Tax or Cut? The Role of Rainy Day Funds in State Budgetary Responses to Fiscal Crises

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Abstract

This study examines the degree to which state rainy day fund balances affect budgetary responses to fiscal crises. Rainy day funds help states close budget deficits, but they also impact how states choose to close deficits through either tax or spending adjustments. By understanding the funds' impact on deficit reduction, states can plan for budgetary responses that meet local economic conditions and fiscal policy preferences. While research has traditionally analyzed the degree to which rainy day funds alleviate budgetary shortfalls, this study examines the effect of rainy day fund balances on the decision to either raise taxes or cut spending to close a shortfall. Using a regression of panel data from 2000-2003, this study considers the impact of rainy day fund balances compared to political and institutional influences on fiscal policy decisions. This study finds that with a given deficit, higher rainy day fund balances are associated with higher tax increases but have no effect on spending. The results suggest that states with high fund balances prioritize stable revenue streams during crises and are less likely to cut services to maintain fiscal balance. By prioritizing revenue, states with high rainy day fund balances are more likely to protect individuals who rely on government services during fiscal crises.

Introduction: Research Area, Topic, and Purpose

While economic and political differences exist across states, these "laboratories of democracy" share a common framework of governance that allows for policy comparisons (Gold 1993). This study examines the determinants of state policy decisions in response to fiscal crises, when states face a significant unexpected imbalance between revenues and expenditures (Gold 1993). All but a few states are required by constitution or statute to balance their budgets each year. While states typically have reserves in rainy day funds saved from prosperous economic years, rainy day fund balances are typically not sufficient in severe crises and spending cuts or tax increases are necessary. However, little is known about what determines the balance

of tax increases and spending cuts. These decisions have significant implications for broad segments of society, particularly those who rely on social services on a regular basis. The decisions also have economic implications through reduction of government investment in the economy and the reduction of available income through tax increases.

When a state uses tax increases or spending cuts to close a deficit, what determines the balance of tax increases and spending cuts? More specifically, will the size of the rainy day fund influence the decision to tax or cut spending? A wide range of political and institutional factors influence state budgetary outcomes, particularly during times of fiscal crisis. This study adds to the literature on the determinants of taxation and expenditure decisions after a fiscal crisis by examining the influence of state rainy day funds. Rainy day funds, or budget stabilization funds, are accounts that permit state governments to save for unexpected revenue shortfalls (Rose 2008). Rainy day funds were first developed in many states after the recession of the early 1980s, when most states were forced to make painful spending cuts or raise taxes (Douglas and Gaddie 2002). These funds reduce the need for drastic changes in fiscal policy during an economic downturn, and most of the scholarship on the funds focuses on this interaction. However, by reducing fiscal stress, rainy day funds change the conditions of fiscal policy decision-making. This study examines the impact of rainy day funds on the decision to raise taxes or cut spending following the fiscal crisis of 2001-2002.

The 2001-2002 crisis was chosen for this study because it was the first crisis when almost all states (46) had rainy day funds compared to 36 states with rainy day funds in 1991 and just 12 in 1981. In addition to the growing prevalence of rainy day funds, balances greatly increased during the economic boom of the 1990s leading up to the 2001-2002 crisis. States had time to accumulate fund balances greater than five percent of expenditures, the recommended figure

from the National Conference of State Legislatures (Figure 1). When most states had rainy day funds for the first time and when states had time to accumulate significant rainy day funds, how did the funds affect fiscal responses? The study goes beyond an update literature on rainy day funds by suggesting new ways in which rainy day funds may influence fiscal policy in recent crises.

Literature Review

Developing a Theoretical Model for State Taxation and Expenditures

Various theories of public choice have been the basis for state fiscal policy decisions, but these theories tend to de-emphasize the importance of institutions such as rainy day funds. Much of the literature on state taxation and expenditure decisions relies on the median voter theorem established by Black (1948). In the median voter theorem, any voting group will ultimately adopt the position of the median voter. Downs (1957) expanded the theorem to elections in representative democracy. In Downs' model, a competitive electoral system yields a government that holds the policy positions of the median voter in society, given a unidimensional policy space. Borcherding and Deacon (1972) create a model of public finance based on the median voter theorem. In their model, the elected government will adopt the optimal expenditure-taxation balance of the median voter (Borcherding and Deacon 1972). The median voter "chooses the level of spending by voting for candidates who offer him the most efficient set of public services and taxes" (Borcherding and Deacon 1972, 892). Consequently, candidates aim to strike a balance between the median voter's marginal cost of taxes and marginal benefit of government services (Borcherding and Deacon 1972). Studies using this long-standing model have examined the role of state economic characteristics, political factors, and institutional variables in explaining the demand for government services (Crain and Miller 1990, Elder 1992, and Poterba 1994). However, the median voter theorem has serious shortcomings, and the model

fails to explain the reality of fiscal policy decision-making. In practice, legislators often do not adopt the position of the median voter because of information asymmetries, interest groups, and economic factors. Institutions and rules are often adapted to limit the impact of these factors on policy, and the median voter theorem downplays the importance both these external factors and the institutional response.

The median voter theorem falls short on fiscal responsibility, as research shows that voters favor fiscal responsibility more than state legislators (Peltzman 1992). The problem stems from information asymmetries. Buchanan and Wagner (1977) agree with median voter theorists that political competition determines fiscal policy outcomes. However, they also argue that voter perception of government as inexpensive or even free (because of fiscal illusion and hidden or delayed costs) leads politicians to increase spending and deficits contrary to voter preferences. Similar to the median voter theory, politicians attempt to maximize votes, but here vote maximization occurs through an increase in the size of government based on voter misperceptions (Rose 2010).   The increase in government does have an upper limit, as research shows that close elections curb the degree of spending increases (Rogers and Rogers 2000). Nonetheless, politicians maximize votes by appealing to misperceptions of a substantial number of voters that may or may not align with the median voter's policies.

The median voter theorem also does not consider the important influence of interest groups and campaign finance. Mueller and Murrell (1986) establish an interest group model that attributes growth in government to spending favors for interest groups. Politicians must balance the demands of voters and interest groups, and some research suggests the interest groups have more influence than voters because of organization and financial advantages (Mueller and Murrell 1986, Rose 2010).

