

Get Well Soon: Understanding States' Fiscal Health during and after the 2001 Recession

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Abstract: The states experienced rapid and dramatic falls in revenue following the 2001 recession. We show that despite this fall in revenue states were able to keep nominal spending roughly constant without large tax increases in 2002 and 2003 because they had accumulated substantial savings that they drew upon in those years. By the beginning of 2004 three-quarters of the states' savings had been exhausted but revenues began to rise as the economy recovered. During the fiscal crisis states had a very high propensity (nearly equal to 1) to spend out of both savings and policy neutral tax revenue. Spending rose with tax capacity but we did not vary with state need during the crisis. The lack of responsiveness to need could indicate that vulnerable populations in poor states are not protected from fiscal downturns. We also find little evidence that the depth of the fiscal shock in 2002 had a lagged effect on spending in 2004 and 2005. However, there is some evidence that states with relatively low savings entering the recession increased spending more in 2004 suggesting that these states may have been compensating for pent-up demand in 2004.

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Introduction

Every state except Vermont operates under some sort of balanced budget requirement (National Conference of State Legislators 1999). This means that when needs increase, states must either increase revenues or cut programs to decrease spending. The same holds true when revenues decline. This requirement can often cause states substantial fiscal stress, particularly during an economic downturn. Often, states will experience revenue declines (absent offsetting tax or fee increases) at the same time they experience rising eligibility for state services such as unemployment insurance and Medicaid (Mattoon 2003).

The states' response to the 2001 recession differed markedly from the previous recession. Rather than reacting quickly to increase revenues when they declined by increasing broad-based taxes, states enacted relatively few tax increases – and concentrated these increases on narrowly targeted tobacco taxes (Maag and Merriman 2003). Yet, social services for low-income families remained relatively protected (McGuire and Merriman 2006). Possibly, this stems from states' pre-recession preparation, including the building up of substantial rainy day and general fund savings.

This paper examines the extent to which rainy day and general fund savings were a significant factor in helping states cope with fiscal stress, which could be one explanation for the lower than expected legislated tax increases and social welfare cuts. We begin by reviewing previous literature on the effectiveness of rainy day funds. We describe the data used for this analysis and define key terms. We then summarize state resources during and after the 2001 recession. We ask whether states with relatively large levels of savings entering the fiscal downturn were able to weather it with less spending

cuts than those that had less cushion. Furthermore, we explore whether the size of the fiscal shock that a state suffered in 2002 reverberated beyond the recession into 2004 and 2005.

Literature Review

The concept behind state budget stabilization or “rainy day” funds (RDF) is simple: states make deposits in a designated account when revenues exceed what the state needs and make withdrawals from the account when revenues fall below need. An RDF allows states to avoid tax increases that might exacerbate economic slowdowns during periods of fiscal shortfalls. Despite the simplicity of this concept, states have a large variety of budgetary arrangements that might be classified as RDFs. Much of the literature defines an RDF as a fund that allows accumulations during economic expansions that can be spent during economic declines. According to this definition, five states (Arkansas, Colorado, Illinois, Kansas, Montana, and Oregon) had no RDF in FY 2000, as they headed into the 2001 recession.^{1, 2} The absence of a RDF does not preclude the state from saving in the general fund, but to the extent that RDFs increase state savings, states without an RDF may be more vulnerable to budget shortfalls.

Rainy day funds vary widely across states and, as pointed out by Rodriguez-Tejedo (2006), are often configured in ways that undermine their effectiveness. The same policies that attempt to make legislators fiscally prudent during times of economic excess often work in ways that make it more difficult to respond to a crisis quickly. For example,

¹ Kansas did not have a separate RDF in FY2000. However, state statute requires that the Governor’s recommended budget and the final approved budget maintain an ending balance of at least 7.5 percent of expenditures. (NASBO 2000).

² Some of the literature does not consider Alabama’s fund to be an RDF because it is only intended to be used to shore up the education budget. Colorado technically had two funds that could be considered RDFs in FY2000. The first is mandated by TABOR, and cannot be accessed for economic downturns. The second

some states require a supermajority vote of two-thirds to three-quarters before states can make RDF withdrawals (NCSL 2004). Supermajority requirements may make frivolous spending more difficult but they also can increase the probability that minority parties will use the system to reduce the majority party's ability to "solve" a fiscal crisis. Similarly, provisions that require RDF withdrawals be replaced as soon as possible may ensure that the RDF is not used as a device to ratchet up budgets but also may make legislators reluctant to use RDFs even when appropriate.

It is not surprising then, that the mere existence of a RDF does not protect a state from experiencing "fiscal stress" during an economic downturn. Sobel and Holcombe (1996) measure fiscal stress by the amount of discretionary tax increases plus the amount that expenditures are reduced from below their long-term trend growth. Sobel and Holcombe find that RDFs with legal requirements to make deposits significantly reduced fiscal stress for states during the economic downturn of the 1990 – 1991 recession. Other rules, such as those regulating whether the RDF has a cap or can be accessed under ordinary legislative rules, were not significant determinants of the RDF's ability to alleviate fiscal stress.

Douglas and Gaddie (2002) note that RDF caps actually bind in very few states so caps are unlikely to be important determinants of a RDFs effectiveness. Using a definition of fiscal stress similar to Sobel and Holcombe, Douglas and Gaddie study other feature of RDFs to determine their effect on alleviating fiscal stress. Douglas and Gaddie classify withdrawals requirements into two types: withdrawals dictated by a formula (e.g. actual revenues were below estimates, a revenue shortfall is predicted, the state is

is a fund requiring a statutory reserve of 4 percent, but it must be replenished each year. This fund acts more as a short-term cash-flow fund, rather than an RDF. http://www.coloradobudget.com/rdf_report.cfm.
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experiencing high unemployment, or there has been low growth in adjusted personal income) and those that require legislative supermajorities. Here, Douglas and Gaddie find a counter-intuitive result—a positive relationship between the size of a state’s RDF (as a percent of expenditures) and fiscal stress. This could be a result of budget practices that cause more vulnerable states to build up bigger balances or it could be because states under extreme fiscal stress are more likely to cut expenditures to balance budgets, so the ratio of RDF balances to general expenditures will be more pronounced. Joyce (1997) offers support for the former theory. These early studies provide guidance on how states could structure RDFs to be most effective in alleviating fiscal stress.

Since the recession of the 1990s, when these studies were performed, RDFs have changed substantially. Not only did the number of states with RDFs increase, but balances increased as well. Estimates of the size of RDFs (when added to state general fund balances) range from 10.4 percent (Zahradnik and Ribeiro 2003) to over 12 percent of expenditures (Gonzalez and Levinson 2003). Balances entering the previous recession were estimates to be less than 5 percent (Gonzalez and Levinson 2003).

Having an RDF may increase total savings – indeed economic analysis suggests that the states’ relatively large RDF balances at the start of the recession represented “new” savings rather than a rearrangement of existing funds (Gonzalez and Levinson 2003). In our analyses we measure savings by the combined total of general fund and RDF balances. Ultimately the ability to avoid tax increases or service cuts depends on the total amount of savings a state has and whether the state is willing to spend that savings.

Data and definitions

Our analysis uses data on state general fund spending and revenues between 1999 and 2006 from the National Association of State Budget Officers (NASBO). The data for 2006 is the most recent available but is preliminary. Each state defines its own “general fund” according to the accounting rules adopted in that state. The general fund is usually the biggest state government fund but readers should be cautioned that some major expenditures (such as Medicaid) or revenues may be contained in the general fund of some states, but not others. Also, within a particular state, expenditures or revenues recorded in the general fund in one year may be moved to a different fund in another year. Data compiled by the US Census uses a uniform (and time invariant) definition for the general fund but provides less current data and does not detail state rainy day funds. For a more detailed description of the NASBO data and how it is used in this paper, please see the appendix.

Our analyses require that we define two central concepts— policy neutral revenue and fiscal crisis.

Policy neutral revenues. We define policy-neutral revenue as a state’s observed revenues, minus tax increases plus tax cuts. Changes in policy-neutral revenues are a measure of the fiscal impact of economic changes in the state. We believe that it is economy-induced changes in revenue that ultimately drive changes in expenditures. States can, of course, opt to raise taxes to increase revenues, or cut taxes to decrease revenue. These policy changes are a reaction to more fundamental economic and political conditions and should be considered symptoms, as well as causes, of expenditure change.

. Fiscal crisis We define a state to be in a fiscal crisis if its policy neutral revenues in one year are less than its actual revenues in the preceding year. This definition is simpler and more direct than that used by Sobel and Holcombe (1996) since our definition allows states to make a policy choice to slow the rate of spending growth below its long-term trend without being declared in crisis. Admittedly, our definition is conservative in the sense that it is hard to imagine a state that we classify as being in a fiscal crisis without that state having severe budgetary problems. Some states that do not meet our criteria (e.g. those with very slow revenue growth rates) may still face significant budgetary stress. However, we conduct a sensitivity analysis and show that our qualitative conclusions are not altered when we use a less conservative measure of fiscal crisis.

State resources during and after the 2001 recession

Revenues and tax policy responses

Despite similarities to the previous recession nationally, during the 2001 recession state revenues reacted quite differently. Both recessions lasted about eight months – but unlike the earlier recession where revenues declined, but roughly tracked GDP, revenues in the 2001 recession dropped markedly five quarters after the recession started and stayed depressed (Figure 1). As described in our earlier work (Maag and Merriman 2003), both recessions resulted in significant state fiscal stress. Total tax revenues did not exceed their pre-recession level until the fourth quarter (Oct. to December) of 2004. In the four and one quarter years between the end of the last recession in March 2001 and January 2006 (the latest data available) real total state tax revenues grew only two-thirds as fast as real GDP. State tax revenue’s “failure to thrive” during this period is stunning

because, over the long term (from 1977 to 2001), total tax revenue grew almost 25 percent faster than GDP³.

