

What's So Magical about Five Percent? A Nationwide Look at Factors That Influence the Optimal Size of State Rainy Day Funds

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State rainy day funds have increased in popularity as countercyclical planning devices over the past 15 years. The view is widely held that all states need a rainy day fund balance of five percent in order to guard themselves against the threat of budgetary dislocation. This article compares the actual balances in state rainy day funds in 1997 to several factors affecting budgetary volatility. Little relationship is found between rainy day fund balances and the actual level of volatility in a given state. The article finds no justification for a "one size fits all" approach; each state should design policies based on its own peculiar needs.

Budgeting is about allocating resources to match demands for government action. But it is also about predicting the future. There are a number of reasons, on both the revenue and the expenditure sides of the budget, that these predictions may be wrong. Because of the business cycle, revenues and expenditures may often come in either over or under the predicted level. Alternatively, forecasters may be unable to predict with accuracy the connection between economic and demographic factors and government revenue or spending. These errors necessitate actions to correct any resulting fiscal deficits (fiscal surpluses cause other problems or opportunities), particularly since 49 of the 50 states have balanced-budget requirements.

State governments have four basic options available to them to deal with budget disruptions that will lead to fiscal deficits:¹

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1. Jon David Vasche and Brad Williams, "Optimal Governmental Budgeting Contingency Reserve Funds," *Public Budgeting and Finance* 7, no. 1 (Spring 1997): 66.

1. *increase revenues*, through increasing (permanently or temporarily) tax rates, broadening the base, or speeding up collections
2. *reduce expenditures*, through the permanent or temporary scaling back of programs or entitlements, postponing capital projects or deferring maintenance on existing projects, or delaying payments
3. *borrow money*, either directly from the public or from other funds (for example pension funds) not normally available to finance general government activities
4. *use contingency funds* as a temporary stopgap in order to avoid either increasing taxes or decreasing expenditures

The first three of these options carry with them some significant potential problems. Tax increases and spending cuts cause fluctuations in taxpayer burden and receipt of government services. Further, since shortfalls frequently occur because of unanticipated weaknesses in the state economy, these corrective actions may serve to increase the severity of the impact on citizens, taking money out of their pockets at the precise time that they most need it. Speeding up tax collections or delaying payments are options that have the potential to simply put off budgetary problems until later, since they pull revenues and push spending into the next fiscal year. Borrowing from other state funds is politically difficult (and perhaps economically undesirable), and borrowing from the public can be costly, particularly since bond rating agencies are more likely to downgrade states during bad economic times.²

Because these budgetary fluctuations inevitably occur, and because these other options provide suboptimal ways of dealing with them, governments are increasingly recognizing that the maintenance of long-term fiscal health without wide fluctuations in revenues or expenditures from year to year requires some kind of countercyclical planning. The most common of such planning devices, which has been popularized over the last 15 years, is the rainy day fund.³ In fact, the National Association of State Budget Officers (NASBO) reports that, as of 1997, 44 states had some form of budget stabilization fund, although some of these funds would probably not meet the technical definition of a rainy day fund.⁴

Table 1 shows the increase in rainy day funds between 1987 and 1997. Whereas 35 states had some form of rainy day fund in 1987, this number had increased to 44 by 1997. The total balances in state rainy day funds increased from just over \$3 billion in 1987 to \$13.4 billion in 1997. Even if one excludes Alaska's Budget Reserve Account (which, as it results from excess energy tax revenues, is not a classic rainy day fund in any sense),

2. Vasche and Williams, 68.

3. See, on rainy day funds generally, Penelope Lemov, "Patching the Fiscal Umbrella," *Governing* 8 (December 1995): 39–40. See also Richard Pollock and Jack P. Snyderhoud, "The Role of State Rainy Day Funds in Achieving Fiscal Stability," *National Tax Journal* 49, no. 4 (December 1986): 485–97.

4. National Association of State Budget Officers, *Budget Processes in the States* (Washington, D.C.: National Association of State Budget Officers, 1997).

TABLE 1
Balances in State Rainy Day Funds, 1987-97 (in Millions of Dollars)

State	1987	% of General Fund	1997	% of General Fund	Method of Disbursement
Alabama	No Fund	N/A	0	0.0%	G or L (2/3)
Alaska	N/A	N/A	3,135.9	130.0%	L
Arizona	No Fund	N/A	243	4.9%	F or L (2/3)
Arkansas	No Fund	N/A	No Fund	N/A	
California	570.7	1.0%	408	0.8%	D or L
Colorado	66.8	1.4%	166.7	3.9%	D
Connecticut	215	3.2%	241	2.6%	D
Delaware	50	2.9%	92.9	5.3%	L (3/5)
Florida	57.6	0.4%	686	4.4%	G, L
Georgia	213	2.5%	0	0.0%	L
Hawaii	No Fund	N/A	No Fund	N/A	
Idaho	0	0.0%	315	2.9%	L
Illinois	No Fund	N/A	No Fund		
Indiana	164	2.0%	466.2	5.9%	F
Iowa	70	1.5%	430	10.4%	L
Kansas	No Fund	N/A	No Fund	N/A	
Kentucky	21	0.4%	200	3.5%	L
Louisiana	No Fund	N/A	0	0.0%	L
Maine	25	1.1%	45.5	2.5%	L
Maryland	50	0.6%	489.3	6.6%	L
Massachusetts	70	0.5%	794.1	4.5%	L
Michigan	371	2.1%	1,212.5	14.6%	D, F
Minnesota	206	2.3%	697.3	7.2%	DL
Mississippi	64	1.8%	209	7.5%	L
Missouri	0	0.0%	120	1.9%	G, L
Montana	No Fund	N/A	No Fund	N/A	
Nebraska	24	1.1%	40	2.2%	D
Nevada	0	0.0%	129	8.3%	DL
New Hampshire	0	0.0%	20	2.3%	D, L
New Jersey	No Fund	N/A	327.7	2.1%	D, L
New Mexico	74.3	2.3%	122.2	4.1%	D, L
New York	169	0.4%	312	1.0%	D
North Carolina	No Fund	N/A	501	4.8%	L
North Dakota	0	0.0%	0	0.0%	G, F
Ohio	263	1.6%	828.3	6.2%	L
Oklahoma	0	0.0%	307.8	7.5%	D, G, or L (3/4)
Oregon	No Fund	N/A	0	0.0%	
Pennsylvania	52	0.3%	221	1.3%	G, L

TABLE 1
Continued

State	1987	% of General Fund	1997	% of General Fund	Method of Disbursement
Rhode Island	19	0.9%	53.4	3.0%	D, L
South Carolina	N/A	N/A	127	2.7%	D, L
South Dakota	No Fund	N/A	24.6	3.8%	L
Tennessee	75	1.2%	101	1.8%	D
Texas	No Fund	N/A	8.5	0.0%	L (3/5)
Utah	20	0.7%	71.8	2.4%	L
Vermont	8.7	0.7%	35.1	4.9%	D
Virginia	13.9	0.2%	160	2.0%	L
Washington	95	1.1%	0	0.0%	L
West Virginia	No Fund	N/A	71.5	2.9%	L
Wisconsin	No Fund	N/A	0	0.0%	L
Wyoming	117	7.6%	0	0.0%	L
Total	3,145		13,414.3		

Source: National Association of State Budget Officers, *Fiscal Survey of the States* (Washington, D.C.: Author, 1987 and 1998).