Barro (1979) also demonstrates the absence of economic criteria in the median voter theorem and presents an alternative economic model. Barro's model is based on the Ricardian invariance or equivalence theorem, which assumes no difference in the economic impact of tax increases and debt. The model then establishes a framework for determining the optimal level of deficits based on the economic limits of taxation (Barro 1979). Decisions based on the economic limits of taxation may not necessarily reflect the position of the median voter in society.

Lastly, the median voter theorem does not consider the importance of institutions. When the political reality presents information asymmetries, interest groups and economic criteria, institutions may be necessary to align voter preferences with policy (Rose 2010). Institutions such as rainy day funds, balanced-budget requirements, and tax and expenditure limits are attempts by some states to curb external influences (Rose 2010). Many institutions, particularly tax and expenditure limits, are initiated or even passed by the voters in what may be viewed as an attempt to reclaim the power of the median voter. Other institutions are passed by legislators who may be voting against their own interests in tax cuts or more spending for the greater good of a fiscally responsible government, so as long as all legislators must follow the same rules (Rose 2010). Ultimately, one theory cannot explain fiscal policy decisions. However, it is evident that a wide range of factors determines fiscal policy decisions and the importance of institutions has been undervalued in fiscal policy theory. The goal of this paper is to examine how one institution designed to promote fiscal responsibility, the rainy day fund, affects state policy responses to fiscal crises.

Fiscal Crises

Gold (1993) defines a fiscal crisis as a "significant prospective imbalance between revenues and expenditures" (Gold 1993, 43). A short-term crisis is characterized by a deficit in

the current fiscal year, while a long-term crisis is a structural imbalance where tax levels are not

enough to sustain long-term spending trends (Gold 1993). Researchers have historically relied

on state total year-end balances as a percentage of expenditures to identify fiscal crises. The

literature has examined the crises of 1981-1982, 1990-1991, 2001-2002, and 2007-2009,

identified by the decline in year-end balances in Figure 1.

Figure 1. State General Fund and Rainy Day Fund Balances, FY1988-2011
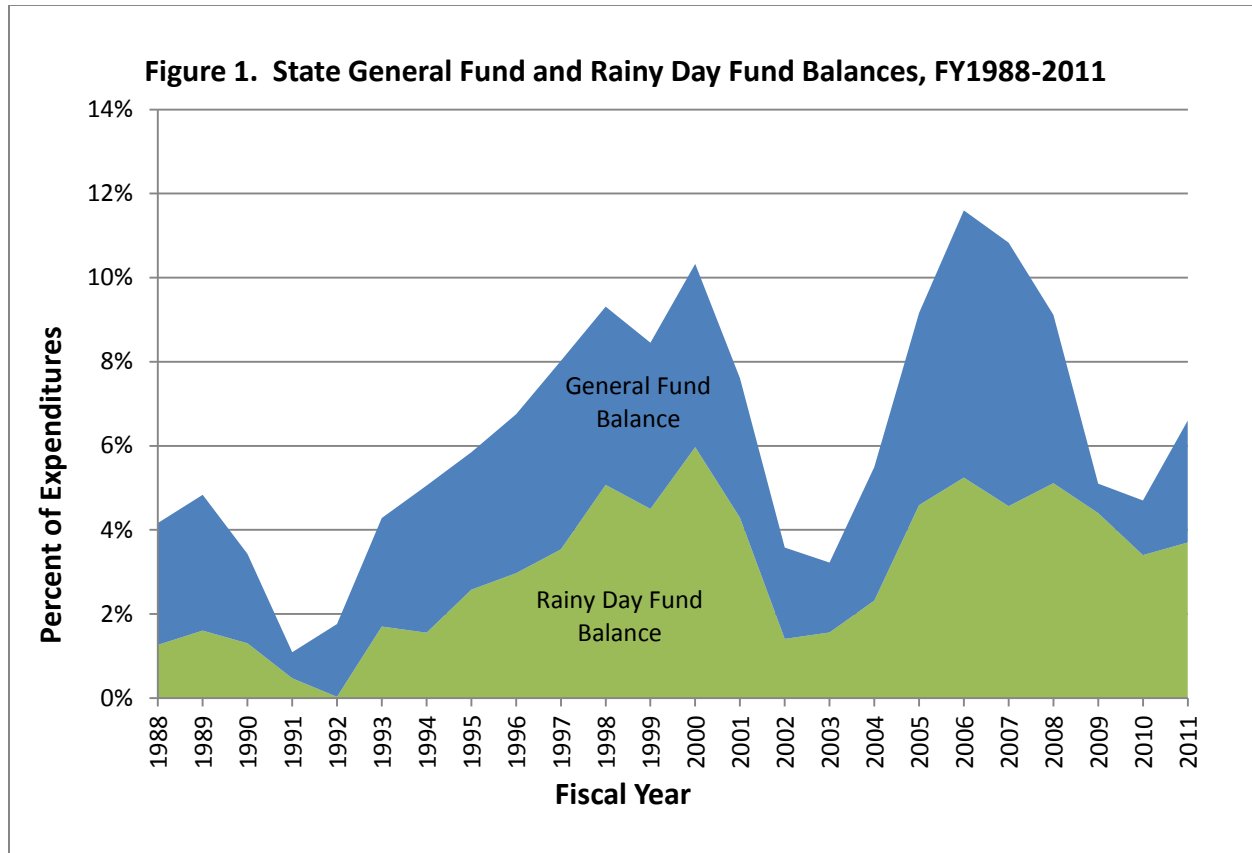
Source: National Association of State Budget Officers, *Fiscal Survey of the States*, 1988-2001.

States can respond primarily to short-term crises with spending cuts, tax increases, or

gimmickry (Gold 1993). Such gimmicks include a wide-range of typically one-time options,

including borrowing, reliance on general fund balances, and cosmetic changes (Poterba 1994).

Cosmetic changes include accounting adjustments and modifications to baseline assumptions for

long-term expenditures, especially pension systems (Poterba 1994). During crises, these one-

time options do rarely close state deficits entirely, and states are often forced to change taxes or spending in a crisis.

