Partisan Politics in Fiscal Unions: Evidence from U.S. States.

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Abstract

States are important agents of fiscal policy in the federal countries such as the U.S., but political frictions can impact how such subnational governments transmit federal fiscal policy. We analyze how state partisanship of politicians affects state fiscal policy and quantify the possible macroeconomic consequences for federal fiscal policy. First, using data from close elections, we find strong partisanship effects in the spending propensity of federal transfers, the so-called fly-paper effect: Republican governors spend less and cut distortionary taxes. Second, we calibrate a New Keynesian model of Republican and Democratic states in an open economy monetary union, drawing the key partisan pass-through parameters from distribution estimated in the state data. The model delivers aggregate multipliers that differ significantly by state partisan preferences. Finally, we find empirical support for the structural model's partisan predictions using local-projection methods.

Keywords: partisanship, Republican, Democratic, states, fiscal policy, distortionary taxes, monetary union, fiscal multiplier, regression discontinuity.

JEL codes: C24, E62, F45, H72, H77.

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1 Introduction

It is now well recognized that heterogeneity among households and firms matters for the transmission of macroeconomic policies (e.g., Kaplan et al., 2018; Ottonello and Winberry, 2018). In this paper we argue that political heterogeneity, or partisan differences, may matter as well. We explore this possibility for a federal economy where the central government allocates transfers to state and local governments for local spending or tax relief. For example, 40 percent of the 2009 stimulus package in the U.S. went to state and local governments (Carlino and Inman, 2014). But just as the recent macro literature has emphasized that there is no single representative private-sector agent, there is no single representative state or local policymaker. Governors, for example, may have Democratic or Republican preferences in the allocation of public resources. Partisan differences may determine the strength of demand and supply effects of aggregate fiscal policies. We estimate whether the spending pass-through of federal transfers by state and local governments depends on partisan preferences of elected officials and, if so, whether these differences affect the aggregate multiplier of federal transfers.

The importance of subnational governments in federal countries is well documented (OECD/UCLG, 2016). In federal economies, state and local governments are responsible for close to 50 percent of all government expenditures and more than 50 percent of all public investment. Even in countries with unitary governments, lower tier governments account for as much as 20 percent of all public expenditures and a third of all public investment. Subnational governments are also important providers of services such as education, police, and public transit, and often administer and disburse national income transfers.

The predominant means by which the national government influence the fiscal policies of state and local governments is through intergovernmental transfers. The relationship is that of a national principal to a state or local agent; the "contract" is to provide services in exchange for federal transfers. For the U.S. economy, such transfers have grown six times faster than GDP since 1947 and are now higher than federal government non-defense consumption and investment, accounting for about 3 percent of GDP in recent years. In the US, these national transfers provide 22 percent of state and local government revenues, and even more in the average federal country, both in the OECD and across the world. And the state fiscal relief in the 2009 stimulus bill, i.e., the 40 percent share of the total stimulus allocated to state and local governments, was central to the passage of ARRA (Boone et al., 2014).

In this paper, we analyze the degree of partisanship in the fiscal policies of U.S. states and the impact of state level partisanship on national fiscal policies. Partisan differences were particularly evident in the implementation of the Obama era Medicaid expansion. But these differences are also present in the takeup of the option to introduce work requirements for Medicaid recipients under the Trump administration.[1] Central to our analysis is the identification of partisan effects, i.e., fiscal rules, under Democratic and Republican governors. We estimate fiscal rules as typically

[1] See *Washington Post* "Millions will remain uninsured because of blocked Medicaid expansion in states" (11/15/2013) and *The Economist*, "The Arkansas experiment" (2/16/2019), respectively.

specified in both the literature on the political economy of state government finance (e.g. Inman, 2009) and in the macroeconomic analysis of fiscal policy (e.g. Fernández-Villaverde et al., 2015), but also include federal transfers revenues and allow for partisan differences in responses. Similar to the methodology of Ferreira and Gyourko (2009), we use data on close elections of these governors to isolate partisan differences in fiscal behavior. To quantify the national effects, we then calibrate a structural macroeconomic model with these estimates and verify the model predictions in time series data. In doing so, our paper makes two contributions.

First, we document partisan differences in the propensity to spend out of federal transfers, a propensity called the "flypaper effect" (surveyed by Hines and Thaler, 1995). We estimate a Democratic spending propensity of one dollar of federal transfers to be 1.20 dollars. In contrast, a Republican governor spends only 0.10 of each transferred dollar. Instead of spending increased transfers, Republican governors have lower revenue growth and lower effective tax rates. Further, the lower tax revenue growth under Republican governors in response transfers emerges in the post-Reagan era. The timing of these increased partisan policy differences is consistent with time variation in measured national partisanship; see McCarty et al. (2016) and Azzimonti (2018).

Second, we compute the macroeconomic effects of state partisanship. We extend the Nakamura and Steinsson (2014) New Keynesian model of states within a monetary union to include partisan state fiscal policies. The federal government transfers money to the states, but a fraction of states has a governor with the estimated Republican policy preferences, while the remainder is endowed with the Democratic preferences. Specifically, we draw the key spending pass-through elasticities from the asymptotic distribution estimated using the state-level data, allowing us to quantify both point estimates as well as uncertainty about the macroeconomic effects of partisanship. We provide two counterfactuals. In the first counterfactual, we remove the partisan bias in foscal policy and find that the aggregate impact multiplier of federal transfers rises from 0.32 to 0.56. This result is due do the initially lower aggregate demand in Republican states, even though Republican states have higher output in the longer run due to cuts to taxes. These results are consistent with state-level regressions for economic activity.

The second counterfactual examines the effects of varying the fraction of states governed by Republicans, given our estimated partisan preferences. The model predicts that that the aggregate impact multiplier falls as the share of Republican governors rises. Since 1980, the share of Republicans has varied between 30 percent and 68 percent. In our baseline calibration, the time-varying impact multiplier varies from a peak of about 0.4 to as low as 0.2. Local-projection estimates confirm the prediction that the impact response of aggregate GDP to an innovation in intergovernmental transfers falls with the share of Republican governors. Our finding thus points to a novel source of time-dependence in fiscal multipliers.

We continue by developing the empirical specification and describing the data in Section 2. Section 3 presents the empirical results. Section 4 introduces our empirical estimates in a model of a monetary union. Finally, Section 5 uses time series data to test the model prediction that transfer multipliers depend on the partisan affiliation of governors.

2 Empirical specification and data

2.1 Empirical specification

In our model, we estimate otherwise standard rules that also allow for state partisanship. Both in public finance (e.g. Inman, 2009) and in macroeconomics (e.g. Fernández-Villaverde et al., 2015), researchers model government spending and revenues as functions of aggregate income and lagged fiscal variables, such as the stock of governments debt. To account for the institutional importance of federal transfers, we also introduce intergovernmental transfers as a possible determinant.

For state s at time t, our specification relates current state government expenditures $E_{s,t}$ or revenues $R_{s,t}$ (exclusive of government transfers) to state income $GDP_{s,t-1}$ and state debt $D_{s,t-1}$, as well as federal intergovernmental transfers received by the state $IG_{s,t}$. Importantly, partisan preferences $\rho_{s,t}$ of the state governor may interact with these other determinants. For expenditures, this leaves us with the following rule:

$$E_{s,t} = \gamma_0(\rho_s, t) + \gamma_{GDP}(\rho_{s,t})GDP_{s,t-1} + \gamma_D(\rho_{s,t})D_{s,t-1} + \gamma_I(\rho_{s,t})IG_{s,t} + \upsilon_{s,t}. \tag{2.1}$$

Here, $\upsilon_{s,t}$ includes an error term that may be correlated within or across states. Partisan bias affects outcomes through the coefficients of the fiscal rule.

We focus on the governor as the central political agent for state fiscal policies to measure partisanship for four reasons. First, fiscal policies begin with the governor's constitutional agenda powers to propose a budget and then to deter deviations from that budget by the use of an executive veto. The line-item veto, common in many states, gives the governor particularly strong powers to check any significant deviations from her initial agenda; see Holtz-Eakin (1988) and Bohn and Inman (1996). Second, divided government and increasing partisanship between legislative parties make a coordinated legislative effort to undo the executive's budget very difficult; see McCarty et al. (2016, chapter 8) and Bohn and Inman (1996) for evidence from state budgets. Third, over the years of our sample most federal intergovernmental transfers are continued funding for existing state programs and do not require state legislative approval of new programs. When approved, new federal aid programs have typically been unconstrained, or broadly mandated transfers giving the governor wide latitude for fund allocations (Carlino and Inman, 2014). As such, aid allocation will be much like an executive order and independent of legislative review.

Our focus is on close elections because full-sample regressions may not reveal the actual partisan behavior. Voters might "select" one party during certain economic conditions or parties might cater to voters' political preferences. In both cases, policy choices would not reflect the partisan preferences of policymakers. Policy choice could also be obscured by rent-seeking motives of politicians in non-competitive races that could lead to higher spending. To account for this potential endogeneity, we estimate budget rules for marginally-elected governors. This resembles regression discontinuity designs, which compare two groups near an arbitrary cutoff where selection into a "treatment" group is essentially random and then makes inference based on differences in outcomes for the two groups. Inference on the impact of the treatment group is then as good as using randomly assigning

treatments (Lee, 2008). Similarly, we argue here that conditioning on close elections allows us to give the estimated differences between political parties a causal interpretation.

We estimate fiscal rules of the type of (2.1) in log-differences. This specification eliminates state fixed effects directly and allows for different trends via state fixed effects in these log-differences. Using fixed effects as in Besley and Case (2003) isolates the within-state variation in political outcomes and the between-state variation in intergovernmental transfers and business cycles. Specifically, we estimate regressions of the following form, where our focus is on the interaction terms:

$$\begin{aligned}\Delta Y_{s,t} = \mu_s + \nu_{c(s),t} + \alpha_r \times Rep_{s,t-1} \\ + (\beta_{0,debt} + \beta_{r,debt} \times Rep_{s,t-1})\Delta \ln Debt_{s,t-1} + (\beta_{0,gdp} + \beta_{r,gdp} \times Rep_{s,t-1})\Delta \ln(GDP_{s,t-1}) \\ + (\gamma_{0,+} + \gamma_{r,+} \times Rep_{s,t-1})\Delta \ln IG^{+}_{s,t} \\ + (\gamma_{0,-} + \gamma_{r,-} \times Rep_{s,t-1})\Delta \ln IG^{-}_{s,t} + \epsilon_{s,t}, \end{aligned} \tag{2.2}$$

where s denotes states and t denotes years. $Y_{s,t}$ is (log) expenditures in our main results and a measure of (log) revenue or economic activity in our extensions. μ_s denotes state fixed effects. $\nu_{c(s),t}$ denotes Census region$\times$ year fixed effects. $Rep_{s,t-1}$ is a dummy for Republican governors at the time the budget was passed. Here, $\Delta \ln IG^{+}_{s,t} \equiv \max\{0, \Delta \ln IG_{s,t}\}$ and $\Delta \ln IG^{-}_{s,t} \equiv \min\{0, \Delta \ln IG_{s,t}\}$. $\epsilon_{s,t}$ is the error term. In what follows, we focus on the estimates of $\gamma_{r,+}$ and $\gamma_{r,-}$, that is, on how the pass-through elasticity changes when the governor is Republican rather than a Democrat.

Underlying our specification is the idea that if governors were randomly assigned, then any errors from potentially endogenous transfers would average to zero across Democrats and Republicans. We assume that in narrow elections, the governor assignment is quasi-random. Appendix A provides the formal argument. The key assumption is that the outcome of the close election is independent of the values of the control variables such as the flows of intergovernmental transfers and the error terms of the regression. While we cannot test our assumption in terms of the actual, unobserved ϵ, we can test the unconditional correlations of other (control) variables and the *Rep* dummy. As our discussion of Table 1 highlights, there are no significant partisan differences in the flows of intergovernmental transfers in the sample of narrowly elected governors, nor in the other model variables. The sample is thus consistent with our identifying assumption.

We also use a different set of fixed effects to allay other potential concerns. Specifically, one concern for identification is that even though the governor dummy is independent, the federal government could target transfers to governors of a specific party. To mitigate this concern we also estimate versions of our regression that have party$\times$state and party$\times$year fixed effects. Intuitively, allowing for party$\times$year fixed effects allays concerns that marginally elected governors of one party might have systematically different IG flows. For example, Republican governors could all decline to participate in a new federal program, such as Medicaid expansion, and the independence assumption would then be violated. Party$\times$year fixed effects would account for that and only use residual variation for identification. In this case our regression setup is that of Caetano et al. (2017). They formally develop a RDD when the average effect across the threshold is zero.

2.2 Data sources and definitions

We construct a panel data set encompassing fiscal and political outcomes in U.S. States from 1963 to 2014, supplemented with select macroeconomic indicators. Appendix B provides variable definitions and additional details.

Political data. We assemble a political database including state legislature partisan affiliation, governor party and marginal victory, and state presidential vote. The state legislature data comes from Klarner (2015). Klarner assembles this open source data set from primary sources. This database also includes a variety of budget power variables assembled by Klarner's study of legal fiscal rules. Using text recognition software, we assembled a database of gubernatorial outcomes from the Council of State Government's Book of States, which provides margin of victory and party affiliation from 1933 to date. Since the vote share can lead to ambiguous outcomes when other parties won the most vote, we manually check the election results whenever third parties are shown as having the most votes. In addition, we check all governors elected within a 5pp. margin of victory (MOV). We also collect non-electoral gubernatorial change outcomes from the National Governors Association.[2] Finally, we take state-level presidential voting records from the University of California Santa Barbara's American Presidency Project. Our final data set spans 1963 to 2008 with full fiscal and political data. Note most states switch governors during our sample period. For example, even states that produce landslide victories in some elections, such as California or Texas, had marginally elected governors from both parties.

Fiscal variable definitions. We collect comprehensive data on revenues and expenditures for all states from the U.S. Census Bureau's State and Local Government Finance historical database for 1958 to 2006 by fiscal year. For both expenditures and revenues, the State and Local Government Finance database provides detailed accounts for both the end use and source of financing, including purpose of intergovernmental transfers as well as type of spending. The more recent data comes from the Census' Annual Surveys of State and Local Government Finances. [3]

Our fiscal variables definitions follow U.S. Census Bureau (2006). Our measure of government expenditures is called "Total Expenditure". The Census defines it as "includ[ing] all amounts of money paid out by a government during its fiscal year [...] other than for retirement of debt, purchase of investment securities, extension of loans, and agency or private trust transactions." (U.S. Census Bureau, 2006, p. 5-1.) This measure is the sum of current operating expenditures, total capital outlays, total spending on assistance and subsidies, total insurance trust benefits, total interest on debt, and total intergovernmental expenditures.

We use "General Revenue" net of federal intergovernmental transfers as the main measure of

[2] In years with a change in governor party, we assign the governor's political party to the party during the budget process in the first quarter of the previous calendar year. Unless otherwise noted, we drop state-years with independent governors – a rare occurrence, as Figure B.2 shows.

[3] We do not use the preliminary estimate for 2015 because we found that preliminary estimates can be off substantially in 2007 and 2008, when the historical and contemporaneous sources overlap.

revenue for our analysis. General Revenue is defined by the Census as "compris[ing] all revenue except that classified as liquor store, utility, or insurance trust revenue." (U.S. Census Bureau, 2006, p. 4-3) General revenue is the sum of tax revenue, intergovernmental revenue, current charges, and miscellaneous charges. While the Census provides an alternative and larger measure called "Total Revenue" that also includes social insurance trust revenue, the Census requires unrealized gains or losses to be booked in the fiscal year that they occur, which skews the data during recessions.

To measure the constraints on fiscal policy, we also use "total debt" from the census data set. The weakness of this measure is that it is based on the face value of outstanding debt, rather than its market value. However, by focusing on the change in total debt we should limit the importance of the composition problem of debt. We also focus on debt with a maturity of at least one year which accounts for almost all debt. Our results are, however, robust to using all debt outstanding. The Census discourages using alternative measures, such as the past surplus.[4]

Economic activity. We also data on state GDP, employment, and population data from the U.S. Bureau of Economic Analysis's Regional Economic Accounts by calendar year. To merge the dataset, we line up fiscal years with the calendar years straddling the end of the previous fiscal year and the beginning of the current fiscal year, to best reflect states' contemporaneous information. Fiscal years begin in the calendar year before with the state budget allocation being set in advance for all U.S. states, despite difference in the timing of fiscal years for four states. We assign the political status of the state to be that in the first quarter of the calendar year preceding the fiscal year as it is in the middle of the budget process.

Macroeconomic data. We use the aggregate annual GDP deflator to deflate all quantities to real dollar values in our state level data set. In addition, we collect quarterly data on grants-in-aid to both state and local governments, and on federal, and state and local government expenditures as well as consumption and investment expenditures, as well as aggregate GDP.

2.3 Sample selection

We organize our analysis according to the predominant state fiscal year definition and begin our estimation sample in the (state) fiscal year of 1983. This fiscal year is the first fiscal year that states knew the Reagan policies: Reagan assumed office in 1981 and the first new federal fiscal year in his presidency begins in September 1981. Fiscal years begin in July in most states, whereas the federal fiscal year begins in September. States could react to the 1981 federal budget during their budget deliberations for FY 1983 that take place in the first half of 1982. In our analysis, we relate the expenses in a given fiscal year to the political majorities in the previous fiscal year because of the implementation lag. Some of our results are depend on excluding the pre-Reagan years, and we analyze this time-dependence explicitly below.

[4] "[...] the Census Bureau statistics on government finance cannot be used as financial statements, or to measure a government's fiscal condition. For instance, the difference between a government's total revenue and total expenditure cannot be construed to be a 'surplus' or 'deficit.'" See U.S. Census Bureau (2006, p. 3-13.).

We define the cutoff for a close election in terms of the percentage point difference between Republican and Democratic votes. I.e., if no votes were cast for independent candidates, a MOV of 4pp. would correspond to a 52.0% Republican vote share with the remaining 48.0% going to the Democratic candidate. Only half as many voters (plus one) have to switch to reverse the election outcome. Figure B.1 in the Appendix shows the corresponding number of marginally elected governors by year for our baseline cutoff of a 4pp. MOV. All years have marginally elected governors from both parties, with a minimum of three marginally elected governors in 2009 and a maximum of 13 in 2003 and 2004.

We drop states that have large sovereign wealth funds financed through severance taxes. In the literature (e.g., Conley and Dupor, 2013), it is common to remove the four smallest U.S. states, which include three of the most oil dependent states, or to control for oil prices. Instead, we focus on states that have sovereign wealth funds with explicit requirements on revenues and expenditures. For example, the Alaska Constitution mandates that at least 25% of oil revenue is deposited in its wealth fund. Such fiscal rules and the potential to use these funds to smooth expenditures or taxes may create problems for our model. We thus drop the states starting in the the year that they instituted their wealth fund: Wyoming (since 1975), Alaska (1976), and North Dakota (2009).[5]

2.4 Descriptive statistics

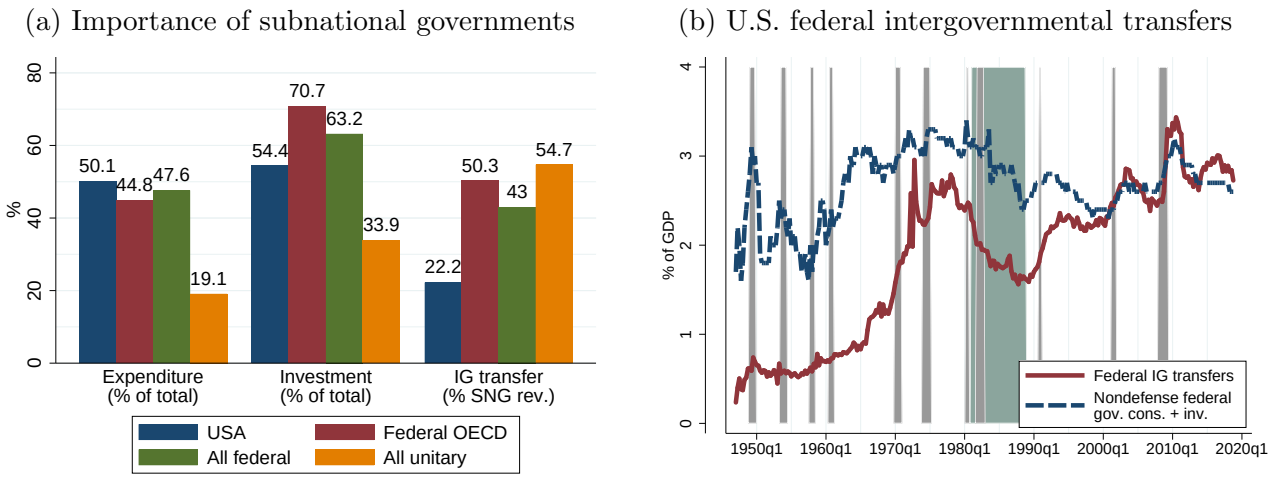
Before turning to the state-level data, we provide a summary of the aggregate importance of lower levels of government across the world and in the U.S. Figure 1(a) illustrates the relative importance of subnational governments in overall government fiscal policies for the United States, federal OECD economies, all federal economies, and for unitary governments. In federal countries, state and local governments are responsible for close to 50 percent of all government expenditures and more than 50 percent of all national investment in public infrastructure. Even in countries with unitary governments, lower tier governments account for almost 20 percent of public expenditures and a third of public investment.

In the U.S., state and local governments have been growing in importance. Figure 1(b) shows the growing importance of intergovernmental transfers for the U.S. economy; transfers have grown six times faster than GDP since 1947 and are now higher than federal government non-defense consumption and investment, accounting for about 3% of GDP in recent years.[6]

Figure 2 provides a breakdown of the general revenue, tax revenue, and expenditures for U.S. state governments only. Federal transfers are the second most important source of state general revenue, accounting for 29% of the total. The main revenue source of states are taxes, accounting for 51%. General charges and miscellaneous revenue accounts for most of the remainder. Almost half of the tax revenue is due to sales taxes and almost 30% of taxes come from individual income

[5]They are the only states to receive 20% of their revenue from severance taxes. Our main results are robust to including these states.

[6]Intergovernmental transfers to states in the Census data differ from the data in Figure 1 in the introduction. However, Figure B.3 shows that the Census data underlying our analysis behaves very similarly to the NIPA data despite coverage differences.



All data for panel (a) are from OECD/UCLG (2016) and from FRED (2019) in panel (b). In panel (b), gray shaded areas indicate NBER recession dates. The green shaded area indicates the Reagan presidency.

Figure 1: Importance of subnational governments in federal countries in 2013 and U.S. federal intergovernmental transfers since 1947

taxes. The remaining 22% are split roughly evenly into other taxes, license revenue, and corporate income taxes. 54% of total expenditures go towards operating expenses and others. States spend one quarter of expenditures on transfers to municipalities and 13% are transfers to households. The remaining 8% are capital outlays.

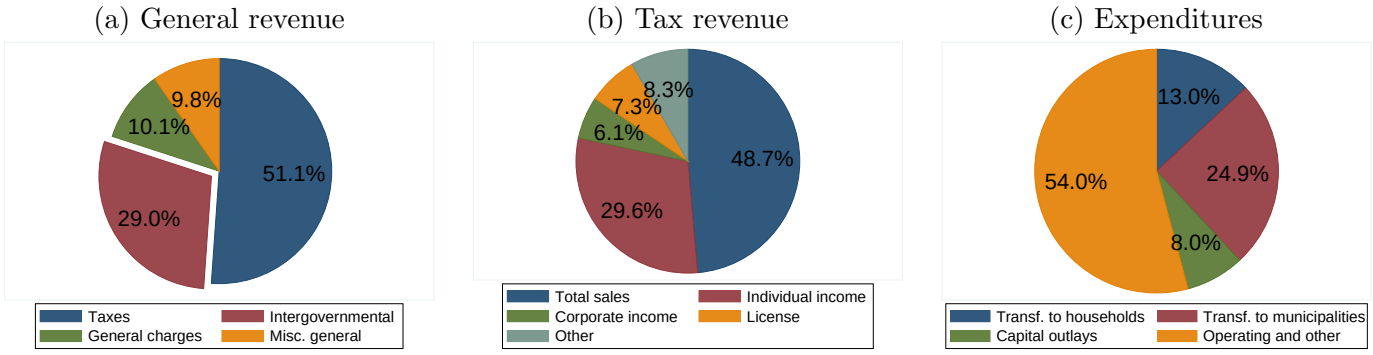


Figure 2: State budgets: Average shares from 1983–2014

Table 1 provides summary statistics for the state level data. It also report p-values for tests of the Republican and Democratic difference in our main sample of close elections, after removing state and year fixed effects and clustering by state and year. The top part of the table characterizes the states during our sample period. During our main sample period from 2013 to 2014, real GDP per capita averaged just below $40,000 (all in 2012 terms). The sample of states with close elections had a per capita GDP that was just $300 higher. The states with Democratic governors had a GDP that was 1,700$ higher than in Republican states, but the difference is not statistically significant, with a p-value of 0.2. Debt per capita averaged $2,800 in the main sample and was $200 higher in the

sample of closely elected governors. The average state had 5.8 million inhabitants, and averaged 6.6 million in the sample of closely elected governors. The employment to population ratio averages around 56%. Total expenditures amounted to 12.6% of GDP in both the overall sample since 1983 and the sample of close elections. General revenue averaged only 11.3% because it excludes insurance trust revenue. Of the general revenue, around 29% came from federal intergovernmental transfers. None of the differences between closely elected Democrats and Republics are statistically significant.

The bottom part of Table 1 summarizes the growth rates of the economic variables that enter our main regression specification as regressors and dependent variables. Differences in the growth rates of the variables are insignificant throughout. This is important, because our identifying assumption is that once we condition on close elections, the control variables and the variables whose interaction with the governor's party we analyze are not significantly different across parties. For example, IG increases are 4.6% both under closely elected Democratic governors and under closely elected Republican governors. After removing fixed effects and clustering standard errors, the difference is, unsurprisingly, insignificant with a p-value of 0.6. Similarly, the difference in IG decreases of 0.3pp. has a p-value of 0.7.

Table 1: Sample means of main variables for various samples.

		Main sample	Main sample with close elections			Dem=Rep
	1963-2014	1983-2014	Within 4pp.	Dem<4pp.	Rep<4pp.	p-val
Debt per capita (1,000)	2.1	2.8	3.0	2.7	3.2	0.4
GDP (1,000)	33.2	39.8	40.1	41.1	39.4	0.2
Population (1,000)	5177.1	5777.4	6570.8	5762.0	7156.6	0.2
Emp to population	53.5	56.4	56.2	57.0	55.6	0.2
Expenditures to GDP	11.8	12.6	12.6	12.6	12.6	0.6
General revenue to GDP	10.6	11.3	11.3	11.4	11.2	0.7
General rev share: IG	29.0	29.0	29.1	29.5	28.8	0.9
Debt growth	-0.8	0.0	0.0	0.2	-0.1	0.6
Population growth	1.1	1.0	0.8	0.9	0.8	0.6
Overall GDP growth	2.1	1.9	2.1	2.0	2.1	0.2
Emp to pop ratio change	0.3	0.3	0.4	0.5	0.4	0.6
Expenditure growth	3.2	2.6	2.6	2.7	2.5	0.2
Net general rev growth	3.0	2.2	2.8	3.1	2.6	0.4
Income sales tax rev growth	2.9	2.1	2.7	2.9	2.5	0.6
Tax rev growth	2.6	2.0	2.6	2.8	2.5	0.6
IG increases	5.5	5.0	4.6	4.6	4.6	0.6
IG decreases	-1.9	-1.6	-1.3	-1.5	-1.2	0.7
Observations	2089.0	1508.0	269.0	113.0	156.0	.

Population in 1,000s. Debt per capita in 2012 dollars. Shares and ratios in percent. All growth rates, except for population growth, are real per capita. p-values based on standard errors clustered by state and year after removing state and year fixed effects. The 4pp. MOV includes three observations that drop out with these fixed effects.

3 Partisan policies post-Reagan

We now turn to the results of estimating equation (2.2), beginning with the expenditure side of the budget, before then turning to revenues. Last, we extend our analysis to the pre-Reagan era.