At least some of the reasons for the lagged downturn in state revenues are well understood. The robust stock market that preceded the recession meant that some taxpayers had accumulated large capital gains. The realization of these capital gains after the economy turned sour provided a flood of income, and perhaps sales tax revenues that offset essentially all of the loss in revenue resulting from diminished economic activity (Sjoquist and Wallace 2003, Jenny 2003). The sharp dip in revenues long after the recession had ended is more puzzling but, as explained in our earlier work, is at least partially attributable to the states' atypical policy response to the recession—in the immediate aftermath of the recession. In FY2002, 12 states legislated personal income tax cuts while only three enacted increases (Figure 2). Similarly, more states enacted cuts than increases in the sales and corporate income taxes. Four states did enact increased excise taxes while none enacted cuts. The story was similar in FY2003 when 12 states again cut personal income taxes and only three increased them. In FY2003 states cutting and increasing the sales tax were equally matched (at eight) but there was a surge in excise tax increases (19 states) with no state legislating excise tax cuts.

In subsequent fiscal years (FY2004 to FY2006) states were almost equally prone to increase or cut the personal income tax (25 legislated increases and 24 legislated cuts) but continued to cut the general sales tax (25 legislated increases and 30 legislated cuts). During this period 39 states legislated excise tax increases while only three legislated cuts. Since the end of the recession legislated tax policy changes have accounted for a

³ Statements in previous paragraph are based on data from FRED <https://research.stlouisfed.org/> and Urban Institute Tax Base <http://www.taxpolicycenter.org/slf-dqs/pages.cfm>.

very small share of the increase in revenue. Tax policy changes probably account for less than \$20 billion of the \$150 billion increase in state tax revenues after December 2001. The tax increases that did occur were overwhelming attributable to increased excise (mostly tobacco) taxes.

Broad tax increases were not avoided because tax systems were robust enough to react to the recession without legislating changes. At the height of the fiscal crisis in 2002, 37 states experienced declining policy-neutral revenues (Figure 3). We did not adjust this calculation for inflation, so the estimate is a conservative estimate, indicative of fiscal stress. In Figure 4 we graph the percentage change in nominal revenue from 1999 to 2000 and from 2001 to 2002. Several states had high rates of growth in 2000 but large declines in 2002 including MN, OR, MA, ID and NE. This turbulence may have made the fiscal crisis of 2002 especially challenging for these states. Only a few states (WV, NY, SD, DE and FL) managed similar rates of revenue growth in 2000 and 2002.

State savings

Savings (or lack of savings) is a key factor that could contribute to a state's willingness to increase taxes in the face of declining revenues. As noted by others, on paper, states appeared ready for the 2001 recession. Figure 5 shows the number of states with various levels of savings as a percent of expenditures from 2001–2006. At the start of the recession, almost two-thirds of states had at least five percent of their expenditures saved in either a rainy day or general fund (Figure 5). This number declined as the recession wore on – but rebounded in 2005 and 2006.

The Impact of State Revenues, Savings and Need on Spending during Fiscal Crises

The other half of a state's budget equation – beyond revenues and savings – is spending. This section links spending and revenues to analyze the role savings played in a state's spending patterns.

Stylized Facts

Rather than increasing taxes – which, most states opted against during the last recession – states could choose to balance budgets by decreasing expenditures. Some basic facts about state spending, revenues, and savings are displayed in Figure 6. The top panel shows actual general fund revenue and expenditures for each year between 1999 and 2006. In the bottom panel we plot state rainy day fund balances and total savings (rainy day fund balances plus other ending balances) at the start of each year between 2000 and 2007. A clear story emerges from these two graphs.

Policy neutral and actual revenues increased much more than expenditures between 1999 and 2000, allowing states to build-up savings and cut taxes. During 2000 revenues again exceeded spending despite net tax cuts (policy-neutral revenues are greater than actual revenues) so that savings was higher at the start of 2001 than it had been in 2000. In 2001 tax cuts intensified and spending increased but actual revenues stayed nearly flat and savings declined. From 2001 to 2002 both policy neutral and actual revenues declined precipitously as expenditures increased slightly. This was paid for by draining a large share of states' remaining savings. By the start of 2003 states' savings had fallen by three-fourths since their peak at the start of 2001. Despite states'

low level of savings at the start of 2003 they were able to maintain spending at almost 2002 levels in 2003 because policy-neutral tax revenues began to rise and tax increases generated additional revenue. In 2004 actual revenues rose a bit, partially because of increased taxes, and expenditures began to rise as states also rebuilt their savings. Expenditures were higher in 2005 than 2004 but revenues rose substantially more and almost none of the increase was due to tax policy change. By the start of 2006, states' savings exceeded their 2001 levels. In 2006 spending and revenues both increased again and states had total savings of about \$50 billion at the start of the 2007 budget year. From this aggregate national data it seems clear that savings provided a cushion that allowed states to maintain spending in 2001 and to continue without massive cuts in nominal spending despite the collapse of revenues in 2002.

Basic Regression Analysis

Next we investigate whether individual states' experience during this fiscal crisis reflected the national data. In particular, all else equal, did states with more savings cut expenditures less than states with less savings? We also wondered whether there was a lingering effect of the 2002 fiscal crisis that was reflected in spending after the crisis ended in 2003 and, if there was such an effect, whether it was attenuated by substantial savings at the start of the recession.

Even after we adjust spending, change in policy neutral revenues, and savings for population and inflation we observe large over-time and cross-state variation in per capita spending, revenues, and saving (Table 1). The recession affected policy neutral revenues rather differently across states. While, on average, per capita policy neutral revenues

increased in every year except 2002, some states experienced significant per capita declines. For example, at the start of the recession in 2001, per capita policy neutral revenues increased an average of \$45. However, one state lost \$123 per capita; while another saw revenues increase \$234 – a difference of over \$300.

Policy neutral revenues and savings may have differing effects on a state's spending patterns, depending on whether the state is in crisis. During non-crisis periods, states may not spend all the revenues available, but instead may choose to save or cut taxes. During times of crisis, states may spend down savings and may spend an increased share of revenues.

We use standard statistical techniques to measure the effect of state saving and changes in policy neutral revenue on the change in state spending. Regression coefficients appear in Table 2. The simplest specification is the first, which suggests that expenditures rise by about 35 cents for each additional dollar of policy-neutral revenue while an additional dollar of savings is associated with spending increases of about 48 cents. Specification 2 generalizes specification 1 by allowing the elasticity of expenditures out of both policy-neutral revenue and savings to be different during periods of “crisis” than in other periods. We find that during ordinary (non-crisis) periods each dollar of policy-neutral revenue is associated with increased spending of only 20 cents but during crisis periods an extra dollar of revenue results in about 80 cents ($= .20 + .60$) of additional spending. Similarly, an additional dollar of savings is associated with 87 cents

(.47 + .40) additional spending during crisis periods but only 47 cents of spending during non-crisis periods⁴.

We study the sensitivity of these results in columns 3 to 6. In columns 3 and 4 we add time and then state fixed effects. Time fixed effects account for the many uniform national factors (e.g. changes in federal tax and expenditure policy) that may alter states' need and desire for spending changes. State fixed effects control for the many state-specific factors (such as population trends and political ideology) that vary little over the short span of years (1999 to 2006) studied here. These controls prove to be relatively unimportant here. Our qualitative conclusions remain unchanged—state spending is much more responsive to savings and changes in revenue during periods of crisis than it is in other periods—and the quantitative results are similar.

Some states adopt budgets every year while others only adopt budgets every second year. Of those that budget every second year nine states (see Table 2) also have a legislature that meets only every other year. Because these states adopt budgets less frequently they may differ systematically in how they react to fiscal stress. To account for this possibility we drop the nine states that have biennial budgets and legislatures from the sample in column 5. In column 6 we also drop 2006 data (which is still preliminary) from the sample. Again our qualitative conclusions are not sensitive to these changes.

Implications

We use these statistical results to better understand what would have happened to state spending during the recession if the states had entered 2001 with no savings. We

⁴ In order to examine the robustness of our results, we reran the regressions in columns 2 through 6 of table 2 with a “fiscal crisis” redefined to be a year in which nominal policy neutral revenue grew less than 2.5

simulate this by predicting spending with observed savings and recalculating what predicted spending would have been if each of the states had enacted tax cuts that would have left them with zero savings at the start of 2001. We assume that states' savings would have stayed at zero for the years 2002 and 2003 and use our regression results (Table 2 specification 4) to simulate what spending would have been in each year from 2001 to 2004. We find that on average, across the states included in our analyses, real per capita spending would have fallen from \$936 in 2000 to \$895 in 2001 if states did not have savings, rather than rising from \$936 to \$948 as it did in the base (observed) case⁵. By 2004 we predict that base case spending falls to \$891, a decline of 4.8 percent since 2000. However, if state savings had been zero at the start of the recession, we find spending would have fallen to \$740, a decline of 21 percent. Our simulations suggest that if states had not had a substantial cushion of savings there might have been draconian cuts in spending.

In Figures 7 and 8 we display the implications of savings for a few illustrative states. In figure 7 we see that simulated 2004 spending in Michigan, New Hampshire and South Dakota is far below both actual spending and the level predicted (assuming observed savings) based on our regression results. However, in New Hampshire and Tennessee predicted and simulated savings are quite similar since savings was relatively small. Figure 8 shows several states with a much higher level of spending. Savings was also important in some of these states (MN and RI) but less so in others (WI, NY and NJ).

percent. The qualitative conclusions were identical to those reported here.

