No. 2286

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INTERNATIONAL MACROECONOMICS

Centre for Economic Policy Research

ISSN 0265-8003

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Discussion Paper No. 2286
November 1999

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CEPR Discussion Paper No. 2286

November 1999

ABSTRACT

Output Fluctuations and Fiscal Policy: US State and Local Governments 1978–1994*

What are the cyclical properties of US state and local government fiscal policy? The budget surplus of local and, in particular, state governments is procyclical, smoothing disposable income and consumption of state residents. This happens over both short- and medium-term horizons. Procyclical surpluses are the result of strongly procyclical revenues and weakly procyclical expenditures. The budgets of trust funds and utilities are procyclical. Federal grants are procyclical, exacerbating the cyclical amplitude of state level income movements; although they smooth the idiosyncratic component of shocks to state output. State and local budget surpluses are affected by balanced budget rules at the short- but not at the medium-term horizon. Further, budgets are less procyclical in conservative states.

JEL Classification: E60, H10, H20, H30, H50, H72
Keywords: state and local government fiscal policy, off-budgeting, political business cycles

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*We thank the Armand Hammer Fund for Economic Cooperation in the Middle East, Tel Aviv University, for support, participants at presentations at Brown and Tel Aviv universities and, especially, Robert Inman, for helpful comments, Robert Inman and Stephen Mark for access to their estimates of the liabilities of state pension funds, Donna Hirsch at the US Bureau of the Census for help in understanding the data, Phil Barengolts, Shu-Yi Oei and, in particular, David Tom for outstanding research assistance. The views expressed herein are solely those of the authors and do not necessarily reflect the views of the Federal Reserve Bank of Kansas City, the Federal Reserve System or the Department of Finance Canada.

Submitted 5 September 1999

NON-TECHNICAL SUMMARY

US state and local governments have, in general, been successful in containing deficits in spite of considerable output fluctuations. Many OECD country governments have been less successful and have used deficit spending during recessions but failed to increase government saving during expansions, leading to large debt burdens. US state and local governments have, in general, avoided such behaviour. For instance, in the 1998 fiscal year, 32 US state governments had surpluses exceeding 5% of their budget and at least 25 states increased the size of their reserve funds in 1997 (USA Today, 23 January 1998). Presently, several European governments are striving to maintain deficit and debt levels within the Maastricht treaty criteria for European Monetary Union (EMU) countries. The United States is enjoying a rare budget surplus, but concerns about the long-run fiscal situation linger.

Uncovering the factors that determine the fiscal policy of US state and local governments is an important topic in its own right and can contribute to an understanding of the determinants of national-level fiscal performance. Our goal is to investigate how state and local government fiscal policy differs across states, whether state and local governments exhibit similar fiscal behaviour and whether the US federal government's system of grants to state and local governments has any effect on their fiscal performance. We further explore whether surpluses are lower in election years and whether political attitudes affect fiscal policy.

Countercyclical fiscal behaviour contributes to smoothing the impact of output shocks on income and consumption. By running a larger surplus during upturns, rather than increasing spending or lowering taxes and decreasing the surplus during slumps, fiscal policy smoothes disposable income and (private and public) consumption. Our work sheds light on the extent to which US state and local governments, through their own fiscal policy, complement other mechanisms for smoothing shocks to state output. In most states intertemporal smoothing behaviour is institutionalized in the form of so-called 'rainy day' funds. Such funds are designed to help state governments accumulate buffer stocks of financial wealth in good years and run them down in bad years (In 1994, 44 states had rainy day funds, compared to 25 states in 1985 and 12 states in 1982.).

The income and consumption smoothing of state and local governments entails potentially large welfare gains. We document the extent to which state and local governments smooth output fluctuations through budget surpluses or deficits, but we do not, in this Paper, impose a structural model in order to assess the size of such gains. State and local governments play an important

role in smoothing consumption if some consumers face credit constraints, or extremely high interest rates, when trying to borrow in a recession.

Procyclical behaviour of budget surpluses may, however, be an unintended result of institutional rigidities in tax collecting and budgeting (although tax collection and budgeting practices would eventually be changed if such rigidities caused major departures from the desired consumption path). We therefore carry out the empirical analysis at both the 1- and 3-year frequencies. Since tax rates and spending budgets can be adjusted at the 3-year horizon, we interpret income and consumption smoothing via the budget at this frequency as reflecting a choice on the part of governments. Because our results indicate that the cyclical response of the budget surplus over 3-year horizons typically is a multiple of the response over 1-year horizons, we believe that the pattern of smoothing reflects intentional behaviour on the part of governments rather than institutional rigidities of the fiscal system.

State governments control trust funds (mainly unemployment and pension funds), utilities and liquor stores. The operations of these entities are less conspicuous than other types of activities (being 'off-budget'), so state and local governments are often tempted to shift deficits to these funds. We study this previously unexplored issue empirically, looking at the cyclical patterns of 'off-budgeting', which occur through trust funds, utilities and liquor stores. We find that utility surpluses are procyclical, in particular at the local level and that insurance trust fund surpluses are strongly procyclical.

Political economy considerations are potential determinants of fiscal policy, with state governments behaving opportunistically in election years. If politicians spend as much as they can in election years that occur during expansions (rather than 'save for a rainy day'), the political cycle may contribute to the forming of deficits. We investigate this issue and confirm that fiscal behaviour is indeed not independent of the political process.

Local governments, whose fiscal behaviour has seen little systematic study, may also smooth the income of citizens through procyclical surpluses, although local governments typically do not operate with explicit rainy day funds. For example, New York City authorities have been accumulating large budget surpluses for several years in a row, 'holding on tight to their extra money, saying that they need it for those difficult years that are sure to come' (New York Times, 23 February 1998). It is important to study local government fiscal policy in order to learn whether income and consumption smoothing through fiscal policy at various levels of government offset each other. If so, any welfare gains from procyclical state government surpluses would be nullified by opposite movements in the surpluses of local governments.

It is reasonable to expect that state governments contribute more to income and consumption smoothing through fiscal policy than local governments. Since the taxing power of state governments is much larger than that of local governments (which tend to rely on property taxes) the bond ratings of state governments are likely to be less sensitive to deficits than the corresponding ratings of local governments. Another important reason for studying local government budgets together with state fiscal policy is that local government fiscal policy, to a large extent, is dictated by the state governments who may offload parts of the budget to local governments. This implies that examining state fiscal policy alone may miss an important part of the story. In fact, the 'division of labour' between state governments and local governments is constantly changing. Over the past few years, there have been many shifts in state versus local government responsibilities with large variation among states: a few have taken over responsibility for local courts, some have implemented welfare reform by shifting more responsibility to local governments and most states have been shifting mental health patients from state institutions to community programs. Further, some states – notably Michigan, South Dakota and Wisconsin – increased state taxes in recent years because they were concentrating on reducing local property taxes.

What is the relative contribution of individual budget components to the smoothing of output shocks? We focus on three main components: intergovernmental grants, other revenues and expenditures. In the absence of a procyclical budget surplus, governments would need to raise tax rates or decrease public consumption in recessions. The 'tax-smoothing' literature focuses on optimal tax rates in the presence of exogenous government expenditures, but we make no assumption as to whether taxes or expenditures are exogenous, although one may note that if state and local governments prefer a smooth tax rate, this may lead to procyclical budget surpluses. We do not attempt to separate tax-smoothing motives from other motives for procyclical surpluses. We also do not attempt to separate predictable from unpredictable shocks to output.

A central finding is that, in contrast to national-level fiscal policy, the procyclical surplus at the state and local government level occurs due to strongly procyclical revenues and mildly procyclical expenditures. In this context, it is important to distinguish between state-specific and US-wide output shocks, a distinction that yields interesting findings. For example, we find that federal grants to state and local governments do not smooth the aggregate (US-wide) component of shocks to state output, but smooth the idiosyncratic component of shocks to state output.

1 Introduction

U.S. state and local governments have, in general, been successful in containing deficits in spite of considerable output fluctuations. Many OECD country governments have been less successful, and have used deficit spending during recessions but failed to increase government saving during expansions, leading to large debt burdens. U.S. state and local governments have, in general, avoided such behavior. For instance, in fiscal year 1998, 32 U.S. state governments had surpluses exceeding 5 percent of their budget and at least 25 states increased the size of their reserve funds in 1997.[1] Presently, several European governments are striving to maintain deficit and debt levels within the Maastricht treaty criteria for European Monetary Union (EMU) countries. The United States is enjoying a rare budget surplus, but concerns about the long run fiscal situation lingers. (Auerbach (1994) discusses the sensitivity of the U.S. deficit to, among other things, the growth rate of the economy.)

Uncovering the factors that determine the fiscal policy of U.S. state and local governments is an important topic in its own right, and can contribute to an understanding of the determinants of national-level fiscal performance. Our goal is to investigate how state and local government fiscal policy differs across states, whether state and local governments exhibit similar fiscal behavior, and whether the U.S. federal government's system of grants to state and local governments has any effect on their fiscal performance. We further explore whether surpluses are lower in election years, and whether political attitudes affect fiscal policy.

Poterba and von Hagen (1999) stress the importance of assessing how effective institutions are in shaping fiscal policy. Auerbach (1994), for example, argues that mechanisms designed for deficit reduction failed at the U.S. national level (e.g., due to "off-budgeting" and intertemporal reallocation of expenditure items). By contrast, Eichengreen and Bayoumi (1994), Poterba (1994), and Bohn and Inman (1996) note that a central reason for the superior fiscal discipline of U.S. state-level governments is that many states have adopted balanced-budget rules. These studies focus on the role of institutions and balanced budget

[1] USA Today, January 23rd, 1998.

rules in maintaining long-run fiscal discipline, whereas we investigate their effect on the *cyclical* properties of state and local government fiscal policy.