3.1 Expenditure side

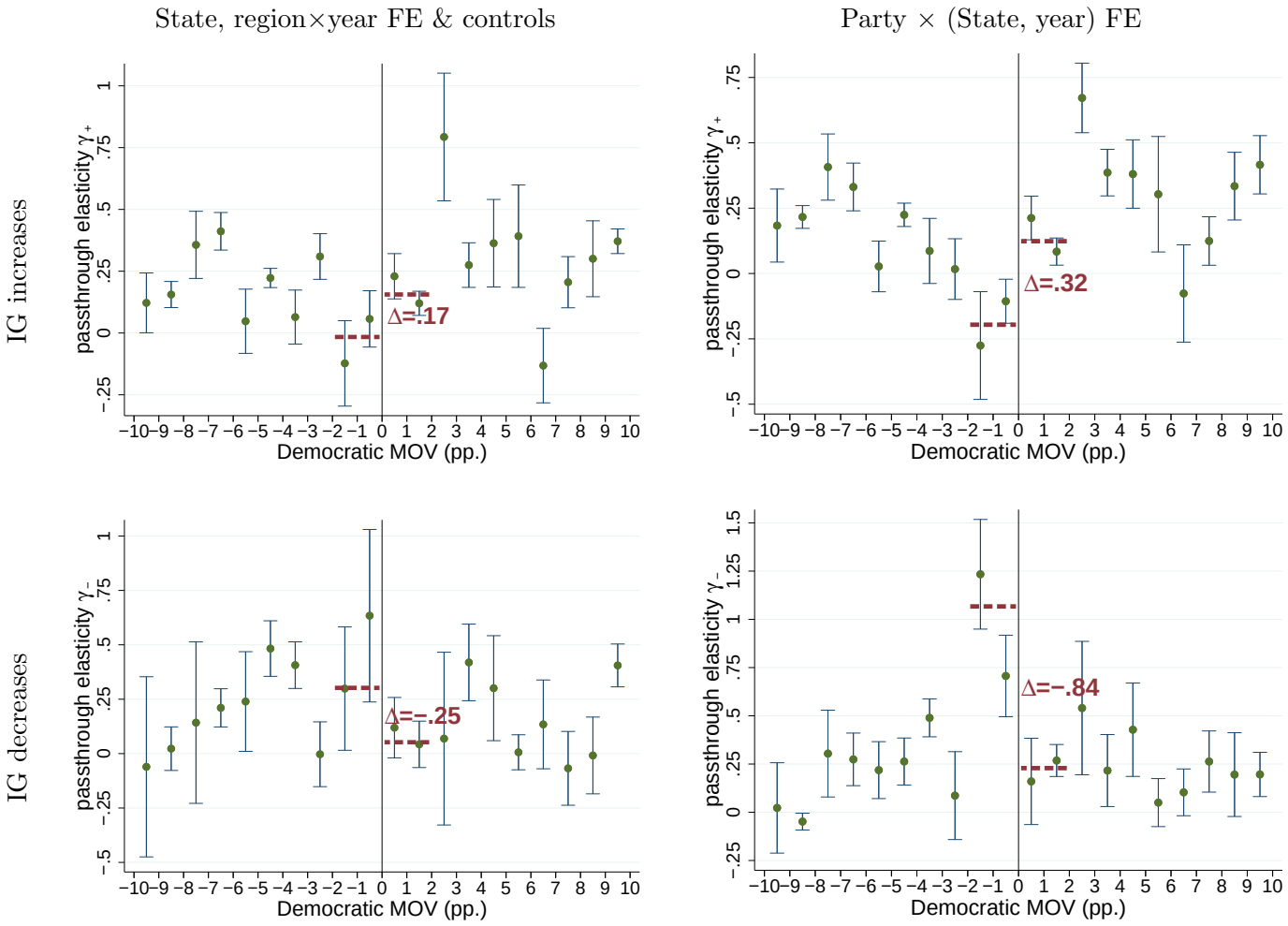
Graphical analysis. To begin our analysis of state expenditure growth, we illustrate our identification. RDD typically focuses on differences in levels and illustrates the design by plotting the levels in terms of the running variable and showing the discontinuity. We are interested in discontinuities at a MOV of zero. But we are looking for a discontinuity in slopes, i.e., the passthrough elasticities, that we have to estimate first. For the illustration, we estimate (2.2) in two steps: (1) In the sample of governors elected with a MOV of up to 10pp., we remove fixed effects and the estimated effects of other controls from total expenditure growth and, separately, from positive and negative IG growth. (2) We estimate the slopes of the residual expenditure growth on the residual of $\Delta \ln IG_+$ and $\Delta \ln IG_-$ for each 1pp. MOV bin and plot the estimated slopes in Figure 3.

Figure 3 shows that marginally elected Democratic governors have a higher pass-through of intergovernmental transfer increases to spending than marginally elected Republicans.]footnoteSee Figure C.11 for the estimates in the 4pp. MOV sample. The differences are most pronounced within margins of victory of two percentage points or less, but vary somewhat with the regression specification. For example, with region-year fixed effects, and control variables (the top left graph), the pass-through elasticity averages -0.02 for Republican governors elected with a MOV no larger than 2pp., but averages about 0.16 for Democrats elected within the same margin, as the horizontal dashed lines in the figure show.[7] The 0.17 difference between the horizontal lines corresponds roughly to a difference in dollar-to-dollar pass-through of 0.68, given the ratio of IG to expenditures of about 0.25 (0.17×4, 4 being the ratio of total expenditures to federal IG revenue): If a Democrat were to spend, say 70 cents for each dollar transferred from the Federal government, this estimate would imply that the Republican counterpart spends virtually none of it. When we use the same specification, but with only party×year and party×state fixed effects as controls (the top right graph), the difference in elasticities is 0.32. When averaging over the closest 4pp. MOVs, the differences in elasticities between specifications are smaller: With region-year fixed effects and controls the difference remains 0.17, while it falls to 0.29 with party-year and party-state fixed effects.[8]

For cuts to intergovernmental transfers we have suggestive evidence that the pass-through to spending (cuts) is higher for Republican governors. Focusing on governors elected within two percentage points, we find an elasticity that is 0.25 higher for Republicans (0.30 vs 0.05) with the region-year specification with controls in the 10pp MOV sample. After removing (only) party-year and party-state fixed effects, we find an elasticity that is 0.84 higher for Republican governors.

[7] These lines mark the pass-through elasticities estimated over 2pp. bins and are, thus, a weighted average.

[8] Here, we find no unconditional difference on average between Republican and Democratic governors regarding expenditure growth. Figure C.12 shows the analogous figure for the intercept term, replacing only the third panel with one without party interactions since party interactions render the intercept unidentified.



We construct the plots in two steps: (1) Calculate $\Delta Y^{res}_{s,t} = \Delta Y_{s,t} - \text{fixed effects}_{s,t} - X'_{s,t}\hat{\beta}_{s,t}$ and also remove fixed effects and controls from $\Delta \ln IG^{+}_{s,t}$ and $\Delta \ln IG^{-}_{s,t}$, where β and the fixed effects are estimated in the 10pp. sample. (2) Estimate $\Delta Y^{res}_{s,t} = \hat{\alpha}^{(m)} + \hat{\gamma}^{(m)}_{+}(\Delta \ln IG^{+}_{s,t})^{res} + \hat{\gamma}^{(m)}_{-}(\Delta \ln IG^{-}_{s,t})^{res}$ where m denotes 1pp. MOV bins, e.g., $[-1\text{pp.}, 0)$. The figure shows $\hat{\gamma}^{(m)}_{+}$ and $\hat{\gamma}^{(m)}_{-}$ along with heteroskedasticity-robust ± 1 standard error. The standard errors are suggestive only: When reporting the direct estimates of (2.2) we include properly clustered standard errors.

Figure 3: Illustrating our regression discontinuity in slopes: Republican Governors pass less of IG increases on to spending and pass more of IG decreases on to spending cuts.

Within a 4pp. MOV, the elasticities are only 0.18 and 0.26 higher for Republicans with the two different specifications. These results imply that Republican governors cut state expenditures relatively more than Democrats in response to cuts in federal transfers.

Detailed estimates. While suggestive, the results in Figure 3 do not show proper standard errors and our heuristic discussion neglects the fact that the slopes in some bins are more precisely estimated than in others. To aggregate slopes and properly compute standard errors, we now estimate (2.2) directly. Our inference uses standard errors clustered by state and year (Correia, 2016, see). We use the 4pp. MOV as our baseline, since the results are similar across specifications and more precisely estimated, trading off potential small-sample bias for higher precision.

Table 2: Partisan determinants of total expenditure growth by state governments: 1983 to 2014.

	(1) ≤100 pp.	(2) ≤5 pp.	(3) ≤4 pp.	(4) ≤3 pp.	(5) >5pp.	(6) ≤4pp.	(7) ≤4pp.	(8) ≤4pp.
Debt change	0.005	-0.026	-0.058	0.007	0.012	-0.029	0.006	
	(0.30)	(-0.64)	(-0.96)	(0.14)	(0.74)	(-1.18)	(0.14)	
GDP growth	0.173***	0.169	0.169	0.151	0.150**	0.103	0.215	
	(3.34)	(0.83)	(0.79)	(0.46)	(2.25)	(0.61)	(0.99)	
Rep x Debt change	0.011	0.038	0.042	0.044	0.010	-0.030	-0.093**	
	(0.54)	(0.96)	(0.63)	(0.82)	(0.49)	(-0.97)	(-2.04)	
Rep x Growth	0.008	-0.261	-0.001	0.405	0.050	0.038	-0.364	
	(0.13)	(-1.22)	(-0.00)	(1.20)	(0.75)	(0.21)	(-1.27)	
Republican Gov.	0.002	0.015**	0.025**	0.000	-0.002	0.016	0.000	
	(0.70)	(2.13)	(2.15)	(.)	(-0.53)	(1.46)	(.)	
IG incr.	0.268***	0.339***	0.301***	0.316**	0.224***	0.367***	0.322***	0.337***
	(6.92)	(11.68)	(5.35)	(2.16)	(5.93)	(7.58)	(4.58)	(4.85)
IG decr.	0.086***	0.201	0.209	0.024	0.072**	0.092	0.056	0.089
	(3.04)	(1.61)	(1.57)	(0.12)	(2.60)	(0.94)	(0.34)	(0.54)
Rep x IG incr.	-0.084**	-0.182**	-0.275**	-0.405**	-0.028	-0.434***	-0.407***	-0.428***
	(-2.36)	(-2.14)	(-2.67)	(-2.41)	(-0.74)	(-4.69)	(-3.33)	(-3.34)
Rep x IG decr.	0.197***	0.298**	0.263**	0.231	0.181***	0.357***	0.499**	0.461**
	(5.12)	(2.55)	(2.20)	(1.43)	(4.10)	(3.18)	(2.50)	(2.27)
Expenditure/IG Rev.	4.01	4.12	4.08	4.15	3.98	4.05	4.06	4.06
R-squared	0.51	0.75	0.79	0.79	0.53	0.65	0.72	0.71
R-sq, within	0.19	0.30	0.25	0.20	0.16	0.26	0.22	0.20
Observations	1499	300	239	119	1187	266	259	259
States	48	43	40	28	48	41	41	41
Years	32	31	31	27	32	32	32	32
State FE	Yes	Yes	Yes	Yes	Yes	Yes	By party	By party
Year FE	By region	By region	By region	By region	By region	Yes	By party	By party

Estimated following equation 2.2. Column (8) is estimated without lagged debt changes and GDP growth. t-statistics based on standard errors clustered by state and year. p-values based on t-distribution with degrees of freedom equal to the number of year-clusters. ***: $p < 0.1$, **: $p < 0.05$, *: $p < 0.01$. To compute a dollar-to-dollar pass-through, multiply the elasticity by the Expenditure/IG revenue ratio.

To summarize, estimating the expenditure policy rule directly using data from closely elected governors confirms the takeaway from the graphical analysis: Democratic governors have a higher pass-through of transfer increases to spending, while Republican governors have a higher pass-

through of transfer cuts to spending cuts. Table 2 shows the results of estimating (2.2) from 1983 to 2014 for total expenditure growth by state governments. The different columns represent results for varying MOV cutoffs, with Column (1), the 100pp. MOV, corresponding to the full sample. Before turning to the partisan differences, we discuss the baseline coefficients first, starting with the full sample. Governors of either party have higher expenditure growth when lagged GDP growth is higher: the 0.173 point estimates implies that expenditure growth is 0.17pp. higher when GDP growth is 1pp higher; lagged debt growth is not a significant determinant of spending.

Transfer increases are associated with significantly higher spending: The baseline pass-through elasticity is 0.27. It is highly significant, with a t-statistic of 6.92. In economic terms, given the expenditure to IG revenue ratio of about 4, it corresponds to a dollar pass-through of 1.07 (4×0.268) for Democratic governors. For Republican governors, the elasticity is 0.084 lower and this difference is significant with a t-statistic of 2.36. The corresponding dollar pass-through is 0.74 (4×(0.268-0.084)). These estimates are comparable to estimates in the literature: The average of the Democratic and Republican pass-through, 0.90, is at the higher end of the results surveyed in Hines and Thaler (1995), but significantly below the 2.40 pass-through for highway spending in Leduc and Wilson (2017). The pass-through for transfer cuts is lower, with a baseline elasticity of only 0.086. The full-sample estimates also imply that Republican governors have a lower pass-through of spending increases and a much higher pass-through of transfer cuts.

For tighter margins of victory, the difference in the pass-through elasticity decreases almost monotonely. It decreases from -0.084 in the full sample to -0.275 with a 4pp. MOV and -0.405 for a 3pp. MOV for transfer increases. These differences are all significant, with t-statistic larger than 2 in absolute value. In dollar terms, the estimate for the 4pp. MOV corresponds to a pass-through that is 1.10 dollar lower per dollar received when a Republican governs the state. The partisan difference is only -0.028 and insignificant if we drop close elections all together (column (5)). For transfer cuts, we find a roughly stable difference, with Republican governors having a pass-through elasticity to spending cuts that is 0.197 higher in the full sample, 0.213 in the 3pp. MOV sample (albeit insignificantly), and somewhat higher elasticities for intermediate cutoffs that are all statistically significant. For the 4pp. MOV, the dollar pass-through for transfer cuts is 1.05 dollars higher when a Republican governs the state, implying that the Republican cuts expenditures more. Again, the point estimate is smaller if we drop close elections.

The estimates are robust across specifications. Table 2 also shows results for the 4pp. MOV with different sets of fixed effects and also without controls. Specifically, column (6) shows the results with state and year fixed effects and control variables. The pass-through elasticity is somewhat larger, with a point estimate of 0.367 for transfer increases, as opposed to 0.301 in the baseline. The difference between elasticities is also larger: We estimate that Republican governors have a pass-through elasticity that is 0.434 lower than Democrats. The difference in pass-through elasticities is also larger for transfer cuts. In this case we estimate that it is 0.357 higher for Republicans, as opposed to 0.263 in our baseline specification. The results in columns (7) and (8) with party by state and party by year fixed effects are very similar, independent of whether we control for GDP,

debt, and their interactions.

Different channels could bias the transfer pass-through down in the full sample and explain why conditioning on close elections increases the pass-through difference. A bias could arise if governors are more partisan in contested elections, for example to turn out the vote, while governors with a large margin of victory are opportunistic and engage in rent-seeking by spending less carefully independent of their party affiliation. Omitted variables that affect the parties differentially may also bias the full sample results. Together, we find it plausible that the estimated differences in the spending elasticities are attenuated in the full sample.

Unlike in the binned regressions underlying the graphical illustration, we do find significantly higher spending growth intercepts for Republican governors at intermediate margins of victory. For example, for the 4pp. MOV in column (3), the "Republican governor" intercept of 0.025 implies that a Republican governor has, unconditionally, a 2.5pp. higher expenditure growth than a Democratic governor. This effect is zero at the 3pp. MOV and 1.5% at the 5pp. MOV. We can interpret this estimate as Republican governors smoothing transfer growth by not responding much to federal transfers, while Democrats do. To see this, note that at the 4pp. MOV the combined pass-through elasticity for a Republican governor for transfer increases is only 0.026 ($= 0.301 - 0.275$), or a dollar pass-through of 10 cents on the dollar. In contrast, given the elasticity of 0.301 for Democrats, the corresponding estimate is of 1.20 for each dollar. However, this result is not robust. The Republican intercept is insignificant in when we drop the (insignificant) control variables (see Table C.4 in the appendix), we do not pursue this aspect of our estimates further.

While we have focused on annual changes in transfers and expenditures, our results also hold for multi-year changes. Federal stimulus bills may increase transfers to the states from one year to the next but then gradually cut transfers after the initial increase. We now show that our baseline results for annual IG increases also apply to such a stimulus plan. Specifically, our results hold when we consider multi-year changes in transfers and expenditures. We can then interpret the changes both on the left-hand-side and the right-hand-side as changes relative to a pre-stimulus baseline. For IG increases, our results are fairly stable across horizons and specifications: The point estimate of the partisan difference in elasticities over two-year to four-year horizons is between -0.199 and -0.277 and thus only slightly smaller than the point-estimate of -0.291 for the 1-year horizon; see Table 3. For transfer cuts, which are less common at longer horizons, the results hold up to the three-year horizon, but are insignificant at the four-year horizon.

Breaking down total expenditure growth into its constituent categories, our results suggest that states adjust most types of expenditures to changes in transfers. Tables C.6 to C.9 report estimates for various specifications at the 4pp. MOV for capital expenditures, transfers to local governments, transfers to households, and other expenditures, such as operating expenditures. Except for transfers to households, which comprise only about one eighths of total expenditures (Figure 2), some regression specification indicates that the other three expenditure categories are adjusted. We conclude that the expenditure cuts can largely be viewed as across the board cuts.

Table 3: Partisan determinants of total expenditure growth by state governments over longer horizons: 1983 to 2014, 4pp. MOV

Horizon	(1) 1-year	(2) 2-year	(3) 3-year	(4) 4-year	(5) 3-year	(6) 3-year
Republican Gov.	0.028***	0.032**	0.052***	0.045**	0.013	0.000
	(2.89)	(2.18)	(2.91)	(2.68)	(0.60)	(.)
IG incr.	0.307***	0.265***	0.278***	0.330***	0.276***	0.305***
	(4.91)	(5.77)	(3.43)	(5.10)	(3.36)	(4.73)
IG decr.	0.226*	0.165	-0.016	0.000	-0.005	-0.053
	(1.80)	(1.50)	(-0.22)	(0.01)	(-0.07)	(-0.64)
Rep x IG incr.	-0.291**	-0.215	-0.277**	-0.199**	-0.230**	-0.270**
	(-2.72)	(-1.65)	(-2.07)	(-2.12)	(-2.10)	(-2.39)
Rep x IG decr.	0.263**	0.164	0.625***	-0.046	0.452***	0.518***
	(2.21)	(1.26)	(3.70)	(-0.25)	(3.45)	(3.09)
R-squared	0.78	0.84	0.87	0.88	0.77	0.84
R-sq, within	0.24	0.18	0.18	0.21	0.21	0.14
Observations	239	239	239	239	266	259
States	40	40	40	40	41	41
Years	31	31	31	31	32	32
StateFE	Yes	Yes	Yes	Yes	Yes	By party
YearFE	By region	By region	By region	By region	Yes	By party
Controls	No	No	No	No	No	No

t-statistics based on standard errors clustered by state and year. p-values based on t-distribution with degrees of freedom equal to the number of year-clusters. ***: $p < 0.1$, **: $p < 0.05$, *: $p < 0.01$. To compute a dollar-to-dollar pass-through, multiply the elasticity by the Expenditure/IG revenue ratio of four.

3.2 Revenue

If Republican governors do not spend much of their federal transfer revenue, what do they do with the transfer income? Revenues are the other side of states' budgets, and we show that Republicans tend to cut revenues relative to Democrats.[9] We first estimate the overall revenue response and then the response of the components of general revenue. [10] We subtract federal intergovernmental transfers from general revenue to focus the states' own revenue choices.

Table 4 shows that tax revenue grows less rapidly under Republican governors in the presence of transfer increases. In the full sample (not shown) we find no significant determinant of any of the three revenue components. In contrast, we find that revenue shrinks under Republican governors relative to Democratic governors once we condition on close elections. For example, the partisan difference in the elasticity of tax revenue with respect to transfer increases is -0.220 at the 4pp. MOV (column (2)), and fairly stable across the various specifications in columns (1) through (5). While the effect is marginally insignificant for net general revenue (column (7)), the significant partisan difference also holds for the growth of income and sales tax revenue (column (6)), which together account for about 80% of tax revenue. The relatively lower tax revenue growth is consistent

[9] We do not have high quality data on states net asset positions. For the debt data that is available, we find only insignificant partisan differences.

[10] General revenue excludes insurance trust revenue, which reflects valuation effects in insurance trust funds.

with the relatively lower expenditure growth documented above.

Table 4: Partisan determinants of general own revenue growth by state governments: 1983 to 2014.

	Overall tax revenue					Income & sales tax	Gen. revenue net of IG
	(1) ≤5 pp.	(2) ≤4 pp.	(3) ≤3 pp.	(4) ≤4pp.	(5) ≤4pp.	(6) ≤4 pp.	(7) ≤4 pp.
Debt change	0.061	0.090	0.046	0.009	0.070	0.094	0.047
	(1.52)	(1.26)	(0.90)	(0.19)	(1.42)	(1.38)	(0.85)
GDP growth	-0.159	-0.153	-0.346	0.007	-0.084	-0.197	-0.016
	(-0.75)	(-0.70)	(-1.67)	(0.04)	(-0.42)	(-0.92)	(-0.07)
Rep x Debt change	-0.057	-0.095	-0.123**	0.009	-0.062	-0.063	-0.063
	(-0.98)	(-1.32)	(-2.34)	(0.20)	(-1.04)	(-0.87)	(-1.05)
Rep x Growth	0.340	0.539*	1.273***	0.658***	0.390	0.565**	0.333
	(1.38)	(2.00)	(3.72)	(2.78)	(1.27)	(2.40)	(1.27)
Republican Gov.	0.012	0.013	0.000	0.002	0.000	0.017	0.005
	(1.18)	(0.93)	(0.00)	(0.18)	(0.00)	(1.03)	(0.42)
IG incr.	0.175**	0.201***	0.144	0.266***	0.126*	0.224***	0.169**
	(2.44)	(3.40)	(1.27)	(3.75)	(1.91)	(3.22)	(2.50)
IG decr.	-0.173	-0.276*	-0.349**	-0.290*	-0.236*	-0.282	-0.189
	(-1.11)	(-1.75)	(-2.77)	(-1.99)	(-1.75)	(-1.64)	(-1.09)
Rep x IG incr.	-0.217**	-0.220*	-0.162	-0.291**	-0.186**	-0.234*	-0.174
	(-2.15)	(-1.73)	(-0.97)	(-2.60)	(-2.11)	(-1.74)	(-1.63)
Rep x IG decr.	0.463***	0.414**	0.338***	0.353**	0.463**	0.490**	0.293*
	(2.86)	(2.17)	(2.81)	(2.15)	(2.32)	(2.41)	(1.94)
R-squared	0.71	0.79	0.90	0.62	0.75	0.79	0.77
R-sq, within	0.07	0.13	0.39	0.17	0.06	0.15	0.09
Observations	300.00	239.00	119.00	266.00	259.00	239.00	239.00
States	43	40	28	41	41	40	40
Years	31	31	27	32	32	31	31
State FE	Yes	Yes	Yes	Yes	By party	Yes	Yes
Year FE	By region	By region	By region	Yes	By party	By region	By region

All regressions include state and year fixed effects. t-statistics based on standard errors clustered by state and year.

The reduced form estimates in Table 4 imply that Democratic-run states have higher revenue growth. For example, the elasticity of tax revenue with respect to transfer increases is 0.201 in the 4pp. MOV sample (column (2)). This positive point estimate could reflect that higher expenditures lead to a larger tax base and, in turn, to higher tax revenue. This (Democratic) baseline coefficient is also consistent with the spending propensity of 1.20 dollars for each dollar received by Democratic governors, who would then have to raise revenue to finance the additional expenses. Together with the identified partisan difference of -0.220 the baseline estimate would imply that tax revenue does not react to transfer growth under Republican governors.

When transfers are cut, tax revenue is cut more under Republican governors than under Democratic governors. The difference is in elasticities is 0.414 for overall tax revenue (column (2)) and 0.490 for income and sales tax revenue (column (6)). While we only give these partisan differences

a causal interpretation, taking the baseline response to transfer cuts points to a coherent narrative: Our expenditure growth estimates suggest that Democratic governors do not cut spending in response to transfer cuts. Consistent with this, the estimated elasticity of -0.276 (column (2)) in Table 4 for tax revenue growth implies Democratic governors raise overall tax revenue following transfer cuts. In contrast, the combined Republican point estimate of 0.138 ($= -0.276 + 0.414$) implies that Republicans may even lower tax revenue growth when transfer cuts happen.

Table 5: Partisan determinants of income tax rates: 1983 to 2014.

	Average individual income tax rate					Current marginal TR	Future marginal TR
	(1) ≤5 pp.	(2) ≤4 pp.	(3) ≤3 pp.	(4) ≤4pp.	(5) ≤4pp.	(6) ≤4 pp.	(7) ≤4 pp.
Debt change	-0.100	0.022	-0.044	-0.083	0.178	2.664**	0.297
	(-0.59)	(0.10)	(-0.26)	(-0.33)	(0.83)	(2.24)	(0.32)
GDP growth	1.062	0.679	-0.163	0.002	-0.551	6.512	6.741
	(1.13)	(0.73)	(-0.20)	(0.00)	(-1.23)	(1.14)	(1.09)
Rep x Debt change	-0.208	-0.393	0.597***	-0.394	-0.438	-5.879***	-3.159***
	(-0.87)	(-1.55)	(3.20)	(-1.31)	(-1.67)	(-3.14)	(-2.95)
Rep x Growth	-1.353	-1.263	2.119	-0.355	0.405	-22.721**	-22.800**
	(-1.08)	(-0.87)	(1.29)	(-0.32)	(0.28)	(-2.17)	(-2.28)
Republican Gov.	-0.016	-0.081	0.000	-0.075	0.000	-0.422	-0.209
	(-0.24)	(-1.15)	(0.00)	(-0.79)	(.)	(-0.78)	(-0.45)
IG incr.	0.249	0.592	0.716*	0.552*	-0.249	3.115**	2.735*
	(0.70)	(1.54)	(1.87)	(1.87)	(-0.76)	(2.11)	(1.93)
IG decr.	-0.250	-0.619	-0.754*	-0.674	-0.156	-4.504**	-2.356
	(-0.33)	(-0.89)	(-1.92)	(-1.18)	(-0.50)	(-2.31)	(-1.26)
Rep x IG incr.	-0.814*	-1.389**	-1.247**	-0.957**	-0.297	-6.269*	-6.552*
	(-1.93)	(-2.34)	(-2.07)	(-2.35)	(-0.72)	(-1.94)	(-1.99)
Rep x IG decr.	0.768	0.508	-0.730	1.199*	1.655**	-4.362	-0.550
	(1.35)	(0.77)	(-1.31)	(1.90)	(2.29)	(-1.56)	(-0.19)
R-squared	0.98	0.98	0.99	0.97	0.99	0.96	0.97
R-sq, within	0.08	0.14	0.25	0.14	0.08	0.33	0.25
Observations	300.00	239.00	119.00	266.00	259.00	239.00	239.00
States	43	40	28	41	41	40	40
Years	31	31	27	32	32	31	31
State FE	Yes	Yes	Yes	Yes	By party	Yes	Yes
Year FE	By region	By region	By region	Yes	By party	By region	By region

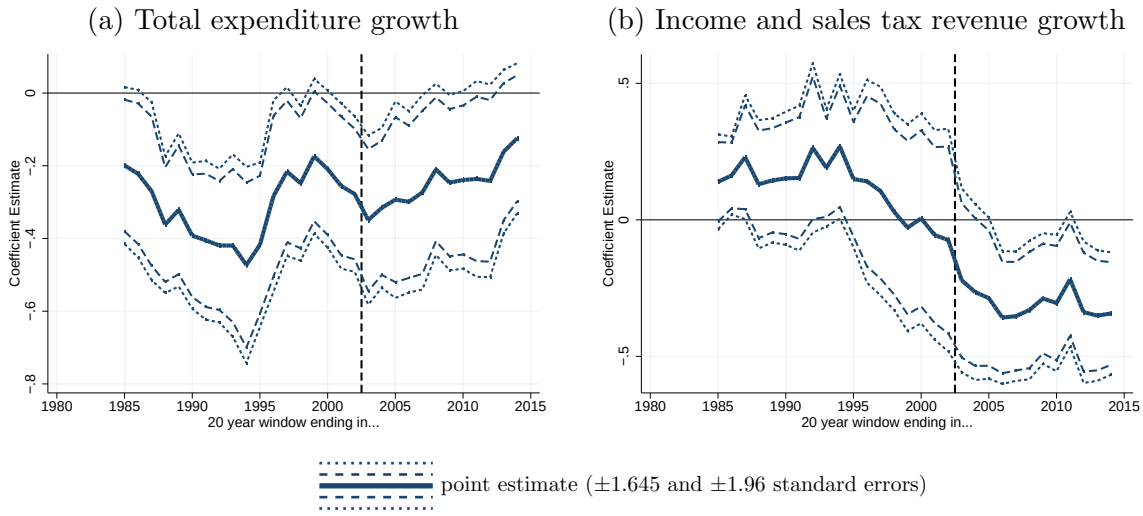
All regressions include state and year fixed effects. t-statistics based on standard errors clustered by state and year.

Policymakers can influence tax revenue through various policy instruments, including tax rates, but also tax enforcement. Looking at income tax rates, as a direct policy instrument, we also find suggestive evidence of partisan differences (Table 5). We consider two measures of tax rates: (1) An average individual income tax rate, which we calculate as the individual income tax revenue relative to state GDP, where GDP is averaged across the two calendar years straddling the fiscal year. (2) The maximum state marginal tax rates on wage income from the NBER TAXSIM database. In both cases, we find evidence of a partisan difference in the response to transfer increases. The coefficient estimate of -1.389 for the 4pp. MOV in column (2) implies that Republican governors

have an average personal income tax rate that is 0.08pp. ($= -1.389 \times 0.059$) or 4.5% lower than in Democratic states when transfer growth is 5.9pp. higher, where 5.9pp. is the median IG increase in the post Reagan era. This estimate is fairly similar across MOV cutoffs and with only state fixed effects (columns (1) through (4)), but becomes insignificant with party specific fixed effects. The corresponding coefficient estimate for the (statutory) top marginal tax rate is -6.29, corresponding to a 0.37pp tax rate difference for the median IG increase (column (6)). The estimates for transfer decreases are insignificant with region by year fixed effects.

3.3 Time variation in partisan policies

To connect with the literature on political partisanship in the U.S., we now document how our estimates of partisan bias vary with the sample period. To summarize the time variation, we focus on the coefficient estimates from our baseline regression, namely the difference in the elasticity of fiscal policy outcomes with respect to changes in federal transfers. We introduce time-variation by estimating a rolling window version of (2.2) with fixed 20 year windows, ending between 1985 and 2014. Figure 4(a) shows the estimated partisan differences in elasticities on increases for expenditure growth and Figure 4(b) shows the estimated differences for income and sales tax revenue.[11] We show the point estimate along with confidence intervals. A dashed vertical line marks the time when our sample includes only observations after Reagan came to power.