Legend:

L – Legislative appropriation (type of majority in parentheses, where known)

D – In the event of a fund deficit or revenue shortfall—automatically

DL – In the event of a deficit legislature may recommend usage

G – Governor declares fiscal emergency

F – By formula

Note: By far the most popular method is legislative action, either alone or in conjunction with governor's recommendation.

the balance of \$10.3 billion represents more than a threefold increase from the 1987 level.

Not all rainy day funds are created equal. They differ significantly from state to state in terms of the procedures for disbursement. These differences are not simply cosmetic. If rainy day funds are to meet their countercyclical objective, it is important that their use be limited to times of extraordinary need. A rainy day fund fails to serve its purpose if it can be used with equal ease during “sunny” or rainy times. Accordingly, the last column of Table 1 divides the states into categories according to how difficult it is to withdraw monies from their rainy day funds. As the table indicates, only a few states require a supermajority vote of the legislature in order to release funds. In 19 states, there is a simple requirement that the funds be appropriated by the legislature, without regard to the underlying fiscal situation. Although there may be political constraints to using rainy day funds during “good weather” in these states, there are no procedural hurdles to doing so.

THE OPTIMAL SIZE OF RAINY DAY FUNDS

There is a strong argument for rainy day funds, and these funds, in one form or another, exist in the vast majority of the states. However, this tells us nothing in particular about the other important question: how large should rainy day funds be? Here state budgeters have been operating under a rule of thumb that says that rainy day funds should represent approximately five percent of general fund expenditures. There is no specific source for this five-percent target: Navin and Navin cite National Conference of State Legislatures (NCSL) documents that themselves cite “Wall Street analysts” as recommending a five-percent fund size.⁵ Not every state that has a rainy day fund adheres (or intends to adhere) to the five-percent target. Nonetheless, this five-percent figure serves as a benchmark that is consistently cited for the optimal size of rainy day funds.

A number of studies have attempted to review individual state experiences with rainy day funds, and several of these have focused on the issue of optimal size and use of the funds. No study, however, has addressed the question of the factors that influence optimal size of contingency reserve funds on a national basis.

Vasche and Williams reviewed the experience of California in presenting data on the criteria that should be used in determining the optimal size of a contingency reserve fund. They demonstrated that, over a 12-year period from fiscal year 1974 to fiscal year 1985, revenue estimating errors in California averaged almost six percent of total revenues per year. The impact of these errors was significant. The overestimates of the late 1970s are widely credited with setting the political stage for Proposition 13, and the underestimates of the early 1980s led to “sharp cutbacks in state and local public services, steep increases in student education fees and other license charges, and severe reductions in state financial assistance to local governments.”⁶ Vasche and Williams conclude that California’s experience indicates that the five-percent target is defensible in that state; it would cover disruptions of an “average” size, while giving policymakers time to deal with shortfalls that are above average.

Navin and Navin studied seven Midwestern states, evaluating the characteristics and use of rainy day funds in Indiana, Iowa, Missouri, Michigan, Minnesota, Ohio, and Wisconsin. They found that the funds differ substantially on three dimensions: the determination of fund size, the method of deposit, and the method of withdrawal. By comparing the deposit and withdrawal of funds to key economic indicators in the seven states, the authors concluded that only in the states of Indiana, Michigan, and Ohio did the funds behave like countercyclical devices, growing in good economic times and declining in bad economic times. Although they drew a clear connection between the economy and the

5. John C. Navin and Leo J. Navin, “The Optimal Size of Countercyclical Budget Stabilization Funds: A Case Study of Ohio,” *Public Budgeting and Finance* 17, no. 2 (Summer 1997): 117.

6. Vasche and Williams, 72.

rainy day funds in these states, Navin and Navin did not attempt to determine the optimal size of the funds in any of the states covered by their review.⁷

A subsequent study by the same authors, however, did attempt to confront the question of optimal size directly by studying the particular experience of the state of Ohio. In that study, Navin and Navin concluded that the “widely accepted” target of five percent would be inadequate for Ohio. Instead, a review of historical data on fluctuations in Ohio personal income and a review of revenue forecasting accuracy led them to conclude that a fund target in excess of 13 percent would be necessary in order for Ohio’s stabilization fund to act as an effective device for guarding against budgetary surprises.⁸

These studies offer key insights into both the use of rainy day funds and their optimal size in specific states. They do not, however, provide an indicator of the use of rainy day funds across all of the states. Sobel and Holcombe attempted to fill this gap by evaluating how rainy day funds were used by all state governments in the 1990–91 recession. They suggested that, given the stated purpose of rainy day funds, the appropriate standard on which to judge them would be the degree to which state fiscal policy fluctuated substantially over different points in the business cycle. They found that, in aggregate, the balances built up in rainy day funds were inadequate to see the states through the 1990–91 recession without significant revenue increases and expenditure cuts. State rainy day funds did reduce the fiscal stress that states experienced during the recession, but this was only empirically true in those cases in which the state was statutorily required to contribute to the rainy day fund, usually through some established formula. The authors attempted to evaluate the level of rainy day fund that each state would have needed in order to carry it from 1989 to 1992 without any fiscal stress. They noted that most states would have required rainy day funds equal to more than 30 percent of their 1988 budgets (as opposed to the five-percent benchmark) in order to get through the recession with no tax increases or spending cuts.⁹

Although several of these studies have dealt with the question of optimal size, none has attempted to compare the actual size of rainy day funds in each state to a measure of the relative need, from state to state, for such a fund. There is wide recognition that the five-percent figure is oversimplified—that is, it may be adequate for some, but inadequate for others—but no study to date has attempted to explore the factors that lead to the variance in optimal size of rainy day funds across the 50 states. Understanding what these factors are, and how they can be applied to individual states, is crucial to evaluating the extent to which an individual state’s rainy day fund will serve the stated countercyclical purpose: preventing the kind of fluctuations in taxes or spending that they are designed to prevent.

7. John C. Navin and Leo J. Navin, “An Evaluation of State Budget Stabilization Funds among Midwestern States,” *Growth and Change* 25, no. 4 (Fall 1994): 445–66.

8. Navin and Navin, “The Optimal Size of Countercyclical Budget Stabilization Funds,” 114–25.

9. Russell Sobel and Randall G. Holcombe, “The Impact of State Rainy Day Funds in Easing State Fiscal Crises during the 1990–1991 Recession,” *Public Budgeting and Finance* 16, no. 3 (Fall 1996): 28–47.

WHAT ARE THE FACTORS INFLUENCING OPTIMAL SIZE?

There are a number of factors that should influence the optimal size of rainy day funds. These factors, considered in total, may enable us to differentiate states according to their need for devices that can smooth out year-to-year fluctuations. States that operate in a more volatile budgetary environment will, all other things being equal, require larger rainy day fund balances. This volatility may arise either on the revenue or on the expenditure side of the budget, and often on both. In this article, I will not attempt to establish the optimal size of a rainy day fund in each state. I will, however, start with the presumption that there are significant reasons to believe that a “one size fits all” rainy day fund misses some of the important variations among states in terms of the volatility of their budgeting environment. In this exploratory analysis, there are several characteristics of states that will be evaluated that are assumed to lead to greater volatility, including greater revenues from corporate taxes, volatility of economic environment, reliance on federal aid, gambling revenues, and Medicaid expenditures.

