Revenue Patterns in the U.S. States

An Empirical Re-Examination of Partisan Policy Views

Arnd Plagge

Working Paper

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AN EMPIRICAL RE-EXAMINATION OF
PARTISAN POLICY VIEWS

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— Draft version of July 19, 2006* —

WORK IN PROGRESS – COMMENTS WELCOME

Abstract

This paper empirically evaluates partisan policy influences on state-level general fund revenue changes in all 50 American states for the period 1988 to 2004. Contrary to the earlier literature on partisan tax policy in the U.S., I find no substantially meaningful evidence to back up the claim of a systematic difference in general fund revenue changes depending upon state governors' party affiliation.

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1 Introduction

Few notions about economic policy in the U.S. command such wide-spread acceptance as the idea that there are marked differences in tax policy between Democrats and Republicans. Indeed, if one were to point out that Democrats favor high tax rates, while Republicans aim to lower them, many might conclude that not much more than the obvious has been stated.

Rather than re-affirming the conventional wisdom about tax policy in the U.S., however, this paper squarely challenges it. Employing state-level data for the fiscal years 1988 to 2004, I test how well partisan models of economic policy-making in the U.S. fit the actual record at the often neglected sub-national level. The surprising conclusion that I reach is that there is *no* substantively meaningful difference between states ruled by Republicans vs. Democrats when it comes to revenue changes during the period under study. The regression results predict at most a one-time partisan revenue adjustment effect of $64.02, which translates into a 1.10% difference in the average general fund revenue level over a four-year term.

As the results presented in this paper if not contradict, then at least challenge a vast, well-entrenched literature, extensive robustness checks are performed, and three different specifications of the dependent variable are discussed and various sub-periods of the data examined. Throughout, the main finding remains intact: There is no substantively meaningful evidence in favor of the partisan view of tax policy that is such a prominent feature of current thinking about economic policy in the U.S.

Section 2 of this paper reviews the central literature on state-level fiscal policy. Section 3 outlines the empirical approach pursued and discusses several important obstacles that have to be overcome in a sensible analysis of state-level revenue patterns, showing how results based upon an analysis of revenue data in levels can lead to invalid inferences. Section 4 focuses on changes in revenue levels, shows that an OLS analysis is appropriate for this data, and discusses the regression results in detail, while section 5 concludes.

2 Earlier work

The determinants and effects of tax policy have been a topic of long-standing interest in the U.S. and around the world. Not surprisingly, this general interest is reflected in a vast scholarly literature on topics such as optimal taxation and its counterpart, the distortionary effects of taxation. Indeed, numerous textbooks have been written on these issues, too, and some of the best nowadays also include an extensive coverage of political determinants of tax levels. Yet, unlike in the case of the economic underpinnings of taxation, whether these political aspects travel easily from one setting to another—either across borders or to different, typically sub-national, levels within one country—remains relatively unclear.

While a voluminous body of work exists that discusses federal-level tax policy in the U.S., at the level of the 50 American states the literature on the revenue effects of political factors is still in its infancy. However, at least from the early 1990s on, several notable papers that focus on institutions such as term limits and balanced-budget requirements have been published in the leading journals in economics and political science, and I will briefly sketch their main ideas and results below.

Bohn & Inman (1996) conduct a comprehensive study of the effects that balanced-budget rules exert on the level of public deficits for a panel of 47 American states. Based on data for 1970-1991, they find that end-of-the-year balance requirements influence the level of a state's general fund surplus positively. Importantly, spending cuts, not tax increases, are said to give rise to this result. In his study of states' reactions to "fiscal shocks" in the early 1990s, Poterba (1994) also finds that such rules matter. However, he attributes a much greater role to tax adjustments based on his data for 1988-1992, stating that "[b]oth the ordinary least squares and instrumental variables results suggest that states react to unexpected deficits with real changes in fiscal position. [...] Tax increases within the fiscal year make a relatively small contribution to deficit reduction, but tax changes that take effect the next fiscal year are more important than spending cuts in closing unexpected deficits."[1]

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[1] Poterba (1994: 812)

Poterba (1994) also tests whether single-party rule, as opposed to divided government, has any effect on adjustment patterns. He concludes that in those states that have strict anti-deficit rules the two setups indeed lead to different outcomes, with adjustment taking place more rapidly in states that are under single-party control.[2] Indeed, this result could be explained by the fact that one would expect a gridlock over revenue vs. expenditure changes with divided government. By contrast, it is troubling for the view that under divided government the electorate has more difficulty attributing blame for unpopular measures to one of the parties that effectively share (some) power, which would lead one to expect that painful adjustments—raising taxes and cutting spending in already troubled times—should be easier to carry out under such circumstances.[3] Apparently, balanced-budget requirements, which are often part of a state's constitution, insulate policy-makers under unified government to a considerable extent from the wrath of the electorate.

Electoral accountability, in turn, is one of the main foci of the paper by Lowry et al. (1998). They conclude that accountability is indeed higher under unified government, yet they also assert that Republicans are punished for an expansion of the size of state-level government activity, while Democrats are rewarded for it.[4] Niemi et al. (1995), on the other hand, find that voters punish the incumbent party's candidate for past tax increases, regardless of party affiliation, a finding echoed by Kone & Winters (1993).

Besley & Case (1995) examine budget data for the 48 continental U.S. states from 1950 to 1986. They find that Democratic incumbents faced with a term limit on average tend to increase total taxes by \$10 to \$15 per year in their last term in office, while their Republican colleagues leave the tax burden unchanged. Moreover, "[a]n F–test rejects that, for Democratic governors taken as a group, the regression coefficients on different years in the

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[2]Krause (2000) shows for the federal level that the simple discrete distinction between unified and divided government can usefully be extended by considering the (continuous) degree of ideological fragmentation between the executive and the legislature. Data at this level of detail is not available at the state-level, however.

[3]Powell & Whitten (1993). See also the discussion in Berry & Berry (1992, 1994) on the politically most opportune moments for introducing new taxes or raising existing ones.

