

Research Report



Achieving Greater Fiscal Stability: Guidance for the New England States

By Yolanda K. Kodrzycki and Bo Zhao



New England Public Policy Center

Staff

Kevin Behan
Robert Clifford
Osborne Jackson
Calvin Kuo
Darcy Saas
Riley Sullivan
Robert Triest
Bo Zhao

For more information about the New England Public Policy Center, please visit:
<http://www.bostonfed.org/neppc>

The views expressed in this report are those of the authors and do not necessarily represent positions of the Federal Reserve Bank of Boston or the Federal Reserve System.

Table of Contents

Introduction	3
Recent Increases in Revenue Cyclicalilty	4
How Rainy Day Funds Can Help	7
How Large a Rainy Day Fund Is Needed?	8
The Role of Rainy Day Fund Caps in Restricting Savings	10
Tax Reform as an Alternative Remedy	11
Conclusion	12
References	14
Appendix: Overview of Data and Research Methodology	15

Acknowledgements

The authors would like to thank their colleagues in the Federal Reserve Bank of Boston research department for their helpful comments and suggestions. Jingyi Huang provided excellent research assistance.

Achieving Greater Fiscal Stability: Guidance for the New England States

Introduction

Following periods of very strong revenue growth, many states across the nation saw their tax receipts fall steeply during the two most recent recessions in 2001 and 2007–2009. These unusually sharp swings led to abrupt cuts in public spending that not only were disruptive to state residents but also had broader negative ramifications. For example, cuts in state spending on higher education resulted in higher tuition and lower-quality education at public colleges and universities, harming human capital formation and the long-run competitiveness of the state's economy.¹ Similarly, cuts in state spending on transportation delayed capital projects and allowed many poorly maintained roads and bridges to deteriorate further. Such delays would likely incur even higher costs in the future to complete projects required to meet transportation safety standards.

Moreover, contractionary state fiscal policies worsened the most recent recession and exerted a sizeable drag on the national economic recovery by depressing overall demand. State spending cuts triggered layoffs of public employees and a reduction in government payments to private firms and nonprofit organizations doing business with state governments. These reductions impact employees of these firms and organizations, who have less to spend on consumption. According to the Bureau of Economic Analysis, the contribution of the state and local government sector to real GDP growth was consistently negative from the fourth quarter of 2009 through the first quarter of 2013. In particular, the sector decreased real GDP growth by 0.95 percentage points in the first quarter of 2010—the largest negative contribution from this sector since the second quarter of 1947 (the earliest data point in the Bureau of Economic Analysis data series).

In the aftermath of these crises, state governments are being urged to consider structural reforms that would lead to greater fiscal stability in the future. One frequently suggested change is to strengthen rainy day funds.² Forty-five states across the country, including the six New England states, have longstanding rainy day funds to help smooth their budgets over the business cycle. However, state rainy day fund balances have generally turned out to be too small to effectively counteract the revenue shortfalls associated with economic downturns, especially during the 2000s.³ How large they should be remains an important, unresolved question. Just as there are adverse consequences when rainy day fund balances are too small, there are also negative ramifications if they are allowed to grow too large. Saving too much in a rainy day fund diverts economic resources that could instead be used to cut taxes or fees or make improvements to public services.

1 Oliff, Mai, and Palacios (2012).

2 In theory, if private citizens are aware that their welfare depends on smooth state spending, they may internalize state revenue cyclicality in their saving behaviors. For example, they may save more than they would need for private purposes during economic booms. Then, when revenues decline during economic downturns, states would simply raise tax rates to tap into private savings to maintain their spending, rather than relying on rainy day funds. However, there is evidence suggesting that private citizens do not internalize state revenue cyclicality, at least not fully. McGranahan and Mattoon (2012) find that since 2000 states have been less willing to increase tax rates to cope with recessions than previously, likely due to the growing anti-tax sentiment. Therefore, it has become less feasible politically for states to tap into private savings during recessions when they need additional revenues to address budget gaps. In addition, raising tax rates during recessions is a procyclical policy that worsens recessions and delays recoveries.

3 Both the politically liberal Center on Budget and Policy Priorities and the politically conservative Tax Foundation agree that states did not save enough in their rainy day funds to deal with the two most recent recessions, which resulted in deep spending cuts across the country and tax hikes in some states. See McNichol and Boadi (2011) and Henschman (2013).

This report considers the New England states' past preparedness for cyclically induced revenue downturns and assesses policy actions they might usefully consider in order to achieve greater fiscal stability going forward.⁴ The key findings are as follows:

- Over the past 25 years and especially during the recessions of 2001 and 2007–2009, the New England states experienced very sizeable revenue shortfalls relative to their long-term trends, and their rainy day fund balances were frequently insufficient to offset revenue shortfalls induced by economic downturns.
- States vary widely in the size of the rainy day funds they would have needed to offset the revenue drops below trend resulting from the recessions of the 2000s and the economic downturns of the 1980s and 1990s.
- Among the New England states, Massachusetts and Connecticut would have needed the largest rainy day funds. This is mostly because both states rely more heavily on volatile capital gains and other investment-related revenues than the other New England states.
- Except for Massachusetts, the New England states have capped their rainy day funds at levels below what they would need to offset revenue dips below trend; the rainy day fund caps in Connecticut, Rhode Island, and Vermont are particularly low.
- While reducing reliance on personal income taxes might also help to stabilize state finances, such reforms should not be undertaken without carefully considering the potentially detrimental effects on progressivity, economic efficiency, and long-term revenue adequacy.

