

Rainy Day Funds and State Government Savings

***Abstract** - This paper examines the effect of rainy day funds (RDFs) on state savings behavior. We find that states with RDFs have higher total balances than states without such funds and also have higher balances after adoption than before adoption. Furthermore, RDF deposits increase total balances dollar-for-dollar. While we cannot rule out that states planning future savings may adopt RDFs, our findings are robust to the inclusion of measures of savings preferences. In sum, these funds appear to belong to the growing set of fiscal institutions with real fiscal and economic consequences.*

INTRODUCTION

During the last two decades, virtually all of the U.S. states have adopted budget stabilization funds, often called “rainy day funds” (RDFs), that allow them to save for unexpected revenue shortfalls. Prior to 1981, few states had such funds (Gold, 1981). By 1984, 18 states had enacted RDFs, and by 1994, 45 states had them (ACIR, 1995). These accounts are designed to help state governments stabilize public spending over time by saving during booms and using the balances to cover revenue shortfalls during recessions. In 1996, RDF balances averaged \$135 per capita, or six percent of total state expenditures.

The existence and significant size of these accounts do not necessarily imply that RDFs have increased total government savings, because the revenue deposited into a RDF may only represent funds that would otherwise have been saved in states’ general funds. That is, to the extent that RDF and general fund balances are fungible substitutes, deposits to RDFs may simply replace savings in general funds, resulting in no net increase in total state government savings.

While a number of previous studies have shown that various state fiscal institutions have real economic consequences,¹

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¹ For a general discussion of fiscal institutions, see Alt and Lowry (1994) or Poterba (1994, 1996). For specific examples, see Holtz-Eakin (1998), Carter and Schap (1990), Alm and Evers (1991), or Dearden and Husted (1993) on the line-item veto; see Levinson (1998) or Bohn and Inman (1996) on balanced budget rules; see Rueben (1995) or Elder (1992) on tax and expenditure limitations; see McGranahan (1998) or Poterba (1995) on state borrowing restrictions; see Knight (1998a) or Temple (1998) on supermajority rules for tax increases; see Matsusaka (1995) on voter direct legislation; and see Knight (1998b) on unfunded mandates.

few have examined rainy day funds in particular. Sobel and Holcombe (1996) show that states with RDFs suffered less fiscal stress during the 1990–1 national recession, where fiscal stress is measured by how much states' expenditures fell below their long-run growth. While this suggests that the funds have had an effect on states' fiscal health, it may be that the states with RDFs are inherently savers and would have saved enough to avoid fiscal stress in their general fund accounts even in the absence of special savings accounts. Similarly, Levinson (1998) shows that states with rainy day funds have smoother business cycle fluctuations over the period from 1969 to 1995. While suggestive, this finding also cannot rule out that states with RDFs are inherently better at smoothing fiscal policy.

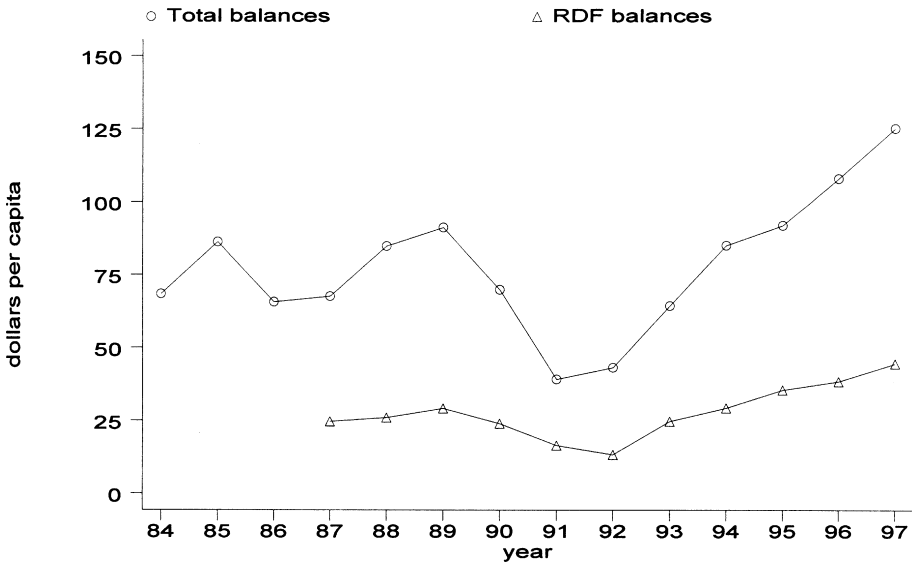
In this paper, we ask whether RDFs have increased state government savings above what they would have been in the absence of the funds. We use a panel of data describing states and their govern-

ments between 1984 and 1997, a period during which 27 states adopted RDFs. This variation within states over time allows us to use state fixed effects to control for any unobserved differences between states with and without RDFs.