[4]To be more exact, Lowry et al. (1998: 759) state that Democratic governors may be rewarded for *small* increases in a state's budget.

electoral cycle are identical for governors who may run again and for governors who cannot."[5] Clearly, both the notion that term limits will influence incumbent governors' behavior and that Republicans and Democrats behave differently is vindicated by these results.[6]

The explanation that Besley & Case (1995: 786) offer for the different taxation patterns is rather unconvincing, however: "Governors hold taxes and expenditures low in their first term [...], and voters allow them a second term. At that point the governors care less about putting in effort, resulting in increased taxes and spending." Yet, this view leaves the difference in behavior between Democratic and Republican officeholders unexplained, as one is left to wonder why only Democrats but not Republicans give in to demands for higher spending levels that under balanced-budget rules necessarily accompany any revenue increase.

Alt and Lowry (2000) are the first who tried to quantify the difference in the preferred scale of state-level general fund revenues and estimate that Democrats aim for 50% higher revenues than Republicans.[7] If their findings are correct, one should observe sizable differences in aggregate revenue trajectories under Democratic and Republican governors, as transitions in the governor's mansion from one party to another were quite frequent during the period under study in this paper.

In a related article, Crain & Tollison (1993) have examined the impact of legislative stability and executive term limits on the volatility of fiscal policy for the U.S. states from 1969–1989. They find sizable effects for a wide range of political variables, including the legislature's stability and gubernatorial term limits. Most importantly in the present context, "the impact of legislative stability on the volatility of taxes is 15 times the effect on the volatility of spending. Approximately the same result holds for surpluses and deficits; surpluses and deficits respond much more dramatically to the expectation of legislative change than do expenditures."[8] Yet, as so often,

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[5]Besley & Case (1995: 785)

[6]One point that is not fully captured by Besley & Case's (1995) paper is that keeping tax rates constant could also be interpreted as a "relative" cut in rates. There is a well-known tendency for state-level governmental activity to continually expand in absolute terms, and this pattern is also reflected at the level of the individual states.

[7]Alt & Lowry (2000: 1064)

[8]Crain & Tollison (1993: 157–158)

a result pointing in the opposite direction can be found, too. Kneebone & MacKenzie (2001) have studied the fiscal choices of Canadian provincial governments using data for 1966–1997 and find that "partisan responses are largely absent from revenues but appear more frequently in program spending choices."[9]

Overall, there is a near-consensus that it substantively matters whether the conservative or liberal party (or coalition) rules, with higher expected levels of taxation and revenue more generally under left-leaning governments, that divided government can attenuate these partisan effects, and that term limits might also play a role in the formulation and implementation of revenue policies. Consequently, the econometric analysis in this paper focuses mainly on these three political variables.

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[9]Kneebone & MacKenzie (2001: 753)

3 Empirics

3.1 Data and dependent variables

Yearly data on the budget for all 50 states in the U.S. and on governors' party affiliations as well as the states' legislatures has been compiled from fiscal 1987 onwards.[10] As there are good theoretical reasons to suspect that policies will differ not only between parties, but also under unified and divided government, a variable containing this information is included, too.[11] Finally, the data set also contains dummy variables indicating (binding) gubernatorial term limits and the fiscal years before and after a party change in the governor's mansion between a Republican and Democratic officeholder.

A major problem that one encounters during the analysis of revenue data is the impact the business cycle, a subject that is too often simply glossed over, has on tax receipts.[12] For one, so-called business cycle filters, such as the widely used Hodrick-Prescott filter or the Baxter-King bandpass filter, which are frequently employed in business cycle research at the national level, cannot sensibly be used in the analysis presented here, as the time period covered is too short, and it is also theoretically unclear whether the filters perform well at the sub-national level. Moreover, a time-series analysis of the general fund revenue properties makes clear little more than the difficulty of controlling for the impact of the business cycle and trends more generally via including lagged variables when the dependent variable is in levels.

I employ three different specifications of the dependent variable in my analysis. The first two feature a dependent variable that is expressed in levels, while the third one captures *changes* in levels. The former setups echo common practices in the literature on state-level fiscal policy, and I

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[10]Budget data is taken from NASBO (yearly). Per-capita state income data is taken from the *Bureau of Economic Analysis*. The Political and demographic variables are compiled from the *Statistical Abstract of the United States* (various years), the *CQ's State Fact Finder* (various years), and the websites of the *National Conference of State Legislatures* (www.ncsl.org) and the NGO *U.S. Term Limits* (www.termlimits.org). All U.S. dollar values are converted to constant 2000 U.S. dollars using *Bureau of Labor Statistics* data to control for the effects of nominal price-level changes.

[11]See for instance the work by Alt & Lowry (1994) and Heller (1997).

[12]See Andrews (2005) for a detailed discussion of the interplay between cross-section regressions and potential problems with them when common shocks are present.

proceed to show that they are inadequate for the data at hand. The third specification is the preferred one, and all substantive results that I derive are based upon information obtained via the various models that employ a measure of the general fund revenue's change as the dependent variable.

The first set of models uses the level of per capita general fund revenue in U.S. dollar amounts as the dependent variable. Using this specification, several variables are found to be statistically significant, yet I proceed to argue that these results are misleading, as there is a time trend in the data. Moreover, a swing in party dominance from Democratic to Republican from fiscal 1996 onwards proves problematic in this context, too.

Next, a set of regressions that rely on a "burden" measure for the general fund revenue level is performed. It expresses the per capita general fund revenue levels in a given state as a fraction of per capita state income. To take a very simple example, consider a state where the per capita general fund revenue level stood at $1,000, while income per capita was $20,000 on average. The burden would then simply be 5%. Yet, just like in the case of using the U.S. dollar amount of the general fund revenue as the dependent variable, I show that the time series of the burden level is integrated of order 2 and exhibits a positive time trend that leads to biased OLS estimates.

The final measure of state-level revenue trajectories I use as a dependent variable in the econometric analysis below measures the year-over-year change of the burden level. In order to treat increases and decreases symmetrically, I compute the yearly change as a function of the natural logarithm of the burden, i.e., $change = ln(burden_t) - ln(burden_{t-1})$. After this adjustment, away from levels and towards changes, the aggregated series for the years 1989–2004 is stationary, as indicated by an Augmented Dickey-Fuller (ADF) test.