Recent Increases in Revenue Cyclicity

Although states vary in the degree to which their tax revenues fluctuate in response to state economic conditions, a Boston Fed analysis indicates that 39 of the 50 states experienced higher sensitivity in the 2000s than in the 1980s and 1990s.⁵ In four of the New England states—Connecticut, Massachusetts, Rhode Island, and Vermont,—cyclical variability of tax revenues increased in the 2000s over their levels in the previous two decades. The timing and magnitude of financial market fluctuations played a key role in these patterns. Stock-market-dependent sources of income fell sharply as a fraction of taxable income during the 2001 recession, which coincided with the bursting of the dot-com bubble. These income sources increased sharply with the strong stock market of the mid-2000s and then plummeted during the financial crisis and the ensuing Great Recession of 2007–2009. In the prior two decades, financial market fluctuations were less closely correlated with economic fluctuations and were frequently milder.

The problem of revenue cyclicity is particularly noticeable in New England. For example, in Massachusetts, revenues from the personal income tax account for over 50 percent of total tax revenues on average, more than in any other state in the nation except New York and Oregon.⁶ In addition, capital gains account for a higher share of taxable income in Massachusetts than in many other states, and short-term capital gains are taxed at a substantially higher rate than wage and salary income. Like Massachusetts, Connecticut relies heavily on personal income tax revenues and its residents collectively derive a relatively large proportion of their income from the stock market. Connecticut has progressive income tax rates, so fluctuations in the stock market income of that state's taxpayers have larger effects on income tax revenues than similarly sized fluctuations in wages

⁴ This report builds on the authors' previous research on this subject. See Kodrzycki (2014) and Zhao (2014).

⁵ Kodrzycki (2014), Table 5.

⁶ Kodrzycki (2014), Table 4.

and salaries, because most stocks are held by taxpayers in the highest tax bracket.

The remaining three New England states with a broad-based income tax—Maine, Rhode Island, and Vermont—also rely somewhat more heavily on income tax revenues than the national average and have progressive rates.⁷ And although New Hampshire lacks a broad-based income tax, its collections from selective income taxes and business enterprise taxes fluctuate with financial market gyrations.

To measure the magnitude of overall revenue fluctuations in each of the New England states, we combine the amounts collected from personal income, sales, and other taxes with nontax sources, such as fees and charges, and then use statistical methods to divide each state's total own-source revenue into two parts: the state's long-term revenue trend and the deviation from trend due to cycles (see the appendix). Figure 1 shows the estimated deviations from the revenue trend for each of the New England states, expressed relative to each state's average general expenditure for the FY 1988-to-FY 2012 period, as measured by the U.S. Census Bureau.⁸ (In the case of Connecticut, the analysis starts in FY 1993, after the state adopted a new broad-based income tax in response to the fiscal crisis of the early 1990s.) The positive numbers represent the swings above trend during years when the economy was relatively strong, and the negative numbers represent the dips below trend during recessions and other periods of economic weakness.

Among the six New England states, Connecticut and Massachusetts experienced the most substantial revenue shortfalls from trend, especially in the 2000s. For example, Connecticut's revenue shortfall from trend, relative to the state's average general expenditure for FY 1988–FY 2012, was 4.9 percent in FY 2003 and 6.6 percent in FY 2010. Similarly, Massachusetts's revenue shortfall from trend (relative to its average general expenditure for FY 1988–FY 2012) was 7.7 percent in FY 2003 and 5.4 percent in FY 2010. Vermont also experienced noticeably larger revenue deviations from trend in the

Box 1. Measuring the Volatility of State Tax Revenues

In the nation as a whole, the volatility of state tax revenues has exceeded the volatility of the states' economies since around 2000. For every 1 percentage point change in real per capita personal income, real state per capita tax revenues changed in the same direction by 1.8 percentage points, nationwide. During the 1980s and 1990s, state tax revenues, on the whole, were slightly less volatile than state economies.

Personal income tax revenues account for about one-third of total state tax revenues and tend to be the largest source of tax revenues in the 41 states that tax personal income. During the 2000s, personal income tax revenues became much more cyclically sensitive. A 1 percentage point change in real per capita income resulted in a 2.2 percentage point change in income tax receipts in the same direction in these states. This represents a fourfold rise in cyclical sensitivity relative to what states experienced in the 1980-to-1999 period, and in four of the five New England states that have a broad-based income tax—all but Maine, the volatility of personal income tax receipts was greater in the 2000s than the national average.

Most states in the nation impose a general sales tax. The revenues from this tax were also more volatile than the state economies in the 2000s, changing 1.4 percentage points on average for every percentage point change in personal income in the same direction. However, this relationship was roughly in line with what it had been in prior decades, and all five New England states that have a general sales tax saw somewhat less cyclical variability in sales tax revenues than the national average.

