; BBR = balanced budget requirements; GDP = gross domestic product.
*$p < .1$. **$p < .05$. ***$p < .01$.

The independent variables are categorized as three groups of preferences, resources, and constraints. In the six equations, 39 of 78 preference variables are statistically significant, with 37 of these in the expected direction. For the resource variables, eight of 18 coefficients are statistically significant, with eight in the expected direction. For the constraint variables, 37 of 54 coefficients are statistically significant, with 37 in the expected direction.

Key Independent Variables

Except for government liberalism, each variable measuring preferences of state decision-makers shows statistically significant effects. First, the variables measuring gubernatorial power and party show results consistent with expectation. To interpret the total effects of Democratic governor, one must take into account the interaction term between gubernatorial party and power. The average marginal effects of Democratic governor on budget trade-offs are about 0.051, 0.044, −0.048, and −0.041 and statistically significant in columns 1, 2, 5, and 6, respectively.[2] These effects do not vary with gubernatorial power. The sizes of these effects represent about 14%, 13%, 12%, and 7% of one standard deviation in the dependent variables, respectively. This suggests that Democratic governors shift budgets from developmental and allocational spending to educational and redistributive spending regardless of their power. This is consistent with the party hypothesis that Democratic Party prefers redistributive spending over other expenditures.

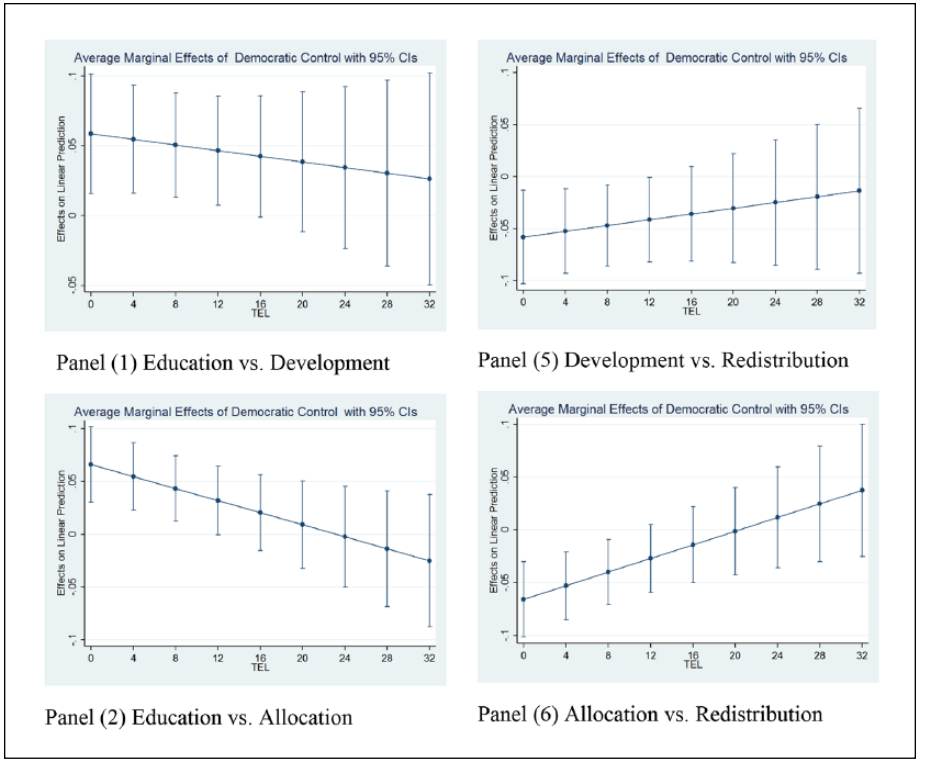


Figure 1. Average marginal effects of democratic control on budget trade-offs.
Note. CI = confidence interval.

Second, one must consider their interactions with TEL when interpreting the coefficients of Democratic and Republican control. Figure 1 shows the average marginal effects of Democratic control on budget trade-offs based on the results in columns 1, 2, 5, and 6 of Table 1. In each column, the effects of Democratic control vary with the level of TEL restrictiveness. As Panel 1 of Figure 1 shows, Democratic control has a positive and statistically significant effect on the budget trade-offs between education and development when TEL restrictiveness is low. When the TELs become more restrictive, Democratic control loses statistical significance. The same pattern applies to Panels 2, 5, and 6 of Figure 1. Specifically, when TEL restrictiveness is low, Democratic control shows a positive effect on budget trade-offs in Panel 2 and negative coefficients in Panels 5 and 6. This suggests that, when TEL restrictiveness is low, Democratic control increases spending in education relative to allocation and increases spending in redistribution relative to development and allocation.