The literature proposes different measures of fiscal stress that can be used to determine times of fiscal crisis. In the literature associating rainy day funds and the relief of fiscal stress, fiscal stress is measured by the aggregate size of the adjustment in taxes and expenditures from long-term trends as a percentage of state expenditures (Sobel and Holcombe 1996, Douglas and Gaddie 2002). However, in the literature on the state responses to fiscal stress, a measure of deficit shock is used to represent fiscal stress (Poterba 1994, Alt and Lowry 1994). A deficit shock is an unforeseen change in revenue or expenditure and reflects a change within one fiscal year. The "shock" measure of stress is necessary in these studies because adjustments in taxes and expenditures are the *dependent* variable and cannot serve as independent variables. Furthermore, the simple adjustments in taxes and expenditures do not fully measure fiscal stress, as part of state gaps are closed by other means such as gimmicks. A shock indicator more accurately reflects the prospective deficits states face.

Rainy Day Funds and Fiscal Crises

Studies suggest that state rainy day funds, formally called budget stabilization funds, have an important role in determining how much states are forced to cut spending or increase taxes. States traditionally relied on general fund surpluses to save for financial uncertainties, but tax and expenditure limits in the 1970s severely restricted general fund surpluses (Hou 2006). After states faced the 1980-1981 crisis with limited general fund surpluses, many states implemented rainy day funds in the 1980s (Sobel and Holcombe 1996). Many of the funds have limits on contributions and require a shortfall for withdrawal (Hou 2006). The fiscal crisis of the early 1990s was the first major test of state rainy day funds. Early studies of state responses to

the crisis examined rainy day funds balances and their role in alleviating state fiscal conditions (Gold 1993). However, later studies expanded these findings to show that rainy day funds impact both state fiscal conditions and state responses to poor fiscal conditions (Sobel and Holcombe 1996).

Sobel and Holcombe (1996) find that the presence of a rainy day fund had no significant impact on fiscal stress during the 1990-1991 fiscal crisis. However, rainy day funds did have a significant effect in states that were required to make contributions. Sobel and Holcombe (1996) define fiscal stress as the level of tax increases and spending cuts following a recession, in contrast with the state response literature, which defines fiscal stress as the unexpected shock to revenues and expenditures (Poterba 1994). Withdrawal limits did not have a significant effect on fiscal stress (Sobel and Holcombe 1996). Sobel and Holcombe (1996) also find that rainy day funds cannot entirely prevent spending cuts and tax increases. Their study predicts that states would have needed to save 30 percent of expenditures in a rainy day fund in order to avoid policy changes during the 1990-1991 recession (Sobel and Holcombe 1996). While 30 percent is not a recommended or practical level of funding (typically around 5 percent), the study demonstrates that properly constructed rainy day funds can help to alleviate fiscal stress in the states. When states have mandatory requirements, they are better prepared to weather fiscal crises.

In addition to examining the effect of rainy day funds on the total spending and taxation response (fiscal stress), Sobel and Holcombe (1996) examine the relationship between rainy day funds and the *decision* to either cut spending or raise taxes. Sobel and Holcombe (1996) also find that states with rainy day funds are more likely to cut spending than increase taxes than states that do not have a fund (Sobel and Holcombe 1996). Sobel and Holcombe (1996) do not

test the size of a rainy day fund and offer only a brief explanation. The authors speculate that states with rainy day funds created the funds specifically to avoid tax increases. These findings suggest that the presence of rainy day funds influences the nature of fiscal policy responses to crisis.

To explain why rainy day funds would impact taxation and expenditure, it may be useful to examine why states contribute to the funds beyond statutory requirements. Hou (2004) finds that rainy day fund balances increase when the executive and the legislature are controlled by opposing parties. Hou (2004) also finds that when isolating party effect of the legislature, states with Democratic legislatures had lower rainy day fund balances. These findings suggest that the both the division of power and party control influence rainy day fund balances. When considering Alt and Lowry's (1994) findings that these same political variables influence state responses to fiscal crises, division of power and party control may be influencing the relationship between rainy day fund balances and state responses.

Hou (2004) also analyzes the impact of balanced budget requirements on rainy day fund balances. Hou (2004) finds that rainy day fund balances are higher when legislatures are required to pass a balanced budget, but the relationship is not significant when governors are required to sign a balanced budget. While this discrepancy compels future research, the findings suggest that balanced budget requirements have an impact on rainy day fund balances. Given Poterba's (1994) results that balanced budget requirements also increase the reliance on spending cuts following a crisis, the literature suggests that balanced budget requirements may be influencing the relationship between rainy day fund balances and state responses. Both party control and balanced-budget requirements may be useful in explaining the relationship between rainy day funds and fiscal policy decisions following the 2001-2002 crisis.

While there are possible interaction effects between politics, balanced budget requirements, rainy day funds, and state fiscal decisions, this study predicts a unique impact for rainy day funds. Sobel and Holcombe (1996) suspect that political leaders created rainy day funds to avoid tax increases. Rainy day funds were created under pressures from the tax revolts of the 1970s (Hou 2004). In several states a large surplus provoked taxpayers to demand a refund, and states needed a legal way to keep reserve funds. The tipping point occurred during the 1981-1982 recession, when many states had to cut deeply into spending due to tax limits (Gold 1993). States responded by creating rainy day funds to cover deficits created by crises and to avoid tax increases (Sobel and Holcombe 1996). From 1982 to 1990, the number of states with rainy day funds more than tripled, from 12 to 38 (Sobel and Holcombe 1996). Given that taxpayers demanded a tax refund from high surplus balances before rainy day funds, history suggests that taxpayers will have a low tolerance for tax increases with a high rainy day fund balance.

Hypothesis 1: *States with higher rainy day fund balances will rely more on spending cuts to close deficits than states with lower rainy day fund balances.*

Hypothesis 2: *States with higher rainy day fund balances will rely less on tax increases to close deficits than states with lower rainy day fund balances.*

Establishing a Theoretical Framework: Politics and Fiscal Policy

A study of rainy day funds and fiscal policy must consider the wide range of other factors that influence fiscal policy. From the literature on politics, Gold (1993) shows that tax increases are higher in odd-numbered years, suggesting that tax increases are higher in the year following gubernatorial elections. Rogers and Rogers (2000) present evidence that close gubernatorial elections are correlated with lower spending and Alt and Lowry (1994) find that divided

governments hold down levels of spending and taxation. From these studies, state fiscal decisions are clearly influenced by the level of political competition.