⁵ The "base case" is our prediction of spending based on the observed level of savings and the observed level of policy neutral revenue growth. Although the base case is not equal to observed data in general

Tax capacity and Need

We recognize that changes in spending may be driven by recession-induced changes in the demand for expenditures as well as by changes in resources. Unfortunately, timely, high-quality measures of expenditure demand are scarce. Yilmaz, Hoo, Nagowski, et. al. (2006) provides indices of expenditure need and tax capacity based on average national behaviors. The measures of tax capacity depend upon the tax base in various categories while the measures of expenditure need depend upon the size of the vulnerable population as well as cost differences. It is plausible that both tax capacity and expenditure need are determined exogenously from state expenditures. In Table 3 we present indices of expenditure need and tax capacity by state for 2002 and 1999. The indices are measured relative to the national average so that Oregon's 2002 tax capacity index of 100 indicates that it had exactly the natural average ability to raise tax revenue per capita in 2002. According to these figures in 1999 Oregon had the ability to raise eight percent more revenue than the average in 1999. However, in 2002 Oregon only had 93 percent of the average spending need while it had 100 percent of the average need in 1999.

We try to determine whether states with growing tax capacity and falling need reacted differently to the 2002 fiscal downturn than those that did not. In Table 4 we report estimated parameters from regressions of the change in need and tax capacity indices between 1999 and 2002 on the change in real per capita spending for 38 states. Specification 1 shows that states that had growing tax capacity tended to have smaller expenditure cuts in 2002. Thus, the fall in Oregon's tax capacity index from 1999 to

because of statistical variability, base, observed and simulated spending are constrained to be equal in 2000..

2002 is associated with a decline in spending of about \$26 per capita. Changes in the need index result in no significant change in expenditures in 2002 indicating that states that had a high rate of increase in need did not compensate by raising spending at a relatively rapid rate. We also estimate regressions of the change in the tax capacity and need index against the change in real per capita spending from 1999 to 2002 (specifications 2, 4 and 6). We find that tax capacity continues to have a positive and significant effect. The coefficient on the need index is still negative and, in specification 2, nearly significantly different from zero at the 10 percent confidence level. This suggests that states that had the greatest increase in their need index between 1999 and 2002 had the smallest increase in spending. This is illustrated in Figure 9 which shows that Massachusetts, Rhode Island, New Jersey, Maryland and Ohio had high increases in spending despite almost unchanged relative need, while Tennessee, South Carolina and Mississippi had large increases in relative need but only average changes in spending. The remaining specifications in Table 4 add controls for the 2002 change in policy neutral revenues and level of savings. The basic results remain unchanged although the statistically insignificant coefficient on change in the need index in specification 6 casts some doubt about whether increased need is associated with decreased expenditures or is simply irrelevant to expenditures. We also find that even after controlling for long-term changes in need and tax capacity, the level of savings at the start of 2001 and the change in policy neutral revenue between 2001 and 2002 help explain the change in spending between 2001 and 2002 (specification 5) and the change in spending between 1999 and 2002 (specification 6).

Beyond the recession

It is unclear how long effects of a state fiscal crisis can linger. If a state spends all of its available revenue and exhausts its savings it may have little option but to resort to budget gimmicks such as switching payment years or transferring money between various funds. In such cases, it is possible that a recession in one year could have lingering effects. Balanced budget requirements, on the other hand, could prevent fiscal stress from lingering. States with strong balanced budget requirements might be forced to make hard choices and cut their budgets during lean fiscal times. So long as these cuts do not effect spending in future years, we would not expect a lingering effect of the crisis.

In Table 5 we ask whether the revenue shock a state experienced in 2002 had reverberations in future years. Specification 1 simply regresses the policy-neutral revenue during 2002 and savings at the beginning of 2002 on the change in expenditure from 2001 to 2002. Consistent with our earlier estimates (Tables 2 and 4) we find a positive and significant effect of both variables. In specification 2, 3 and 4 we ask whether the 2002 fiscal situation had an impact on savings in each of the years from 2003 to 2005. It is not clear *a priori* what sign should be expected for these variables in years after 2002. On one hand, a state that had a large revenue shock in 2002 (change in policy neutral revenues is small or negative) might have had to constrain its spending in 2002 (e.g. suspend pay raises for its workers) so that there would be significant pent up demand in 2003. In this case, we might expect that the coefficient on policy-neutral revenue change in 2002 would have a negative coefficient when the change in spending in 2003 (or 2004 or 2005) was the dependent variable. On the other hand, one might expect that a state that had a large revenue shock in 2002 would use all its resources (e.g.

surpluses in ancillary funds might be swept into the general fund) to prop up spending in that year. In future years, the state might try and replenish those funds and thus constrain spending. We find that these two effects balance out so that the change in policy neutral revenue in 2002 has no significant correlation with the spending change in 2003 through 2005.

Analogously, it is not clear how we should expect the level of savings at the start of 2002 to be related to spending changes in 2003 to 2005. It could be positive if 2002 savings allowed states to maintain fiscal balance and continue spending at a normal pace, or it might be negative if states that drained their savings in 2002 tried to replenish it at the first opportunity. This latter story has some support in the data. The level of savings at the start of 2002 does nothing to explain spending changes from 2002 to 2003 when revenues were growing very slowly, it is significantly negatively correlated with spending growth between 2003 and 2004 suggesting states may have been trying to compensate for savings that they expended during the two previous years. With limited data we cannot fully explore the potential impact of other control variables (e.g. the level of policy neutral revenue change in 2003, 2004, etc.) but there is at least weak evidence that post-recession spending increases are diminished as states try to right their fiscal houses.

Conclusion

Nearly universal state balanced budget requirements mean that when revenues decline, as they did following the recession starting in March 2001, states must either act to increase those revenues or cut spending. Starting in the second quarter of 2002, tax revenues fell precipitously for the states – yet, somewhat miraculously, nominal

expenditures remained roughly constant despite the almost absence of tax policy change. When considering only policy-neutral revenue, the revenue a state would have received absent tax changes, 37 states experienced declines in 2002 compared to the prior year. In spite of this rather extreme stress, pre-recession savings allowed states to avoid significant expenditure cuts during this time.

Between 2001 and 2003, states drained three-quarters of their savings, about \$30 billion. At the same time, nominal total expenditures remained roughly constant. In 2002 revenue dropped substantially. During this time of falling revenues, state savings in general funds and rainy day funds played a significant role in propping up spending. We find that states have a significantly increased propensity to spend out of both current revenue and saving during times of fiscal stress. Our simulations suggest that if states did not have savings when they entered the recession real per capita spending would have fallen about 21 percent by 2004 rather than the observed five percent fall.

State spending during the recession increased with savings and other available resources (policy neutral revenue and tax capacity) but appears almost unresponsive to state need. In fact, there is some evidence that states with the biggest increase in need during the fiscal crisis did the least to maintain expenditures. We find that the fiscal crisis had a relatively transitory effect on expenditures. The change in policy-neutral revenues in 2002 does not help explain state expenditures in later years. The level of savings entering the fiscal crisis (at the start of 2002) does not help explain spending changes in 2003 but is negatively correlated with spending increases in 2004. This might be because states that had low levels of savings entering the recession were forced to

curtail spending in 2002 and 2003 and so had high levels of pent up demand for spending in 2004.

As states climbed out of the recession and spending began to increase, so too, did savings. At the start of 2007, balances in rainy day funds equaled those at their peak in 2001 – and when added with general fund savings, exceeded that of 2001 when state savings last peaked.

Our analysis of state fiscal data suggests that states weathered the last recession without severe budget cuts or substantial tax increases because they had accumulated substantial savings that they drew upon to keep nominal spending almost constant between 2001 and 2003. We find little evidence that this three year hiatus in spending growth has caused a post recession spending surge. In fact, it appears that states are replenishing their savings rapidly and may be prepared even if there were another fiscal crisis soon. This generally positive picture is marred by the lack of evidence that growth in state spending rises with growth in an index of state need. We fear that, despite the healthy level of savings in most states, the most vulnerable people in the poorest states may bear the biggest burden during fiscal crises.

Appendix

As explained in the body of the paper, most of the data used in our analysis come from the The Fiscal Survey of States, NASBO (Table A1 various years) and describes the states' general funds. The data for 2006 is the most recent available but is preliminary. Each state defines its own “general fund” according to the accounting rules adopted in that state. The general fund is usually the biggest state government fund but readers

should be cautioned that some major expenditures (such as Medicaid) or revenues may be contained in the general fund of some states but not others. Also, within a particular state expenditures or revenues recorded in the general fund in one year may be moved to a different fund in another year.

This appendix describes the adjustments we have made to the data so that it represents the conceptual variables we seek to describe. First, we put all monetary variables in real (1982-84 dollars) per capita terms.

We use the following notation:

EB=ending balance, BB=beginning balance, REV=revenue, RAJ=revenue adjustments, EXP=expenditures, EA=expenditure adjustment, RDF=rainy day fund at end of year

An accounting identity assures that:

$$(1) EB_t = BB_t + REV_t + RAJ_t - EXP_t - EA_t$$

This implies

$$(2) EXP_t = (BB_t - EB_t) + REV_t + RAJ_t - EA_t$$

According to the notes from table A1 of Fiscal Survey of the States fall 2005 “For all states, unless otherwise noted, transfers into budget stabilization funds are counted as expenditures and transfers from budget stabilization funds are counted as revenues.”

Since we want to measure government expenditures on goods and services we adjust expenditures and revenues as follows:

$$(3) \text{ Adjusted expenditure} = \begin{cases} AEXP_t = EXP_t - (RDF_t - RDF_{t-1}) & \text{if } RDF_t > RDF_{t-1} \\ AEXP_t = EXP_t & \text{else} \end{cases}$$

$$(4) \text{ Adjusted revenue} = \begin{cases} AREV_t = REV_t + (RDF_t - RDF_{t-1}) & \text{if } RDF_t \leq RDF_{t-1} \\ AREV_t = REV_t & \text{else} \end{cases}$$

We use NASBO data (Table A10 various years) to calculate dollar value of 1. Tax increases=TXINC and 2. Tax cuts=TXCUT.