States with More Revenues from Corporate Taxes

Although corporate income taxes are not a major source of revenue in any state, they can be among the most volatile sources—far more volatile than major tax sources such as personal income and sales taxes. Holcombe and Sobel note that corporate net income (and therefore tax revenues) “declines quite drastically during recessions and expands rapidly during economic booms.” They cite the corporate tax as “the most unstable of the four largest sources of revenues for state governments.”¹⁰

States with More Volatile Economic Environments

The volatility of the economic environment can differ significantly among states. If a state has a mix of economic activity (less manufacturing, for example) that is more or less volatile over the business cycle than that of other states, this will have implications for the stability and/or predictability of revenue flows in that state. This article will therefore include a measure of economic volatility in the overall assessment of budget volatility.

States with a Greater Reliance on Federal Aid

States that receive a larger amount of aid from the federal government may be more sensitive to changes in the economy, since the federal government is more likely to cut back on aid during recessions. This was less true prior to federal welfare reform, since an in-

10. Randall G. Holcombe and Russell S. Sobel, *Growth and Variability in State Tax Revenue: An Anatomy of State Fiscal Crises* (Westport, Conn.: Greenwood, 1997), 71

crease in Aid to Families with Dependent Children (AFDC) caseloads automatically carried with it more federal aid at the same time that it was increasing state expenditures on welfare. The advent of block grants for welfare under the replacement program for AFDC, Temporary Aid for Needy Families (TANF), has changed the situation facing states. Now states that are dependent on federal aid are more likely to be at risk should an administration or a Congress decide, as was the case in the early 1980s, to cut back on the level of discretionary assistance provided to states and localities.

States That Rely on Gambling Revenues

The increase in the use of gambling revenues as a more important source of revenue for state governments has increased the potential volatility of revenues. Thirty-seven states now have lotteries, and nine permit casino gambling (in addition, there are operative casinos and bingo halls on Native American lands in 31 states). These revenue sources have proved to be quite unpredictable and may be more responsive than other revenue sources to changes in the economy, since individual gambling behavior is related in part to how much disposable income citizens have.

States with Larger Medicaid Expenditures

Finally, states can experience volatility on the spending side of the budget. Here the most volatile item in the budget over the past decade has been Medicaid, which, particularly during economic downturns, has driven up state budgets in unpredictable ways. This unpredictability is related not only to the inability to forecast the effect of the economy on Medicaid caseloads, but also to the volatility of inflation for medical care over the past decade, which often exceeded 10 percent per year during the 1990s.

HOW DO STATES COMPARE TO EACH OTHER ON THESE FACTORS?

As noted above, the volatility index that will be created in this article will consist of five factors: the percentage of a state's revenues derived from corporate taxes, the volatility of its economic environment, the percentage of its revenue that comes from federal aid, the percentage of its revenue arising from gambling, and the percentage of its spending devoted to Medicaid. Data exist on each of these factors. Viewed in total, a review of these data should enable us to differentiate states according to which ones have a greater need for rainy day funds. It follows from this that those that have the greatest need will require the largest rainy day fund balances.

Percentage of Revenue from Corporate Income Tax

As noted above, since corporate profits can fluctuate so widely between good and bad economic times, this revenue source can prove to be particularly unreliable. Accordingly,

TABLE 2
Corporate Tax Revenue, by State (dollars in thousands)

	Total Gen. Revenue	Total Corp. Tax	% Corp.	Volatility Score
Nevada	\$ 4,386,336	\$ 0	0.00%	0.0000
Texas	45,546,186	0	0.00%	0.0000
Washington	18,212,938	0	0.00%	0.0000
Wyoming	2,095,423	0	0.00%	0.0000
Hawaii	6,700,545	67,570	1.01%	0.6764
South Dakota	1,920,419	36,888	1.92%	1.2884
Alabama	11,487,011	226,616	1.97%	1.3233
Vermont	2,052,541	45,327	2.21%	1.4813
South Carolina	10,750,064	239,350	2.23%	1.4934
Colorado	9,944,905	224,275	2.26%	1.5127
Maryland	14,799,832	343,499	2.32%	1.5568
Virginia	18,089,498	425,154	2.35%	1.5765
Kentucky	12,431,136	292,753	2.35%	1.5796
Maine	4,059,117	97,146	2.39%	1.6053
Ohio	30,792,152	737,363	2.39%	1.6062
New Mexico	6,963,118	173,205	2.49%	1.6685
Oklahoma	8,703,926	221,172	2.54%	1.7044
Rhode Island	3,500,923	89,198	2.55%	1.7090
Iowa	8,360,300	221,041	2.64%	1.7734
Louisiana	13,529,327	380,155	2.81%	1.8847
Montana	2,878,900	81,999	2.85%	1.9105
Mississippi	7,895,021	225,924	2.86%	1.9194
Nebraska	4,740,329	137,338	2.90%	1.9433
Florida	41,432,077	1,232,731	2.98%	1.9957
Missouri	13,773,787	411,045	2.98%	2.0017
Utah	5,903,010	177,415	3.01%	2.0160
North Dakota	2,426,989	75,223	3.10%	2.0790
Arkansas	7,290,031	229,982	3.15%	2.1161
Oregon	11,285,810	384,073	3.40%	2.2827
Tennessee	13,365,828	479,660	3.59%	2.4071
Georgia	19,713,921	726,321	3.68%	2.4713
Wisconsin	16,916,226	638,975	3.78%	2.5336
Kansas	7,264,375	291,080	4.01%	2.6877
New York	75,382,513	3,042,094	4.04%	2.7069
Minnesota	17,207,455	699,234	4.06%	2.7257
Idaho	3,401,841	138,277	4.06%	2.7265
Connecticut	13,014,623	530,430	4.08%	2.7338
West Virginia	6,038,200	251,230	4.16%	2.7908
Alaska	7,424,923	331,337	4.46%	2.9932

TABLE 2
Continued

	Total Gen. Revenue	Total Corp. Tax	% Corp.	Volatility Score
Pennsylvania	35,212,460	1,575,707	4.47%	3.0015
North Carolina	21,695,686	981,378	4.52%	3.0341
New Jersey	26,963,004	1,263,979	4.69%	3.1444
Delaware	3,469,482	172,562	4.97%	3.3361
Massachusetts	23,810,978	1,213,366	5.10%	3.4181
Arizona	11,499,078	600,890	5.23%	3.5051
California	103,929,227	5,803,652	5.58%	3.7457
Illinois	32,068,167	1,803,931	5.63%	3.7732
Indiana	15,991,546	904,265	5.65%	3.7929
Michigan	33,857,435	2,228,753	6.58%	4.4154
New Hampshire	2,795,550	208,388	7.45%	5.0000

Source: Bureau of the Census, *Governmental Finances in 1997* (Washington, D.C.: U.S. Government Printing Office, 1998).

those states that rely on it to any significant degree can find that they are less able to predict revenues with precision. Table 2 presents data on corporate taxes for each state as a percentage of total general revenue. Four states (Nevada, Texas, Washington, and Wyoming) have no corporate income tax. The tax for other states ranges from less than 2 percent (Hawaii, South Dakota, and Alabama) to 6.6 percent in Michigan and 7.4 percent in New Hampshire. In all, there are seven states that receive more than 5 percent of revenues from the corporate tax.