TRENDS IN STATE GOVERNMENT BALANCES

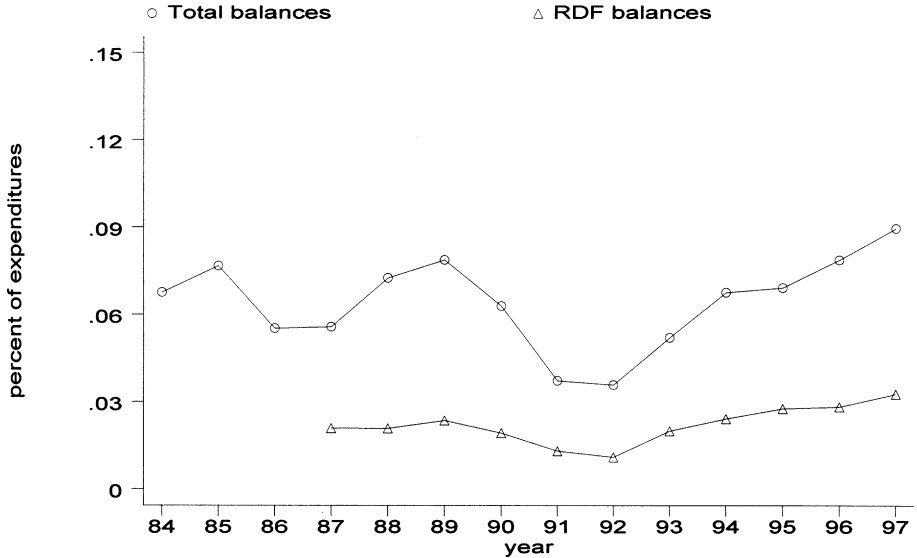
Figure 1 plots trends in average real per-capita state RDF balances and average per-capita total balances over time, where total balances are defined as general funds plus RDFs.² To allow for comparisons across years, all balances are presented in 1997 dollars. The upward trend in RDF balances is especially pronounced in the years following the 1990–1 national recession. Figure 2 plots these same balances as a percentage of total state expenditures. The upward trend in state balances is less apparent in Figure 2 due to the growth of state expenditures during the 1990s, though the patterns in both figures are

Figure 1. Total and RDF Balances (48 States)



² All of the figures and tables exclude Alaska and Hawaii, except where noted.

Figure 2. Balances as Percent of Expenditures (48 States)



roughly the same. Together these first two figures demonstrate a significant rise in both RDFs and total balances over this period. The recent and simultaneous increase in rainy day funds and total balances provides some initial evidence that RDFs have increased total savings. If RDFs had not increased total state savings, we would have expected to see no relationship between the two time series depicted in Figures 1 and 2.

As cross-sectional evidence on the effect of RDFs, Figures 3 and 4 compare the 17 states with RDFs enacted prior to 1985 to the four states without RDFs for all years 1984–97. In every year but 1990 and 1991, the two recession years, the RDF states had vastly larger total balances per capita than the non-RDF states. These differences suggest that RDFs have more than simply replaced general fund balances and have actually increased total state government saving.

Both the time-series evidence from Figures 1 and 2 and the cross-sectional evidence in Figures 3 and 4 suggest that RDFs have increased state savings. However,

none of these aggregate comparisons demonstrates that the relationship is necessarily causal. It may be, for example, that state governments that choose to adopt RDFs are systematically different from states that do not choose to do so. In econometric terms, states may be heterogeneous in ways that are correlated with both their propensity to save and their establishment of RDFs. If that heterogeneity is unobservable, then it will likely bias any assessment of the effect of RDFs on savings in favor of finding a large effect.