Coefficient estimates based on (2.2) estimated over a 20 year window ending in the year shown. All estimates are based on 4pp. margin of victory cutoffs. Standard errors based on standard errors clustered by state and year. The horizontal line marks the beginning of our baseline post-Reagan sample period.

Figure 4: Time-variation in the differences of fiscal policy elasticities between Republican and Democratic governors following IG increases.

We find increased partisan differences in tax policies since the beginning of the Reagan era, while the differences in expenditure pass-throughs have not varied significantly over time. Turning

[11] Appendix D also shows the estimates for transfer cuts.

to the spending elasticity differences in Figure 4(a), we see that there is little qualitative change through most of our sample. The point estimates very somewhat over time, but are consistent with a constant pass-through difference. The horizontal dashed line that marks the beinning of the Reagan era has no obvious relation to our estimates. Partisan differences in tax policies, in contrast, seem to have increased since the beginning of the Reagan era, as Figure 4(b) shows. The lower tax growth under Republican governors has emerged in recent years. The point estimates show a significant decrease in magnitude relative to the early sample period. We conclude that the partisan tax policy differences have varied over time and are now more pronounced.

The timing of the increased partisan differences is consistent with time variation in measured partisan polarization between policy makers. For example, using data on roll-call votes in the U.S. House of Representatives McCarty et al. (2016) document a sharp increase in polarization in the 1980s, while we find that the partisan differences in tax policy have emerged around the same time. Using news sources, Azzimonti (2018) also finds a persistent increase in her historical measure of partisan conflict since the 1980s.

4 Model

We build on the model of a monetary union with complete markets and local capital from Nakamura and Steinsson (2014). The model is a two-region version of a standard New-Keynesian model with common monetary policy and a common federal government.

4.1 Environment

State governments. State governments provide public services to households and public infrastructure to firms.[12] State governments also levy income taxes, but are able to accumulate surpluses (or deficits) to smooth taxes.

We summarize partisanship through a single parameter: The pass-through of federal transfers to state spending. ψ_{IG} is the pass-through of the home governor, while ψ^*_{IG} is the pass-through of the representative other governor. State spending is also partly given by an exogenous process, leading us to the following representation of state spending:

$$G_{st,t} = \psi_{IG} IG_t + G^x_{st,t}$$
$$G^x_{st,t} = \mu_{G,st} + \rho_{st,g} G^x_{st,t-1} + \omega_{st,g} \epsilon^x_{st,t}$$

Motivated by our estimates that most spending components adjust to changes in transfers, we

[12] States can partly provide services or infrastructure through funding lower level governments such as school districts and municipal governments. In addition to services and infrastructure, states may also transfer funds to households, either directly or indirectly.

assume that states spend a fraction $1-\phi$ on public services. These may affect the households' flow utility. States invest the remaining fraction ϕ of overall spending in infrastructure:

$$K_{st,t} = (1-\delta_G)K_{st,t-1} + \phi G_{st,t}.$$

States adjust labor taxes to finance the part of the budget not covered by federal transfers and, potentially, past surpluses:

$$(1-\gamma^s)(P_t G_{st,t} - IG_t - \psi_{G,SP} R^n_{t-1} SP_{t-1}) = \tau_{st,t} W_t N_t.$$

$\psi_{G,SP} = 1$ implies that past surpluses go fully towards offsetting current expenses, whereas values of $\psi_{G,SP} < 1$ imply some smoothing of surpluses even if otherwise labor taxes are fully adjusted period by period ($\gamma^s = 1$). The remainder of the budget is financed through changes in the surplus:

$$SP_t + \bar{T} + \gamma^s IG = \gamma^s P_t G_{st,t} + (\gamma^s \psi_{G,SP} + (1-\psi_{G,SP})) R^n_{t-1} SP_{t-1}.$$

Federal government. The federal government levies lump-sum and distortionary taxes to finance federal government consumption and to provide intergovernmental transfers to states. Nominal per capita transfers are equal to IG_t in each region.

For simplicity, federal transfers to the states are exogenous:

$$IG_t = \rho_{IG} IG_{t-1} + \sigma_{IG} \epsilon_{IG,t}.$$

Purchases equal real per capita amounts $G^f_{Ht} = G^f_{Ft} = G^f_t$ per region (exogenous).

Similar to state governments, labor income taxes finance a fraction of the budget every period:

$$(1-\gamma^f)(nP_{Ht}G_{Ht} + (1-n)P_{Ft}G_{Ft} + IG_t) = \tau^f_t \int_0^1 W_t(x) L_t(x) dx.$$

The federal government finances the remaining fraction γ^f of expenditures via lump-sum taxes.

Households. Households value private consumption, state consumption, and leisure. Their labor income is subject to a linear income tax. In this version of our model, markets are complete.

Lifetime utility is given by:

$$\begin{aligned}
V_t &= \mathbb{E}_t \sum_{s=0}^{\infty} \beta^s U(C_{t+s}, G_{st,t+s}, N_{t+s}) \\
C_t &= \left(\phi_H^{\frac{1}{\eta}} C_{Ht}^{1-\frac{1}{\eta}} + (1-\phi_H)^{\frac{1}{\eta}} C_{Ft}^{1-\frac{1}{\eta}} \right)^{\frac{\eta}{\eta-1}} \\
C_{Jt} &= \left(\int_0^1 c_{jt}^{1-\frac{1}{\theta}} dj \right)^{\frac{\theta}{\theta-1}}, \quad (J,j) \in \{(H,h),(F,f)\}
\end{aligned}$$

Here, C_t is a CES aggregate of consumption from the home region C_{Ht} and the foreign region C_{Ft}. These are, in turn, also CES aggregates of individual varieties.

Households' felicity function is balanced-growth consistent and implies a constant Frisch-elasticity ϵ_ν, following Trabandt and Uhlig (2011):

$$U(C, G_{st}, N) = \frac{\left(C_t^{1-\frac{1}{\lambda}} + \kappa_G((1-\phi)G_{st,t})^{1-\frac{1}{\lambda}}\right)^{\frac{\lambda}{\lambda-1}(1-\frac{1}{\epsilon_c})} \left(1 - \left(1-\frac{1}{\epsilon_c}\right)\kappa_N N^{1+\frac{1}{\epsilon_\nu}}\right)^{\frac{1}{\epsilon_c}} - 1}{1-\frac{1}{\epsilon_c}}$$

ϵ_c is the intertemporal elasticity of substitution, λ is the elasticity of substitution between private and public consumption, and $\kappa_G \geq 0$ is the (unnormalized) weight on public consumption. $1-\phi$ is the fraction of state expenditures spent on state consumption. Note that only a fraction $1-\phi$ of state spending enters as consumption, reflecting the fact that the state spends the remainder on infrastructure.

The household's budget constraint is given by:

$$\begin{aligned} &P_t(C_t + I_t + \kappa(\nu_t)K_{t-1}^p) + \mathbb{E}_t[M_{t,t+1}B_{t+1}(\cdot)] \\ \leq &B_t + (1-\tau_t^f-\tau_t^s)W_tL_t + R_t^kK_{t-1}^p\nu_t + \int_0^1 \Xi_{ht}(z)dz - T_t \end{aligned}$$

Labor income taxes have a federal and a state component, τ_t^f and τ_t^s. The price P_t is the minimum cost of the consumption bundle:

$$P_t = \left(\phi_H P_{H,t}^{1-\eta} + (1-\phi_H)P_{F,t}^{1-\eta}\right)^{\frac{1}{1-\eta}}$$

Households also accumulate capital subject to adjustment costs in the rate of investment:

$$K_t^p = (1-\delta)K_{t-1} + I_t\left(1 - \frac{\kappa_I}{2}\left(\frac{I_t}{I_{t-1}} - 1\right)^2\right).$$

Intermediate goods producers. In each region, there is a continuum of producers $\ell \in [0,1]$ who produce using public infrastructure, private capital, and labor. They perceive constant returns to scale to private capital and labor, although there is a congestion externality for public infrastructure, following Barro and Sala-I-Martin (1992) and Drautzburg and Uhlig (2015). Intermediate goods producers set nominal prices in units of the home region. They may reset prices with an *iid* (Calvo-)probability of $1-\xi$ every period.

Each producer has access to the following constant returns to scale production technology:

$$y_{ht}(\ell) = \left(\frac{K_{st,t-1}}{\bar{y}_{H,t}}\right)^{\frac{\zeta}{1-\zeta}} K_t(\ell)^\alpha N_t(\ell)^{1-\alpha}.$$

The congestion externality on public infrastructure implies that in a symmetric equilibrium, public

infrastructure has a share of ζ in aggregate intermediate production.

Each producer faces an *iid* Calvo probability ξ of being stuck with its price $p_{h,t+s}(\ell) = p_{ht}(\ell)$ for another period. Producers therefore set prices to maximize the expected discounted profit flow:

$$\mathbb{E}_t \sum_{s=0}^{\infty} M_{t,t+s} \left(p_{h,t+s}(\ell) y_{h,t+s}(\ell) - W_{t+s} N_{t+s} - R^k_{t+s} K_{t+s} \right).$$

Monetary policy. The monetary authority sets nominal interest rates following a Taylor rule.[13] Specifically, interest rates are smoothed over time and respond to aggregate inflation, and detrended aggregate output:

$$\begin{aligned}
\ln R^n_t &= \rho_r \ln R^n_{t-1} + (1-\rho_r) \left(-\ln \beta + \phi_\pi \ln \Pi^{agg}_t + \phi_y \ln \frac{Y^{agg}_t}{\bar{Y}} \right), \\
\Pi^{agg}_t &= n\Pi_t + (1-n)\Pi^*_t, \\
Y^{agg}_t &= nY_t + (1-n)Y^*_t.
\end{aligned}$$

4.2 Equilibrium

We focus on a standard competitive equilibrium: Firms and households take prices, aggregate quantities, and government policies as given when they make their decisions.

To solve the model we, use perturbation methods to compute a first order approximation to the equilibrium dynamics. We analyze an economy only with shocks to intergovernmental transfers. This is possible because we focus on linear dynamics and the dynamic effect only, rather than business cycle statistics in general.

4.3 Calibration

For the common parameters, our calibration follows Nakamura and Steinsson (2014). We thus focus our discussion on the new parameters that we introduce.

To pin down the state spending rules, we draw from the asymptotically normal distribution of estimated dollar pass-throughs of IG increase to expenditures, based on the estimates in column (3) of Table 2 but converted to dollar terms. The implied dollar coefficients are summarized in column (4) of Table C.10. We feed the resulting draws into our structural model. The resulting distribution can also be interpreted as a posterior based given a flat prior.

Even though our underlying state panel data estimates feature asymmetric response to year-over-year transfer cuts and increases, the difference in pass-through is robust across several specifications. First, we have already shown in Table 3 that similar estimates hold when we consider multi-year changes, as we do in the policy-experiment here. Second, only the difference between pass-through coefficients is identified, while the baseline coefficient is better viewed as calibrated.

[13] In the background, we assume the presence of federal lump-sum transfers and taxes that offset the revenue (or losses) generated by monetary policy.

The absolute difference between elasticities are of comparable magnitude when we look at increases and cuts in Table 2, so that our model applies equally to long-lasting cuts when we switch labels.

Among the remaining parameters, the parameters that govern how important state governments are for private sector consumption and investment are key. To pin them down, we assume that in steady state, state governments behave optimally: State governments equate marginal utilities to marginal costs, pinning down $\kappa_G = \left(\frac{(1-\phi)\bar{G}^s}{\bar{C}}\right)^{1/\lambda}$ as in Bachmann et al. (2017). And when government services are productive, state governments maximize production net of costs of public infrastructure, as in Drautzburg and Uhlig (2015). This implies that $\zeta = \frac{\phi\bar{G}^s}{\bar{Y}}$, where ϕ is the fraction the state spends on investment.

Table 6: Calibrated parameters

Parameter	Value / Distribution
Discount factor β	0.99
Frisch elasticity of labor supply ν	1
Calvo stickiness ξ	0.75
Private capital share in production α	0.33
Within-region elasticity of demand θ	6
Across-region elasticity of demand η	2
Home demand for home goods ϕ_H	0.69
Foreign demand for home goods ϕ_H^*	$\frac{n}{1-n}(1-\phi_H)$
Investment adj. cost	0.7
Utilization cost elasticity	1
Taylor rule: inflation ϕ_π	1.5
Taylor rule: output ϕ_y	0.5
Taylor rule: smoothing ρ_r	0.8
Size of home region n	0.5
Elasticity of substitution w.r.t state consumption λ	0.5
Steady state & contemporaneous labor tax fraction $1-\gamma^f = 1-\gamma^s$	0.7
Elasticity of taxes with respect to surplus $\psi_{G,SP}$	0
Federal government consumption $\bar{G}/\bar{Y}$	0.075
Federal government IG $\overline{IG}/\bar{Y}$	0.025
State government consumption $\bar{G}/\bar{Y}$	0.125
Persistence of IG ρ_{IG}	0.89
Standard deviation of IG σ_{IG}	0.10
Democratic transfer pass-through ψ_{IG}^*	Table 2, column (3)
Republican transfer pass-through ψ_{IG}	Table 2, column (3)

The pass-through coefficients are taken from column (3) of Table 2: the "IG incr." coefficient times the expenditure to IG revenue ratio yields ψ_{IG}^* for Democratic governors and ("IG incr." + "Rep x IG incr.") times the expenditure to IG revenue ratio yields ψ_{IG} for Republican governors.

To discipline the importance of taxes, we impose that labor income taxes contribute 70% of revenue net of intergovernmental transfers. This reflects the importance of total taxes in general revenue net of intergovernmental transfers; see Figure B.5. We use the same fraction both in steady state and over time, i.e., we set $1-\gamma^s = 0.7$. For simplicity, we also set $\gamma^f = \gamma^s$. This amounts

to treating current charges and miscellaneous general revenue as lump-sum taxes in the model. We also capture the most important revenue sources as sales and personal income taxes account for 80% of tax revenue in the data (Figure B.6), and we follow Prescott (2004) in modeling both revenue sources simply as an income tax.

We calibrate the IG process to the 2009 stimulus package: We choose $\rho_{=}0.89$ to match a half-life of six quarters (Drautzburg and Uhlig, 2015) and a cumulative (non-discounted) value of 320 bn dollars (Carlino and Inman, 2013), or 2.22% of GDP. This yields $\omega_{IG} = 100 \times (1 - \rho_{IG}) \times 0.0222$.

Here we focus on the case when private and state consumption are substitutes since Fiorito and Kollintzas (2004) argue that consumption is an (Edgeworth) complement to consumption. In Appendix F we also discuss the case when private and state consumption are substitutes.

4.4 Dynamics following a shock to federal transfers

Figure 5 shows the exogenous shock hitting the economy and the equilibrium responses of fiscal policy and prices for two scenarios. In one scenario, labeled "all Democrats" and shown as dashed, orange lines, both regions are perfectly symmetric. We focus on the median response here.[14] As a fraction of GDP, their spending increases by the same amount and the dynamics are the same within each region. Consequently, the real exchange rate is constant. Producer prices rise in both regions as labor costs rise due to higher federal taxes and the increased hours worked. State taxes slightly increase as states increase spending by slightly more than one to one.

In the other scenario, labeled "with political friction" and shown as solid, blue lines, one region has the lower "Republican" pass-through. We focus again on the posterior median. This is evident in the lower Republican spending increase in this scenario. Because the regions spend asymmetrically, also the response are asymmetric. Federal taxes still rise, hardly affected by the asymmetric responses. However, the Republican region now cuts taxes, while the Democratic regions still has increasing taxes. The Republican PPI therefore remains roughly flat while the Democratic real exchange rate appreciates.

All differences between the two scenarios are statistically significant when we take the estimation uncertainty from our empirical section into account: We interpret the asymptotic distribution of ψ_{IG} and ψ^*_{IG} as their posterior for a flat prior. We then take draws from this distribution and compute the difference for each of the joint draws. The yellow line shows the median difference along with the 80% credible set.

[14] I.e., we use the draw from Democratic pass-through for both states and report the median across draws.

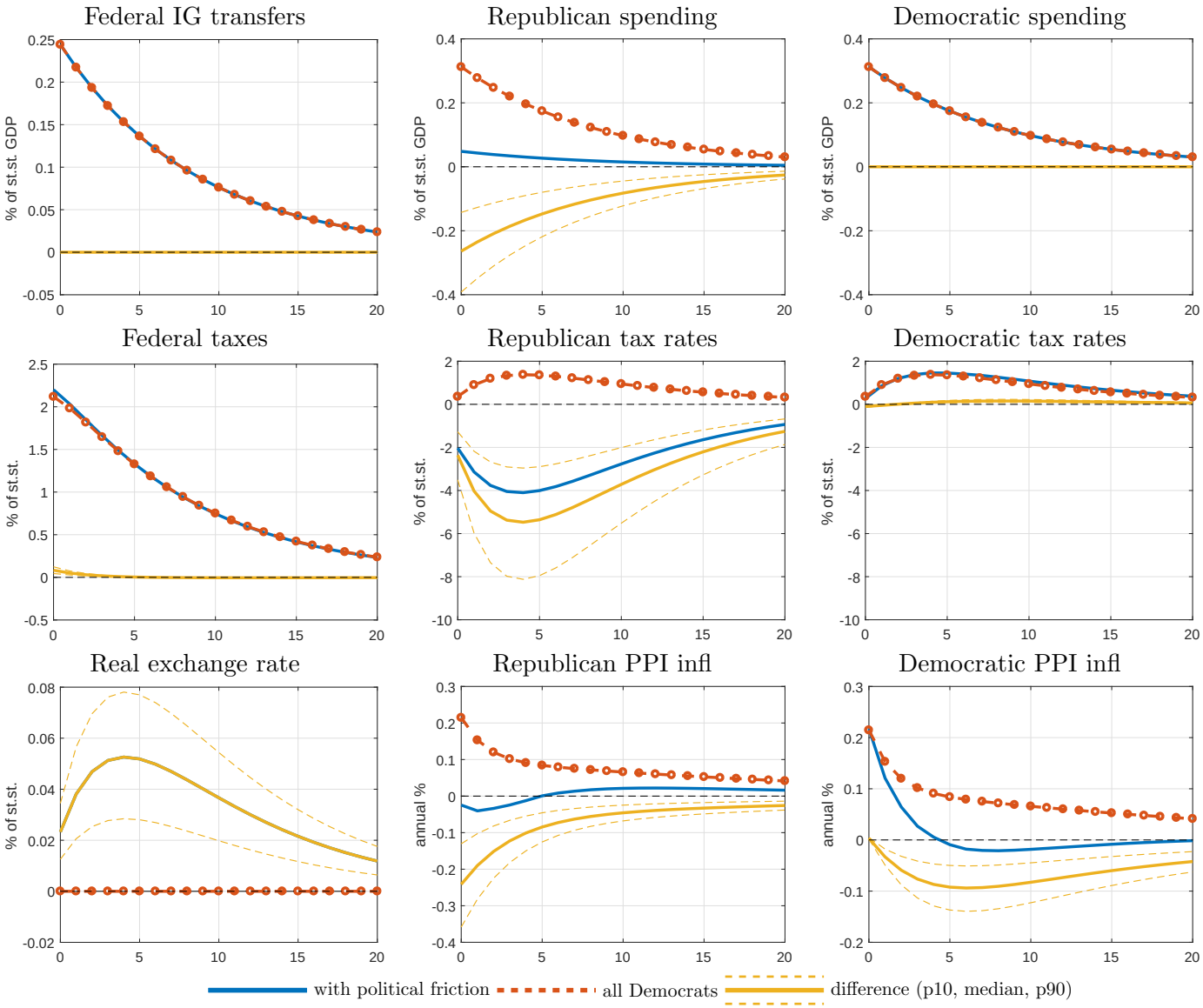


Figure 5: IRFS: Initial shock, fiscal policy responses, and price effects

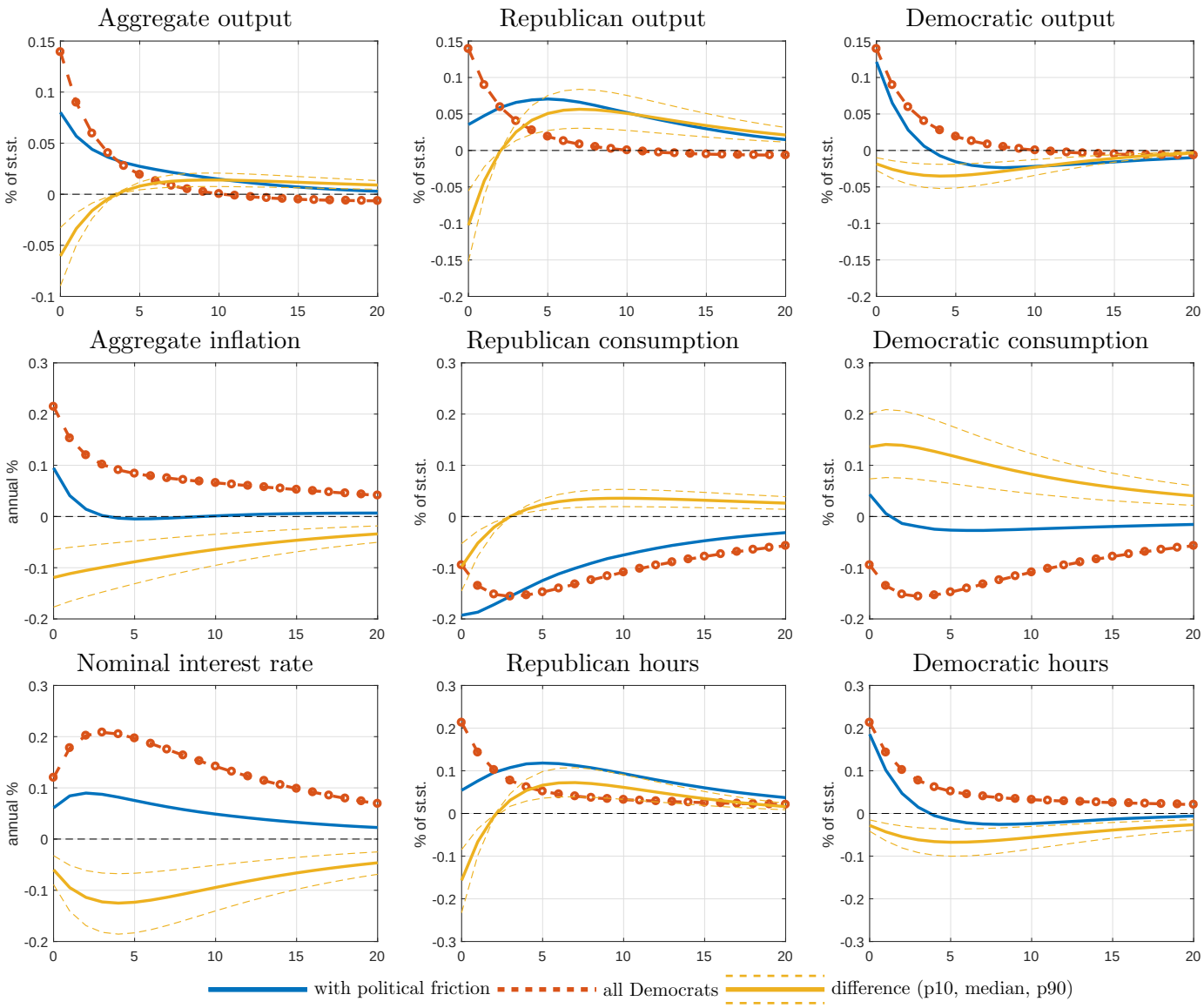


Figure 6: IRFs: output, consumption, and hours

Figure 6 shows the responses of various private sector quantities for each scenario. If both regions behave the same, aggregate output rises by about 0.14% following the 0.25% spending increase. Output reverts to zero somewhat faster than spending, dropping about 0 after ten quarters already. Because households are poorer and real interest rates rise (with a one quarter delay), private consumption falls, while hours worked increase. The results with the political friction are more nuanced: The increase in aggregate output is only 0.08% and is spread unevenly across the two regions. Initially, the Democratic region with its larger increase in demand experiences an increase almost as large as when both regions behaved the same. But whereas the Republican output rises by about 0.05% after five quarters, the Democratic region's output is slightly negative by then. Hours worked are, largely, a scaled up version of output. Again, all differences are statistically significant.

4.5 Multipliers

How much does the federal government stimulate the economy for each dollar it spends under the two scenarios? To answer this question, we follow Mountford and Uhlig (2009) and analyze present discounted value (PDV) multipliers: The ratio of the PDV of output relative to the PDV of federal transfers. Figure 7 shows these PDV multipliers over time, varying the importance of distortionary taxes. In the "all Democrats" scenario and the baseline calibration, the initial multiplier is 56 cents – the ratio of the GDP increase of a good 0.14% to the spending increase of 0.25pp. of GDP. Since output declines more quickly than spending, the multiplier subsequently declines and falls slightly below 0.2 after 20 quarters. With political frictions, the impact multiplier falls by about 40%, to 0.32. It then declines to slightly more than 0.2 after 20 quarters.

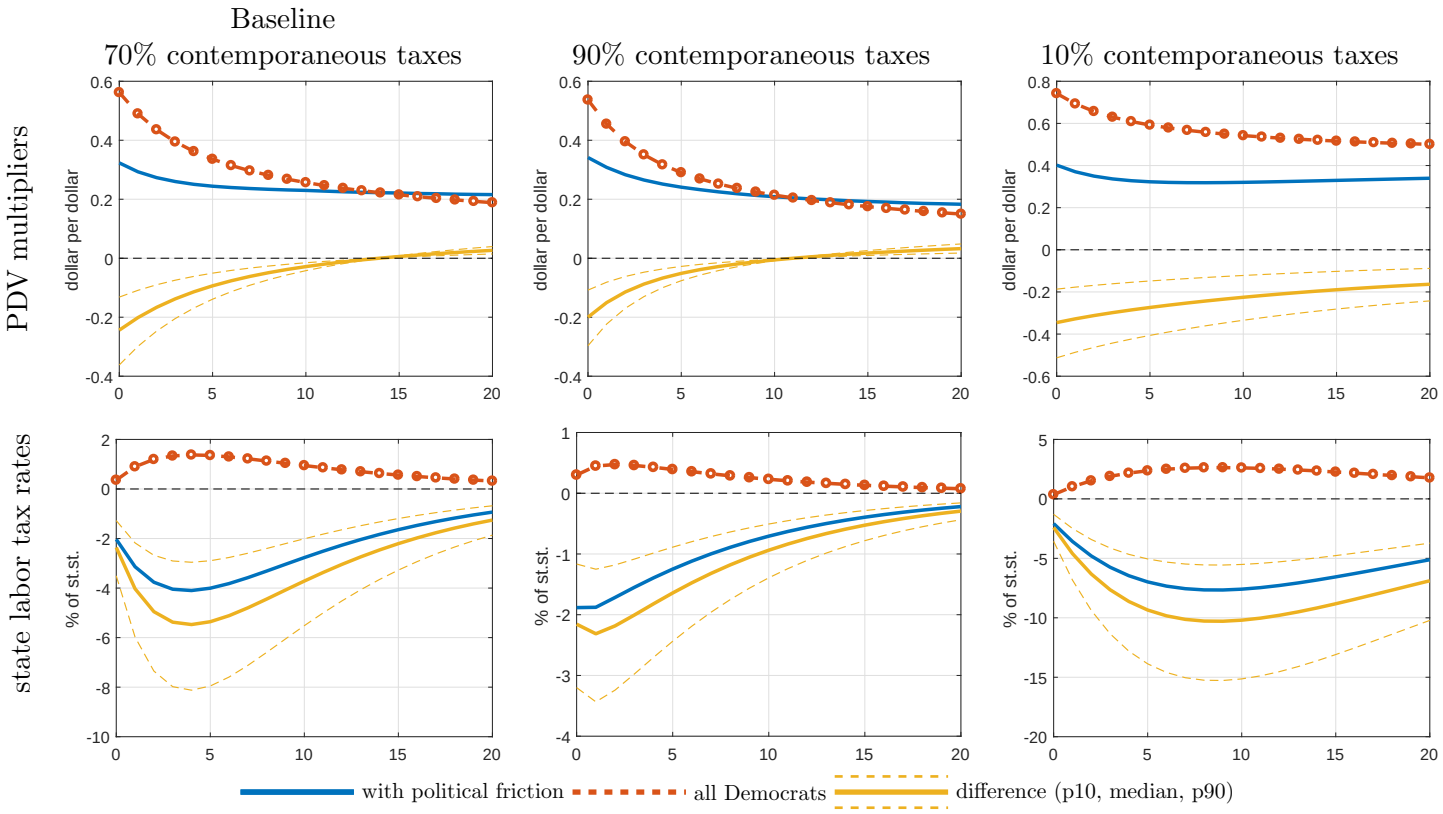


Figure 7: PDV multipliers and distortionary taxes

The proportional fall in the multiplier is robust for different calibrations of labor income taxes. When labor taxes account for only 10% of the financing need, the impact multiplier rises to 0.74, but the partisan difference also increases to 0.34, keeping the relative change in the impact effect roughly constant. The multipliers rise in our calibration because we simultaneously change the steady state share of labor income taxes. Thus, the 2.5% tax rate increase in the scenario in which labor income taxes account only for 10% of tax revenue applies to a lower tax rate, resulting in a smaller percentage point increase.

We now turn to analyzing how the multiplier varies with how large the Republican region is in

the economy. Figure 8 shows the PDV multipliers both as a function of time and the share n of the Republican region in the economy – keeping all other parameters at their baseline value. Without partisan differences, the multiplier simply declines with the horizon, as in Figure 7 above. With partisan differences, both the impact multiplier and the time-profile of the multiplier vary with the size of the Republican region in our model.