Volatility of Economic Environment

State economies vary in terms of their volatility, which affects the predictability and volatility of revenue in the states. Some states, for example, have a mix of industries or services that makes them more or less vulnerable to budgetary fluctuations over the business cycle. For this reason, we have included a measure of the volatility of the state's economic base as a part of our measure of total state budget volatility. Specifically, Table 3 presents the average absolute deviation of each state's unemployment rate from the national average, covering 1990–97. Those states with lower values are assumed to have more stable economies over the business cycle, whereas those with higher values have less stable ones. As the table shows, many states track very closely to national trends. More than 60 percent of the states (31) experienced unemployment rates between 1990 and 1997 that, on average, were within one percent of the national average. Most notably, Pennsylvania (.18 percent difference), Connecticut (.28 percent), and Texas (.31 percent) tracked national trends

TABLE 3
Average State Unemployment Rate Difference,
Compared to National Average, 1990–97

	Average	Volatility Score
Pennsylvania	0.18%	0.2602
Connecticut	0.28%	0.4089
Texas	0.31%	0.4647
Illinois	0.36%	0.5390
Arizona	0.38%	0.5576
Florida	0.38%	0.5576
Ohio	0.40%	0.5948
Kentucky	0.46%	0.6877
Idaho	0.48%	0.7063
Alabama	0.49%	0.7249
Montana	0.49%	0.7249
Oregon	0.51%	0.7621
Washington	0.51%	0.7621
Nevada	0.51%	0.7621
New Jersey	0.59%	0.8736
Arkansas	0.59%	0.8736
Maine	0.60%	0.8922
South Carolina	0.61%	0.9108
Tennessee	0.61%	0.9108
Maryland	0.66%	0.9851
Missouri	0.74%	1.0967
Oklahoma	0.74%	1.0967
Georgia	0.76%	1.1338
Massachusetts	0.79%	1.1710
New York	0.83%	1.2268
New Hampshire	0.88%	1.3011
Wyoming	0.89%	1.3197
New Mexico	0.90%	1.3383
Michigan	0.93%	1.3755
Vermont	0.94%	1.3941
Mississippi	0.95%	1.4126
Louisiana	1.01%	1.5056
Delaware	1.01%	1.5056
Indiana	1.03%	1.5242
Rhode Island	1.06%	1.5799
Virginia	1.14%	1.6914
North Carolina	1.39%	2.0632
Colorado	1.44%	2.1375
Kansas	1.55%	2.3048

TABLE 3
Continued

	Average	Volatility Score
California	1.61%	2.3978
Wisconsin	1.65%	2.4535
Minnesota	1.66%	2.4721
Alaska	1.81%	2.6952
Hawaii	1.86%	2.7695
Utah	2.06%	3.0669
Iowa	2.09%	3.1041
North Dakota	2.30%	3.4201
South Dakota	2.78%	4.1264
West Virginia	2.96%	4.4052
Nebraska	3.36%	5.0000

Source: Unemployment rates by state from Department of Commerce, *Survey of Current Business* (Washington, D.C.: U.S. Government Printing Office, 1990–1997).

Note: Data represent average annual difference between a state’s unemployment rate and the national average, 1990 through 1997.

very closely. On the other hand, there were six states (Nebraska, West Virginia, South Dakota, North Dakota, Iowa, and Utah) that differed from national unemployment rates by an average of more than two percent.

Percentage of Federal Aid

Table 4 compares the states according to the percentage of their revenues they received from the federal government in fiscal year 1997. The average state received 28 percent of its revenues from federal aid in that year. There was wide variation across the 50 states, however, from 14 percent of revenues (Alaska) to more than 40 percent of revenues (New York and Wyoming). More than half (28) of the states received somewhere between 20 and 30 percent of their revenues from the federal government in 1997. Six states, however, received more than 35 percent. Again, we would expect these states to have more volatile revenue systems.

Percentage of Revenues from Gambling

Table 4 also presents information ranking the states in terms of the percentage of revenues derived from gambling. For the purpose of this analysis, “gambling revenue” is defined as including revenues from state lotteries (37 states had lotteries in 1997), casino gambling (31 states received revenue from some form of gambling), and parimutuel reve-

TABLE 4
Revenues from Federal Aid and Gambling, by State

Federal Aid			Gambling		
	% of General Revenue	Volatility Score		% of General Revenue	Volatility Score
Alaska	14.04	1.7278	Hawaii	0.00%	0.0000
Nevada	18.91	2.3271	North Carolina	0.00%	0.0000
Delaware	19.37	2.3837	Tennessee	0.00%	0.0000
Virginia	19.60	2.4120	Utah	0.00%	0.0000
Minnesota	21.07	2.5929	Wyoming	0.01%	0.0056
Washington	22.58	2.7787	Alaska	0.03%	0.0112
Connecticut	22.62	2.7837	Alabama	0.04%	0.0169
Maryland	23.05	2.8366	Arkansas	0.11%	0.0475
Wisconsin	23.08	2.8403	Oklahoma	0.20%	0.0879
Hawaii	23.57	2.9006	South Carolina	0.25%	0.1132
New Jersey	23.60	2.9043	Montana	0.44%	0.1942
Iowa	24.02	2.9559	North Dakota	0.46%	0.2034
Indiana	24.13	2.9695	New Mexico	0.65%	0.2896
Florida	24.20	2.9781	Washington	0.84%	0.3755
Massachusetts	24.40	3.0027	Louisiana	0.91%	0.4068
Michigan	24.42	3.0052	Arizona	0.92%	0.4096
Nebraska	24.56	3.0224	Nebraska	0.95%	0.4207
Oklahoma	24.93	3.0679	California	0.95%	0.4228
Idaho	24.97	3.0729	Idaho	0.99%	0.4400
Kansas	25.33	3.1172	Wisconsin	1.00%	0.4450
Colorado	26.10	3.2119	Kansas	1.05%	0.4652
Pennsylvania	26.75	3.2919	Minnesota	1.09%	0.4860
Utah	26.97	3.3190	Indiana	1.31%	0.5829
Missouri	27.01	3.3239	Colorado	1.33%	0.5914
Illinois	27.17	3.3436	Vermont	1.55%	0.6874
Kentucky	27.87	3.4297	Kentucky	1.66%	0.7386
Arizona	28.15	3.4642	West Virginia	1.67%	0.7437
New Mexico	28.34	3.4876	Maine	1.68%	0.7472
North Carolina	29.12	3.5836	Michigan	1.91%	0.8497
California	29.20	3.5934	Missouri	2.11%	0.9401
Ohio	29.21	3.5946	Pennsylvania	2.18%	0.9680
South Carolina	29.41	3.6192	Iowa	2.19%	0.9733
Texas	30.30	3.7288	New York	2.20%	0.9793
Georgia	30.47	3.7497	New Hampshire	2.40%	1.0685
Alabama	30.94	3.8075	Virginia	2.44%	1.0844
Arkansas	31.06	3.8223	Mississippi	2.45%	1.0881
Oregon	31.17	3.8358	Ohio	2.79%	1.2397

TABLE 4
Continued

Federal Aid			Gambling		
	% of General Revenue	Volatility Score		% of General Revenue	Volatility Score
Rhode Island	31.67	3.8974	Texas	2.79%	1.2400
Louisiana	32.00	3.9380	Florida	2.92%	1.3006
Maine	32.00	3.9380	Illinois	2.97%	1.3193
Vermont	32.49	3.9983	Rhode Island	3.10%	1.3778
Montana	33.32	4.1004	Massachusetts	3.29%	1.4618
North Dakota	33.46	4.1176	Maryland	3.40%	1.5139
West Virginia	33.79	4.1583	Georgia	3.45%	1.5320
South Dakota	35.06	4.3145	New Jersey	3.77%	1.6762
New Hampshire	35.35	4.3502	Connecticut	4.16%	1.8506
Mississippi	36.79	4.5274	Delaware	4.92%	2.1870
Tennessee	37.90	4.6640	South Dakota	5.41%	2.4038
New York	40.42	4.9742	Oregon	6.75%	3.0005
Wyoming	40.63	5.0000	Nevada	11.24%	5.0000

Source: Bureau of the Census, *Governmental Finances in 1997* (Washington, D.C.: U.S. Government Printing Office, 1998).

nues (for example, horse racing or dog racing); 37 states received revenues from one or more of these sources. In 1997, the average state received approximately two percent of revenues from gambling. Four states—Hawaii, North Carolina, Tennessee, and Utah—had no gambling revenues. In 15 other states, gambling revenues made up less than one percent of total revenues. At the extreme other end of the scale, Nevada received more than 11 percent of its revenues from gambling. Other states where gambling revenues exceeded four percent were Connecticut (4.2 percent), Delaware (4.9 percent), South Dakota (5.4 percent), and Oregon (6.8 percent).

