Federal Reserve Bank of Chicago

Creating a National State Rainy Day Fund: A Modest Proposal to Improve State Fiscal Performance

Richard Mattoon

WP 2003-20

Creating a national state rainy day fund: a modest proposal to improve future state fiscal performance

Abstract

Throughout the 1990s states created budget stabilization (rainy day) funds to help provide counter-cyclical support in their budgeting process. Today 46 states have rainy day funds. Despite the sweeping popularity of such funds, many states have failed to adopt either contribution or expenditure rules that would create significant balances in their rainy day accounts. The recent state fiscal crisis found only 4 states with fund balances in excess of 10% and consequently many states found that their rainy day funds failed to provide significant fiscal relief during the latest recession.

This paper ask the question; what would happen if a national rainy day fund were established for the states with specific contribution and expenditure rules? The proposed fund would borrow from the unemployment compensation trust fund model by creating experience ratings for each state that would trigger differential fund contributions. Also like the UI system, borrowing would be permitted from the pooled fund, with interest being charged to the borrowing state. Simulations on fund performance under differing rules are provided.

This national fund would be designed to create an aggregate rainy day balance of 15% of state expenditures. By constructing a national fund, local state pressure to spend reserve balances whenever they reach significant levels, could be avoided. In addition, a more tightly constructed fund might improve state credit ratings and reduce capital financing costs for states.

Richard Mattoon
Federal Reserve Bank of Chicago
230 S. LaSalle Street
Chicago, IL 60604-1413

Ph: 312-322-2428
e-mail: Rick.Mattoon@chi.frb.org

The last three fiscal years have proven to be extremely challenging for state policymakers. A relatively shallow national recession precipitated a state budget crisis as revenues plunged and expenses for programs such as Medicaid and education spiked. Boom and bust cycles have long plagued state governments. In the past, revenue and expenditure volatility has often triggered tax increases and spending cuts.

In response to this volatility, state governments have increasingly tried to build savings to help bridge downturns in the economy that effect their budgets. Often these budget stabilization funds are called "rainy day" funds and are intended to serve as counter-cyclical aid. Currently 46 states have rainy day funds.

Rainy day funds have some general properties. These include:
- The funds are designed to accumulate revenues during periods of strong economic performance.
- They can improve a state's credit rating by demonstrating that a state has sufficient reserves to weather a moderate recession without making drastic fiscal adjustments.
- They are designed to be counter-cyclical funds. They should be sufficient to weather an economic slowdown, but are not designed to address a structural budget deficit.[1]
- They are sometimes designed to have contribution rules requiring states to make regular or semi-regular appropriations to the fund.
- Withdrawals from rainy day funds are often made as part of a political process and are only sometimes based on specific rules.

Leading up to the most recent recession, states had accumulated (by historical standards) significant rainy day funds. On a national level total fund balances (rainy day plus other savings) by FY 2000 exceeded 10% of state spending.[2] Given that bond-rating agencies have long recommended that fund balances should be kept at a minimum of 5%, the 10% figure suggested that reserves would be sufficient to weather a mild recession. However, this has not proven to be the case. In retrospect, several analysts have suggested that balance levels would need to be in the 18% to 20% range if they were to provide significant counter-cyclical aid.[3] The problem with this is that it would be politically difficult for any state governor or legislature to have a 20% rainy day fund over any period of time without pressure being applied to reduce the balance through either expenditure increases or tax cuts. Efforts to protect rainy day funds from budget raids often fall short of requiring that fund levels build significant balances. Often states are only required to fill the fund to a given balance level (usually less than 10% of expenditures) and then are released from further contributions. Given this reality, states tend to under-save.

---

[1] While rainy day funds should not be used to address a structural deficit, it may be worth considering using rainy day funds to offset future program costs that can be forecasted because of demographic or economic changes. Work on intertemporal state budgeting by Baker, Besendorf and Kotlikoff (2002) provides a framework through which states can estimate future budget requirements based on the evolving structure of their states economy. Much like an individual saving for their child's college or retirement, rainy day funds could be used to offset these predictable future expenditure needs.

[2] National Association of State Budget Officers, "The Fiscal Survey of the States 2003", p.13

[3] Zahradnick, Bob and Rose Riberio, "Heavy Weather: are state rainy day funds working" p.1.

The recent experience of Wisconsin highlights the pressures on state rainy day funds. The state created such a fund in 1985 but has been reluctant to actually put revenue into the fund. As of the beginning of June 2003, the fund had a balance of only $2,600. The battle over the value of creating significant reserves was highlighted by Wisconsin Assembly Speaker John Gard who said, "The difference between families and government is that families are saving their own money and the government's money is someone else's." "While rainy day funds can be helpful, a lot of the time they're over-taxation funds."[4] University of Wisconsin professor Don Kettl has also observed that rainy day funds have been too easy of a source of funding. As Kettl puts it, "the weather's always cloudy, and its easy to dip into it." In the case of Wisconsin this seems to be an apt description. If revenues haven't been channeled to program expansions, they have been used for tax cuts such as the one-time $700 million sales-tax rebate provided in 1998.

This paper suggests that a national rainy day fund be established based on an unemployment insurance compensation trust fund model. Participating states would make contributions to this pooled fund based on flexible contribution rules and could make withdrawals and borrow from the fund in bad times. The justification for such a proposal is based on a several stylized facts that suggest that a properly funded rainy day fund could provide meaningful stability to state budgets.

- States (with the exception of Vermont) must balance their budgets annually. Meaningful counter-cyclical assistance is more important to states (than the federal government that can run deficits) that often see service demands rise when revenues and resources are falling.
- State revenues have become more volatile as states have grown to rely on narrower, and often more elastic tax basis such as personal income, and higher nominal rates. The recent recession showed that a shallow decline in economic activity could have a profound effect on state revenues.
- Federal devolution has increased the importance of state programs. State responsibility for education, health care and prisons has grown and insuring adequate funding over an economic downturn has become a more important need.
- States seem reluctant to "fix" their tax structures to better mange volatility. In addition, it is unclear that revenue volatility is necessarily a bad thing if states are willing to create budget stabilization tools. Efforts to broaden major tax bases, such as subjecting services to sales taxation, have seen little progress.
- From a political perspective, it is unrealistic that states will ever be able to build sufficient reserves to protect against any significant budget shortfall. A fund that would be insulated from state political pressures could accumulate larger reserves.
- Federal assistance to help bridge a state fiscal shortfall is unlikely. The federal government is often in no better fiscal shape in a recession than the states and is likely to be grudging in helping states out of a bind.

---

[4] Phil Brinkman, "Budget Woes Have No Easy Solutions", The Capitol Times and Wisconsin State Journal, June 15, 2003, D1.

- A large national rainy day fund could improve the credit-worthiness of the state and local sector. Rating agencies could reward states with better credit ratings (lowering borrowing costs) in response to the creation of such a fund.[5]
- By smoothing state fiscal reaction to recessions, a national rainy day fund could reduce the drag that state tax increases or expenditure cuts might have on the national economy.
- An adequately funded rainy day fund could help states adjust to unanticipated program expenses such as when the September 11th disaster forced higher spending for security programs in most states.
- Finally, a properly funded rainy day fund could reduce fiscal pressure on local government. With states increasing responsibility for funding K-12 education and providing local government assistance, recent state budget gaps have lead to reductions in state aid to localities that in turn often force increases in local property taxes and fees.