3.2 Summary statistics and first OLS results

All in all, budget data and information on other economic and political variables has been collected for a panel of all 50 U.S. states for the fiscal years 1987 to 2004, resulting in 900 complete observations.[13] The 33 ob-

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[13]Note that a fiscal year is named after the calendar year in which it ends. The federal fiscal year 2005, for instance, began on October 1, 2004, and ended on September 30,

Table 1

Summary statistics for state-level political and economic data

	Democratic	Republican	Sum
Governors' party affiliation	373 (46.4%)	428 (53.4%)	801 (100%)
Unified government	177 (22.1%)	149 (18.6%)	326 (40.7%)
Binding term limit	83 (10.4%)	104 (13.0%)	187 (23.3%)
Average per capita income		$25,192	
Average per capita revenue level		$1,457	
Average burden		5.74%	

Note: Percentage figures may not add up exactly due to rounding.

servations where the governor was neither a member of the Democratic nor the Republican Party were excluded, as were all 17 observations where the year-over-year change in general fund revenues exceeded 25 percent.[14] In addition, the data for the year 1987 cannot be used in the analysis, as it is needed to initiate the change rate computation. In the end, even after all adjustments, 801 observations remain and form the basis for the analysis. Table 1 reports the key summary statistics.

All regression results reported in this paper make heavy use of qualitative regressors to ensure that the variables that have theoretically been identified as potentially relevant are all included in the regression models at some point.[15] Table 2 presents information on the influence of party affiliation, binding term limits, and unified government for the three different specifications of the dependent variable discussed above.

Interestingly, while in models 1 and 2 several variables are reported as statistically significant, in the last set of results no variable is statistically significant at conventional levels, i.e., at the 95% level or above. In what follows, I argue that only model 3's results are valid, while the estimates

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2005. Information on fiscal year start and end dates, which vary between states, can be found in compact form in ACIR (1995: 4–5, table 2).

[14]These changes often reflect one-time events, such as new revenue sharing agreements between state and local governments.

[15]See Gujarati (2003), chapter 9, on this approach.

Table 2

OLS regression results for basic political variables

Independent variable	Model 1	Model 2	Model 3
Republican governor	97.47	0.0039	−0.0012
	(69.71)	(0.0021)	(0.0062)
Republican governor with	−44.14	−0.0026	0.0062
binding term limit	(50.38)	(0.0014)	(0.0055)
Democratic governor with	125.23	0.0005	−0.0039
binding term limit	(76.38)	(0.0025)	(0.0067)
Unified Republican	−195.69**	−0.0079**	−0.0028
government	(49.34)	(0.0014)	(0.0052)
Unified Democratic	15.43	0.0049*	0.0115
government	(64.05)	(0.0021)	(0.0062)
Intercept	1430.30**	0.0560**	−0.0052
	(56.35)	(0.0018)	(0.0051)

Baseline: Democratic governor without term limit and with divided government. *Dependent variable: model 1 = revenue level, model 2 = burden level, model 3 = change ln(burden). Heteroscedasticity-adjusted standard errors are shown in parentheses. Levels of statistical significance are denoted as follows: $^{*}p < 0.05$, $^{**}p < 0.01$. $N = 801$.*

for models 1 and 2 are plagued by biases arising from the presence of time trends in the data and thus cannot serve as a sound basis for inference.

3.3   Examination of the data in levels

The first step here is to examine the data with the general fund revenue level as the dependent variable. This is the simplest possible setup and will serve as the starting point for my analysis.

The first regression I consider includes three dummy variables as the independent variables, namely one indicating a Republican governor faced with a non-Republican legislature, i.e., divided government, and two variables indicating a Democratic governor faced with unified or divided government. In this case, the intercept will show the expected average effect a unified Republican government has on the dependent variable. The results of this regression are reported in table 3 (model 4).

The regression results from model 4 suggest that, when compared to the baseline category unified Republican government, states with Democratic governments witness higher levels of general fund revenues, as do states

Table 3

OLS regression results for the general fund revenue level specification (I)

Independent variable	Model 4	Model 5
Democrat, unified government	156.34* (65.11)	−40.62 (56.27)
Democrat, divided government	134.69* (63.65)	−62.27 (54.58)
Republican, unified government	—	−196.96** (59.42)
Republican, divided government	196.96** (59.42)	—
Intercept	1320.53** (47.97)	1517.49** (35.06)
Benchmark	Republican governor, unified government	Republican governor, divided government

dependent variable: general fund revenue level per capita
Note: Standard errors are shown in parentheses. N = 801.
Levels of statistical significance are denoted as follows: $^{*}p < 0.05$, $^{**}p < 0.01$.

with a Republican governor but a non-Republican legislature. Notably, as table 3 also shows (model 5), we do not on average expect a statistically significant difference in the general fund revenue levels between states ruled by Democratic governors and those that have a Republican governor but a non-Republican legislature.[16] In addition, the signs of the coefficients for Democratic states are negative, contrary to the theoretical expectations derived from a partisan model.

So far, the reports in table 3 do not account for the revenue structure that might be idiosyncratic to a given state. This problem is addressed in a first shot in table 4, which reports the regression results for a set of dummy variables that indicate whether there has been a transition between the parties in the governor's mansion or not. The partisan model leads one to expect that after the governing party has changed, there should be pronounced changes in a state's general fund revenue levels. However, as

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[16]Note that the results of models 4 and 5 match exactly, as they must by definition. The information is restated in order to facilitate the understanding of the findings and to highlight the similarities between Democratic states and those with a Republican governor faced with divided government.