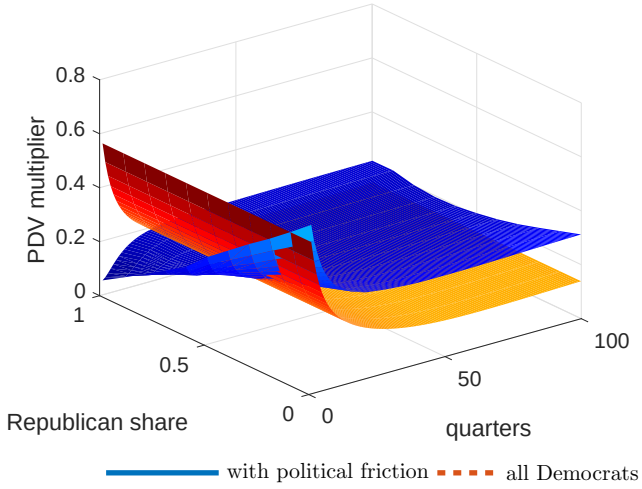


Figure 8: PDV multipliers over time and as a function of the share of Republican governors: baseline

Our results suggest that the effects of federal fiscal policy depend on who is running the states. Who has run the U.S. states, Republicans or Democrats, has varied significantly over our sample period: The left panel in Figure 9 shows the fraction of states governed by Republicans, omitting the occasional independent governor. This fraction ranges from a low of 30% after Reagan took office to a high of roughly two thirds during Clinton's second term. Using these value to calibrate n in our model, translates to sizable differences in the impact transfer multiplier, shown in the middle panel of Figure 9. The transfer multiplier peaks during the early Reagan years with values slightly above 0.4 and falls to about 0.2 during Clinton's and Obama's second terms. The long-run multiplier, in contrast, hardly depends on n and is therefore largely time-invariant (right panel). Computing the difference to the initial multiplier draw by draw, we find that the differences over time are statistically significant.

4.6 Economic activity in the data

The model prediction that, on impact, Democratic-governed states have higher levels of economic activity, but that after a few quarters growth in Republican-governed states is higher, is also borne out in the data. In Appendix E we report results from baseline regressions (2.2) with indicators of economic activity on the LHS. There, we use the employment-to-population ratio and state GDP growth as indicators. Neither of the indicators is lined up with the fiscal year, but overall the results are consistent with our model results.

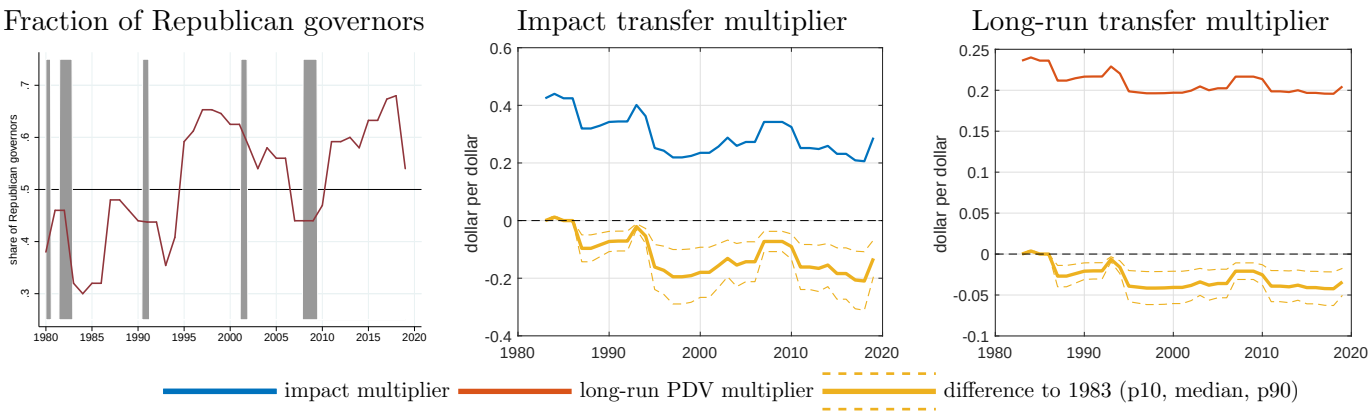


Figure 9: Party control and transfer multipliers over time: State consumption as a complement (baseline)

First, we find that current activity – straddling the first half of the fiscal year – is lower in Republican-run states following increases in IG. Specifically, Table E.16 shows that the employment-to-population ratio is lower lower under marginally elected Republican governors than under Democratic governors when IG is growing. If IG increased by 1pp, the employment to population ratio drops by 0.05pp relative to the Democratic-run state. This effect is not concentrated due to public employment, but disappears after one year. We find no significant difference in GDP responses over the same time period.

Second, we find that future activity – straddling the second half of the fiscal year – is higher in Republican-run states following increases in IG. As Table E.15 shows, a 1pp increase in IG transfers leads to future GDP growth that is 0.15pp higher than under Democrats. This result holds both for overall and private-sector GDP growth, and for both profits and compensation.

4.7 Robustness

Here we highlight the robustness of our conclusions about transfer multipliers with regards to three characteristics: (1) How complementary state consumption is to private consumption, (2) how easy it is to adjust capital, and (3) whether part of government consumption is productive. To that end, Figure F.18 compares the multiplier in Republican share n space and over time to the baseline and three scenarios, varying one parameter at a time.

Whether state consumption is a gross complement or a gross substitute is a crucial parameter. While Fiorito and Kollintzas (2004) argue that consumption is an (Edgeworth) complement to consumption, here we also consider what would happen if it were a gross substitute. In that case, the impact effect is largely unchanged, but in the long-run, the multiplier would be much higher when the fraction of Republicans is high, as not growing public consumption but cutting taxes stimulates private consumption.

Specifically, when states public consumption does not complement but substitute private consumption ($\lambda = 1.5$), the multipliers shrink (Figure F.19). The impact multiplier falls from an

average of 0.15 to about 0.05 in 2018. The long-run multiplier increases by up to 8 cents from an initial level slightly below zero. The recent difference in the impact-multiplier shrinks in absolute terms, but accounts for a fall of the initial multiplier by two thirds. The long-run multiplier is now higher when Republicans are running more states.

Figure F.18 shows that the differences between policies also become more important if capital is harder to adjust. Intuitively, with fixed capital, output can only increase when labor input rises. However, higher labor taxes lower the incentives to work. Essentially fixed capital, the case in the bottom left panel of Figure F.18, amplifies the time-variation in multipliers. In this case the multiplier remains does not rise over time when Republicans cut taxes because accumulating capital is too costly.

Last, we consider the baseline model, but without productive government investment. This hardly changes the multiplier. Looking closely, the "all Democrats" multiplier rises, but the difference to the baseline is small. Intuitively, we infer a small share of public capital in production to rationalize the small steady state share of public investment. Changes in the public capital stock therefore matter little for private output.

5 Model validation in aggregate time series

We now test the prediction of our model that the intergovernmental transfer multiplier varies with the state of state politics: Does the impact GDP multiplier for a transfer shock indeed fall with the share of Republican governors? We estimate multipliers off the GDP response to a one-percent innovation in intergovernmental transfers. We allow for time-variation in two different ways. First, we estimate rolling window local-projection regressions and then correlate the estimated effects on output with the average share of Republican governors in the same window. The rolling window is a special case of the kernel-based approach to time-variation in Giraitis et al. (2014). Second, we estimate a linear projection that directly allows for a non-linear effect due to the state of politics.

We use the surprise component of intergovernmental transfers as the transfer shock, treating it as exogenous to any other current shocks. For government purchases, Blanchard and Perotti (2002) justify this identifying assumption with decision making lags in government. Since the NIPA series used in the following time series analysis excludes an important automatic stabilizer, the unemployment insurance program, and some other funds, we view this assumption as a reasonable starting point. In addition, we also include a rich information set, and show that our results are robust to including survey expectations.

In our rolling window approach, we regress aggregate real per capita GDP (in log-levels) at horizon $t+h$ on intergovernmental transfers at t plus the controls in the four preceding quarters:

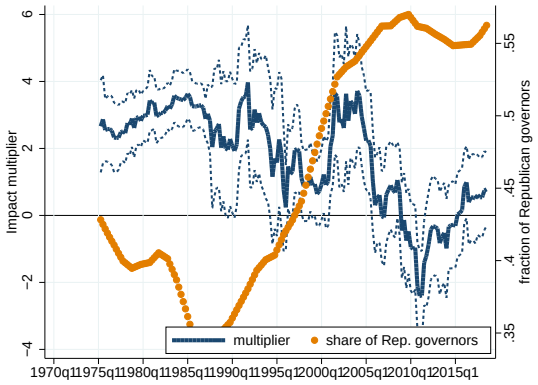
$$\ln GDP_{t+h} = \alpha_h^{(\tau)} + \beta_h^{(\tau)} \ln IG_t + \sum_{\ell=1}^{4} \mathbf{x}'_{t-\ell} \gamma_\ell^{(\tau)} + u_{t+h}, \qquad t \in \{\tau - 39, \ldots, \tau\}.$$

To control for expectations, $\mathbf{x}_{t-\ell}$ includes lags of GDP , federal expenditures, state and local

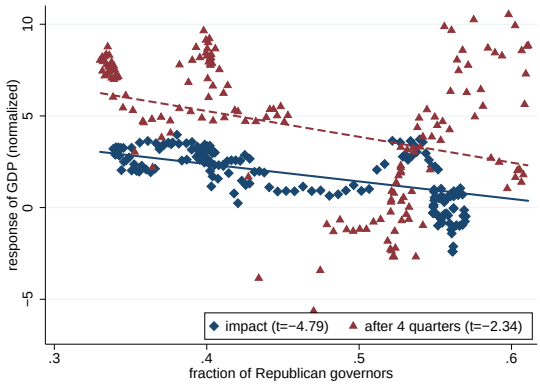
expenditures, federal tax revenue net of transfers, and intergovernmental transfers, all in logs and real per capita terms.

We allow for autocorrelation in u_{t+h} for up to $h+1$ quarters when computing standard errors. We normalize by the average ratio of grants-in-aid to GDP. β_0 has thus the interpretation of an impact multiplier. We reestimate this regression in rolling windows.

(a) Impact multiplier time series



(b) Output effect scatter plot



Note: Only the impact response has the interpretation of a multiplier; the four-quarter ahead result is the cumulative effect on GDP relative to the impact effect on IG.

Figure 10: Reduced-form 15-year rolling window output effects of IG transfers and share of Republican governors.

We use a simple regression to relate the time-varying multipliers to state partisanship. Specifically, we regress the implied output effect of the innovation in intergovernmental transfers to the fraction of Republican governors during the same regression window:

$$\frac{\hat{\beta}_h^{(\tau)}}{(\overline{IG/Y})_\tau} = \delta_h + \kappa_h \overline{Rep}_\tau.$$

To account for the persistence in $\frac{\hat{\beta}_h^{(\tau)}}{(\overline{IG/Y})_\tau}$, we report heteroskedasticity and autocorrelation-robust standard errors.

Figure 10(a) shows the impact multipliers, estimated over a rolling window of 15 years. It also shows the average fraction of Republican governors over the estimation sample. The graph suggests a negative relationship between the multiplier and the share of Republican governors. Figure 10(b) confirms this. It shows a scatter plot of the same relationship and reports the corresponding t-statistic. Both are highly significant, as are the results for the 10-year rolling window in Figure G.20 in the appendix.

An alternative way to allow for time variation in impulse-response is through interaction terms. We also pursue this route and estimate directly:

$$\ln GDP_{t+h} = \alpha_{0,h}^{(\tau)} + \alpha_{Rep,h}^{(\tau)} Rep_{t-4} + \beta_{0,h}^{(\tau)} \ln IG_t + \beta_{Rep,h}^{(\tau)} \ln IG_t \times (Rep_{t-4} - \overline{Rep})$$

$$+\sum_{\ell=1}^{4}\mathbf{x}'_{t-\ell}\gamma_{0,\ell}^{(\tau)}+\sum_{\ell=1}^{4}\mathbf{x}'_{t-\ell}\times(Rep_{t-4}-\overline{Rep})\gamma_{Rep,\ell}^{(\tau)}+u_{t+h}.$$

Here, we lag the share of Republican governors by four quarters to account for the fact that state budgets are passed one fiscal year in advance, the same as in our panel regressions. Table 7 shows the corresponding estimates. Up to four quarters out, the effect of intergovernmental transfers shrinks with the (lagged) fraction of Republican governors, qualitatively the same as in our structural model.

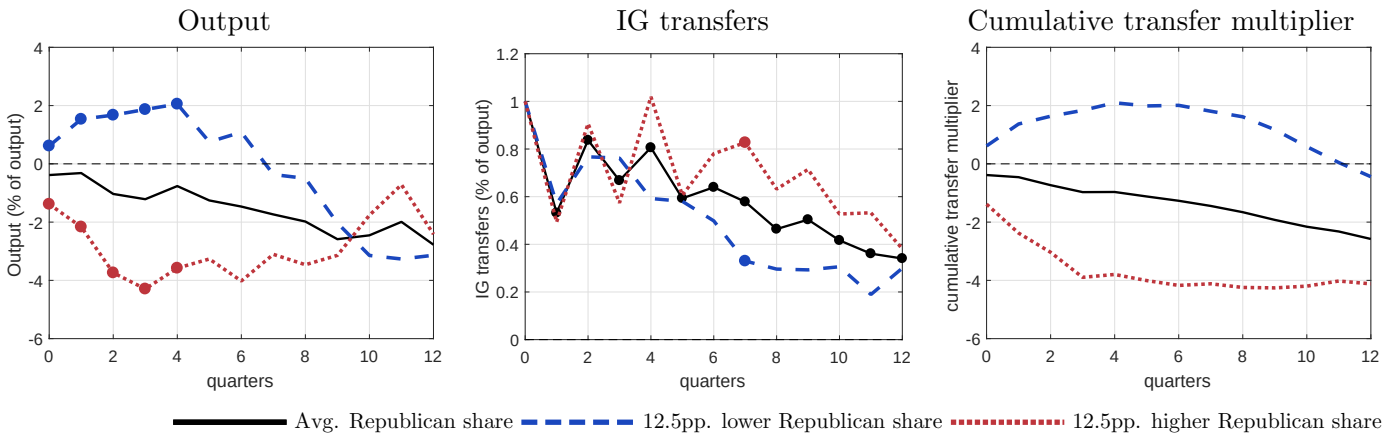
Table 7: Reduced-form output effects of IG innovations and share of Republican governors: Direct regression with single lag for various horizons.

	Impact	h=1	h=2	h=3	h=4
Intergov. Transfers (IG)	-0.008	-0.007	-0.023	-0.027	-0.017
	(-0.80)	(-0.42)	(-1.08)	(-1.29)	(-0.71)
Fraction Rep Gov x IG	-0.176**	-0.325*	-0.476**	-0.542**	-0.495*
	(-2.08)	(-1.92)	(-2.50)	(-2.33)	(-1.88)
Fraction Rep Gov.	0.892	1.709	2.745	3.347	4.202
	(1.26)	(1.22)	(1.39)	(1.38)	(1.56)
R-squared	1.00	1.00	1.00	0.99	0.99
Observations	219	218	217	216	215

Inference based on Newey-West heteroskedasticity and autocorrelation robust standard errors with six lags. Coefficients on control variables omitted.

To interpret the estimates in Table 7, we compute the implied IRFs and the cumulative multiplier. Figure 11 shows the IRFs for output and intergovernmental transfers following an increase in IG equal to 1% of GDP, along with the cumulative multiplier. The partisan effects on output are significant up to four quarters out, while the baseline output effect is not significantly different from zero. Partisan effects on IG transfers itself are largely insignificant, consistent with the notion that state partisan considerations do not influence federal transfers. This lack of partisan effects in intuitive, because transfers largely follow administrative formulas. When the Democratic share of governors is one standard deviation (12.5pp.) higher than usual, the estimates imply an impact multiplier of 0.6, which rises up to 2.1 after six quarters, before declining.

Adding survey expectations as a way to control for fiscal foresight does not affect our qualitative results. Ramey (2011) and Leeper et al. (2013) have documented the importance to account for agents' information set for estimating fiscal multipliers. In Figure G.21 we first add one-quarter ahead inflation and output growth expectations from the Survey of Professional Forecasters to our baseline model. Second, we also add one-quarter ahead expectations of both federal and state and local government purchases. Third, we also add three-quarter ahead purchase expectations. In all cases, we include their interactions with the share of Republican governors. In all three cases, we confirm that the impact output effects are lower when a higher share of states is governed by Republicans. Intriguingly, we also find that once we control for expectations that output effects at the two to three year horizon are rises with the share of Republicans.



For the output and IG transfer IRF, filled markers denote significance at the 10% level or higher. Inference based on Newey-West heteroskedasticity and autocorrelation robust standard errors with two more lags than the response horizon. For the deviations from the baseline, the markers indicate significant differences from the baseline. For the cumulative multiplier, the figure shows point estimates only.

Figure 11: Politics-dependent responses to innovations in intergovernmental transfer: Local projections, 1964q1–2018q3.

To test the predictions of our model, we also estimate whether the national government purchases multiplier depends on the share of Republican governors. Our model implies that the share of Republican governors only affects the economy through their use of intergovernmental transfers. When we run the same interacted regression for the government purchases multiplier, we find an insignificant effect of the interaction term; see Table G.17. This shows that our finding is not an artifact of the Republican share of governors being a proxy for some underlying determinant of federal purchases, policy, or the economy more broadly.

6 Conclusion

U.S. governors have partisan fiscal policy preferences. This heterogeneity matters both as the state level and in aggregate. At the state level, regression estimates based on data from close elections show partisan differences in fiscal policy in response to higher federal intergovernmental transfers to states. For tax policies, these difference are more pronounced now than they were before the Reagan-era, in line with the literature on national partisanship.

At the aggregate level, the results imply that the partisan composition of state governments matters for the efficacy of fiscal policy. A standard macroeconomic model of monetary unions augmented with state governments implies that the impact multiplier is lower when many Republicans are running state-governments because of Keynesian demand effects. This is a novel source of time-variation in fiscal multipliers. Time-series evidence also supports the model prediction that the state of politics causes time-variation in how effective federal transfers are in stimulating the economy.

Appendix

A Identification

Let

$$Y = X\alpha + XD\beta + \epsilon, \tag{A.1}$$

where all variables are zero mean.

X may be correlated with ϵ, so that $\mathbb{E}[X\epsilon] \neq 0$. However, we assume that – in a sample of sufficiently close elections:

$$D \perp\!\!\!\perp (\epsilon, X). \tag{A.2}$$

The OLS estimator of $\theta = [\alpha, \beta]'$ is then given by:

$$\hat{\theta} \equiv \begin{bmatrix} \sum_{i,t} x_{i,t}^2 & \sum_{i,t} x_{i,t}^2 d_{i,t} \\ \sum_{i,t} x_{i,t}^2 d_{i,t} & \sum_{i,t} x_{i,t}^2 d_{i,t}^2 \end{bmatrix}^{-1} \begin{bmatrix} \sum_{i,t} x_{i,t}^2 y_{i,t} \\ \sum_{i,t} x_{i,t} d_{i,t} y_{i,t} \end{bmatrix} = \begin{bmatrix} \sum_{i,t} x_{i,t}^2/N & \sum_{i,t} x_{i,t}^2 d_{i,t}/N \\ \sum_{i,t} x_{i,t}^2 d_{i,t}/N & \sum_{i,t} x_{i,t}^2 d_{i,t}^2/N \end{bmatrix}^{-1} \begin{bmatrix} \sum_{i,t} x_{i,t}^2 y_{i,t}/N \\ \sum_{i,t} x_{i,t} d_{i,t} y_{i,t}/N \end{bmatrix},$$

where N is the sample size.

To see the estimand associated with $\hat{\beta}$, use a LLN and Slutzky's theorem to write:

$$\begin{bmatrix} \sum_{i,t} x_{i,t}^2/N & \sum_{i,t} x_{i,t}^2 d_{i,t}/N \\ \sum_{i,t} x_{i,t}^2 d_{i,t}/N & \sum_{i,t} x_{i,t}^2 d_{i,t}^2/N \end{bmatrix}^{-1} \begin{bmatrix} \sum_{i,t} x_{i,t}^2 y_{i,t}/N \\ \sum_{i,t} x_{i,t} d_{i,t} y_{i,t}/N \end{bmatrix} \xrightarrow{p} \begin{bmatrix} \text{Var}[X] & \text{Cov}[X, XD] \\ \text{Cov}[X, XD] & \text{Var}[XD] \end{bmatrix}^{-1} \begin{bmatrix} \text{Cov}[X, Y] \\ \text{Cov}[XD, Y] \end{bmatrix}$$

We first show that $\text{Cov}[X, XD] = 0$ and $\text{Cov}[XD, Y] = \text{Var}[XD]\beta$, so that $\hat{\beta} \xrightarrow{p} \beta$ under regularity conditions.

1. Claim: $\text{Cov}[X, XD] = 0$.

   $$\text{Cov}[X, XD] = \mathbb{E}[X \times XD] = \mathbb{E}[X^2 \mathbb{E}[D|X]] = \mathbb{E}[X^2 \mathbb{E}[D]] = \mathbb{E}[X^2] \times \mathbb{E}[D] = \mathbb{E}[X^2] \times 0 = 0,$$

   where the first quality follows from the zero mean property of the RHS variables. The second equality is using the law of iterated expectations. The third equality uses Assumption (A.2). We then factor the expectations and use in the second-to-last equality again that D has mean zero.

2. Claim: $\text{Cov}[XD, Y] = \text{Var}[XD]\beta$.

   $$\begin{aligned} \text{Cov}[XD, Y] &= \mathbb{E}[XD \times Y] = \mathbb{E}[XD^2\beta + XD \times \epsilon] = \text{Var}[XD]\beta + \mathbb{E}[X\epsilon\mathbb{E}[D|X, \epsilon]] \\ &= \text{Var}[XD]\beta + \mathbb{E}[X\epsilon\mathbb{E}[D]] = \text{Var}[XD]\beta + \mathbb{E}[X\epsilon] \times \mathbb{E}[D] = \text{Var}[XD]\beta + 0, \end{aligned}$$

   where the steps mirror that for the previous claim.

Since $\text{Cov}[X, XD] = 0$, $\begin{bmatrix} \text{Var}[X] & \text{Cov}[X, XD] \\ \text{Cov}[X, XD] & \text{Var}[XD] \end{bmatrix}^{-1} = \text{diag}([\text{Var}[X], \text{Var}[XD]])^{-1}$ and, therefore, $\hat{\beta} \xrightarrow{p} \text{Var}[XD]^{-1} \text{Cov}[XD, Y] = \beta$.

In a setting with $Y = X\alpha + XD\beta + \mathbf{W}'\gamma + \epsilon$, the corresponding assumption is that $D \perp\!\!\!\perp (\epsilon, X, \mathbf{W})$.

While we cannot test our assumption in terms of ϵ, we can test the unconditional correlations of X and D. Indeed, as our discussion of Table 1 highlights, there are no significant partisan differences in our main model variables.

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Online Appendix

B Data appendix

B.1 Political variables

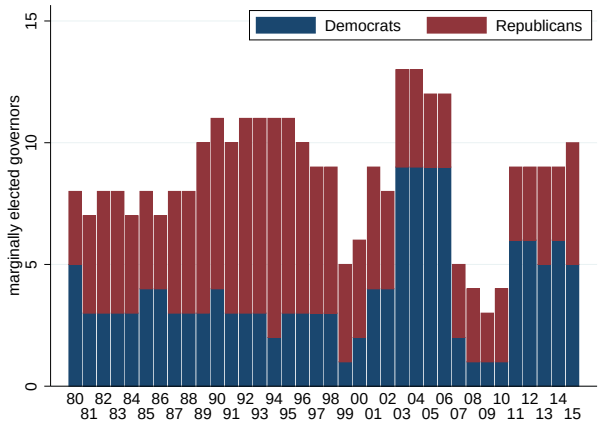


Figure B.1: Democratic and Republican governors elected within a 4pp. margin of victory from calendar year 1980 to 2015.

B.2 Revenues

All census data come from https://www.census.gov/govs/local/ and https://www2.census.gov/pub/outgoing/govs/special60/State_Govt_Fin.zip.

$$
\begin{aligned}
TotalRevenues_t &= GeneralRevenues_t + LiquorStoreRevenues_t \\
&\quad + TotalUtilityRevenues + TotalInsuranceTrustRevenues_t \\
GeneralRevenues_t &= TotalTaxesRev_t + TotalIntergovernmentalTransferRev_t \\
&\quad + TotalGeneralCharges_t + MiscGeneralRevenueRev_t \\
TotalUtilityRevenues_t &= WaterUtilityRevenue_t + ElectricUtilityRev_t \\
&\quad + GasUtilityRev_t + TransitUtilityRev_t \\
TotalInsuranceTrustRevenues_t &= TotalEmploymentRetirementRevenue_t + TotalUnemploymentRevenue_t \\
&\quad + TotalWorkerCompensationRevenue_t \\
&\quad + TotalOtherInsuranceTrustRevenue_t
\end{aligned}
$$

B.2.1 Revenue Definition from Census

- General Government Sector: Within the totals of government revenue and expenditure, internal transfers (e.g., interfund transactions) are "netted out." Therefore, "general revenue" and "general expenditure" represent only revenue from external sources and expenditures to individuals or agencies outside the government, and do not directly reflect any "transfer" or

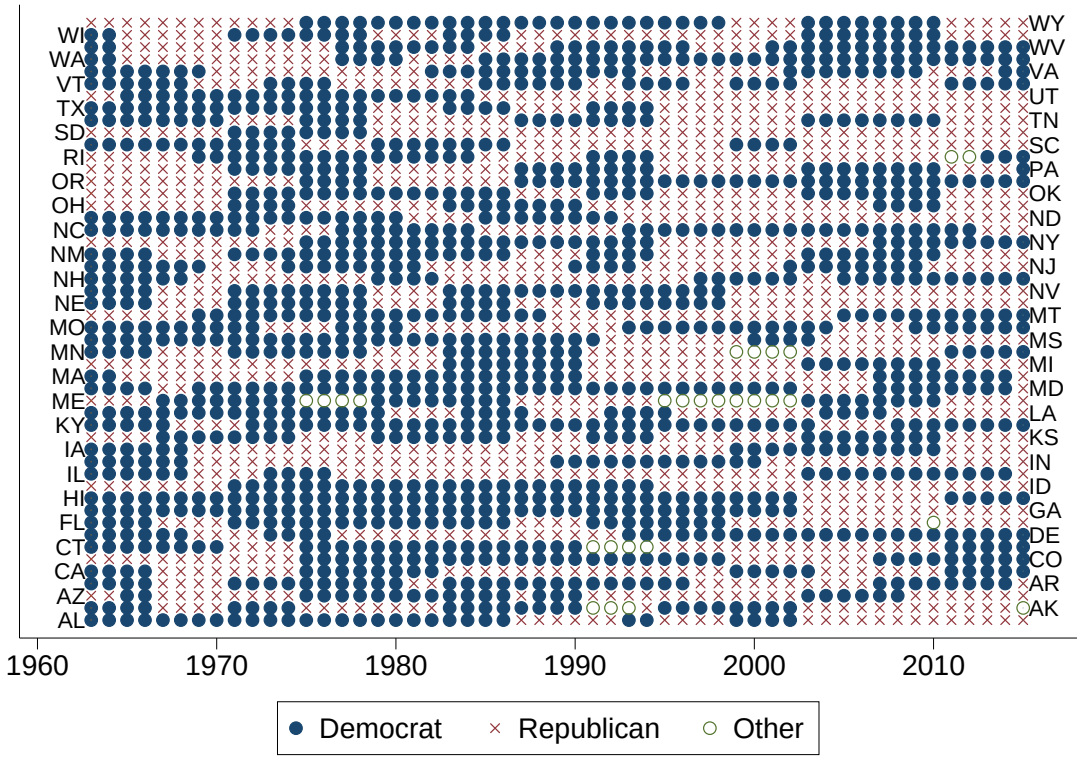
Table B.1: Marginally elected Republican governors up to a 4pp. MOV