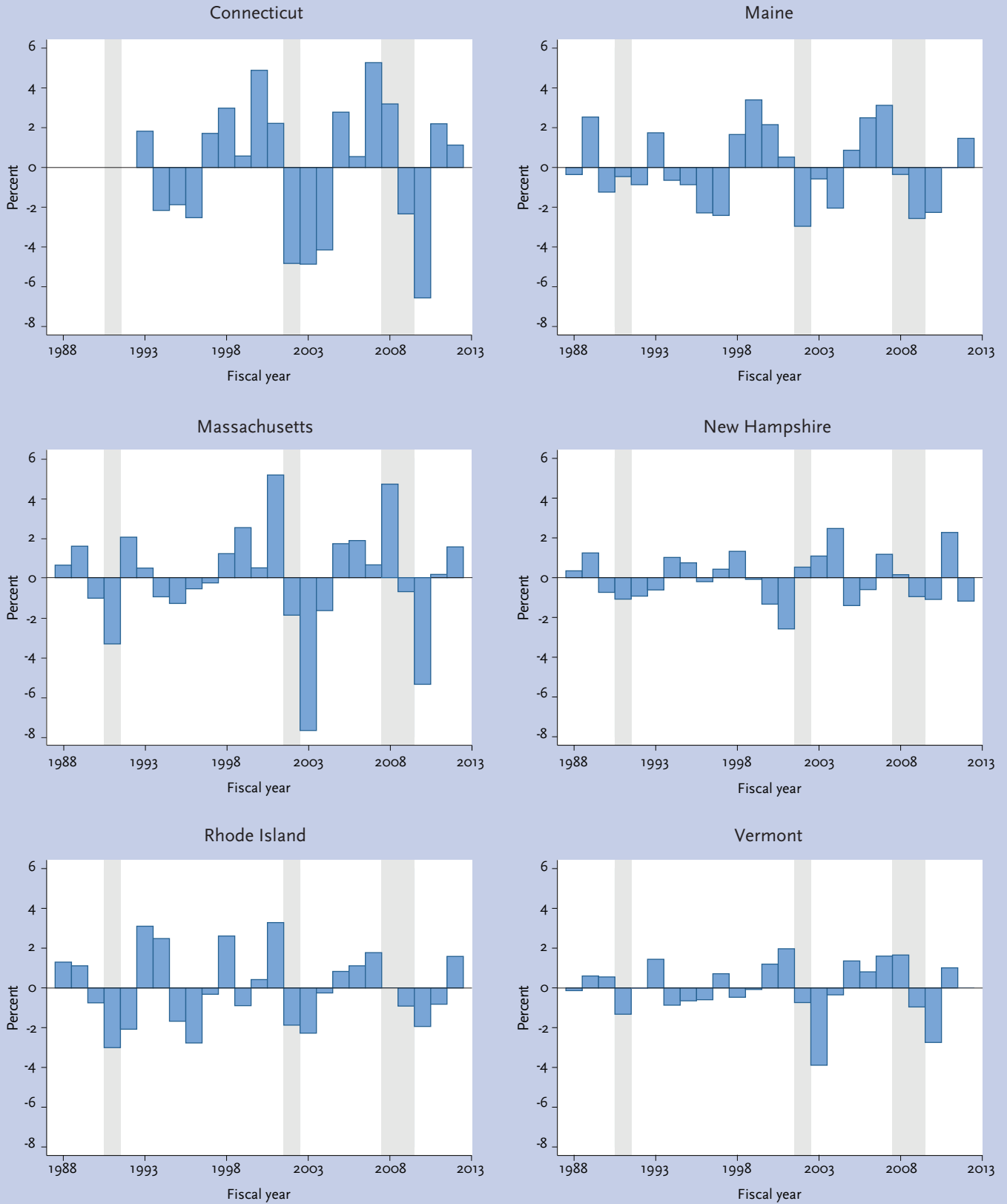
Other factors besides economic cycles also contribute to revenue variability, but for the most part they are less problematic for state budget planning purposes. For example, one-time events—such as a court decision on a major business tax dispute or the death of a wealthy taxpayer—can trigger major changes in state corporate income or estate tax receipts. Abnormal increases or decreases of this sort can result in anomalous changes in overall tax revenues in small states, but they are easily traced to temporary factors. Erratic movements in prices can also cause ups and downs in tax receipts. Such price movements are a major concern for states producing food and energy, because they affect the general economy. In regions like New England that are consumers rather than producers of food and energy, such swings tend to have only a minor effect on overall tax revenues.

Source: Kodrzycki (2014). See especially Table 1 and Appendix Tables 2 and 3.

7 Vermont's income taxpayers as a whole do not appear to derive as large a fraction of their income from financial markets as income taxpayers in Connecticut or Massachusetts. Nonetheless, a review of the state's tax structure notes that "[t]he personal income tax has evolved to become more highly cyclical," as "investment in the stock market, capital gains, bonuses and stock options dramatically increase the individual income tax base in good times, and decrease it as quickly during market downturns." See Vermont Legislative Joint Fiscal Office (2007), p. 19.

8 Using the Census Bureau definition, general expenditure encompasses all state government spending except for the amounts paid out of social insurance trust funds or expended by state-owned liquor stores and utilities.

Figure 1. Estimated Deviation from the Revenue Trend for Each of the New England States



Source: Authors' calculations.

Note: The estimated deviation from the revenue trend is expressed as a percentage of each state's average general expenditure from FY 1988 to FY 2012 to make it comparable across states. The shaded areas indicate national recession periods.

2000s than in the 1980s or 1990s.

Equally important from the standpoint of considering the design of fiscal stabilization policies, the figure also illustrates the persistence of revenue shortfalls. Each of the New England states experienced at least three episodes of below-trend revenues spanning multiple fiscal years. In the case of the 2000s recessions in particular, revenues typically started to dip below trend with the onset of the recession, but remained below trend after the economic recovery had begun.⁹

How Rainy Day Funds Can Help

Rainy day funds are one mechanism by which states can alleviate cyclically induced fiscal stress. Often formally known as budget stabilization funds, rainy day funds are created by state legislation with an explicit countercyclical mandate. States are expected to deposit funds into their rainy day accounts during economic expansions and withdraw funds to offset revenue shortfalls during economic downturns.

All six New England states have longstanding rainy day funds. Connecticut was the first state in the region to adopt a rainy day fund, in 1979. Other New England states joined Connecticut in the mid-to-late 1980s, with Vermont being the last of the region's states to do so, in 1988.¹⁰

State laws specify the purposes for which rainy day fund balances should be used.¹¹ For example, Rhode Island General Laws 35-3-20 specifies that “a state budget reserve and cash stabilization account...shall be used solely for the purpose of providing such sums as may be appropriated to fund any unanticipated general revenue deficit caused by a general revenue shortfall.” Maine Revised Statute Title 5, Chapter 142 states that “amounts in the stabilization fund may be expended only to offset a General Fund revenue shortfall.”