Table 4

OLS regression results for the general fund revenue level specification (II)

Independent variable	Model 6	Model 7
Democratic governor	—	0.86
		(50.39)
Republican governor	−31.73	—
	(51.91)	
Switch to Democratic governor	—	−29.24
(Year 1)		(105.01)
Switch to Democratic governor	—	50.73
(Year 2+)		(57.69)
Switch to Republican governor	−61.13	—
(Year 1)	(104.20)	
Switch to Republican governor	6.63	—
(Year 2+)	(52.00)	
Intercept	1465.49**	1448.92**
	(30.52)	(28.49)

dependent variable: general fund revenue level per capita
Note: Standard errors are shown in parentheses. $N = 801$.
Levels of statistical significance are denoted as follows: $^{*}p < 0.05$, $^{**}p < 0.01$.

the regression results for this specification show, no such pattern is found in the data. In fact, the coefficients are not only statistically insignificant at all conventional levels, but also have the same signs for both parties. In model 6, states with Democratic governors serve as the baseline category, while in model 7 those with Republican ones do.

A likely explanation for the rather strange pattern visible in table 4 is the fact that the general fund revenue data exhibits a notable time trend. Figure 1 shows the trajectory of revenues from 1988 to 2004 and a ten-year forecast.[17]

Some notes on the time-series analysis are in order here: Only differencing twice gives us a stationary series, as the Augmented Dickey-Fuller test shows. The plots of the auto-correlation function (ACF) and partial auto-correlation function (PACF) hint at an autoregressive process, as the ACF does not end abruptly at some point, while the PACF does not dampen down, either. As the Akaike information criterion (AIC) indeed reaches its

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[17]The aggregate data is obtained by adding up the real per capita revenue for all 50 states for every year in the sample, thus eliminating the effect of population growth.

lowest value for an ARIMA(2,2,0) specification, it is used as the basis for the forecast for the years 2005–2014.

Diagnostics for the ARIMA(2,2,0) specification confirm its econometric appropriateness, yet it quickly becomes clear how woefully inadequate this specification appears to be substantively. The long-witnessed trend of increasing per capita state revenue levels would be broken if we believed the forecast to be accurate, an unlikely, even though not impossible result.[18]

General fund revenues and forecast (1987 = 100)
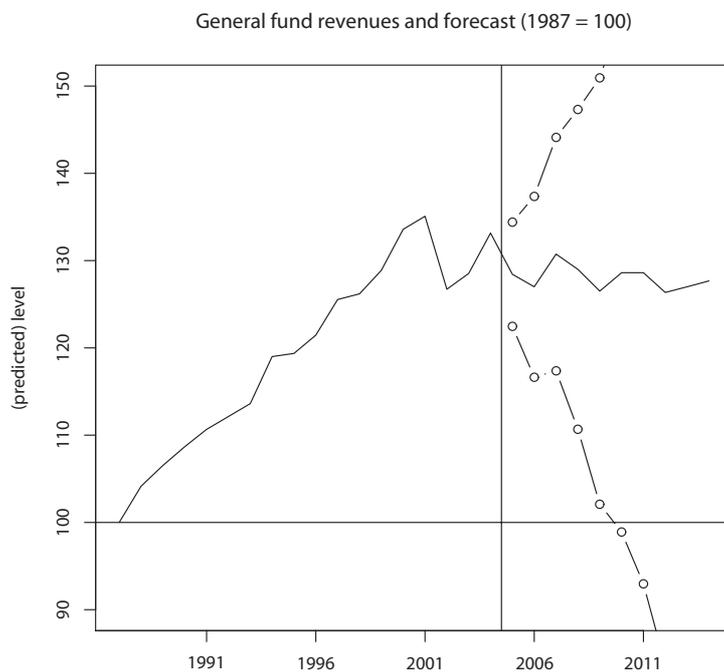
Figure 1
Actual and projected level of aggregated general fund revenues
Note: Forecast is based upon an ARIMA(2,2,0) process.

Given the well-known econometric problems that a time trend causes (Phillips 2003), the simple explanation for the pattern visible in table 4 is that later years in the sample on average witnessed higher general fund revenues than earlier ones. Under these circumstances, using an OLS framework will produce biased estimates of the coefficients, exactly what can be seen in models 6 and 7.

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[18]The dotted lines in figure 1 show the confidence interval for ±2 standard errors. Lowry et al. (1998) discuss the historic upward trend in state spending in more detail.
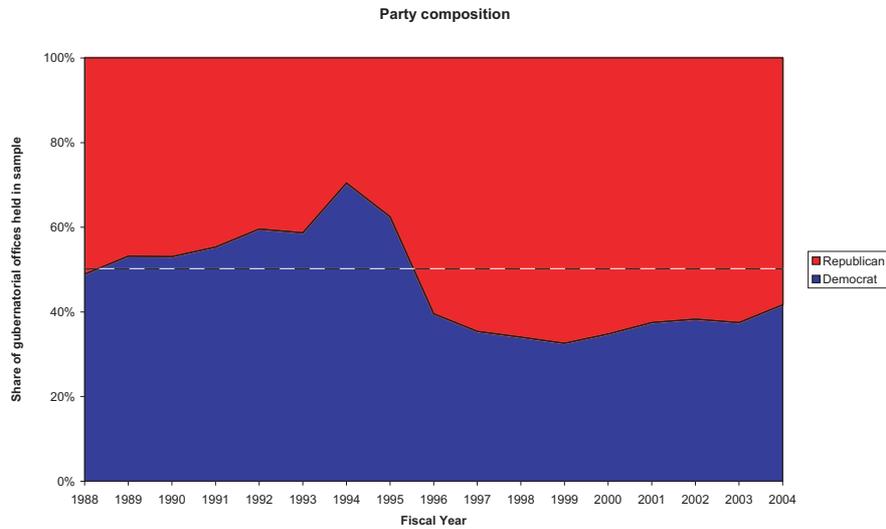
Figure 2

Composition of state governorships, 1988–2004

To compound the problems with using the level of general fund revenue as the dependent variable, there is also a marked downward trend in the share of states with Democratic governors in the second half of the time-period under study. Figure 2 shows the share of Democratic and Republican governorships in the sample for the fiscal years 1988 to 2004, and a near-reversal in the party composition from fiscal 1996 onwards is visible. Taken together with the time series analysis, this pattern renders any statistical analysis of levels highly suspect and points towards the conclusion that the effects reported in tables 3 and 4 might simply be statistical artifacts.