Medicaid

Thus far, the analysis presented has focused only on the revenue side of the budget. Expenditures can be equally hard to predict in some cases. The key such case, as noted above, is Medicaid. The volatility of Medicaid expenditures bedeviled state governments through the 1980s and into the 1990s, preventing them from accurately predicting spending. For this reason, the percentage of funds devoted to Medicaid is considered, for our purposes, to be a key indicator of volatility on the expenditure side. As Table 5 indicates, although the average state spent about 14 percent of its budget on Medicaid in 1997, there was wide

TABLE 5
Spending on Medicaid, by State, FY97

	Total Spending	Medicaid Spending	Percentage Medicaid	Volatility Score
Alaska	2,380,800	139,400	5.86%	1.0070
West Virginia	2,407,445	162,046	6.73%	1.1576
South Carolina	4,611,879	322,082	6.98%	1.2011
Mississippi	2,779,193	208,960	7.52%	1.2931
Louisiana	5,912,862	481,287	8.14%	1.3999
Missouri	5,737,666	468,613	8.17%	1.4046
New Mexico	2,974,500	243,500	8.19%	1.4079
Oregon	7,434,000	660,000	8.88%	1.5269
Idaho	1,391,693	124,020	8.91%	1.5326
Vermont	720,908	68,828	9.55%	1.6420
Wisconsin	9,025,700	865,600	9.59%	1.6494
Oklahoma	4,105,937	401,104	9.77%	1.6801
Maine	1,768,653	177,402	10.03%	1.7251
Kentucky	5,617,344	563,886	10.04%	1.7264
Delaware	1,765,700	184,700	10.46%	1.7990
Hawaii	3,171,025	332,272	10.48%	1.8021
Arkansas	5,113,500	548,500	10.73%	1.8448
Kansas	3,538,106	384,000	10.85%	1.8666
North Carolina	10,466,776	1,150,458	10.99%	1.8904
Montana	1,977,420	220,000	11.13%	1.9134
Arizona	4,312,711	509,291	11.81%	2.0310
Ohio	16,404,000	1,987,800	12.12%	2.0841
Texas	49,372,278	6,045,854	12.25%	2.1060
Wyoming	2,487,000	313,000	12.59%	2.1645
Indiana	7,195,000	943,000	13.11%	2.2541
Florida	15,202,522	1,995,356	13.13%	2.2573
Minnesota	18,629,098	2,461,702	13.21%	2.2726
Nevada	1,273,788	174,590	13.71%	2.3573
Virginia	7,903,135	1,094,719	13.85%	2.3823
California	49,088,000	6,838,000	13.93%	2.3958
Maryland	7,379,861	1,070,266	14.50%	2.4942
Nebraska	1,851,490	270,671	14.62%	2.5143
Washington	17,732,412	2,631,373	14.84%	2.5521
Pennsylvania	16,466,648	2,537,000	15.41%	2.6497
New Jersey	15,857,904	2,638,742	16.64%	2.8618
Colorado	4,531,307	756,414	16.69%	2.8709
South Dakota	635,031	112,163	17.66%	3.0377
Georgia	15,852,085	2,853,375	18.00%	3.0957
New York	30,858,000	5,814,000	18.84%	3.2404

TABLE 5
Continued

	Total Spending	Medicaid Spending	Percentage Medicaid	Volatility Score
Alabama	924,513	181,271	19.61%	3.3721
Massachusetts	17,090,075	3,445,500	20.16%	3.4673
Connecticut	9,319,400	1,949,300	20.92%	3.5973
Michigan	8,378,537	1,780,000	21.24%	3.6538
Illinois	16,860,100	3,668,000	21.76%	3.7416
Rhode Island	1,760,369	383,900	21.81%	3.7506
North Dakota	676,456	150,432	22.24%	3.8246
Iowa	5,732,815	1,332,782	23.25%	3.9983
Utah	2,828,432	676,943	23.93%	4.1162
New Hampshire	854,600	246,200	28.81%	4.9547
Tennessee	11,713,459	3,405,389	29.07%	5.0000

Source: Data collected by Syracuse University as part of Government Performance Project, 1998.

variation across the states. At one end of the scale, there are 10 states that devoted more than 20 percent of their general fund budgets to Medicaid in that year. Chief among these were Tennessee and New Hampshire, each of which devoted approximately 29 percent of its budget to Medicaid. On the other hand, 11 states spent less than 10 percent of their budgets on Medicaid, most notably South Carolina, West Virginia, and Alaska, each of which spent less than seven percent.

COMPARING CURRENT SIZE OF RAINY DAY FUNDS WITH VOLATILITY

Having presented data on the current size of rainy day funds in the states and data on the factors that should influence the optimal size of these funds, it remains to put the pieces of this puzzle together. This involves answering two questions. First, how can we combine these characteristics to evaluate the states in terms of the comparative demands that they have for rainy day funds? Second, how can we compare the actual rainy day fund balances in the states to what this demand index would tell us about which states have a greater need for larger balances and which do not?

The Optimal Size of Rainy Day Funds: A Composite Index

The data presented in the tables evaluated the states according to their relative volatility on various factors. If we combine these data and compare them to data regarding balances in rainy day funds, we can determine the extent to which states that had the highest balances in their rainy day funds in 1997 were also those that had the most volatile budgets.

The first step in this analysis is to create a composite “volatility index” that presents the relative position of each state in terms of its budgetary volatility. In order to do this, we converted the values for each of the variables to “volatility scores” ranging from 1 to 5. In each state, the least volatile state would have a score of 1, and the most volatile state would have a score of 5. An individual state score on this index would depend on how far it deviated from the top or the bottom score.

Take the calculation of Medicaid spending in Table 5, for example. Medicaid spending among the states ranges from 5.86 percent (Alaska) to 29.07 percent (Tennessee). The score for each state on the volatility index for Medicaid represents its relative position, on a five-point scale, to the state with the highest value for the variable. In this case, then, Tennessee would be given a volatility score of 5.0 and Alaska would have a score of 1.0. Georgia, which by spending 18 percent of revenues is approximately halfway between the two extremes, would have a score of just over 3.0. This calculation is repeated for each of the other variables, and the scores for each state for each of the five variables are added together to make up the total score for that state on the volatility index.

An individual state’s position on the volatility index, then, represents the sum of its position on each of the volatility measures. Table 6 compares the position of each state on the volatility index with the same state’s ranking in terms of its rainy day fund balances. An initial glance at the table shows that there is a wide disparity between the two. There are many states with quite volatile budgetary environments that have either relatively low rainy day fund balances or no rainy day fund at all (these states are indicated by negative numbers). For example, North Dakota, which has no rainy day fund, is judged, according to this index, to have the most volatile budget environment in the country. Three factors contribute to the volatility of the North Dakota budget environment: the percentage of its revenues received in federal aid, the percentage of its expenditures on Medicaid, and the volatility of its economic base. Other states that fare particularly badly according to this index, when compared to their rainy day fund balances, are Illinois, Georgia, New York, Kansas, and New Hampshire.