Other reasons why rainy day funds are a good idea

Knight and Levinson (1999) examined the saving behavior of states with rainy day funds. A common concern is that rainy day funds displace other forms of savings that a state might already undertake. The authors major finding is that even when state fixed effects are included in their econometric work, the existence of a rainy day fund increased total state savings dollar for dollar.[6] The point estimate from the fixed effects regression suggests that states that adopted rainy day funds saved 14% more than before they adopted such funds.[7] The existence of a rainy day fund can promote state savings.

Knight and Levinson also found some limited evidence that states with stricter deposit and withdrawal rules tended to save more than states that simply transferred budget surpluses or permitted withdrawals by appropriation. Sobel and Holcombe (1996) had observed that during the 1990-91 recession, only states with strict deposit requirements had found that their rainy day funds significantly reduced fiscal stress.[8]

In addition, Wagner (2002) offers some additional benefits from rainy day funds. These include:
- A proper rainy day fund can reduce the overall level of "fiscal uncertainty." A stable economic environment is an important component in the investment decisions of the private sector. The use of surplus funds as an alternative to tax increases and/or expenditure cuts will aid in the promotion of private investment.

---

[5] One study found that states with strict governing rules for the construction of their rainy day funds had borrowing costs of up to 10 basis points (.10 percentage points) lower than states with more discretionary rain day funds. See Wagner, G.A. and J.M. Gropp, 2002. "The Municipal Bond Market and Fiscal Institutions: Have Budget Stabilization Funds Reduced State Borrowing Costs?" Unpublished manuscript, Duquesne University.

[6] Brian Knight and Arik Levinson, "Rainy Day Funds and State Government Savings", National Tax Journal, Vol. LII, no.3, September 1999, pp.459-472.

[7] Knight and Levinson, p.468.

[8] Sobel and Holcombe (1996)

- Use of a rainy day fund can reduce the time and energy expended by policymakers during fiscal crises modifying existing policies/programs. Cutting programs that provide long-term benefits to the state in order to bridge a temporary fiscal crisis makes little policy sense.
- Rainy day funds can reduce tax increases during periods of fiscal stress and help keep the "excess burden of taxation" (the social costs of taxes) low.[9]

A history of rainy day funds

Many states created rainy day funds in the wake of the 1980-82 recession but funds balances did not begin to appreciably build until the 1990s. Prior to the 1990-91 recession, only about half of the states had such funds and total balances (rainy day plus all other fund balances) prior to the recession were $12.5 billion or 4.8% of spending. Prior to creating rainy day funds, states did have savings that they used to carry them through unanticipated budget problems. However, these were usually surpluses in general funds and as such were always vulnerable to political pressure for new spending or tax cuts. The advent of the rainy day fund was an effort to bring structure to state savings and reduce its ad hoc quality.

By the mid-1990s most states had created rainy day funds. This was not only seen as a good budgeting practice, but was strongly encouraged by debt rating agencies that were interested in seeing states build reserves that might prevent tax hikes and budget cuts during recessions. Currently only 5 states do not have rainy day funds (Arkansas, Colorado, Illinois, Kansas and Montana).

Despite the popularity of these funds, many states have chosen fund designs that have compromised their effectiveness (table 1). On the contribution side, many states cap the total revenues that can be placed in the fund. For example, 19 states limit the size of their rainy day funds to 5% or less of expenditures. Eight states limit the fund size to between 5% and 10%, while 9 states limit the fund to 10%. Only 10 states have no cap on their rainy day fund. Evidence suggests that cap limits reduced savings effort. For example states with a cap of less than 5% only saw their fund balances grow from around 1% of expenditures in 1993 to 3.7% of expenditures by 2000. In comparison states with uncapped funds saw their fund balances grow from 2.3% to 9.0%.

Table 1—Structure of Rainy Day Funds (as of 2002)

Deposit Rules	Withdrawal rules	Fund size
1=appropriation	1=appropriation	1=5% of budget or less
2=general fund surplus	2=revenue shortfall	2=between 5% and 25%
3=required appropriation	3=supermajority	3=no limit
4=stautory formula	4=stautory formula	

State	Year Adopted	Deposit Rule	Withdrawal	Fund Size

---

[9] Wagner, Gary A., Fiscal Stress and State Rainy Day Funds: Are They the Answer for Brighter Days Ahead? Mimeo, Duquesne University, 2002, p.6.

			Rule	
Alabama		NO FUND		
Alaska	1986	1	1	3
Arkansas		NO FUND		
Arizona	1990	4	4	2
California	1985	2	2	3
Colorado	1983	3	2	1
Connecticut	1979	2	3	1
Delaware	1977	2	3	1
Florida	1959	2	2	2
Georgia	1976	2	1	3
Hawaii		NO FUND		
Idaho	1984	1	1	3
Illinois*	2000	1	1	1
Indiana	1982	4	4	2
Iowa	1992	1	1	1
Kansas	1993	3	1	3
Kentucky	1983	2	1	1
Louisiana	1990	2	1	3
Massachusetts	1986	2	1	1
Maine	1985	2	1	1
Maryland	1986	3	1	1
Michigan	1977	4	4	2
Minnesota	1981	1	1	2
Mississippi	1982	1	1	2

State	Year Adopted	Deposit Rule	Withdrawal Rule	Fund Size
Missouri	1992	1	1	1
Montana		NO FUND		
Nebraska	1983	2	2	3
Nevada	1994	4	2	2
New Hampshire	1987	2	2	1
New Jersey	1990	2	2	1
New Mexico	1978	2	1	1
New York	1945	4	2	3
North Carolina	1991	2	1	1
North Dakota	1987	2	4	3
Ohio	1981	2	1	3
Oklahoma	1985	2	3	3
Oregon		NO FUND		
Pennsylvania	1985	2	3	1
Rhode Island	1985	1	2	1

South Carolina	1978	3	2	3
South Dakota	1991	2	2	1
Tennessee	1972	3	2	1
Texas	1987	2	2	2
Utah	1986	2	2	2
Vermont	1988	2	2	1
Virginia	1992	4	4	2
Washington	1981	2	3	1
West Virginia	1994	2	2	1
Wisconsin	1981	3	2	3
Wyoming	1982	1	1	1

Source: Wagner (2002)
*authors note—while called a rainy day fund, the Illinois RDF is really designed as an annual supplement to the budget.

Contributions are also frequently hampered by inadequate contribution rules. In 30 states contributions are based on depositing a portion of the year-end surplus. In these cases the contribution is determined only after decisions about tax cuts or spending increases that will effect the size of the surplus are made. Surpluses are not predictable so this is hardly a formula for a rigorous savings plan. Ironically, while the states may not be overly strict with their contribution rules, some states are overly strict with requirements for replenishing fund balances. The problem with strict replenishment rules is that they often dissuade states from using rainy day funds as intended (counter-cyclical support). For example, Alaska, Florida and New York require that withdrawals be replenished in 5 years while Missouri and South Carolina require repayments within 3 years. The most restrictive are Rhode Island (2 years) and the District of Columbia (1 year). The problem with such strict repayment requirements is that states are forced to replenish their funds with resources that might be needed for other programs. Replenishing a rainy day fund may not be a state's top expenditure priority. Furthermore, as counter-cyclical budget tool, it only makes sense to replenish the fund in good economic times.