Despite the obvious inadequateness—given the data at hand—of a dependent variable that is expressed in levels, the tables 5 and 6 report regression results for setups equivalent to those underlying tables 3 and 4. The only change is that the dependent variable now is the relative tax burden, which is simply the fraction of per capita general fund revenue relative to per capita state income.

Some descriptive statistics are interesting in this context, too. On average, the burden level rose from 5.40% to 5.64% (+0.24 percentage points) in the first year after a transition to a Democratic governor, while it also *rose*,

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Table 5

OLS regression results for the general fund revenue burden specification (I)

Independent variable	Model 8	Model 9
Democrat, unified government	0.0097** (0.0019)	0.0018 (0.0017)
Democrat, divided government	0.0048* (0.0019)	−0.0032* (0.0016)
Republican, unified government	——	−0.0080** (0.0018)
Republican, divided government	0.0080** (0.0018)	——
Intercept	0.0513** (0.0014)	0.0593** (0.0010)
Benchmark	Republican governor, unified government	Republican governor, divided government

dependent variable: general fund revenue burden per capita
Note: Standard errors are shown in parentheses. $N = 801$.
Levels of statistical significance are denoted as follows: $^*p < 0.05$, $^{**}p < 0.01$.

albeit a little less, from 5.44% to 5.49% (+0.05 percentage points) after a transition to a Republican governor. Note that the partisan difference in the first year after a switch is equal to just 0.19 percentage points.

It should also be pointed out that the average burden was 5.83% pre-1996 in states with Democratic governors and rose to 5.86% post-1995 (+0.03 percentage points), while the average burden for states with Republican governors was 5.72% pre-1996 vs. 5.75% post-1995 (+0.03 percentage points). Note that the difference in burden levels between states with Democratic governors vs. those with Republican ones widened slightly from 0.1077 to 0.1083 percentage points from the earlier to the later period (+0.0006 percentage points), yet this can hardly be interpreted as evidence in favor of the partisan policy view, as from fiscal 1995 to fiscal 1996 the share of Democratic governors in the sample fell from 62.5% (30 out of 48) to 39.6% (19 out of 48), so that a more pronounced divergence should have ensued.

Once more, the above results have to be interpreted with considerable caution. As an ADF test shows, the aggregated time series for the general fund revenue burden is not stationary, suggesting biased OLS results yet

Table 6

OLS regression results for the general fund revenue burden specification (II)

Independent variable	Model 10	Model 11
Switch to Democratic governor (Year 1)	—	−0.0001 (0.0031)
Switch to Democratic governor (Year 2+)	—	0.0034 (0.0017)
Democratic governor, no switch	—	0.0013 (0.0015)
Switch to Republican governor (Year 1)	−0.0036 (0.0031)	—
Switch to Republican governor (Year 2+)	−0.0040** (0.0015)	—
Republican governor, no switch	0.0004 (0.0015)	—
Intercept	0.0585** (0.0009)	0.0565** (0.0008)
Benchmark	Democratic governor	Republican governor

dependent variable: general fund revenue burden per capita

Note: Standard errors are shown in parentheses. $N = 801$.
Levels of statistical significance are denoted as follows: $^*p < 0.05$, $^{**}p < 0.01$.

again and potentially "explaining" the increase in burden levels that the descriptive statistics showed for after-transition changes. Curiously, even differencing the series up to seven times does not induce stationarity according to the ADF test. As the alternative Philipps-Perron unit root test indicates that the series is stationary after differencing twice, however, I follow this result and in figure 3 plot a forecast based on the model with the lowest AIC value, namely an ARIMA(0,2,1) specification, to assess the specification's substantive plausibility. While the forecast is overall not implausible on average, it becomes clear from the graph that there is a slight upward trend in burden levels when the ARIMA(0,2,1) specification is used, giving rise to biased OLS estimates and undermining the validity of the tables 5 and 6.

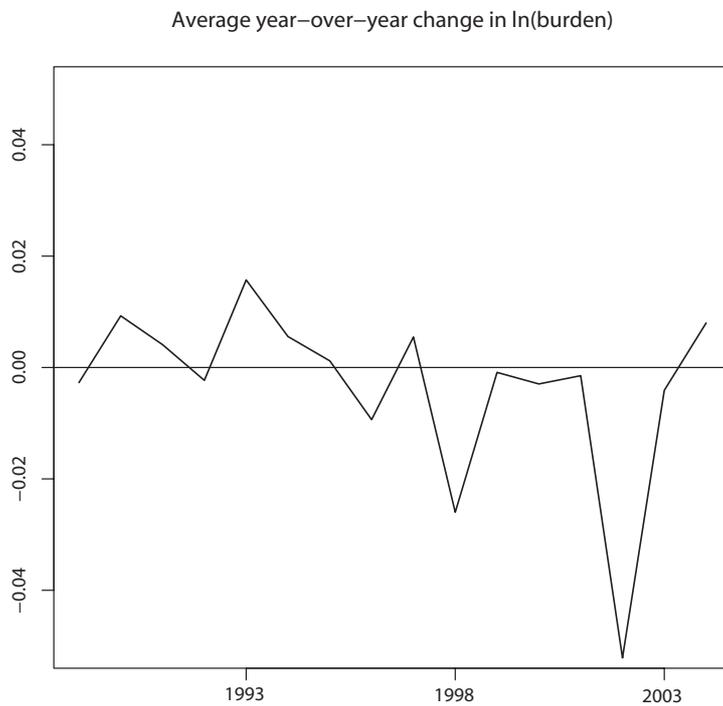**General fund revenue burden (in %) and forecast**
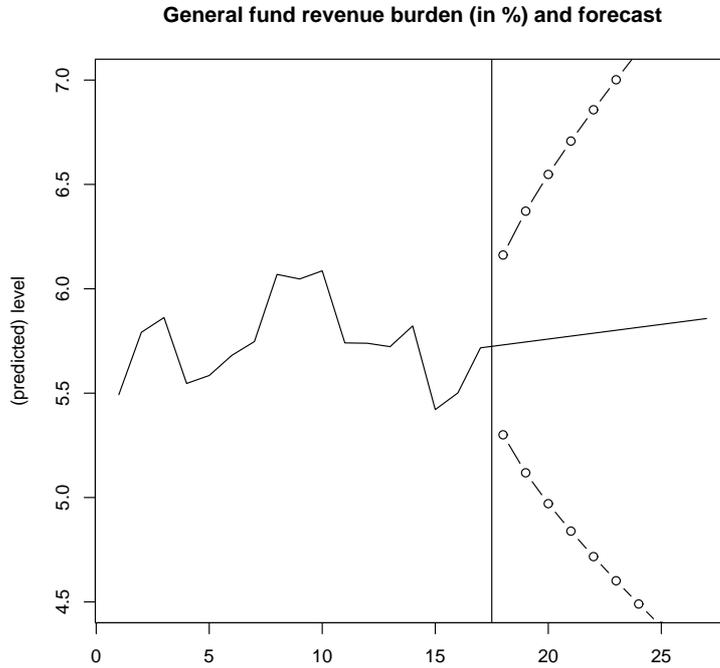
Figure 3
Time-series analysis of the aggregated general fund revenue burden
Note: Forecast is based upon an ARIMA(0,2,1) process.