Countercyclical fiscal behavior contributes to smoothing the impact of output shocks on income and consumption. By running a larger surplus during upturns, rather than increasing spending or lowering taxes, and decreasing the surplus during slumps, fiscal policy smooths disposable income and (private and public) consumption. Our work sheds light on the extent to which U.S. state and local governments, through their own fiscal policy, complement other mechanisms for smoothing shocks to state output.[2] In most states intertemporal smoothing behavior is institutionalized in the form of so-called "rainy day" funds. Such funds are designed to help state governments accumulate buffer stocks of financial wealth in good years and run them down in bad years.[3]

The income and consumption smoothing of state and local governments entails potentially large welfare gains. We document the extent to which state and local governments smooth output fluctuations through budget surpluses or deficits, but we do not, in this paper, impose a structural model in order to assess the size of such gains. State and local governments play an important role in smoothing consumption if some consumers face credit constraints, or extremely high interest rates, when trying to borrow in a recession. (Casual observation surely reveals that non-collateralized consumer loans carry interest rates well in excess of typical interest rates on municipal bonds.)[4]

Procyclical behavior of budget surpluses may, however, be an unintended result of institutional rigidities in tax-collecting and budgeting (although tax collection and budgeting practices would eventually be changed if such rigidities caused major departures from the desired consumption path). We, therefore, carry out the empirical analysis at both the 1- and 3-year frequencies. Since tax rates and spending budgets can be adjusted at the 3-year horizon, we interpret income and consumption smoothing via the budget at this frequency

[2]Mechanisms for smoothing state income and consumption include nation-wide capital markets and the federal government tax-transfer system, as well as borrowing and lending of individuals.

[3]In 1994, 44 states had rainy day funds, compared to 25 states in 1985 and 12 states in 1982. See Holcombe and Sobel (1997).

[4]In the absence of such credit market imperfections, consumers could choose their preferred consumption path without any consumption smoothing role for governmental fiscal policy.

as reflecting a choice on the part of governments. Because our results indicate that the cyclical response of the budget surplus over 3-year horizons typically is a multiple of the response over 1-year horizons, we believe that the patterns of smoothing reflects intentional behavior on the part of governments rather than institutional rigidities of the fiscal system.

State governments control trust funds (mainly unemployment and pension funds), utilities, and liquor stores. The operations of these entities are less conspicuous than other types of activities (being "off-budget"), so state and local governments are often tempted to shift deficits to these funds. For example, New Jersey governor Christine Whitman has on several occasions balanced the state budget through reducing the state government's payment to the state pension funds,[5] whereas Indiana allocated $170 Million of the budget surplus to the teachers' pension fund in the 1998 fiscal year.[6] We study this, previously unexplored, issue empirically, looking at the cyclical patterns of "off-budgeting" which occurs through trust funds, utilities, and liquor stores. We find that utility surpluses are procyclical, in particular at the local level, and that insurance trust fund surpluses are strongly procyclical. These results are broadly consistent with Inman and Mark (1998), who study the determinants of underfunding of U.S. state-level public employee pension plans. In particular, they find (using a different empirical set-up) that the net fiscal obligation of such state-level pension plans is negatively related to the budget surplus of the state government. The common story that emerges is that state governments take advantage of "off-budget" entities, including pension funds, to help smooth the impact of output shocks.

Political economy considerations are potential determinants of fiscal policy, with state governments behaving opportunistically in election years.[7] If politicians spend as much as they can in election years that occur during expansions (rather than "save for a rainy day"), the political cycle may contribute to the forming of deficits. We investigate this issue and confirm that fiscal behavior is indeed not independent of the political process.

Local governments, whose fiscal behavior has seen little systematic study, may also

[5] New York Times, April 22, 1997.

[6] USA Today, January 5, 1998. See also Bunch (1991) and Kiewiet and Szakaly (1996).

[7] See, e.g., Nordhaus (1975), Cukierman and Meltzer (1986), Rogoff (1990), and Alesina and Roubini (1997).

smooth the income of citizens through procyclical surpluses, although local governments typically do not operate with explicit rainy day funds. For example, New York City authorities have been accumulating large budget surpluses for several years in a row, "holding on tight to their extra money, saying that they need it for those difficult years that are sure to come."[8] It is important to study local government fiscal policy in order to learn whether income and consumption smoothing through fiscal policy at various levels of government offset each other. If so, any welfare gains from procyclical state government surpluses would be nullified by opposite movements in the surpluses of local governments.

It is reasonable to expect that state governments contribute more to income and consumption smoothing through fiscal policy than local governments. Since the taxing power of state governments is much larger than that of local governments (which tend to rely on property taxes) the bond ratings of state governments are likely to be less sensitive to deficits than the corresponding ratings of local governments.[9] von Hagen and Eichengreen (1996) explain why central governments may want to limit deficits of sub-central governments. If sub-central governments have less taxing power than central governments then central governments may be under pressure to bail out sub-central governments in a debt crisis. Anticipating this, higher level governments will impose limitations on the borrowing ability of lower level governments. von Hagen and Eichengreen provide empirical evidence that this has significant explanatory power for the incidence of borrowing restrictions. While their study does not compare U.S. state to U.S. local government fiscal policy, their argument may explain why state-level governments impose restrictions on local government borrowing.

Another important reason for studying local government budgets together with state fiscal policy is that local government fiscal policy, to a large extent, is dictated by the state governments who may "off-load" parts of the budget to local governments. This implies that examining state fiscal policy alone may miss an important part of the story. In fact, the "division of labor" between state governments and local governments is constantly changing. Over the past few years, there have been many shifts in state versus local gov-

[8] New York Times, February 23, 1998.

[9] Poterba and Rueben (1999) show that governments running deficits face higher interest rates on debt.

ernment responsibilities with large variation among states: a few states have taken over responsibility for local courts, some have implemented welfare reform by shifting more responsibility to local governments, and most states have been shifting mental health patients from state institutions to community programs. Further, some states—notably Michigan, South Dakota, and Wisconsin—increased state taxes in recent years because they were concentrating on reducing local property taxes.[10]

What is the relative contribution of individual budget components to the smoothing of output shocks? We focus on three main components: intergovernmental grants, other revenues, and expenditures. In the absence of a procyclical budget surplus, governments would need to raise tax-rates or decrease public consumption in recessions. The "tax-smoothing" literature focuses on optimal tax rates in the presence of exogenous government expenditures,[11] but we make no assumption as to whether taxes or expenditures are exogenous, although one may note that if state and local governments prefer a smooth tax rate, this may lead to procyclical budget surpluses. We do not attempt to separate tax smoothing motives from other motives for procyclical surpluses. We also do not attempt to separate predictable from non-predictable shocks to output.

A central finding is that, in contrast to national-level fiscal policy (see Alesina and Roubini (1997, Chapter 7)), the procyclical surplus at the state and local government level occurs due to strongly procyclical revenues and mildly procyclical expenditures. In this context, it is important to distinguish between state-specific and U.S.-wide output shocks, a distinction that yields interesting findings. For example, we find that federal grants to state and local governments "dis-smooth" the aggregate (U.S.-wide) component of shocks to state output, but smooth the idiosyncratic component of shocks to state output.

In the next section we study statistical properties of state and local government fiscal components. In Section 3 we perform the empirical analysis and discuss the results, and we conclude in Section 4.

[10] See State Policy Reports (1998), Vol. 16.

[11] A recent contribution is Cooley and Ohanian (1997), which may be consulted for further references.

2 Data

The data are from *Governmental Finances*, U.S. Bureau of the Census,[12] covering the period 1978-1994.We refer to utilities, insurance trust funds, and liquor stores as UILs. Our sample includes the 48 mainland states.[13] Table 1 displays the average per capita real surplus, revenue, and expenditure of state and local governments and the surplus of UILs for three subperiods.[14] In the rows labeled std1 and std2 we show the average cross-state standard deviation (across the years of the subperiod) and the average time series standard deviation (across states) of each variable. It is immediately apparent from the first row of Table 1 that state and local general surpluses have declined in recent years, and that insurance trust surpluses have been increasing, both for state and local governments, reflecting the rise in pension obligations. Utility surpluses have been roughly constant (and negative, most likely as a result of capital investments) while the surplus of liquor stores has been declining.

To further illustrate the order of magnitude of state and local budget items, Table 2 displays additional information for 1994. In 1994, total (general + UILs) per capita revenues and expenditures of state governments were each on the order of 12–13 percent of per capita gross state product (GSP), with the total surplus (including trusts and UILs) amounting to approximately 1 percent of GSP. The 1994 revenue of state insurance trust funds was about 2 percent of GSP whereas the revenue of local insurance trust funds as a fraction of GSP was negligible. In the same year, the budget size of state-managed utilities was very small as a fraction of GSP, while the expenditure of local government managed utilities was about 1 percent of GSP. For reference, components of the 1994 U.S. federal government budget are displayed in Table 5.

Table 3 displays intergovernmental per capita net transfers from the federal government to state and local governments, and from state to local governments for three subperiods

[12] We also benefitted from estimates of the liabilities of state pension funds kindly provided to us by Robert Inman and Stephen Mark. We provide further details regarding these estimates later.

[13] Alaska relies heavily on severance taxes and exhibits a huge standard variation in several fiscal components as a result of variability in oil prices. Hawaii has a very particular institutional structure.

[14] In *Governmental Finances*, the accounts of utilities, liquor stores, and insurance trust activities are displayed separately.

and as a percent of GSP in 1994. We see that federal transfers to state governments have been increasing, federal transfers to local governments have been declining, and state government transfers to local governments have been increasing. On net, transfers to local governments have been relatively constant over time. In Table 4, linear time trends of the various variables are reported.