#	State	Year	MOV	in sample with following FE: State & Year	Party-State Party-Year	State & Region-Year
1	Alabama	1995	-.9	yes	yes	yes
2	Alabama	1996	-.9	yes	yes	yes
3	Alabama	1997	-.9	yes	yes	yes
4	Alabama	1998	-.9	yes	yes	yes
5	Alabama	2003	-.2	yes	yes	yes
6	Alabama	2004	-.2	yes	yes	yes
7	Alabama	2005	-.2	yes	yes	yes
8	Alabama	2006	-.2	yes	yes	yes
9	California	1983	-1.2	yes	yes	yes
10	California	1984	-1.2	yes	yes	yes
11	California	1985	-1.2	yes	yes	yes
12	California	1986	-1.2	yes	yes	yes
13	California	1991	-3.5	yes	yes	yes
14	California	1992	-3.5	yes	yes	yes
15	California	1993	-3.5	yes	yes	yes
16	California	1994	-3.5	yes	yes	yes
17	Colorado	1999	-1.1	yes	yes	yes
18	Colorado	2000	-1.1	yes	yes	yes
19	Colorado	2001	-1.1	yes	yes	yes
20	Colorado	2002	-1.1	yes	yes	yes
21	Connecticut	1995	-3.5	yes	yes	yes
22	Connecticut	1996	-3.5	yes	yes	yes
23	Connecticut	1997	-3.5	yes	yes	yes
24	Connecticut	1998	-3.5	yes	yes	yes
25	Florida	2011	-1.1	yes	yes	yes
26	Florida	2012	-1.1	yes	yes	yes
27	Florida	2013	-1.1	yes	yes	
28	Illinois	1983	-.1	yes	yes	yes
29	Illinois	1984	-.1	yes	yes	yes
30	Illinois	1985	-.1	yes	yes	yes
31	Illinois	1986	-.1	yes	yes	yes
32	Illinois	1991	-2.6	yes	yes	yes
33	Illinois	1992	-2.6	yes	yes	yes
34	Illinois	1993	-2.6	yes	yes	yes
35	Illinois	1994	-2.6	yes	yes	yes
36	Illinois	1999	-3.6	yes	yes	
37	Illinois	2000	-3.6	yes	yes	
38	Illinois	2001	-3.6	yes	yes	yes
39	Illinois	2002	-3.6	yes	yes	yes
40	Iowa	1987	-3.9	yes	yes	yes
41	Iowa	1988	-3.9	yes	yes	yes
42	Iowa	1989	-3.9	yes	yes	yes
43	Iowa	1990	-3.9	yes	yes	yes
44	Kansas	1987	-3.8	yes	yes	yes
45	Kansas	1988	-3.8	yes	yes	yes
46	Kansas	1989	-3.8	yes	yes	yes
47	Kansas	1990	-3.8	yes	yes	yes
48	Louisiana	1982	-.7	yes	yes	yes
49	Louisiana	1983	-.7	yes	yes	
50	Maine	1991	-2.6	yes	yes	yes
51	Maine	1992	-2.6	yes	yes	yes
52	Maine	1993	-2.6	yes	yes	yes
53	Maine	1994	-2.6	yes	yes	yes
54	Maryland	2003	-3.9	yes	yes	yes
55	Maryland	2004	-3.9	yes	yes	yes
56	Maryland	2005	-3.9	yes	yes	yes
57	Maryland	2006	-3.9	yes	yes	yes
58	Massachusetts	1991	-3.2	yes	yes	yes
59	Massachusetts	1992	-3.2	yes	yes	yes
60	Massachusetts	1993	-3.2	yes	yes	yes
61	Massachusetts	1994	-3.2	yes	yes	yes
62	Massachusetts	1999	-3.4	yes	yes	yes
63	Massachusetts	2000	-3.4	yes	yes	yes
64	Massachusetts	2001	-3.4	yes	yes	yes
65	Massachusetts	2002	-3.4	yes	yes	
66	Michigan	1991	-.7	yes	yes	yes
67	Michigan	1992	-.7	yes	yes	yes
68	Michigan	1993	-.7	yes	yes	yes
69	Michigan	1994	-.7	yes	yes	yes
70	Minnesota	1991	-3.3	yes	yes	yes
71	Minnesota	1992	-3.3	yes	yes	yes
72	Minnesota	1993	-3.3	yes	yes	yes
73	Minnesota	1994	-3.3	yes	yes	yes
74	Minnesota	2007	-1	yes	yes	yes
75	Minnesota	2008	-1	yes	yes	yes
76	Minnesota	2009	-1	yes	yes	
77	Minnesota	2010	-1	yes	yes	
78	Mississippi	1992	-3.2	yes	yes	yes
79	Mississippi	1993	-3.2	yes	yes	yes
80	Mississippi	1994	-3.2	yes	yes	yes
81	Mississippi	1995	-3.2	yes	yes	yes
82	Missouri	2005	-3	yes	yes	yes
83	Missouri	2006	-3	yes	yes	yes
84	Missouri	2007	-3	yes	yes	yes
85	Missouri	2008	-3	yes	yes	yes
86	Montana	1993	-2.7	yes	yes	yes
87	Montana	1994	-2.7	yes	yes	yes
88	Montana	1995	-2.7	yes	yes	
89	Montana	1996	-2.7	yes	yes	
90	Montana	2001	-3.9	yes	yes	yes
91	Montana	2002	-3.9	yes	yes	yes
92	Montana	2003	-3.9	yes	yes	yes
93	Montana	2004	-3.9	yes	yes	yes
94	New Jersey	1982	-.1	yes	yes	
95	New Jersey	1983	-.1	yes	yes	yes
96	New Jersey	1984	-.1	yes	yes	yes
97	New Jersey	1985	-.1	yes	yes	yes
98	New Jersey	1994	-1	yes	yes	yes
99	New Jersey	1995	-1	yes	yes	yes
100	New Jersey	1996	-1	yes	yes	yes
101	New Jersey	1997	-1	yes	yes	yes
102	New Jersey	1998	-1.1	yes	yes	yes
103	New Jersey	1999	-1.1	yes	yes	yes
104	New Jersey	2000	-1.1	yes	yes	yes
105	New Jersey	2001	-1.1	yes	yes	yes
106	New Jersey	2010	-3.6	yes	yes	yes
107	New Jersey	2011	-3.6	yes	yes	yes
108	New Jersey	2012	-3.6	yes	yes	yes
109	New Jersey	2013	-3.6	yes	yes	yes
110	New York	1995	-3.3	yes	yes	yes
111	New York	1996	-3.3	yes	yes	yes
112	New York	1997	-3.3	yes	yes	yes
113	New York	1998	-3.3	yes	yes	yes
114	Ohio	1982	-1.7	yes	yes	yes
115	Ohio	2011	-2	yes	yes	yes
116	Ohio	2012	-2	yes	yes	yes
117	Ohio	2013	-2	yes	yes	yes
118	Oklahoma	1987	-2.9	yes	yes	yes
119	Oklahoma	1988	-2.9	yes	yes	yes
120	Oklahoma	1989	-2.9	yes	yes	yes
121	Oklahoma	1990	-2.9	yes	yes	yes
122	Pennsylvania	1983	-2.7	yes	yes	yes
123	Pennsylvania	1984	-2.7	yes	yes	yes
124	Pennsylvania	1985	-2.7	yes	yes	yes
125	Pennsylvania	1986	-2.7	yes	yes	yes
126	Rhode Island	1989	-1.7	yes	yes	yes
127	Rhode Island	1990	-1.7	yes	yes	yes
128	Rhode Island	1995	-3.8	yes	yes	yes
129	Rhode Island	1996	-3.8	yes	yes	yes
130	Rhode Island	1997	-3.8	yes	yes	yes
131	Rhode Island	1998	-3.8	yes	yes	yes
132	Rhode Island	2007	-2	yes	yes	
133	Rhode Island	2008	-2	yes	yes	
134	Rhode Island	2009	-2	yes	yes	
135	Rhode Island	2010	-2	yes	yes	yes
136	South Carolina	1987	-3.1	yes	yes	yes
137	South Carolina	1988	-3.1	yes	yes	yes
138	South Carolina	1989	-3.1	yes	yes	yes
139	South Carolina	1990	-3.1	yes	yes	yes
140	South Carolina	1995	-2.5	yes	yes	yes
141	South Carolina	1996	-2.5	yes	yes	yes
142	South Carolina	1997	-2.5	yes	yes	yes
143	South Carolina	1998	-2.5	yes	yes	yes
144	South Dakota	1987	-3.6	yes	yes	yes
145	South Dakota	1988	-3.6	yes	yes	yes
146	South Dakota	1989	-3.6	yes	yes	yes
147	South Dakota	1990	-3.6	yes	yes	yes
148	Texas	1982	-.7	yes		yes
149	Utah	1989	-1.7	yes	yes	yes
150	Utah	1990	-1.7	yes	yes	yes
151	Utah	1991	-1.7	yes	yes	yes
152	Utah	1992	-1.7	yes	yes	yes
153	Vermont	2003	-2.6	yes	yes	
154	Vermont	2004	-2.6	yes	yes	

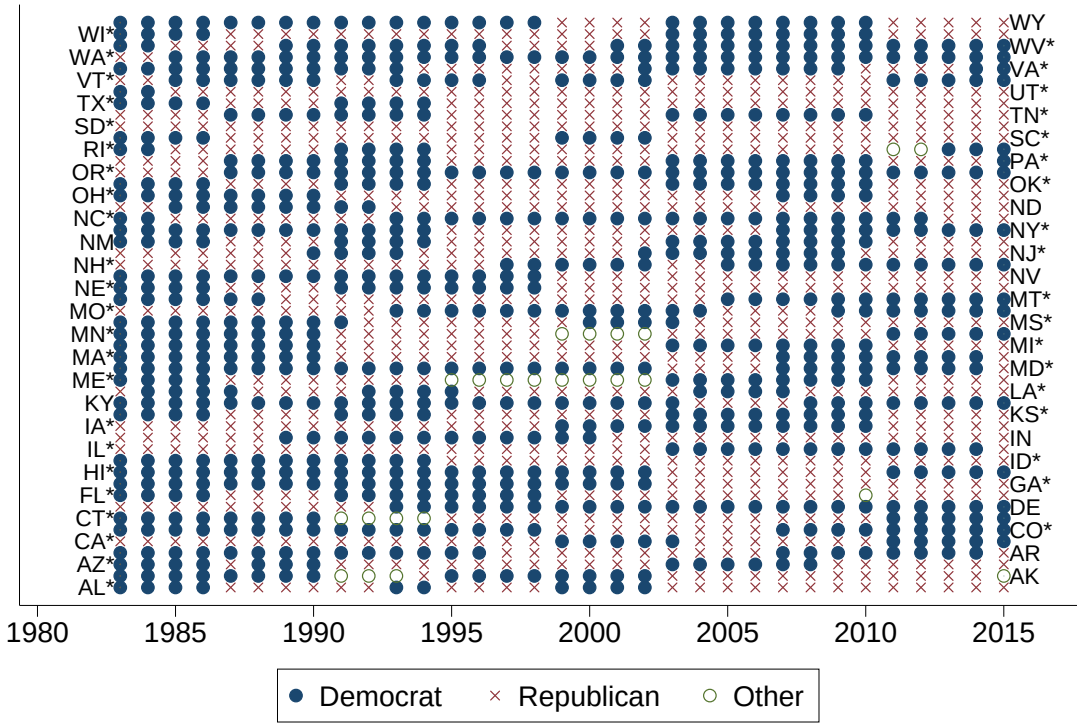
Table B.2: Marginally elected Democratic governors up to a 4pp. MOV

#	State	Year	MOV	in sample with following FE: State & Year	Party-State Party-Year	State & Region-Year
1	Arizona	2003	1	yes	yes	yes
2	Arizona	2004	1	yes	yes	yes
3	Arizona	2005	1	yes	yes	yes
4	Arizona	2006	1	yes	yes	yes
5	Connecticut	2011	.6	yes	yes	yes
6	Connecticut	2012	.6	yes	yes	yes
7	Connecticut	2013	.6	yes	yes	yes
8	Florida	1995	1.5	yes	yes	yes
9	Florida	1996	1.5	yes	yes	yes
10	Florida	1997	1.5	yes	yes	yes
11	Florida	1998	1.5	yes	yes	yes
12	Georgia	1995	2.1	yes	yes	yes
13	Georgia	1996	2.1	yes	yes	yes
14	Georgia	1997	2.1	yes	yes	yes
15	Georgia	1998	2.1	yes	yes	yes
16	Hawaii	1987	3.9	yes	yes	yes
17	Hawaii	1988	3.9	yes	yes	yes
18	Hawaii	1989	3.9	yes	yes	yes
19	Hawaii	1990	3.9	yes	yes	yes
20	Hawaii	1999	1.3	yes		yes
21	Hawaii	2000	1.3	yes	yes	yes
22	Hawaii	2001	1.3	yes	yes	yes
23	Hawaii	2002	1.3	yes	yes	yes
24	Idaho	1983	1.3	yes	yes	yes
25	Idaho	1984	1.3	yes	yes	yes
26	Idaho	1985	1.3	yes	yes	yes
27	Idaho	1986	1.3	yes	yes	yes
28	Idaho	1987	.9	yes	yes	yes
29	Idaho	1988	.9	yes	yes	yes
30	Idaho	1989	.9	yes	yes	yes
31	Idaho	1990	.9	yes	yes	yes
32	Illinois	2011	.9	yes	yes	yes
33	Illinois	2012	.9	yes	yes	yes
34	Illinois	2013	.9	yes	yes	yes
35	Kansas	1982	2.1	yes		yes
36	Louisiana	2004	3.9	yes	yes	yes
37	Louisiana	2005	3.9	yes	yes	yes
38	Louisiana	2006	3.9	yes	yes	yes
39	Louisiana	2007	3.9	yes	yes	
40	Minnesota	2011	.4	yes	yes	yes
41	Minnesota	2012	.4	yes	yes	yes
42	Minnesota	2013	.4	yes	yes	yes
43	Mississippi	2000	1.1	yes	yes	
44	Mississippi	2001	1.1	yes	yes	yes
45	Mississippi	2002	1.1	yes	yes	yes
46	Mississippi	2003	1.1	yes	yes	yes
47	Missouri	2001	.9	yes	yes	yes
48	Missouri	2002	.9	yes	yes	yes
49	Missouri	2003	.9	yes	yes	yes
50	Missouri	2004	.9	yes	yes	yes
51	Montana	2013	1.6	yes		yes
52	Nebraska	1983	1.3	yes	yes	yes
53	Nebraska	1984	1.3	yes	yes	yes
54	Nebraska	1985	1.3	yes	yes	yes
55	Nebraska	1986	1.3	yes	yes	yes
56	Nebraska	1991	.7	yes	yes	yes
57	Nebraska	1992	.7	yes	yes	yes
58	Nebraska	1993	.7	yes	yes	yes
59	Nebraska	1994	.7	yes	yes	yes
60	New Hampshire	2005	2.2	yes	yes	
61	New Hampshire	2006	2.2	yes	yes	
62	New York	1983	3.4	yes	yes	yes
63	New York	1984	3.4	yes	yes	yes
64	New York	1985	3.4	yes	yes	yes
65	New York	1986	3.4	yes	yes	yes
66	North Carolina	2009	3.4	yes		
67	North Carolina	2010	3.4	yes		
68	North Carolina	2011	3.4	yes	yes	yes
69	North Carolina	2012	3.4	yes	yes	yes
70	Oklahoma	2003	.7	yes	yes	yes
71	Oklahoma	2004	.7	yes	yes	yes
72	Oklahoma	2005	.7	yes	yes	yes
73	Oklahoma	2006	.7	yes	yes	yes
74	Oregon	2003	1	yes	yes	yes
75	Oregon	2004	1	yes	yes	yes
76	Oregon	2005	1	yes	yes	yes
77	Oregon	2006	1	yes	yes	yes
78	Oregon	2011	1.5	yes	yes	
79	Oregon	2012	1.5	yes	yes	
80	Oregon	2013	1.5	yes	yes	yes
81	Pennsylvania	1987	2.3	yes	yes	
82	Pennsylvania	1988	2.3	yes	yes	
83	Pennsylvania	1989	2.3	yes	yes	yes
84	Pennsylvania	1990	2.3	yes	yes	yes
85	Tennessee	2003	3.1	yes	yes	yes
86	Tennessee	2004	3.1	yes	yes	yes
87	Tennessee	2005	3.1	yes	yes	yes
88	Tennessee	2006	3.1	yes	yes	yes
89	Texas	1991	2.5	yes	yes	yes
90	Texas	1992	2.5	yes	yes	yes
91	Texas	1993	2.5	yes	yes	yes
92	Texas	1994	2.5	yes	yes	yes
93	Vermont	1985	1.6	yes	yes	yes
94	Vermont	1986	1.6	yes	yes	yes
95	Vermont	2011	1.8	yes	yes	yes
96	Vermont	2012	1.8	yes	yes	yes
97	Virginia	1990	.4	yes	yes	yes
98	Virginia	1991	.4	yes	yes	yes
99	Virginia	1992	.4	yes	yes	yes
100	Virginia	1993	.4	yes	yes	yes
101	Washington	2005	0	yes	yes	yes
102	Washington	2006	0	yes	yes	yes
103	Washington	2007	0	yes	yes	
104	Washington	2008	0	yes		
105	West Virginia	2001	2.9	yes	yes	yes
106	West Virginia	2002	2.9	yes	yes	yes
107	West Virginia	2003	2.9	yes	yes	yes
108	West Virginia	2004	2.9	yes	yes	yes
109	Wisconsin	2003	3.7	yes	yes	yes
110	Wisconsin	2004	3.7	yes	yes	yes
111	Wisconsin	2005	3.7	yes	yes	yes
112	Wisconsin	2006	3.7	yes	yes	yes

(a) Full sample: 1963–2014

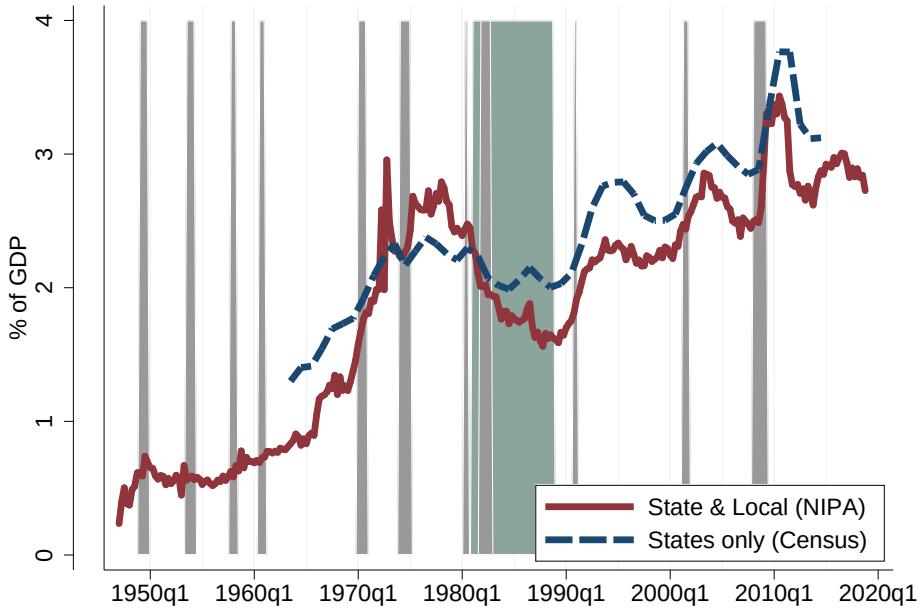


(b) Baseline sample: 1983–2014



* ever in 4pp MOV sample

Figure B.2: State composition



Gray shaded areas indicate NBER recession dates. The green shaded area indicates the Reagan presidency. NIPA only considers a subset of budgeted intergovernmental transfers, so that the sum of state and local according to NIPA does generally lie below the line for transfers to states only according to the Census. However, the NIPA series is close to the series for transfers to states only in the Census budget data.

Figure B.3: Federal intergovernmental transfers to state and local governments in NIPA vs. federal intergovernmental transfers to states only in Census data

"contributions" to or from the utilities, liquor stores, or insurance trust sectors. See Section 3.9 for more information on internal transactions.

- Utilities Sector: In the primary classification of government revenue and expenditure, the term "utility" is used to identify certain types of revenue and expenditure categories. Utility revenue relates only to the revenue from sales of goods or services and by-products to consumers outside the government. Revenue arising from outside other aspects of utility operations is classified as general revenue (e.g., interest earnings). Utility expenditure applies to all expenditures for financing utility facilities, for interest on utility debt, and for operation, maintenance, and other costs involved in producing and selling utility commodities and services to the public (other than noncash transactions like depreciation of assets).

- Liquor Stores Sector: Liquor stores revenue relates only to amounts received from sale of goods and associated services or products. Liquor store expenditure relates only to amounts for purchase of goods for resale and for provision, operation, and maintenance of the stores. Any associated government activity, such as licensing and enforcement of liquor laws or collection of liquor taxes, are classified under the general government sector

- Social Insurance Trust Sector: Insurance trust revenue comprises only (1) retirement and social insurance contributions, including unemployment compensation "taxes" received from employees and other government or private employers, and (2) net earnings on investments set aside to provide income for insurance trusts. Transfers or contributions from other funds of the same government are not classified as insurance trust revenue but rather are reported under special exhibit categories (see Chapters 8 and 9). Insurance trust expenditure comprises only benefit payments and withdrawals of contributions made from retirement and social insurance trust funds. Costs for administering insurance trust systems are classified under the general government sector. Social Insurance Trust Sector: Insurance trust revenue comprises only (1) retirement and social insurance contributions, including unemployment compensation "taxes" received from employees and other government or private employers, and (2) net earnings on investments set aside to provide income for insurance trusts.3 Transfers or contributions from other funds of the same government are not classified as insurance trust revenue but rather are reported under special exhibit categories (see Chapters 8 and 9). Insurance trust expenditure comprises only benefit payments and withdrawals of contributions made from retirement and social insurance trust funds. Costs for administering insurance trust systems are classified under the general government sector.

B.3 Expenditures

$$
\begin{aligned}
TotalExpenditure_t &= TotalIGExpenditure_t DirectExpenditure_t \\
TotalIGExpenditure_t &= TotalIGExpenditure2Federal_t + TotalIGExpenditure2Local_t \\
DirectExpenditure_t &= TotalCurrentOperationalExpendture_t \\
&\quad + TotalCapitalOutlayExpenditure_t \\
&\quad + TotalAssistanceAndSubsidies_t + TotalInterestOnDebt_t \\
&\quad + TotalInsuranceTrustBenefits_t \\
TotalCapitalOutlayExpenditure_t &= TotalConstructions_t + TotalOtherCapitalOutlays_t
\end{aligned}
$$

B.3.1 Expenditures Definition from Census

- Current Operations: Direct expenditure for compensation of own officers and employees and for supplies, materials, and contractual services except any amounts for capital outlay (i.e., for personal services or other objects used in contract construction or government employee construction of permanent structures and for acquisition of property and equipment).
- Interest on Debt: Amounts paid for the use of borrowed money.
- Assistance and Subsidies: Direct cash assistance to foreign governments, private individuals, and nongovernmental organizations (e.g., foreign aid, agricultural supports, public welfare, veteran bonuses, and cash grants for tuition and scholarships) neither in return for goods and services nor in repayment of debt and other claims against the government.
- Capital Outlay: Direct expenditure for purchase or construction, by contract or government employee, construction of buildings and other improvements; for purchase of land, equipment, and existing structures; and for payments on capital leases.
- Intergovernmental expenditure is defined as amounts paid to other governments for performance of specific functions or for general financial support. Includes grants, shared taxes, contingent loans and advances, and any significant and identifiable amounts or reimbursement paid to other governments for performance of general government services or activities.

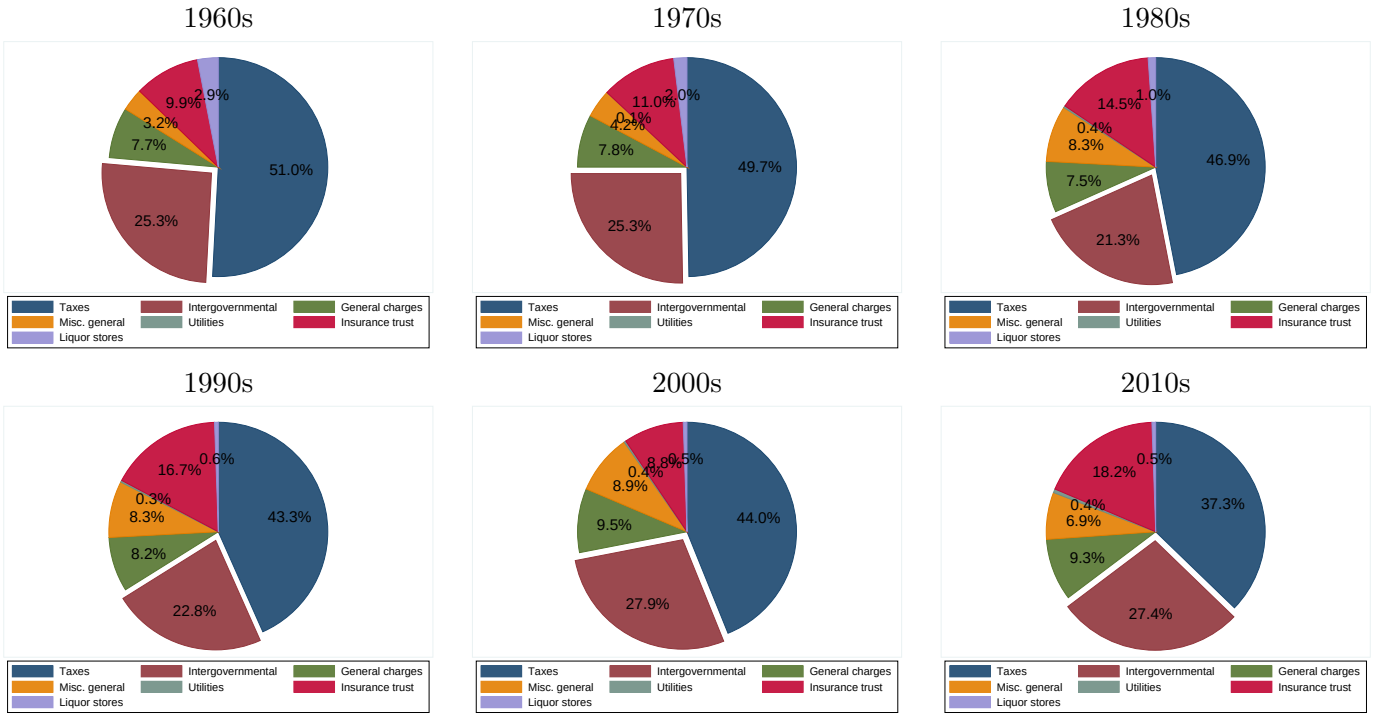


Figure B.4: Overall revenue components: Average by decade, 1963–2014

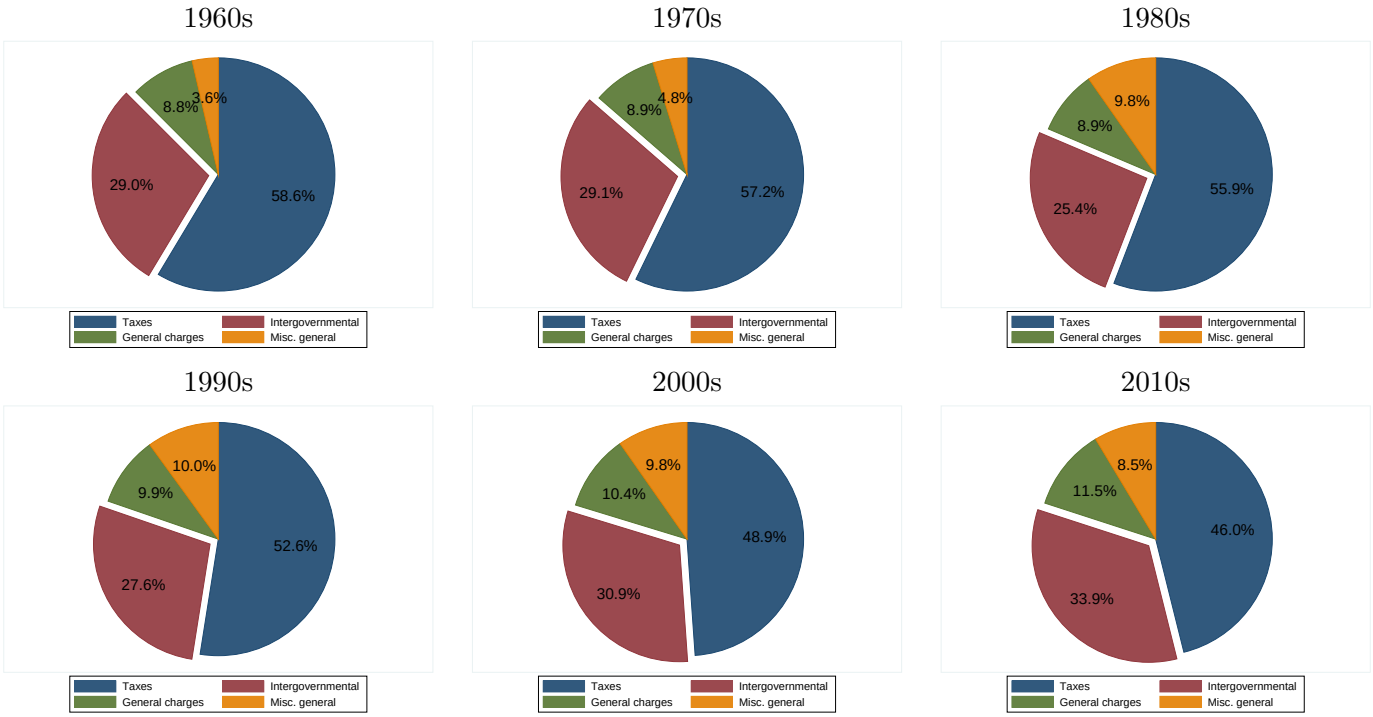


Figure B.5: General revenue components: Average by decade, 1963–2014

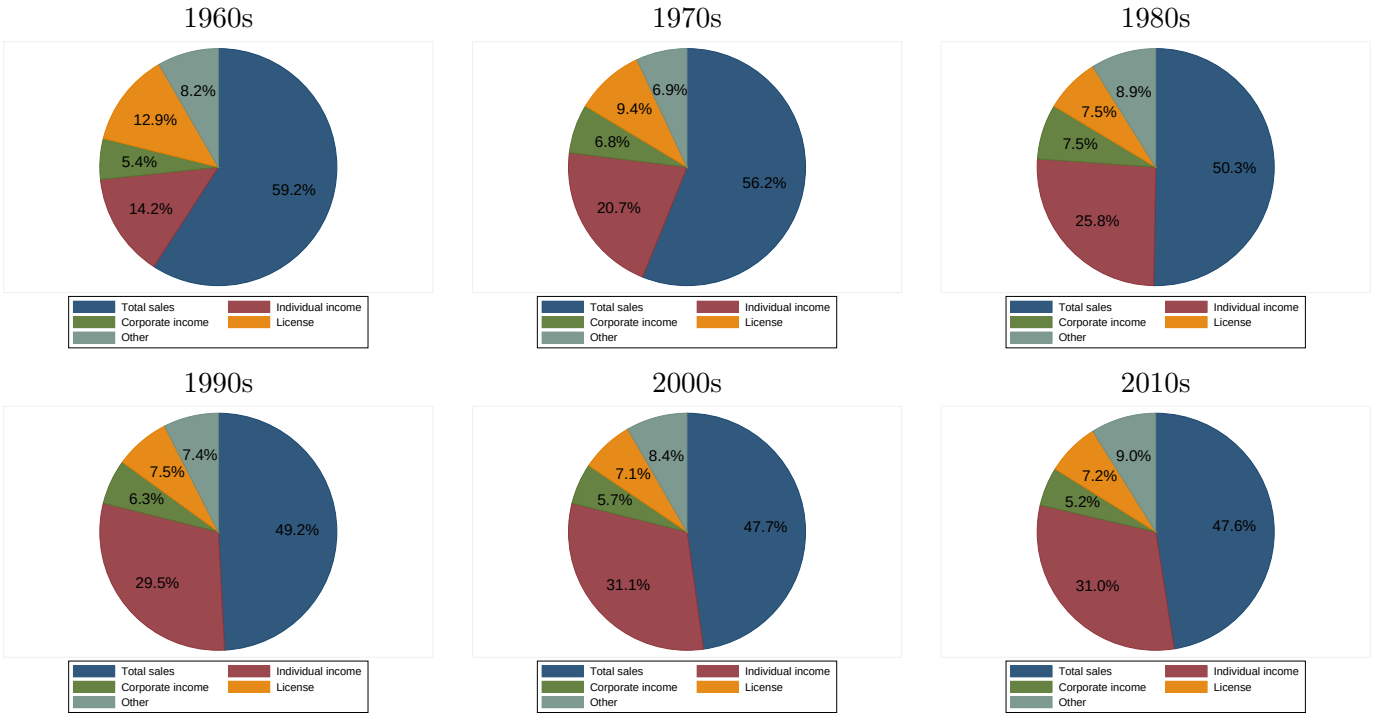


Figure B.6: Tax revenue components: Average by decade, 1963–2014

Figure B.7: Total expenditure components: Average by decade, 1963–2014

Table B.3: Descriptive statistics: Means and standard deviations

		Main sample	Main sample with close elections			Dem=Rep
	1963-2014	1983-2014	Within 4pp.	Dem<4pp.	Rep<4pp.	p-val
Debt per capita xxxx mean	2.1	2.8	3.0	2.7	3.2	0.4
standard deviation	0.8	0.7	0.4	0.2	0.5	.
Debt growth mean	-0.8	0.0	0.0	0.2	-0.1	0.6
standard deviation	11.4	8.3	7.6	7.5	7.6	.
Population xxxx mean	5177.1	5777.4	6570.8	5762.0	7156.6	0.2
standard deviation	1301.4	827.7	563.7	110.7	513.8	.
Population growth mean	1.1	1.0	0.8	0.9	0.8	0.6
standard deviation	0.7	0.6	0.6	0.9	0.4	.
Expenditure growth mean	3.2	2.6	2.6	2.7	2.5	0.2
standard deviation	3.8	3.5	3.4	3.5	3.2	.
Net general rev growth mean	3.0	2.2	2.8	3.1	2.6	0.4
standard deviation	6.8	3.9	3.4	3.0	2.8	.
Income sales tax rev growth mean	2.9	2.1	2.7	2.9	2.5	0.6
standard deviation	5.3	4.6	3.8	3.3	3.3	.
Tax rev growth mean	2.6	2.0	2.6	2.8	2.5	0.6
standard deviation	4.8	4.5	3.8	3.2	3.2	.
General rev share Taxes mean	54.0	51.8	52.5	52.1	52.8	0.5
standard deviation	3.4	2.8	2.3	1.5	1.7	.
General rev share IG mean	29.0	29.0	29.1	29.5	28.8	0.9
standard deviation	3.2	2.4	2.1	1.5	1.6	.
IG increases mean	5.5	5.0	4.6	4.6	4.6	0.6
standard deviation	5.6	4.9	4.4	5.0	3.8	.
IG decreases mean	-1.9	-1.6	-1.3	-1.5	-1.2	0.7
standard deviation	3.4	3.2	2.7	2.7	2.4	.
Overall GDP growth mean	2.1	1.9	2.1	2.0	2.1	0.2

Population in 1,000s. Debt per capita in 2012 dollars. All other variables, except for population growth, also in real per capita terms. p-values based on standard errors clustered by state and year after removing state and year fixed effects. The 5 pp. MOV includes two observations that drop out in the presence of these fixed effects. Standard deviations are after taking out state and year fixed effects.

