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## **Tax Cuts and the Recession in the Massachusetts Fiscal Crisis**

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# Tax Cuts and the Recession in the Massachusetts Fiscal Crisis

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## SUMMARY

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Massachusetts, like many states across the country, is facing its worst fiscal crisis since World War II. Budget cuts of \$1 billion in the last fiscal year have been followed up by cuts of \$1.7 billion in the current one. Rather than raise taxes in a significant way, the state has slashed key services for the majority of its citizens.

The consensus among politicians and pundits is that the problem is the recession, or, alternatively, “extravagant” state spending in the 1990s. But an analysis of state tax revenue data reveals that the major reason for the budget shortfall is legislated cuts in capital gains and personal income tax rates, and declines in the yield of the corporate income tax.

Without these policy decisions to cut taxes, the state would not be facing a budget crisis. The \$5.5 billion foregone in tax revenue, saved in a rainy day fund, would have more than compensated for the \$3 billion in spending cuts enacted over the last three fiscal years. Unless the state restores tax rates to previous levels, it will continue to experience serious budget shortfalls and more cuts to essential services.

In the future, lawmakers should resist the temptation to cut taxes during boom times. After all, a bust is always just around the corner. Instead of lowering taxes, the state should save excess revenue, then draw on reserves to maintain spending during recessions.

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## I. Introduction

Nearly two years after the recession of 2001 officially ended, states across the country are facing their worst fiscal crisis since World War II. Yet, as nearly every state legislature confronts drastic cuts in core services such as public education and health care, there is little understanding of what brought this crisis about. Pundits and politicians have attributed it to “extravagant” state spending in the 1990s that left states unprepared fiscally for an economic downturn. But while some states may have increased their spending during the boom times of the late 1990s, many also did something else that made them vulnerable if the economy slowed—they cut taxes.

Massachusetts is one of those states. Having already cut \$1 billion from the budget last year, it faces another \$3 billion budget gap in the current fiscal year. The state has slashed key services for the majority of the commonwealth’s citizens rather than raise taxes, even though legislated tax cuts in the late 1990s are the primary cause of the budget shortfall:

- Between 1996 and 2002, cuts in effective tax rates for personal income, capital gains, corporate profit, and sales reduced state revenue by \$5.5 billion. The overwhelming majority of these cuts—70%—were in capital gains and corporate tax collections.
- Had the revenue foregone through tax cuts been saved instead in a rainy day fund, the fund could have absorbed the \$3 billion in state spending cuts implemented since the crisis began in 2001.
- The recession of 2001 and the continuing slowdown in 2002 also diminished state revenues, but only by a fraction of the loss from the reduction in effective rates—a \$1.5 billion loss from the slowdown compared with the \$5.5 billion drop from tax cuts.

- State spending as a share of state income actually declined between 1991 (the depth of the last recession) and 2002. In 1991, state expenditures were 9.7 percent of personal income; in 2002, they were 9.1 percent. This trend does not comport with the argument that state spending was “extravagant” in the 1990s.
- If effective tax rates were returned to the base rate levels of 1993-95, the state would collect an additional \$2.4 billion in revenue, more than enough to cover the shortfall projected for next year.

As a result of policy decisions to reduce taxes, Massachusetts cut itself out of some of the dividends from one of the strongest growth periods in postwar history. It missed not only increased revenue from historic growth in wages and corporate profits, it also, by drastically reducing the levy on capital gains, shut itself out from much of the gains of the stock market boom.

Unless the state restores tax rates to previous levels, it will continue to experience serious budget shortfalls and more cuts to essential services.

This report evaluates Massachusetts state government tax revenue during the boom and bust years of 1996-2002. After the following discussion of methodology, Section II reviews the Massachusetts fiscal crisis. Section III discusses the role of state spending in the current crisis, and Section IV discusses the structure of taxation in the state. Section V presents the estimates on business cycle effects and effective tax cuts, and Section VI offers policy considerations.

### *A note about the research and methodology*

The focus of this report is tax revenue, as opposed to expenditure, because the central issue to be addressed is, would the fiscal crisis have been averted without the formidable tax cuts of the late 1990s? Three different aspects of the crisis are examined to answer this question. The first is

the impact of tax cuts, beginning in the early boom with the implementation of the first capital gains tax cut in 1996 and ending in 2002. If the state had collected and then saved this revenue, it could have used these funds to deal with the crisis. Hence, measuring the effect of tax cuts between 1996 and 2002 really illuminates a missed opportunity that would have helped insure the state against the budgetary effects of recession. The second is the impact of the recession in 2001 and 2002 on state tax revenue and a comparison of this amount to the impact of the 1996-2002 tax cuts. The resulting comparison shows the relative importance of tax cuts versus the recession for the state's tax revenue. Finally, budget shortfalls in fiscal years 2002-04 are employed as an objective measure of the crisis, a yardstick by which to gauge the impact of tax cuts and the recession.

These comparisons use estimates of two sources of change in tax revenue. The first, business cycle effects, measures the impact of the economy. It captures how changes in economic growth—boom versus bust—affect tax revenue.

The second measure, effective tax cuts, captures the impact of changes in effective tax rates while assuming a consistent rate of economic growth. Effective tax rates, which express actual tax revenue as a percent of income, are a measure of taxation that, when considered over time, capture broad changes in the structure of taxation, such as changes in the statutory tax rate, the effectiveness of the state's tax collection efforts, or the ability of taxpayers to avoid paying taxes. All of these factors will change the amount of tax revenue that the state collects, and thus alter the effective tax rate. Taken together, they largely reflect the public policy environment.<sup>1</sup> Thus, while declines in effective tax rates do not necessarily indicate statutory tax cuts, they do indicate a shift in the tax policy environment that results in what is, effectively, a tax cut.

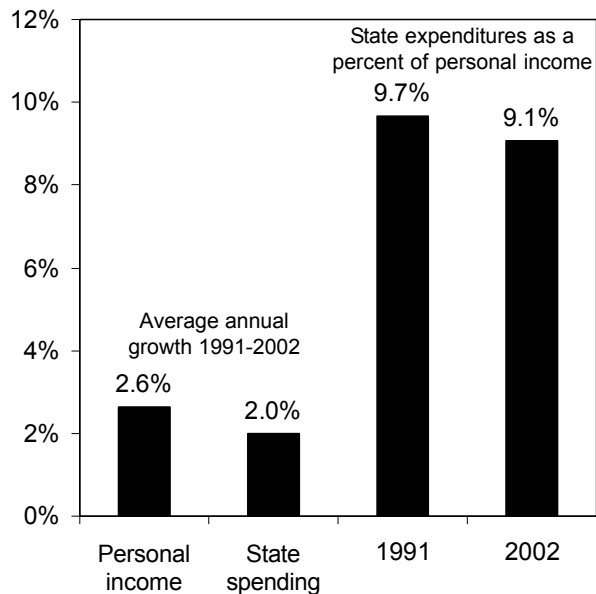
Because personal income tax rates often vary by income level, changes in the distribution of income will also change effective rates. For instance, if income tax rates increase with income level, then a greater concentration of wealth among upper-income households will result in a higher effective tax rate. This occurs because a greater proportion of total income is being taxed at a higher rate. But because income is, for the most part, taxed at a flat rate in Massachusetts, income distribution is likely to play only a relatively small role in effective rate changes.<sup>2</sup> Moreover, changes in the distribution of income are not only the result of economic changes, like increases in unemployment or rallies in the stock market; they are also partly the result of public policy. Laws that govern inheritance, the extent of social welfare supports for families, and funding for education are all public policies that impact the distribution of income. As a result, the change in effective tax rates is also a reflection of public policy.

## II. The Massachusetts Fiscal Crisis<sup>3</sup>

The state budget crisis followed closely on the heels of the recent recession. Real personal income in Massachusetts declined 0.03 percent in 2001 and 0.18 percent in 2002. This decline represented quite a shift from the late 1990s: between 1995 and 2000, income grew an average of 4.7 percent a year. State tax revenue grew at an average annual rate of 4.3 percent between 1995 and 2000, compared to 1.8 percent between 1991 and 1994. As personal income growth slowed, so did tax collections: in 2002, real state government tax collections declined by about 13.8 percent, from \$17.0 billion in 2001 to \$14.8 billion in 2002.