Furthermore, states that choose to adopt the funds may do so during the years in which they plan to save. In econometric terms, while RDFs may affect savings behavior, planned savings behavior may simultaneously affect the adoption of RDFs. Like the unobserved heterogeneity, this simultaneity will bias any attempt to measure the effect of RDFs on states' savings behavior in favor of finding a large effect. To address these issues of heterogeneity and simultaneity, in the empirical analyses that follow, we control for as many

Figure 3. Total Balances: RDF States versus Non-RDF States

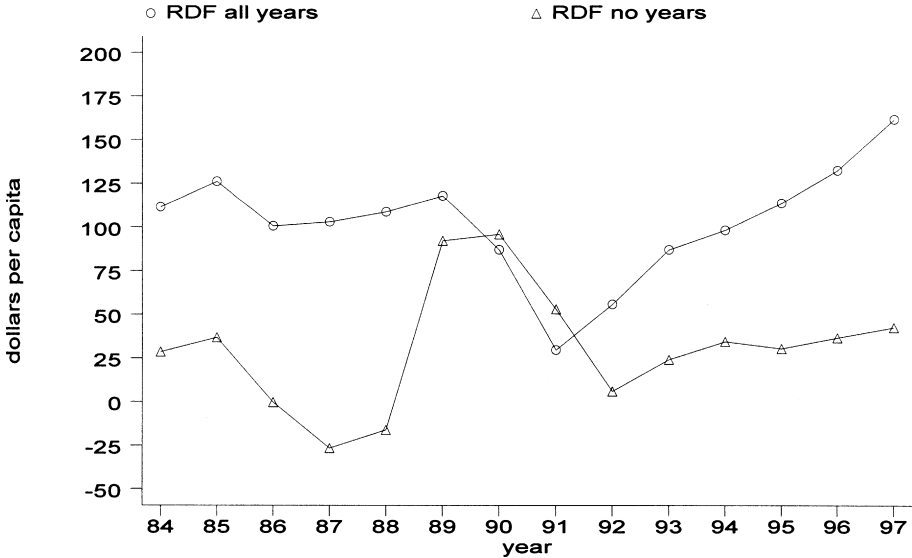
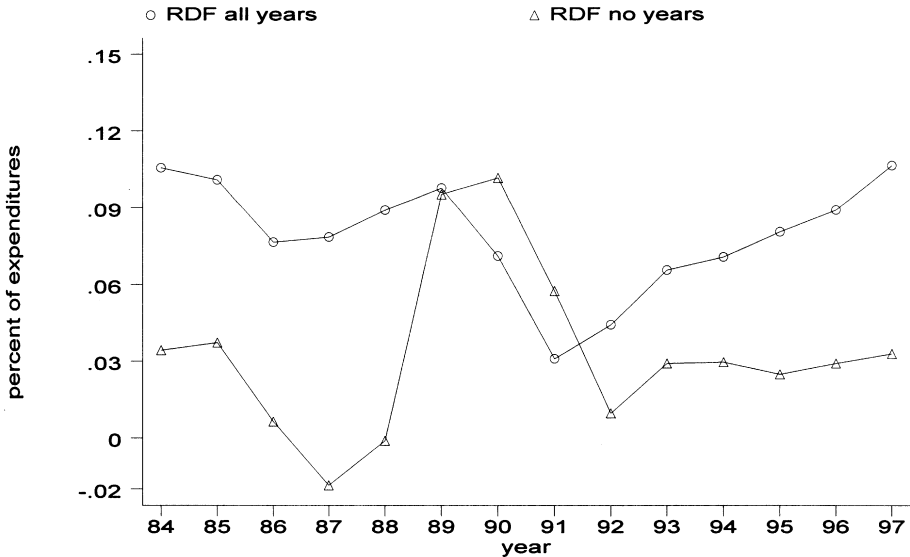


Figure 4. Total Balances as Percent of Expenditures



observable state differences as possible and we employ a fixed-effects specification, taking advantage of the fact that from 1984 to 1997 RDFs were adopted by 17 states that did not previously have such

funds. Before describing those results, however, we must first detail the ways in which we characterize the existence, size, and stringency of states' rainy day legislation.

MEASURING THE SIGNIFICANCE OF RDFs

To assess how RDFs have affected state savings, we use three alternative characterizations of state RDFs: whether states have adopted such funds, the size of the funds' balances, and the rules for contributions and withdrawals from the funds.

RDF Indicators: 1984–97

We begin by characterizing states as either having RDFs or not. The National Association of State Budget Officers (NASBO) published data on RDF balances between 1984 and 1997. We define a RDF as existing in the year in which a positive balance is first reported in these NASBO data.³ If RDFs increase state savings, states with RDFs will have larger total balances than states without RDFs. Specifically, in a regression of total state balances on a RDF indicator and other state characteristics, including state fixed effects, the RDF indicator coefficient will be large and positive. Alternatively, if RDFs merely substitute for savings that otherwise would have gone into general fund balances, the RDF indicator coefficient will be zero.