States have also gotten into a bind over requirements to limit withdrawals from their rainy day funds. Ten states (Alaska, Delaware, Hawaii, Louisiana, Missouri, Oklahoma, Oregon, Pennsylvania, Texas and Washington) require legislative super-majorities to release funds. The requirement of a supermajority can pose problems if a minority party has sufficient clout to block release of rainy day funds in an effort to damage the majority parties ability to respond to a fiscal crisis. Other states limit the amount of money that can be withdrawn at any one time. In Idaho, Louisiana, Missouri, Oklahoma, Tennessee and Virginia, one-time withdrawals are typically capped at 50% of the fund balance. In Arizona, Indiana and Michigan the level of fund withdrawal is limited to a formula that is tied to the severity of the economic downturn. (For example, in Michigan, transfers from the rainy day fund to the general fund are permitted when real annual growth in personal income is negative or unemployment in any quarter exceeds 8%. The level of transfer is equal to the percentage decline in personal income multiplied by the general funds annual revenue. The amount of transfer cannot exceed the amount necessary to balance the

budget.) Clearly, some limits should be placed on haphazardly spending rainy day balances, but states should be allowed some flexibility in how they chose to use savings to meet financial emergencies.

Some states also limit the use of rainy day funds. In the Oregon, rainy day funds can only be used to support education. In the District of Columbia only 44% of the funds can be used in the event of an economic downturn (remaining fund availability is for a natural disaster). In the case of the state of Georgia, a Governor can only recommend using an amount equal to 2% of revenues regardless of the available balance in the fund.

In many cases the hesitancy to spend rainy day funds stems from a fear that an even rainer day may lay ahead (a reasonable concern) or fear that spending rainy day reserves will effect a state's credit rating. In judging whether it is prudent to hold back on using rainy day funds in the face of future economic softness, a state must examine the timing of economic recovery and its effects on revenues. In addition it must examine its revenue system to determine whether its revenue problem is cyclical or structural. If it is cyclical, the timing of economic recovery may be adequate to rebalance the state's books. This might encourage the state to spend more of its rainy day balance upfront. If the problem is structural, using a rainy day fund will prove to be the wrong fiscal tool since a counter-cyclical fund cannot solve a structural revenue problem and may mask the need to make fundamental reform to the states tax and expenditure system. As for concerns about ratings downgrades, it is true that Standard & Poor's gives a "strong" rating to governments with fund balances with reserves of 15% or better, but it is not true that they expect governments to never use these fund balances. Standard & Poor's comments, "Use of reserves is not a credit weakness in and of itself. These reserves are accumulated in order to be spent during times of budgetary imbalance and extraordinary economic events. The last month has highlighted the importance and critical nature of these reserves from a credit standpoint. Given this period of economic uncertainty, a balanced approach of adjusting spending and drawing on reserves will reduce out-year structural imbalance."[10]

Recent performance of Rainy Day Funds

By the end of 2000, states had amassed total reserve balances of $48.8 billion or 10.4% of spending. These reserves represented rainy day funds plus other savings such as budget surpluses and other fund balances. (Rainy day balances peaked in 2000 at 5.85% of expenditures.) States have used this money aggressively drawing balances down to 3.4% of spending by the end of FY 2003 and an estimated 1.3% by FY 2004. The use of this money has provided $33 billion in relief that otherwise would have been made up through program cuts or tax increases. The 10.4% reserve size would have proven adequate to bridge a one-year deficit in 2002. The 2002 deficit was estimated at roughly $37 billion or 7.2% of spending. However larger deficits in 2003 ($79 billion or 15.1% of spending) and 2004 ($78 billion or 15% of spending) have exhausted reserves.

---

[10] Standard & Poor's, Commentary on the States, October 18, 2001.

The level of fund balance continues to vary widely suggesting the still ad hoc nature of these rainy day funds. While the aggregate balance by 2000 was 10.4%, and the rainy day balance hit 5.85%, only 4 states, Michigan, Minnesota, Alaska and California were in fact carrying rainy day balances of greater than 10%. In fact, these four states accounted for over 51% ($14.044 billion out of the $27.4 billion) of rainy day fund balances. (figure 1, table 2) Given this uneven level of savings effort, a national contribution rule could substantially increase aggregate available balances.

Table 2. Rainy Day Fund Balances and Fund Balances as a Percent of State expenditures in 2000 and 2002

State	Fund Balance 2000 (in millions)	Fund Balance as % of Expenditure 2000	Fund Balance 2002 (in millions)	Fund Balance as % of Expenditure 2002	2002 Balance Rank
Alabama	$3	.06%	$13	.25%	42
Alaska	2,734	120.87	2,857	118.40	1
Arkansas	0	0	0	0	43
Arizona	408	6.79	266	4.06	23
California	8,666	13.03	2,596	3.30	26
Colorado	583	9.73	0	0	44
Connecticut	564	5.17	595	5.0	14
Delaware	114	5.08	126	5.13	13
Florida	1,666	8.98	941	4.64	19
Georgia	551	4.00	618	4.18	21
Hawaii	6	.19	54	1.48	39
Idaho	36	2.14	73	3.57	25
Illinois*	0	0	230	.92	41
Indiana	540	6.02	526	5.48	9
Iowa	444	9.32	463	9.55	3
Kansas	0	0	0	0	45
Kentucky	279	4.26	239	3.26	28
Louisiana	59	1.02	150	2.34	33
Massachusetts	1608	7.72	1,715	7.58	5
Maine	144	6.21	123	4.74	17
Maryland	582	6.45	563	5.22	12
Michigan	1,264	13.20	500	5.37	11
Minnesota	1,380	12.03	1,140	8.81	4
Mississippi	232	6.60	192	5.41	10
Missouri	143	1.95	156	1.99	36
Montana	0	0	0	0	46
Nebraska	142	6.06	110	4.14	22

Nevada	136	8.46	136	7.36	6
New Hampshire	20	1.95	55	4.78	16
New Jersey	698	3.59	720	3.20	30
New Mexico	0	0	0	0	47
New York	547	1.47	627	1.49	38
North Carolina	38	.27	339	2.33	34
North Dakota	0	0	0	0	48
Ohio	1,003	5.21	1,011	4.57	20
Oklahoma	158	3.48	170	3.27	27
Oregon	0	0	0	0	49
Pennsylvania	1,097	5.69	1,223	5.91	8
Rhode Island	71	3.18	81	3.06	31
South Carolina	145	2.81	63	1.13	40
South Dakota	37	4.80	40	4.70	18
Tennessee	165	2.50	178	2.36	32
Texas	85	.31	550	1.76	37
Utah	110	3.27	125	3.21	29
Vermont	41	4.80	44	4.93	15
Virginia	575	5.10	865	7.03	7
Washington	754	7.38	421	3.75	24
West Virginia	73	2.77	63	2.12	35
Wisconsin	0	0	0	0	50
Wyoming	39	7.53	130	20.63	2
U.S. total	27,389	5.85	21,087	4.05	

Source: Fiscal Survey of the States: December, 2002, National Governors Association and the National Association of State Budget Officers.