There are other states that have relatively stable budget environments with healthy rainy day fund balances (these states are indicated by positive numbers). The two states with the greatest positive balance (greatest excess of rainy day funds over budget volatility) are Alaska and Oklahoma. Each is in the top five states in terms of rainy day fund balances, yet each has one of the 10 least volatile budget environments in the country. Other states that score particularly well include New Mexico, Ohio, Kentucky, and South Carolina.

In order to better illustrate this phenomenon, Figure 1 presents a three-by-three diagram that categorizes states on two dimensions: the size of their rainy day balances and their position on the volatility index. The closer a state is to the upper-right-hand corner of the table (that is, a relatively low volatility score and a relatively high rainy day fund balance), the better its position with respect to rainy day fund balances versus the likely need for them. Conversely, the closer a state is to the lower-left-hand corner of the table, the worse its position.

States with Cause for Greatest Concern

Consider those 16 states with rainy day fund balances of less than one percent (note that 14 of these states have no rainy day fund balances at all and that California and New York have rather paltry balances). Of these states, those that have placed themselves at the greatest risk are the five (California, Georgia, Illinois, New York, and North Dakota) with the highest scores on the volatility index. Each of these states has a relatively high volatility score of 11 or higher but no (or virtually no) rainy day fund balance. The states of Alabama, Kansas, Louisiana, Oregon, and Wisconsin also have reason to be concerned, as their volatility scores fall toward the middle and they have no rainy day fund balances. Finally, the six states in which the lack of a rainy day fund appears to be of least concern are Arkansas, Hawaii, Montana, Texas, Washington, and Wyoming which have relatively low volatility scores. Even in the case of these states, however, the lack of any balance in the rainy day fund is likely to create future problems. These problems are likely to be of a less severe nature than the other states in this category.

Other states that would appear to have cause for concern are the nine with high volatility scores whose balances in their rainy day funds fall toward the median (greater than one percent but less than four percent). New Hampshire seems to be a state where particular concern is warranted, given that its volatility index is the highest of any state in the country, yet it has only a 2.3 percent rainy day fund balance. Other states that seem at risk are Tennessee, Nebraska, West Virginia, and South Dakota.

What do we conclude from this analysis? In 1997, fully half of the states had a lower rainy day fund balance than seemed prudent, given the volatility of the state's budget environment based on the measure of volatility used in this article. These states are, for clarity, presented in boldface type in Figure 1. Even if we exclude those six states with low volatility scores (a generous exclusion, since each of these states had no rainy day fund balance at all in 1997), there are 19 states where the gap between rainy day fund balances and budget volatility should give us the greatest cause for concern.

States That Appear in Best Condition

At the other end of the spectrum are those states with healthy balances in rainy day funds but a less volatile budget environment. These states fall into three categories:

States with high balances but little volatility. Unquestionably, those states in the best position are those that have high balances in their rainy day funds (greater than four percent) but exist in a very stable budget environment. The most extreme example of this is the state of Alaska, which (owing to massive energy revenues) has a balance of more than 100 percent in its rainy day fund yet has one of the least volatile budget environments in the country. Other states with high balances but very stable environments include New Mexico and Oklahoma. In each of these cases it seems unquestionable that their rainy day fund balances seem more than adequate for their needs.

States with high balances and mid-level volatility scores. In less good shape, but nonethe-

TABLE 6
Comparison of Volatility and Rainy Day Fund Balances, by State

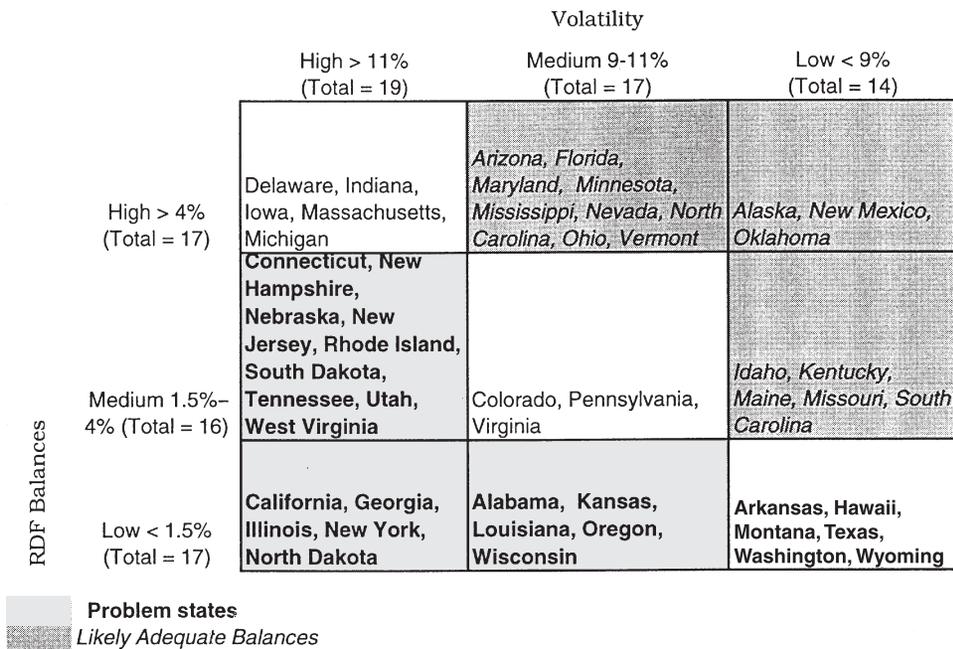
	Volatility Index	Rank	RDF as % of Budget	Rank	Rank Difference
North Dakota	13.64	48	0	1	-47
Illinois	12.72	41	0	1	-40
Georgia	11.98	36	0	1	-35
New York	13.13	45	1	16	-29
Kansas	10.44	28	0	1	-27
New Hampshire	16.67	50	2.3	23	-27
Tennessee	12.98	44	1.8	18	-26
California	12.56	40	0.8	15	-25
Wisconsin	9.92	23	0	1	-22
Oregon	9.88	22	0	1	-21
Nebraska	12.90	43	2.2	22	-21
Alabama	9.24	20	0	1	-19
West Virginia	13.26	46	2.9	29	-17
South Dakota	15.17	49	3.8	32	-17
Louisiana	9.13	17	0	1	-16
New Jersey	11.46	35	2.1	21	-14
Utah	12.52	38	2.4	24	-14
Montana	8.84	13	0	1	-12
Arkansas	8.70	11	0	1	-10
Wyoming	8.49	10	0	1	-9
Pennsylvania	10.17	25	1.3	17	-8
Connecticut	11.37	34	2.6	26	-8
Rhode Island	12.31	37	3	30	-7
Hawaii	8.15	5	0	1	-4
Massachusetts	12.52	39	4.5	36	-3
Texas	7.54	3	0	1	-2
Washington	6.47	1	0	1	0
Virginia	9.15	18	2	20	2
Michigan	13.30	47	14.6	49	2
Colorado	10.32	27	3.9	33	6
North Carolina	10.57	31	4.8	37	6
Iowa	12.81	42	10.4	48	6
Missouri	8.77	12	1.9	19	7
Delaware	11.21	33	5.3	40	7
Indiana	11.12	32	5.9	41	9
Maine	8.91	14	2.5	25	11
Arizona	9.97	24	4.9	38	14
Minnesota	10.55	30	7.2	44	14
Nevada	10.45	29	8.3	47	18