4 Examination of the data in changes and results

Unlike in the two cases discussed so far, the third specification of the dependent variable is not plagued by econometric complications arising from the presence of a time trend, as indicated by an ADF test. Figure 4 shows the new series, where the yearly change in the burden is set to the average of all 50 states' changes in that year. One should keep in mind that in the econometric analysis below, no such averaging takes place and that the results presented are therefore not influenced by any averaging.

One problem when examining this data is that there are often no strong theoretical priors that could guide the analysis. Consider, for instance, the effect a term limit might have on an incumbent's behavior. As she cannot be re-elected, she might decide to implement her preferred policy in her last term in office. In her first term in office, however, she might not feel

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Average year−over−year change in ln(burden)

Figure 4

Average change in the level of ln(general fund revenue burden)

so uninhibited, as she cannot disregard the electorate's wishes too much if she plans on standing for re-election. Conversely, she might want to change revenue levels most when coming into office in order to signal her type to voters, especially if there has been a switch in ruling parties, and there is simply no need for vigorous action in her second term as revenue levels are already in line with her preferences. Indeed, there are good theoretical reasons to suspect either a move towards higher or lower revenue levels for all the political variables safe party affiliation, so ultimately the empirical results have to settle the question which of the countervailing effects prevail.

Despite the weak guidance that theoretical considerations provide us with, one can identify some cases where partisan influences should be particularly pronounced. First, when a Republican governor is succeeded by a Democrat, revenue levels should subsequently increase. Likewise, when a Democrat is succeeded by a Republican, revenue levels should fall. These expectations could be moderated by the effects of divided government, though,

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so that we might expect the most pronounced revenue level increases when there is a switch to a Democratic governor who is faced with a Democratic legislature, while revenue levels should fall most after a switch to a Republican governor who is backed by a Republican legislature. There are some arguments regarding the impact of unified vs. divided government that point in the opposite direction, however, so the possibility that the strongest effects ensue when governors are faced with divided government is also examined. The rationale behind this approach is that voters will generally find it easier to attribute blame for unpopular policies to a specific party under unified government, which might attenuate the fervor of the governors and legislatures when it comes to implementing their preferred policies under such circumstances.[19]

- **_Term limits_**

Based upon the relevant literature on state-level fiscal policy, I perform a first regression analysis that sheds light on the behavior of governors who are faced with a term limit. Given the uncertainty about the effect of term limits, I do not have any theoretical priors regarding the signs of the regression coefficients. The results of the analysis of the impact of term limits are presented in table 7. Strikingly, not a single coefficient reported there is statistically significant at the 95% level, and I thus conclude that the presence or absence of term limits does not exert any systematic influence on state-level general fund revenues.

- **_Divided vs. unified government_**

Next, I examine the effect that divided vs. unified government has on state-level fiscal policy. The results obtained by running this regression are shown in table 8. In contrast to the regression results for the impact of term limits, there are several coefficients that are statistically significant in this case. Yet, in substantive terms, the burden difference between a state that has a unified Democratic government and one that is under Republican control amounts to only 1.3% of 5.74% (model 16). Put differently, we expect the burden to differ on average by $18.92 between the two setups. As a fraction

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[19]See Berry & Berry (1994) and Powell & Whitten (1993).

Table 7
OLS regression results for the effect of term limits

Independent variable	Model 12	Model 13	Model 14	Model 15
Democrat, term limit and unified government	0.0013 (0.0112)	-0.0049 (0.0090)	—	-0.0011 (0.0113)
Democrat, term limit and divided government	0.0010 (0.0122)	-0.0053 (0.0102)	-0.0017 (0.0113)	—
Democrat, no term limit and unified government	0.0122 (0.0097)	0.0060 (0.0071)	0.0096 (0.0086)	0.0097 (0.0098)
Democrat, no term limit and divided government	-0.0031 (0.0102)	-0.0093 (0.0077)	-0.0057 (0.0091)	-0.0055 (0.0103)
Republican, term limit and unified government	—	-0.0077 (0.0101)	-0.0042 (0.0112)	-0.0040 (0.0122)
Republican, term limit and divided government	0.0054 (0.0100)	—	0.0028 (0.0090)	0.0029 (0.0101)
Republican, no term limit and unified government	-0.0042 (0.0098)	-0.0104 (0.0073)	-0.0068 (0.0087)	-0.0066 (0.0099)
Republican, no term limit and divided government	-0.0028 (0.0093)	-0.0090 (0.0065)	-0.0055 (0.0081)	-0.0053 (0.0094)
Intercept	-0.0041 (0.0085)	0.0021 (0.0053)	-0.0015 (0.0072)	-0.0016 (0.0086)
Benchmark (throughout: term limits)	Republican governor, unified government	Republican governor, divided government	Democratic governor, unified government	Democratic governor, divided government

dependent variable: year-over-year change in ln(general fund revenue burden per capita)

Note: Heteroscedasticity-adjusted standard errors are shown in parentheses. $N = 738$.
Levels of statistical significance are denoted as follows: $^*p < 0.05$, $^{**}p < 0.01$.