Merrifield (2000) examines a wide range of tax and expenditure determinants including political parties, legislative characteristics, and election variables. For parties, a higher percentage of Democrats in the legislature and a Democratic governor are associated with higher spending and taxation (Merrifield 2000).   Merrifield (2000) also finds that voter turnout and spending and taxation levels have a significant positive relationship, while states that can vote for initiatives have lower spending and taxation levels (Merrifield 2000).   Merrifield's study demonstrates the complex array of political factors that affect fiscal policy decisions.

Institutions Matter

Institutions also affect fiscal policy outcomes and become particularly important in determining a state's options during crises. Poterba (1996) criticizes the view that institutional rules restricting deficits, taxes, or spending have no impact on budgetary outcomes. Poterba (1994) and Alt and Lowry (1994) demonstrate that state balanced budget rules impact state responses to unexpected deficits. Bohn and Inman (1995) present evidence that strict balanced-budget requirements reduce deficits by an average of $100 per capita. Bohn and Inman's (1995) findings are significant because balanced-budget rules are important whether or not the state faces a fiscal crisis characterized by a large unexpected deficit. Crain and Miller (1990) provide evidence that states with tax limits had lower tax increases than states without limits between 1979 and 1986. Furthermore, Kiewiet and Szakaly (1996) show that states that require public approval of debt through referendum have less debt. Like previous literature, this study considers the effect of both political party and institutional balanced-budget requirements on fiscal policy outcomes in response to a crisis.

Poterba (1994) found that tax limits in the states restricted tax growth, but spending limits had no effect on spending growth. The results for taxation limits are consistent with Crain and Miller's (1990) findings for the period 1979 to 1986. Schunk and Woodward (2005) note that the literature is divided over the effect of tax and expenditure limits (TELs) on fiscal policy. Divisions arise because of the complexity of quantifying TELs and the diverse nature of TELs. Many TELs are not strict caps but rather institutional rules. For example, in 2002 twelve states required more than a majority in the legislature (typically 2/3 or 3/4) to pass a tax increase (National Association of State Budget Officers 2002a). The diversity of TEL structures makes these limits difficult to quantify, and this diversity has resulted in state-specific impacts on fiscal policy (Schunk and Woodward 2005).

State Responses to Fiscal Crises: A Closer Look at 1990-1991

A body of literature has examined fiscal policy solely during times of crisis, and much of this research has been conducted on the 1990-1991 crisis. This crisis was the last one before the 2001-2002 crisis of interest in this study and serves as the model for analysis of the 2001-2002 crisis. Between 1989 and 1992, there was a considerable decline in the state year-end balances, which indicated the declining fiscal condition of the states (Gold 1993). States show high variation in fiscal condition, and conditions fluctuate greatly from year to year (Gold 1993). In a study on the fiscal crisis of 1990-1991, Gold (1993) finds that taxes increased as in previous recessions. Tax increases were larger in states that were hit harder by the recession than states with high spending increases during the 1980s, a finding echoed by Blackley and DeBoer (1993). Gold (1993) also found that states with unbalanced tax systems (lacking either a sales tax or a personal income tax) were more likely to enact a major tax increase in response to the recession. States with balanced tax systems are more financially stable and less likely to implement a

significant tax increase in any one area of taxation. This finding suggests that the cause of the

crisis can determine the taxation response. Gold (1993) also explains changes in spending

during the crisis of the early 1990s.   The recession and federal policies caused welfare and

Medicaid spending to increase. Corrections spending also increased. In response, states cut

welfare benefits and education funding (Gold 1993).   From this research, it is evident that states

face deficit pressures both from falling revenues and spending increases largely beyond the

states' control. Furthermore, the causes of the deficit and institutional factors such as the tax

structure impacted how states responded to the 1990-1991 crisis.

Alt and Lowry (1994) analyze the political and institutional influences on state responses

to deficit shocks using data from 1968 to 1987. According to Alt and Lowry (1994), unified

governments exist when one party controls the legislative and executive branches. In divided

government, power is split either between the houses of the legislature or between the legislature

and the governor. Alt and Lowry (1994) find that divided state governments take a longer time

to respond to a deficit shock than single party governments. Unified governments with rules

against deficit carryover are more likely to react quickly and prevent ongoing deficits than

unified governments without rules restricting deficit carryover (Alt and Lowry 1994). The

relationship was not found with divided governments, where deficit carryover rules had no effect

(Alt and Lowry 1994).

Alt and Lowry (1994) also find that unified governments are more likely to respond

with tax increases than divided governments. The study supports previous conclusions that

federal deficits are caused by divided government, but the researchers also found that unitary

governments without deficit carryover limits were not likely to reduce deficits. Based on Alt and

Lowry's (1994) findings, this study examines the effect of divided control on state spending and taxation responses to fiscal crises.

Poterba (1994) finds some overlapping results using a different model and data set. In contrast with Alt and Lowry's (1994) model, Poterba's model focuses solely on the years of the crisis from 1988-1992, and Poterba's model serves as the basis for this study of the crisis from 2000-2003. Poterba (1994) examines the crisis of the early 1990s and found that with each $100 deficit increase, states will reduce spending by $22 and raise taxes by $9 in the current fiscal year. Tax increases for the next fiscal year are $45 per every $100 deficit increase. Poterba (1994) concludes that two-thirds of state deficits are closed by state spending and taxation changes during the current fiscal year or the next fiscal year. The remaining deficit is closed by largely one-time measures, including carrying over deficits, refinancing state bonds and deferring pension contributions. Poterba (1994) also demonstrates that anti-deficit institutions, such as balanced budget requirements or restrictions on carrying over deficits, influence state responses. For every $100 deficit, states with weak anti-deficit rules will cut $17 in spending while all other states will cut $44, but there was no significant difference in taxes (Poterba 1994). The results for anti-deficit rules are consistent with the findings in Alt and Lowry (1994). Based on Poterba's (1994) findings, this study accounts for the effect of balanced-budget requirements when examining the effect of rainy day funds.

Do Influences on Fiscal Stress Affect Budgetary Responses?