We calculate policy neutral revenue (5) $PNREV_t = AREV_t - TXINC_t + TXCUT_t$

We calculate savings (6) $SAV_t = RDF_t + EB_t$

We estimate the following regression:

$$(7) \Delta AEXP_t = \beta_1 \Delta PNREV_t + \beta_2 SAV_{t-1} + \alpha_i + \gamma_t + \mu_{it}$$

where $\Delta X_t = X_t - X_{t-1}$

α_i is a state-specific fixed effect and γ_t is a time-specific fixed effect.

We define a state as having a fiscal “crisis” (crisis dummy equals 1) when (nominal) policy neutral revenues fall below (nominal) actual revenues (as adjusted) in the previous year⁶.

$$(8) \begin{aligned} CRISIS_DUM_t &= 1 \quad PNREV_t - AREV_{t-1} < 0 \text{ else} \\ CRISIS_DUM_t &= 0 \end{aligned}$$

Throughout the statistical analyses we drop Alaska from the sample because it had extraordinary high saving (due to revenues from oil extraction) and may use a different process than other states for making budgetary choices. We also omit Hawaii in 2000 and Wyoming in 2005 and 2006 because of suspicious data about policy neutral revenue changes or savings. We omit other states and years either because they budget biennially (as explained in the paper) or because of missing data.

We treat Colorado and Illinois as having a zero RDF balance in each year because we view their special funds (which NASBO classifies as RDF) as being inaccessible

during recessionary times. We also treat North Dakota's 2000 RDF as zero for similar reasons.

The methodology for our simulations (Figures 6 and 7) assumes that at the start of 2001 through 2004 states had zero savings. States might have accomplished this, for example by enacting a tax cut in 2000 to distribute their savings. We then simulate what spending would have been in each year with the observed (base case) level of saving and with zero savings using the following equations (i subscript suppressed for notational convenience).

$$(S1) \overline{AEXP}_{2000} = AEXP_{2000} \text{ where } \widetilde{X}_t = \text{simulated value of X in year t and}$$

$$(S2) \overline{AEXP}_{2000+j} = \overline{AEXP}_{2000+j-1} + \overline{\Delta AEXP}_{2000+j} \text{ for } j=1\dots4$$

Our base case simulations are:

$$(S3) \overline{\Delta AEXP}_{2000+j} = \widehat{\beta}_1 \Delta PNREV_{2000+j} + \widehat{\beta}_2 (\text{crisis_dum} * \Delta PNREV_{2000+j}) \\ + \widehat{\beta}_3 \overline{SAV}_{2000+j} + \widehat{\beta}_4 (\text{crisis_dum} * \overline{SAV}_{2000+j}) + \widehat{\alpha}_i + \overline{\gamma}_{2000+j}$$

Simulations in the alternative case simply assume savings is zero, i.e.;

$$(S3) \overline{\Delta AEXP}_{2000+j} = \widehat{\beta}_1 \Delta PNREV_{2000+j} + \widehat{\beta}_2 (\text{crisis_dum} * \Delta PNREV_{2000+j}) \\ + \widehat{\alpha}_i + \overline{\gamma}_{2000+j}$$

References

Douglas, James W. and Ronald Deith Gaddie. 2002. "State Rainy Day Funds and Fiscal Crises: Rainy Day Funds and the 1990-1991 Recession Revisited", Public Budgeting and Finance, Spring.

Gonzalez, Christian and Arik Levinson. 2003. "State Rainy Day Funds and the State Budget Crisis of 2002-?", State Tax Notes, August 11.

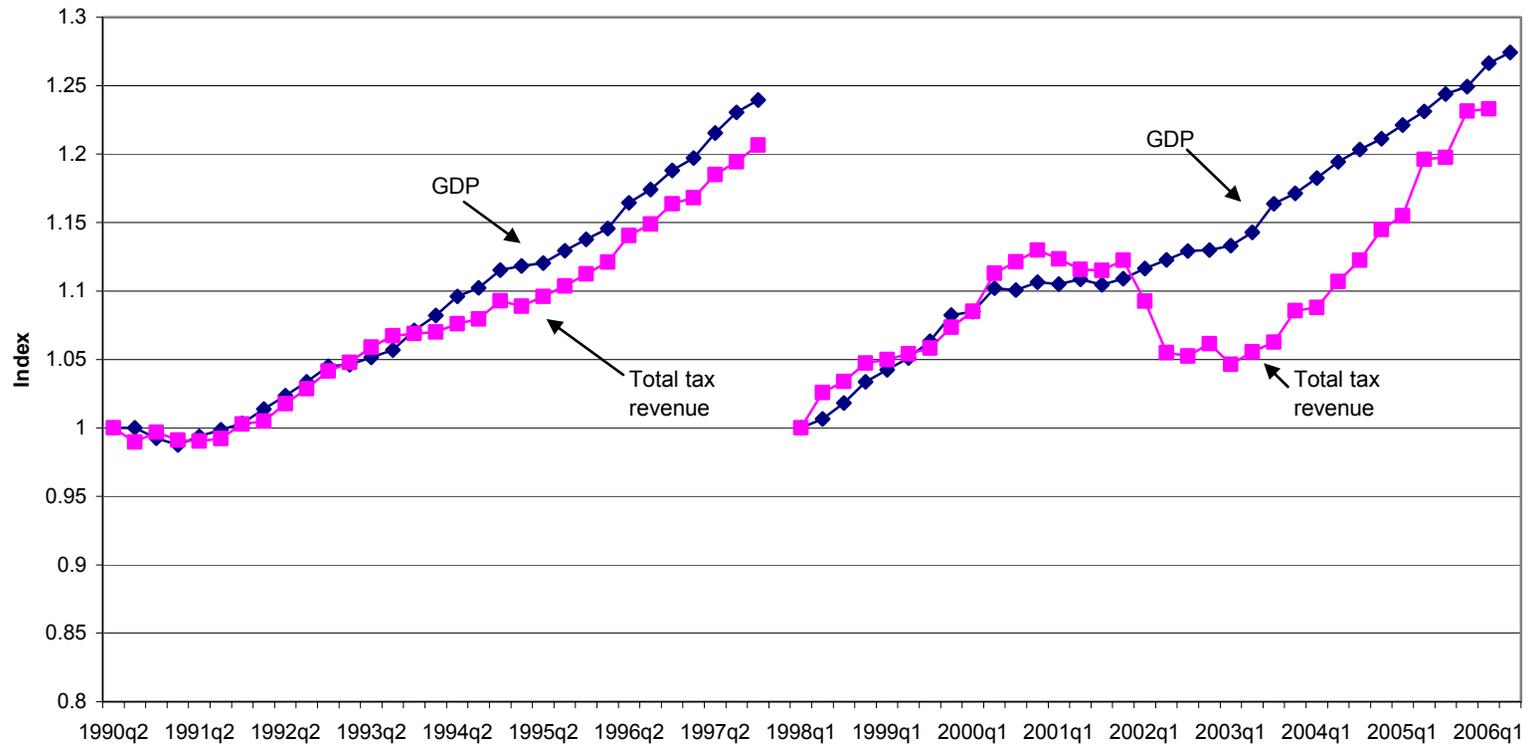
⁶ For equation (8) only we use observed rather than real per capita values because we believe that this best represents a fiscal crisis.

- Jenny, Nicholas. 2003. "Continued Weakness in State Tax Revenue", State Tax Notes, January 13.
- Joyce, Philip G. 1999. "What's so Magical About 5%? A Nationwide Look at the Optimal Size of State Rainy Day Funds", August.
- Maag, Elaine and David Merriman. 2003. "Tax Policy Responses to Revenue Shortfalls", State Tax Notes, August 4.
- Mattoon, Richard. 2003. "Creating a National State Rainy Day Fund: A Modest Proposal to Improve State Fiscal Performance", Federal Reserve Bank of Chicago, WP2003-20.
- McGuire, Therese and David Merriman 2006. "State Spending on Social Assistance Programs Over the Business Cycle," pp. 289-311 in Working and Poor: How Economic and Policy Changes are Affecting Low-Wage Workers edited by Rebecca Blank, Sheldon Danziger and Robert Schoeni. New York: Russell Sage Foundation.
- Poterba, James M. 1994. "State Responses to Fiscal Crises: The Effects of Budgetary Institutions and Politics", Journal of Political Economy, August. [not included in text]
- Rodriguez-Tejedo, Isabel. 2006. "The Determinants of Rainy Day Fund Characteristics", Department of Economics, University of Maryland, College Park. October.
- Sjoquist, David L. and Sally Wallace 2003. "Capital Gains: Tis Recent, Varied, and Growing (?) Impact on State Revenues", State Tax Notes, August 18.
- Sobel, Russell S. and Randall G. Holcombe. 1996. "The Impact of State RDFs in Easing State Fiscal Crises During the 1990-91 Recession", Public Budgeting and Finance, Fall.
- Sobel, Russell S. and Gary A. Wagner. 2003. "Cyclical Variability in State Government Revenue: Can Tax Reform Reduce It?" State Tax Notes, August 25. [not included in text]
- Zahradnik, Bob and Rose Ribeiro. 2003. "Heave Weather: Are State Rauny Day Funds Working?", Center on Budget and Policy Priorities, Washington, DC. May 13.