3 Estimation and Results

3.1 Cyclical Properties of Budget Surpluses

For fiscal policy to smooth the impact of output shocks, governments must run a larger surplus (or a smaller deficit) in good times than in bad times. The simplest manner in which to capture this empirically is through the correlation of the budget surplus with output shocks. If state and local governments use the budget to smooth income and (private and public) consumption, we should expect this correlation to be positive. Since the budget surplus (i.e., state and local government savings) is stationary while gross state product is not, we focus on the covariance of the per capita budget surplus with first differences of GSP.[15]

To compare the cyclical properties of the surplus across subperiods and subgroups of states, we normalize this covariance by the variance of GSP. Thus, our measure of smoothing through the budget surplus is

$$\beta_{\mathrm{S}} = \frac{\mathrm{Cov}\left(\mathrm{S}_{it}, \Delta \mathrm{GSP}_{it}\right)}{\mathrm{Var}\, \Delta \mathrm{GSP}_{it}}, \tag{1}$$

which is the coefficient in the regression of the budget surplus, S_{it}, on $\Delta \mathrm{GSP}_{it}$. It is interpreted as the response (in dollars) of the surplus to a one dollar change in state output. We allow for state-specific intercepts, so (since the GSP data are differenced) we are in fact

[15] We performed Dickey-Fuller tests for unit roots in gross state product and could never reject unit roots, but the tests have extremely low power due to the relatively short data series. Since aggregate (longer) time series of output behave like unit root or near unit root processes, we used the GSP series in first-differenced form in order to avoid potentially spurious inferences. We also based our judgment on visual inspection of the series, but we do not claim to provide any serious evidence as to whether these series ultimately are stationary or not. Dickey-Fuller tests easily reject unit roots in the budget surplus series.

estimating the effect on the surplus of deviations from state-specific trends. We run all the regressions with and without time-fixed effects. In regressions with time-fixed effects (time dummies), aggregate output fluctuations are controlled for so β_{S} is interpreted as the response of the surplus to a 100 dollar change in idiosyncratic state output.[16]

For better exposition, we multiply the coefficient in (1) by 100, which is then interpreted as the response of the budget surplus to a 100 dollar change in output. We do not claim that the regression (1) fully captures the dynamics in the data (it clearly does not), so in order to obtain valid standard errors we correct for autocorrelation in the residuals using a standard two-step Prais-Whinston procedure.

Tables 6 displays the amount of smoothing achieved through state and local total (including UILs) budget surpluses, with and without time-fixed effects. The numbers in columns with the heading $k = 1$ are obtained by regressing the current budget surplus on 1-year differenced GSP. The numbers displayed in columns with the heading $k = 3$ are obtained by regressing the total budget surplus over 3 years on 3-year differenced GSP. To obtain an annualized measure of smoothing, these numbers should be divided by three. For comparison, we also report estimates of the (time series) regression coefficient $\mathrm{Cov}\left(\mathrm{S}_t, \Delta\mathrm{GDP}_t\right)/\mathrm{Var}\,\Delta\mathrm{GDP}_t$ for the U.S. federal government, where S_t is the year t federal budget surplus and GDP_t is U.S. gross domestic product in year t.

From the estimated coefficients of the regressions without time-fixed effects, we learn that the surpluses of state and local governments are strongly and significantly procyclical, especially at the 3-year frequency.[17] Interpreting the magnitude of the coefficients, if the change in per capita state output over a 3-year period is 100 dollar below average, our estimates imply that per capita state and local government surpluses are 8.62 dollar and 2.57 dollar, respectively, below average. Asdrubali, Sørensen, and Yosha (1996) find that about half of idiosyncratic output shocks are diversified away through capital markets, and Zeldes (1989) finds that about one fifth of consumers are credit-rationed. None of these

[16] The empirical model (with time-fixed effects) can be written as $\mathrm{S}_{it} = \alpha_i + \gamma_t + \beta_{\mathrm{S}}\Delta\mathrm{GSP}_{it} + \epsilon_{it}$, where α_i are (cross-sectional) state-fixed effects. The time-fixed effects, γ_t, control for *any* aggregate time variation, e.g. in macroeconomic variables such as U.S.-wide GDP or monetary policy.

[17] Eichengreen and Bayoumi (1994) report that local government surpluses are not correlated with state output at the quarterly frequency. Their (dynamic) specification is somewhat different from ours.

numbers are directly comparable to ours, but the general impression is that state and local governments buffer a significant fraction of the income variance that is not diversified away on capital markets and is not smoothed by (potentially credit-constrained) consumers.

The results with time-fixed effects are similar and suggest that state and local governments do not respond differently to idiosyncratic and aggregate output shocks. By contrast, the federal government budget surplus is countercyclical, dis-smoothing shocks to output (although the coefficients are not significantly different from zero).[18]

3.2 Cyclical Properties of Budget Components

The year t budget surplus of state i's government can be broken down as follows,

$$\text{S}_{it} = \text{GRANTS}_{it} + \text{OWNREV}_{it} - \text{EXP}_{it} \ , \tag{2}$$

where GRANTS are federal grants,[19] OWNREV is the revenue of the state government raised within state (total tax revenue, including fees, excluding federal grants), and EXP is the total expenditures of the state government. An analogous breakdown holds for local governments with GRANTS representing federal grants plus state government grants.

We study the cyclical behavior of these major budget components, and their contribution to income and consumption smoothing. Intergovernmental grants are studied here since they are part of the state and local government budgets and potentially affect the cyclical behavior of deficits and surpluses.

While state government budget surpluses behave like stationary time series, the components of the surplus in equation (2) behave like unit root processes. We, therefore, analyze the comovement of the first difference of each component with the first difference of GSP,

[18] This result should not be confused with the federally-provided income smoothing of *idiosyncratic* shocks to state output through the federal tax-transfer system, as studied by, e.g., Sala-i-Martin and Sachs (1992), von Hagen (1992), and Asdrubali, Sørensen, and Yosha (1996).

[19] More precisely, we use net federal grants calculated as state government revenue from the federal government minus federal revenue from the state government.

namely, we calculate the following regression coefficients:

$$\beta_{\mathrm{G}} = \frac{\mathrm{Cov}\left(\Delta \mathrm{GRANTS}_{it}, \Delta \mathrm{GSP}_{it}\right)}{\mathrm{Var}\, \Delta \mathrm{GSP}_{it}}, \tag{3}$$

$$\beta_{\mathrm{R}} = \frac{\mathrm{Cov}\left(\Delta \mathrm{OWNREV}_{it}, \Delta \mathrm{GSP}_{it}\right)}{\mathrm{Var}\, \Delta \mathrm{GSP}_{it}}, \tag{4}$$

$$\beta_{\mathrm{E}} = \frac{\mathrm{Cov}\left(\Delta \mathrm{EXP}_{it}, \Delta \mathrm{GSP}_{it}\right)}{\mathrm{Var}\, \Delta \mathrm{GSP}_{it}}, \tag{5}$$

controlling for cross-sectional fixed effects. Since federal grants are a source of revenue not raised from the residents of the state, an increase in grants received, for a given expenditure and budget surplus, allows the state government to tax the residents of the state by a smaller amount. Thus, federal grants smooth income in a state if they vary negatively with gross state output, that is, if $\beta_{\mathrm{G}} < 0$. State government revenue raised within state smoothes the income of the residents of a state if it varies positively with gross state output, namely, if $\beta_{\mathrm{R}} > 0$. State government expenditures smooth consumption in a state if they vary negatively with gross state product, $\beta_{\mathrm{E}} < 0$, i.e., if the state government provides less public consumption (or transfers) in good times.

Table 7 displays these regression coefficients (multiplied by 100), with and without time-fixed effects.[20] It is readily apparent from the two panels that the major factor driving smoothing via the budget is state government revenue raised within state. It is strongly procyclical, which is not surprising since many taxes are proportional to income and the personal income tax is typically progressive.

State expenditures are positively correlated with GSP, dis-smoothing consumption. A possible explanation is that government consumption behaves according to the "Permanent Income Hypothesis" with government consumption responding positively to persistent positive shocks to output that reflect a long-lasting increase in output. A second explanation is that the federal government legislature imposes higher expenditures on state governments

[20]The amounts of smoothing provided by the three budget components do not exactly add up to the amount of smoothing through the total surplus reported in Table 6 since the left-hand side variables in the regressions of Table 7 are first-differenced while the left-hand side variables (the budget surpluses) in the regressions of Table 6 are not.

in business cycle upturns (e.g., more generous health care benefits or better schooling services that the state must provide). A pertinent example is the present tax increases in many states caused by state court orders to equalize school finance.[21] (Of course, it may be coincidental that such court orders occur in the present major economic upturn, but then again, it may not.) A third potential explanation is that the procyclicality of expenditures is driven mainly by capital expenditure. Some parts of capital expenditures are better regarded as investment (i.e., saving) rather than consumption: for example, necessary spending on the maintenance of highway and school structures. In that case, the procyclicality of capital expenditures is interpreted as smoothing consumption (state governments save more in good years). In the next sub-section we demonstrate that capital spending *is* procyclical, but it is not the main underlying source of procyclical state government expenditures.

When time-fixed effects are not included, federal grants dis-smooth output shocks, i.e., federal grants increase with state output, increasing the resources available to the state government in good times and decreasing them in bad times (other things being equal, of course). Since many grants are "progressive," in the sense that they are directly tied to the level of poverty within a state (Medicaid, in particular), an opposite result might have been expected. Our interpretation of the dis-smoothing result is that the federal government distributes more generous grants during U.S.-wide upturns, an effect that dominates the insurance properties of the federal grant system.

When we control for U.S.-wide effects by allowing for time-fixed effects—see the lower panel of Table 7—we find that federal grants indeed smooth consumption in response to idiosyncratic output shocks. The effect is rather small, since federal grants typically constitute no more than 25 percent of total state government revenues.[22]

In Table 8 we display the cyclical behavior of the components of local government budget surpluses: federal grants, state government grants, own revenue, and expenditures. The

[21] State Budget & Tax News, April 3, 1998.