RDF Balances: 1987–97

As a second test of the effect of RDFs on state savings, we will examine the *size* of state RDFs, again using the NASBO data on RDF balances. For this approach, we are unable to use data for the first three years because RDF balances were not reported separately from general fund balances for some states. If RDFs increase state savings, states with larger RDF balances should have larger total balances.

Specifically, in a regression of total balances on RDF *balances* and other state characteristics, including state fixed effects, the RDF coefficient will be close to one. Alternatively, if RDF contributions merely replace contributions to general funds, the rainy day coefficient will be close to zero.

Fund Legal Provisions

Finally, a third approach examines the *characteristics* of state RDFs, recognizing that not all RDFs are alike. The National Council of State Legislatures (NCSL) has surveyed states as to provisions of their funds. We use three aspects of these provisions, summarized in Table 1.⁴ First, some states' laws mandate deposits to RDFs in certain years. For example, some states must deposit their fiscal-year-end surplus into the fund, while in other states, deposits are determined by a formula tied to the performance of the state economy. At the other extreme, some states only deposit funds into RDFs through occasional legislative appropriation. Second, some states have maximum limits, or caps, on fund sizes. These limits range from 2 percent of expenditures in three states to 25 percent of expenditures in Michigan. The most common limit is five percent, the generally accepted minimum level of total balances by credit rating agencies (Eckl, 1997) and the amount suggested by the NCSL (Sobel and Holcombe, 1996). Third, fund provisions differ in the availability of the balances for expenditure. Some states require only legislative appropriation for withdrawal, making the funds a politically attractive source of spending. Other states have provisions requiring that funds be used only

³ An alternative definition would be the first year a state is listed with a balance, even if the balance is zero. Unfortunately, in some years of the NASBO survey, zeros are used to denote both states without funds and states with zero balance RDFs. Gary Wagner, at West Virginia University, has conducted a phone survey of the states and found a close, but not exact, match between his findings and the NASBO data.

⁴ For the four states with more than one RDF, the provisions from the stricter fund are used for the deposit and withdrawal method variables. Further, the fund balance limit for these states is the combined limit from the two funds.

TABLE 1
STATE RDF DETAILS AS OF APRIL 1995

State	Deposit Method	Limit (As Percent of Expenditures)	Withdrawal Method	Year Started (First Balance)
Alabama	formula	2	appropriation	1988
Alaska	appropriation	no limit	appropriation	pre-1985
Arizona	formula	5	formula	1994
Arkansas	—			
California	year-end surplus	no limit	revenue shortfall	pre-1985
Colorado	formula	2	revenue shortfall	pre-1985
Connecticut	year-end surplus	5	revenue shortfall	pre-1985
Delaware	year-end surplus	5	revenue shortfall	pre-1985
Florida	formula	20	revenue shortfall	pre-1985
Georgia	year-end surplus	3	appropriation	pre-1985
Hawaii	—			
Idaho	appropriation	no limit	appropriation	pre-1985
Illinois	—			
Indiana	formula	7	formula	1985
Iowa	appropriation	10	appropriation	pre-1985
Kansas	appropriation	no limit	appropriation	1993
Kentucky	appropriation	no limit	revenue shortfall	1987
Louisiana	appropriation	no limit	revenue shortfall	never balance
Maine	year-end surplus	4	appropriation	1985
Maryland	formula	no limit	appropriation	1987
Massachusetts	year-end surplus	5	revenue shortfall	1987
Michigan	formula	25	formula	pre-1985
Minnesota	year-end surplus	5	revenue shortfall	pre-1985
Mississippi	year-end surplus	7.5	revenue shortfall	1985
Missouri	appropriation	5	revenue shortfall	1992
Montana	—			
Nebraska	year-end surplus	no limit	revenue shortfall	pre-1985
Nevada	formula	8	revenue shortfall	1987
New Hampshire	year-end surplus	5	revenue shortfall	1987
New Jersey	year-end surplus	5	revenue shortfall	1988
New Mexico	appropriation	no limit	revenue shortfall	pre-1985
New York	year-end surplus	2	revenue shortfall	pre-1985
North Carolina	year-end surplus	5	appropriation	1990
North Dakota	year-end surplus	no limit	revenue shortfall	1989
Ohio	appropriation	4	appropriation	1985
Oklahoma	year-end surplus	10	revenue shortfall	1988
Oregon ^a	—			1994
Pennsylvania	appropriation	3	revenue shortfall	1986
Rhode Island	appropriation	3	revenue shortfall	1985
South Carolina	appropriation	5	revenue shortfall	pre-1985
South Dakota	year-end surplus	5	appropriation	pre-1985
Tennessee	appropriation	no limit	revenue shortfall	pre-1985
Texas	year-end surplus	10	revenue shortfall	1990
Utah	year-end surplus	8	revenue shortfall	1987
Vermont	year-end surplus	5	revenue shortfall	1988
Virginia	formula	10	appropriation	1985
Washington	formula	no limit	revenue shortfall	1989
West Virginia	year-end surplus	5	revenue shortfall	1994
Wisconsin	appropriation	no limit	appropriation	1993
Wyoming	year-end surplus	no limit	appropriation	pre-1985