Figures and Tables

Figure 1

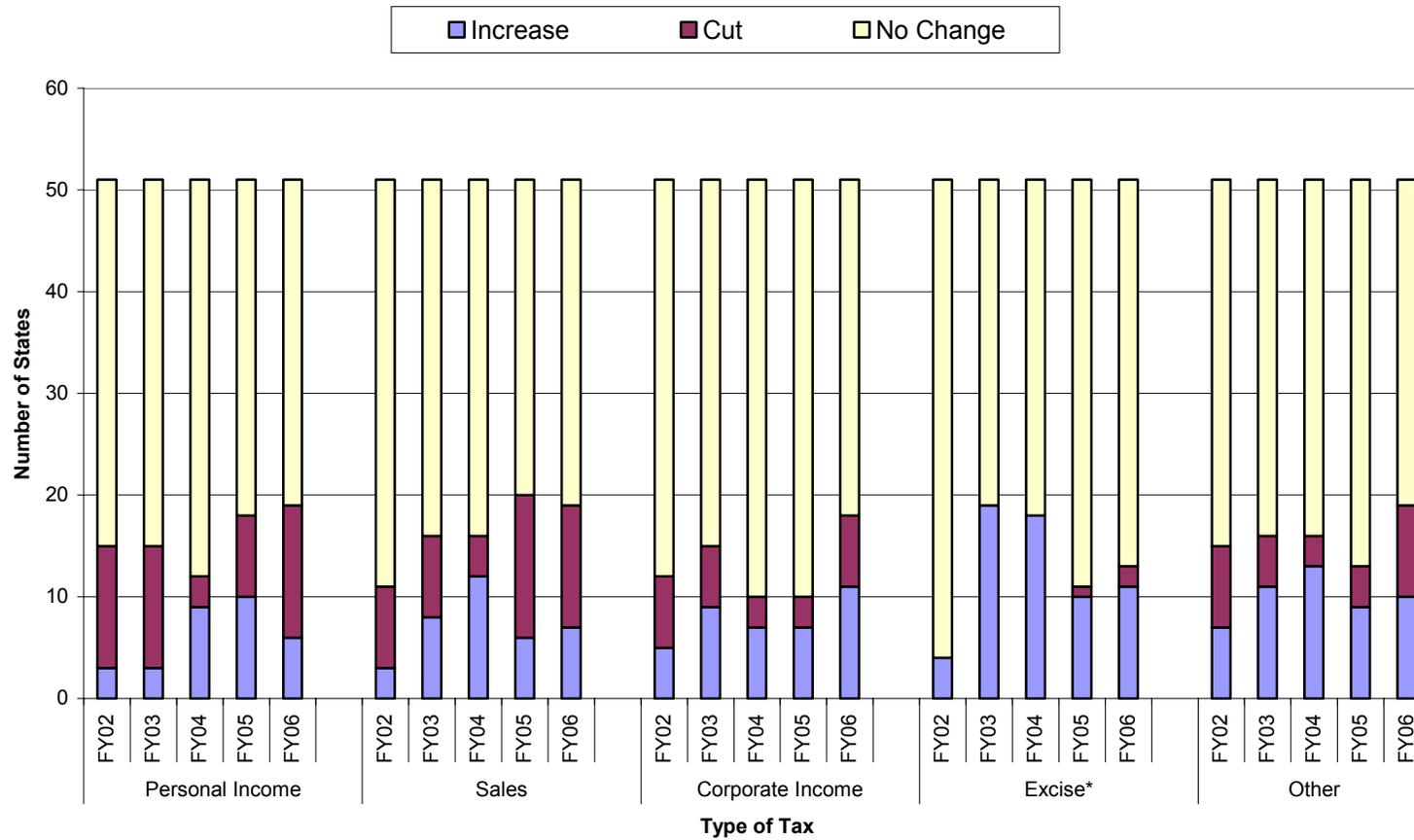
Indices of Real GDP and Real Annualized State Total Tax Revenue in Last Two Recessions



Source: State tax revenue data comes from the Census Bureau. Downloaded on 10/19/06 from <http://ftp2.census.gov/govs/qtax/table2.xls>, available at <http://www.census.gov/govs/www/qtax.html> (Table 2); GDP data comes from the Bureau of Economic Analysis. Downloaded on 10/26/06 from <http://bea.gov/bea/dn/gdplev.xls>, available at <http://bea.gov/bea/dn/home/gdp.htm>.

Figure 2

Net State Tax Changes FY2002 - FY2006



Note: Excise includes taxes on alcoholic beverages, motor fuel, and tobacco.
 Source: NASBO 2001 - 2005.