[22] Inman and Mark (1998) find that the change in underfunding (the current actuarial "deficit") of state employee pension funds varies positively with federal grants to state governments, although the reported coefficient is not statistically significant. It may be that federal grants respond to state government fiscal performance (states with higher deficits obtain larger grants) or, alternatively, that state government fiscal policy responds to federal grants (e.g., larger grants encourage spending).

results are somewhat similar to those in the previous table. When time-fixed effects are not included, federal and state grants are positively correlated with output, dis-smoothing output shocks. Own revenues smooth output fluctuations, but to a much smaller extent than state government revenues, probably because local government taxes are less directly tied to income. Local government expenditures are procyclical and the regression coefficients are of the same order of magnitude as those for state government expenditures displayed in the previous table.

Controlling for U.S.-wide fluctuations by including time-fixed effects—see the lower panel of Table 8—we find that federal grants to local governments are slightly (although not significantly) countercyclical. State government grants to local governments are no longer significant at the 1-year horizon, although we still see significant procyclical movements in state government grants to local governments at the 3-year horizon. Local government revenues and expenditures do not vary significantly with output at the 1-year frequency, but both components are procyclical at the 3-year frequency.

All in all, it is clear that the major part of income smoothing by the state and local government sector in the United States is accomplished via procyclical state government own revenues, namely, state government tax revenue increases during upturns and decreases during slumps.

This behavior stands in sharp contrast to results reported in Alesina and Roubini (1997), Chapter 7. For a sample of eighteen OECD countries, for the period 1963–1993, they estimate a pooled cross-section time-series regression, where the dependent variable is the national-level government budget deficit (measured as the change in the debt-to-GDP ratio). They report a negative and highly significant coefficient for the change in the GDP growth rate, namely, in periods of high growth national governments reduce the surplus. They run similar regressions with the ratios of government expenditures and tax revenues to GDP as dependent variables (see Tables 7.7 and 7.8 in their book), finding that both spending and tax revenues decrease in low growth years. A detailed comparison of the cyclical patterns of U.S. state and local government fiscal policy versus that of OECD national government fiscal policy is beyond the scope of this study, but the different observed patterns of behavior

call for a systematic analysis of regional- and municipal-level fiscal policy, with potential lessons for national-level governments.

3.3 Capital Outlays over the Business Cycle

In Tables 7 and 8 we reported the amount of smoothing achieved through state and local government expenditures. In those calculations we implicitly regarded all expenditures, including capital outlays, as consumption expenditures or transfers. Many capital outlays, however, are a form of saving and if they vary procyclically, they smooth consumption. Thus they are unlike consumption expenditures or transfers that smooth consumption if they vary countercyclically. Of course, certain capital expenditures should be regarded as consumption (e.g., a more lavish mansion for the governor), but we cannot quantify which capital expenditures constitute "necessary" investment. In any event, the saving aspect of capital expenditures implies that the dis-smoothing effect of expenditures reported in Tables 7 and 8 may be overstated, an issue we address shortly.

In Table 9 we display results confirming that capital outlays of both state and local governments are procyclical. (We only display results for regressions without time-fixed effects when the results for regressions including time-fixed effects are similar, in this and subsequent tables.) For state governments we can break down capital outlays into construction outlays and land and equipment outlays. At the 1-year horizon, equipment outlays are somewhat more procyclical than construction outlays, but at the 3-year horizon construction outlays are considerably more procyclical. A natural interpretation is that state governments quickly adjust expenditure on equipment, whereas construction projects (e.g., highways) are not quickly reversed. Over longer horizons, expenditures on construction projects are adjusted and, therefore, follow output fluctuations more closely.

Since the estimates of smoothing through capital outlays are statistically significant, the estimates of the dis-smoothing effect of state and local government expenditures reported in the third column of Tables 7 and 8 are indeed likely to be overstated. However, the point estimates in Table 9—smoothing via capital outlays—are considerably smaller than the corresponding point estimates of dis-smoothing via government expenditures (especially at

the local level). Therefore, controlling for smoothing through capital outlays does not alter the qualitative conclusions regarding the dis-smoothing effect of state and local government expenditures.

3.4 Using "Off-Budget" Accounts to Smooth Output Shocks

In Table 10, we show the behavior of utility, trust fund, and liquor store budgets over the business cycle.[23] Liquor stores provide no smoothing—they even provide significant dis-smoothing at the 3-year frequency—which may reflect a countercyclical demand for liquor, i.e., people may buy more alcoholic beverages during slumps. Since the amount of dis-smoothing is tiny, reflecting the fact that liquor store revenue is a small and declining fraction of state and local government revenue, we will not pursue the issue further. Utilities provide some smoothing, in particular at the local level. (This is not surprising as they are mainly managed by local governments.) The amount of smoothing is significant at the 3-year horizon and almost so at the 1-year horizon for local governments. "Off-budget" smoothing is most clearly evident from the procyclicality of insurance trust fund surpluses, which provide a substantial amount of smoothing at the state level. (The coefficients are small at the local level since trust funds are mainly state government managed.) All in all, the evidence suggests that state and local governments systematically use "off-budget" accounts to smooth output shocks.

The results for insurance trust surpluses are broadly consistent with Inman and Mark (1998). They study in great detail the time-series characteristics, as well as the economic and political economy determinants, of underfunding of U.S. state-level public employee pension plans. Controlling for several relevant variables, they regress the change in underfunding (the current actuarial "deficit") of the funds on shocks to the (personal per capita) income of the state and on shocks to the budget surplus of the state government. The coefficients of both regressors are negative (significantly so for the latter regressor), suggesting that state governments improve the actuarial position of their pension funds in

[23] In virtually all states, balanced budget rules apply to the general fund, and in many states the rules also apply to other budget accounts such as the capital fund, or the federal funds account. See NASBO (1992) and Bohn and Inman (1996) for details.

"good years" but not in "bad years."

3.5 Insurance Trust Funds: A Closer Look

State governments are subject to restrictions on their ability to manipulate trust fund budgets. For example, from 1992 to 1994 California governor Pete Wilson withheld about $700 million in pension plan contributions. However, this diversion was declared unconstitutional in court and the state government was ordered to repay.[24] This anecdote clearly illustrates how big the temptation is for politicians to use pension funds to alleviate revenue shortfalls, even in the face of possible court reversals, a phenomenon that is consistent with our finding of statistically significant procyclical trust fund surpluses. We, therefore, pursue this issue in greater detail.

Unemployment insurance funds versus pension and other trust funds

The estimates of smoothing through insurance trust funds reported in Table 10 are based on a broad definition of state (and local) government-managed trust funds that includes unemployment insurance funds. Since state unemployment insurance trust funds are managed by the Treasury, and since there is federal legislation regarding minimum contributions and defining benefits, it would also make sense to regard unemployment contributions and benefits as part of the federal (rather than the state-level) tax-transfer system. The results in Table 10 may, thus, confound the smoothing role of the state and the federal levels of government.

On the other hand, there are good arguments for regarding unemployment insurance as a state-level institution, the main argument being that many states contribute beyond the minimum requirement imposed by the federal authorities. Rather than taking a stand on this issue, we decompose the trust fund surpluses to surpluses of unemployment insurance funds and of other (including pension) funds, and measure the amount of smoothing provided by each class of funds. The results, displayed in the top panel of Table 11, indicate that both types of funds smooth output shocks significantly at both differencing

[24] Forbes, June 5, 1995.

frequencies.[25]

Pension Fund Assets and Liabilities: Is there Buffer Stock Savings Behavior?

So far we concentrated on the behavior of trust fund surpluses—a flow measure of the excess of current receipts over current expenses—in response to output shocks. It is also of interest to study the response of the stock of the assets managed by these funds to output shocks. For example, acyclical behavior of the stock of assets suggests that funds distribute more benefits (or raise less revenues) during booms, and vice versa during recessions, in order to maintain a constant stock of assets over the cycle. Procyclical behavior of assets means that funds accumulate a buffer stock of savings during booms to be run down during recessions. The more interesting variable to look at may be assets net of discounted future pension liabilities, since this amount of "over-funding" is in principle the correct measure of the net saving of a pension fund. Since over-funding is difficult to estimate, we report the amount of smoothing using different measures of trust fund saving.

For pension funds we use the variable ASSETS_{it}, financial assets of state pension funds (the major subset of the trust funds considered above), and the variable NETASSETS_{it}, the financial assets of the funds net of future pension liabilities. These variables were estimated following the econometric approach described in Inman (1986), and constructed by Robert Inman and Stephen Mark (1998).[26] In the bottom panel of Table 11 we display the regression coefficients, $\text{Cov}\left(\Delta\,\text{ASSETS}_{it}, \Delta\text{GSP}_{it}\right) / \text{Var}\,\Delta\text{GSP}_{it}$ and $\text{Cov}\left(\text{NETASSETS}_{it}, \Delta\text{GSP}_{it}\right) / \text{Var}\,\Delta\text{GSP}_{it}$.[27] A positive regression coefficient is interpreted as buffer stock accumulation of assets. The results indicate a clear and strong buffer stock savings behavior at the 3-year horizon for

[25] Since the pension and other trust fund surplus series look non-stationary, the results in the second column are calculated by regressing first-differenced surplus series on the first-differenced GSP series. Therefore, adding the amount of smoothing provided by both types of funds (e.g., 0.39 and 0.18 for $k = 1$) does not exactly yield the corresponding number reported in Table 10 (0.72 for $k = 1$). Inman and Mark (1998) study the time series properties of the actuarial underfunding of state-level public employee pension plans, concluding that underfunding is a mean-reverting process. As is well known, unit root tests typically have low power, so it is hard to determine what exactly lies behind the different conclusion we reach regarding the time-series properties of the trust fund surplus. It may well be that the *actuarial* surplus, as calculated by Inman and Mark, is stationary, while the simple "pay-as-you-go" surplus is not.

[26] We are grateful to Inman and Mark for providing us their estimates of pension fund assets adjusted for the present value of accumulated pension liabilities.