Source: Eckl (1997).

^aThe publication did not include Oregon in its list of states with RDFs.

in years of economic downturn (determined through formulas) or in the case of a revenue shortfall or a deficit. If the RDFs increase total savings, and if the legal provisions of those funds matter, then we would expect RDFs with deposit and withdrawal formulas, and with large size limits, to have the largest balances.

EMPIRICAL MODEL AND RESULTS

Table 2 provides some initial summary statistics for three sets of states: those with RDFs in all years of the sample period, those without funds in any years of the period, and those with funds adopted during the period. All monetary variables are presented in 1997 dollars. The 17 states with RDFs in 1984, in column (1), have significantly larger average balances over the period 1984–97 than the other two sets of states. The four states without RDFs in all years tend to have lower per-capita incomes, higher unemployment rates, lower per-capita government expenditures, and more elected officials from the Democratic party.

Table 3 estimates the relationship between total state balances per capita and state RDFs, controlling for other state characteristics. It presents the results of both ordinary least-squares (OLS) and fixed-effects regressions using the three alternative measures of the significance of RDFs. The regressions also control for per-capita income, state unemployment rates, per-capita government expenditures, legislative party control variables, and state governors' political party affiliations. The coefficient on per-capita income captures the state government's marginal propensity to save, while the unemployment rate captures business cycle effects on balances. The government expenditure variable is included because large state governments may desire to save more or less in absolute terms than smaller governments. The political variables attempt to

measure differences across political parties in savings preferences. We exclude Alaska and Hawaii from all the regressions. Alaska's savings behavior is unlike the rest of the states. It had balances of \$3.3 billion in 1997, or \$5,534 per capita. Minnesota, the next highest state, had a per-capita balance of \$550. In addition, Nebraska is excluded due to its unicameral, nonpartisan legislature.

For comparison with fixed-effects results, the first three columns present OLS regressions for the three alternative characterizations of the RDF. Column (1) regresses total balances per capita on state characteristics and an indicator equal to one for states with RDFs. The RDF indicator coefficient demonstrates that states with RDFs save more than states without these funds, although the standard errors are large. While the coefficient is statistically insignificant, its magnitude suggests that RDFs increase total balances by 20 percent, relative to the sample average of \$78 per capita.

Low-income states save more than high-income states. States experiencing low unemployment rates increase their balances, while those experiencing high unemployment spend down those balances, as benefits the expenditure-smoothing motive for savings. State governments with higher expenditures tend to save more. States with Republican legislatures and Democrat governors save more than those with Democrat legislatures and Republican governors, although these political coefficients are all statistically insignificant.

Column (2) employs the balance in the RDF as the key independent variable. The coefficient on this variable, close to one and statistically different from zero at the one percent level, suggests that savings in RDF balances do not replace savings in general fund balances. Rather, RDFs appear to increase total balances approximately dollar-for-dollar. The other variables have similar signs and magnitudes.