B.4 Additional Variable Definitions

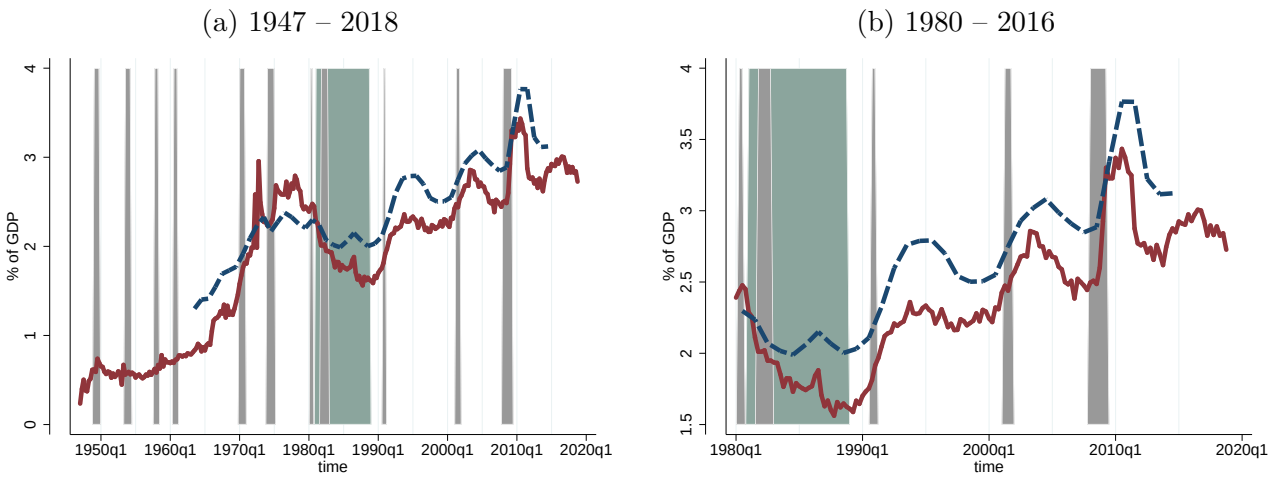
Variables used in the analysis of state level panel data:

- Annual GDP deflator: FRED label `A191RD3A086NBEA`).
- Personal Income: BEA Regional Accounts (https://apps.bea.gov/regional/downloadzip.cfm), Table CA4.
- State GDP and its components: BEA Regional Accounts, GDP by State.
- Population: BEA Regional Accounts.

Variables used in the time-series analysis:

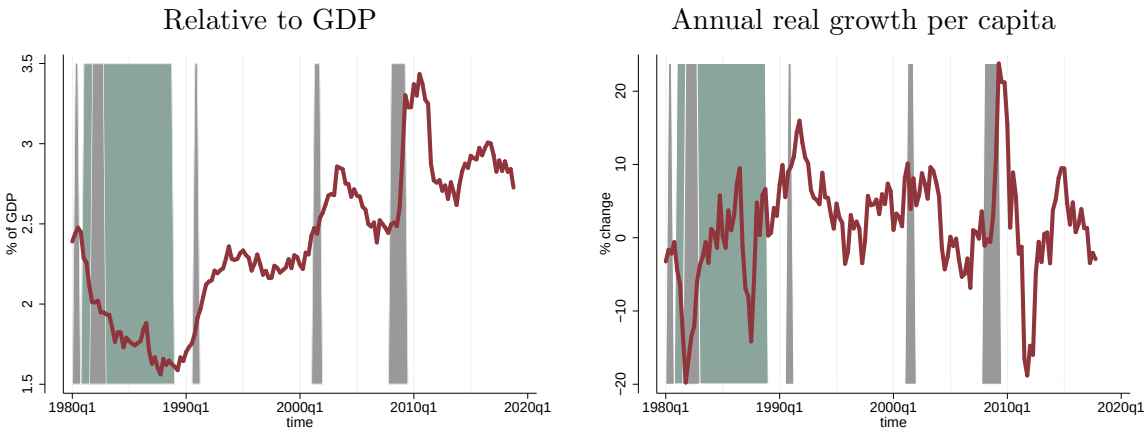
- Civilian population above 16: FRED label `CNP16OV`
- Real government consumption and investment: FRED label `GCEC1`
- Real GDP: FRED label `GDPC1`
- GDP deflator: FRED label `GDPDEF`
- State and local government expenditures: FRED label `SLEXPND`
- Federal transfers to state and local governments: FRED label `FGSL`
- Federal government current transfer receipts from persons: FRED label `B233RC1Q027SBEA`
- Federal government current transfer receipts from business: FRED label `W012RC1Q027SBEA`
- Federal government current transfer payments: FRED label `W014RC1Q027SBEA`
- Federal government current tax receipts: FRED label `W006RC1Q027SBEA`

We define taxes as current tax receipts plus transfer receipts from persons and business minus federal transfers, but plus federal transfers to state and local governments. We smooth the population estimate by initializing population to be the value in the data and then updating population as: $Pop_t = \frac{3}{4}Pop_{t-1} + \frac{1}{4}CNP16OV_t$.



Two types of coverage differences explain the discrepancies: (1) Capital expenditures and state-run unemployment insurance numbers are excluded from NIPA. (2) The Census series does not cover local governments.

Figure B.8: NIPA federal grants-in-aid to state and local governments vs Census intergovernmental transfers to states.



Note: Intergovernmental transfers from the federal government to state and local governments show both cyclical and idiosyncratic patterns. When Reagan came into office, intergovernmental transfers were cut despite the 1981–82 recession. In all other recession since 1980, intergovernmental transfers rose.

$$\Delta \log \frac{IG_t}{GDP_t} = \underset{[0.79]}{0.002} + \underset{[2.04]}{0.025} \times \mathbf{1}\{Recession\}_t - \underset{[2.57]}{0.019} \times \mathbf{1}\{Reagan\}_t, \qquad N = 152.$$

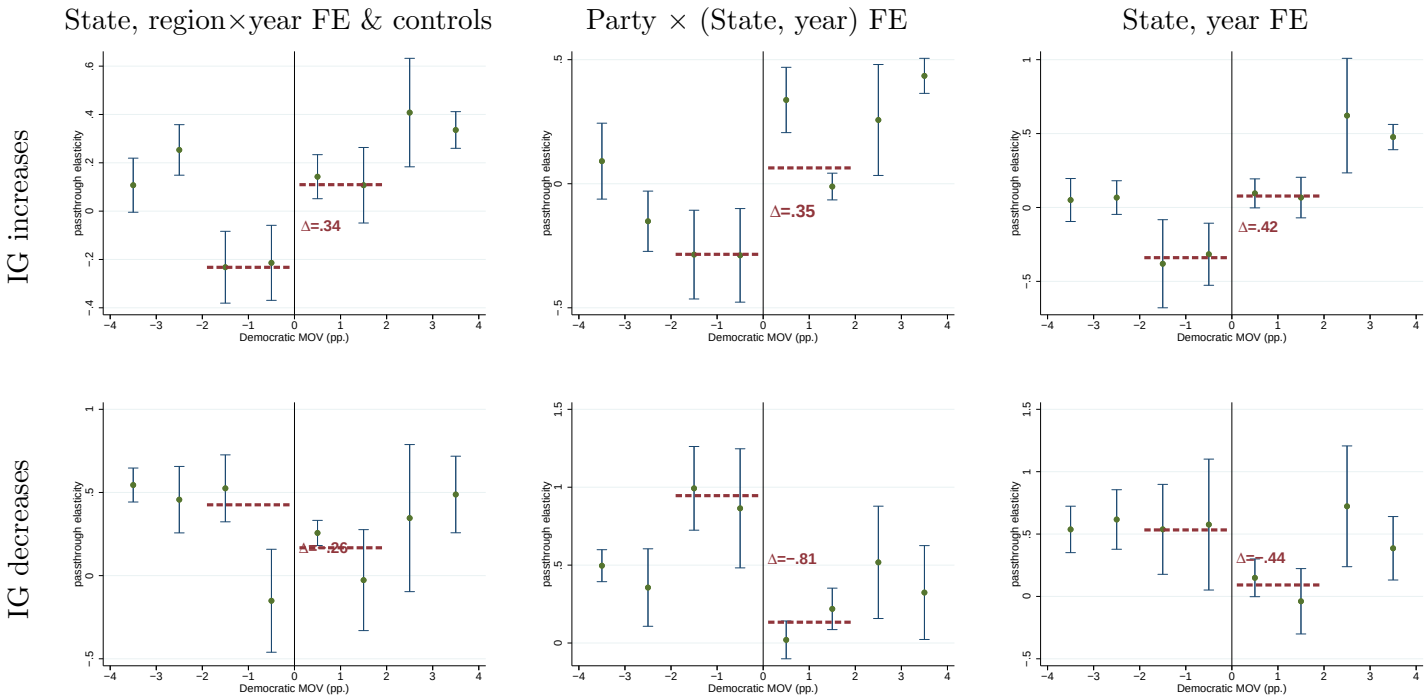
$$\Delta \log \frac{IG_t}{GDP_t} = \underset{[2.03]}{0.008} - \underset{[2.21]}{0.950} \times \Delta \log GDP_t - \underset{[2.04]}{0.015} \times \mathbf{1}\{Reagan\}_t, \qquad N = 152.$$

Robust (absolute) t-statistics in brackets based on Newey-West standard errors with three lags.

Figure B.9: Intergovernmental transfers (Grants-in-aid to state and local governments) since 1980

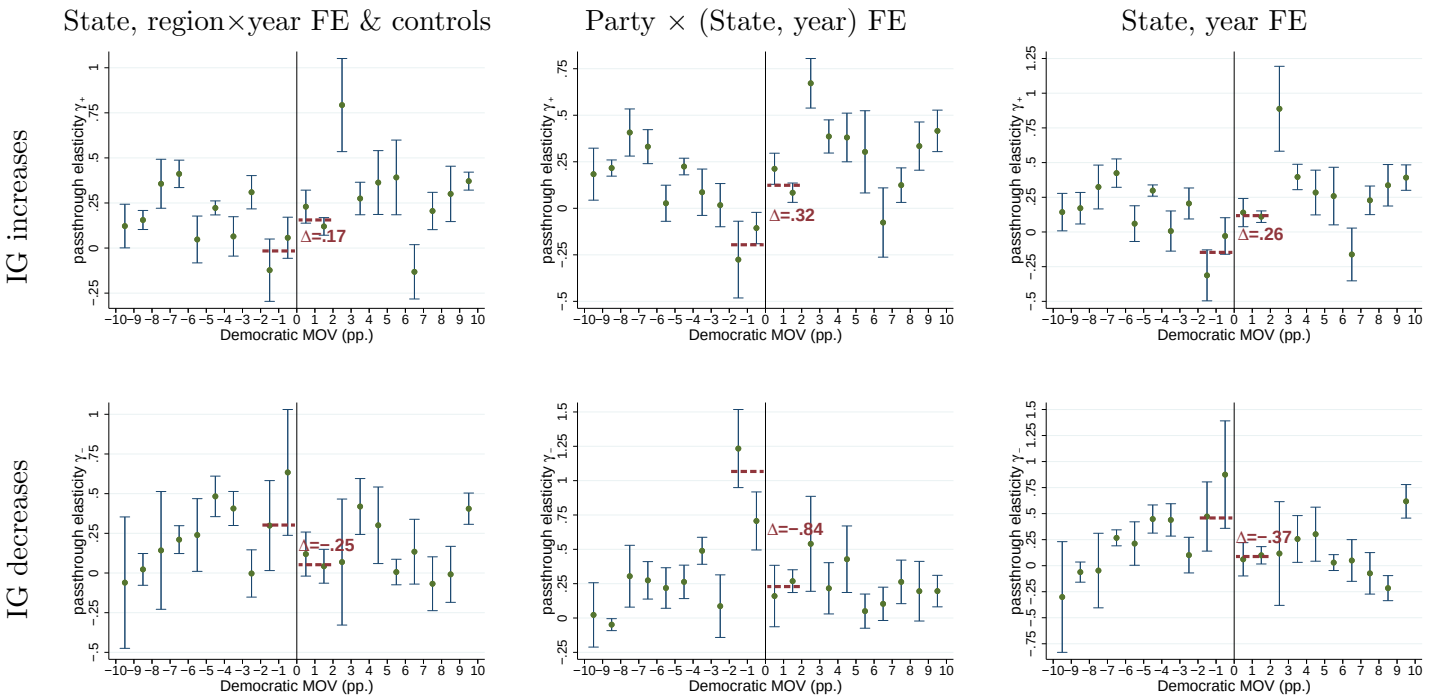
C Additional estimates

C.1 Expenditure growth



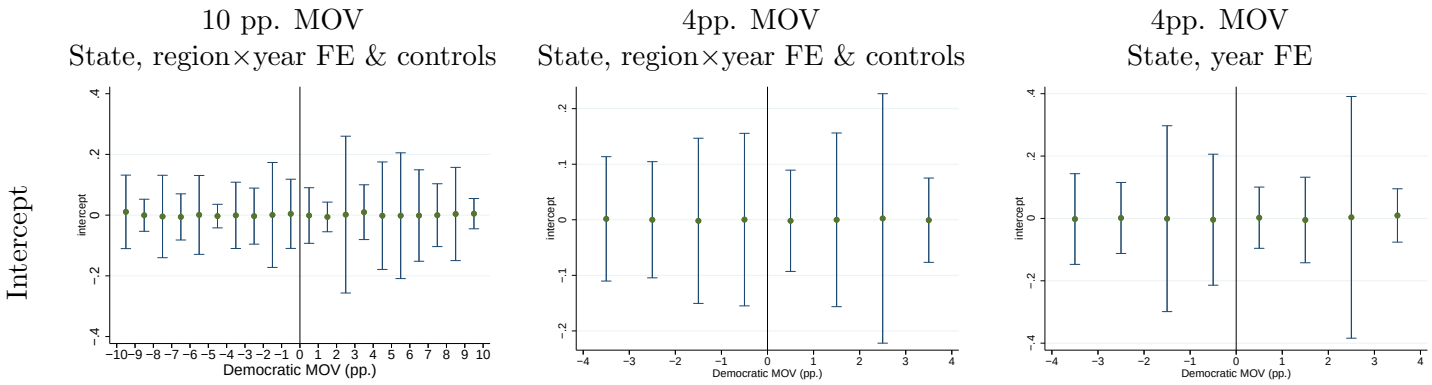
To construct the plots, we first remove fixed effects and, if applicable, controls in the full sample 10pp and 4pp samples, respectively. We then estimate slopes for one percentage point bins. The figures show the estimated slopes and heteroskedasticity-robust ± one standard error. The standard errors are meant to be suggestive only. When we report direct estimates of (2.2), we quantify the uncertainty coming from the controls and fixed effects and clusters standard errors.

Figure C.10: Illustrating our regression discontinuity in slopes: Republican Governors pass less of IG increases on to spending and pass more of IG decreases on to spending cuts. 4pp.



To construct the plots, we first remove fixed effects and, if applicable, controls in the full sample 10pp and 4pp samples, respectively. We then estimate slopes for one percentage point bins. The figures show the estimated slopes and heteroskedasticity-robust ± one standard error. The standard errors are meant to be suggestive only. When we report direct estimates of (2.2), we quantify the uncertainty coming from the controls and fixed effects and clusters standard errors.

Figure C.11: Illustrating our regression discontinuity in slopes: Republican Governors pass less of IG increases on to spending and pass more of IG decreases on to spending cuts. up to 10pp.



To construct the plots, we first remove fixed effects and, if applicable, controls in the full sample 10pp and 4pp samples, respectively. We then estimate slopes for one percentage point bins. The figures show the estimated slopes and heteroskedasticity-robust ± one standard error. The standard errors are meant to be suggestive only. When we report direct estimates of (2.2), we quantify the uncertainty coming from the controls and fixed effects and clusters standard errors.

Figure C.12: Illustrating our regression discontinuity in slopes: No average difference between Republican and Democratic governors.

Table C.4: Expenditure growth: State FE, Region x Year FE, without controls

	(1) 100 pp.	(2) 6 pp.	(3) 5 pp.	(4) 4 pp.	(5) 3 pp.
IG incr.	0.267***	0.369***	0.338***	0.307***	0.335**
	(6.67)	(8.72)	(24.58)	(4.91)	(2.28)
IG decr.	0.091***	0.050	0.219*	0.226*	0.075
	(3.29)	(0.64)	(1.74)	(1.80)	(0.41)
Republican Gov.	0.003	0.008	0.010	0.028***	0.000
	(0.91)	(1.27)	(1.43)	(2.89)	(0.00)
Rep x IG incr.	-0.087**	-0.209***	-0.176**	-0.291**	-0.488**
	(-2.67)	(-3.32)	(-2.22)	(-2.72)	(-2.51)
Rep x IG decr.	0.190***	0.289**	0.288**	0.263**	0.160
	(4.67)	(2.31)	(2.37)	(2.21)	(1.07)
Expenditure/IG Rev.	4.01	4.11	4.12	4.08	4.15
R-squared	0.50	0.67	0.75	0.78	0.77
R-sq, within	0.17	0.22	0.29	0.24	0.16
Observations	1499	374	300	239	119
States	48	45	43	40	28
Years	32	32	31	31	27

t-statistics based on standard errors clustered by state and year. p-values based on t-distribution with degrees of freedom equal to the number of year-clusters. ***: $p < 0.1$, **: $p < 0.05$, *: $p < 0.01$.

Table C.5: Expenditure growth: Various specifications, 4pp MOV

	(1)	(2)	(3)	(4)	(5)	(6)
IG incr.	0.381***	0.337***	0.307***	0.367***	0.322***	0.301***
	(7.57)	(4.85)	(4.91)	(7.58)	(4.58)	(5.35)
IG decr.	0.090	0.089	0.226*	0.092	0.056	0.209
	(0.93)	(0.54)	(1.80)	(0.94)	(0.34)	(1.57)
Republican Gov.	0.016*		0.028***	0.016		0.025**
	(1.76)		(2.89)	(1.46)		(2.15)
Rep x IG incr.	-0.449***	-0.428***	-0.291**	-0.434***	-0.407***	-0.275**
	(-5.40)	(-3.34)	(-2.72)	(-4.69)	(-3.33)	(-2.67)
Rep x IG decr.	0.362***	0.461**	0.263**	0.357***	0.499**	0.263**
	(3.38)	(2.27)	(2.21)	(3.18)	(2.50)	(2.20)
R-squared	0.64	0.71	0.78	0.65	0.72	0.79
R-sq, within	0.24	0.20	0.24	0.26	0.22	0.25
Observations	266	259	239	266	259	239
States	41	41	40	41	41	40
Years	32	32	31	32	32	31
StateFE	Yes	By party	Yes	Yes	By party	Yes
YearFE	Yes	By party	By region	Yes	By party	By region
Controls	No	No	No	Yes	Yes	Yes

t-statistics based on standard errors clustered by state and year. p-values based on t-distribution with degrees of freedom equal to the number of year-clusters. ***: $p < 0.1$, **: $p < 0.05$, *: $p < 0.01$.

Table C.6: Capital Expenditure growth: State FE, Region x Year FE, with controls

	(1)	(2)	(3)	(4)	(5)	(6)
IG incr.	0.430	0.434	0.229	0.385	0.366	0.179
	(1.18)	(1.25)	(0.58)	(1.12)	(1.10)	(0.48)
IG decr.	-0.379	-0.690**	-0.148	-0.381	-0.715**	-0.289
	(-1.08)	(-2.23)	(-0.28)	(-1.05)	(-2.26)	(-0.52)
Republican Gov.	0.089**		0.108**	0.096**		0.104*
	(2.70)		(2.30)	(2.14)		(1.85)
Rep x IG incr.	-0.798*	-0.876*	-0.375	-0.764*	-0.789	-0.323
	(-1.94)	(-1.71)	(-0.63)	(-1.93)	(-1.61)	(-0.54)
Rep x IG decr.	1.221**	2.167***	0.853	1.212**	2.198***	0.901
	(2.60)	(3.16)	(1.58)	(2.45)	(3.15)	(1.64)
R-squared	0.28	0.39	0.51	0.29	0.40	0.52
R-sq, within	0.03	0.04	0.03	0.04	0.06	0.04
Observations	266	259	239	266	259	239
States	41	41	40	41	41	40
Years	32	32	31	32	32	31
StateFE	Yes	By party	Yes	Yes	By party	Yes
YearFE	Yes	By party	By region	Yes	By party	By region
Controls	No	No	No	Yes	Yes	Yes

t-statistics based on standard errors clustered by state and year. p-values based on t-distribution with degrees of freedom equal to the number of year-clusters. ***: $p < 0.1$, **: $p < 0.05$, *: $p < 0.01$.

Table C.7: Municipal Transfer Expenditure growth: State FE, Region x Year FE, with controls

	(1)	(2)	(3)	(4)	(5)	(6)
IG incr.	0.686***	0.563**	0.581***	0.651***	0.574**	0.549***
	(3.66)	(2.65)	(2.91)	(3.15)	(2.50)	(2.95)
IG decr.	-0.201	-0.152	-0.059	-0.219	-0.239	-0.082
	(-0.88)	(-0.58)	(-0.20)	(-0.94)	(-0.89)	(-0.26)
Republican Gov.	0.048***		0.045*	0.048**		0.018
	(2.79)		(2.03)	(2.31)		(0.65)
Rep x IG incr.	-0.834***	-0.835***	-0.781***	-0.798***	-0.844***	-0.705***
	(-4.73)	(-3.20)	(-2.95)	(-4.03)	(-3.31)	(-2.81)
Rep x IG decr.	0.817***	1.005**	0.542	0.822***	1.126***	0.481
	(3.32)	(2.72)	(1.67)	(3.40)	(3.12)	(1.58)
R-squared	0.35	0.52	0.60	0.40	0.55	0.63
R-sq, within	0.11	0.09	0.09	0.17	0.15	0.16
Observations	266	259	239	266	259	239
States	41	41	40	41	41	40
Years	32	32	31	32	32	31
StateFE	Yes	By party	Yes	Yes	By party	Yes
YearFE	Yes	By party	By region	Yes	By party	By region
Controls	No	No	No	Yes	Yes	Yes

t-statistics based on standard errors clustered by state and year. p-values based on t-distribution with degrees of freedom equal to the number of year-clusters. ***: $p < 0.1$, **: $p < 0.05$, *: $p < 0.01$.

Table C.8: Household Transfer Expenditure growth: State FE, Region x Year FE, with controls

	(1)	(2)	(3)	(4)	(5)	(6)
IG incr.	0.199	0.301	-0.028	0.266	0.330	0.007
	(0.98)	(1.46)	(-0.12)	(1.54)	(1.62)	(0.03)
IG decr.	0.000	-0.091	0.134	-0.011	-0.068	0.136
	(0.00)	(-0.28)	(0.32)	(-0.04)	(-0.20)	(0.30)
Republican Gov.	0.002		0.007	0.015		0.031
	(0.15)		(0.40)	(0.70)		(1.04)
Rep x IG incr.	-0.223	-0.313	0.224	-0.311	-0.336	0.207
	(-0.86)	(-1.28)	(0.84)	(-1.38)	(-1.34)	(0.79)
Rep x IG decr.	0.358	0.320	-0.035	0.408	0.272	0.026
	(1.11)	(0.53)	(-0.09)	(1.31)	(0.46)	(0.07)
R-squared	0.66	0.69	0.75	0.66	0.70	0.76
R-sq, within	0.02	0.01	0.01	0.04	0.03	0.03
Observations	266	259	239	266	259	239
States	41	41	40	41	41	40
Years	32	32	31	32	32	31
StateFE	Yes	By party	Yes	Yes	By party	Yes
YearFE	Yes	By party	By region	Yes	By party	By region
Controls	No	No	No	Yes	Yes	Yes

t-statistics based on standard errors clustered by state and year. p-values based on t-distribution with degrees of freedom equal to the number of year-clusters. ***: $p < 0.1$, **: $p < 0.05$, *: $p < 0.01$.

Table C.9: Other Expenditure growth: State FE, Region x Year FE, with controls

	(1)	(2)	(3)	(4)	(5)	(6)
IG incr.	0.362***	0.319***	0.316***	0.336***	0.308**	0.314***
	(4.79)	(2.80)	(3.11)	(4.55)	(2.59)	(3.01)
IG decr.	0.341**	0.409*	0.435**	0.350**	0.409*	0.427**
	(2.56)	(1.96)	(2.61)	(2.55)	(1.94)	(2.39)
Republican Gov.	-0.000		0.014	-0.005		0.013
	(-0.06)		(1.01)	(-0.54)		(0.84)
Rep x IG incr.	-0.301***	-0.250	-0.137	-0.269***	-0.236	-0.133
	(-3.31)	(-1.58)	(-1.05)	(-2.83)	(-1.49)	(-1.05)
Rep x IG decr.	-0.022	-0.138	0.033	-0.043	-0.137	0.035
	(-0.17)	(-0.62)	(0.21)	(-0.32)	(-0.58)	(0.22)
R-squared	0.58	0.66	0.70	0.59	0.66	0.70
R-sq, within	0.23	0.17	0.26	0.24	0.18	0.26
Observations	266	259	239	266	259	239
States	41	41	40	41	41	40
Years	32	32	31	32	32	31
StateFE	Yes	By party	Yes	Yes	By party	Yes
YearFE	Yes	By party	By region	Yes	By party	By region
Controls	No	No	No	Yes	Yes	Yes

t-statistics based on standard errors clustered by state and year. p-values based on t-distribution with degrees of freedom equal to the number of year-clusters. ***: $p < 0.1$, **: $p < 0.05$, *: $p < 0.01$.