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of average per capita GDP, this partisan difference translates into 0.075%.[20]

To ensure that the results obtained for the full sample are not driven by unusually large swings in single years, an analysis of three ten-year subsamples, spanning the years 1988–1997, 1991–2000, and 1994–2003, was performed, too.[21] An analysis of the first subperiod does not yield a single statistically significant coefficient at the 95% level, even though the ones that are significant at the 95% level in table 8 are all significant at the 90% level, with their size very close to what is reported in table 8. For subsample 2, spanning the years 1991 to 2000, again not a single coefficient is statistically significant in the analysis, and the t-values drop across the board. Finally, in the third subsample, for the years 1994 to 2003, only the intercepts in models 16 and 17 are statistically significant at the 95% level. In the case of model 16, a unified Republican government is expected to on average lower general fund revenue levels by 1.41%, or $21.66, vs. all other constellations, while model 17 predicts that a Republican governor operating under divided government will on average lower the revenue level by 0.7917%, or $12.18, when compared to the three other possible combinations.

- *Change in the governing party*

Given the null result that was found for the effect of term limits and the substantively small effects of unified vs. divided government, one major aspect of state-level fiscal policy remains to be examined. This section studies the behavior of Democratic governors who succeeded a Republican officeholder and Republican governors who followed a Democrat in office. Under these two setups, the partisan policy model strongly suggests that revenue levels will rise in the former case and fall in the latter. Unlike in the earlier cases, where it could potentially be argued that there was no need for adjustments, as revenue levels might already have been at or close to the governors' ideal points, if no sizable adjustment effects are found here, then one has to wonder whether the partisan model actually generates useful predictions or not.

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[20]The estimated average difference falls to 1.01% of 5.74% for the unified Democratic and divided Republican case (model 17), or about $14.79. Note that the estimates for model 18 by construction match those for models 16 and 17.

[21]The results of these regression are only reported in summary form here. Tables with the complete regression results are available from the author.

Table 8

OLS regression results for the effect of divided vs. unified government

Independent variable	Model 16	Model 17	Model 18	Model 19
Democrat, unified government	0.0129* (0.0058)	0.0101* (0.0050)	—	0.0113 (0.0062)
Democrat, divided government	0.0015 (0.0064)	−0.0012 (0.0056)	−0.0113 (0.0062)	—
Republican, unified government	—	−0.0027 (0.0052)	−0.0129* (0.0058)	−0.0015 (0.0064)
Republican, divided government	0.0027 (0.0052)	—	−0.0101* (0.0050)	0.0012 (0.0056)
Intercept	−0.0076 (0.0043)	−0.0048 (0.0031)	0.0053 (0.0040)	−0.0060 (0.0047)
Benchmark	Republican governor, unified government	Republican governor, divided government	Democratic governor, unified government	Democratic governor, divided government

dependent variable: year-over-year change in ln(general fund revenue burden per capita)

Note. Heteroscedasticity-adjusted standard errors are shown in parentheses. $N = 738$.
Levels of statistical significance are denoted as follows: $^{*}p < 0.05$, $^{**}p < 0.01$.

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In order to measure the impact of a partisan change in the governor's mansion, I specify four models that once more rely heavily on qualitative regressors. Given the results from table 8, I distinguish not only between party affiliation and the time that has passed since a switch, but also between unified and divided government. The partisan policy view predicts the strongest effects in the case of a switch to either a unified Republican or unified Democratic government, and the adjustments that one ought to observe after such a switch should be rather sizable.

As a look at table 9 shows, in the first year after a party change in the governor's mansion, Democratic officeholders faced with a likewise Democratic legislature indeed do oversee rising revenue levels (models 20 and 21). Yet, over the longer run, i.e., when all years after a switch and before the next change are taken into account, this effect disappears.[22] Also, note that the standard errors for the longer-run coefficients are about half the size of the ones for the first-year effect, which is not surprising given that we are dealing with 62 vs. 18 observations that these are based upon. Thus, there is a "jump" upwards in the first post-election (fiscal) year, but it is a one-time event.

Moreover, the predicted "jump" in the first year on average amounts to 4.39% of 5.74%, or $64.02, in the most favorable case, i.e., when the difference between the baseline category and the effect of the first-year switch is computed for model 20. Compared to the average per capita general fund revenue level of $5826.55 over a governor's four-year tenure, this translates into a partisan effect of 1.10%, or just 0.0676% of the average person's $94742.96 GDP over the same four-year period.

Strikingly, Republican governors appear to neither lower revenues in the short nor in the long run when they succeed a Democrat under any constellation, at least not when standard levels of statistical confidence are employed. Given the magnitudes involved, one can hardly call the partisan effects found here sizable, and despite the three statistically significant variables reported

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[22]Alt & Lowry (2000) likewise find that adjustments only take place in the first two years after a change of the ruling party, yet they still maintain that there are marked differences in policy preferences between Democrats and Republicans. Standard regression diagnostics, including checks for influential observations, were performed for all models, but did not indicate any serious problems.

in table 9, not much of substantive significance can be discerned from this set of regressions, either.

As a further robustness check, I estimated the (potential) breakpoints of the aggregated time series shown in figure 4. As figure 2 above shows, there was a pronounced change in party composition at the levels of the U.S. states from fiscal 1996 onwards. In fiscal 1995, 30 of the 48 states in the sample were governed by a Democrat, while 18 had Republican governors. In fiscal 1996, however, this relationship had been almost reversed, and only 19 states still had Democratic governors (-36.67%), whereas the Republicans recorded a large gain of 11 governorships for a total of 29 ($+61.11\%$). Overall, if the partisan policy theory is accurate, one would expect a break in the general fund revenue time series at the end of fiscal 1995. Yet, as a structural break computation shows, the (statistically) most notable break present in the data is found at the end of fiscal 1997, i.e., at a time when there was no change in the number of Republican governors at all (31 in both 1997 and 1998), while the number of Democratic governorships in the sample fell by just 1 (from 17 to 16).[23] In fact, the six largest trend breaks are identified at the end of the fiscal years 1990, 1992, 1994, 1997, 2000, and 2002. Note that the year 1995 is conspicuously absent from this list.