TABLE 6
Continued

	Volatility Index	Rank	RDF as % of Budget	Rank	Rank Difference
Idaho	8.48	9	2.9	28	19
Mississippi	10.24	26	7.5	45	19
Florida	9.09	15	4.4	35	20
Vermont	9.20	19	4.9	39	20
Maryland	9.39	21	6.6	43	22
South Carolina	7.34	2	2.7	27	25
Kentucky	8.16	6	3.5	31	25
Ohio	9.12	16	6.2	42	26
New Mexico	8.19	7	4.1	34	27
Oklahoma	7.64	4	7.5	46	42
Alaska	8.43	8	130	50	42

Note: Volatility index represents sum of those items presented in Tables 2 through 5. States are ranked in ascending order, from 1 (least volatile) to 50 (most volatile). Similarly, states are ranked in rainy day balances, from 1 (smallest percentage) to 50 (largest percentage).

FIGURE 1
Comparing Rainy Day Fund Balances to Budget Volatility



less appearing to be sufficiently protected, are those nine states with rainy day fund balances in excess of four percent, but with volatility scores near the median (between 9 and 11). Of the states in this category, Ohio, Maryland, Vermont, Mississippi, and Nevada seem (in order of adequacy) particularly well-positioned. Both Ohio and Maryland, for example, have volatility scores of slightly more than 9 but have rainy day fund balances of greater than six percent. Other states in this category include Arizona, Florida, Minnesota, and North Carolina.

States with mid-level balances yet low volatility scores. Five other states that appeared to be in relatively good shape had relatively low volatility scores and rainy day fund balances approaching three percent. Kentucky, South Carolina, and Idaho are in the almost identical position of having very stable budget environments (each among the 10 least volatile in the country) with rainy day fund balances of between 2.7 and 3.5 percent. Maine and Missouri are a bit less well off, with slightly higher volatility scores combined with slightly lower rainy day balances.

The Rest of the States

The remaining states (those not included in either of the above discussions) are those whose rainy day fund balances appear to be justified by their position on the volatility index. There are five states, for example, that score very high in terms of volatility yet also have relatively high rainy day fund balances. Perhaps the best examples of such a match between a volatile budget environment and a high rainy day fund balance can be found in the states of Michigan and Iowa. Michigan has the fourth most volatile budget environment in the country, yet its rainy day fund balance is exceeded only by that of Alaska; Iowa's volatility score is in the top 10 in the country, yet its rainy day fund balance ranks third behind Alaska and Michigan. Of somewhat greater concern are the states of Delaware, Massachusetts, and Indiana, which have rainy day fund balances between 4.5 percent and 5.9 percent; these balances, although relatively high, may not be sufficient given the volatile budgetary environment in these states.

Three states—Colorado, Pennsylvania, and Virginia—are clustered toward the middle on both measures. These states appear to have rainy day fund balances that match their budget environment, although Pennsylvania's relatively small rainy day balance of 1.3 percent should give state policymakers pause. Even though the state seems to be relatively insulated from budget shocks, such a small balance would not do Pennsylvania much good in the case of anything but the smallest dislocation.

The major point of this discussion is to suggest, as Figure 1 indicates, that there is wide variation among states both in their balances in rainy day funds and in their need for such balances. This provides strong evidence that a "one size fits all" rainy day balance does not provide an appropriate norm for state governments. Beyond the strong case that can be made against such a norm, however, the more disturbing result (from a policy perspective) is the lack of correlation between budget volatility and rainy day fund balances. Fully half

of the states, according to the analysis just presented, have rainy day fund balances that are less (sometimes far less) than seems justified by their budgetary environment.

MORE RECENT DEVELOPMENTS

Before reaching any conclusion about the potential problems faced by these states, however, it would be useful to review the current status of their rainy day fund balances. It may be that some have built up balances sufficient to eliminate (or at least diminish) the concern over the gap between their volatility and their balances. Table 7 compares the states in terms of their rainy day fund balances in two fiscal years: 1997 and 1999. Those 25 states that were identified as potentially at risk in the previous analysis are presented in bold. We want, in short, to use these data to determine whether any of the states determined to be most at risk based on 1997 data have built up their reserves such that their level of risk has decreased significantly since then. It might be reasonable to expect, given that state economies have continued to be strong since 1997 and surpluses have continued to grow, that rainy day balances may have grown as well.

And indeed they have. States had \$5.4 billion more in rainy day funds in 1999 than they had only two years earlier—an increase of almost 40 percent! With a couple of notable exceptions, however, those increases are not concentrated in the states identified as at risk in this study. Instead, states that already had healthy balances have tended to build them up even further between 1997 and 1999. In fact, only three states—Oklahoma (−4.2 percent), New Mexico (−4.0 percent), and Michigan (−3.0 percent)—experienced reductions of greater than half a percent in their rainy day fund balances. Other states that already had healthy balances in 1997 have either maintained a roughly constant level or have actually increased their balances since then.

On the other hand, states that had low rainy day balances relative to budget volatility scores did not, by and large, build up these balances between 1997 and 1999. The only significant gains (greater than two percentage points) have been in Washington (+5.3 percent), Nebraska (+4.8 percent), California (+2.4 percent), and North Dakota (+2.3 percent). These states have apparently taken advantage of good economic times to strengthen their rainy day funds, but (at least in the latter two cases) are probably still short of what is necessary. They stand in sharp contrast, however, to the other 21 states, in which rainy day funds have risen by an average of 0.2 percentage points. In fact, in only 10 of these other states has the balance risen at all; in the other 11, it has either declined or stayed the same.

The conclusion to be drawn from this analysis is that, with the notable exception of the four states highlighted above, the states that were determined to be most at risk from the lack of a rainy day fund or the existence of a fund with a paltry balance found themselves in the same position in 1999 that they did in 1997: at risk of trying to weather the next fiscal storm without an umbrella.