[27] The series NETASSETS_{it} look stationary, while the series ASSETS_{it} do not. Therefore, ASSETS_{it} is first-differenced whereas NETASSETS_{it} is not.

both series, and a significant buffer stock behavior at the 1-year horizon for the series ASSETS_{it}.

We repeated the regressions allowing for time-fixed effects to examine if the results might be driven by U.S.-wide procyclical capital gains of pension funds (driven by a general increase in asset prices). These regressions (not reported) resulted in somewhat smaller coefficients for the buffering by assets alone, but the effect of net assets was very similar.

3.6 The Role of Institutions

Balanced budget rules

We turn to the relation between smoothing output shocks through surpluses and deficits, and balanced budget rules. We divide the sample according to the index of balanced budget stringency suggested in ACIR (1987) that ranks states on a scale of 0 to 10 (where 0 is the "least stringent"). There are 13 states with an index of 6 or lower, while the rest have an index of 8 or higher. We use 7 as our cut-off point.[28] The results are displayed in Table 12. At the 1-year differencing frequency we find that states with more stringent budget rules achieve less smoothing via the budget: the P-values of the test statistic of the null hypothesis that there is no difference between the amount of smoothing in the two groups are 0.07 for the total surplus and 0.05 for the general surplus, confirming the general perception that fiscal discipline comes with a cost in the form of a reduced ability to smooth output shocks. (A similar result was found by Eichengreen and Bayoumi (1994).) The point estimates for 3-year differencing and for local government surpluses are consistent with the above results, but the order of magnitude of the smoothing across low and high stringency groups is the same. Since the smoothing behavior is only affected at short horizons, the welfare costs of stringent budget rules are likely to be minor.[29]

[28] The median state is not a good cut-off point for the sample since more than 25 states have an index of 10 (highly stringent balanced budget rules).

[29] Robert Inman pointed out to us that since balanced budget rules are effective only over short horizons, a superior mechanism for a achieving smoothing without running deficits is to maintain (by decree) a permanent surplus around which smoothing can take place. A back of the envelope calculation suggests that the cost of such a policy is not prohibitive. In this paper, we do not pursue this interesting point further, but it is certainly worth more careful scrutiny, perhaps with the aid of a more "structural" model.

Our point estimates also suggest that local governments emulate the behavior of state governments; namely, that local government fiscal policy is not entirely independent of state government fiscal policy. This can be interpreted as state governments off-loading part of the burden of smoothing output shocks to local governments. To the extent that local government fiscal policy is the result of actual choices by local governments, one may further conjecture that the correlation with state government behavior reflects a general level of "fiscal conservatism" in states with more stringent rules, but a detailed study of these interesting issues is left for future exploration.

Historical debt levels

Governments with a high level of debt may be more constrained in their ability to smooth shocks. Alternatively, governments which are more prone to deficit smoothing may build up higher debt. To explore if there is a relation between debt levels and smoothing behavior, we split the sample of states according to their 1978 per capita levels of state government net long-term debt.

Table 13 indicates that states with higher levels of debt achieve more smoothing. This is true for the total and, in particular, the general surplus, for both 1-year differencing and 3-year differencing. It is therefore likely that relatively high debt levels are a result of deficit smoothing, and that these debt levels are moderate enough to not interfere with the ability of governments to use the budget as a tool for smoothing consumption.[30]

It is conceivable that low historical long-term debt levels proxy for credit market imperfections with poor states being more credit constrained. To explore this issue, we split the states according to wealth (per capita state output) and according to output growth, and find (details not reported) that neither is correlated with the amount of smoothing achieved through state government fiscal policy. That is, historical debt levels do not simply proxy for credit market imperfections. Our favored interpretation is that a general "fiscally conservative" attitude in some states manifests itself in both low debt and little

[30]For OECD contries, Arreaza, Sørensen, and Yosha (1999) find little correlation between the average size of the deficit and the amount of deficit smoothing.

cyclical smoothing.

We repeated the test of the effect of long-term debt on the amount of smoothing for local governments, using 1978 gross long-term debt[31] as the criterion for splitting the sample. We found no significant effect of debt levels on the cyclicality of the budget surplus at the local level. (Results not reported.)

Disentangling the effect of balanced budget rules and of historical debt levels

Conceptually, the stringency of balanced budget rules is not independent of the level of long-term debt. Stringent budget rules may affect the debt level in a state directly by limiting the size of the deficit that the government can run, or may simply be correlated with debt levels, with both reflecting underlying attitudes to fiscal policy. Recalling that a high stringency index is associated with less smoothing through the budget (Table 12), and that a low historical debt level is also associated with low smoothing through the budget at the state level (Table 13), it is natural to ask whether these effects are one and the same.

In order to provide some evidence on this question we go beyond the simple univariate regressions employed so far. First, we estimate the amount of smoothing through the total state budget achieved by the government of state i using the following time-series regression coefficient:

$$\hat{\beta}_i = 100 * \frac{\mathrm{Cov}\left(\mathrm{S}_{it}, \Delta \mathrm{GSP}_{it}\right)}{\mathrm{Var}\, \Delta \mathrm{GSP}_{it}} . \tag{6}$$

The coefficients for the individual states are estimated imprecisely, being based on short samples of time-series, but each estimate is unbiased and we can therefore perform a cross-sectional multivariate regression of the form

$$\hat{\beta}_i = \alpha_0 + \alpha_1 \log \mathrm{GSP}_i + \alpha_2 \log \mathrm{LTDS}_{i,t_0} + \alpha_3 \, \mathrm{INDEX}_i + \varepsilon_i \ , \tag{7}$$

where GSP_i is the average of GSP_{it} over the sample years, LTDS_{i,t_0} is the level of long-term debt in 1978 (the first year of the sample) of state i's government, and INDEX_i is the balanced

[31] Offsets to gross local debt are not available for 1978. Using 1984 net local debt levels for sample splitting made little difference to the results.

budget stringency index for state i. The regression estimates the marginal impact of each right-hand side variable on the amount of smoothing through the state government budget. We include the level of output as a regressor since a high level of wealth may itself facilitate income or consumption smoothing, and a state's debt level need not be independent of the wealth of the state. By including both the debt level and the stringency index we can evaluate the marginal impact of each when the other is controlled for.

The results, shown in Table 14, indicate that the historical debt level is positively related to smoothing, with the coefficient being significant at the 5 percent level at the 1-year frequency and weakly significant at the 3-year frequency, while the effect of the stringency of balanced budget rules is negative (as in the univariate regressions reported in Table 12) but not statistically significant.

These results are similar to the results obtained from splitting the sample: there we found a borderline significant impact of balanced budget rules at the 1-year horizon and a strong correlation with historical long-term debt (cf. the P-values in Tables 12 and 13). The t-statistics in the multivariate regression are lower, reflecting the small sample, but the qualitative conclusions are similar, indicating that our previous univariate regressions are sound.[32]

Type of taxes more heavily used

U.S. states differ in the mix of tax instruments used by state (and local) governments.[33] We restrict attention to state personal income taxes, state general sales and gross receipts taxes, state severance taxes, and local property taxes. Except for severance taxes, these tax categories generally constitute more than 10 percent of total tax revenue. Seventeen states (not including Alaska and Hawaii, which are not included in our sample) do not have severance taxes. Severance taxes are typically small but they are important for states with large amounts of mining or oil extraction. We leave out the corporate income tax which is

[32] As a further check for collinearity, we find that the (simple) correlation of the balanced budget stringency index and state government long-term debt is -0.34. This low value further supports the validity of the sample splitting methodology.

[33] See Feenberg and Rosen (1986) for a comprehensive study of this issue.

relatively small for all states.

The tax revenue of state governments that rely on certain types of taxes may be more sensitive to output shocks. A pertinent example is oil states that rely heavily on severance taxes. The reliance on certain types of taxes may be a consequence of a particular attitude towards the use of fiscal policy to smooth shocks. For example, do states such as New Hampshire, that ideologically oppose personal income taxes, also oppose "fiscal activism" of the type we have been studying?

To address such questions, we classify states according to the share of particular types of taxes in the 1978 state or local government total tax revenue, and check whether the extent of income and consumption smoothing through fiscal policy varies systematically across groups. The results are displayed in Table 15. At the 3-year differencing frequency there are no significant differences across groups of states, but at the 1-year frequency we find that states with a higher share of state personal income taxes[34] smooth more via the budget. The opposite is true for general sales and gross receipts taxes and severance taxes. To check if our results are robust, we repeated the experiment using 1986 as the year for classifying states into groups, and obtained qualitatively similar results.

We conjecture that reliance on personal income taxes—which are more directly tied to income than sales taxes—provides state governments with better tools for smoothing residents' income in response to output shocks. Consequently, this results in smoother consumption at the shorter horizon. The—more or less automatic—smoothing impact of the personal income tax is often remarked upon. For instance, State Budget & Tax News, March 25, 1998, states that "Many states are revising their revenue estimates for the current fiscal year upward as tax collections continue to roll in. The upward revisions are particularly pronounced in jurisdictions with high reliance on personal income taxes ..."

At the 3-year horizon, where smoothing of output shocks is likely to reflect a choice by governments rather than institutional rigidities, we do not see a significant relation between a major tax source and smoothing obtained. (Of course, the tax structure is also endogenous, at least in the longer run. We do not, however, explore this intriguing issue.)

[34]Six states, Florida, Nevada, South Dakota, Texas, Washington, and Wyoming did not have state income taxes in 1978.