What perhaps may be more familiar to state residents is the impact of these declines on the state's budget. In fiscal year 2002,<sup>4</sup> the final budget approved by the legislature was about \$600 million less than the original House and Senate recom-

**FIGURE 1: Income growth and state spending in Massachusetts, 1991-2002**



Source: Author's calculations based on data described in Appendix A. Years are fiscal years.

mentations (MBPC 2003). For fiscal year 2003, the deficit was \$2.7 billion, or a little over 11 percent of the “baseline” budget (the amount required to pay for mandatory spending increases and to maintain all other discretionary programs at their inflation-adjusted fiscal 2002 levels) (TEAM 2002a). To address the shortfall, legislators took three approaches: (1) they reduced the personal exemption and froze scheduled personal income tax cuts, increasing revenue by \$1.14 billion;<sup>5</sup> (2) they used \$550 million from the state’s rainy day fund; and (3) they cut the state budget by about \$1 billion (TEAM 2002a) The shortfall for the fiscal 2004 budget is about \$3 billion. Almost \$1.7 billion will be covered by lower spending. The remainder of the gap will be closed by using one-time measures, such as drawing on various reserve funds, as well as raising new revenue by, for example, charging higher fees and closing corporate tax loopholes (MBPC 2003). All told, Massachusetts residents have seen about \$3

billion in spending cuts since the fiscal crisis began.

Contributing to the Massachusetts budget problem (and the crisis in most other states) is a balanced budget requirement that bars deficit spending. The state is essentially left with the three options it already used in fiscal 2003: tax increases, draws on rainy day funds, and spending cuts. Taxes were last raised in 2002, and the administration of Governor Mitt Romney and the Massachusetts legislature have proposed no new increases. While the state’s rainy day fund, with a balance of about \$700 million, could be of some help, the last option, spending cuts, is now the main strategy used to deal with the ongoing crisis.

According to the Massachusetts Budget and Policy Center, by fiscal 2004 the state was spending 28 percent less on higher education than it spent in fiscal 2001. Public health funding declined by 32 percent during the same period; environmental spending by more than 20 percent; and housing and community development by more than 59 percent (MBPC 2003)

### III. Is Spending the Problem?

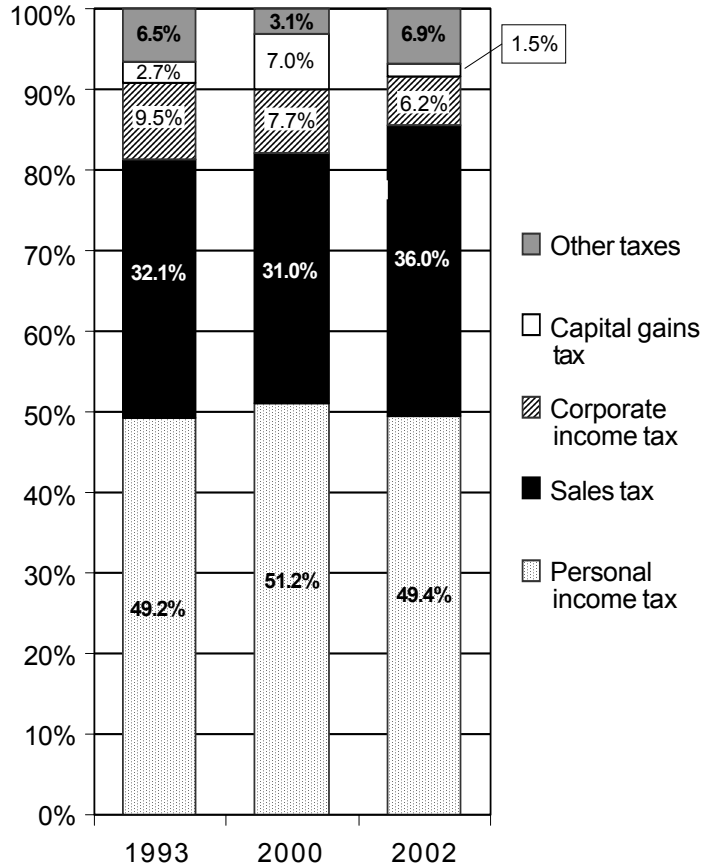
An often-heard argument is that the state is a profligate spender, and that the budget crisis will instill fiscal discipline and enhance government efficiency. But state spending has grown more slowly than personal income growth over the last decade. The real annual growth rate of state spending between 1991 and 2002 was 2.0 percent, while personal income rose an average of 2.6 percent annually (see **Figure 1**). Hence, state spending is actually declining as a proportion of income earned: in 1991, state expenditures were 9.7 percent of personal income; in 2002, they were 9.1 percent.<sup>6</sup>

Arguments about overspending also gloss over the fact that the bulk of state spending is devoted to health and welfare. According to census data for fiscal year 2001, almost 64 percent of total state expenditures flowed to the following

categories: education, public welfare, hospitals, health, highways, police and corrections, natural resources, and parks and recreation. Another 4 percent was devoted to government administration, and 8 percent to the state's insurance trust.<sup>7</sup> Another way to consider this point is to assess the state's spending priorities. Of new state spending in the 1990s, K-12 education received 51 percent, health care 40 percent,<sup>8</sup> and corrections 8 percent (St. George and Nolan 2003). Taken together, these categories represent 99 percent of new state spending.

Because states spend such a high proportion of their budgets on health and welfare, ongoing budget cuts can lead to significant declines in social welfare. Lowering spending is not a matter of "enhancing government efficiency" or "fiscal discipline," but rather a question of what sort of state we want to have, and what types of investments we are willing to make in education and health.

**FIGURE 2: Distribution of Massachusetts state government tax revenue**



Source: Author's calculations based on data described in Appendix A.  
 Note: See endnote 9 for a description of the "other" category.

#### IV. Massachusetts State Tax Revenue

The fact that state government spending as a proportion of personal income has actually declined over the last decade suggests that tax revenue is the key cause of the crisis. What is the recent history of state tax revenue?

Figure 2 shows the percent of revenue contributed by different types of state taxes—personal income, capital gains, corporate income, sales taxes, and "other"<sup>9</sup>—for 1993, 2000, and 2002. Personal income taxes are the main source of tax revenue for Massachusetts, with the sales tax a significant second. The major changes to this picture when comparing 1993 to 2002 appear

in corporate income and sales taxes. In 1993, corporate income taxes were 9.5 percent of total tax revenue, while in 2002 they were only 6.2 percent. The bulk of this difference was made up for by an increase in the proportion of sales tax revenue, which rose from 32.1 percent of the total in 1993 to 36.0 percent in 2002. Clearly, corporate income taxes are declining in importance as a source of state tax revenue, a point that will be discussed in more detail below.

It is also interesting to note how revenue from capital gains fits into this picture, as it is a clear reflection of changing fortunes in the stock market. At the height of the market, in

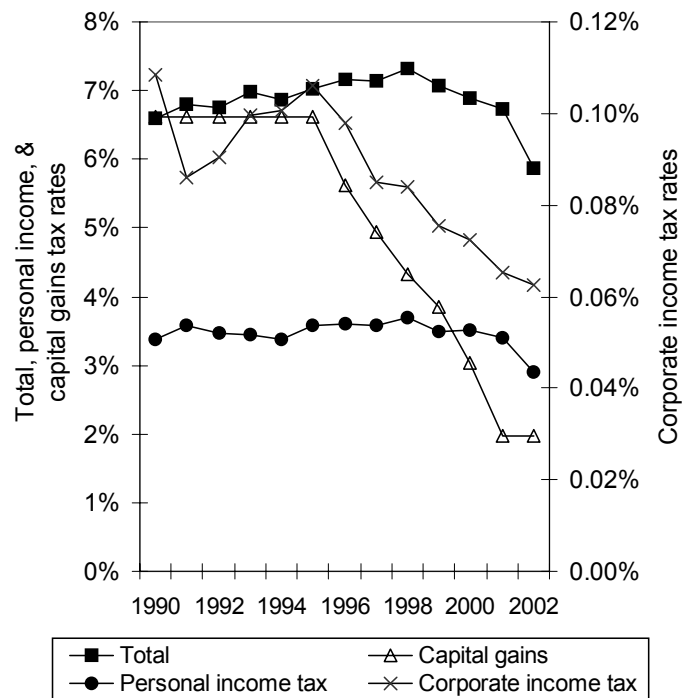
2000, tax revenue collected as a result of capital gains income was 7.0 percent of total tax revenue, or just a bit less than total corporate income tax collections that year. This share is a marked shift from the 2.7 percent of total revenue capital gains represented in 1993, and from the 1.5 percent to which it declined by 2002.

But the movement in capital gains tax revenue also reflects changes in the statutory rate on capital gains, as illustrated by the time series for four different effective tax rates in **Figure 3**. The “total” line is the ratio of total tax revenue to personal income. After a slow but steady increase over the course of the early and mid-1990s, the total effective tax rate began to decline in 1999, ending at 5.9 percent in 2002. “Personal” is the ratio of personal income tax collections to personal income. This line was fairly flat over the early to mid-1990s, hovering at around 3.5 percent, until it begins to decline in 1999, ending at 2.9 percent in 2002.