In addition to political and institutional factors, the causes of state fiscal crises have been shown to affect state responses. Kusko and Rubin (1993) find that states would still have had deficits in the late 1980s and early 1990s even if the states had full employment. The findings suggest that other factors were at work, including spending pressure from a growing elderly

population and prison population (Kusko and Rubin 1993). Blackley and DeBoer (1993)

examine state tax increases in 1991 and 1992 following a crisis and find that the cause of the

crisis influenced the level of tax increases. States with crises caused by recessions or declining

federal funds are more likely to have high tax increases than states with crises caused by

spending pressures (Blackley and DeBoer 1993). The findings contradicted popular explanations

of the time attributing tax increases to state spending increases during the 1980s, highlighted in

pieces from *The Economist* (1991) and the Cato Institute (Moore 1991). Blackley and DeBoer's

(1993) findings are important because they suggest states faced with a revenue shortage will

prefer to maintain revenues rather than cut spending. The National Conference of State

Legislatures reported that the 2001 crisis, which is the focus of this study, was primarily caused

by a precipitous drop in revenue (National Conference of State Legislatures 2002). In 1990-

1991, there was greater disparity in the cause of the crisis across states, which in turn produced a

wider range of state responses. With a primarily revenue-driven crisis in 2001-2002, the cause

of the crisis was much more uniform across states. Consequently, the literature suggests that the

specific causes of the crisis will matter less in state responses to the 2001-2002 crisis.

A Framework for Study Designs

Poterba (1994) presents the most relevant framework for this study. Poterba (1994) first

calculates the dispersion of fiscal conditions across states and the average state adjustments in

taxation and spending made in response to the revenue shock of 1990-1991 using data from the

National Association of State Budget Officers. He defines a deficit shock as a combination of

the unexpected revenue decreases and spending increases during the fiscal year. This study uses

Poterba's (1994) definition of fiscal shock to determine the effect of rainy day fund balances on

taxation and expenditures with a given level of deficit shock.

Poterba (1994) then uses the public spending model outlined in Borcherding and Deacon (1972) to analyze the effect of politics and institutions on the state crisis response. However, studies using this model have examined the static totals of spending and taxation, and Poterba modifies the framework to examine the changes to spending and taxation during a fiscal crisis. This study uses a similar model aimed at addressing changes to fiscal policy during a crisis.

Key Gaps: Bridging Rainy Day Funds with Political and Institutional Factors

While political factors, institutional factors, and state rainy day funds appear to influence fiscal policy decisions, few studies have analyzed the interaction of the rainy day fund with political and institutional variables and the resulting impact on fiscal policy. As Schunk and Woodward (2005) find, "By and large, the state taxation and fiscal policy literature has been silent on spending stabilization rules" (Schunk and Woodward 2005, 107). Sobel and Holcombe (1996) only test the presence of a rainy day fund and not the balances of rainy day funds. The data used for rainy day funds were nominal, as 38 states had rainy day funds and 12 did not for the 1990-1991 crisis (Sobel and Holcombe 1996).

This study fills part of this gap by analyzing the effect of the total fund balance on taxation and expenditure decisions after the 2001-2002 crisis. Rainy day fund balances changed dramatically throughout the crisis. The balances in 2000 reflect the total before state taxation and expenditure responses to fiscal crisis. In 2001 and 2002, the states faced revenue shortfalls during the fiscal year and made mid-year adjustments (National Association of State Budget Officers 2002b). In 2003, the prospective deficit had declined slightly, but rainy day funds were depleted, forcing states to make further difficult cuts or tax increases.

Furthermore, the impact of state rainy day funds will be analyzed in the context of the key political and institutional determinants of fiscal policy to bridge parts of the two bodies of

literature discussed, the first on rainy day funds and the second on fiscal policy determinants. The study aims to provide a more complete picture of the decision to tax or spend following a fiscal crisis.

Study Design

This study uses a non-experimental panel design to test the hypotheses that high rainy day fund balances will lead to more spending cuts and less tax increases during a fiscal crisis. States are the unit of analysis, and panel data is used from fiscal years 2000 to 2003 in a time-series cross section design. This time frame captures the period immediately before the downturn in 2001 when rainy day fund balances were at pre-recession levels. Poterba (1994), Sobel and Holcombe (1996) and Douglas and Gaddie (2002) all analyzed the years 1989 through 1992 in their crisis studies to capture the pre-recessionary effect of their independent variables.

The study uses the model of fiscal policy determinants as the base and adds the impact of rainy day funds. In the fiscal policy model, the dependent variables are changes in enacted expenditures and taxation (Poterba 1996; Merrifield 2000). The National Association of State Budget Officers (NASBO) reports annually the enacted tax and spending changes in a given year. To isolate the effect on deficit-closing fiscal policy, this model follows Sobel and Holcombe (1996) and Douglas and Gaddie (2002) by only examining enacted tax increases (**ΔTAX**) and spending cuts **(ΔSPEND)**. These changes will be measured in total dollars in a given year as reported by NASBO.

The independent variable is the balance of the rainy day fund at the end of the previous fiscal year (**RDFBAL**). The balance from the previous year is used to examine the impact of a pre-existing balance on the current year's fiscal policy. State policymakers make decisions based on the ending balance of the previous year. A dummy variable for the presence of a rainy day fund is also included in the initial model. When Douglas and Gaddie (2002) added the size

of the rainy day fund to Sobel and Holcombe's (1996) presence-only test, they kept both

variables in the model to accurately compare size and presence. However, the presence of a rainy

day fund is excluded from the final model due to multicollinearity.[1]

The study tests the impact of a fund balance on tax and expenditure change using

multiple regression with panel data. The multiple regression equations follow:

$$Y_1 = A + BX_{1t-1} + CZ_{it} + \epsilon_{it}$$

$$Y_2 = A + BX_{1t-1} + CZ_{it} + \epsilon_{it}$$

Where: Y_1 = Increase in taxation
Y_2 = Decrease in expenditures
X_1 = State rainy day fund balance, t-1 years
Z_i = Set of control variables
ϵ_{it} = Stochastic error term