3.7 Political Economy

Consider a state governor, in an election year that occurs in the midst of an economic expansion. Most likely he (or she) will be tempted to spend the extra funds rather than increase saving. To test for such behavior, we construct, for each state, a dummy variable that takes the value one in a state governor election year. (If, for example, the election takes place in 1990, the dummy variable equals one in fiscal year 1989; i.e. July 1st, 1989 to June 30th, 1990.) We then interact this dummy with another dummy variable that equals one if in that year the growth of the state's GSP is above average (i.e., higher than the average over the years of the state's GSP growth). The results, shown in Table 16, indicate that state governments indeed refrain from smoothing positive output shocks if these occur in an election year, but do smooth such shocks if they occur in a non-election year. For negative shocks no such asymmetry is apparent (shocks are always smoothed).[35]

Clearly, the temptation for politicians to "consume" in a good year, rather than "save," is too large to resist. The lack of asymmetry (election versus non-election years) in the response to negative GSP shocks suggests that, despite the temptation to do so, politicians do not go as far as—or simply cannot get away with—digging into accumulated savings (or borrowing large amounts) to avoid cutting down public consumption or increasing taxes in an election year that occurs during an economic downturn.

For their sample of OECD countries Alesina and Roubini (1997), Chapter 7, find that national-level government deficits are higher in election years, whereas our results indicate that there is an expansionary fiscal response of U.S. state governments to election years only during economic upturns. This is fully consistent with our findings, reported earlier, that states with more stringent budget rules achieve less smoothing via the budget, and with the lack of such rules for national-level governments (at least prior to the imposition of the EMU Maastricht criteria).

We further divided the states according to whether they are "conservative" or not, according to the classification developed in Erikson, Wright, and McIver (1993). The

[35]The regressions displayed in Table 16 do not include time-fixed effects. Similar (although somewhat weaker) results are obtained with time-fixed effects.

results, displayed in Table 17, indicate that the fiscal policy of conservative governments provides less smoothing. We further studied whether the political variables "Democrat Governor," "United Legislature," and "United Executive and Legislative Branches"[36] affect the amount of smoothing via the budget, and found no significant results.[37]

3.8 Other Results

We studied whether smoothing through the budget, at the state and local government level, and through the total and general surplus, varies in response to positive and negative output shocks regardless of elections, and found scant evidence that positive shocks are smoothed more than negative shocks.

We classified states according to whether balanced budget rules apply to trust funds,[38] finding no strong differences in the amount of smoothing through pension fund surpluses and in the cyclical behavior of the assets of the funds across the two groups.

4 Concluding Remark

Our analysis in this paper has provided a set of stylized facts for structural models to match. One obvious—but we believe difficult—task is to derive models for the optimal amount of smoothing by state and local governments through fiscal policy, for the optimal mix of smoothing through expenditures and revenues, for smoothing through adjustment of wealth buffer stocks (rainy day funds), and for smoothing through borrowing and lending out-of-state. Another, related, challenging task is to model the optimal "division of labor"

[36] "United Legislature" refers to the number of times the bicameral (upper and lower) state legislatures were united (i.e., a majority of the same party in both). "United Branches" refers to the number of times the executive and the two legislative branches were united. Nebraska has a unicameral legislature and was dropped from these political groupings.

[37] The sample period, 1978-1994, was divided into two-year periods (governors are elected every four years, but not all states vote in the same year, and the legislature is elected every two years). For each period we computed the average budget surplus and the average output, and attributed the appropriate political dummy variable that was used to form two groups of observations. We computed the amount of smoothing via the budget in each group comparing the results across groups.

[38] According to NASBO (1992), it is often a matter of judgment of state officials if generally worded balanced budget rules cover trust funds. NASBO (1992) estimates that balanced budget rules cover trust funds in 30 states.

among various levels of government in smoothing output shocks. We believe that our findings in this paper can help construct such models.

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Table 1: State and Local Government Per Capita
Surplus, Revenue, and Expenditure (Dollars)

		State Governments			Local Governments		
		1978–82	1983–88	1989–94	1978–82	1983–88	1989–94
General	mean	43	63	28	39	50	3
Surplus	std1	95	102	83	53	63	57
	std2	49	54	55	30	41	39
Revenue	mean	1286	1457	1698	1132	1270	1393
	std1	276	359	331	301	359	343
	std2	59	116	106	53	80	51
Expenditure	mean	1243	1394	1670	1093	1220	1390
	std1	226	298	316	275	327	345
	std2	53	107	107	45	88	53
Insurance	mean	72	122	132	2	10	11
Trusts	std1	59	72	93	6	15	17
Surplus	std2	23	45	40	2	5	6
Utilities	mean	− 20	−17	−17	−47	−44	−27
Surplus	std1	24	26	27	77	70	32
	std2	9	9	5	17	19	9
Liquor	mean	11	8	7	4	3	2
Stores	std1	10	7	6	2	2	1
Surplus	std2	3	2	1	1	1	1

Notes. **std1** (cross-section): time average of $\left[(1/n)\sum_i (X_{it} - \bar{X}_t)^2\right]^{1/2}$ where $\bar{X}_t$ is the period t average across states of X_{it}, and n is the number of states. **std2** (time series): average over i of $\left[(1/T)\sum_t (X_{it} - \bar{X}_i)^2\right]^{1/2}$ where $\bar{X}_i$ is the time average of X_{it} for state i, and T is the number of years in the sub-sample.
Real per capita 1983 dollars. General Surplus: does not include revenue and expenditure of utilities, liquor stores, and insurance trust funds. Insurance Trusts: 50 state-run; 45 local-run. Utilities: 13 state-run; 50 local-run. Liquor Stores: 17 state-run; 5 local-run.

Table 2: State and Local Government Per Capita
Budget Components in 1994

		State		Local	
		Dollars	% GSP	Dollars	% GSP
General Surplus	mean	73.36	0.28	23.73	0.10
	std	134.98	0.46	87.28	0.32
Revenue	mean	2709.73	10.92	2151.06	8.58
	std	481.87	1.91	511.93	1.43
Expenditure	mean	2636.38	10.64	2127.33	8.48
	std	435.81	1.85	520.39	1.46
Insurance Trusts Surplus	mean	213.87	0.88	14.73	0.06
	std	151.83	0.60	20.40	0.08
Revenue	mean	510.45	2.06	43.13	0.16
	std	207.79	0.85	47.01	0.17
Expenditure	mean	296.58	1.19	28.40	0.10
	std	130.30	0.51	39.23	0.13
Utilities Surplus	mean	−24.30	−0.08	−34.73	−0.13
	std	33.08	0.11	48.40	0.17
Revenue	mean	35.47	0.14	223.07	0.90
	std	51.54	0.22	191.06	0.78
Expenditure	mean	59.78	0.23	257.80	1.03
	std	74.46	0.29	204.71	0.81
Liquor Surplus	mean	10.46	0.04	2.64	0.01
	std	9.39	0.04	2.59	0.01
Revenue	mean	52.56	0.22	29.47	0.11
	std	36.23	0.14	8.07	0.03
Expenditure	mean	42.10	0.18	26.83	0.10
	std	28.91	0.11	6.51	0.02

Notes. Per capita 1994 dollars. % GSP calculated by dividing variable by own state GSP. The mean and standard deviation (std) are then calculated over all states. General Surplus: does not include revenue and expenditure of utilities, liquor stores or insurance trust funds.

Table 3: Intergovernmental Net Per Capita Transfers

		1978–82	1983–88	1989–94	% GSP in 1994
Federal to State	mean	348	345	438	3.12
	std1	86	95	117	—
	std2	29	29	61	—
Federal to Local	mean	101	69	50	0.30
	std1	28	20	17	—
	std2	17	12	7	—
State to Local	mean	387	414	471	2.92
	std1	128	144	144	—
	std2	29	34	27	—

Notes. **std1** (cross-section): time average of $\left[(1/n)\sum_i (X_{it} - \bar{X}_t)^2\right]^{1/2}$ where $\bar{X}_t$ is the period t average across states of X_{it}, and n is the number of states. **std2** (time series): average over i of $\left[(1/T)\sum_t (X_{it} - \bar{X}_i)^2\right]^{1/2}$ where $\bar{X}_i$ is the time average of X_{it} for state i, and T is the number of years in the sub-sample.
Real per capita 1983 dollars. All state and local governments receive revenue from the federal government. All local governments receive revenue from their state government.

Table 4: Trends in State and Local Government Budget Components

	State		Local	
	Trend[1]	t-stat	Trend[1]	t-stat
General Budget				
Surplus	−1.57	−1.31	−3.49	−3.40
Revenue	36.09	13.38	21.74	12.05
Expenditure	37.66	14.58	25.23	12.63
Insurance Trusts				
Surplus	5.11	4.49	0.79	5.37
Revenue	10.04	10.59	1.25	8.41
Expenditure	4.93	6.16	0.47	14.78
Utilities				
Surplus	0.19	1.02	1.70	5.81
Revenue	0.43	3.93	2.98	6.50
Expenditure	0.24	1.22	1.28	2.01
Liquor Stores				
Surplus	−0.34	−7.92	−0.15	−8.44
Revenue	−2.07	−14.94	−1.11	−22.50
Expenditure	−1.73	−16.57	−0.96	−23.05
Net Intergovernmental Transfers				
Federal to—	8.79	4.45	−4.40	−12.29
State to Local	—	—	8.02	11.89

Notes. [1] "Trend" is $\hat{b}$ estimated from the equation: $X_{it} = a + b\,t + \varepsilon_{it}$, where X is the relevant budget component.
Real per capita 1983 dollars. General Surplus: does not include revenue and expenditure of utilities, liquor stores, and insurance trust funds. Insurance Trusts: 50 state-run; 45 local-run. Utilities: 13 state-run; 50 local-run. Liquor Stores: 17 state-run; 5 local-run. Sample period: 1978-94.

Table 5: Federal Government
Budget Components in 1994

	Dollars	% GDP	Trend[1]	t-stat
Total Budget				
Surplus	–779.38	–3.09	–17.28	–1.99
Revenue	4828.78	19.16	32.45	5.33
Expenditure	5608.00	22.25	49.67	9.67
Social Security Budget				
Surplus	222.90	0.88	14.59	8.14
Revenue	1462.15	5.80	25.60	16.90
Expenditure	1239.25	4.92	11.00	19.17

Notes. [1] "Trend" is $\hat{b}$ estimated from the equation: $X_t = a + b\,t + \varepsilon_t$, where X is the relevant budget component.
Per capita 1994 dollars. Social Security Budget includes OASDI (federal old-age, survivors' and disability insurance) and federal disability insurance trust funds.