These declines reflect substantial cuts in personal income tax rates, first implemented in 1999 (see note 20 for a description of these statutory cuts).

The magnitude of these drops is much larger for the effective tax rate on capital gains, which measures capital gains tax revenue as a percent of capital gains realizations. Starting in 1996, the effective rate drops precipitously, from 6.6 percent to a little under 2 percent by 2002. This decline reflects a change in Massachusetts tax law that dramatically lowered the tax rate on long-term capital gains (defined as assets held for more than one year). Prior to the tax cut in 1996, the state taxed long-term assets, after a 50 percent exclusion, at 12 percent. The

**FIGURE 3: Effective tax rates in Massachusetts, 1990-2002**



Source: Author's calculations based on data discussed in Appendix A.

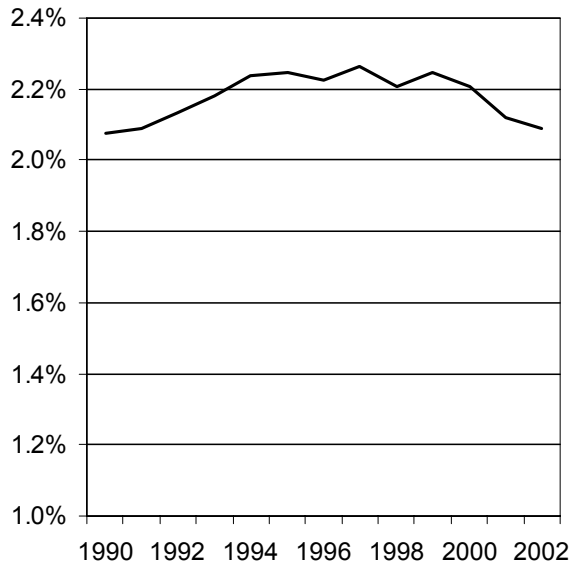
Notes: Specific numbers on effective tax rates appear in Table A.1 of Appendix A.

The total effective tax rate is total state tax revenue as a percentage of Massachusetts personal income. The capital gains tax rate is state tax collections on capital gains as a percent of the capital gains realizations of state taxpayers. The personal income tax rate is personal income tax collections, less capital gains taxes, as a percent of personal income. The corporate income tax rate is the state's corporate income tax collections as a percent of total corporate profits for corporations filing in Massachusetts.

tax cut was phased in over a period of years, as reflected in the steady decline in the effective tax rate. When fully phased in, capital gains tax rates ranged from 5 percent for assets held one to two years to zero for assets held more than six years.<sup>10</sup> Tax legislation in 2002, passed in response to the fiscal crisis, backpedaled on this legislation, taxing long-term gains at the same rate as other types of income. Still, as we will see below, the damage had already been done. Because of this decrease in tax rates on capital gains, Massachusetts missed out on a tax revenue boom.

The effective corporate income tax rate, figured as corporate income tax revenue as a

**FIGURE 4: Effective sales taxes in Massachusetts, 1990-2002**



Source: Author's calculations based on data explained in Appendix A.

Note: Years are fiscal years.

proportion of total profits for corporations filing income tax returns in Massachusetts, declined at a pace similar to that for capital gains. The effective rate fell by almost half between 1990 and 2002, from 0.11 percent to 0.06 percent (the very low rates overall are due to our use of total corporate profits rather than just Massachusetts income). When considering effective tax rates on corporations, it is important to understand how corporations are taxed. Because corporations' profits come from doing business across many states and countries, states use "apportionment" formulas to figure out what proportion of profits is subject to taxation. Historically, the most common apportionment formula has equally weighted sales, payroll, and property, and the proportion of profits taxed has been based on the share of a corporation's sales (one-third weight), payroll (one-third weight) or property (one-third weight) located in that state. Massachusetts recently changed from a double-weighted sales

apportionment formula<sup>11</sup> to a sales-only apportionment formula for the manufacturing and mutual fund industries (more will be said about this below). For the purposes of effective rates, then, it seems most appropriate to use total profits to capture the impact of changes in the structure of the state's apportionment formula.<sup>12</sup>

The effective sales tax, calculated as the proportion of sales tax revenue (which includes excise taxes) to personal income, is charted separately in **Figure 4**. At the beginning of the 1990s, the effective sales tax rate was 2.1 percent; it increased to about 2.25 percent during the mid-1990s, only to decline once again to 2.1 percent by 2002. Given the fact that services and Internet sales, which are not subject to sales taxes, grew in proportion to the rest of the state economy, one might have expected more of a systematic decline in the effective rate. However, increases in tobacco tax revenues compensated for the trend somewhat.

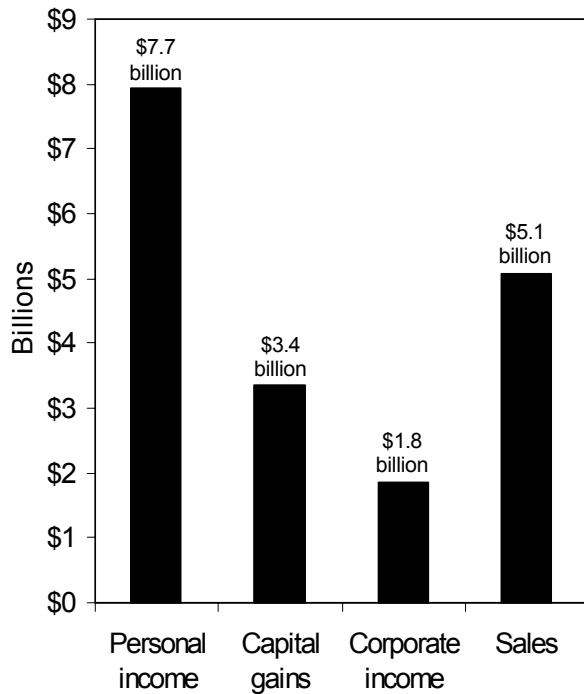
In sum, a cursory inspection of the state's effective tax rates suggests that corporations and sellers of capital assets have enjoyed the biggest tax cuts. But to better evaluate the role of these tax cuts in the fiscal crisis, it is important to compare it to the role the recession played in terms of state tax revenue. The next section addresses this issue by estimating the impact of the business cycle and effective tax cuts on state tax revenue.

## **V. The Business Cycle Versus Effective Tax Cuts**

Effective tax rates are good indicators of what is happening to the structure of the overall tax system. But if we want to know exactly how much of the change in tax revenue collection was due to cuts in effective rates and how much to the shifting economy, we need to *divide* these changes into their component parts: business cycle effects versus effective tax cuts.

The basic method for isolating business

**FIGURE 5: Impact of the business cycle on tax revenue, 1996-2002**



Source: Author's calculations based on data described in Appendices A and F.

cycle effects is fairly simple: multiplying the increase in income for each year (relative to the base year 1995) by the prevailing effective tax rate yields the change in tax revenue due solely to changes in income, or the business cycle. (A complete derivation of this method is presented in Appendix B.)

**TABLE 1: Effects of the recession on tax revenue, 2001-02 (millions \$2002)**

	Personal income	Capital gains	Corporate income	Sales	Total
Effect on state tax revenue, 2001-02	-\$18	-\$1,025	-\$476	-\$13	-\$1,532
Percent of spending cuts, FY2002-04*	0.6%	34.2%	15.9%	0.4%	51.1%

Source: Author's calculations based on data described in Appendices A and F.  
\*Spending cuts for FY2002-04 equal \$3 billion.

Figure 5 presents the results for each type of tax between 1996 and 2002. What may be striking at first is that even with the strong economic downturn in 2001 and 2002, the combined effects of boom and bust have been strong net positive growth for state tax revenue across the board. The effect of the business cycle on personal income taxes had the biggest absolute impact, adding \$7.7 billion to state tax revenue, followed by the sales tax (\$5.1 billion), the capital gains tax (\$3.4 billion), and finally the corporate income tax (\$1.8 billion). Overall, the business cycle has contributed more than \$18 billion to the net change in tax revenue between 1996 and 2002.