TABLE 2
SUMMARY STATISTICS (MONETARY VARIABLES IN 1997 DOLLARS)

Variable	Description	States with RDF in 1984 (17 States)	States without RDF in All Years (4 States)	States Adopting RDF in Sample (27 States)	Source
		(1)	(2)	(3)	
Total balance per capita	per-capita general fund and RDF balances	102.38 (133.19)	31.28 (59.05)	69.39 (67.06)	NASBO Fiscal Survey
RDF indicator	—	1.00 (0.00)	—	0.68 (0.47)	NASBO Fiscal Survey
Per-capita income	total income per capita (thousands)	21.89 (3.70)	19.43 (3.16)	21.26 (3.36)	Bureau of Economic Analysis
Unemployment rate	—	5.67 (1.61)	7.24 (1.78)	5.93 (1.81)	Bureau of Labor Statistics
Government expenditures	total general fund expenditures	1310.17 (473.33)	1084.93 (255.17)	1217.90 (367.26)	NASBO Fiscal Survey
Both chambers Democrat	—	0.48 (0.50)	0.71 (0.46)	0.56 (0.50)	Book of the States
Both chambers Republican	—	0.25 (0.43)	0.07 (0.26)	0.21 (0.41)	Book of the States
Governor Democrat	—	0.55 (0.50)	0.57 (0.50)	0.56 (0.50)	Book of the States
RDF balance per capita	—	42.85 (51.68)	—	22.51 (26.38)	NASBO Fiscal Survey
Deposit by formula	money deposited into RDF by formula	0.13 (0.34)	—	0.17 (0.37)	NCSL / Eckl
Deposit of year- end surplus	year-end surplus deposited into RDF	0.58 (0.50)	—	0.31 (0.46)	NCSL / Eckl
Limit 5-9% indicator	RDF cap 5-9% of expenditures	0.29 (0.46)	—	0.30 (0.46)	NCSL / Eckl
Limit >9% indicator	RDF cap greater than 9% of expenditures	0.18 (0.38)	—	0.08 (0.27)	NCSL / Eckl
No limit indicator	no cap on RDF balances	0.35 (0.48)	—	0.14 (0.35)	NCSL / Eckl
Withdrawal by formula	withdrawal by formula only	0.06 (0.23)	—	0.04 (0.21)	NCSL / Eckl
Withdrawal of shortfall	withdrawal allowed if revenue shortfall	0.60 (0.49)	—	0.42 (0.49)	NCSL / Eckl

Standard errors in parentheses.

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TABLE 3
RDFs EFFECTS ON STATE GOVERNMENT SAVINGS

Dependent Variable is Total Balances Per Capita	OLS		OLS	Fixed Effects	Fixed Effects	Fixed Effects
	(1)	(2)	(3)	(4)	(5)	(6)
RDF indicator	15.664 (14.228)	—	-35.969 (21.838)	11.165 (9.692)	—	-21.284 (27.563)
Per-capita income (thousands)	-6.810* (2.827)	-5.117* (2.245)	-7.029* (3.008)	-4.750 (3.273)	-3.167 (3.259)	-2.853 (3.378)
Unemployment rate (percentage points)	-10.034* (4.861)	-10.809* (3.356)	-9.691** (4.828)	-12.507* (2.344)	-14.918* (2.281)	-12.038* (2.367)
Government expenditures	0.083** (0.042)	0.045 (0.030)	0.086* (0.040)	0.060* (0.024)	0.055* (0.023)	0.053* (0.025)
Both chambers Democrat	-35.332 (23.540)	-22.175 (17.362)	-36.964 (23.853)	-21.733* (10.658)	-12.236 (9.394)	-20.671** (10.928)
Both chambers Republican	13.200 (33.569)	1.253 (17.094)	1.998 (24.955)	8.479 (11.730)	11.801 (9.763)	7.665 (11.718)
Governor Democrat	6.636 (12.841)	4.549 (8.846)	5.992 (12.698)	4.373 (6.610)	2.861 (5.970)	6.448 (6.737)
RDF balance	—	1.370* (0.158)	—	—	1.137* (0.084)	—
Deposit by formula	—	—	34.724** (17.325)	—	—	0.137 (23.020)
Deposit of year-end surplus	—	—	32.251 (28.089)	—	—	-17.933 (23.353)
Limit 5-9% indicator	—	—	44.970 (27.911)	—	—	42.134 (32.420)
Limit >9% indicator	—	—	29.727 (21.086)	—	—	102.238 (39.489)*
No limit indicator	—	—	63.916* (30.851)	—	—	40.486 (28.920)
Withdrawal by formula	—	—	5.262 (27.529)	—	—	78.386** (45.807)
Withdrawal of shortfall	—	—	-15.199 (22.766)	—	—	-14.305 (18.866)
R squared (excluding FE)	0.1423	0.4914	0.1931	0.0888	0.4133	0.1112
Years	1984-97	1987-97	1984-97	1984-97	1987-97	1984-97

Standard errors in parentheses, adjusted to reflect within-state correlation for OLS.