Table C.10: Expenditure growth: Dollar to dollar pass-through based on Table **??**

	(1) 100 pp.	(2) 6 pp.	(3) 5 pp.	(4) 4 pp.	(5) 3 pp.
IG incr.	1.073***	1.558***	1.395***	1.238***	1.341**
	(6.90)	(7.73)	(12.00)	(5.49)	(2.29)
IG decr.	0.346***	0.126	0.836	0.851	0.120
	(3.04)	(0.36)	(1.63)	(1.57)	(0.14)
Rep x IG incr.	0.738***	0.639***	0.649**	0.104	-0.336
	(4.79)	(3.27)	(2.21)	(0.29)	(-0.71)
Rep x IG decr.	1.135***	1.414***	2.051***	1.928***	1.052
	(7.42)	(2.89)	(5.07)	(3.99)	(1.14)
Diff–IG incr.	-0.334**	-0.919***	-0.746**	-1.134***	-1.677**
	(-2.35)	(-3.45)	(-2.14)	(-2.69)	(-2.48)
Diff–IG decr.	0.788***	1.288**	1.215**	1.077**	0.932
	(5.16)	(2.46)	(2.54)	(2.25)	(1.41)
Observations	1499	374	300	239	119

t-statistics based on standard errors clustered by state and year. p-values based on t-distribution with degrees of freedom equal to the number of year-clusters. ***: $p < 0.1$, **: $p < 0.05$, *: $p < 0.01$.

C.2 Revenue growth

Table C.11: Growth of net general revenue components: State FE, Region x Year FE, with controls

	Net general revenue				
	(1) 100 pp.	(2) 6 pp.	(3) 5 pp.	(4) 4 pp.	(5) 3 pp.
Debt change	0.029	-0.004	0.055	0.047	0.018
	(1.46)	(-0.08)	(1.57)	(0.85)	(0.40)
GDP growth	0.364***	0.071	-0.074	-0.016	-0.298
	(4.78)	(0.48)	(-0.39)	(-0.07)	(-1.18)
Rep x Debt change	0.018	0.036	-0.066	-0.063	-0.155**
	(0.59)	(0.68)	(-1.27)	(-1.05)	(-2.23)
Rep x Growth	-0.031	0.173	0.209	0.333	0.878**
	(-0.55)	(0.67)	(0.97)	(1.27)	(2.50)
Republican Gov.	0.003	-0.000	0.007	0.005	0.000
	(0.80)	(-0.04)	(0.66)	(0.42)	(.)
IG incr.	0.074	0.099*	0.155**	0.169**	0.171*
	(1.63)	(1.99)	(2.36)	(2.50)	(1.72)
IG decr.	-0.030	-0.083	-0.127	-0.189	-0.383**
	(-1.02)	(-0.97)	(-0.78)	(-1.09)	(-2.60)
Rep x IG incr.	-0.026	-0.118	-0.176**	-0.174	-0.131
	(-0.52)	(-1.53)	(-2.08)	(-1.63)	(-0.70)
Rep x IG decr.	0.018	0.183	0.348**	0.293*	0.127
	(0.38)	(1.59)	(2.43)	(1.94)	(0.92)
R-squared	0.48	0.66	0.73	0.77	0.86
R-sq, within	0.05	0.04	0.06	0.09	0.31
Observations	1499	374	300	239	119
States	48	45	43	40	28
Years	32	32	31	31	27

t-statistics based on standard errors clustered by state and year. p-values based on t-distribution with degrees of freedom equal to the number of year-clusters. ***: $p < 0.1$, **: $p < 0.05$, *: $p < 0.01$.

Table C.12: Growth of tax revenue components: State FE, Region x Year FE, with controls

	Tax revenue				
	(1) 100 pp.	(2) 6 pp.	(3) 5 pp.	(4) 4 pp.	(5) 3 pp.
Debt change	0.015	0.036	0.061	0.090	0.046
	(0.68)	(1.03)	(1.52)	(1.26)	(0.90)
GDP growth	0.510***	-0.006	-0.159	-0.153	-0.346
	(5.69)	(-0.04)	(-0.75)	(-0.70)	(-1.67)
Rep x Debt change	0.015	-0.003	-0.057	-0.095	-0.123**
	(0.47)	(-0.05)	(-0.98)	(-1.32)	(-2.34)
Rep x Growth	-0.007	0.329	0.340	0.539*	1.273***
	(-0.09)	(1.47)	(1.38)	(2.00)	(3.72)
Republican Gov.	-0.002	0.005	0.012	0.013	0.000
	(-0.26)	(0.56)	(1.18)	(0.93)	(0.00)
IG incr.	0.047	0.114**	0.175**	0.201***	0.144
	(1.01)	(2.28)	(2.44)	(3.40)	(1.27)
IG decr.	-0.080*	-0.198**	-0.173	-0.276*	-0.349**
	(-1.86)	(-2.44)	(-1.11)	(-1.75)	(-2.77)
Rep x IG incr.	0.059	-0.176**	-0.217**	-0.220*	-0.162
	(0.80)	(-2.59)	(-2.15)	(-1.73)	(-0.97)
Rep x IG decr.	0.045	0.317***	0.463***	0.414**	0.338***
	(0.54)	(2.95)	(2.86)	(2.17)	(2.81)
R-squared	0.49	0.66	0.71	0.79	0.90
R-sq, within	0.07	0.05	0.07	0.13	0.39
Observations	1499	374	300	239	119
States	48	45	43	40	28
Years	32	32	31	31	27

t-statistics based on standard errors clustered by state and year. p-values based on t-distribution with degrees of freedom equal to the number of year-clusters. ***: $p < 0.1$, **: $p < 0.05$, *: $p < 0.01$.

Table C.13: Growth of income and sales tax revenue growth: State FE, Region x Year FE, with controls

	Income & sales tax				
	(1) 100 pp.	(2) 6 pp.	(3) 5 pp.	(4) 4 pp.	(5) 3 pp.
Debt change	0.034	0.079**	0.099*	0.094	0.045
	(1.42)	(2.06)	(1.97)	(1.38)	(0.91)
GDP growth	0.371***	-0.070	-0.162	-0.197	-0.336*
	(4.90)	(-0.43)	(-0.81)	(-0.92)	(-1.80)
Rep x Debt change	-0.001	-0.035	-0.048	-0.063	-0.127**
	(-0.03)	(-0.60)	(-0.72)	(-0.87)	(-2.45)
Rep x Growth	0.024	0.267	0.225	0.565**	1.294***
	(0.26)	(1.11)	(0.99)	(2.40)	(4.09)
Republican Gov.	-0.003	0.009	0.021*	0.017	0.000
	(-0.49)	(0.83)	(1.88)	(1.03)	(0.00)
IG incr.	0.039	0.094	0.195**	0.224***	0.144
	(0.74)	(1.35)	(2.20)	(3.22)	(1.17)
IG decr.	-0.101**	-0.161*	-0.195	-0.282	-0.339**
	(-2.27)	(-1.86)	(-1.16)	(-1.64)	(-2.42)
Rep x IG incr.	0.088	-0.133*	-0.273**	-0.234*	-0.103
	(1.07)	(-1.70)	(-2.58)	(-1.74)	(-0.64)
Rep x IG decr.	0.053	0.332***	0.548***	0.490**	0.515***
	(0.58)	(2.94)	(2.90)	(2.41)	(4.11)
R-squared	0.51	0.70	0.73	0.79	0.91
R-sq, within	0.05	0.06	0.09	0.15	0.44
Observations	1499	374	300	239	119
States	48	45	43	40	28
Years	32	32	31	31	27

t-statistics based on standard errors clustered by state and year. p-values based on t-distribution with degrees of freedom equal to the number of year-clusters. ***: $p < 0.1$, **: $p < 0.05$, *: $p < 0.01$.

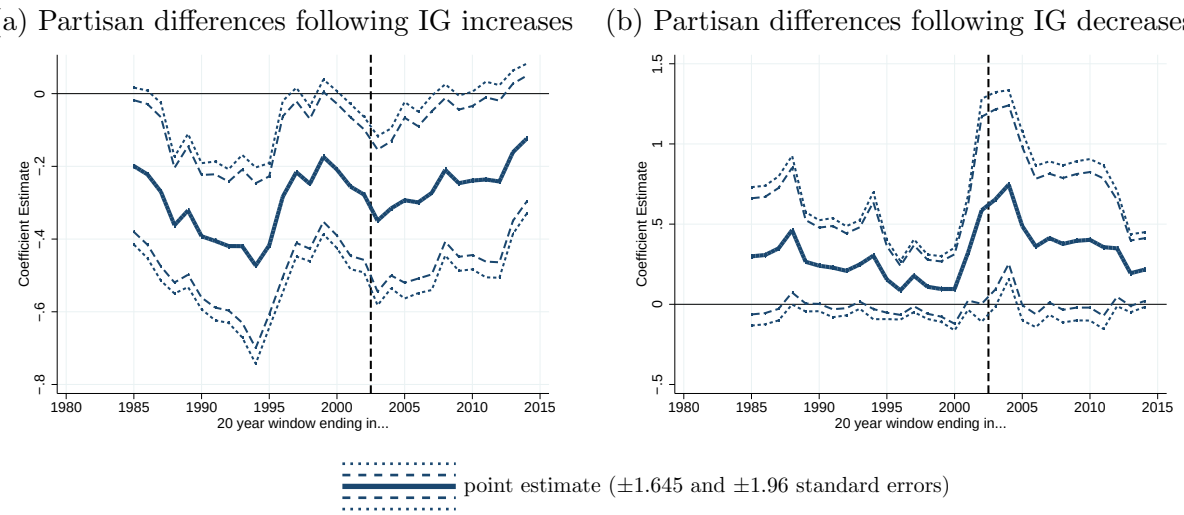
C.3 Private sector activity

Table C.14: Per capita real private GDP growth and its components: State FE, Region x Year FE, with controls

	Future $(t+\frac{1}{2})$ private GDP		Future $(t+\frac{1}{2})$ private profits		Future $(t+\frac{1}{2})$ private compensation	
	(1) 100 pp.	(4) 4 pp.	(1) 100 pp.	(4) 4 pp.	(1) 100 pp.	(4) 4 pp.
Debt change	-0.022	-0.042	-0.041	-0.059	-0.008	-0.037*
	(-1.02)	(-1.30)	(-1.37)	(-1.04)	(-0.46)	(-1.78)
GDP growth	0.174***	0.043	0.165	-0.029	0.205***	-0.006
	(2.85)	(0.28)	(1.62)	(-0.09)	(3.83)	(-0.07)
Rep x Debt change	0.023	0.025	0.040	0.013	0.008	0.016
	(0.80)	(0.63)	(1.04)	(0.17)	(0.35)	(0.49)
Rep x Growth	-0.019	-0.040	-0.042	-0.113	-0.012	0.114
	(-0.56)	(-0.26)	(-0.85)	(-0.38)	(-0.25)	(1.44)
Republican Gov.	0.000	-0.009	0.001	-0.015	-0.001	-0.007
	(0.04)	(-0.90)	(0.34)	(-0.89)	(-0.63)	(-1.32)
IG incr.	0.020*	-0.142**	0.035	-0.249**	0.009	-0.115**
	(1.70)	(-2.66)	(1.66)	(-2.40)	(0.62)	(-2.26)
IG decr.	-0.054***	0.176***	-0.103***	0.320***	-0.015	0.055
	(-2.76)	(3.10)	(-2.96)	(3.15)	(-0.87)	(1.30)
Rep x IG incr.	-0.000	0.152**	-0.006	0.262**	0.004	0.134**
	(-0.02)	(2.71)	(-0.16)	(2.17)	(0.23)	(2.18)
Rep x IG decr.	0.029	-0.119**	0.069	-0.066	-0.007	-0.145***
	(1.33)	(-2.32)	(1.51)	(-0.58)	(-0.23)	(-3.16)
R-squared	0.50	0.78	0.31	0.66	0.73	0.88
R-sq, within	0.03	0.10	0.01	0.11	0.06	0.12
Observations	1499	239	1499	239	1499	239
States	48	40	48	40	48	40
Years	32	31	32	31	32	31

t-statistics based on standard errors clustered by state and year. p-values based on t-distribution with degrees of freedom equal to the number of year-clusters. ***: $p < 0.1$, **: $p < 0.05$, *: $p < 0.01$.

D Time-variation in partisan policies



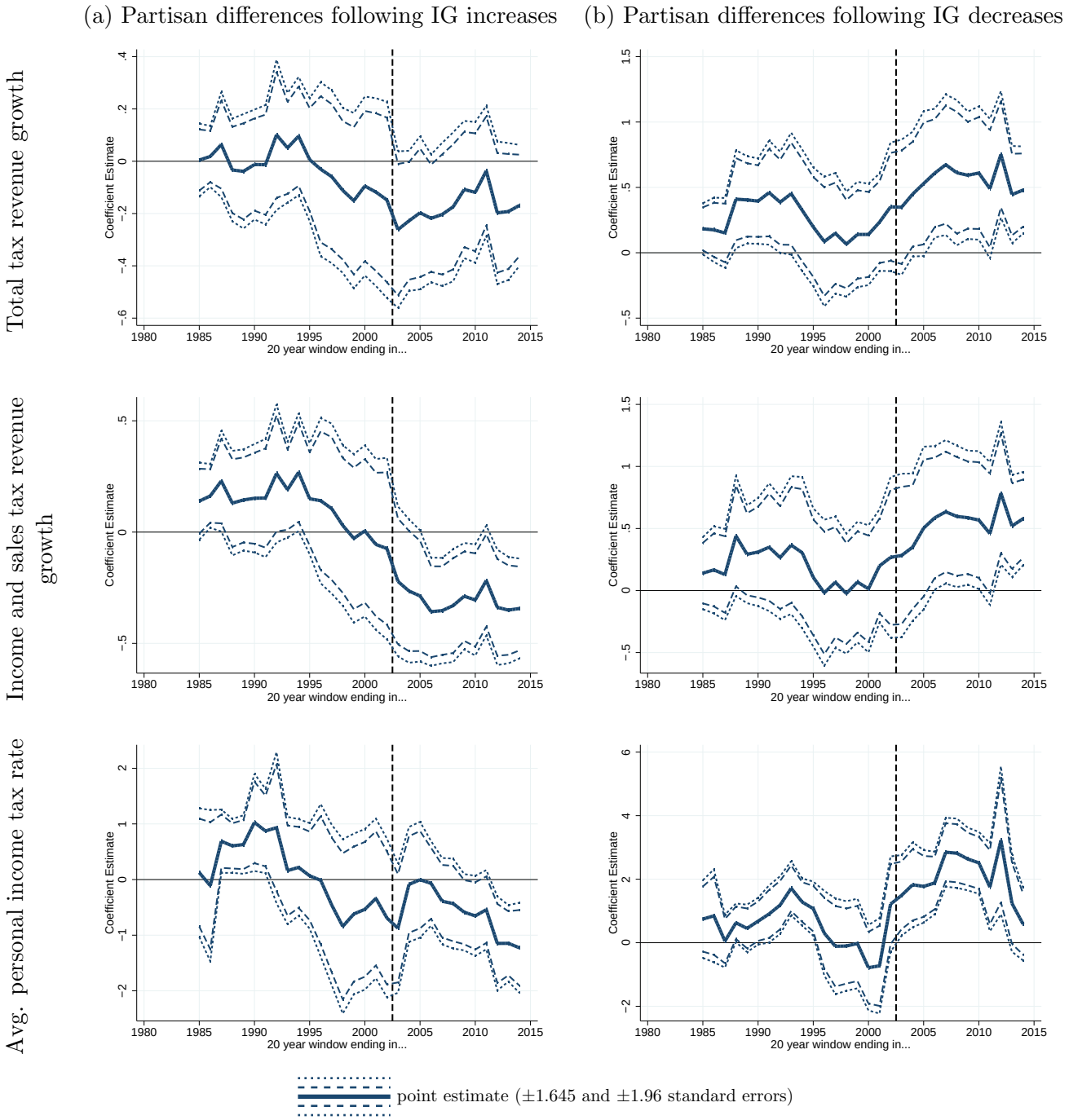
Coefficient estimates based on (2.2) estimated over a 20 year window ending in the year shown. All estimates are based on 5pp. margin of victory cutoffs. Standard errors based on standard errors clustered by state and year. The horizontal line marks the beginning of our baseline post-Reagan sample period.

Figure D.13: Time-variation in the differences of fiscal policy elasticities between Republican and Democratic governors: Total expenditure growth.

To summarize the time variation, we focus on the coefficient estimates from our baseline regression, namely the difference in the elasticity of fiscal policy outcomes with respect to changes in federal transfers. We introduce time-variation by estimating a rolling window version of (2.2) with fixed 20 year windows, ending between 1985 and 2014. Figure D.13 and D.14 show the estimated partisan differences in elasticities on transfer cuts and increases for expenditure growth and taxes. We show the point estimate along with confidence intervals. A dashed vertical line marks the time when our sample includes only observations after Reagan came to power.

Throughout our sample period, we find evidence for a smaller pass-through of federal transfer to state spending under Republican governors. Figure D.13(a) shows the corresponding partisan difference in pass-through elasticity for transfer increases. While the point estimates vary, qualitatively there is little change through most of our sample and there is some indication the lower spending pass-through may have eased in recent years. The horizontal dashed line that marks the beinning of the Reagan era has no obvious relation to our estimates. The point estimates suggest, in contrast, that the partisan difference in response to transfer cuts in Figure D.13(b) may have risen since the Reagan era, i.e., in samples ending in 2002. Given the wide confidence intervals, however, we interpret the partisan differences on the expenditure side as qualitatively constant over time.

Partisan differences in tax policies, in contrast, seem to have increased since the beginning of the Reagan era, according to our results. Figure D.14 shows the coefficient estimates for overall tax revenue growth, income and sales tax revenue growth, and our calculated average personal income tax rate. Here we find evidence that the lower tax growth under Republican governors has strengthened or emerged in recent years. This holds true both for transfer cuts and increases. Beginning with the response to transfer increases, the point estimates for all three tax measures show a decrease in magnitude relative to the early sample period. For income and sales tax



Coefficient estimates based on (2.2) estimated over a 20 year window ending in the year shown. All estimates are based on 5pp. margin of victory cutoffs. Standard errors based on standard errors clustered by state and year. The horizontal line marks the beginning of our baseline post-Reagan sample period.

Figure D.14: Time-variation in fiscal policy elasticities between Republican and Democratic governors: Tax revenues.

growth and the calculated average personal tax rate the differences to earlier sample periods are statistically significant, as the non-overlapping (pointwise) confidence intervals indicate. While the results for transfer cuts are noisier, they also show qualitatively a significantly lower tax increase under Republican governors than under Democratic governors at the end of our sample that does not hold in samples that include the late 1970s and early 1980s or the early 1960s. We conclude that the partisan tax policy differences have varied over time and are now more pronounced.

The timing of the increased partisan differences is consistent with time variation in measured partisan polarization between policy makers. For example, McCarty et al. (2016) document a sharp increase in polarization in the 1980s, while we find that the partisan differences in tax policy have emerged around the same time. Azzimonti (2018) also finds a persistent increase in her historical partisan conflict index since the 1980s.

E Economic Responses to Federal Transfers: Partisan effects

Do the differences in state policy response to federal transfers affect the private economy? We estimate the same model as above, but now look at the broader economy. Specifically, we look at per capita GDP growth and changes in the employment to population ratio. We find that the partisan differences also affect the private sector to federal transfers, though the estimates are noisy.

First, we look at per capita GDP growth over the calendar year in the private sector in Table E.15. Since we include state and year fixed effects, which pick up average state inflation differences and common inflation changes, we interpret GDP growth as real. Because GDP is measured over the calendar year that begins in the second half of the typical state fiscal year, we focus on GDP growth in the private sector for the "future" calendar year that straddles the second half of the fiscal year, which we denote by $t + \frac{1}{2}$. Our baseline specification in column (2) of Figure E.15 implies that Republican governors react to IG inflows and IG outflows in ways that increase future GDP growth: A 1pp. increase in IG transfers leads to future GDP growth under Republican governors that is 0.152pp. higher than under Democrats. While the baseline coefficient may be biased, the point estimate for the Democratic baseline of -0.142 is consistent with the Democratic use of IG inflows lowering growth, while growth in Republican states is unaffected. The results for IG outflows are similar: A cut to IG of 1pp. is associated with an increase in GDP growth in Republican-run states that is 0.119pp higher than in Democratic states. Other sets of fixed effects (columns (4) and (5)) show comparable magnitudes, but the estimates sometimes have t-statistics of only around 1.3. Overall GDP growth behaves similar to private sector GDP growth, with slightly smaller elasticities for IG increases (column (6)). Both the profit and the compensation components of GDP rise, as we document in the appendix (Table C.14). There is no effect for current year GDP growth, i.e., the calendar year straddling the beginning of the fiscal year (column (7)).

Second, we find effects on current employment opposite to those for future GDP growth; see Table E.16. Specifically, we estimate our baseline model for the change in the current total employment-to-population ratio. Our baseline result in column (2) indicates that Republican-run states have a lower employment-to-population ratio than Democratic-run states when federal transfers increase. Specifically, the coefficient estimate of -5.023 implies that if federal transfers growth increases by 1pp., the employment to population ratio drops by 0.05pp. relative to the Democratic-run state. No other coefficient is significant in column (2), but the (Democratic) baseline coefficient of 3.907 would imply an increase of the employment to population ratio of 0.04pp. for a 1pp. increase, but it is estimated imprecisely with a t-stat below 1.6. The coefficients on cuts to IG are also insiginificant. The result at the 5pp. MOV in column (1) is similar, while the result is insignificant at the 3pp. MOV (column (3)). The estimates with other sets of fixed effects in columns (4) and (5) point in the same direction, but the t-statistics are only -1.08 and -1.58. The results for the future employment and for current public sector employment in columns (6) and (7) are insignificant.

In summary, our results for GDP and employment are noisy, but consistent with Democrats stimulating short-run activity relatively more following IG increases, while Republican policies stimulate private sector activity relatively more with a delay. The data does not allow us to isolate any specific mechanism. However, to anticipate our model below, these effects are consistent with initially higher demand in Democratic-run states through higher public spending. Subsequently, the model generate higher output in Republican-run states through expansionary supply-side policies, i.e., tax cuts.

Table E.15: Partisan determinants of per capita GDP growth: 1983 to 2014.

	Future $(t+\frac{1}{2})$ private GDP					Future overall GDP	Current $(t-\frac{1}{2})$ private GDP
	(1) ≤5 pp.	(2) ≤4 pp.	(3) ≤3 pp.	(4) ≤4pp.	(5) ≤4pp.	(6) ≤4 pp.	(7) ≤4 pp.
Debt change	-0.026	-0.042	-0.073**	-0.050	-0.015	-0.032	-0.044*
	(-1.01)	(-1.30)	(-2.08)	(-1.48)	(-0.38)	(-1.07)	(-1.80)
GDP growth	0.175	0.043	0.100	0.199**	-0.073	0.018	-0.180
	(1.01)	(0.28)	(0.47)	(2.40)	(-0.55)	(0.15)	(-1.09)
Rep x Debt change	0.014	0.025	-0.022	0.049	0.014	0.020	0.011
	(0.46)	(0.63)	(-0.53)	(1.62)	(0.32)	(0.55)	(0.38)
Rep x Growth	-0.185	-0.040	-0.274	-0.109	0.061	-0.022	0.301**
	(-1.20)	(-0.26)	(-1.28)	(-0.88)	(0.37)	(-0.17)	(2.07)
Republican Gov.	-0.000	-0.009	0.000	-0.007	0.000	-0.006	-0.005
	(-0.00)	(-0.90)	(.)	(-0.91)	(0.00)	(-0.74)	(-0.55)
IG incr.	-0.110*	-0.142**	-0.044	-0.060	-0.111**	-0.123**	-0.061
	(-2.04)	(-2.66)	(-0.41)	(-1.06)	(-2.07)	(-2.43)	(-0.65)
IG decr.	0.055	0.176***	0.202**	0.022	0.073	0.188***	0.045
	(0.83)	(3.10)	(2.30)	(0.55)	(1.11)	(3.63)	(0.57)
Rep x IG incr.	0.129**	0.152**	0.068	0.086	0.164**	0.122**	0.002
	(2.60)	(2.71)	(0.60)	(1.26)	(2.72)	(2.26)	(0.02)
Rep x IG decr.	-0.043	-0.119**	0.003	-0.056**	-0.128	-0.125**	0.044
	(-0.83)	(-2.32)	(0.04)	(-2.13)	(-1.34)	(-2.36)	(0.79)
R-squared	0.77	0.78	0.84	0.63	0.74	0.78	0.81
R-sq, within	0.06	0.10	0.15	0.06	0.05	0.10	0.09
Observations	300.00	239.00	119.00	266.00	259.00	239.00	239.00
States	43	40	28	41	41	40	40
Years	31	31	27	32	32	31	31
State FE	Yes	Yes	Yes	Yes	By party	Yes	Yes
Year FE	By region	By region	By region	Yes	By party	By region	By region

All regressions include state and year fixed effects. t-statistics based on standard errors clustered by state and year.

F Model Appendix [under construction]

Nominal federal budget

$$(1-\gamma_f)(P_{H,t}nG_{fed,t} + P_{F,t}(1-n)G_{fed,t} + IG_t) = \tau_{fed,t}(nW_tN_t + (1-n)W_t^*N_t^*) \tag{F.1}$$

Real federal purchases

$$\ln G_{fed,t} = (1-\rho_{G,fed})\ln(\bar{G}_{fed}) + \rho_{G,fed})\ln G_{fed,t-1} + \omega_{G,fed}\epsilon_{G,fed,t}. \tag{F.2}$$

Nominal federal transfers:

$$\ln IG_t = (1-\rho_{IG})\ln(\overline{IG}) + \rho_{IG})\ln IG_{t-1} + \omega_{IG}\epsilon_{IG,t}. \tag{F.3}$$

Monetary policy for log of nominal rate:

$$r_{n,t} = \rho_r r_{n,t-1} + (1-\rho_r)(\ln \bar{r}_n + \psi_{r,\pi}\pi_t^{agg} + \psi_{r,y}(\ln y_t^{agg} - \ln \bar{y}^{agg})) \tag{F.4}$$

Table E.16: Partisan determinants of employment-to-population ratio changes: 1983 to 2014.

	Current $(t-\frac{1}{2})$ total employment					Future $(t+\frac{1}{2})$ total emp.	Current public emp.
	(1) ≤5 pp.	(2) ≤4 pp.	(3) ≤3 pp.	(4) ≤4pp.	(5) ≤4pp.	(6) ≤4 pp.	(7) ≤4 pp.
Debt change	0.638	0.068	-0.374	0.616	1.338**	-0.147	-0.219
	(0.96)	(0.09)	(-0.80)	(0.83)	(2.17)	(-0.20)	(-0.33)
GDP growth	5.813	6.488	-1.471	8.908***	3.756	0.113	-0.313
	(1.66)	(1.66)	(-0.78)	(3.94)	(0.93)	(0.03)	(-0.10)
Rep x Debt change	-0.103	0.309	0.334	-0.151	-0.806	-0.383	0.720
	(-0.14)	(0.39)	(0.24)	(-0.17)	(-1.13)	(-0.40)	(0.78)
Rep x Growth	3.004	4.723	11.222***	2.765	8.949*	7.652*	-3.428
	(0.92)	(1.18)	(3.67)	(1.03)	(2.00)	(1.97)	(-0.85)
Republican Gov.	0.146	0.037	0.000	0.080	0.000	-0.312	0.272**
	(0.99)	(0.15)	(0.00)	(0.64)	(.)	(-1.68)	(2.09)
IG incr.	3.839*	3.907	-1.378	2.365	4.131	-2.717	1.636
	(1.84)	(1.56)	(-1.02)	(1.44)	(1.61)	(-1.35)	(1.09)
IG decr.	-0.323	-0.425	2.793*	-1.141	-1.494	1.605	-0.943
	(-0.26)	(-0.29)	(1.83)	(-0.73)	(-1.31)	(1.42)	(-0.80)
Rep x IG incr.	-3.990*	-5.023**	-1.247	-1.993	-4.221	1.622	-1.022
	(-1.98)	(-2.16)	(-0.40)	(-1.08)	(-1.58)	(0.79)	(-0.60)
Rep x IG decr.	0.479	0.867	-1.063	0.435	1.121	-0.936	0.162
	(0.43)	(0.78)	(-0.84)	(0.41)	(0.64)	(-0.94)	(0.15)
R-squared	0.91	0.90	0.95	0.81	0.85	0.90	0.75
R-sq, within	0.21	0.26	0.27	0.23	0.22	0.13	0.04
Observations	300.00	239.00	119.00	266.00	259.00	239.00	239.00
States	43	40	28	41	41	40	40
Years	31	31	27	32	32	31	31
State FE	Yes	Yes	Yes	Yes	By party	Yes	Yes
Year FE	By region	By region	By region	Yes	By party	By region	By region

All regressions include state and year fixed effects. t-statistics based on standard errors clustered by state and year.

Aggregate GDP

$$y_{t,agg} = ny_t + (1-n)y_t^*$$

Aggregate inflation

$$\pi_{agg,t} = n\pi_t + (1-n)\pi_t^*$$

Home Euler equation [with nominal SDF]

$$1 = \mathbb{E}_t[M_{t+1}e^{r_{n,t}}] \qquad \text{or} \qquad 1 = \mathbb{E}_t[M_{t+1}e^{r_{n,t}}]\left(1 + \left(\frac{nb_t}{(1-n)b_t^*}\right)^{-\eta_b}\right)$$

In the incomplete markets world, a positive net foreign asset position lowers the return to the household. For this to be resource-neutral, it should be in terms of total holdings, though.