The combined effect of the 1990s boom and the 2001-02 downturn was on net positive for tax revenues, but what about the effect of the recession itself? And how does it measure up against the impact of tax cuts? Table 1, which details the effect of the recession on tax revenues for the negative growth years of 2001 and 2002, shows that, by a wide margin, the biggest recession-based declines in state tax revenue were in capital gains taxes (approximately \$1 billion) and corporate income taxes (\$476 million). In total, the recession was responsible for a decline of \$1.5 billion in state tax revenue. Figure 6 compares that amount to the state's budget cuts in fiscal years 2002-04, about \$3 billion. Clearly, the recession is at most responsible for about one-half of the spending cuts.

As for the tax cuts, one way to get at their effect is to interpret the difference between the recession's effects on tax revenue and the state's budget cuts as a measure of the impact of factors other than the business cycle, like tax cuts and tax avoidance strategies.<sup>13</sup> From Figure 6, this residual amount is about \$1.5 billion, or one-half of spending

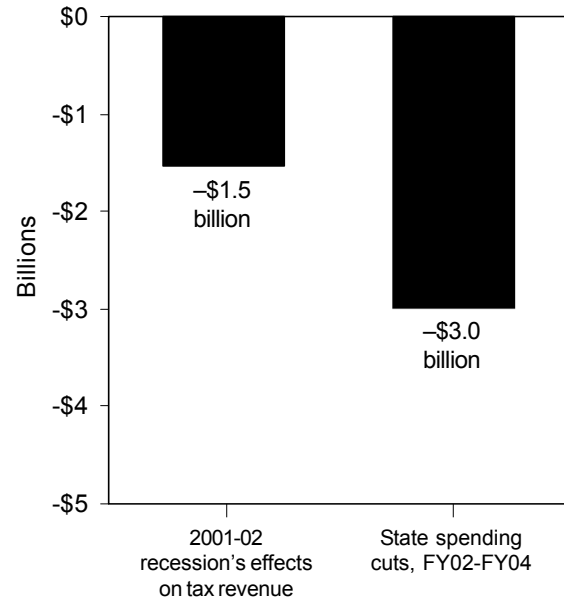
cuts in fiscal years 2002-04. But this method has limitations. First, by using spending cuts as an upper limit on missed tax revenue, it rules out the possibility that revenue might have exceeded these spending cuts. Second, it does not account for how tax cuts are distributed among the various streams of tax revenue—what types of taxpayers are getting the benefit of tax cuts? This is a key question in examining the nature of the fiscal crisis.

The methodology for estimating effective tax cuts (explained in detail in Appendix B) addresses both of these issues. Similar to the business cycle estimate, we can isolate the impact of effective tax cuts by holding income constant at its inflation-adjusted 1995 level and multiplying that by the difference between the effective tax rate and some reference or base tax rate. (To double-check the validity of this method, an alternative method for calculating tax cuts is presented in Appendix D. The results support the conclusions discussed below.) The base tax rate we have selected is the average effective tax rate by type of tax between 1993 and 1995.<sup>14</sup> An analysis of the sensitivity of the tax cut estimates to the base rate chosen is discussed in Appendix E; the results confirm the validity of the base rates used.

**Figure 7** details the results by type of tax. As for capital gains tax revenue, effective tax cuts were responsible for a \$1.5 billion decline in state tax revenue between 1996 and 2002. The 1996 capital gains tax cut that lowered tax rates on long-term capital gains underlies this decline.

What if lawmakers had not passed the 1996 tax cut? If effective rates had remained at their 1993-95 levels, *and* the economy had performed as it did (allowing the growth in capital gains realizations to stand), the state government would have collected about \$9.6 billion in capital gains taxes between 1996 and 2002, or \$4.4 billion more than it actually collected. If the state had put this money away into a rainy day fund,<sup>15</sup> it would have had enough to cover the spending cuts in fiscal years 2002-04. Unfortunately, by legislating the state out

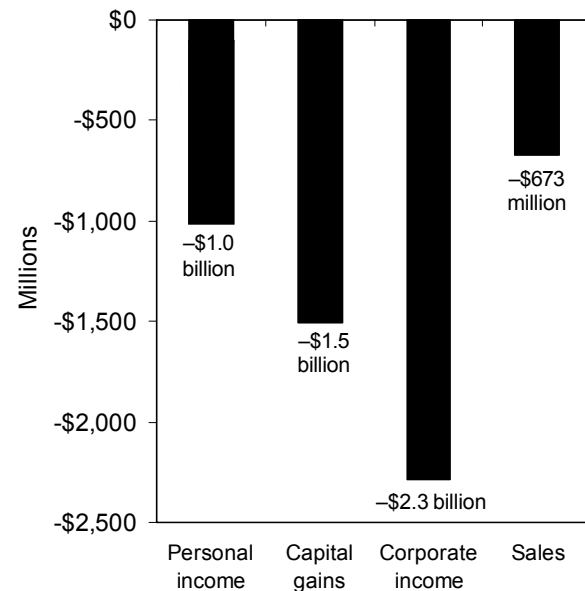
**FIGURE 6: The recession and state budget cuts**



Source: Author's calculations based on data described in Appendices A and F.

Note: Recession's effects are in 2002 dollars; state budget cuts are in nominal terms.

**FIGURE 7: Effective tax cuts by type of tax, 1996-2002**



Source: Author's calculations based on data described in Appendices A and F.

of much of the tax revenue it might have collected from the stock market boom, the 1996 capital gains tax cut left the state ill-prepared for the bust.<sup>16</sup>

The second major source of the decline in state tax revenue is the effective tax cut in corporate income taxes, which caused a \$2.3 billion decline in taxes between 1996 and 2002, equivalent to 25 percent of corporate tax revenue during this period. However, the underlying reasons for these substantial effective cuts are not as straightforward as those for capital gains.<sup>17</sup>

A number of statutory changes to corporate tax law decreased tax revenue in the 1990s. Of particular significance was the institution of the single sales factor apportionment formula, which taxes corporate profits based on the proportion of their sales that take place in Massachusetts. In 1995, Lexington-based defense contractor Raytheon successfully lobbied for the application of the single sales factor to defense contractors; it was later extended to all manufacturers, and Fidelity successfully bargained for the break for mutual fund companies less than a year later. For corporations such as these, with large state payrolls and limited state sales, a sales-only apportionment formula is a significant tax break because then only a small proportion of profits is subject to state income taxes. Despite this tax revenue loss, Governor Romney remains committed to the single sales factor because, he claims, Massachusetts must maintain its competitiveness relative to other states.

Another factor driving down corporate tax revenue is simply the increasing incidence of tax avoidance. Corporations are using ever more complex strategies to shift profits out of Massachusetts and into states where they either will not be taxed or will be taxed at a lower rate. Sometimes states tacitly collude in this tax avoidance as they jockey for a competitive edge against other states in attracting business. This is part of a national trend, and one does not have to go far to find

ample evidence of the effect of these tax cuts and avoidance strategies. Between 1995 and 2000, inflation-adjusted federal corporate income taxes grew an average of 2.0 percent a year; the annual average for state and local corporate tax revenue actually declined by 0.12 percent during the same period.<sup>18</sup>

As for personal income tax revenue, changes in the structure of taxes resulted in a \$1 billion decline in personal income tax collections between 1996 and 2002. This amount reflects the significant statutory cuts between 1999 and 2002.<sup>19</sup>

Lastly, sales tax revenue declined by \$673 million due to effective tax cuts. This result is not surprising in light of the natural erosion in the sales tax base that takes place as services and Internet sales grow in proportion to the rest of the economy. It suggests, though, that state governments should reconsider the sales tax base if they are determined to maintain its viability as an ongoing source of revenue.

**Figure 8** summarizes the effective tax cut results and contrasts them to the impact of the recession and the size of the state's recent budget cuts. Recall that the reason for comparing these three results is twofold. First, isolating the costs of the effective tax cuts during 1996-2002 shows the amount that the state could have put into a rainy day account and then used to avoid budget cuts. Second, comparing these cuts with the impact of the recession on tax revenue (business cycle effects for 2001 and 2002) illustrates that the recession-induced decline in state tax revenue was only partly responsible for the budget shortfalls.