*Significant at 5 percent level.

**Significant at 10 percent level.

Column (3) of Table 3 uses measures of the RDF legal provisions. Because we have only one year of NCSL data describing RDF provisions, there is no time-series variation in the seven fund descriptors. We have assumed that the details of state RDFs have remained constant over time. Therefore, the only within-state variation in the seven RDF provision dummy variables at the bottom of column (3) occurs in the 27 states that adopted RDFs, in the year in which they adopted their funds. Of course, there remains considerable cross-state variation between the 43 states that have RDFs at any point during our sample. Put differently, the seven RDF provision dummies are technically interactions between constant descriptive variables about each state and the RDF indicator at the top of column (3).

States with strict fund deposit provisions, those states with either required savings through a formula or a requirement of saving the year-end budget surplus, have larger balances than those with deposits only through appropriation, the omitted category. However, the year-end surplus variable is statistically insignificant. States with high fund balance limits or no limits save more than states with low limits, the omitted category. Funds with no limits save significantly more (\$64) than those with low limits (less than five percent). States with the strictest withdrawal provision, allowing access to RDF balances only according to a formula measuring the state of the business cycle, save more than states that allow access to balances through appropriation, the omitted category, though this coefficient is statistically insignificant. The final variable, withdrawal allowed in the case of a revenue shortfall, has an unexpected negative sign, although it is also statistically insignificant. The inclusion of these fund legal provision variables causes the RDF

indicator coefficient (in the top row) to become negative, suggesting that strict legal provisions, rather than the mere existence of an account, increase total savings.⁵

Columns (4)–(6) present the results of fixed-effects regressions. The only difference between these regressions and those in the first three columns is that the fixed-effects regressions include 48 state-specific dummy variables. The coefficients on the RDF indicator in column (4) and on the associated balances in column (5) are smaller than the corresponding OLS coefficients. The point estimate of the RDF indicator coefficient suggests that states that adopt RDFs save 14 percent more than before they adopted those funds, again relative to the sample average of \$78 per capita. The reduction in these coefficients may reflect the institutional endogeneity: if states with a strong preference for savings tend to adopt funds, the cross-sectional OLS results will be biased toward finding a positive effect of these funds. The fixed-effects regressions attempt to correct this endogeneity by controlling for time-invariant unobserved differences in savings preferences across states. However, even when state fixed effects are included, the coefficient on the RDF balance in column (5) is very close to one, suggesting that RDFs increase total savings dollar-for-dollar.

Column (6) estimates a fixed-effects version of column (3), with fund provision regressors. Because we have no intertemporal variation in fund provisions, with state fixed effects included, there is no variation over time in the fund provisions that can be separately identified from fixed effects and from the existence of the RDFs in the first place. For example, the deposit by formula coefficient tells us that those states that adopted RDFs during our sample, and which re-

⁵ Sobel and Holcombe (1996) found that the mere existence of rainy day funds during the 1990–1 recession did not alleviate fiscal stress. Rather, those states with the strict deposit requirements were the ones with the reduced fiscal stress.

quired deposits to those funds based on economic formulas, had insignificantly higher balances per capita (\$0.137) after adopting their funds than before, compared to the before-after difference for states that adopted funds with occasional legislative appropriations. Only six states fit this description, four of which adopted their funds in 1987 or earlier, the very beginning of our time series. Consequently, the deposit by formula coefficient is small and insignificant. The high limit states, those with a limit between five and nine percent, those with a limit above nine percent, and those with no limit, save more than states with a low limit, though only the limit above nine percent coefficient is statistically significant. In contrast with the OLS results, states with the strictest withdrawal provisions, allowing access to funds only in recessions, save significantly more than states that can access funds through appropriation.

Taken together, these results suggest that RDFs and their associated balances increase total savings. While the methods for deposit do not seem to change total balances, states with high balance limits or no limits tend to save more than states with low limits. Similarly, states that provide access to the fund balances only during an economic downturn tend to have higher balances.

As a sensitivity check, Table 4 presents the results including Alaska, Hawaii, and Nebraska and excluding the legislative variables. Though still insignificant, the coefficients on the RDF indicator in columns (2) and (5) are larger, reflecting the fact that Alaska has large balances and a RDF. The coefficients on the RDF balance are smaller but still close to one. The limit variables are all positive, and a few are statistically significant, similar to those in Table 3. Finally, the withdrawal variables are negative in the OLS results and positive in the fixed-effects results. The withdrawal by formula coefficient is large, although statistically insignificant, in the

fixed-effects case. Thus, the results are relatively insensitive to the exclusion of these three states.