Figure 1. Distribution of state rainy day funds balances as a % of expenditures, 2000 and 2002
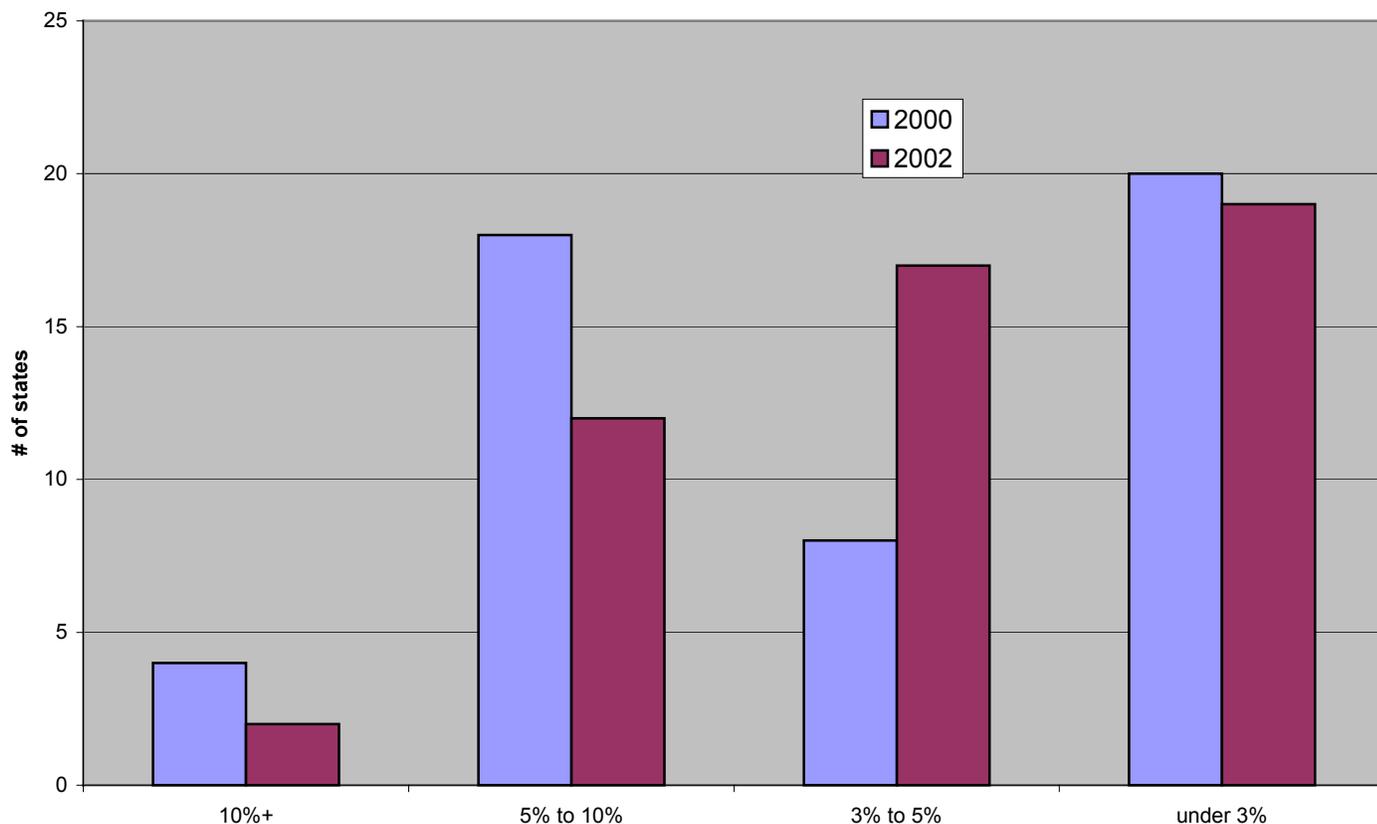
Rules governing rainy day fund structure—
Contributions

Several states have rules forcing contributions. The following are some potential
contribution rules
- Contributions based on economic growth. Indiana and Michigan both require
  contributions to their rainy day funds when personal income growth exceeds 2%.
- Contributions based on maintaining minimum fund size. Colorado requires that the
  budget reserve must be maintained at 4% of general fund appropriations, although if
  expenditures are made from the reserve, the reserve can fall to 2%

- Contributions from general fund surplus. Some states require that all or part of any surplus generated in the general fund is deposited to the rainy day fund. (Arizona)
- Contributions based on revenues. One rule is for 5% of annual revenue growth to be dedicated to the rainy day fund. Proposals have also been based on a percentage (example 1%) of general revenues.

RDF withdrawal rules

Several states have automatic rules for making withdrawals of rainy day funds. These include:
- Arizona allows transfers of rainy day balances when real personal income growth is less than 2% and less than the seven-year trend.
- Colorado automatically transfers rainy day balances when revenues decline from forecasted levels.
- Indiana requires automatic transfers to the general fund if annual growth in personal income is less than negative 2%. The amount of the transfer is driven by a formula in which annual general fund revenues are multiplied by the percentage by which annual personal income growth is less than negative 2%. For example if personal income grows at negative 5%, the automatic transfer would be 3% of general fund revenues. Michigan's is similar but the transfer is based on the total percentage decline in personal income times general fund revenues.
- Minnesota uses a two-pronged test. Withdrawals can be made when a deficit in the general fund is projected and "objective measures" reflect a downturn in the state's economy. These measures include, reduced growth in total wages, retail sales or employment.
- Texas permits the appropriation of money from its rainy day fund when general revenues are less than the appropriations made by the preceding legislature or if anticipated revenues for a succeeding biennium are less than the revenues available for the current biennium.

The modest proposal—a unemployment insurance trust fund style national rainy day fund

The notion this paper proposes is to set up a national risk pool to provide counter-cyclical aid to states during tough budget years. A similar counter-cyclical fund is the private, unemployment insurance compensation trust fund, where individual states establish tax and benefit rules for contributions and withdrawals from the fund but fund resources are pooled nationally permitting states that exhaust their available fund balances to borrow. In the UI system states set a range of tax rates for different types of employers usually based on the tendency of that employer to use UI funds. Employers with more frequent layoffs pay a higher tax rate than stable employers since they are more likely to use the fund. This is usually referred to as an "experience" rating.

Part of the success of the UI system is that states that fail to adequately contribute to the fund do have to pay interest on loans and this helps states to adjust their UI system to return their portion of the fund to balance.

In this stylized national rainy day proposal, states would also be given different "experience" ratings that would require larger contributions under certain circumstances. The goal of this fund would be for each state to accumulate a fund balance of 15%. This will require a two-stage process. Initially the fund will need to be capitalized and as this simulation will show, that will be no easy process. Once capitalized an "experience rating" will need to be assigned to each state based on the state's experience in using rainy day funds. This "experience" rating could be based on either a state specific value at risk model or based on a floating cap for each state's fund balance. State's whose expenditure and tax variability proved to be low would be permitted to reduce the level of their rainy day fund balance to 10% while states with high variability might be required to increase their balance to greater than 15%.

In addition, this proposal would also create a withdrawal rule that would limit annual withdrawals to 50% of a states total fund balance and would authorize withdrawals only when a state's real revenue growth is negative, or unemployment rises by greater than 1% from the previous year or personal income growth is negative.

Step 1—capitalizing a national rainy day fund balance—contribution rules

The goal of the national rainy day fund would be for each state to initially amass a minimum fund balance of 15% of prior year expenditures. Reaching this level, as simulations will show can take some time unless a state was willing to contribute a large lump sum amount to its fund balance. (For example, tobacco settlement or other legal settlement funds, unanticipated budget surpluses). At a minimum, the goal would be to establish a contribution rule that rewards states that reach given fund balance levels. The proposed rule would create four tiers for contributions.