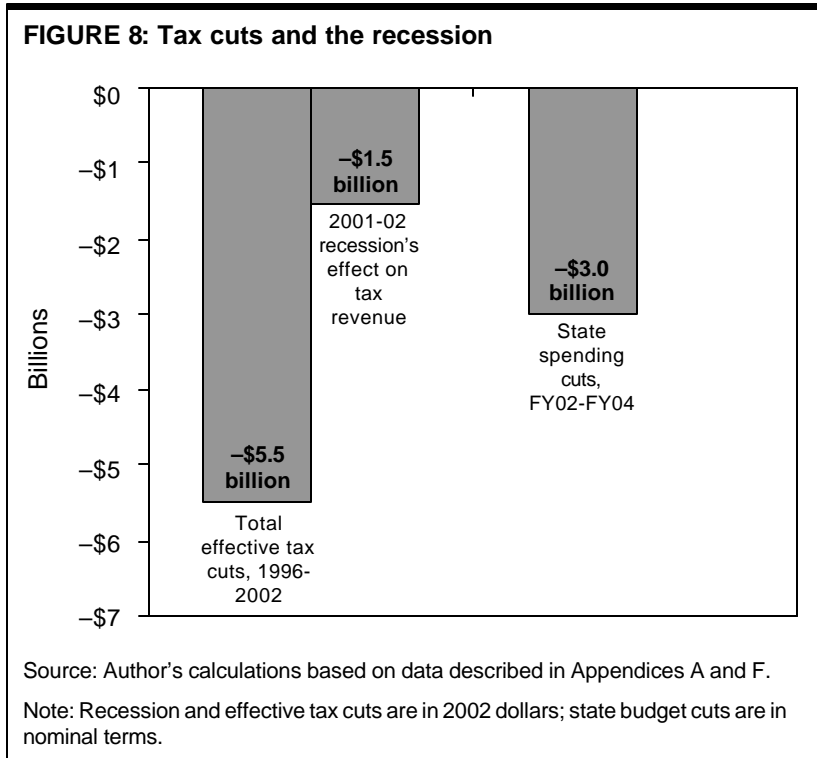
In total, effective tax cuts were responsible for a loss of \$5.5 billion between 1996 and 2002. Much of that decline (70 percent) was due to tax cuts in capital gains (\$1.5 billion) and corporate income (\$2.3 billion). Another \$1 billion, or 18 percent, was due to declines in personal income tax rates. If the revenue had been put into a rainy day fund, this amount comfortably would have covered

the spending cuts required in fiscal 2002-04 (\$3 billion), with a significant amount left over to address future shortfalls. What about the recession? Although the net business cycle effect on tax revenue over the entire period was a significant boost to state tax revenue (totaling about \$18 billion), the significant downturn in 2001 and 2002 cost the state \$1.5 billion, certainly a sizeable amount but only one-half the size of the spending cuts for the last three fiscal years. Clearly, the state is in its current crisis not primarily because of the recession, or (as discussed in an earlier section) because of overspending, but because of the tax cuts it implemented in the late 1990s.

## VI. Policy Options

Corporations and the wealthy have benefited enormously from the tax cuts of the 1990s. As a result, the state has been driven into a serious fiscal crisis, and legislators have chosen primarily to cut state spending to deal with it. Who ultimately pays for these cuts? The answer is consumers of state services—the poor and disabled, the elderly, children in school or in need of child care assistance, state college students, and state employees. The list touches on most state citizens, but is heavily weighted toward children, the poor, the elderly, and the disabled. Such a contrast, between those benefiting and those paying for the tax cuts of the 1990s, could not be starker.

Are there better times ahead? Not without policy changes. When the economy recovers, tax revenue, given currently legislated effective tax rates, cannot rise enough to cover the continuing

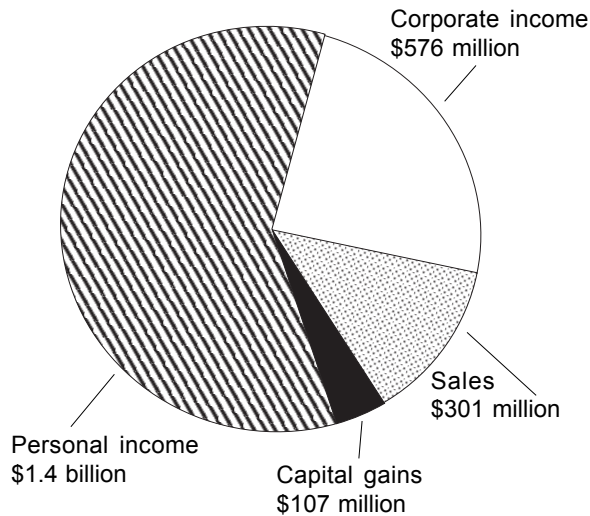


budget shortfall. Thus, the state's government must reassess its seemingly unshakable commitment to tax cuts that largely benefit the wealthy. Restoring tax rates on income to their 1995 levels and rolling back corporate tax breaks should be considered immediately.<sup>20</sup> In 2002, the legislature made some progress on this front by taxing long-term capital gains the same as other types of income, but there is still some distance to go. Consider the following: if effective tax rates were returned to their base rate levels (the average effective tax rate between 1993 and 1995), assuming no income growth between 2002 and 2003, the state would collect an additional \$2.4 billion in taxes, as illustrated in **Figure 9**.<sup>21</sup> Most of that revenue would come from personal income taxes (\$1.4 billion). But even with zero growth, restoring rates on corporate income would raise an additional \$576 million. This amount could cover a significant portion of the \$2-3 billion budget gap projected for fiscal 2005.

Increasing federal aid to the states, or "revenue sharing," would also have an immediate

**FIGURE 9: Additional tax revenue in 2003 if state returns to 1993-95 tax rates**

TOTAL ADDITIONAL TAX REVENUE: \$2.4 BILLION



Source: Author's calculations based on data described in Appendix A and in the text.

impact on state revenue. Up until the last round of budget negotiations in the Senate, the Bush administration and Republican leaders stubbornly resisted increasing state aid, despite its obvious stimulating effects on the economy. A bipartisan group of senators finally added a \$20 billion aid package for states in an effort to attract votes for the president's dividend tax cut package (Firestone 2003), signed into law in May 2003. But the difference between \$20 billion and what is really needed is large. Ac-

ording to the National Conference of State Legislatures, since fiscal year 2001 states have had to close a cumulative budget gap of \$200 billion (NCSL 2003).

Restoring tax rates and increasing federal aid to the states are key short-term solutions to the crisis. But such reforms will not guard against future crises. For that, we need to curtail the tendency of state legislators to cut taxes in boom times, only to reluctantly raise them during recessions as budgets get squeezed. There is considerable evidence that state governments do this; a strong correlation exists between economic growth and tax cuts (McGranahan 2002). It makes much more sense to maintain tax rates in boom times, thus enabling states to bank excess revenues in rainy day funds that can be used during recessions—a period when tax revenue is down, the state cannot borrow for operating expenses, and spending cuts have heavy impacts. If Massachusetts had had the income to save for a rainy day, it could have weathered its fiscal crisis with money to spare.

## Appendix A: Data

**State tax revenue.** All data on tax revenue (with the exception of capital gains) were drawn from the Census Bureau's quarterly figures on state government tax revenue. Recent years are downloadable from [www.census.gov/govs/www/statetax.html](http://www.census.gov/govs/www/statetax.html). Sales taxes include the total general sales tax, as well as select sales taxes on purchases like alcohol and tobacco. Personal income tax revenue was figured by subtracting state capital gains tax revenue from personal income tax revenue, with one adjustment. Because taxes on capital gains are paid mostly in April of the year *after* capital gains income is realized, capital gains tax revenue in year (n-1) is subtracted from personal income tax revenue in year n. **Table A.1** details tax revenue by source, income, and effective tax rates for 1990-2002.

**State expenditures.** Unless otherwise indicated, data used for state expenditures are from the Massachusetts Comptroller's Statutory Basis Financial Reports.

**Personal income.** Data are from the Bureau of Economic Analysis at the U.S. Commerce Department, downloadable from [www.bea.gov/bea/regional/data.htm](http://www.bea.gov/bea/regional/data.htm).

**Capital gains.** All data on capital gains realizations and revenue are from the Office of Tax Policy Analysis at the Massachusetts Department of Revenue, with the exception of 2002. Realizations and revenues for 2002 were estimated based on national numbers. For realizations, IRS data were used to figure the proportion of national capital gains realizations attributable to Massachusetts over the most recent five year period for which data were available (1997-2001). The average of these five years was then applied to the Congressional Budget Office's estimate of capital gains realizations for 2002 (CBO, *Budget and Economic Outlook: Fiscal Years 2004-2013*, January 2003). The effective tax rate on capital gains in 2001 was used for capital gains tax revenue; the statutory changes were completely phased in by 2000, and the tax changes passed in 2002 were not yet effective.