Officials in many states have followed some rule of thumb as a guideline in setting the size of their rainy day fund. The most commonly cited rule of thumb, which is based on a 1983 report by the National Conference of State Legislatures, recommends a rainy day fund of 5 percent of annual general fund revenue or expenditure.¹² This 5-percent rule remains influential. For example, in early 2014, the Massachusetts Undersecretary of Administration and Finance emphasized that the state needed to continue to rebuild its rainy day fund because “the reserve is not yet at the healthier amount of 5 percent of revenues.”¹³

Box 2. Alternative Definitions of “Revenue Shortfall”

The term “revenue shortfall” is commonly used to denote the gap between currently projected revenue for the fiscal year and the amount projected at the time the state budget was either originally developed or last updated. In this context, revenue shortfalls arise because of forecasting errors. And since states aim for balanced operating budgets, any revenue shortfalls that emerge during the course of a budget cycle must usually be closed by some combination of additional revenues and expenditure cuts relative to the planned amounts.

In analyzing how much states need to set aside in their rainy day funds, this report uses a different concept of “revenue shortfall.” Here, this term is used to denote the gap between actual revenue for the fiscal year (adjusted for policy changes) and the amount that states would have collected if revenue had been consistent with longer-run trends.

There are valid reasons for employing this new measure of revenue shortfall. The basic intent behind establishing a rainy day fund is to have access to savings during periods when revenues are unusually strained. It seems reasonable to argue that, in itself, a one-time error in forecasting revenues does not justify tapping such reserves. Instead, rainy day funds should be accessed when revenues are depressed primarily because of a weak economy. At such times, adding to taxes or fees or cutting public services is likely to worsen economic conditions in the state.

9 Owyang, Piger, and Wall (2005) also show that state-level business cycles are not in perfect sync with one another. Therefore, there is a potential for states to share risks of revenue shortfalls through pooling their rainy day fund reserves. Mattoon (2003) presents a design of a national state rainy day fund. However, there has been no political will to implement such a national state rainy day fund. Nonetheless, federal fiscal policy already provides some degree of risk sharing among states through taxes, transfers, and grants to states (Asdrubali, Sorensen, and Yosha 1996).

10 Wagner (2003).

11 In some states the laws also specify requirements for making deposits. In general, however, lawmakers have considerable discretion.

12 Yondorf (1983).

13 Andy Metzger, “Debt levels weigh on state efforts to address water system woes,” *State House News Service*, January 31, 2014.

In light of state experiences during the two most recent recessions, some policy groups have proposed higher targets for state rainy day funds. The Center on Budget and Policy Priorities suggests that rainy day funds equal 15 percent of annual general fund operating expenditure.¹⁴ The Government Finance Officers Association recommends a “best practice” of setting rainy day funds equal to two months of regular general fund operating revenue or expenditure, which is equivalent to about 17 percent of annual operating revenue or expenditure.¹⁵

But even these higher targets do not take into account the fact that both the magnitude of business cycles and the degree of revenue cyclicalities vary across states.¹⁶ As the analysis of deviations from revenue trend for the New England region suggests, a “one-size-fits-all” approach to setting rainy day fund targets may not make economic sense. Another important issue is that, even within the New England area, states vary widely in the degree to which they use special funds to account for the services they provide. Setting the rainy day fund target in terms of a certain fraction of general fund operating revenue or expenditure provides less potential for fiscal stabilization in a state with a narrowly defined general fund than in one where the general fund covers most spending categories.

How Large a Rainy Day Fund Is Needed?

In setting the target size of its rainy day fund, a state should combine the objective information on the size of its revenue cycles with an assessment of how best to deal with fiscal stress. For example, the consensus in one state might favor keeping overall revenues and public services unchanged during all economic downturns regardless of their severity, while another state might adopt a less ambitious target.¹⁷ The former approach avoids the need to adopt contractionary fiscal policies during bad economic times. Having a less ambitious target means that state policymakers would have to find new sources of revenues or reduce expenditures during especially bad economic times.¹⁸ Assuming the two states face similar revenue cycles, the first state would “need” to accumulate a larger rainy day fund relative to its budget than the second.

This section provides estimates of how large a rainy day fund each New England state would require under two such sets of illustrative assumptions. First, suppose that a state’s goal is to withstand a serious recession without raising taxes or fees and without reducing expenditures below a level consistent with the long-term revenue trend. In this case, it should aim to accumulate a rainy day fund balance sufficient to completely offset a “worst case” revenue shortfall from trend. Given the near-impossibility of making accurate predictions, a reasonable approach would be to use past periods of below-trend revenue as a guide. This implicitly assumes that recessions will not change in severity, and that the sensitivity of tax revenues to economic conditions will not change in the future.

The amount accumulated in the rainy day fund would need to cover shortfalls over the entire period when revenue fell below trend. For example, using the calculations underlying Figure 1, Massachusetts would have needed a rainy day fund balance of \$4.4 billion at the end of FY 2001 in order to be sufficiently equipped to deal with the recession-induced revenue shortfalls (relative to the trend) that prevailed from FY 2002 to FY 2004. This was equivalent to 10.2 percent of the Census Bureau-defined state general expenditure in FY 2001, the highest share for the full post-FY 1988 period. (The amounts cited in this section have been inflated to 2012 dollars.)

Alternatively, suppose the state adopts the less ambitious goal of accumulating sufficient savings to avoid adjusting taxes or fees in a “typical” instance of below-trend revenue. As shown in Figure 1, Massachusetts experienced three additional periods of below-trend revenue during the

14 McNichol and Boadi (2011).

15 Government Finance Officers Association (2009).

16 Gold (1995).

17 See Joyce (2001) and Gramlich (2011).

18 Although harder to justify from the standpoint of macroeconomic theory, such an approach represents a smaller departure from historical practices.