RDF fund balance	Contribution rule
Balance of 0 to 5%	1% of general fund revenue (+) 5% of total revenue growth
Balance of 5% to 10%	1% of general fund revenue
Balance of 10% to 15%	5% of total revenue growth (not to exceed 1% of general fund revenue)
Balance of 15%+	No contribution required

A simulation of applying such a contribution rule from 1992 to 2001 demonstrates that in aggregate, even if the first tier rule of 1% of general fund revenues plus 5% of revenue growth had been applied during this period, the accumulated rainy day fund balance would have reached only 10.0% (approximately $109 billion) of 2000 state expenditures (table 3). However such a rule would have left 30 states with fund balances of 10% or greater, a significant improvement on the actual state performance over this period. One of the assumptions in performing this exercise, is that the era from 1992 to 2001 represents a period of strong economic performance that would have allowed the states to make fund contributions while avoiding making withdrawals.

A second simulation recognizes what rainy day fund balances would have been if the same contribution rule was used and any existing (1993) fund balance were applied. The result improves the aggregate fund balance total to 10.5% of 2000 expenditures but reflects the fact that existing rainy day fund balances in 1993 were only $5 billion.

Table 3--rainy day fund balances simulated from 1992 to 2001		RDF balance		RDF balance	
	contribution tier 1,	as % of 2000	contribution tier 1	as % of 2000	2000
	1% of general revenues	expenditures	(+) any existing	expenditures	expenditures
	(+) 5% of revenue growth		RDF balance		
	(RDF balance, $ in thousands)	(%)	(balance, $ in thousands)	(%)	
United States	108,835,720.89	10.0	114,133,720.89	10.5	1,084,097,152
Alabama	1,535,705.13	9.7	1,535,705.13	9.7	15,872,589
Alaska	930,811.47	14.1	1,657,811.47	25.1	6,611,154
Arizona	1,548,044.81	9.5	1,590,044.81	9.7	16,315,915
Arkansas	972,942.44	10.1	972,942.44	10.1	9,589,172
California	14,381,151.80	9.6	14,381,151.80	9.6	149,772,310
Colorado	1,544,674.15	11.1	1,679,674.15	12.1	13,929,779
Connecticut	1,670,376.91	10.0	1,670,376.91	10.0	16,723,201
Delaware	463,810.24	11.0	535,810.24	12.7	4,210,656
Florida	4,711,091.27	10.4	5,007,091.27	11.1	45,207,930
Georgia	2,619,254.47	10.6	2,886,254.47	11.6	24,812,898
Hawaii	621,121.34	9.4	621,121.34	9.4	6,604,609
Idaho	483,137.48	10.8	516,137.48	11.5	4,492,552
Illinois	4,180,937.79	10.2	4,180,937.79	10.2	41,182,904
Indiana	1,940,137.50	9.6	2,310,137.50	11.4	20,289,362
Iowa	1,046,955.79	9.1	1,084,955.79	9.5	11,453,109
Kansas	945,012.96	10.4	1,017,012.96	11.1	9,123,858
Kentucky	1,645,254.52	10.5	1,735,254.52	11.1	15,682,365
Louisiana	1,676,007.46	10.1	1,676,007.46	10.1	16,553,676
Maine	546,099.82	10.0	563,099.82	10.3	5,448,061
Maryland	1,924,476.48	9.9	2,086,476.48	10.8	19,370,058
Massachusetts	2,926,446.94	9.9	3,309,446.94	11.2	29,478,165
Michigan	4,654,842.54	10.9	5,430,842.54	12.7	42,748,895
Minnesota	2,272,656.03	9.7	2,772,656.03	11.9	23,326,005
Mississippi	1,076,854.15	9.8	1,271,854.15	11.6	10,972,174
Missouri	1,812,315.49	10.5	1,849,315.49	10.7	17,293,111
Montana	360,337.74	9.7	360,337.74	9.7	3,718,168
Nebraska	586,968.51	10.2	614,968.51	10.7	5,772,418
Nevada	607,440.76	10.0	625,440.76	10.3	6,047,267
New Hampshire	404,428.37	9.3	423,428.37	9.7	4,366,072
New Jersey	3,441,704.02	9.9	3,600,704.02	10.4	34,783,171
New Mexico	926,202.15	10.6	926,202.15	10.6	8,700,579
New York	9,313,186.48	9.6	9,447,186.48	9.7	96,924,806
North Carolina	3,001,229.74	10.1	3,212,229.74	10.8	29,615,132
North Dakota	309,448.35	10.8	309,448.35	10.8	2,855,663
Ohio	4,106,060.39	9.2	4,387,060.39	9.8	44,630,567
Oklahoma	1,137,680.30	10.7	1,182,680.30	11.1	10,629,560
Oregon	1,631,534.57	10.3	1,700,534.57	10.8	15,776,050

Pennsylvania	4,465,268.76	9.4	4,495,268.76	9.4	47,681,749
Rhode Island	452,173.10	9.7	495,173.10	10.7	4,648,008
South Carolina	1,449,364.52	8.9	1,549,364.52	9.5	16,236,728
South Dakota	266,406.28	11.1	288,406.28	12.0	2,403,103
Tennessee	1,682,404.87	10.0	1,783,404.87	10.6	16,853,438
Texas	6,586,900.85	10.9	6,615,900.85	10.9	60,425,369
Utah	865,269.39	10.1	908,269.39	10.6	8,591,768
Vermont	290,310.58	9.0	291,310.58	9.0	3,219,388
Virginia	2,505,774.98	10.3	2,566,774.98	10.6	24,313,963
Washington	2,460,710.51	9.5	2,585,710.51	10.0	25,901,790
West Virginia	748,803.75	9.9	769,803.75	10.2	7,551,834
Wisconsin	2,708,419.86	11.9	2,781,919.86	12.2	22,833,463
Wyoming	401,821.77	15.7	419,821.77	16.4	2,552,590

Given the difficulty in establishing a significant fund balance, rules would also have to be in place to allow states to suspend contributions when withdrawals are needed to balance the state budget. The first rule for suspending contributions would allow a state with a balance of greater than 15% to suspend contributions, but additional rules could allow a state to suspend contributions when real revenue growth is negative or if personal income growth is negative.

Step 2—Rules for operating the fund once capitalized

Establishing the experience rating

In order for the fund to create the right incentives for states to manage their budgets wisely, states need to be rewarded for good and bad budgeting practice. The most elegant (but most likely not the most practical approach) would create a specific experience rating for each state based on the volatility of its revenue and expenditure system. States whose revenue systems tended to crash during recessions while seeing spikes in expenditures should have an incentive to build larger surpluses in the rainy day fund. States that have relatively stable revenues and expenditures would not need to carry such large balances. However, measuring revenue and expenditure volatility is a tricky business since legislative changes in tax rate and bases can effect revenue measures and changes in program criteria can effect eligibility for many large spending programs such as Medicaid. While elasticity measures might be able to serve as proxies for experience ratings, these measurements are far from exact and might even be subject to gaming. (see appendix 2, tax elasticities by state)

Russell Sobel (2000), suggests an analysis of revenue variability could be constructed for each tax source in a state. This could be done by decomposing the variation in each source of tax revenue into two components—cyclical variability and random variance. Cyclical variability would be measured as the change in revenue historically associated with a 1 percent change in the state economy. The movement in tax revenue not accounted for by movements in the state economy is then considered to be random variance. The limitation of such a measure is that it is based on the historic relationship between tax revenues and economic growth in a state and this can change overtime.