DEPENDENT VARIABLES		
ΔTAX	NASBO FISC.	Enacted tax increases for the following fiscal year, millions of dollars
ΔSPEND	NASBO EXP.	Enacted spending cuts in the current fiscal year, millions of dollars
INDEPENDENT VARIABLE		
RDFBAL	NASBO FISC.	Rainy day fund balance at the end of the previous fiscal year, millions of dollars
CONTROL VARIABLES		
PCTLEGREP	CENSUS	Percent of all seats in the legislature held by Republicans
DIVIDE	NGA	Division of power between governor and legislature (1=Unified Republican, 0=Divided, -1=Unified Democratic)
BBR	NASBO BUDG.	1 to 4 point strictness scale (1=No Requirement, 2=Governor Submits, 3=Legislature Passes, 4=Governor Signs)
SEVERITY	NASBO FISC./EXP.	Difference between projected expenditures and revenues and actual revenues and expenditures, millions of dollars
GENFUNDBAL	NASBO FISC.	General fund balance at the end of the previous fiscal year, millions of dollars
CAPACITY	SHEEO	State total taxable resources, millions of dollars

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[1] Only four states did not have rainy day funds at some point from 2000-2003: Arkansas, Montana, Illinois, and Oregon. The presence of rainy day funds was not significant when included in the model.

used by Alt and Lowry (1994 and 2000). In unified government, one party controls the executive and legislative. In divided government, party is divided either between the governor and the legislature or between the two houses of the legislature (Alt and Lowry 1994). **DIVIDE** is structured to measure both the division of power and partisan control on the same indicator by assigning a 1 to unified Republican states, a 0 to divided states, and a -1 to unified Democratic states.

The study controls for the influence of state balanced budget requirements (**BBR**). In the period 2000-2003, 45 states required the governor to submit a balanced budget, 41 states required the legislature to pass a balanced budget, 35 states required the governor to sign a balanced budget, and 5 states had no requirements, according to NASBO. The requirements did not change during the time period studied. A one to four point strictness scale is created and treated as an interval-level variable with four as the most strict.[2]

In addition to political and institutional factors, the severity of the crisis has been demonstrated to influence the budgetary response (Poterba 1994, Sobel and Holcombe 1996). In the fiscal policy literature, the severity of fiscal stress is measured by the unexpected deficit in a given year. This unexpected deficit is comprised of unforeseen changes to revenue and expenditures. **SEVERITY** is measured by the sum of the expenditure shock and revenue shock in a given year (Poterba 1994). The expenditure shock is the difference of the expected and actual expenditures, while the revenue shock is the difference between expected and actual revenues. As new revenue projections are made throughout the fiscal year, states must make adjustments based on this new information.

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[2] For balanced budget requirements, many studies in the 1990s used the Advisory Council on Intergovernmental Relations (ACIR) 10 point restrictiveness scale. However, ACIR was disbanded in 1995. Hou (2004) uses the four classifications reported by *The Book of the States* which are identical to NASBO's classifications.

The study also controls for the general fund balance at the end of the previous fiscal year **(GENFUNDBAL).** Douglas and Gaddie (2002) note that these funds are typically available for countercyclical fiscal action in times of crisis. The general fund balance is the surplus in a given year and does not have many of the restrictions tied to rainy day funds. States with high general fund balances may not have to dip into their rainy day funds as much, altering the relationship between rainy day funds and fiscal policy. However, general fund balances do not have restrictions for when or how they can be used and their use in closing deficits is not as consistent as the use of rainy day funds.

Lastly the study controls for state tax capacity (**CAPACITY**) measured by the state's total taxable resources. Previous studies on state fiscal policy have used a wide range of state economic indicators, including income, poverty, and population indicators, but capacity is the indicator most closely tied to tax and spending decisions. Capacity is a function of income, poverty, and population, and including all variables in the model could produce multicollinearity.

In this time-series study, autocorrelation within each state is a potential problem, as observations in 2002 are not completely independent of the observations in 2001. This is particularly true for many states which budget incrementally based on the history of previous years. To address the problem of autocorrelation, the study includes state fixed-effects in the form of three dummy year-variables for 2001-2003 with 2000 as the reference year. Furthermore, the standard errors are adjusted for the 49 states analyzed. Alaska is excluded from the analysis following previous studies because reserve funds from oil revenues present an extreme outlier in the data.

The study uses multiple regression to estimate the effect of changes in each independent variable within the average state on each of the two dependent variables. Data from 49 states for

four years (2000-2003) is analyzed. Multiple regression will isolate the effect of rainy day fund balances by including key control variables from the literature. The regression will also reveal whether the effect of rainy day funds is spurious and determined by the control variables.

Results and Analysis

In the model, rainy day fund balances had a significant positive relationship with tax increases (ΔTAX) but had no relationship with spending cuts (ΔSPEND). While rainy day fund balances do significantly impact the tax side of fiscal policy, the results are in the opposite direction of the hypotheses. The results suggest that rainy day fund balances *raise* the amount of tax increases but do not impact the level of spending cuts. High rainy day fund balances are associated with a propensity to rely more on tax increases than spending cuts following a crisis, holding constant political, institutional, and economic variables. The coefficients indicate that a $100 dollar increase in the state rainy day fund balance is corresponds with additional tax increases of $13. The results may be linked with the original purpose of rainy day funds to stabilize revenue during fiscal crises. States with a preference for revenue stabilization through high rainy day fund balances may also lean more on the revenue side of the fiscal equation when closing a deficit.

Table 1. Regression coefficients and p-values for ΔTAX and ΔSPEND models, clustered standard errors.