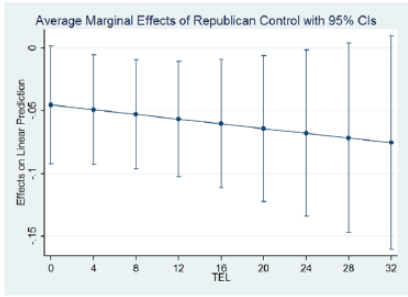
To interpret the substantive significance of the coefficients, one must hold TEL restrictiveness constant at a point. In the sample, about 45% of state-years have no TELs in place. Holding the value of TEL restrictiveness at 0, the sizes of the marginal effects of Democratic control are about 0.059, 0.067, −0.058, and −0.066 in columns

1, 2, 5, and 6, respectively. This represents about 17%, 20%, 11%, and 18% of one standard deviation in the dependent variables, respectively. Overall, this pattern is consistent with the Party Hypothesis that the Democratic Party shifts budget to redistribution from other categories. It also supports the Conditional Party Hypothesis that partisan effects become stronger when TEL restrictiveness is lower.

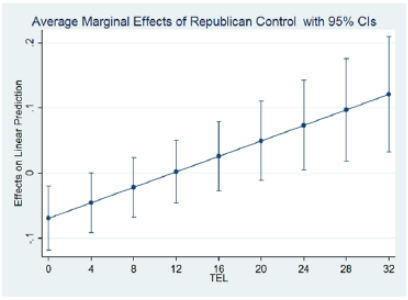
Similarly, Figure 2 shows the average marginal effects of Republican control on budget trade-offs based on the results in columns 1, 2, 3, 4, and 6 of Table 1. The effects of Republican control also vary with TEL restrictiveness. Again, Republican control shows statistically significant effects when TEL restrictiveness is low. In Figure 2, except for the positive coefficient in the Panel 6, Republican control shows negative coefficients. This indicates that Republican control increases spending in development, allocation, redistribution relative to education and increases spending in allocation relative to development and redistribution when TEL restrictiveness is low. On the contrary, when TEL restrictiveness is high, Republican control shows statistically significant effects with opposite signs in Panels 4 and 6. This indicates that Republican control increases spending in development and redistribution relative to allocation when TEL restrictiveness is high. Similarly, holding the value of TEL restrictiveness at 0, the sizes of the marginal effects of Republican control are about −0.045, −0.114, −0.068, −0.069, and 0.047 across the five columns of Table 1, respectively. These amount to 13%, 35%, 20%, 17%, and 13% of one standard deviation of the respective dependent variables.

These results provide mixed support for the Party Hypothesis and Conditional Party Hypothesis. On one hand, consistent with the Party Hypothesis, Republican control increases spending in development relative to education when TEL restrictiveness is low and increases spending in development relative to allocation when TEL restrictiveness is high. As predicted by the Conditional Party Hypothesis, Republican control shows stronger effects when TEL restrictiveness is low. On the other hand, Republican control increases allocational spending relative to developmental spending when TEL restrictiveness is low, contradicting the Party Hypothesis. When TEL restrictiveness is high, Republican control shows reverse signs for the budget trade-offs between allocational spending and developmental spending, and between allocational spending and redistributive spending. In other words, allocational spending "wins" the budget trade-offs against development and redistribution when TEL restrictiveness is low but "loses" them when TEL restrictiveness is high. More research is needed to explore why Republican Party gives high priority to allocational spending when TEL restrictiveness is low and why TEL restrictiveness reverses the direction of budgeting trade-offs.

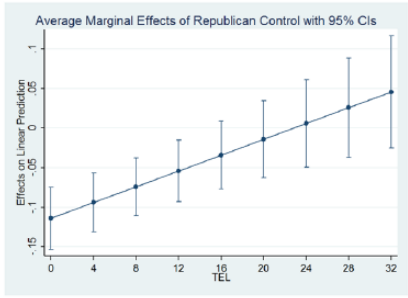
Third, while government liberalism does not show statistically significant results, citizen liberalism shows statistically significant effects in columns 2, 5, and 6. The sizes of coefficients are 0.002, −0.002, and −0.003, representing 0.6%, 0.4%, and 0.8% of one standard deviation of the dependent variables, respectively. The sizes of these effects are smaller than that of gubernatorial party and government partisan control, suggesting that partisan factors have stronger effects on budget trade-offs than ideological factors do. More specifically, the positive coefficient of citizen liberalism