For the purpose of establishing an experience rating, potential both cyclical variability and random variance could be used to adjust a state's contribution to the fund. States with high variance in both indicators would be expected to carry larger balances.

From a practical perspective, some institution would be required to annually calculate revenue variability but this could be done either by a state revenue agency or the fund administrator.

To be fair, a similar measure of expenditure variability would need to be created. It is possible for some states due to demographic characteristics or public policy decisions to experience larger expenditure spikes during bad times. States with more generous counter-cyclical aid programs for the unemployed and indigent will face greater fiscal pressure than states with more restrictive policies.

A second alternative would borrow from the work of Corina and Nelson (2003)[11] and develop state specific value at risk (VAR) models to serve as proxies for experience ratings. VAR is a statistic developed in the risk management literature. Jorian (2001)[12] describes VAR as summarizing the…"worst loss over a target horizon with a given level of confidence. More formally VAR describes the quartile of the forecasted PDF of gains and loses over the target horizon. If 1-p is the selected confidence level, VAR corresponds to the p lower-tailed level."

Corina and Nelson provide a simulation of VAR for the state of Utah for 2003. In their example the portfolio of state revenues consists of sales, income and corporate franchise taxes. Using a commercial available spreadsheet program, the authors produced a probability distribution function (PDF) for the budget surplus/deficit for Utah simulating over 10,000 values. The simulation calculated that a 5% chance would exist that a deficit of $135.75 million or more might occur in FY03. In otherwords, an RDF of $135.75 million would give the state adequate revenues to match planned expenditures 95 percent of the time.

This approach has several potential advantages. A primary advantage is that it allows a measurement of a portfolio of taxes that can be decomposed into systemic and and unsystemic risk. This allows the development of a unique measure of risk over the business cycle for states using significantly differing tax structures. In addition as VAR is used extensively in risk management, an extensive literature and the development of software and specific tools to accommodate this measure already exist. In addition VAR can be run at differing levels of confidence and produce state specific measures for optimal rainy day fund size. Such an approach would allow a central fund administrator to provide reasonable estimates across all states using a standard methodology that could be easily and efficiently produced.

---

[11] Corina, Gary C. and Ray D. Nelson, "Rainy Day Funds and Value at Risk" State Tax Notes, August 25, 2003, pp.563-567.
[12] Jorian, Phillipe. 2001 Value at Risk (Second Edition), New York, McGraw-Hill

A very simple alternative, is to establish a floating cap based on the experience of the state in utilizing the fund during a recession. For example if a state exhausted its fund balance during a recession and was forced to borrow, its post-recessionary fund cap might be raised to 18 to 20% of expenditures rather than 15%. Conversely for states maintaining a fund balance, interest could be paid on their reserves to reward good budgeting practice or its fund cap might be reduced to 10%. Of course since rainy day funds are countercyclical, states would be permitted a rerasonable period of time to restore their fund balances, perhaps 5 to 7 years.

Creating a withdrawal rule

A goal of the fund should be to allow states to use rainy day funds as they see appropriate. The experience rating provision should provide enough of an incentive for states to be prudent in using their funds, but it should not discourage the states from making significant withdrawals when conditions warrant such actions. Given this states should be permitted to withdrawal up to half of their existing balance in a given year however the withdrawal should also have to pass an economic test. These economic tests could include a drop in real revenue over the preceding year or an increase in unemployment by 1% or more or a decline in personal income. The economic tests should not be particularly rigorous and states would still have their own options for creating withdrawal rules specific to their state in addition to this national rule.

Borrowing

If a state faced a protracted downturn, it could deplete its entire balance in two years. In such a case, a state might want to borrow from the fund to help alleviate fiscal stress if tax and spending options are inadequate to restore fiscal balance. Borrowing however would require the payment of interest to the fund. It would be a last resort for a state, but it might still be a better option than making draconian tax or expenditure cuts.

Who administers the fund?

Most likely a quasi-governmental agency created by the states would be the logical organization to administer the fund. The agency would need to be autonomous enough to enforce rainy day fund rules and to have sufficient expertise to adjust rainy day fund structure to reflect emerging conditions. If specific experience ratings were created to reflect state revenue and expenditure volatility, the agency would need to have the staff expertise to calculate annual experience ratings. The agency would need to function as an independent third party administrator.

If the fund had been created, would it have helped over the recent recession?

A final simulation (table 4) illustrates the cumulative deficits reported by states from FY 2002 to 2004. In addition, it simulates the states fund balance if it had been

participating in a national rainy day fund based on the rules suggested in this proposal. As the table illustrates, reserves would not have been sufficient for all states to have entered fiscal 2005 in the black. Twenty-two states would have exhausted their rainy day funds over this period with the state of California accounting for nearly 56% of the rainy day fund deficit. However, absent any other budget actions such as spending cuts or tax increases, the existence of the fund would have covered 74% of the cumulative deficit for the states. In addition, it should be remembered that rainy day funds should not cover structural state deficits. Recent state fiscal experience suggests that many states have experienced structural rather than cyclical deficits that will require revenue and expenditure actions in addition to tapping rainy day funds.

Table 4--Cumulative state deficit, FY02, 03, 04 vs simulated rainy day balance

	Cumulative deficit 2002-2004	Simulated RDF balance (in millions)	Remaining Balance
Alabama	1,465.0	1,535.7	70.7
Alaska	2,292.0	930.8	(1,361.2)
Arkansas	243.0	972.9	729.9
Arizona	2,350.0	1,548.0	(802.0)
California	35,600.0	14,381.1	(21,218.9)
Colorado	1,843.0	1,544.7	(298.3)
Connecticut	1,791.5	1,670.4	(121.1)
Delaware	44.2	463.8	419.6
Florida	3,300.0	4,711.0	1,411.0
Georgia	1,950.0	2,619.2	669.2
Hawaii	4.6	621.1	616.5
Iowa	208.0	1,046.9	838.9
Idaho	356.0	483.1	127.1
Illinois	3,474.0	4,180.9	706.9
Indiana	1,750.0	1,940.1	190.1
Kansas	1,067.3	945.0	(122.3)
Kentucky	1,113.0	1,645.2	532.2
Louisiana	86.0	1,676.0	1,590.0
Massachusetts	3,947.0	2,926.4	(1,020.6)
Maryland	1,914.0	1,924.5	10.5
Maine	653.2	546.0	(107.2)
Michigan	3,042.0	4,654.8	1,612.8
Minnesota	6,085.0	2,272.6	(3,812.4)
Missouri	1,928.3	1,812.3	(116.0)
Mississippi	176.8	1,076.8	900.0
Montana	124.0	360.3	236.3
North Carolina	3,700.0	3,001.2	(698.8)
North Dakota	7.6	309.5	301.9
Nebraska	829.5	586.9	(242.6)
New Hampshire	1,386.0	404.4	(981.6)
New Jersey	11,900.0	3,441.7	(8,458.3)
New Mexico	42.0	962.2	920.2
New York	15,500.0	9,313.2	(6,186.8)
Nevada	790.0	607.4	(182.6)
Ohio	5,441.6	4,106.0	(1,335.6)
Oklahoma	1,091.7	1,137.7	46.0