	ΔTAX MODEL			ΔSPEND MODEL	
	Coefficient	P-Value		Coefficient	P-Value
RDFBAL	**0.13**	**(0.005)**		-0.05	(0.181)
PCTLEGREP	-308.70	(0.049)		219.32	(0.098)
DIVIDE	55.44	(0.157)		-36.78	(0.269)
BBR	-49.51	(0.204)		47.28	(0.128)
SEVERITY	**0.10**	**(0.038)**		**0.10**	**(0.000)**
GENFUNDBAL	0.02	(0.554)		-1.00	(0.731)

CAPACITY[3]	0.00	(0.727)		**0.00**	**(0.006)**
YEAR-2001	12.71	(0.567)		16.83	(0.447)
YEAR-2002	46.36	(0.279)		147.96	**(0.001)**
YEAR-2003	157.15	**(0.014)**		105.47	**(0.011)**
	ΔTAX MODEL			**ΔSPEND MODEL**	
R²	0.35			0.64	
N	186			186	

The political control of the legislature (**PCTLEGREP**) was significant at the .05 level for tax increases. The legislature variable was significant for spending at the .10 level. The results suggest that Republican legislatures favor spending cuts to tax increases, consistent with findings in previous studies (Alt and Lowry 1994, 2000). Notably, the division of power in state government (**DIVIDE**) was not significant for tax increases or spending cuts. Alt and Lowry (1994) found that divided governments hold down spending levels and Poterba (1994) found that divided governments had larger overall responses to fiscal crises on both the spending and taxation side. However, the **DIVIDE** indicator in this study is modified to consider which party has unified control. The inclusion of party may explain why **DIVIDE** is not significant in this model but not in other similar studies.

Balanced-budget requirements also did not have a significant result. Part of the challenge with measuring balanced-budget requirements is differentiating requirements across states. As Hou (2004) has noted, the end of Advisory Council on Intergovernmental Relations left researchers with four categories of balanced budget requirements: no requirement, the governor must submit a balanced budget, the legislature must pass a balanced budget, and the governor

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[3] State income and poverty were removed from the model due to multicollinearity. **CAPACITY** acts as a proxy for these variables. The sum of the variance inflation factors (VIF) is 16.7 in the final model.

must sign a balanced budget. There may not be enough of a distinction between these categories

for balanced budget requirements to significantly affect fiscal policy decisions after a crisis.

The severity of the crisis did have a significant relationship with Δ**TAX** and Δ**SPEND.**

SEVERITY grew worse for states in 2001, reaching a peak in 2002 before declining in 2003 as

shown in Figure 2. The relationship is positive in both models so that the more severe the crisis,

the greater the tax increases and spending cuts. Perhaps more relevant to this study, the severity

variable demonstrates that rainy day fund balances' relationship with fiscal policy exists even

when controlling for severity. Because Douglas and Gaddie (2003) found that rainy day fund

balances do affect severity, and Poterba (1994) found that severity affects fiscal policy, this study

considered the possibility of an intervening **SEVERITY** variable. However, the results indicate

a rainy day fund effect that is independent of severity, while both rainy day fund balances and

severity play an important part in tax and spending decisions.
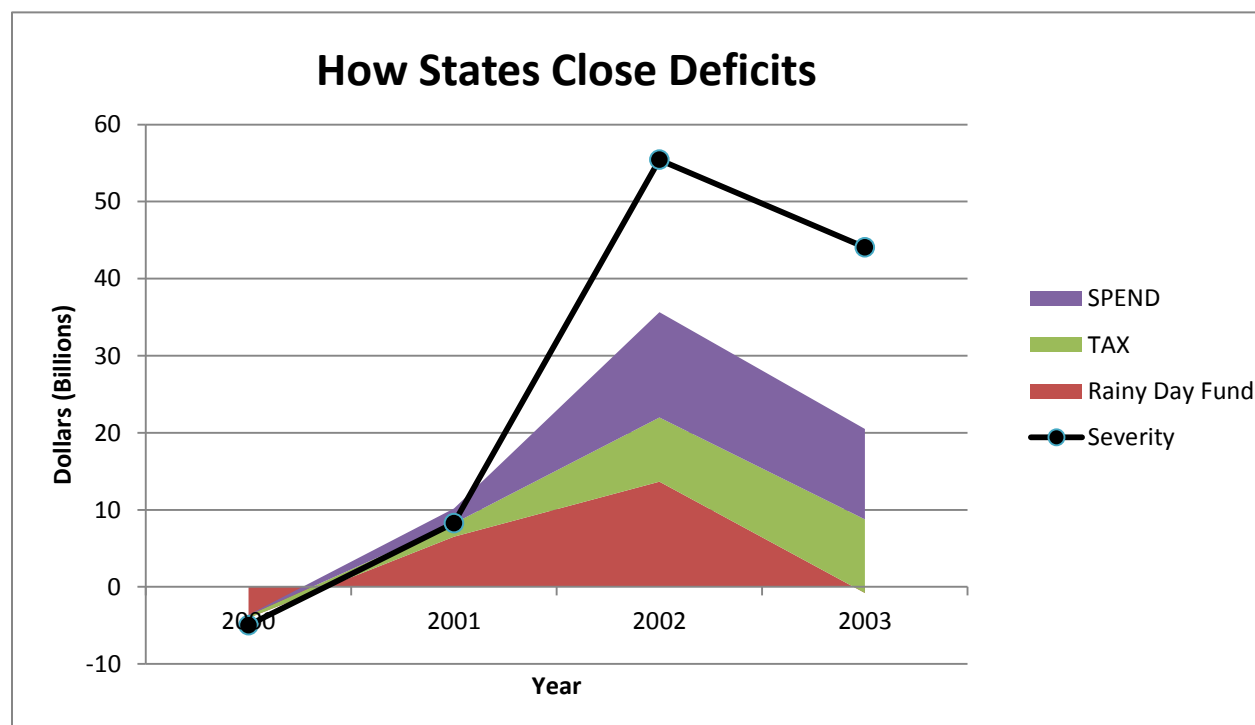
Figure 2. How States Close Deficits, 2000-2003

Figure 2 demonstrates how much of the deficit (**SEVERITY**) was closed by rainy day funds, tax increases, and spending cuts. **SPEND** reflects the total spending cuts in all states, while while **TAX** is the total level of tax increases in all states. In Figure 2, **Rainy Day Fund** is the amount of the rainy day fund withdrawn to close the deficit and is not the independent variable in this study, which is the total rainy day fund *balance* of the preceding year. In 2001, at the start of the crisis, states had more than enough in corrective policy to close the fiscal gap of $8 billion. However, 2002 presented a severe challenge for states with nearly $55 billion in unexpected deficits. $35 billion was closed with rainy day funds, tax increases, and spending cuts, but the remaining balance was closed by other means. These other means are classified as "gimmicks" and may include accounting changes, one-time federal grants, and borrowing. By 2003, states had depleted most of their rainy day funds and did not have funds to use in 2003. In fact, 2003 saw a net increase in rainy day fund balances because certain states were in better fiscal condition and others faced mandatory rainy day fund contributions (Center on Budget and Policy Priorities 2012).