Table 6: Smoothing Output Shocks through the Total Surplus of State and Local Governments

	$k = 1$	$k = 3$
Without Time-Fixed Effects[1]		
State	2.98	8.62
	(8.25)	(14.99)
Local	0.92	2.57
	(4.72)	(9.73)
With Time-Fixed Effects[2]		
State	3.12	9.35
	(6.01)	(11.68)
Local	0.35	1.69
	(1.34)	(5.26)
	Total Surplus	Total Surplus Less OASDI
Federal Government[3] $(k = 1)$	−7.08	−7.00
	(−0.85)	(−0.87)

Notes. [1]Coefficient $\hat{\beta}$ from regression $s_{it} = \alpha_i + \beta\,\Delta\text{GSP}_{it} + \epsilon_{it}$, where s is the total surplus and GSP is gross state product.
[2]Coefficient $\hat{\beta}$ from regression $s_{it} = \alpha_i + \nu_t + \beta\,\Delta\text{GSP}_{it} + \epsilon_{it}$.
[3]Coefficient $\hat{\beta}$ from regression $s_t = \alpha + \beta\,\Delta\text{GDP}_t + \epsilon_t$, where s is the federal budget surplus and GDP is aggregate U.S. GDP.
The "$k = 3$" column reports the $\hat{\beta}$-coefficient from a regression of $s_{it} + s_{i,t-1} + s_{i,t-2}$ on $\text{GSP}_{it} - \text{GSP}_{i,t-3}$ using non-overlapping data, allowing for fixed cross-sectional effects. Estimates are scaled by 100 to reflect the response of the corresponding budget surplus to a $100 increase in per capita gross state product.
Real per capita 1983 dollars. t-statistics in parentheses. Total Surplus includes revenue and expenditure of utilities, liquor stores, and insurance trust funds. OASDI = federal old-age, survivors' and disability insurance. Sample period: 1978-1994.

Table 7: Cyclical Response of
State Government Budget Components

	Federal Grants	Own Revenue	Expenditure
Without Time-Fixed Effects[1]			
$k = 1$	0.43	5.42	1.01
	(2.89)	(17.92)	(2.94)
$k = 3$	1.01	6.37	2.95
	(8.43)	(25.47)	(8.98)
With Time-Fixed Effects[2]			
$k = 1$	−0.35	3.17	0.53
	(−2.35)	(7.89)	(1.46)
$k = 3$	−0.48	5.94	1.33
	(−3.54)	(14.58)	(4.28)

Notes. [1]Coefficient $\hat{\beta}$ from regression $\Delta X_{it} = \alpha_i + \beta\,\Delta \text{GSP}_{it} + \epsilon_{it}$, where X is the budget component indicated in the column title and GSP is gross state product.
[2]Coefficient $\hat{\beta}$ from regression $\Delta X_{it} = \alpha_i + \nu_t + \beta\,\Delta \text{GSP}_{it} + \epsilon_{it}$.
The "$k = 3$" rows report the $\hat{\beta}$-coefficient from a regression of $X_{it} - X_{i,t-3}$ on $\text{GSP}_{it} - \text{GSP}_{i,t-3}$ using non-overlapping data, allowing for cross-sectional fixed effects. Estimates are scaled by 100 to reflect the response of the corresponding budget surplus to a $100 increase in per capita gross state product.
Real per capita 1983 dollars. t-statistics in parentheses. Note that although Total Surplus = Federal Grants + Own Revenue – Expenditure, the total net smoothing achieved by these individual components will not add up to the smoothing through the state government total surplus reported in Table 6 since the individual budget components are first-differenced (being non-stationary) whereas in the regressions reported in Table 6 the state government total surplus is not differenced (as it is stationary). Sample period: 1978-1994.

Table 8: Cyclical Response of
Local Government Budget Components

	Federal Grants	State Grants	Own Revenue	Expenditure
Without Time-Fixed Effects[1]				
$k = 1$	0.14	0.89	1.66	1.53
	(2.70)	(7.05)	(8.47)	(5.19)
$k = 3$	0.20	1.51	2.35	3.42
	(3.12)	(10.24)	(17.24)	(12.67)
With Time-Fixed Effects[2]				
$k = 1$	−0.08	0.24	0.17	−0.42
	(−1.33)	(1.44)	(0.71)	(−1.26)
$k = 3$	−0.11	1.17	0.72	2.26
	(−1.88)	(5.76)	(2.10)	(6.03)

Notes. [1]Coefficient $\hat{\beta}$ from regression $\Delta X_{it} = \alpha_i + \beta \, \Delta \text{GSP}_{it} + \epsilon_{it}$, where X is the budget component indicated in the column title and GSP is gross state product.
[2]Coefficient $\hat{\beta}$ from regression $\Delta X_{it} = \alpha_i + \nu_t + \beta \, \Delta \text{GSP}_{it} + \epsilon_{it}$.
The "$k = 3$" rows report the $\hat{\beta}$-coefficient from a regression of $X_{it} - X_{i,t-3}$ on $\text{GSP}_{it} - \text{GSP}_{i,t-3}$ using non-overlapping data, allowing for cross-sectional fixed effects. Estimates are scaled by 100 to reflect the response of the corresponding budget surplus to a $100 increase in per capita gross state product.
Real per capita 1983 dollars. t-statistics in parentheses. Note that although Total Surplus = Federal Grants + State Grants + Own Revenue – Expenditure, the total net smoothing achieved by these individual components will not add up to the smoothing through the state government total surplus reported in Table 6 since the individual budget components are first-differenced (being non-stationary) whereas in the regressions reported in Table 6 the state government total surplus is not differenced (as it is stationary). Sample period: 1978-1994.

Table 9: Smoothing Output Shocks through Capital Outlays

		Total Capital Outlays	Construction Outlays	Land and Equipment Outlays
State	$k = 1$	0.40	0.17	0.23
		(3.59)	(1.29)	(5.62)
	$k = 3$	1.02	0.79	0.23
		(10.13)	(5.89)	(3.74)
Local	$k = 1$	0.07	—	—
		(0.55)	—	—
	$k = 3$	0.98	—	—
		(7.19)	—	—

Notes. Coefficient $\hat{\beta}$ from regression $X_{it} = \alpha_i + \beta\,\Delta\text{GSP}_{it} + \epsilon_{it}$, where X is the budget component indicated in the column title and GSP is gross state product.
The "$k = 3$" rows report the $\hat{\beta}$-coefficient from a regression of $X_{it}+X_{i,t-1}+X_{i,t-2}$ on $\text{GSP}_{it}-\text{GSP}_{i,t-3}$ using non-overlapping data, allowing for cross-sectional fixed effects. Estimates are scaled by 100 to reflect the response of the corresponding budget component to a $100 increase in per capita gross state product.
Real per capita 1983 dollars. t-statistics in parentheses. Capital Outlays = Construction Outlays + Land and Equipment Outlays. Construction and Land and Equipment Outlays data not available for the whole sample period for local governments. Sample period: 1978-1994. Time-fixed effects not included.

Table 10: Smoothing Output Shocks through the Budget Surplus of Utilities, Insurance Trust Funds, and Liquor Stores

	Utilities		Trust Funds		Liquor Stores	
	$k=1$	$k=3$	$k=1$	$k=3$	$k=1$	$k=3$
Without Time-Fixed Effects[1]						
State	−0.00	0.19	0.72	2.56	−0.02	−0.08
	(−0.01)	(3.68)	(4.20)	(7.34)	(1.61)	(−2.11)
Local	0.08	0.38	0.01	0.11	−0.00	−0.02
	(1.80)	(5.22)	(2.50)	(3.83)	(−0.54)	(−0.78)

Notes. [1]Coefficient $\hat{\beta}$ from regression $s_{it} = \alpha_i + \beta\,\Delta\text{GSP}_{it} + \epsilon_{it}$, where s is the total surplus and GSP is gross state product.
[2]Coefficient $\hat{\beta}$ from regression $s_{it} = \alpha_i + \nu_t + \beta\,\Delta\text{GSP}_{it} + \epsilon_{it}$.
The "$k = 3$" column reports the $\hat{\beta}$-coefficient from a regression of $s_{it} + s_{i,t-1} + s_{i,t-2}$ on $\text{GSP}_{it} - \text{GSP}_{i,t-3}$ using non-overlapping data, allowing for fixed cross-sectional effects. Estimates are scaled by 100 to reflect the response of the corresponding budget surplus to a $100 increase in per capita gross state product.
Real per capita 1983 dollars. t-statistics in parentheses. Estimates are scaled by 100 to reflect the response of the corresponding budget surplus to a $100 increase in per capita gross state product. Sample period: 1978-1994.

Table 11: Insurance Trust Funds: A Closer Look

Smoothing Output Shocks: Unemployment Insurance Funds versus Pension Funds and Other Trust Funds

	Unemployment Insurance[1]	Pension and Other[2]
$k = 1$	0.39	0.18
	(5.32)	(2.68)
$k = 3$	0.97	0.78
	(8.40)	(6.61)

Pension Fund Assets and Liabilities: Do Pension Fund Assets Buffer Output Shocks?