Oregon	2,667.0	1,631.5	(1,035.5)
Pennsylvania	3,122.0	4,465.3	1,343.3
Rhode Island	530.0	452.2	(77.8)
South Carolina	1,531.0	1,449.4	(81.6)
South Dakota	102.1	266.4	164.3
Tennessee	1,996.0	1,682.4	(313.6)
Texas	8,000.0	6,586.9	(1,413.1)
Utah	373.0	865.3	492.3
Virginia	3,366.0	2,505.7	(860.3)
Vermont	88.0	290.3	202.3
Washington	2,454.0	2,460.7	6.7
Wisconsin	5,285.3	2,708.4	(2,576.9)
West Virginia	20.0	748.8	728.8
Wyoming	n/a	401.8	401.8
	147,030.7	108,874.9	(38,155.8)

Conclusion

Research has demonstrated that rainy day funds can be a meaningful counter-cyclical tool to relieve state fiscal stress. Research has also demonstrated that rainy day funds are most effective when states have strict rules governing contributions and withdrawals. This proposal for a national rainy day fund is based on a practical problem states face when trying to put aside significant savings. Once significant balances accrue, political pressure to spend the balances or cut taxes deplete fund balances. A national fund would allow reserves to accumulate without facing this political constraint. The fiscal and economic benefits of smoother state fiscal behavior over the business cycle could make the creation of such a fund a significant benefit to both the states and the nation as a whole.

References

Baker, Bruce, Daniel Besendorfer and Laurence J. Kotlikoff, "Intertemporal State Budegting", June 2002, mimeo

Brinkman, Phil. "Budget Woes Have No Easy Solutions", The Capitol Times and Wisconsin State Journal, June 15, 2003, p. D1.

Bruce, Donald, William F. Fox and M.H. Tuttle, "Tax Base Elasticities: A Multi-State Analysis of Long Run Dynamics", University of Tennessee, manuscript, December, 2002.

Corina, Gary C. and Ray D. Nelson, "Rainy Day Funds and Value at Risk" State Tax Notes, August 25, 2003, pp. 563-567.

Holcombe, Randall G. and Russell S. Sobel, "The Impact of Rainy Day Funds in Easing State Fiscal Crises During the 1990-1991 Recession," Public Budgeting and Finance, 16, 3 pp. 28-48

Jorian, Philippe, *Value at Risk,* (Second Edition), New York, McGraw-Hill, 2001.

Knight, Brian and Arik Levinson, "Rain Day Funds and State Government Savings", National Tax Journal, Vol LII, no. 3, September, 1999, pp. 459-472.

National Governors Association/National Association of State Budget Officers, "The Fiscal Survey of the States 2003". Washington, D.C. June 2003.

Rockefeller Institute of Government, "State Fiscal Brief", no.63, January, 2002, Albany, N.Y.

Standard and Poors, "Commentary on the States", October 18, 2001.

Wagner, G.A. and J.M. Gropp, "The Municipal Bond Market and Fiscal Institutions: Have Budget Stabilization Funds Reduced State Borrowing Costs?" unpublished manuscript, Duquense University, 2002.

Wagner, Gary A., "Fiscal Stress and State Rainy Day Funds: Are They the Answer for Brighter Days Ahead?" Duquesene University, mimeo, 2002.

Washington State Tax Structure Study Committee, William H. Gates, Sr. Chair, "Tax Alternatives for Washington State: A Report to the Legislature", Department of Revenue, Olympia, Washington, November 2002.

Zahradnik, Bob and Rose Riberio, "Heavy Weather: Are State Rainy Day Funds Working?". Center on Budget and Policy Priorities, Washington, D.C. revised May 13, 2003.

Appendix 1
An alternative—the Washington Tax Study Model

In 2001, the state of Washington created a commission to carry out a comprehensive analysis of the states tax structure. Among the items discussed was a proposed restructuring of the state's rainy day fund. The commission suggested several rules for contributions and withdrawals from the fund. First on the contribution side, revenues would be based on transferring up to 1% of general fund revenues to the rainy day fund based on certain economic criteria. The level of transfer would be based on the

difference between the predicted growth rate in general fund revenues (as forecasted by the states Office of Forecast Council (OFC)) and the predicted growth in the Seattle Consumer Price Index. For example in FY97 (a boom year for the state) the estimated increase in general fund revenues was $429.9 million or 5%. The Seattle CPI 1.587%. Since the general fund revenues growth would exceed the CPI, the maximum contribution of 1% of general fund revenues would be required. In that year general fund revenues were slightly over $9 billion, so a 1% transfer would equal $90 million. The Washington proposal caps fund size at 10% of general fund revenues.

The Washington plan would also structure withdrawals. To begin with no more than the current balance of the fund could be withdrawn in a given fiscal year. Annual withdrawals would also be govern by the relationship between percentage revenue growth and the Seattle CPI. For example, in FY2002, the OFC predicted that general fund revenues would grow by a relatively anemic 1.7% (from $10.7 billion in FY01 to $10.9 billion in FY02). In the meantime, the Seattle CPI was expected to increase to 2.2%. The difference between these two (1.7-2.2) would yield –0.5. The negative number would trigger a rainy day fund withdrawal equal to 0.5 times the level of general fund revenues ($10.7 billion) or roughly $50 million.

Appendix 2
Tax elasticities by state

Recent work by Bruce, Fox and Tuttle (2002)[13] produced long-run tax base elasticities for the two primary state tax bases—sales and personal income. The study demonstrates that there is considerable variability in state tax base elasticities caused primarily by the policy choices of individual states. As a general rule of thumb, the income tax is significantly more elastic than the sales tax with an average elasticity across all states nearly twice that of the sales tax. The authors find that for the personal income tax that states are more income elastic when the maximum tax bracket occurs at lower income levels, pensions are taxed and where the tax rate structure is more progressive. In the case of the sales tax, states with broader bases and larger shares being paid by consumers tend to have higher income elasticities.[14]

The variation in tax elasticities and the relative dependence on a particular tax base in each state could be modeled to provide

State	Long-run sales tax elasticity	Long-run personal income tax elasticity
Alabama	.712	1.823
Alaska	N/A	
Arkansas	.835	2.102
Arizona	.744	1.140

---

[13] Donald Bruce, William F. Fox and M.H. Tuttle, "Tax Base Elasticities: A Multi-State Analysis of Long Run Dynamics", University of Tennessee, December 2002.
[14] Bruce, et al, p.25.

California	.833	1.749
Colorado	.781	1.256
Connecticut	1.242	
Delaware	N/A	1.018
Florida	.926	
Georgia	.708	1.690
Hawaii	1.110	1.320
Idaho	.847	1.565
Illinois*	.871	1.565
Indiana	N/a	2.435
Iowa	.374	2.349
Kansas	.630	2.260
Kentucky	.654	2.600
Louisiana	.514	2.272
Massachusetts	1.365	1.415
Maine	.904	2.873
Maryland	.767	1.183
Michigan	.772	1.879
Minnesota	.876	1.320
Mississippi	.486	1.910
Missouri	.639	2.292
Montana		1.604
Nebraska	.431	2.491
Nevada	.781	
New Hampshire		
New Jersey	1.049	2.016
New Mexico	.924	3.024
New York	.750	1.295
North Carolina	.874	1.545
North Dakota	.339	.809
Ohio	1.033	3.983
Oklahoma	.695	2.613
Oregon		1.440
Pennsylvania	1.069	1.431
Rhode Island	.531	1.756
South Carolina	.773	1.564
South Dakota	1.145	
Tennessee	.716	
Texas	.997	
Utah	.873	1.477
Vermont	.735	.974
Virginia	.800	1.474
Washington	.740	
West Virginia	1.013	2.569
Wisconsin	1.113	1.215

Wyoming	.720					

Source: Donald Bruce, William F. Fox and M.H. Tuttle, "Tax Base Elasticities: A Multi-State Analysis of Long Run and Short Run Dynamics", December 2002, mimeo, University of Tennessee.