DISCUSSION AND CONCLUSION

We have found that not only do states with RDFs save more in total than states without such funds, but states that *adopt* RDFs save more than they did before they adopted the funds. Even more striking, balances saved in RDFs appear to increase total state savings *dollar-for-dollar*. We recognize that these findings do not comprise incontrovertible evidence that the RDFs themselves *cause* the savings. States that decide to save may simultaneously decide to adopt RDFs. However, because we have controlled for numerous state characteristics, including state fixed effects, we believe these results provide considerable evidence that the enactment of RDFs changes states' fiscal policies.

There are, however, several potential alternative explanations for our findings. One might ask, for example, why the growth in RDFs has occurred only recently, mostly in the last two decades. One explanation is that California's Proposition 13 tax reforms in 1978 represented in large part a revolt against the high concurrent state budget surpluses (Gold, 1984). It may be, therefore, that Proposition 13 made states leery of saving in general fund accounts, and they created RDFs to provide a politically acceptable means of savings.

We should also be careful not to interpret these results by themselves as implying that RDFs have smoothed states' fiscal policies. It might be, for example, that states without RDFs smooth expenditures over the business cycle by borrowing during recession years. Of the 17 states that have had RDFs the longest, since before 1985, 11 have strict balanced budget rules that do not allow deficits to be carried over into subsequent fiscal years. And, of the ten states that have adopted RDFs most

TABLE 4
ROBUSTNESS CHECKS

Dependent Variable is Total Balances Per Capita	OLS	OLS	OLS	Fixed Effects	Fixed Effects	Fixed Effects
	(1)	(2)	(3)	(4)	(5)	(6)
RDF indicator	30.379 (25.248)	—	7.222 (59.692)	28.191 (22.492)	—	-35.635 (65.429)
Per-capita income (thousands)	-9.544** (4.942)	-6.871* (2.606)	-4.784 (8.840)	38.993* (6.068)	-2.908 (3.508)	42.068* (6.194)
Unemployment rate (percentage points)	-7.375 (10.190)	-22.551* (5.886)	-5.267 (11.653)	-5.987 (5.264)	-22.727* (2.610)	-5.327 (5.329)
Government expenditures	0.172* (0.014)	0.076* (0.018)	0.154* (0.022)	-0.422* (0.022)	-0.007 (0.020)	-0.429* (0.022)
Governor Democrat	-13.417 (28.910)	19.525 (12.258)	-19.980 (30.824)	-18.705 (15.116)	3.674 (7.006)	-16.653 (15.466)
RDF balance	—	0.952* (0.012)	—	—	0.890* (0.019)	—
Deposit by formula	—	—	20.787 (58.665)	—	—	-62.811 (54.089)
Deposit of year- end surplus	—	—	-12.940 (55.370)	—	—	-47.414 (54.968)
Limit 5–9% indicator	—	—	76.444 (47.834)	—	—	82.210 (76.841)
Limit >9% indicator	—	—	29.579 (35.027)	—	—	236.214* (92.757)
No limit indicator	—	—	148.465** (76.967)	—	—	67.743 (68.377)
Withdrawal by formula	—	—	-21.850 (59.987)	—	—	97.893 (108.430)
Withdrawal of shortfall	—	—	-88.561 (68.376)	—	—	6.335 (44.771)
R squared (excluding FE)	0.181	0.932	0.219	0.397	0.917	0.406
Years	1984–97	1987–97	1984–97	1984–97	1987–97	1984–97

Standard errors in parentheses, adjusted to reflect within-state correlation for OLS.

*Significant at 5 percent level.

**Significant at 10 percent level.

recently, or not at all, seven have strict balanced budget rules. However, Sobel and Holcombe (1996) and Levinson (1998) provide evidence that states with RDFs do experience less volatile fiscal cycles, which suggests that states without RDFs are not finding alternative means of smoothing expenditures. So though the findings in this paper do not alone show that RDFs

smooth expenditures, in conjunction with the rest of the literature, they do have that implication.

In sum, state budget stabilization funds, or RDFs, appear to belong with a growing class of state fiscal institutions that have acknowledged real effects on state fiscal policy and hence on welfare.

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