Figure 3

Number of States Whose Policy Neutral Revenues Declined Each Year

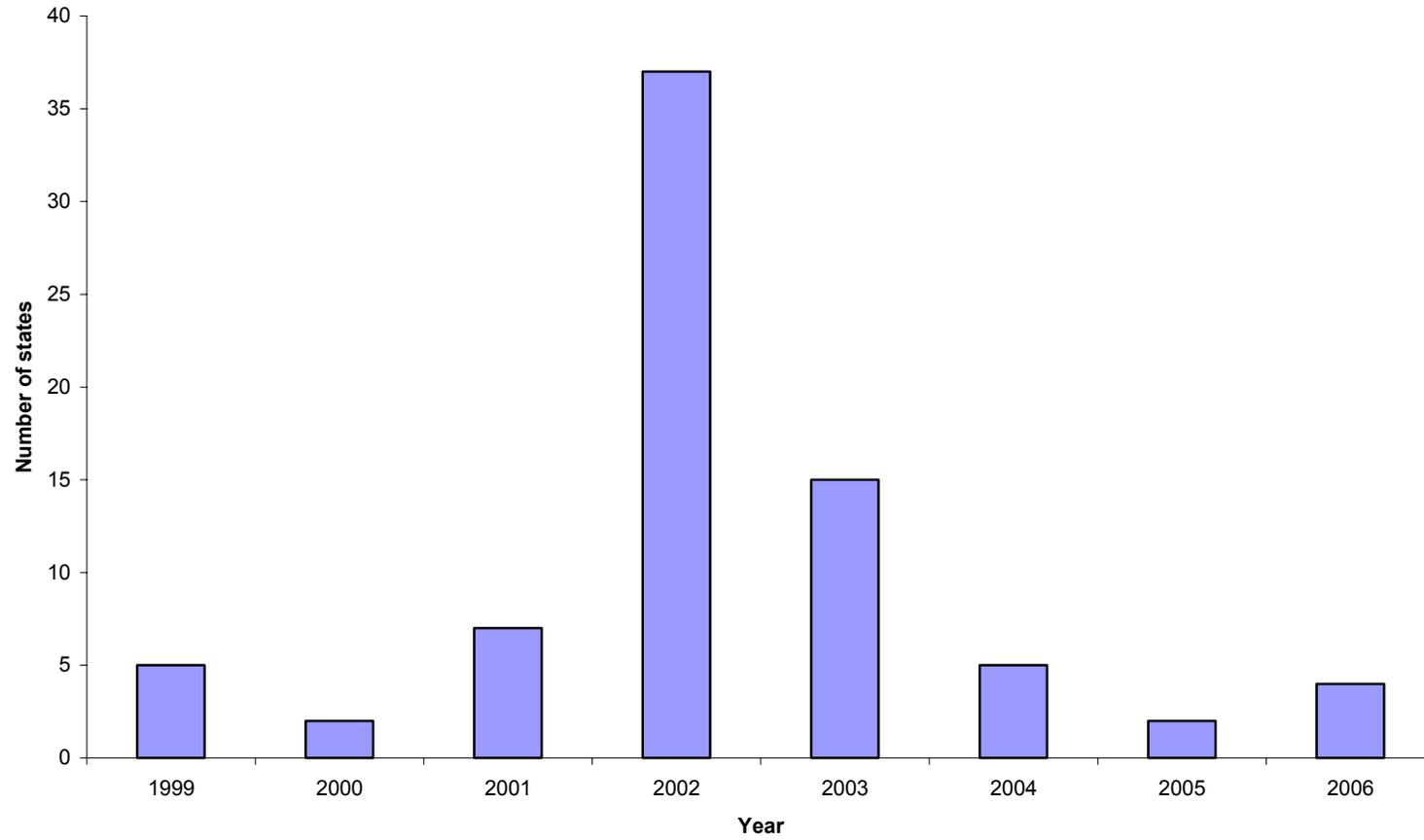


Figure 4
Percent change in nominal revenue 2000 and 2002

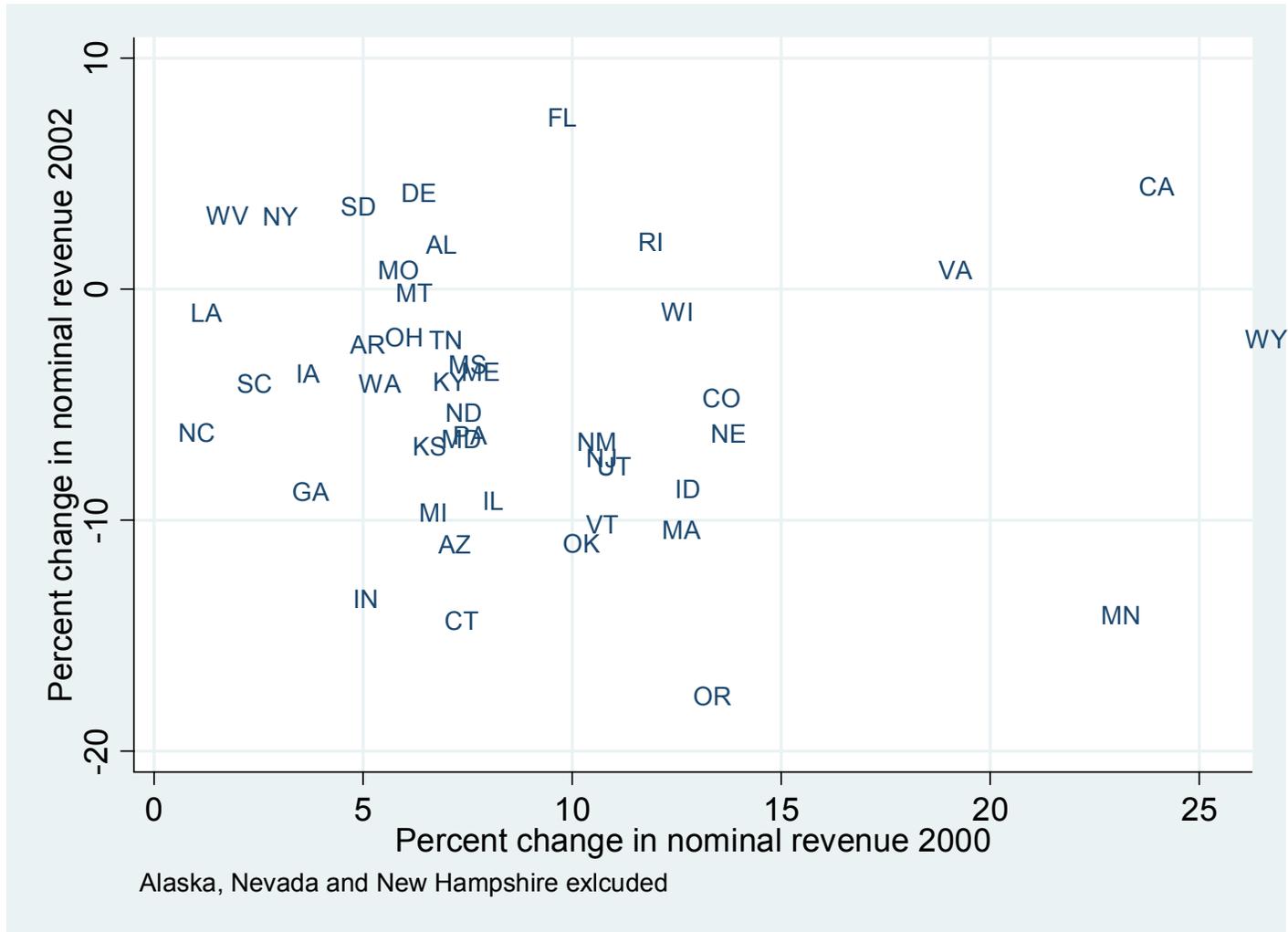


Figure 5

General Fund and Rainy Day Fund Savings as a Percent of Expenditures

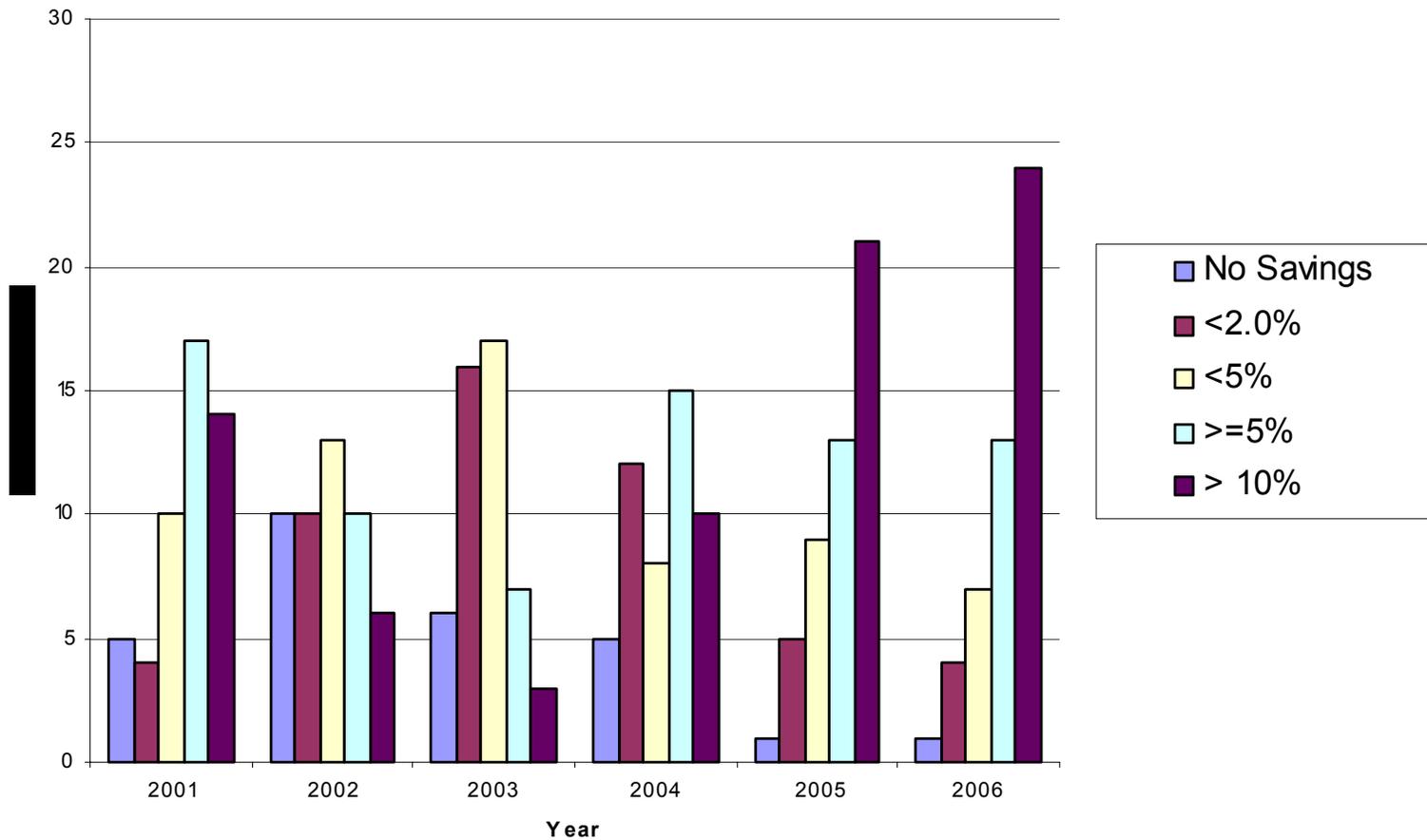
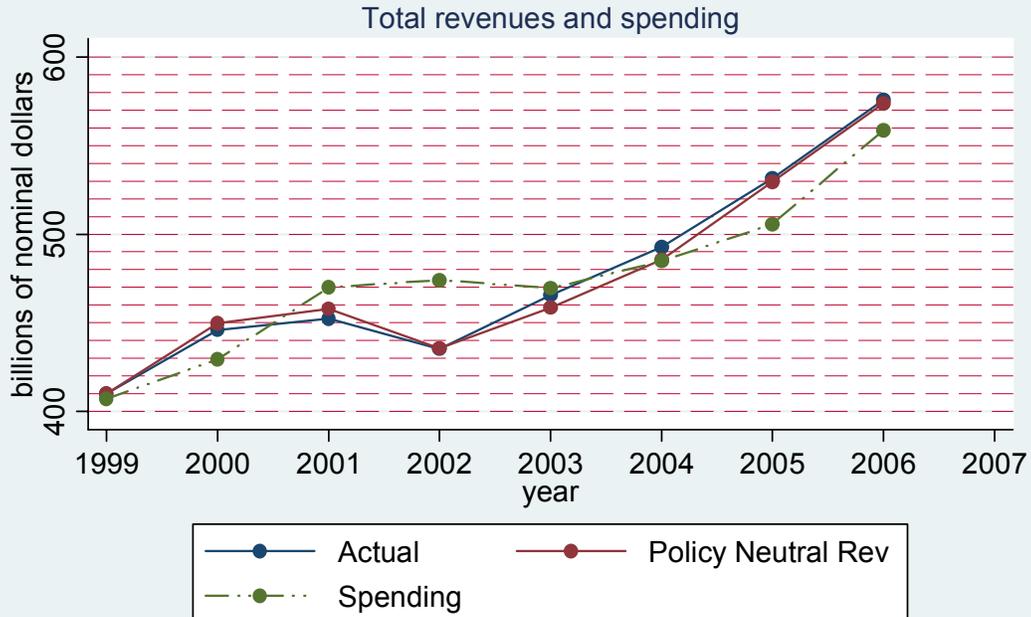
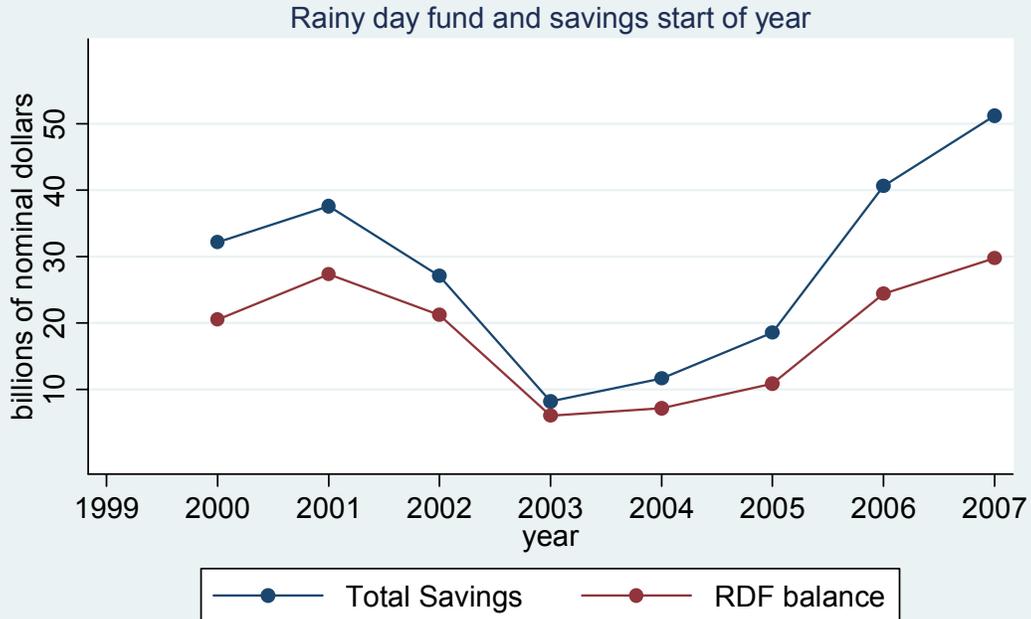