25-year period. Hence, the target for the Massachusetts rainy day fund in this “middle-case” scenario would be nearly 5.5 percent of total general expenditure, using the midpoint of the needed reserves in the four periods of below-trend revenue.¹⁹

Table 1 presents the rainy day fund targets for the worst-case and middle-case scenarios for each New England state. These targets vary substantially across states, reflecting the states’ differing economies and revenue structures. Connecticut and Massachusetts would need larger rainy day fund balances than the other New England states in relation to state general expenditures. This is mostly because both states are more dependent on volatile capital gains and other investment-related revenues than the other New England states.

At the other extreme, New Hampshire and Vermont have the smallest rainy day fund needs among the New England states. In the case of New Hampshire, this result is likely due mostly to the lack of a broad-based personal income tax or general sales tax, the two foremost sources of revenue cyclicity in most states.²⁰ In the case of Vermont, even though tax revenues became more cyclical in the 2000s, the state continued to have milder economic downturns than the rest of New England.

To handle their worst-case scenarios from the past 25 years, Rhode Island and Maine would need similarly sized rainy day funds as a percentage of total general expenditure to what would be required for all 50 states pooled together. However, it turns out that, relative to state general expenditure, their needed rainy day funds for the middle-case scenario are much larger than what would be needed for the 50 states as a whole. The implication is that the “typical” revenue shortfall relative to trend in these two states has been proportionately larger than the corresponding shortfall nationally.

The New England states often had insufficient rainy day funds relative to these definitions of the amounts needed.²¹ Table 2 shows the frequency with which each state’s rainy day fund balance in the year immediately preceding a period of below-trend revenue fell short of the amount needed to offset the subsequent revenue dips below trend. By this metric, Connecticut and Massachusetts never accumulated sufficient rainy day funds during the years considered. Likewise, New Hampshire, Maine, and Rhode Island generally did not accumulate enough reserves. Each of these three states entered only one period of below-trend revenue with enough savings in its rainy day fund to cover the ensuing revenue shortfalls.

As a consequence of insufficient rainy day funds, states have had to resort to tax rate or fee increases and major expenditure cuts during economic downturns.²² For instance, all the New

Table 1. Potential Target Rainy Day Fund Levels for Each New England State
as a percentage of the Census Bureau-defined state general expenditure

State	Needed Rainy Day Fund for the Worst-Case Scenario	Needed Rainy Day Fund for the Middle-Case Scenario
Connecticut	11.9	8.4
Massachusetts	10.2	5.5
Rhode Island	7.8	4.0
Maine	6.9	4.5
New Hampshire	5.7	1.7
Vermont	4.3	2.2
U.S. Aggregate	6.9	2.1

Source: Authors’ calculations.

19 The state would have needed a rainy day fund balance of \$1.7 billion in FY 1989 to offset the total revenue shortfalls experienced in FY 1990–FY 1991; \$1.2 billion in FY 1993 for the FY 1994–FY 1997 period; and \$2.4 billion in FY 2008 for the FY 2009–2010 period (all inflated to 2012 dollars). These amounts are the equivalent of 5.4, 3.4, and 5.4 percent of total general expenditure in these years, respectively.

20 Taxes levied on corporate profits tend to be more cyclically volatile than either personal income taxes or sales taxes, but account for less than 8 percent of state tax revenues nationwide.

21 Zhao (2014) shows that even after taking into account the general fund balance, states still often had insufficient savings relative to the amounts needed in the last 25 years.

22 Because of restrictive withdrawal, deposit, and replenishment rules, some states did not withdraw enough funds from their rainy

England states engaged in revenue-enhancement changes and mid-year spending cuts in the aftermath of the Great Recession, according to the NASBO's Fiscal Survey of States for FY 2009–FY 2012. These policy actions not only disrupted public services, but also likely slowed states' economic recoveries.

The Role of Rainy Day Fund Caps in Restricting Savings

A number of factors could explain the apparent inadequacy of rainy day fund balances in the New England states. For one thing, policymakers may have relied on overly optimistic projections, either for the country as a whole or for their state. During the long U.S. economic expansion of the 1990s, for instance, some forecasters questioned whether business cycle downturns were still inevitable in developed nations. And during past periods when state tax receipts were coming in stronger than normal, state revenue estimators may have underestimated the likelihood that they would fall below trend in subsequent years.

Another possibility is that state policymakers may have mistakenly used statutory caps as their point of reference. Like 34 other states across the country, all the New England states have imposed a cap on the size of their rainy day funds in order to avoid overbuilding their reserves and therefore being unable to address current economic priorities. The caps, which state statutes specify as a percentage of state-reported general fund revenue or expenditure, range from 5 percent in Rhode Island and Vermont to 15 percent in Massachusetts, percentages that are all equal to or higher

than the National Conference of State Legislatures' recommendation of 5 percent.²³ In practice, these caps have rarely been a binding constraint on rainy day fund balances because most New England states have stopped adding to their reserves well short of reaching the legal limit. However, by using the cap as their point of reference instead of the actual amount needed to handle revenue shortfalls associated with economic downturns, policymakers may have misjudged the adequacy of their reserves.

Table 3 compares the rainy day fund caps with the required rainy day funds for the New England states in the worst-case and middle-case scenarios. For comparability,

the rainy day fund requirements are re-expressed as percentages of state-reported general fund revenue or expenditure. State-reported general fund revenue and expenditure are narrower than the Census Bureau measures of general revenue and expenditure because they exclude some

Table 2. The Number of Periods with Below-Trend Revenue When State Rainy Day Funds Were Insufficient
FY 1988 — FY 2012

State	Number of Periods with Below-Trend Revenue (1)	Number of Periods with Below-Trend Revenue When State Rainy Day Funds Were Insufficient (2)	Percentage of Periods with Below-Trend Revenue When State Rainy Day Funds Were Insufficient (3)=100×(2)÷(1)
Connecticut	3	3	100.0
Massachusetts	4	4	100.0
New Hampshire	6	5	83.3
Maine	5	4	80.0
Rhode Island	5	4	80.0
Vermont	7	4	57.1
U.S. Aggregate	6	4	66.7

Source: Authors' calculations.