The dummy variables for year were also significant for 2002 and 2003, although 2002 was only significant for spending cuts. Relative to the base year of 2000, in 2003 states raised taxes and cut spending more, holding all of the control variables constant. The increases are the impact of factors unique to conditions in the year 2003 relative to 2000. Similar to the results for severity, the year results show that when controlling for year-fixed effects, which do impact fiscal policy, rainy day fund balances are still significantly related to tax and spending changes. The results for 2002 suggest that spending cuts may precede tax increases for states facing fiscal crisis.

The regressions explain more of the variation in spending cuts than the variation in tax increases. The R^2 is moderate for the taxation model but strong for the spending model, indicating other variables may be needed to more accurately explain tax increases during a crisis.[4]   Furthermore, it is evident that rainy day funds, tax increases, and spending cuts only close a portion of state deficits. Nonetheless it is important to note the significant positive relationship between rainy day funds and tax increases during a fiscal crisis.

Conclusions: Limits and Future Research

This study aims to broaden the literature on state fiscal crisis responses by analyzing the influence of rainy day funds on taxation and expenditures. State rainy day funds do impact fiscal decisions, and the impact is independent from political and institutional influences. However, the results contrast with the hypotheses and show that rainy day funds are associated with higher tax increases and not greater spending cuts. The results call into question the historical explanation provided by Sobel and Holcombe (1996).   While Sobel and Holcombe (1996) contend that rainy day funds were created to avoid tax increases, other scholars have noted that in practice, rainy day funds were legislated to stabilize revenues (Hou 2004). In both explanations, rainy day funds decrease the need for tax hikes. However, the explanations differ in what happens after states use rainy day funds and whether states turn to tax increases or spending cuts to close remaining deficits.

There is support for the revenue stabilization theory in both the literature and in state statutes. Blackley and DeBoer (1993) compared state responses to revenue-induced and spending-induced crises and found that states with revenue-induced crises relied more heavily on tax increases. Similarly, states with rainy day funds designed to target revenue imbalances may

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[4] The study tested for state-fixed effects by adding 48 state dummy variables, but R^2 and the initial results did not change. Very few of the state dummy variables were significant.

also rely more heavily on tax increases. In many states, the use of rainy day funds is limited to

revenue shortages (Center on Budget and Policy Priorites 2011). Furthermore, some state laws

require legislators to consider tax increases, but not spending cuts, before using the rainy day

fund. New Jersey, for example, has such a requirement:

> *Balances in the 'Surplus Revenue Fund' may be appropriated by the Legislature only…upon a finding by the Legislature, based on its research, that to offset revenue declines anticipated in the General Fund an appropriation from the 'Surplus Revenue Fund' is a more prudent fiscal policy than imposing new taxes or increasing any rate of tax (State of New Jersey 1990).*

Theoretical literature on fiscal policy determinants is incomplete, but this study lends

further evidence to the importance of institutions.   More research on one institution in particular,

tax and expenditure limits (TELs), would greatly inform the literature. While history suggested

that tax limits motivated the creation of rainy day funds, a closer examination of tax limits after

the 1981-1982 crisis is necessary. Some evidence suggests that during the 1980s and 1990s,

states found loopholes in tax limits. Abram and Dougan (1986) show that states with tax and

expenditure limits actually had greater budget growth in the 1980s, which they argue is a result

of states' ability to avoid the limits. While rainy day funds may have been born out of the tax

revolts, the impact of tax and expenditure limits during the 1980s and 1990s is highly contested

(Schunk and Woodward 2005).   If tax limits inspired rainy day funds but were ineffective after

the tax revolts died down, then anti-tax sentiment may not be correlated with high rainy day fund

balances. Instead, states with high rainy day fund balances may prefer stable revenues, resorting

to revenue fixes (tax increases) as opposed to spending cuts to close deficits. Future research can

examine the role of tax and expenditure limits and the political preference for revenue

stabilization, whether this preference exists in the legislature or in the voting public.

To further investigate why rainy day funds impact fiscal policy, future research should examine the specific provisions that govern rainy day funds. States often have minimum and maximum balance requirements, along with very specific rules for withdrawal of funds. These withdrawal rules include both the conditions under which funds may be withdrawn (typically a set level of revenue shortfall) and the voting requirements in the legislature (National Association of State Budget Officers 2002a). Sobel and Holcombe (1996) found that rainy day fund rules affect the total sum of tax increases and spending cuts, and this finding suggests that the rules may also affect the distribution of tax increases and spending cuts. Information on state rules is readily available, but quantitative studies are more difficult because of the nuances of 50 sets of legal provisions. Case studies may be more useful to understand the full circumstances surrounding a state's legal use of the rainy day fund.

The association of rainy day fund balances and tax increases suggests that states with high fund balances also aim to protect those who rely on government services, often the most vulnerable citizens in society. This points to further study of political climate and measures of fiscal conservatism in relation to rainy day funds. Are their certain elements of a state's political climate beyond the political measures included here that would promote thorough savings and a tendency to preserve spending? However, it is important to note that tax increases can also have distributional effects. Not all tax increases are created equal; an increase to a regressive sales tax will have a much greater impact on low-income families than an increase to the income or corporate taxes. However, the type of spending cuts that are made during crises typically affect the most vulnerable through the reduction of social services. The specific types of spending cuts or tax increases have important distributional impacts and should also be examined in future research.

Unlike most studies that focused on the determinants of fiscal stress, this study fills a gap in the literature by evaluating rainy day fund balances as a determinant of fiscal policy. Furthermore, the study adds to the literature by examining the balance of a rainy day fund, as opposed to simply the presence or absence of a fund, during the first crisis in which almost all states had rainy day funds. The results contribute to analysis of the 2008 crisis, when states were faced with unprecedented shortfalls not long after recovering from the 2001-2002 crisis. Once data is available, the 2008 crisis offers several opportunities to expand on this research. First, how does the response change when the time between crises is shortened? Second, how does the response change when state fiscal stress lasts longer than two years? The answers to these questions have important implications for all states and their citizens during difficult economic times.

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