Figure 6



Source: NASBO. 2006 revenues and spending are preliminary actual. All other years are actual. Texas and New Mexico are omitted



Source: NASBO. 2007 rdf and savings are preliminary actual. All other years are actual. Texas and New Mexico are omitted

Table 1

Per capita spending, change in policy neutral revenues, and savings

	N	Mean (SD)	Minimum	Maximum
Per capita spending				
1998	44	874.25 (273.12)	467.01	1762.28
1999	48	914.24 (287.58)	459.26	1863.79
2000	48	914.12 (308.27)	460.62	1881.91
2001	49	960.16 (332.88)	461.27	1961.12
2002	48	953.21 (337.77)	484.06	1970.65
2003	48	917.95 (345.50)	471.51	1893.77
2004	49	907.29 (335.35)	454.67	1874.10
2005	48	936.32 (354.16)	438.18	1950.45
2006	48	978.40 (370.67)	443.77	1996.41
Per capita change in policy neutral revenues				
1999	44	39.36 (36.43)	-83.14	112.30
2000	47	59.54 (98.89)	-470.17	264.39
2001	49	45.52 (63.32)	-123.70	233.84
2002	49	-43.49 (64.97)	-276.65	66.93
2003	48	33.46 (75.79)	-127.54	253.89
2004	48	46.42 (80.13)	-382.22	184.16
2005	48	67.30 (44.08)	-13.57	232.44
2006	48	73.08 (48.23)	-40.18	179.41
Per capita savings				
1998	48	76.07 (54.80)	7.10	235.41
1999	49	78.19 (60.46)	-0.40	324.52
2000	48	79.11 (61.29)	-2.86	298.49
2001	49	62.32 (48.60)	0.00	202.18
2002	48	25.63 (44.22)	-168.49	88.32
2003	49	28.01 (42.49)	-15.14	272.02
2004	49	48.26 (50.74)	-65.34	269.12
2005	48	78.26 (60.07)	0.00	272.96
2006	48	104.01 (73.32)	0.00	303.29

Table 2

Regressions to explain change in spending

Dependent variable is annual change in real capita general fund spending 1999 to 2006						
Variable	1	2	3	4	5	6
change in per capita policy neutral revenue	0.349	0.204	0.183	0.204	0.235	0.138
	0.0395	0.0625	0.0754	0.0785	0.0737	0.0793
	0	0	0.02	0.01	0	0.08
change in per capita policy neutral revenue during "crisis" years		0.597	0.665	0.607	0.36	0.468
		0.1115	0.1272	0.1287	0.15	0.1546
		0	0	0	0.02	0
lagged per capita savings	0.483	0.466	0.656	0.594	0.457	0.434
	0.0525	0.0554	0.0666	0.077	0.0747	0.0826
	0	0	0	0	0	0
lagged per capita savings during "crisis" years		0.40	0.47	0.43	0.42	0.43
		0.12	0.12	0.12	0.13	0.14
		0.00	0.00	0.00	0.00	0.00
legend: b/se/p						
A "crisis" year is one in which nominal policy neutral revenue fell.						
year dummies	no	no	no	yes	yes	yes
state dummies	no	no	yes	yes	yes	yes
adjusted r-squared	0.29	0.35	0.28	0.32	0.28	0.25
N	379	379	379	379	310	271
Excluded states (in addition to AK) by year						
1999	IL,MT,NM, TX,WA	IL,MT,NM, TX,WA	IL,MT,NM, TX,WA	IL,MT,NM, TX,WA	IL, NM,WA & biennial states	IL, NM,WA & biennial states
2000	HI,TX	HI,TX	HI,TX	HI,TX	HI & biennial states	HI & biennial states
2001	HI	HI	HI	HI	HI & biennial states	HI & biennial states
2002	NM	NM	NM	NM	NM & biennial states	NM & biennial states
2003	NM	NM	NM	NM	NM & biennial states	NM & biennial states
2004	NM	NM	NM	NM	NM & biennial states	NM & biennial states
2005	WY	WY	WY	WY	WY & biennial states	WY & biennial states
2006	WY	WY	WY	WY	WY & biennial states	all
biennial states are AR, ME, MT, NV,NC,ND, OR, TX,WI						

For each independent variable we show estimated coefficient, standard error and p value. Shaded coefficients have a p value less than 0.10.