**Corporate income.** Data on Massachusetts corpo-

**TABLE A.1: Tax revenue, income, and effective tax rates in Massachusetts, 1990-2002** (millions of \$2002)

	Personal income	Capital gains	Corporate income	Sales
<b>Tax revenue</b>				
1990	\$6,509	\$232	\$1,043	...
1991	6,745	243	922	...
1992	6,618	284	1,061	...
1993	6,598	362	1,268	\$4,310
1994	6,657	352	1,218	4,391
1995	7,178	484	1,404	4,471
1996	7,469	624	1,421	4,664
1997	7,699	862	1,380	4,847
1998	8,390	994	1,555	4,981
1999	8,170	987	1,414	5,222
2000	8,906	1,220	1,348	5,395
2001	9,578	328	996	5,358
2002	7,325	227	916	5,337
<b>Income</b>				
1990	\$192,388	\$3,498	\$961,722	\$192,388
1991	188,173	3,668	1,072,387	188,173
1992	191,178	4,285	1,172,948	191,178
1993	192,054	5,468	1,270,878	192,054
1994	196,513	5,310	1,209,719	196,513
1995	200,737	7,302	1,323,924	200,737
1996	206,658	11,100	1,453,405	206,658
1997	214,755	17,419	1,621,969	214,755
1998	226,449	22,969	1,849,476	226,449
1999	234,394	25,658	1,877,552	234,394
2000	252,783	40,075	1,864,123	252,783
2001	252,711	16,607	1,523,669	252,711
2002	252,252	11,524	1,460,608	252,252
<b>Effective tax rates</b>				
1990	3.38%	6.63%	0.11%	...
1991	3.58	6.63	0.09	...
1992	3.46	6.63	0.09	...
1993	3.44	6.63	0.10	2.24%
1994	3.39	6.63	0.10	2.23
1995	3.58	6.63	0.11	2.23
1996	3.61	5.62	0.10	2.26
1997	3.59	4.95	0.09	2.26
1998	3.70	4.33	0.08	2.20
1999	3.49	3.85	0.08	2.23
2000	3.52	3.04	0.07	2.13
2001	3.39	1.97	0.07	2.12
2002	2.90	1.97	0.06	2.12

Source: Author's calculations based on sources discussed in the appendix text.

Notes: Calendar year figures for total sales tax receipts unavailable for 1990-93. The category "income" varies by tax: for personal income and sales, it is personal income; for capital gains, it is capital gains realizations; for corporate income, it is total corporate profits for firms filing in the state. Effective rates used for personal income in the business cycle and effective tax cut estimates are listed in the last column of Table F.2.

rate profits between 1990 and 1999 are from the Office of Tax Policy Analysis at the Massachusetts Department of Revenue. Data for years 1993-99 are available at [www.dor.state.ma.us/stats/stats.htm](http://www.dor.state.ma.us/stats/stats.htm).

Profits for 2000-02 were estimated using national data on corporate book profits from the Congressional Budget Office ([www.cbo.gov](http://www.cbo.gov)). Real growth rates of corporate book profits were figured from actual corporate book profits for 1999-2001, and estimated corporate book profits were used for 2002. These growth rates were applied to the Massachusetts data on corporate profits.

**Consumer price index.** All data in Table A.1 are adjusted to 2002 dollars based on the CPI-U from the Bureau of Labor Statistics.

## Appendix B: Methodology

Let  $TR_i$  = tax revenue in year  $i$ ;  $y_i$  = income in that year; and  $r_i$  = the effective tax rate, or  $TR_i/y_i$ . Equation (B.1) indicates that total tax revenue in a particular year is equal to that year's tax rate times that year's income. Equation (B.2) presents the change in tax revenue over the course of one year in terms of changes in tax rates and income. Via the manipulations in equation (B.3), we get the decomposition in equation (B.4). The first term,  $(r_{i+1} - r_i)y_i$ , is the structural change in tax revenue over the course of a particular year, or the change in tax revenue due to changes in effective tax rates (holding income constant). The second term,  $r_{i+1}(y_{i+1} - y_i)$ , is the cyclical change in tax revenue over the course of that year, or the change in tax revenue due exclusively to changes in income. Adding these two terms together gives the difference in tax revenue from one year to the next.

$$(B.1) TR_i = r_i y_i$$

$$(B.2) TR_{i+1} - TR_i = r_{i+1} y_{i+1} - r_i y_i$$

$$(B.3) TR_{i+1} - TR_i = r_{i+1} [y_i + (y_{i+1} - y_i)] - r_i y_i$$

$$(B.4) TR_{i+1} - TR_i = (r_{i+1} - r_i) y_i + r_{i+1} (y_{i+1} - y_i)$$

The problem with this methodology is that the estimates will be greatly understated because each year takes as its starting point, or base year, the year prior. Consider the structural effect first. The ongoing effect of a change in tax rates is not counted after the first year. For instance, consider a span of three years, with incomes of \$10 in each year. Suppose, in the first year, that the income tax rate is 10 percent, and tax revenue is \$1. Suppose that the tax rate is lowered to five percent in the second year. Tax revenue would be \$.50, and the effect of the change in tax rates according to equation (B.4) would be  $-.50$ . However, in year three, the effect of the tax rate change in year two would be

zero because the formula captures only the differences in tax rates between years two and three. This conclusion is not correct if one is trying to capture the total effect of a particular tax rate change on tax revenues. The same can be said for the effect of business cycle changes.

To address this problem, we have to look at changes in tax rates relative to some reference or base year. Equation (B.5) presents such a formula for the impact of effective tax cuts on revenue, where the base year is indicated as  $y_0$ , and the time period ranges between year one and year  $k$ . Equation (B.6) presents a parallel formula for cyclical change over time, referred to as the "business cycle effect" in the paper.

$$(B.5) \text{effective tax cuts} = y_0 \sum_{i=1}^k (r_i - r_0)$$

$$(B.6) \text{business cycle} = \sum_{i=1}^k r_i (y_i - y_0)$$

In practice, base year income should be the income level of the year preceding the time period in question. So, for instance, the base year income used for looking at the period 1996-2002 is 1995 income. The base year income used for looking at the recession, 2001-02, is 2000 income.

## Appendix C: The Effective Corporate Income Tax Rate

Effective corporate income tax rates might be measured in one of two ways: using total profit for corporations filing income tax returns in Massachusetts, or using only profits deemed taxable by the state. The former, which is used in this paper, risks misattributing the effects of out-of-state activities that affect profit (like a new contract at an out-of-state plant) to a change in

**TABLE C.1: Effective corporate income tax rates in Massachusetts**

	Effective rate using gross corporate income	Effective rate using Massachusetts taxable corporate income
1993	0.0997%	17.99%
1994	0.1007	12.81
1995	0.1061	15.23
1996	0.0978	14.13
1997	0.0851	12.30
1998	0.0841	12.01
1999	0.0753	12.45

Source: Author's calculations based on data described in Appendix A.

the state's tax structure. However, using this term also captures important tax avoidance strategies, such as the shift of profits by corporations to states with lower taxes. The latter method, an effective tax rate based only on profits deemed taxable by the state, would miss this potentially important effect.

**Table C.1** and **Figure C.1** show the relationship of the two effective tax rates (for Massachusetts taxable income, data are available only for 1993-99). The two rates are closely related. Note particularly the similarity of the proportional declines—24.5 percent for the gross corporate income rate and 30.1 percent for the taxable corporate income rate—between 1993 and 1999. These results confirm the validity of the corporate income tax rates used in the paper.

## Appendix D: An Alternate Approach

This appendix employs an alternative simulation methodology to assess the report's quantitative conclusions. The first step holds effective tax rates constant (at the average effective tax rate for 1993-95) while allowing income to change. This "tax rates constant" estimate is expressed in equation (D.1). The second step, the "business cycle constant" estimate (equation D.2), applies average income growth between 1995 and 2000 to the entire time period in question, 1996-2002, to smooth out the downturn in 2001-02. The difference between these two estimates, shown in equation (D.3), indicates the change in tax revenue that is comparable to the estimate of effective tax cuts used in this paper.