Foreign Euler equation [usually redundant]

$$1 = \mathbb{E}_t[M_{t+1}e^{r_{n,t}}]\left(1 - \left(\frac{nb_t}{(1-n)b_t^*}\right)^{-\eta_b}\right)$$

Home nominal SDF

$$M_t = \beta\frac{u_{c,t}}{u_{c,t-1}}e^{-\pi_t}$$

Foreign nominal SDF [redundant with full risk sharing]

$$M_t^* = \beta\frac{u_{c,t}^*}{u_{c,t-1}^*}e^{-\pi_t}\frac{X_{t-1}}{X_t}$$

Risk-sharing / Backus-Smith with equal initial financial wealth

$$X_t = \frac{u_{c,t}^*}{u_{c,t}}$$

Home price index for private sector [normalized to unity]

$$1 = \left(\phi_H P_{H,t}^{1-\eta} + (1-\phi_H)P_{F,t}^{1-\eta}\right)^{\frac{1}{1-\eta}}$$

Home price index for state government

$$P_{G,t} = \left(\phi_G P_{H,t}^{1-\eta} + (1-\phi_G)P_{F,t}^{1-\eta}\right)^{\frac{1}{1-\eta}}$$

Foreign price index for private sector

$$X_t = \left(\phi_H^* P_{H,t}^{1-\eta} + (1-\phi_H^*)P_{F,t}^{1-\eta}\right)^{\frac{1}{1-\eta}}$$

Home cost minimization / markups

$$\frac{W_t}{S_t} = (1-\alpha)\frac{Y_t}{N_t}$$

Foreign

$$\frac{W_t^*}{S_t^*} = (1-\alpha)\frac{Y_t^*}{N_t^*}$$

Definition of inflation [given normalization of price level]

$$\frac{\pi_{H,t}}{\pi_t} = \frac{P_{H,t}}{P_{H,t-1}}$$

Home production

$$y_t = ((K_{t-1}\nu_t)^\alpha N_t^{1-\alpha})^{1-\zeta} K_{G,t-1}^\zeta.$$

Home private capital law of motion

$$K_t = (1-\delta)K_{t-1} + I_t\left(1 - \frac{\kappa_I}{2}\left(\frac{I_t}{I_{t-1}} - 1\right)^2\right)$$

Home private investment FOC

$$1 = Q_t\left(1 - \frac{\kappa_I}{2}\left(\frac{I_t}{I_{t-1}} - 1\right)^2 - \kappa_I \frac{I_t}{I_{t-1}}\left(\frac{I_t}{I_{t-1}} - 1\right)\right) + \mathbb{E}_t\left[M_{t+1}\pi_{t+1}Q_{t+1}\kappa_I\left(\frac{I_{t+1}}{I_t} - 1\right)\left(\frac{I_{t+1}}{I_t}\right)^2\right]$$

Capital demand:

$$\frac{R_{k,t}}{S_t} = \alpha\frac{y_t}{k_{t-1}\nu_t}$$

Real state purchases – exogenous

$$\ln G_{s,t}^x = (1-\rho_{G,s})\ln(\bar{G}_s^x) + \rho_{G,s})\ln G_{s,t-1}^x + \omega_{G,s}\epsilon_{G,s,t}. \tag{F.5}$$

Real state purchases – endogenous

$$G_{s,t}^e = \bar{G}_s^e + \psi_{G,y}(y_{s,t} - \bar{y}) + \psi_{G,IG}(I_t - \overline{IG}) \tag{F.6}$$

Calvo denominator

$$\mathbf{D}_t = y_t + \xi\mathbb{E}_t[M_{t+1}\mathbf{D}_{t+1}\pi_{t+1}]$$

Calvo numerator

$$\mathbf{C}_t = y_t S_t + \xi\mathbb{E}_t[M_{t+1}\mathbf{C}_{t+1}\pi_{t+1}]$$

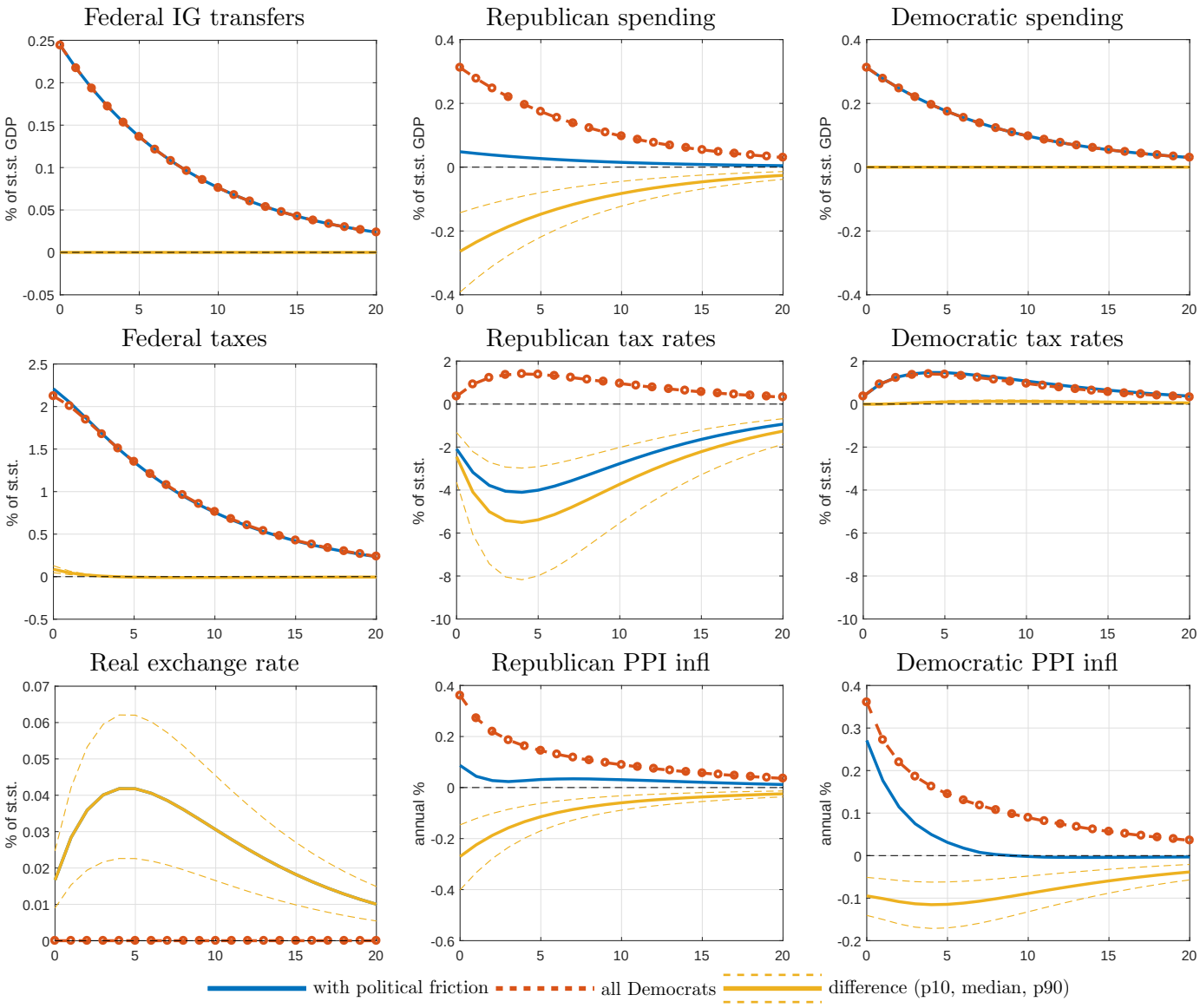


Figure F.15: IRFS: Initial shock, fiscal policy responses, and price effects with state consumption as a substitute

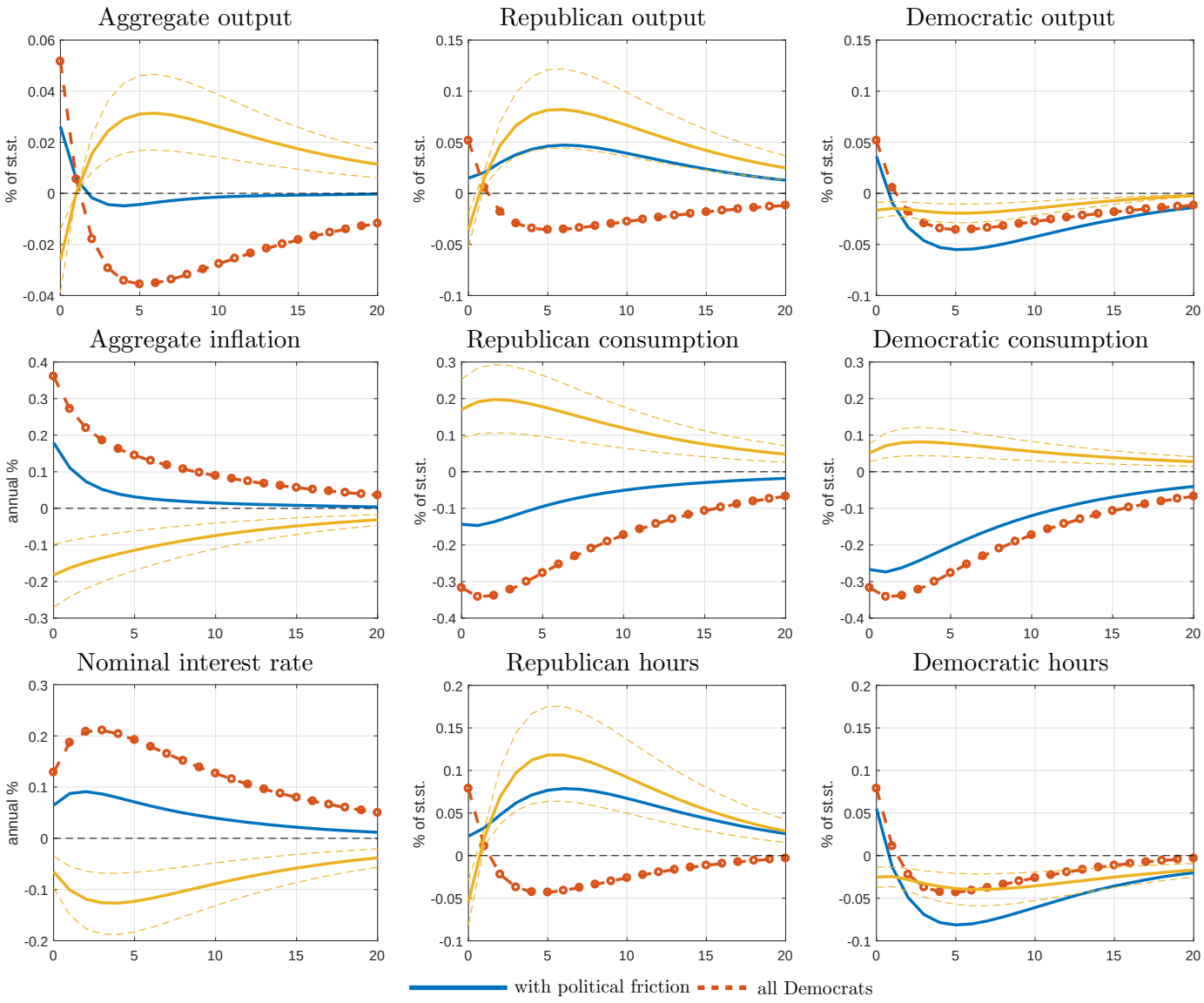


Figure F.16: IRFs: output, consumption, and hours with state consumption as a substitute

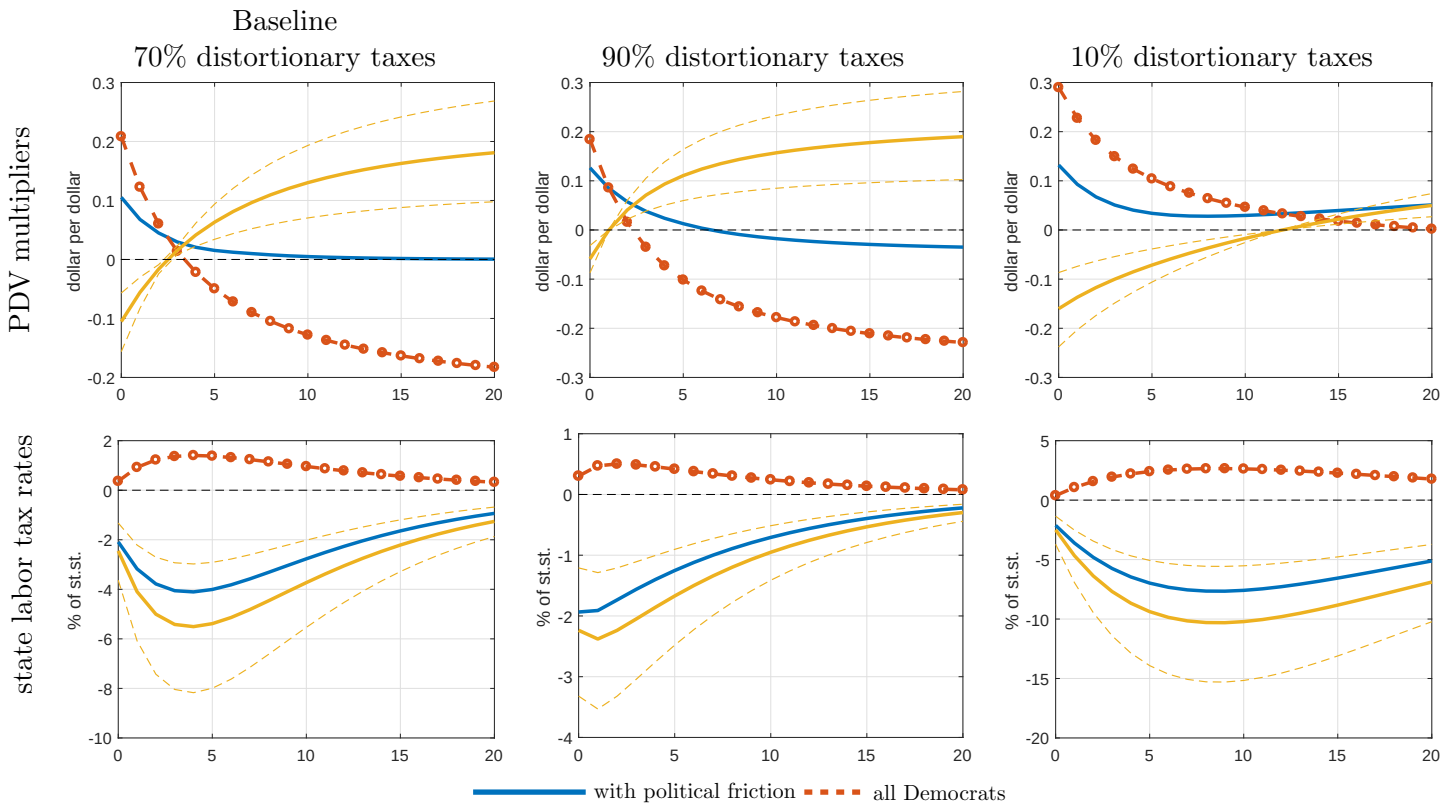


Figure F.17: PDV multipliers and distortionary taxes with state consumption as a substitute

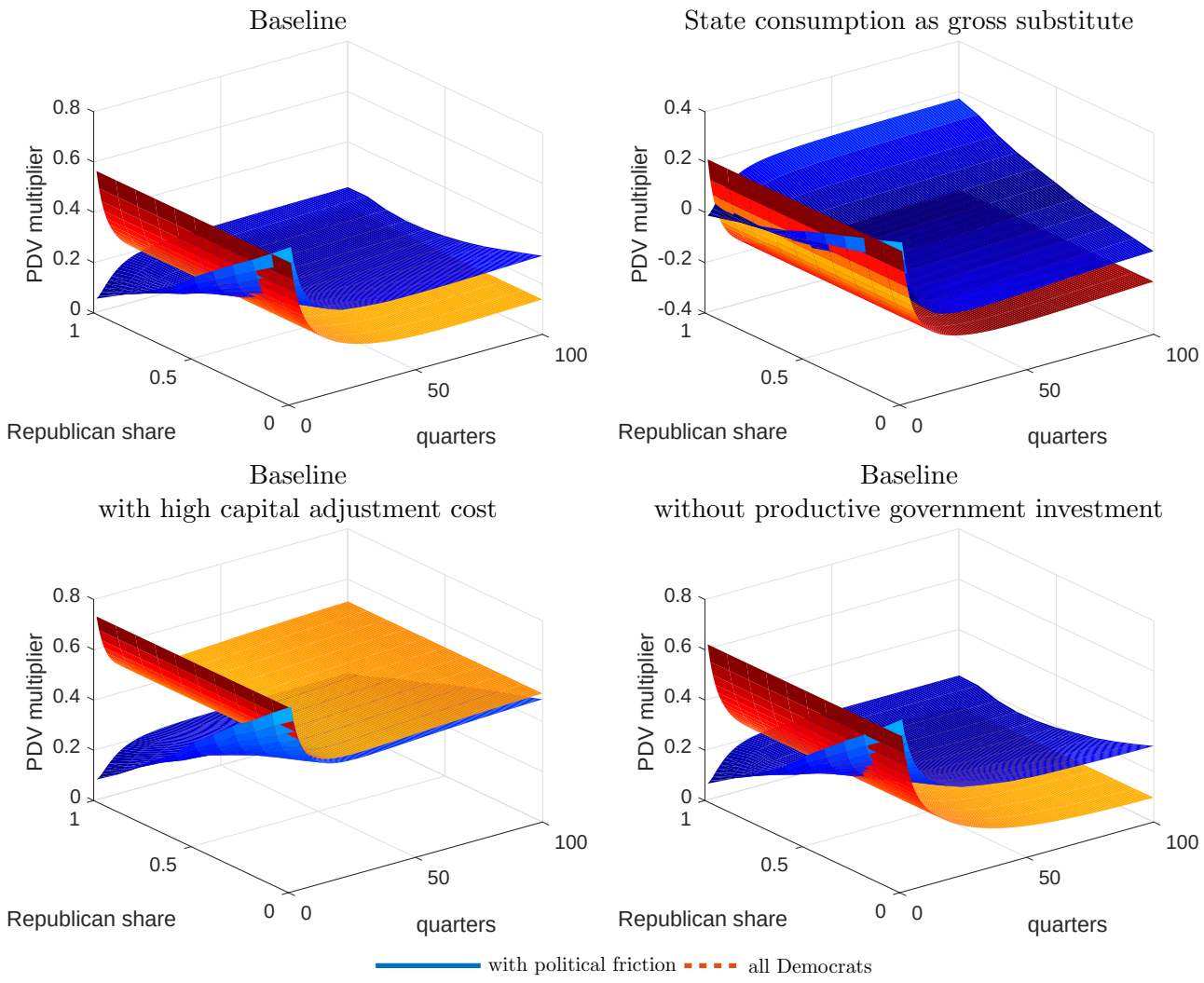


Figure F.18: PDV multipliers over time and as a function of the share of Republican governors: Public consumption as a gross substitute

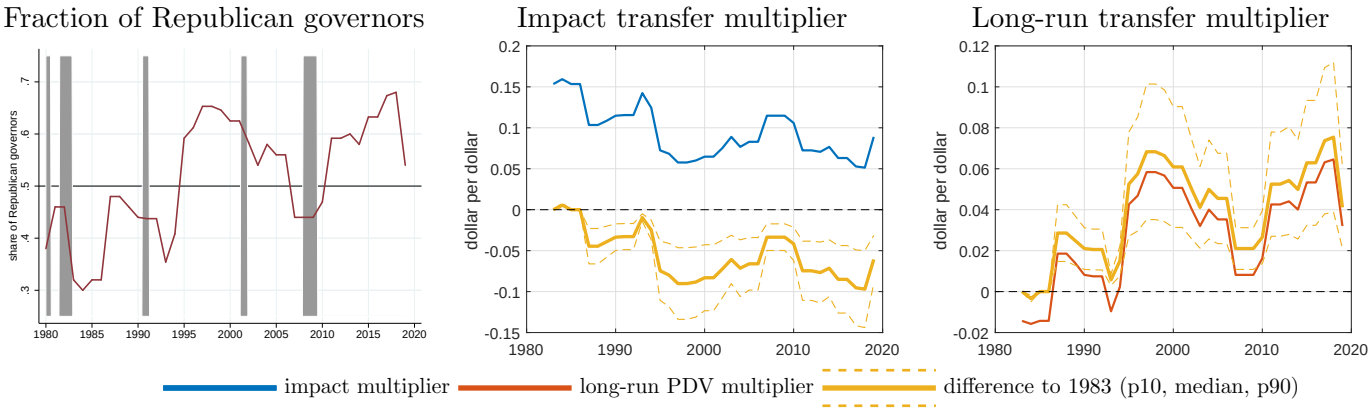
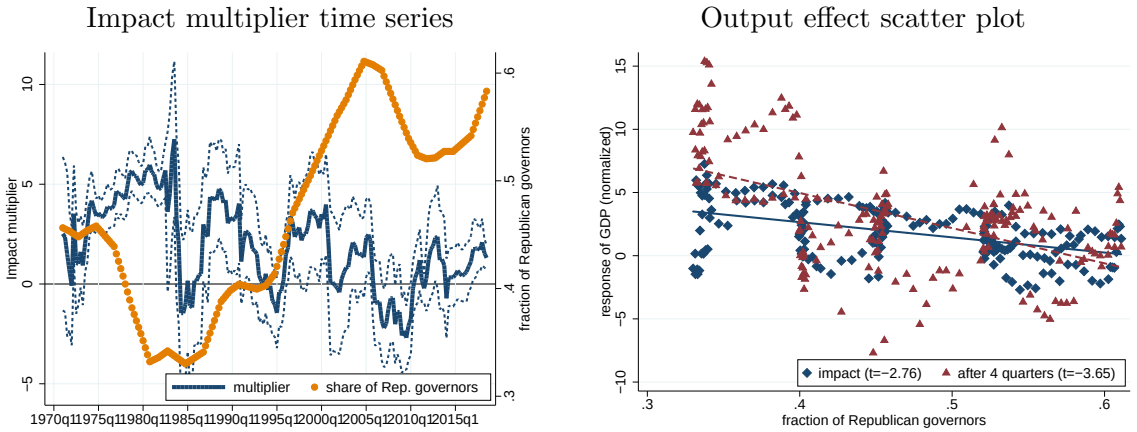


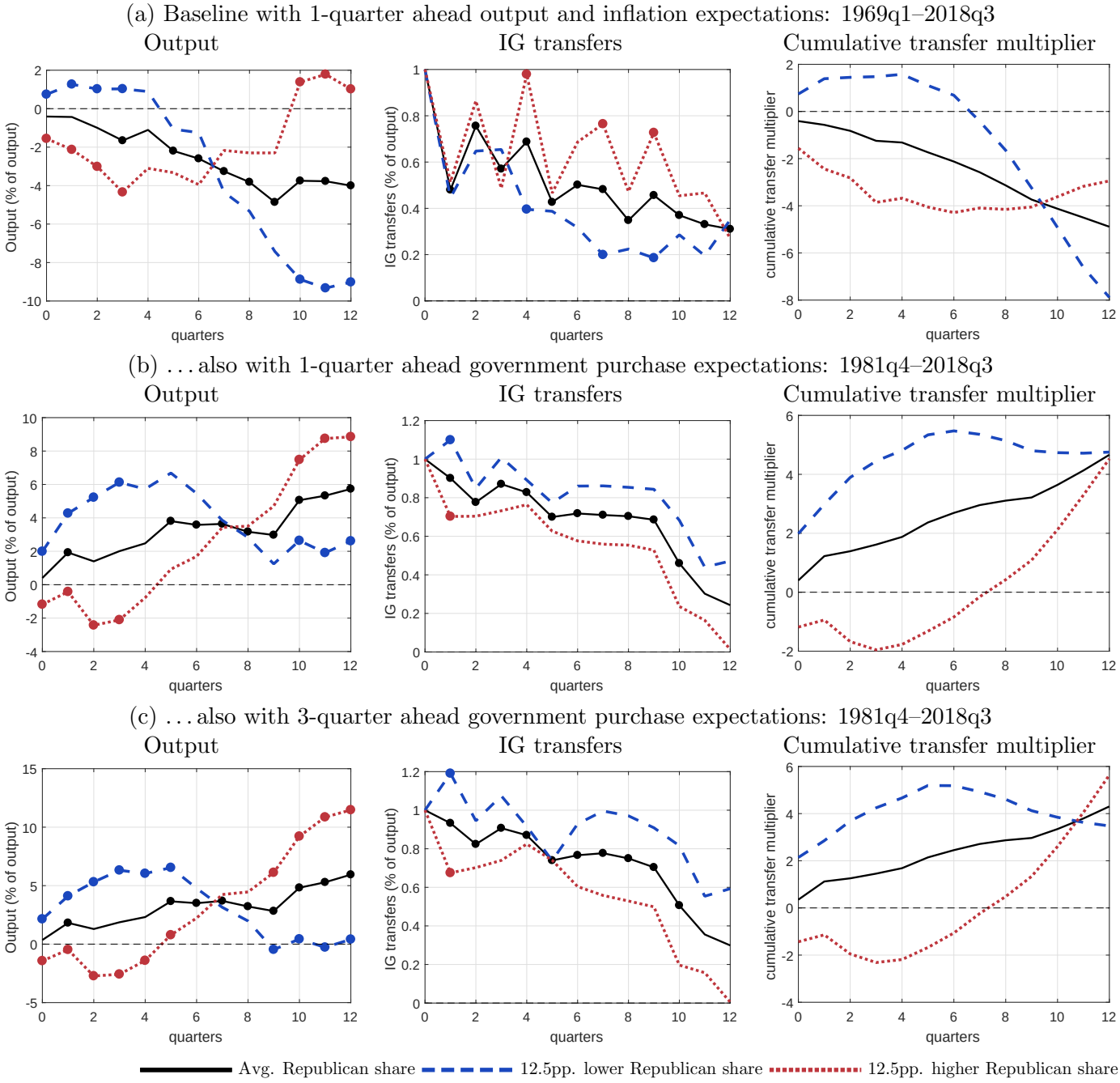
Figure F.19: Party control and transfer multipliers over time: State consumption as a substitute

G Additional time series estimates



Note: Only the impact response has the interpretation of a multiplier; the four-quarter ahead result is the cumulative effect on GDP relative to the impact effect on IG.

Figure G.20: Reduced-form 10-year rolling window output effects of IG transfers and share of Republican governors.



For the output and IG transfer IRF, filled markers denote significance at the 10% level or higher. Inference based on Newey-West heteroskedasticity and autocorrelation robust standard errors with two more lags than the response horizon. For the deviations from the baseline, the markers indicate significant differences from the baseline. For the cumulative multiplier, the figure shows point estimates only. Panel (a) adds the (lagged) one quarter ahead real GDP growth and GDP inflation expectations to the variables in the baseline model in Figure 11. Panel (b) additionally includes the (lagged) one quarter ahead real growth in federal government purchases and in state and local government purchases. Panel (c) also adds the (lagged) three quarter ahead real growth in federal government purchases and in state and local government purchases. In all three cases, we also add the interactions with the lagged share of Republican governors.

Figure G.21: Responses to innovations in intergovernmental transfer: Direct regressions with controls for expectations

Table G.17: Reduced-form output effects of innovations to government spending and share of Republican governors: Direct regression with single lag for various horizons.

(a) Intergovernmental transfers on GDP

	Impact	h=1	h=2	h=3	h=4
Intergov. Transfers (IG)	-0.008	-0.007	-0.023	-0.027	-0.017
	(-0.80)	(-0.42)	(-1.08)	(-1.29)	(-0.71)
Fraction Rep Gov x IG	-0.176**	-0.325*	-0.476**	-0.542**	-0.495*
	(-2.08)	(-1.92)	(-2.50)	(-2.33)	(-1.88)
Fraction Rep Gov.	0.892	1.709	2.745	3.347	4.202
	(1.26)	(1.22)	(1.39)	(1.38)	(1.56)
R-squared	1.00	1.00	1.00	0.99	0.99
Observations	219	218	217	216	215

(b) Intergovernmental transfers on IG transfers

	Impact	h=1	h=2	h=3	h=4
Intergov. Transfers (IG)	1.000	0.532***	0.837***	0.668***	0.806***
		(2.76)	(6.82)	(3.45)	(4.70)
Fraction Rep Gov x IG	0.000	-0.309	0.558	-0.752	1.708
		(-0.38)	(0.84)	(-0.75)	(1.35)
Fraction Rep Gov.	0.000	-2.243	-0.784	-2.445	0.814
		(-0.52)	(-0.12)	(-0.27)	(0.07)
R-squared	1.00	0.99	0.99	0.98	0.97
Observations	219	218	217	216	215

(c) Government purchases on GDP

	Impact	h=1	h=2	h=3	h=4
Gov. purchases (G)	0.153**	0.077	0.105	0.022	0.032
	(2.21)	(0.76)	(0.77)	(0.14)	(0.17)
Fraction Rep Gov x G	-0.365	-0.664	-0.101	0.183	0.625
	(-0.48)	(-0.66)	(-0.08)	(0.14)	(0.42)
Fraction Rep Gov.	0.605	1.390	2.423	3.090	4.009
	(0.81)	(0.98)	(1.22)	(1.28)	(1.47)
R-squared	1.00	1.00	1.00	0.99	0.99
Observations	219	218	217	216	215

(d) Government purchases on purchases

	Impact	h=1	h=2	h=3	h=4
Gov. purchases (G)	1.000	1.039***	1.091***	1.183***	1.306***
		(13.06)	(7.84)	(7.36)	(7.17)
Fraction Rep Gov x G	0.000	-0.097	0.574	1.502	1.257
		(-0.17)	(0.66)	(1.32)	(0.97)
Fraction Rep Gov.	0.000	1.584	3.775**	5.904**	8.036***
		(1.60)	(2.07)	(2.45)	(3.02)
R-squared	1.00	0.99	0.98	0.98	0.97
Observations	219	218	217	216	215

Inference based on Newey-West heteroskedasticity and autocorrelation robust standard errors with six lags. Coefficients on control variables omitted. Standard errors on impact in panels (b) and (d) are not well defined since the equation fits perfectly.