Figure 7
Selected states with low spending

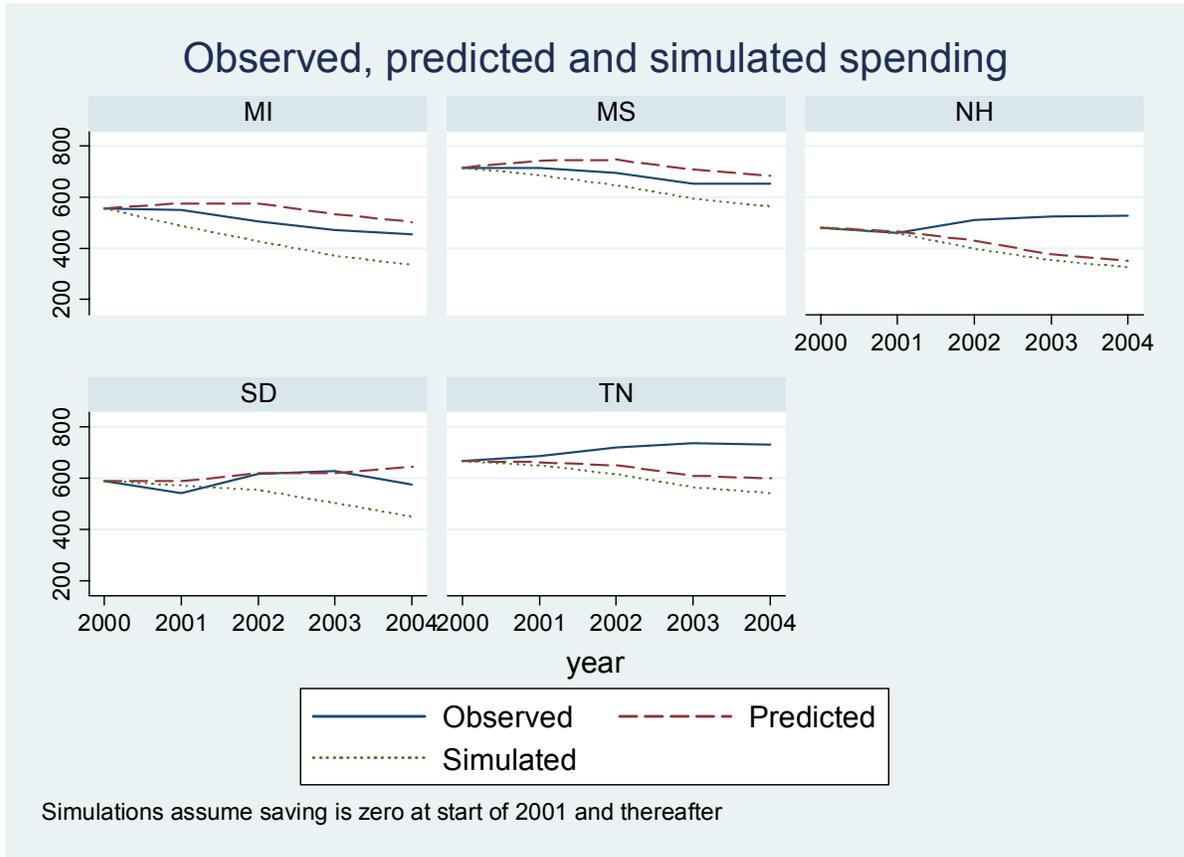


Figure 8
Selected states with high spending

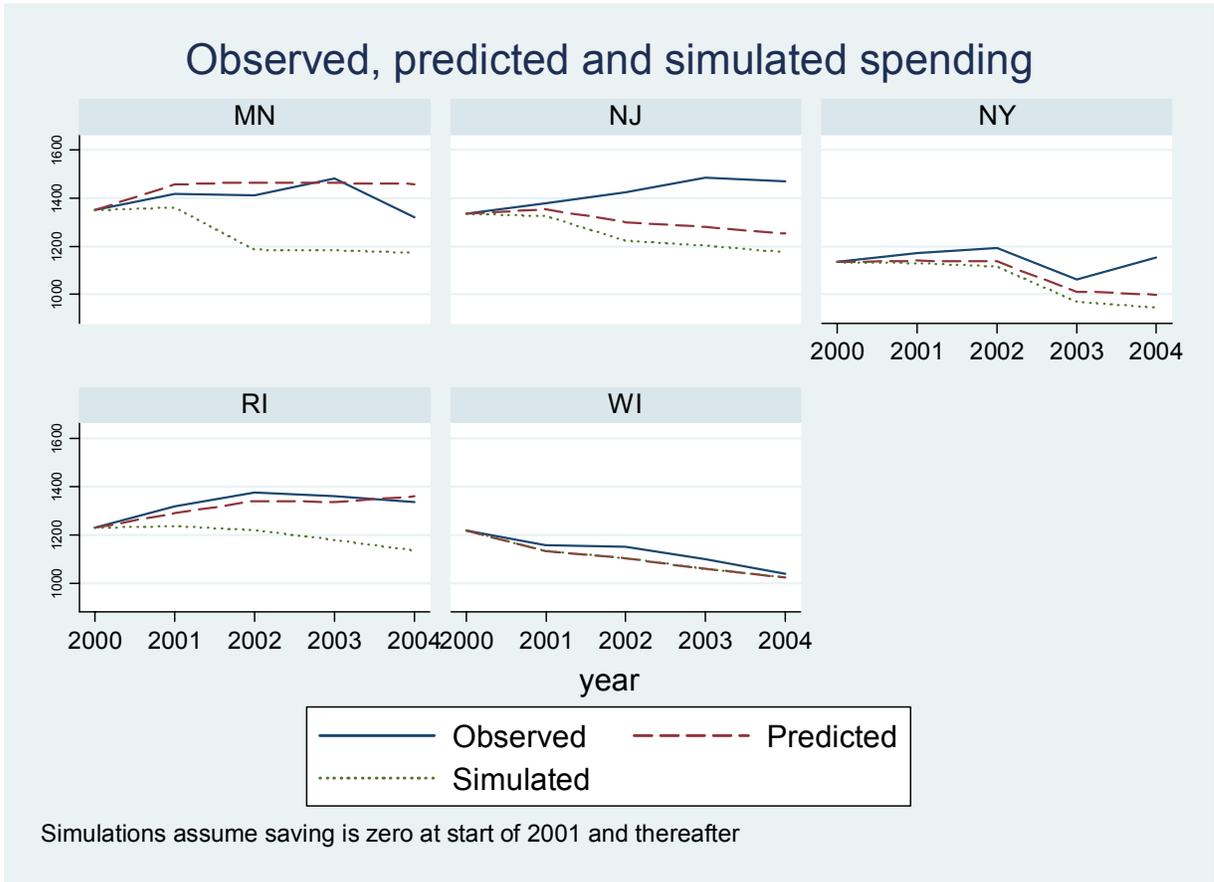


Table 3

Indices of Tax Capacity and Need 2002 and 1999

State	Index of tax capacity			Index of expenditure need		
	2002	1999	change	2002	1999	change
Alabama	82	82	0	108	103	5
Alaska	125	109	16	100	110	-10
Arizona	91	98	-7	102	103	-1
Arkansas	76	81	-5	109	100	9
California	110	111	-1	103	107	-4
Colorado	115	105	10	93	97	-4
Connecticut	130	127	3	96	98	-2
Delaware	129	123	6	93	96	-3
Florida	104	103	1	94	92	2
Georgia	93	98	-5	105	105	0
Hawaii	108	.	.	87	.	.
Idaho	86	84	2	98	102	-4
Illinois	103	104	-1	102	99	3
Indiana	93	94	-1	98	96	2
Iowa	96	96	0	91	90	1
Kansas	90	92	-2	97	98	-1
Kentucky	94	85	9	102	99	3
Louisiana	83	83	0	110	106	4
Maine	95	92	3	93	91	2
Maryland	102	104	-2	95	97	-2
Massachusetts	126	114	12	95	96	-1
Michigan	97	99	-2	104	104	0
Minnesota	110	108	2	92	98	-6
Mississippi	72	74	-2	113	104	9
Missouri	94	93	1	97	96	1
Montana	96	94	2	97	101	-4
Nebraska	96	98	-2	94	96	-2
Nevada	117	129	-12	91	100	-9
New Hampshire	122	114	8	88	93	-5
New Jersey	118	114	4	97	97	0
New Mexico	88	87	1	108	112	-4
New York	111	106	5	101	101	0
North Carolina	93	97	-4	102	100	2
North Dakota	99	96	3	104	102	2
Ohio	93	94	-1	97	98	-1
Oklahoma	82	79	3	101	99	2
Oregon	100	108	-8	93	100	-7
Pennsylvania	92	92	0	93	94	-1
Rhode Island	95	91	4	93	94	-1
South Carolina	83	86	-3	105	98	7
South Dakota	96	96	0	96	95	1
Tennessee	89	92	-3	104	98	6
Texas	90	90	0	107	105	2
Utah	88	90	-2	103	104	-1
Vermont	103	99	4	91	91	0
Virginia	100	102	-2	96	97	-1
Washington	104	110	-6	96	97	-1
West Virginia	74	72	2	104	99	5
Wisconsin	96	96	0	93	94	-1
Wyoming	123	111	12	98	102	-4

Table 4

Regressions on change in spending 2001 to 2002 and 1999 to 2002

Variable	change in real per capita spending					
	2001 to 2002	1999 to 2002	2001 to 2002	1999 to 2002	2001 to 2002	1999 to 2002
change in index of tax capacity 1999 to 2002	3.23	5.35	3.25	5.36	3.25	5.35
	1.79	2.64	1.81	2.68	1.61	2.39
	0.08	0.05	0.08	0.05	0.05	0.03
change in index of expenditure need 1999 to 2002						
	-0.53	-5.99	-0.75	-6.15	2.03	-2.10
	2.44	3.60	2.52	3.73	2.41	3.57
	0.83	0.10	0.77	0.11	0.41	0.56
change in real per capita policy neutral revenue 2001 to 2002						
			0.05	0.03	0.22	0.28
			0.12	0.17	0.12	0.17
			0.68	0.85	0.07	0.11
real per capita savings end of 2001						
					0.601	0.879
					0.189	0.2805
					0	0
legend: b/se/p						
adjusted r-squared	0.05	0.18	0.03	0.15	0.23	0.33
N	38	38	38	38	38	38
Excluded states (in addition to AK)	NM, HI & biennial states	NM, HI & biennial states	NM, HI & biennial states	NM, HI & biennial states	NM, HI & biennial states	NM, HI & biennial states
	biennial states are AR, ME, MT, NV, NC, ND, OR, TX, WI					

For each independent variable we show estimated coefficient, standard error and p value. Shaded coefficients have a p value less than 0.10.

Figure 9

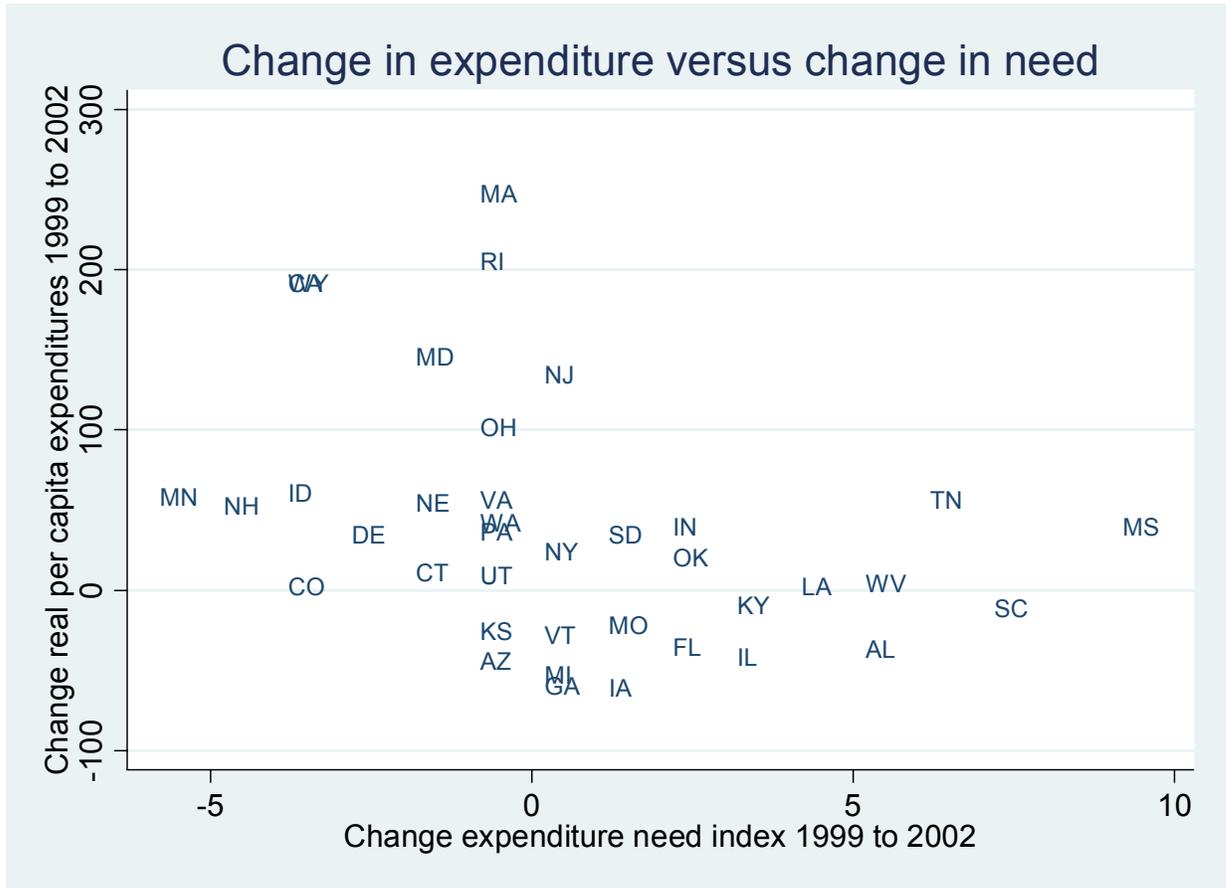


Table 5

Regression on yearly spending change 2002 to 2005

Dependent variable is change in real capita general fund spending				
Variable	2002	2003	2004	2005
change in real per capita policy neutral revenue in 2002	0.23	-0.16	0.00	-0.04
	0.11	0.15	0.11	0.13
	0.05	0.29	0.97	0.79
real per capita savings end of 2001	0.61	0.00	-0.44	0.17
	0.16	0.21	0.16	0.19
	0.00	0.99	0.01	0.37
legend: b/se/p				
adjusted r-squared	0.25	-0.02	0.15	-0.02
N	39	39	39	39
Excluded states (in addition to AK)	NM & biennial states			
biennial states are AR, ME, MT, NV,NC,ND, OR, TX,WI				

For each independent variable we show estimated coefficient, standard error and p value. Shaded coefficients have a p value less than 0.10.