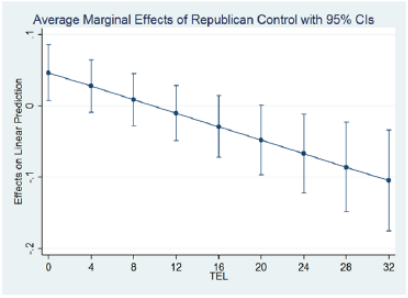
Panel (1) Education vs. Development



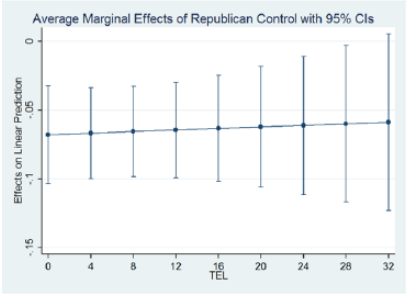
Panel (4) Development vs. Allocation



Panel (2) Education vs. Allocation



Panel (6) Allocation vs. Redistributio



Panel (3) Education vs. Redistribution

Figure 2. Average marginal effects of Republican control on budget trade-offs.
Note. CI = confidence interval.

in column 2 indicates that citizen liberalism increases spending in education relative to allocation. The negative coefficients in columns 5 and 6 suggest that citizen liberalism increases redistributive spending relative to developmental and allocational spending. This is consistent with the Ideology Hypothesis that liberal ideology is associated with more redistributive spending relative to others.

Control Variables

The variables measuring political environment show strong effects on budget trade-offs. Considering its interaction effect with the variable of Democratic governor, the total effects of gubernatorial power on budget trade-offs are about 0.01, 0.033, 0.013, 0.036, and 0.023 and statistically significant in columns 2, 3, 4, 5, and 6, respectively. These effects do not vary with the party affiliation of governors. This means that stronger gubernatorial power increases spending in education and development relative to allocation and redistribution, and increases spending in allocation relative to redistribution. As these effects are independent of gubernatorial party affiliations, they may reflect the impacts of more centralized structures of budgetary decision-making on budget trade-offs.

Gubernatorial term limits show statistically significant effects except in column 1 of Table 1. Specifically, states with gubernatorial term limits spend more in allocation relative to education and development, and spend more in education, development, and allocation relative to redistribution. Legislative professionalism shows statistically significant results in columns 2, 4, and 6 of Table 1. More professional legislatures are associated with more spending in allocation relative to education, development, and redistribution. This might reflect either higher budgetary costs of a more professionalized legislature or a stronger commitment to basic government functions including law enforcement and government administration. Both measures of political competition show statistically significant results but in different equations of budget trade-offs. Government competition increases spending in education and redistribution relative to development and allocation. This is consistent with existing literature in that interparty competition increases redistributive spending (Dawson and Robinson 1963). Electoral competition increases spending in education relative to spending in development, allocation, and redistribution as well as increases spending in development and redistribution relative to allocation.

Both variables measuring available resources are statistically significant. Total own source revenue shows a negative effect in column 4 and a positive effect in column 6. This suggests that states spend more on allocation relative to development and redistribution as their budget constraints are loosened by more own source revenues. Two of the four variables measuring federal grants show statistically significant effects on budget trade-offs. As expected, federal grants in development and redistribution drive state budgets to these areas from all the other three categories. Federal grants have greater impacts on the state budget trade-offs involving developmental and redistributive spending. This is not surprising given that developmental spending includes highway and redistributive spending includes welfare, both of which are policy areas where federal grants are particularly important.

In addition to TEL, other institutional limits matter. BBR has statistically significant effects on budgeting trade-offs except in column 6. This indicates that stricter BBR shift spending in education to the other three categories and shift spending from allocation and redistribution to development. Fiscal transparency shows statistically significant effects in columns 1, 3, 4, and 6. This suggests that fiscal transparency of

state budgeting processes is associated with more spending in development and redistribution relative to education and allocation. Voters are more likely to monitor policy makers when fiscal transparency becomes higher. As a result, policy makers may increase developmental and redistributive spending because they are more salient to the public. Biennial budget shows statistically significant effects in columns 1, 4, and 5. This implies that states with annual budgeting spend more on development relative to education, allocation, and redistribution, maybe because they are more flexible in responding to economic fluctuations.

All three fiscal constraint variables matter for state budget trade-offs. State grants to local governments show positive and statistically significant effects in the first three columns of Table 1. States making more grants to local governments spend more in education relative to the other three categories. GDP per capital shows statistically significant effects in columns 1, 2, 5, and 6. This indicates that, as states get wealthier, they spend more on development and allocation relative to education and redistribution. Unemployment rate shows statistically significant effects except in column 1. This suggests that states spend more on education and development relative to allocation and more on redistribution relative to education, development, and allocation. In other words, states increase spending on development and redistribution when unemployment rate is high.