Note: The study period for Connecticut is from FY 1993 to FY 2012.

day funds when they were clearly needed. See McNichol and Boadi (2011).

²³ Connecticut and Vermont specify their rainy day fund caps as a percentage of state general fund expenditure, while the other New England states specify their rainy day fund caps as a percentage of state general fund revenue. General fund revenue and expenditure levels are very similar in the New England states.

portions of the state budget that have dedicated funding streams or statutory spending requirements. The size of the discrepancy between the two concepts varies from state to state because of differences in accounting practices. Among the New England states, New Hampshire is the most affected by this transformation, because its self-reported general fund averaged only 30 percent of the Census Bureau-defined state general expenditure in the last 25 years.

The rainy day fund caps in Connecticut, Rhode Island, and Vermont are all lower than the needed rainy day funds for the middle-case scenario. Even if these states managed to maintain their rainy day fund at the current cap level before each future period with below-trend revenue, they would likely lack sufficient reserves to deal with at least half of those difficult periods.

The rainy day fund caps in Maine and New Hampshire are higher than the needed rainy day funds for the middle-case scenario but below the needed rainy day funds for the worst-case scenario. This means that these states are prevented by current law from amassing a rainy day fund that is sufficient to compensate for revenue shortfalls in future periods when the worst-case-scenario revenue dips below trend. Massachusetts is the only state in the region with a rainy day fund cap that is consistent with its projected rainy day fund need for the worst-case scenario.

Except for Massachusetts, the New England states may want to consider raising the specified cap levels to improve the capacity of their rainy day funds to meet future needs. Such a change particularly merits discussion in Connecticut, Rhode Island, and Vermont, where current rainy day fund caps are quite low relative to their needed rainy day funds. There have been some recent proposals to reform the rainy day fund caps in these states. For example, in early 2014, Connecticut Governor Malloy proposed increasing the rainy day fund cap from 10 percent to 15 percent, which would allow a rainy day fund balance very close to the amount needed for the worst-case scenario for Connecticut.²⁴

Tax Reform as an Alternative Remedy

Some analysts have suggested structural tax reform as an alternative approach to fiscal stabilization.²⁵ Broad-based personal income and general sales taxes are the largest sources of revenues in many states, including all the New England states except New Hampshire. New Hampshire's state revenues have come mostly from taxing corporate income, selective categories of individual incomes, and selective categories of sales. As a result, New Hampshire's tax revenues have fluctuated slightly less in percentage terms than the total personal income of its residents. And unlike most other states, New Hampshire did not see the sensitivity of overall tax revenues to economic

Table 3. State Rainy Day Fund Caps Compared with the Needed Rainy Day Funds for the Worst-Case and Middle-Case Scenario

as a percentage of state-reported general fund revenue or expenditure

State	Rainy Day Fund Cap	Needed Rainy Day Fund for the Worst-Case Scenario	Needed Rainy Day Fund for the Middle-Case Scenario
Massachusetts	15.0	14.3	7.7
Maine	12.0	14.9	9.6
New Hampshire	10.0	19.1	5.6
Connecticut	10.0	15.7	11.1
Rhode Island	5.0	14.6	7.5
Vermont	5.0	13.1	6.7

Source: Authors' calculations and McNichol and Boadi (2011).

24 Gov. Malloy: State Must Save for the Future while Providing Modest Tax Relief Today: *Three-Point Plan Will Bolster the Rainy Day Fund, Pay Down Long-term Debt, and Provide Tax Relief for Residents*. January 30, 2014.

25 See, for example, Sobel and Wagner (2003).

conditions increase in the 2000s.²⁶

Perhaps the most radical tax policy reform would be to eliminate broad-based income and sales taxes in the five New England states that levy them. The most obvious drawback to adopting a New-Hampshire-style tax structure in the other New England states is that the revenues raised would likely be insufficient to pay for the public services these states provide. New Hampshire is a high-income state with a low poverty rate, and these circumstances reduce the need for government services.²⁷ In addition, the state has chosen to limit the size and scope of the public services it offers.²⁸

An alternative reform might be to reduce the fraction of revenues raised through the personal income tax, especially in states such as Massachusetts and Connecticut, where dependence on the personal income tax is far above the national average. While this would likely decrease the cyclical sensitivity of overall tax revenues, it would also decrease the progressivity of tax payments. On the whole, Massachusetts and Connecticut residents with higher incomes have personal income tax liabilities that amount to higher shares of their overall incomes than the corresponding shares of residents with lower incomes. By contrast, the remaining state taxes paid by residents of Connecticut and Massachusetts generally fall as a percentage of income as income rises. Similar distributional patterns hold in Maine, Rhode Island, and Vermont: state personal income taxes are generally progressive, while the remaining sources of state tax revenue are generally regressive.²⁹

A reform toward consumption-based taxes would present additional challenges and potential drawbacks. Tax-exempt purchases (such as for higher education, health care, and other services) are likely to continue to increase as a share of household budgets, leading to further erosion of the base of state sales taxes.³⁰ Without major expansion of the sales tax base to include more categories of consumer spending or continual increases in sales tax rates, the growth in sales tax revenue may be inadequate to keep pace with the rising demand for public services. And while broadening the base of the sales tax would tend to reduce resource allocation distortions and improve economic efficiency, raising the tax rate on covered items while continuing to exempt other items would lead to further distortions of household spending.