	Assets[3]	Assets less Pension Liabilities[3]
$k = 1$	0.51	0.07
	(1.85)	(0.14)
$k = 3$	2.61	2.67
	(3.96)	(5.19)

Notes. [1] Coefficient $\hat{\beta}$ from regression $X_{it} = \alpha_i + \beta\,\Delta\text{GSP}_{it} + \epsilon_{it}$, where X is the surplus of the unemployment trust fund and GSP is gross state product.
[2] Coefficient $\hat{\beta}$ from regression $\Delta X_{it} = \alpha_i + \beta\,\Delta\text{GSP}_{it} + \epsilon_{it}$, where X is the (non-stationary) surplus of other pension funds.
[3] Coefficient $\hat{\beta}$ from regression $\Delta X_{it} = \alpha_i + \beta\,\Delta\text{GSP}_{it} + \epsilon_{it}$, where X is the assets as indicated in the column head.
"$k = 3$": See notes to previous tables. Estimates are scaled by 100 to reflect the response of the corresponding budget surplus to a $100 increase in per capita gross state product. Real per capita 1983 dollars. t-statistics in parentheses. "Pension Funds" refers to the employee-retirement systems of state governments. "Other Trust Funds" includes state insurance programs such as accident, sickness, and disability benefit systems. "Assets" are cash and investment holdings of the state employee-retirement systems. The amount of smoothing by Unemployment Insurance funds and Pension and Other funds do not exactly add up to the amount of smoothing by State Insurance Trust Funds reported in Table 10 due to differencing. Time-fixed effects not included. Assets and Pension Liabilities data are courtesy of Robert Inman and Stephen Mark. Sample period: 1978-1992 for Assets and Pension Liabilities, 1978-1994 for other data.

Table 12: The Effect of Balanced-Budget Rules
on Smoothing Output Shocks through the Budget

		Total		General	
Stringency of Rule:		Low[1]	High[1]	Low[1]	High[1]
State	$k = 1$	4.23	2.62	3.13	1.97
		(5.56)	(6.41)	(6.28)	(6.61)
	P-value:	0.07		0.05	
	$k = 3$	8.94	8.49	4.92	4.08
		(8.25)	(12.47)	(7.13)	(8.38)
	P-value:	0.72		0.31	
Local	$k = 1$	1.02	0.88	0.85	0.71
		(2.85)	(3.70)	(2.59)	(3.68)
	P-value:	0.74		0.71	
	$k = 3$	2.81	2.14	1.75	1.27
		(8.86)	(4.80)	(3.62)	(3.22)
	P-value:	0.22		0.44	

Notes. [1]Coefficients $\hat{\beta}_L$ and $\hat{\beta}_H$, respectively, from regression $s_{it} = \alpha_i + \beta_L \, \mathrm{D}_i^L \, \Delta \mathrm{GSP}_{it} + \beta_H \, (1 - \mathrm{D}_i^L) \, \Delta \mathrm{GSP}_{it} + \epsilon_{it}$, where s is the total surplus, GSP is gross state product, and D_i^L is a dummy variable which is 1 if state i's balanced budget rules are stringent and 0 otherwise. The "$k = 3$" rows report the $\hat{\beta}$-coefficients from a regression of $s_{it} + s_{i,t-1} + s_{i,t-2}$ on $\mathrm{GSP}_{it} - \mathrm{GSP}_{i,t-3}$ interacted with the dummy-variables, using non-overlapping data, allowing for cross-sectional fixed effects. Estimates are scaled by 100 to reflect the response of the corresponding budget surplus to a $100 increase in per capita gross state product.
Real per capita 1983 dollars. t-statistics in parentheses. P-values are for the null hypothesis that there is no difference in the point estimates across the low and high stringency groups. Data are first-differenced using intervals of k years. Index of balanced-budget stringency is from ACIR (1987), ranging from 0 (least stringent) to 10 (most stringent). Cutoff at index=7, yielding groups of size 13 and 35. Total Surplus includes revenue and expenditure of utilities, liquor stores, and insurance trust funds, while General Surplus does not. Sample period: 1978-1994.

Table 13: The Effect of Historical Long-Term Debt Levels
on Smoothing Output Shocks through the State Government Budget

	Total Surplus		General Surplus	
Level of Long-Term Debt:	Low	High	Low	High
$k = 1$	2.39	3.95	1.68	3.34
	(5.21)	(6.76)	(5.11)	(8.07)
P-value:	0.04		0.00	
$k = 3$	8.04	9.41	3.19	5.90
	(10.86)	(10.43)	(6.39)	(9.79)
P-value:	0.24		0.00	

Notes. The regressions are similar to those reported in Table 12.
Real per capita 1983 dollars. t-statistics in parentheses. P-values are for the null hypothesis that there is no difference in the point estimates across the two groups. States are classified according to 1978 net per capita state government debt levels. Groups are of equal size. Total surplus includes revenue and expenditure of utilities, liquor stores, and insurance trusts funds, while General Surplus does not. Sample period: 1978-1994.

Table 14: Disentangling the Effect of
Balanced Budget Rules and of Historical Debt Levels

Regression: $\hat{\beta}_i = \alpha_0 + \alpha_1 \log \text{GSP}_i + \alpha_2 \log \text{LTDS}_{i,t_0} + \alpha_3 \text{INDEX}_i + \varepsilon_i$

	α_0	α_1	α_2	α_3
$k = 1$	-4.07	-1.28	1.41	-0.28
	(-0.72)	(-0.27)	(2.71)	(-1.02)
$k = 3$	-3.68	-5.66	1.39	-0.03
	(-0.43)	(-0.79)	(1.76)	(-0.07)

Notes. We first estimate the amount of smoothing through the budget achieved by the government of state i using the time series regression coefficient $\hat{\beta}_i = 100{*}\text{Cov}\,(\text{S}_{it}, \Delta\text{GSP}_{it}) \,/\, \text{Var}\,\Delta\text{GSP}_{it}$. Then we perform the above cross-sectional multivariate regression where GSP_i is the average of GSP_{it} over the sample years, LTDS_{i,t_0} is the level of long-term debt in 1978 (the first year of the sample) of state $i's$ government, and INDEX_i is the balanced budget stringency index for state i. The regression estimates the marginal impact of each of the regressors on the amount of smoothing through the state government budget. By including both the debt level and the stringency index we can evaluate the marginal impact of each when the other is controlled for.
Real per capita 1983 dollars. t-statistics in parentheses. Sample period: 1978-1994.

Table 15: The Effect of the Type of Taxes More Heavily Used on Smoothing Output Shocks through the Total Budget Surplus

	State						Local	
Type of Tax:	Personal		Sales		Severance		Property	
Share in Total Tax Revenue:	Low	High	Low	High	Low	High	Low	High
Average Share:	12%	34%	21%	41%	0%	6%	71%	95%
$k = 1$	2.55	3.44	4.04	2.19	3.81	2.20	0.86	0.97
	(5.03)	(6.69)	(7.33)	(4.36)	(7.41)	(4.36)	(2.92)	(3.68)
P-value:	0.22		0.01		0.03		0.80	
$k = 3$	8.63	8.61	9.65	8.02	9.23	7.99	2.59	2.56
	(11.69)	(9.33)	(10.04)	(11.29)	(11.28)	(9.88)	(4.83)	(8.39)
P-value:	0.99		0.17		0.28		0.96	

Notes. The regressions are similar to those reported in Table 12.
Real per capita 1983 dollars. t-statistics in parentheses. P-values are for the null hypothesis that there is no difference across the two groups. Groups are of equal size, and are classified according to 1978 tax shares. "Personal": Personal Income Taxes. "Sales": General Sales and Gross Receipts Taxes. The share of personal, sales, and severance taxes are calculated as shares of total state government tax revenue. The share of property taxes is calculated as the share in total local government tax revenue. Total Budget Surplus includes revenue and expenditure of utilities, liquor stores, and insurance trust funds. "Average Share" is the average (over the states in the sub-group) fraction of total (state or local) tax revenue raised by the tax source considered. Sample period: 1978-1994.

Table 16: Cyclical Properties of the Surplus
in Election Years

	All Shocks	Positive Shocks		Negative Shocks	
Election Year:	Yes	Yes	No	Yes	No
Estimate:	α_0	α_1	α_2	α_3	α_4
$k = 1$	–10.43	–0.40	3.80	2.89	3.00
	(–0.91)	(–0.28)	(5.91)	(2.73)	(5.63)
$k = 1$	—	–1.04	3.80	3.39	3.00
	—	(–0.84)	(5.91)	(3.75)	(5.63)

Notes. The first row displays results of the regression $s_{it} = \alpha_i + \alpha_0 \, \text{D}_{it}^E + \alpha_1 \, \text{D}_{it}^E \Delta\text{GSP}_{it}^+ + \alpha_2 \, (1 - \text{D}_{it}^E) \, \Delta\text{GSP}_{it}^+ + \alpha_3 \, \text{D}_{it}^E \Delta\text{GSP}_{it}^- + \alpha_4 \, (1 - \text{D}_{it}^E) \Delta\text{GSP}_{it}^-$, where s_{it} is the total budget surplus, D_{it}^E is a dummy variable which takes the value 1 if year t is an election in state i (0 otherwise), ΔGSP_{it}^+ is equal to ΔGSP_{it} if ΔGSP_{it} is above its own average (over time for state i), and ΔGSP_{it}^-, correspondingly, for years of below average growth of state i's gross product. The second row is estimated with $\alpha_0 = 0$. Estimates are scaled by 100 to reflect the response of the corresponding budget surplus to a \$100 increase in per capita gross state product. Real per capita 1983 dollars. t-statistics in parentheses. No time-fixed effects. Sample period: 1978-1994.

Table 17: The Effect of Ideology
on Smoothing Output Shocks through the Budget

		Total		General	
Degree of Conservatism:		Low	High	Low	High
State	$k = 1$	4.19	2.31	2.81	1.86
		(6.95)	(5.15)	(7.26)	(5.43)
	P-value:	0.01		0.06	
Local	$k = 1$	1.21	0.67	0.99	0.60
		(4.20)	(2.52)	(3.61)	(2.88)
	P-value:	0.17		0.25	

Notes. The regressions are similar to those reported in Table 12.
Real per capita 1983 dollars. t-statistics in parentheses. P-values are for the null hypothesis that there is no difference across the two groups. Groups are of equal size. Degree of conservatism is measured as percent conservatives minus percent liberals. It ranges from 0 to 28. Average degree of conservatism in low and high groups are 8 and 20, respectively. Sample period: 1978-1994.