Three of the four variables measuring citizen demand show statistically significant effects on budget trade-offs. As expected, education demand increases spending in education relative to other expenditures. Similarly, relative to spending in each of the other categories, development demand increases spending in development and allocation demand increases spending in allocation. This suggests that state budget trade-offs are responsive to citizen demand. It is interesting to observe that redistribution demand fails to reach statistical significance, which is consistent with Peterson's (1981) observation that citizen demand plays little role in politics of redistributive policies.

Conclusion and Discussion

We bring Peterson's (1981) typology of public policy into the literature on state budget trade-offs. Peterson (1981) proposes a typology of public policies of development, allocation, redistribution, and education that covers all state expenditure categories. We build on his work by examining pairwise budget trade-offs among these four expenditure categories. As demonstrated by Philips, Rutherford, and Whitten (2016) and Lipsmeyer et al. (2017), we use the log-ratio transformation of composition data (Aitchison 1982) to measure state budget trade-offs. Using improved measurements and focusing on theoretically meaningful expenditure categories, the empirical analysis shows consistent results in explaining budget trade-offs. Although our model includes factors of preferences, resources, and constraints, we focus on the roles of parties, ideology, and how parties interact with institutional limits in this study.

Several findings emerge from our empirical analysis. First, as indicated by partisan labels and ideological orientations, political preferences matter for state budget trade-offs. The partisan effects on budget trade-offs are shown in the impacts of gubernatorial

party affiliations and partisan control of state governments. The results generally support the hypothesis that the Republican Party prefers developmental spending, while the Democratic Party prefers redistributive spending. The ideological effects on budget trade-offs are shown in the impacts of citizen liberalism; liberal citizen ideology increases redistributive spending. These findings stand in contrast with that of Barrilleaux and Berkman (2003), who find no partisan effects on the relative sizes of redistributive and developmental spending of state governments.

Second, the interactive effects between government partisan control and TEL show that partisan effects on budget trade-offs are conditional on institutional limits. The impacts of partisan control of state governments on budget trade-offs become stronger when parties face weaker institutional constraints. Democratic and Republican parties interact with TELs differently. More restrictive TELs reverse the directions of budget trade-offs under Republican control but not Democratic control of state governments.

More generally, prior studies on the relation between party variables and institutional rules have generated mixed results. Alt and Lowry (1994) find that unified party governments with limits of deficit carryover react more sharply to revenue shortfalls than those without such limits. On the other hand, Primo (2007) finds no interactive effects between party variables and balanced budget rules on state spending. This study adds to the literature by highlighting the constraining effects of TELs on partisan preferences over state budget trade-offs.

Third, the control variables generally show strong results. Beyond TEL, other institutional limits including BBR, fiscal transparency of budgeting processes, and budget periodicity also influence state budget trade-offs. These are largely consistent with previous studies by showing the importance of institutional rules for explaining budgetary outcomes (Alt, Lassen, and Skilling 2002; Kearns 1994; Poterba 1994). The variables capturing political environment also matter for budget trade-offs. Particularly, political competition drives budget trade-offs toward redistributive spending, consistent with prior studies (Barrilleaux, Holbrook, and Langer 2002; Dawson and Robinson 1963). As in Nicholson-Crotty, Theobald, and Wood (2006), federal grants in developmental and redistributive policies drive state budgets to those areas. State budget trade-offs are responsive to citizen demand for developmental, educational, and allocational spending.

The finding on the importance of politics is consistent with the comparative state policy literature that politics matters for state policy outcomes (e.g., Alt and Lowry 2000; Erikson, Wright, and McIver 1989; Jennings 1979). Most studies on budgetary outcomes of state politics have focused on the sizes of government spending, revenue, or deficits as outcome variables (Alt and Lowry 1994; 2000; Krause and Melusky 2012; Poterba 1994). In contrast, budget trade-offs capture the composition of state budgets. A test of the effects of politics on budget trade-offs, like this study, can provide stronger evidence for its impact on budgetary outcomes than that on budget sizes because it accounts for explicit trade-offs among competing expenditure demands. Politics must become stronger to influence budget trade-offs than budget sizes because a budget may expand due to some windfall revenues when decisions become easier. Besides, by applying Peterson's (1981) typology to state budget trade-offs, this study also provides an empirical test of it in a new setting.

The politics variables are most successful in explaining budget trade-offs between developmental spending and others, and between redistributive spending and others. Although empirical results show nontrivial patterns, better theories are needed to explain the budget trade-offs among other expenditure categories. More broadly, future studies may develop a theory to explain patterns of state budget trade-offs beyond any two spending categories.

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Notes

1. Barrilleaux and Berkman (2003) modify Peterson's typology by dividing state spending into two categories of redistributive and developmental spending and thus provide a partial test of it on state budget trade-offs.
2. This is calculated with the "margins" command in Stata 14; detailed results are available on request.

Supplemental Material

Supplemental material for this article is available online.

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