TABLE 7
Balances in State Rainy Day Funds, 1997–1999

State	1997	% of General Fund	General Fund	1999	General Fund	% General Fund	Change
Alabama	0	0.0%	4,440	0	4,940	0.0%	0.0%
Alaska	3,297	132.7%	2,484	2,729	1,291	211.4%	78.7%
Arizona	246	4.9%	5,013	387	5,616	6.9%	2.0%
Arkansas	No Fund	0.0%	2,772	0	3,050	0.0%	0.0%
California	461	0.9%	49,220	1,932	57,927	3.3%	2.4%
Colorado	166.7	3.6%	4,679	188	5,794	3.2%	-0.3%
Connecticut	337	3.5%	9,582	529	10,616	5.0%	1.5%
Delaware	92.9	5.2%	1,779	114	2,191	5.2%	0.0%
Florida	603	3.8%	15,850	1,330	17,815	7.5%	3.7%
Georgia	334	3.0%	11,314	374	12,529	3.0%	0.0%
Hawaii	0	0.0%	3,161	0	3,286	0.0%	0.0%
Idaho	28	2.0%	1,392	36	1,625	2.2%	0.2%
Illinois	No Fund	0.0%	18,854	0	21,674	0.0%	0.0%
Indiana	466.2	5.8%	8,045	525	8,940	5.9%	0.1%
Iowa	430	9.8%	4,370	440	4,397	10.0%	0.2%
Kansas	No Fund	0.0%	3,684	0	3,978	0.0%	0.0%
Kentucky	200	3.5%	5,684	231	6,217	3.7%	0.2%
Louisiana	0	0.0%	5,659	24	5,814	0.4%	0.4%
Maine	46	2.5%	1,863	132	2,237	5.9%	3.4%
Maryland	490	6.5%	7,568	635	8,513	7.5%	1.0%
Massachusetts	799	4.4%	18,017	1,291	19,006	6.8%	2.4%
Michigan	1,152	13.8%	8,367	1,040	9,638	10.8%	-3.0%
Minnesota	584	5.7%	10,203	1,434	10,019	14.3%	8.6%
Mississippi	210	7.3%	2,862	225	3,281	6.9%	-0.5%
Missouri	121	1.9%	6,252	135	7,024	1.9%	0.0%
Montana	No Fund	0.0%	997	0	1,091	0.0%	0.0%
Nebraska	41	2.0%	2,010	146	2,124	6.9%	4.8%
Nevada	129	9.5%	1,353	129	1,536	8.4%	-1.1%
New Hampshire	20	2.3%	854	36	1,043	3.5%	1.1%
New Jersey	388.4	2.4%	16,072	608	17,721	3.4%	1.0%
New Mexico	122.2	4.0%	3,033	0	3,179	0.0%	-4.0%
New York	317	1.0%	33,043	473	36,741	1.3%	0.3%
North Carolina	501	4.6%	10,934	523	12,733	4.1%	-0.5%
North Dakota	0	0.0%	719	17	740	2.3%	2.3%
Ohio	863	5.0%	17,254	953	19,065	5.0%	0.0%
Oklahoma	309	7.5%	4,093	150	4,506	3.3%	-4.2%
Oregon	11	0.3%	4,193	28	4,328	0.6%	0.4%
Pennsylvania	411	2.4%	16,781	941	18,583	5.1%	2.6%
Rhode Island	55	3.0%	1,817	66	2,026	3.3%	0.2%

TABLE 7
Continued

State	1997	% of General Fund	General Fund	General 1999	% General Fund	Fund	Change
South Carolina	127	2.8%	4,588	138	4,931	2.8%	0.0%
South Dakota	25	3.9%	645	35	751	4.7%	0.8%
Tennessee	101	1.8%	5,623	127	6,229	2.0%	0.2%
Texas	8	0.0%	25,069	0	54,474	0.0%	0.0%
Utah	79	2.8%	2,849	94	3,191	2.9%	0.2%
Vermont	35	4.5%	771	40	840	4.8%	0.2%
Virginia	157	1.9%	8,334	362	9,708	3.7%	1.8%
Washington	0	0.0%	9,070	533	9,980	5.3%	5.3%
West Virginia	68	3.0%	2,245	65	2,618	2.5%	-0.5%
Wisconsin	0	0.0%	8,804	0	10,114	0.0%	0.0%
Wyoming	9.6	2.1%	461	13	504	2.6%	0.5%
Total	13,841	3.5%	394,726	19,208	466,174	4.1%	

Note: Data for “problem states” as identified in Figure 1 are presented in boldface type.

DISCUSSION

What does this mean for state policies? First, it should be obvious that, in the vast majority of cases, there is little or no relationship between the current size (as of 1997) of rainy day funds and the volatility of a state’s budget environment. The research reported above demonstrates that although there are some states where budget volatility and rainy day fund size match up fairly well, there are many more where there are significant disconnects between the size of the rainy day fund and the underlying volatility of the budget environment.

Although such a disconnect may not be cause for much concern in cases—such as Alaska, New Mexico, and Oklahoma—where rainy day funds seem more than adequate, there should be substantial reason to worry in cases where the budget environment is unstable, but there are little or no balances in rainy day funds. There were 25 states identified in this article where budget volatility substantially outpaced the preparation of the state for fiscal shocks as of 1997, and only four of those states significantly improved their fortunes in the subsequent biennium.

At least four caveats are in order in interpreting the results of the research presented in this article. First, although it seems clear (at least in relative terms) which states are “in trouble” and which seem well prepared, this article has not attempted to answer the question of exactly how large the rainy day balance should be in each state, except to suggest that it needs to be larger, *ceteris paribus*, in states with a more volatile budget environ-

ment. It may be that rainy day funds are not sufficiently large in any state (the converse—that funds are too large in every state—seems unlikely, given that 14 states have no balances at all). There is simply no way of telling what the appropriate size is in each state, short of conducting a state-by-state analysis equivalent to that conducted by Navin and Navin for Ohio.¹¹

Second, the measure of volatility used in this study is admittedly somewhat crude. Other factors may influence budget volatility, and the use of a measure including these factors might yield different results. The factors included in this article's measure, however, are the most common ones identified in the literature as influencing budget volatility. Still, other factors might be included to refine the measure further. Further, the index as constructed weighted each of these factors equally. It may be that some are much more significant than others and therefore deserve heavier weighting. Future studies might attempt to identify exactly which factors are most influential in determining the volatility of a state's budget environment and weight them accordingly.

Third, this study has looked at rainy day funds in particular. It has not attempted to give states "credit" for carryover balances in the general fund, if those balances can be used for any purpose. To the extent that some states have large balances in their general funds and can resist spending them, it will put those states in a better position to deal with the next recession. Nonetheless, it remains clear that states with true rainy day funds—where the expenditure is limited to times of true fiscal emergency—are in better condition, all other things equal, than those without these funds.

Fourth, there are other (nonfiscal) elements that could clearly be included in a decision about the optimal level of reserve necessary in a state. In some states, policymakers may believe that a fund should fully insulate the state against raising taxes or cutting services during a recession, whereas in others they may take the view that its principal purpose is to provide a shorter-term cushion. Further, states with a history of more interbranch conflict might be justified in running larger reserves, as these states might be less able to reach agreement on actions to take in order to adjust budgets during times of fiscal stress. Finally, some states may have more other tools (such as gubernatorial reserves) at their disposal, should fiscal crises present themselves. Each of these factors would also need to be considered in addition to the economic/budgetary factors explored in this article.

Clearly, the findings reported here should serve to debunk the notion that each state should be shooting for the *same* target, be it five percent or some other number. An Oklahoma or a New Mexico simply does not exist in the same kind of budgetary environment as an Illinois or a Georgia. Policymakers in each state need to evaluate the risk of budgetary instability in their state and establish planning devices that are consistent with that environment.

Future research might proceed in two directions. First, although the creation of a volatility index is an innovation, there clearly may be more work to do on refining such a mea-

11. Navin and Navin, "The Optimal Size of Countercyclical Budget Stabilization Funds."

sure, particularly on the spending side. Second, scholars might search for the specific relationship between a state's budget volatility and the size of its rainy day fund. Excluding Alaska, the research reported in this article finds that rainy day fund balances range from zero (14 states) to almost 14 percent (Michigan). Although clearly the optimal size of rainy day funds is greater than zero even for those states that do not exist in volatile budget environments, it is unclear either what the precise relationship is between extent of volatility and optimal fund size.

In the end, then, the answer to the question "What's so magical about five percent?" is "Nothing much." There is wide variation among the states in terms of the appropriate size for their rainy day funds. Further, even if five percent were viewed as an average, it is not clear whether it is the right one. State policymakers should ask themselves about the validity of five percent as a magical figure for rainy day fund balances with a critical eye toward the budgetary environment in their own states, and further analysis will serve to illuminate the desirable size of the rainy day fund in each individual state.

NOTES

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