Overall, this finding is in line with the regression results presented in table 9, which show that Republican governors who succeed Democrats simply "sit tight," i.e., they do not oversee lower revenue levels than their predecessors. In particular, the trend break analysis does not show any break between fiscal 1995 and fiscal 1996, which indicates that the newly elected Republicans simply continued the policies of their Democratic colleagues.

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[23]The trend break estimation was performed in R 2.1.0 using the command breakpoints() from the strucchange package. Enders (2004: 200-207) presents a compact overview of how to identify structural changes in time series, while Bai & Perron (2003) discuss the procedure used here in more technical terms and much greater detail.

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Table 9

OLS regression results for after-switch behavior

Independent variable	Model 20	Model 21	Model 22	Model 23
Democrat, unified government	—	—	—	0.0108* (0.0051)
Democrat, divided government	—	—	−0.0065 (0.0055)	—
Republican, unified government	—	−0.0036 (0.0050)	—	—
Republican, divided government	0.0001 (0.0045)	—	—	—
Switch to unified Democratic government (year 1)	0.0430** (0.0133)	0.0420** (0.0132)	—	—
Switch to unified Democratic government (year 2+)	0.0086 (0.0067)	0.0077 (0.0064)	—	—
Unified Democratic government, no switch	−0.0096 (0.0111)	−0.0101 (0.0111)	—	—
Switch to divided Democratic government (year 1)	0.0185 (0.0129)	0.0175 (0.0127)	—	—
Switch to divided Democratic government (year 2+)	0.0006 (0.0074)	−0.0003 (0.0072)	—	—
Divided Democratic government, no switch	−0.0197 (0.0143)	−0.0203 (0.01431)	—	—
Switch to unified Republican government (year 1)	—	—	−0.0214 (0.0126)	−0.0155 (0.0127)
Switch to unified Republican government (year 2+)	—	—	−0.0088 (0.0063)	−0.0031 (0.0065)
Unified Republican government, no switch	—	—	−0.0125 (0.0198)	−0.0102 (0.0200)
Switch to divided Republican government (year 1)	—	—	0.0120 (0.0108)	0.0179 (0.0109)
Switch to divided Republican government (year 2+)	—	—	−0.0010 (0.0051)	−0.0043 (0.0053)
Divided Republican government, no switch	—	—	0.0037 (0.0122)	0.0079 (0.0123)
Intercept	−0.0049 (0.0033)	−0.0040 (0.0027)	0.0004 (0.0028)	−0.0055 (0.0032)
Benchmark	Republican governor, unified government	Republican governor, divided government	Democratic governor, unified government	Democratic governor, divided government

dependent variable: year-over-year change in ln(general fund revenue burden per capita)

Note: Heteroscedasticity-adjusted standard errors are shown in parentheses. $N = 738$.

Levels of statistical significance are denoted as follows: $^*p < 0.05$, $^{**}p < 0.01$.

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5 Discussion and implications

Given the results reported in section 4, the notion that governors' policies follow partisan patterns with regard to revenue levels can only be upheld with considerable qualifications based on state-level revenue data for the fiscal years 1988 to 2004. The effects found have a one-shot character and are at best on the order of 5 percent of the average general fund revenue level, which translates into about 0.068% of the average person's $94,742.96 GDP over a four-year period. What explains the complete absence of partisan effects when it comes to members of the Republican party and the only minuscule adjustments that Democrats make to the general fund revenue level despite the appealing logic of the partisan policy model remains an open question, however. Likewise, the discrepancy between the findings of this paper and earlier work discussed in section 2, most notably the papers by Alt & Lowry (2000) and Besley & Case (1995), is a bit puzzling. Especially the claim by Alt and Lowry that Democrats strive for 50% higher revenue levels than Republicans is cast into serious doubt in light of my findings.[24]

The pattern that Democratic governors raise taxes during their "lame duck" term reported by Besley & Case (1995) is not echoed here, either. Indeed, term limits could not be shown to exert statistically significant effects on the general fund revenue level. How much of the divergence between their results and mine are attributable to different time periods covered cannot be ascertained with certainty, but it seems unlikely that this is the main cause for the contrasting results. Indeed, it appears more likely that the insufficient regard earlier papers, including theirs, paid to nationwide economic trends lies at the heart of this difference.[25]

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[24]In order for revenue levels to rise by 50% from the status quo, there would have to be 10 transitions from Republican control of a state's governorship to unified Democratic control, which translates into a time-span of at least 76 years. One should keep in mind that revenue levels are never predicted to fall, so a downward (Republican) adjustment is ruled out here. 10 transitions would be needed to induce a 50% difference in revenue levels because $(1.043938)^{10} = 1.537259$.

[25]Besley & Case (1995), for example, simply include year dummies in their time-series cross-section regressions, which is an inappropriate way of dealing with a unit root. To my knowledge, the only paper published in a political science journal thus far that at length discusses unit roots in the context of fiscal policy, albeit at the federal level, is Krause (2000).

One possible explanation for the absence of evidence pointing towards substantially meaningful partisan revenue effects is the fact that the mobility of both labor and capital is high within the U.S. Once a state's tax rates get too much out of line with those in neighboring areas, either an outflux of capital and labor under relatively rising rates or an influx under relatively falling rates should largely offset the revenue effects of most tax changes. In this sense, tax manipulation should at least not shine through in the revenue data over the longer run. A better approach to testing the partisan policy theory using state-level data might thus be to examine the impact of changes in the tax levels directly, yet reliable impact forecasts for such changes are notoriously hard to come by.

Overall, the result presented here notwithstanding, it is entirely possible that the partisan policy logic applies in settings where mobility is relatively low, i.e, at the national level. Whether patterns similar to the ones found for the state-level can be found at the local level in the U.S., too, is yet another open question and a potentially fruitful avenue for future research.

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