Appendix 3—State Budget Deficits

State Budget Deficits FY 2002, 2003, 2004

State	2002 Deficit	2002 deficit % of budget	2003 deficit	2003 deficit % of budget	2004 deficit	2004 deficit % of budget
Alabama	160.0	3.1	5.0	0.4	1,300.0	24.2
Alaska	906.0	40.1	490.0	20.6	896.0	37.8
Arkansas	20.0	0.6	-	0	223.0	7
Arizona	850.0	14.1	500.0	8	1,000.0	15.8
California	4,500.0	6.8	6,100.0	7.8	15,000 to 25,000	19.5 to 32.5
Colorado	385.0	6.4	558.0	9.2	900.0	13.4
Connecticut	96.0	0.9	495.5	4.1	1,000 to 1,200	8.6 to 10.3
Delaware	n/a	n/a	44.2	1.8	n/a	n/a
Florida	1,300.0	7	-	0	2,000.0	10.1
Georgia	600.0	4.4	450.0	3.1	900.0	5.8
Hawaii	n/a	n/a	162.0	4.6	n/a	n/a
Iowa	158.0	3.3	50.0	1	n/a	n/a
Idaho	36.0	2.1	160.0	8.1	160.0	8.1
Illinois	500.0	2.2	200.0	0.9	2,774.0	11.4
Indiana	456 to 600	5.0 to 6.7	300.0	3	850.0	8.8
Kansas	113.0	2.6	254.3	5.8	700.0	15.7
Kentucky	533.0	8.1	220.0	5	360.0	5.1
Louisiana	n/a	n/a	86.0	1.3	n/a	n/a
Massachusetts	1,400.0	6.7	547.0	2.6	1,400 to 2,000	6.1 to 8.8
Maryland	124.0	1.4	590.0	5.5	1,200.0	11
Maine	30.0	1.3	148.2	5.8	375 to 475	14.5 to 18.4
Michigan	642.0	6.5	600.0	6.5	1,800.0	19.6
Minnesota	1,953.0	17	1,690.0	11.5	2,442.0	18.7
Missouri	80.0	2.3	848.3	10.7	1,000.0	13.1
Mississippi	80.0	2.3	96.8	2.8	n/a	n/a
Montana	n/a	n/a	58.0	4.6	66.0	4.9
North Carolina	n/a	n/a	1,700.0	11	1700 to 2000	12.4 to 14.6
North Dakota	n/a	n/a	7.6	0.9	n/a	n/a
Nebraska	220.0	9.4	160.5	5.9	337 to 449	21.2 to 28.2
New Hampshire	n/a	n/a	490.0	20.6	896.0	37.8
New Jersey	1,900.0	9.8	6,000.0	25.6	4,000.0	19
New Mexico	12.0	0.4	30.0	0.8	n/a	n/a
New York	3,000.0	8.1	2,500.0	6.3	7000 to 10000	17 to 24.3
Nevada	n/a	n/a	206.0	10.5	400 to 534	21.2 to 28.2
Ohio	1500*	8.1	1,941.6	8.4	2,000.0	9.2
Oklahoma	n/a	n/a	291.7	20.6	800.0	15.9

Oregon	900*	8.7	500.0	4.6	950 to 1267	20.4 to 27.2
Pennsylvania	622.0	n/a	500.0	2.4	500 to 2000	2.4 to 9.6
Rhode Island	80 to 100	3.6 to 4.5	300.0	11.2	100 to 130	3.8 to 4.9
South Carolina	500.0	9.7	331.0	6.1	700.0	13.6
South Dakota	12.0	1.6	36.1	4.1	54.0	6.4
Tennessee	300.0	4.6	800.0	8.2	896.0	37.8
Texas	n/a	n/a	-	0	2500 to 8000	8.2 to 26.2
Utah	200.0	5.9	173.0	4.7	n/a	n/a
Virginia	1,300.0	11.5	950.0	7.7	1,116.0	9.3
Vermont	35 to 50	4.1 to 5.8	38.0	4.2	n/a	n/a
Washington	200 to 1000	2 to 9.8	120.0	1.2	1,000 to 1334	8.2 to 11.9
Wisconsin	300 to 1300	2.7 to 11.5	1,117.3	5	1300 to 2868	11.5 to 25.3
West Virginia	n/a	n/a	-	0	200.0	7.1
Wyoming	n/a	n/a	-	0	-	0

Working Paper Series

A series of research studies on regional economic issues relating to the Seventh Federal Reserve District, and on financial and economic topics.

Dynamic Monetary Equilibrium in a Random-Matching Economy
Edward J. Green and Ruilin Zhou
WP-00-1

The Effects of Health, Wealth, and Wages on Labor Supply and Retirement Behavior
Eric French
WP-00-2

Market Discipline in the Governance of U.S. Bank Holding Companies:
Monitoring vs. Influencing
Robert R. Bliss and Mark J. Flannery
WP-00-3

Using Market Valuation to Assess the Importance and Efficiency
of Public School Spending
Lisa Barrow and Cecilia Elena Rouse
WP-00-4

Employment Flows, Capital Mobility, and Policy Analysis
Marcelo Veracierto
WP-00-5

Does the Community Reinvestment Act Influence Lending? An Analysis
of Changes in Bank Low-Income Mortgage Activity
Drew Dahl, Douglas D. Evanoff and Michael F. Spivey
WP-00-6

Subordinated Debt and Bank Capital Reform
Douglas D. Evanoff and Larry D. Wall
WP-00-7

The Labor Supply Response To (Mismeasured But) Predictable Wage Changes
Eric French
WP-00-8

For How Long Are Newly Chartered Banks Financially Fragile?
Robert DeYoung
WP-00-9

Bank Capital Regulation With and Without State-Contingent Penalties
David A. Marshall and Edward S. Prescott
WP-00-10

Why Is Productivity Procyclical? Why Do We Care?
Susanto Basu and John Fernald
WP-00-11

Oligopoly Banking and Capital Accumulation
Nicola Cetorelli and Pietro F. Peretto
WP-00-12

Puzzles in the Chinese Stock Market
John Fernald and John H. Rogers
WP-00-13

The Effects of Geographic Expansion on Bank Efficiency
Allen N. Berger and Robert DeYoung
WP-00-14

Idiosyncratic Risk and Aggregate Employment Dynamics
Jeffrey R. Campbell and Jonas D.M. Fisher
WP-00-15

Working Paper Series *(continued)*

Working Paper Series *(continued)*

Working Paper Series *(continued)*

Working Paper Series *(continued)*

Working Paper Series *(continued)*

Working Paper Series *(continued)*