### (D.1) tax rates constant

$$\sum_{i=1}^k r_0 y_i$$

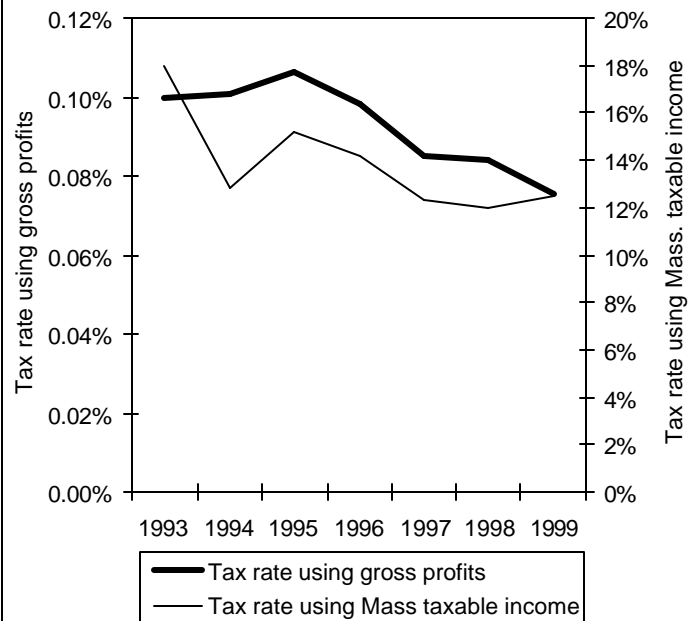
### (D.2) business cycle constant

$$\sum_{i=1}^k r_i y_i^* \quad y_i^* = \text{income in year } i \text{ as estimated using average growth, 1995-2000}$$

### (D.3) effective tax cuts alternative

$$\sum_{i=1}^k (r_i y_i^* - r_b y_i)$$

**FIGURE C.1: Effective corporate income tax rates in Massachusetts**



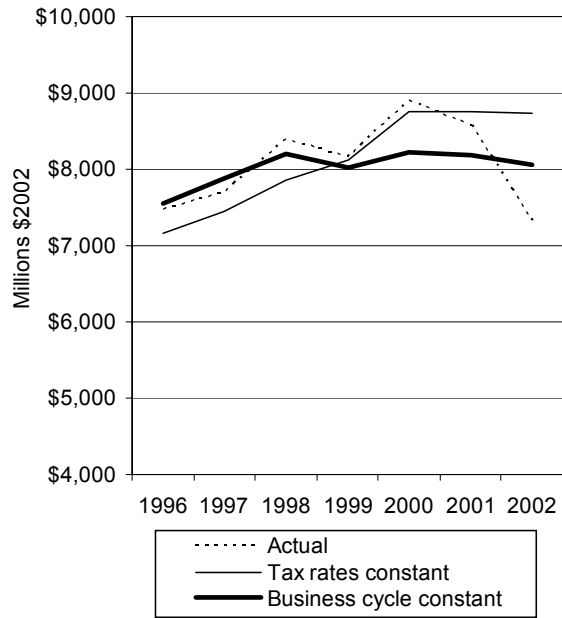
Source: Table C.1.

**Figures D.1-D.4** illustrate the results of this exercise for personal income taxes, capital gains taxes, corporate income taxes, and sales taxes. The "business cycle constant" line tracks state tax revenue according to equation (D.2), while the "tax rates constant" line tracks revenue according to equation (D.1). The difference between these two lines corresponds to equation (D.3), an estimate of the change in state tax revenue due solely to tax cuts. Actual tax revenues are also included in Figure D as a baseline for comparison.

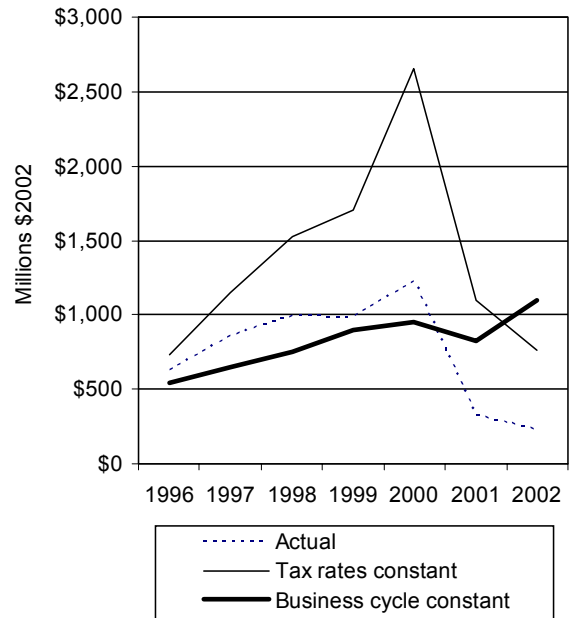
To better understand the relationship of the three series in the graphs, consider an example based on Figure D.2 on capital gains. The "actual" line plots actual capital gains tax revenue between 1996 and 2002. The "business cycle constant" line plots what tax revenue would have been if average economic growth between 1995 and 2000 is applied to the entire period (1996-2002), using actual effective tax rates. The result is more tax revenue in the recession years, when economic growth declined. The "tax rates constant" line takes actual capital gains realizations, and applies the base effective tax rate to each year. The result is much more tax revenue than was actually the case, and more than under the "growth constant" scenario, with the exception of 2002, when the negative impact of the recession on income outweighed the negative impact of lower tax rates. The difference between the "tax

**FIGURE D: An alternate estimate of structural change**

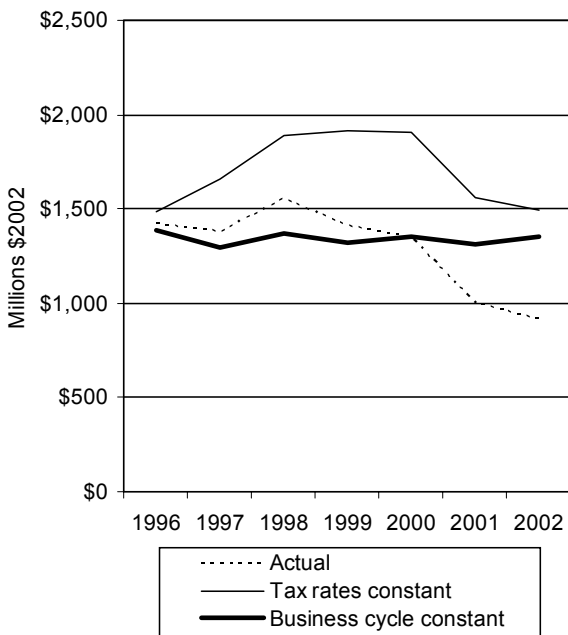
1. PERSONAL INCOME TAX REVENUE



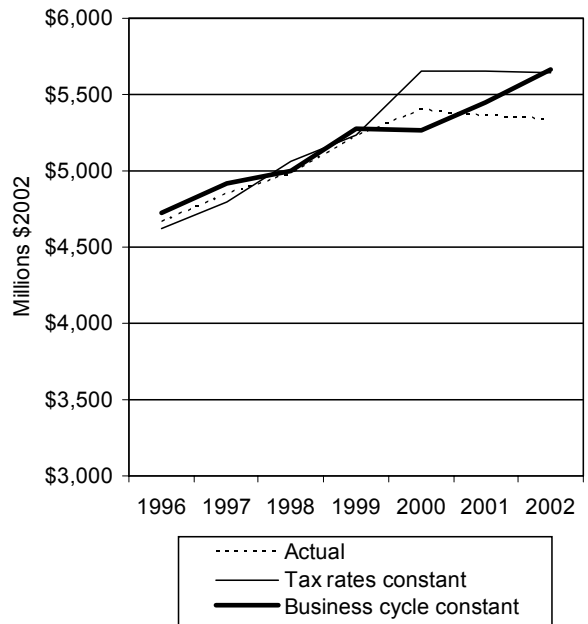
2. CAPITAL GAINS TAX REVENUE



3. CORPORATE INCOME TAX REVENUE



4. SALES TAX REVENUE



Source: Author's calculations based on data described in Appendix A.

rates constant” and the “actual” lines measures the impact of changes in effective tax rates as applied to actual income. The difference between the “growth constant” and the “actual” lines measures the impact of economic growth—in particular, the negative impact of the recession on tax revenues in 2001 and 2002. The difference between the “tax rates constant” and the “business cycle constant” lines measures the impact of effective cuts while controlling for economic growth, as it subtracts the impact of economic growth on tax revenues from the impact of tax cuts. This difference is comparable to the effective tax cuts estimate discussed in the paper.

As with the decomposition methodology used in the paper and described in Appendix B, for personal income and sales taxes effective tax cuts do not have a significant impact on tax revenues. For capital gains and corporate income taxes, though, the difference between the two lines is large. **Table D.1** presents the actual differences between the tax-rate- and business-cycle-constant lines, a difference comparable to the effective tax cuts estimate used in the paper. This alternative measure for effective tax cuts is listed by year, and then the entire span is added up to give the total for 1996-2002. The effective tax cuts estimate discussed in the paper is then listed as a basis for comparison.

While some small differences exist, the decomposition methodology used in the paper seems fairly robust. The estimates for personal income, sales, and corporate income taxes are quite close, while the two estimates for capital gains taxes vary widely.