Finally, some states may wish to consider reducing their taxes on taxpayers with the most variable incomes. Since these tend to be the highest-income taxpayers, such a change raises equity concerns. Moreover, a statistical analysis conducted at the Boston Fed indicates that the existing differences across state income tax laws—such as differences in the structure of tax rate brackets or the tax treatment of capital gains—have contributed relatively little to explaining differences in the degree of cyclicity of revenues from personal income taxes, after accounting for the year-to-year cyclicity of adjusted gross income of their residents on federal income tax returns.³¹ This finding suggests that modifications in state income tax parameters may not materially affect the cyclical sensitivity of state income tax revenues.

Conclusion

Like their peers across the country, all the New England states have experienced extended episodes with below-trend revenue in the last 25 years, especially during the two most recent recessions. These prolonged revenue shortfalls were the product of both fluctuations in economic conditions and the sensitivity of state tax revenues to the economy. These factors differ across

26 Kodrzycki (2014), Appendix Table 1.

27 In 2013, New Hampshire's personal income per capita was 113 percent of the national level. This was lower than in Connecticut or Massachusetts, but higher than in the remaining New England states. New Hampshire's poverty rate was 10.1 percent in 2013. It was lower than in any of the other New England states and also lower than the national average of 15.9 percent.

28 Weiner (2011).

29 Institute on Taxation and Economic Policy (2015).

30 For example, see Bruce, Fox, and Tuttle (2006) and Bruce, Stokely, and Luna (2009).

31 Kodrzycki (2014), Table 8.

states, resulting in different degrees of fiscal stress during recessions. And although all the New England states have rainy day funds, the amounts they have accumulated in these accounts have rarely proved sufficient to obviate the need for tax and fee increases, or service reductions, or both. Such fiscal actions have likely deepened and prolonged economic downturns, compared with what would have happened if states had saved more during good economic times.

This report provides a new framework for the New England states to formulate their rainy day fund targets. The first step is to gain an understanding of the extent to which revenues are likely to deviate from trend during economic downturns. Over the last 25 years, Connecticut and Massachusetts have experienced the largest revenue shortfalls of all the New England states, while New Hampshire and Vermont have experienced the smallest. The second step is to make a collective decision concerning the desirability of avoiding increases in taxes and fees, or reductions in public services, or both during economic downturns. Maintaining stable fiscal policies in recessions provides greater certainty for the public and helps assure a more timely economic recovery. On the other hand, such a policy requires states to forgo tax and fee cuts or expenditure increases that may have popular appeal, when their coffers are full.

This report shows that, for a given degree of protection against being forced to take contractionary fiscal policies during times of economic weakness, the necessary rainy day fund targets vary widely across the New England states. This is contrary to the “one-size-fits-all” optimal rainy day fund recommendations implied by popular rules of thumb. Moreover, the traditional rule of thumb of 5 percent of annual general fund expenditures would have provided a relatively small cushion during the recessions of the 2000s. This is so both because of the magnitude of the fiscal needs and because the general fund is an overly narrow base on which to set savings targets.

The analysis indicates that the existing rainy day fund caps adopted by most of the states in New England—most notably Connecticut, Rhode Island, and Vermont—are lower than the amounts they would need to avoid having to raise taxes and fees or reduce expenditures during a typical downturn. These states should give serious consideration to raising their caps. In addition, the New England states should consider saving more than they historically have in preparation for possible future revenue shortfalls.

Finally, the report considers tax reform as an alternative mechanism for stabilizing state finances in the five New England states with broad-based personal income taxes and general sales taxes. Changes made with this goal in mind would likely involve the need for policymakers to consider making tradeoffs in terms of revenue adequacy, tax progressivity, and economic efficiency. Furthermore, in the absence of larger rainy day fund balances, states that shift to more cyclically stable revenue sources would still need to undertake some degree of contractionary fiscal policy during economic recessions.

References

- Asdrubali, Pierfederico, Bent E. Sorensen, and Oved Yosha. 1996. "Channels of Interstate Risk Sharing: United States 1963–1990." *The Quarterly Journal of Economics*, 111(4): 1081–1110.
- Bruce, Donald, William F. Fox, and M. H. Tuttle. 2006. "Tax Base Elasticities: A Multi-State Analysis of Long-Run and Short-Run Dynamics." *Southern Economic Journal*, 73(2): 315–341.
- Bruce, Donald, William B. Stokely, and LeAnn Luna. 2009. "State and Local Government Sales Tax Revenue Losses from Electronic Commerce." *State Tax Notes*, 52(7): 537–558.
- Gold, Steven G. (ed.) 1995. *The Fiscal Crisis of the States—Lessons for the Future*. Washington, DC: Georgetown University Press.
- Government Finance Officers Association (GFOA). 2009. *Determining the Appropriate Level of Unrestricted Fund Balance in the General Fund. GFOA Best Practice*.
- Gramlich, John. 2011. "Rainy Day Funds Explained: How Much Money Should States Have in the Bank?" *Stateline* by Pew Charitable Trusts.
- Henchman, Joseph. 2013. "Tax Foundation and CBPP Agree: States Need Strong Rainy Day Funds." The Tax Foundation.
- Institute on Taxation and Economic Policy. 2015. *Who Pays? A Distributional Analysis of the Tax Systems in all Fifty States*, fifth edition.
- Joyce, Philip G. 2001. "What's So Magical about Five Percent? A Nationwide Look at Factors that Influence the Optimal Size of State Rainy Day Funds." *Public Budgeting and Finance* 21(2): 62–87.
- Kodrzycki, Yolanda K. 2014. "Smoothing State Tax Revenues over the Business Cycle: Gauging Fiscal Needs and Opportunities." Federal Reserve Bank of Boston working paper no. 14-11.
- Mattoon, Richard H. 2003. "Creating a National State Rainy Day Fund: A Modest Proposal to Improve State Fiscal Performance." Federal Reserve Bank of Chicago working paper 2003-20.
- McGranahan, Leslie, and Richard H. Mattoon. 2012. "Revenue Cyclicalities and Changes in Income and Policy." *Public Budgeting and Finance* 32(4): 95–119.
- McNichol, Elizabeth, and Kwame Boadi, 2011. *Why and How States Should Strengthen Their Rainy Day Funds: Recession Highlighted Importance of Funds and Need for Improvements*. Washington, DC: Center on Budget and Policy Priorities.
- Oliff, Phil, Chris Mai, and Vincent Palacios. 2012. *States Continue to Feel Recession's Impact*. Washington, DC: Center on Budget and Policy Priorities.
- Owyang, Michael T., Jeremy Piger, and Howard J. Wall. 2005. "Business Cycle Phases in U.S. States." *The Review of Economics and Statistics* 87(4): 604–616.
- Sobel, Russell S., and Gary A. Wagner. 2003. "Cyclical Variability in State Government Revenue: Can Tax Reform Reduce It?" *State Tax Notes* 29(8): 569–576.
- Vermont Legislative Joint Fiscal Office. 2007. *Vermont Tax Study, Volume 1: Comparative Analysis* (January 16).
- Wagner, Gary A. 2003. "Are State Budget Stabilization Funds only the Illusion of Savings? Evidence from Stationary Panel Data." *The Quarterly Review of Economics and Finance* 43(2): 213–238.
- Weiner, Jennifer R. 2011. "How Does New Hampshire Do It? An Analysis of Spending and Revenues in the Absence of a Broad-based Income or Sales Tax." *NEPPC Research Report* no. 11-1, Federal Reserve Bank of Boston.
- Yondorf, Barbara A. 1983. *A Legislator's Guide to Budget Oversight after the Appropriations Act has Passed*. Denver, CO: National Conference of State Legislatures.
- Zhao, Bo. 2014. "Saving for a Rainy Day: Estimating the Appropriate Size of U.S. State Budget Stabilization Funds." Federal Reserve Bank of Boston working paper no. 14-12.

Appendix: Overview of Data and Research Methodology

We start the analysis with each state's own-source general revenue as reported in the Census Bureau's Annual Survey of State Government Finances for FY 1988 to FY 2012.³² This includes state taxes and charges as well as miscellaneous revenues.³³ The Census Bureau's measure is defined uniformly across states and over time, thus providing greater comparability than each state's self-reported general fund revenue. The Census Bureau measure of general revenue is also broader than state-reported general fund revenue. We limit the analysis for Connecticut to the period FY 1993 to FY 2012, in recognition of the fact that the state adopted a broad-based personal income tax in FY 1992. This major reform caused a large increase in revenue that year and also likely affected the state's revenue trend and cyclical patterns in future years.

Next, we adjust the state own-source general revenue figures to remove the impact of newly enacted policy changes in each year. If a state introduces new tax cuts, we add back the resulting estimated revenue loss in that year to the Census Bureau's measure so as to reflect only the laws governing state revenues in place at the outset of the fiscal year. If a state increases tax rates, we subtract the resulting estimated revenue gain in that year from the Census Bureau's measure. In doing so, we ensure that the adjusted state own-source revenue figures reflect more fully the impact of the business cycle than the unadjusted state own-source revenue figures do. The adjustment amounts come from annual surveys conducted by the National Association of State Budget Officers.

In the final step of preparing the data needed to analyze rainy day fund targets, we use statistical methods to divide each state's adjusted revenue series into two parts: the state's long-term revenue trend and the deviation from trend due to business cycles.³⁴

About the Authors

Yolanda Kodrzycki was vice president and director of the New England Public Policy Center in the research department of the Federal Reserve Bank of Boston when this report was written. Bo Zhao is a senior economist in the New England Public Policy Center in the research department of the Federal Reserve Bank of Boston. His email address is bo.zhao@bos.frb.org.

³² While this report concentrates on the six New England states, Zhao (2014) encompasses all 50 states. The analysis ends with FY 2012 because the Census Bureau had not yet released more current comprehensive data on state finances at the time of the analysis.

³³ We exclude New Hampshire's and Vermont's state property taxes from their own-source general revenue, because these states simply relabeled an essentially local tax as a state tax for funding local public schools. We also remove from New Hampshire's revenue figures the so-called "other selective sales tax" category, which is largely composed of the state's Medicaid Enhancement Tax. This tax is used to extract more Medicaid reimbursement from the federal government and is therefore essentially a federal revenue transfer. More importantly, we exclude these taxes so as to avoid misinterpreting as attributable to economic booms the revenue increases due to the adoption of these taxes in the 1990s or 2000s.

³⁴ The results presented in this report rely on a method called the Hodrick-Prescott filter. Zhao (2014) also uses three additional methods (linear time-trend model, quartic polynomial model of time, and income-based approach), which turn out to be inferior to the Hodrick-Prescott filter in identifying the revenue dips below trend around economic downturns.



New England Public Policy Center
Federal Reserve Bank of Boston
600 Atlantic Avenue
Boston, MA 02210

PRSR STD
U.S. Postage Paid
New Bedford, MA
Permit No. 450



The New England Public Policy Center was established by the Federal Reserve Bank of Boston in January 2005. The Boston Fed has provided support to the public policy community of New England for many years; NEPPC institutionalizes and expands on this tradition. The Center's mission is to promote better public policy in New England by conducting and disseminating objective, high-quality research and analysis of strategically identified regional economic and policy issues. When appropriate, the Center works with regional and Bank partners to advance identified policy options.

You can learn more about the Center by contacting us or visiting our website:

New England Public Policy Center
Federal Reserve Bank of Boston
Phone: (617) 973-4257
E-mail: neppc@bos.frb.org
Web: <http://www.bostonfed.org/neppc>