The differences between the two methods is perhaps easier to understand when one examines the difference between the two formulas. Equation (D.4) shows this difference by subtracting equation (B.5), which is the formula used to estimate effective tax cuts in the paper (see Appendix B), from equation (D.3), the alternate method explained in this appendix. Both methods posit the effect of effective tax rate cuts as the difference between actual and base tax rates  $(r_i - r_0)$ . But the alternative method estimates the tax cut effect by multiplying the base rate times actual income  $(r_0 y_i)$ . For revenue streams with some dramatically high growth years relative to average growth over the period, as is the case for capital gains, the result is an inflation of the effective tax cut estimate. Overall, then, the decomposition

**TABLE D.1: Effective tax cuts and state tax revenue: an alternative method** (millions \$2002)

	Personal income taxes	Capital gains taxes	Corporate income taxes	Sales taxes
1996	\$395	-\$187	-\$97	\$101
1997	432	-508	-362	118
1998	357	-767	-518	-67
1999	-105	-803	-601	32
2000	-548	-1,706	-549	-388
2001	-574	-278	-243	-202
2002	-684	334	-141	25
1996-2002	-\$727	-\$3,916	-\$2,510	-\$380
<i>Effective tax cuts estimate</i>	-\$1,012	-\$1,508	-\$2,283	-\$673

Source: Author's calculations based on data described in Appendices A and F.

methodology used in the paper seems to give fairly reasonable estimates of effective tax cuts.

$$(D.4) \quad \sum_{i=1}^k (r_i y_i^* - r_0 y_i) - y_0 \sum_{i=1}^k (r_i - r_0)$$

## Appendix E: Sensitivity Analysis

This appendix presents the results of using different base rates for the effective tax cuts method. As discussed in the paper, the base tax rate used is a key determinant of the effective tax cut estimates because all tax rates are compared to that base. **Table E.1** shows the results using various base tax rates.

The left hand column of Table E.1 shows the span of years over which the base rate was taken; 1993-95 is the span used in this paper. Adding one or two years to the span changes the estimates little, if at all. The only substantial difference is for personal income taxes when the base rate refers to the year 1995 only. Here, the effective tax cut changes by about \$1.5 billion: from a drop of \$1 billion for 1993-95 (as cited in the paper) to a drop of \$2.5 billion. Clearly, the base rate year makes an important difference in some cases, so using a multi-year average is preferable to referring to only one year.

### *A note on capital gains*

The Office of Tax Policy Analysis at the Massachusetts Department of Revenue maintains detailed data on capital gains. For instance, it differentiates between long- and short-term gains, a practice that allows an accurate check on the estimates used in this paper. According to these data, the state missed about \$3.7 billion (in \$2002) in revenue between 1996 and 2001 due to the 1996 cut (data were available only through

**TABLE E.1: Sensitivity of the estimates to base rates** (millions \$2002)

	Personal income taxes		Capital gains taxes		Corporate income taxes		Sales taxes	
	Base rate	Eff. tax cut	Base rate	Eff. tax cut	Base rate	Eff. tax cut	Base rate	Eff. tax cut
1993-95	3.47%	-\$1,012	6.63%	-\$2,292	0.10%	-\$2,507	2.24%	-\$673
1992-95	3.47%	-\$995	6.63%	-\$2,292	0.10%	-\$2,209	...	
1991-95	3.45%	-\$790	6.63%	-\$2,292	0.10%	-\$1,989	...	
1995	3.58%	-\$2,551	6.63%	-\$2,292	0.11%	-\$2,902	2.23%	-\$558

Source: Author's calculations based on data described in Appendices A and F.

Note: Base rate is the average effective rate over years cited.

2001). This amount is in line with the estimate cited in the paper (\$4.4 billion up through 2002, which is the base tax rate times actual income less actual tax revenues).

## Appendix F: The Relationship Between Effective Tax Rates and the Economy<sup>22</sup>

One potential drawback with using effective tax rates to measure the structure of taxes is that changes in the economy can change effective tax rates. For example, an increase in personal income due to economic growth can bump taxpayers into a higher tax bracket, inducing an increase in the effective rate. The increased tax revenue would not be the result of an increase in statutory rates, but rather a result of the business cycle. This dynamic means that the methodology used in this paper risks overcounting tax cut effects and undercounting business cycle effects. The importance of this effect is an empirical question, and is addressed by type of tax below.

### *Economic growth and the personal income tax*

A simple bivariate regression, regressing the growth of personal income on the growth in effective personal income tax rates, enables an assessment of whether economic changes are driving changes in effective tax rates. The results appear in **Table F.1**. The relationship between the two variables is statistically significant for the period studied in this paper, 1996-2002, but not for the entire decade.

To control for the potential impact of this relationship, the tax cut and business cycle estimates were calculated based on changes in the statutory tax rate for personal income. The first step was to calculate growth in the statutory tax rate. To do this, we begin by figuring statutory tax rates as a weighted average of dividend and interest income

(taxed at 12 percent until 1999, when it began to be taxed at the same rate as earned income) and other personal income (i.e., the balance of adjusted gross income less capital gains realizations). The results are presented in the second column of **Table F.2**. Up through 1998, changes in the weighted statutory tax rate are due to changes in the distribution of income between dividend and interest income and other personal income. In other words, there were no statutory rate changes between 1996 and 1998.<sup>23</sup> Therefore, we record the “growth” in statutory rates between those years as zero, as indicated in the third column of Table F.2. Between 1996 and 2002, the weighted statutory tax rate for personal income declined by a little over 16 percent, from 6.33 percent to 5.30 percent. The effective tax rate for personal income declined by almost 20 percent, from 3.61 percent to 2.90 percent. This is a significant difference

To account for this difference, the growth rate of the statutory tax rate not due to changes in income distribution (third column of Table F.2) was applied to the actual effective tax rate beginning in 1996 (the fourth column of Table F.2). The resulting effective tax rate, the last column of Table F.2, was

**TABLE F.1: Relationship between growth of effective tax rates and personal income**

Years	Coefficient	t-statistic	Adjusted R <sup>2</sup>
1996-2002	1.65	2.25*	0.41
1991-2002	0.41	0.61	-0.061

Source: Author's calculations based on data described in Appendix A.

\*Significant at the 95 percent level.

Notes: The dependent variable is the annual effective tax rate (measured as personal income tax revenue, less capital gains tax revenue, as a percent of personal income) growth, and the independent variable is growth in personal income.

**TABLE F.2: Statutory and effective personal income tax rates**

	Weighted statutory tax rate (WSTR)	Growth in WSTR <i>not</i> due to changes in income distribution	Effective tax rate	Effective tax rate based on WSTR statutory growth
1996	6.33%	0%	3.61%	3.61%
1997	6.34	0	3.59	3.61
1998	6.32	0	3.70	3.61
1999	5.95	-5.99	3.49	3.39
2000	5.85	-1.69	3.52	3.33
2001	5.60	-4.37	3.39	3.19
2002	5.30	-5.51	2.90	3.01

Source: Author's calculations based on data described in Appendix text. WSTR data based on federal income tax data for Massachusetts taxpayers from the IRS.

Notes: WSTR is equal to the proportion of adjusted gross income (less capital gains) represented by interest and dividend income, times the tax rate for interest and dividend income, plus one minus this proportion times the tax rate for earned income. The effective tax rate is personal income tax revenue (less capital gains tax revenue) as a proportion of personal income.

**TABLE F.3: Impact of personal income taxes on state tax revenue**

	Effective tax cuts (1996-2002)	Business cycle effects (2001-02)
Using unadjusted effective tax rates	-\$108 million	-\$17 million
Using effective tax rates based on statutory tax rate growth	-\$1.0 billion	-\$18 million

Source: Author's calculations based on data described in Table F.2 and appendix text.

**TABLE F.4: Relationship between growth in effective tax rates and capital gains income**

Years	Coefficient	t-statistic	Adjusted R <sup>2</sup>
1996-2002	0.12	1.11*	0.04
1991-2002	0.14	1.35*	0.07

Source: Author's calculations based on data described in Appendix A.

\* Significant at the 75 percent level.

Notes: The dependent variable is annual effective tax rate (measured as capital gains tax revenue as a percent of capital gains realizations) growth, and the independent variable is the growth in capital gains realizations.

**TABLE F.5: Relationship between growth in effective tax rates and corporate income**

Years	Coefficient	t-statistic	Adjusted R <sup>2</sup>
1996-2002	.065	0.21	-0.18
1991-2002	.046	0.27	-0.095

Source: Author's calculations based on data described in Appendix A.

Notes: The dependent variable is the annual effective tax rate (measured as corporate tax revenue as a percent of total corporate income) growth, and the independent variable is the growth in corporate profits.

used to figure the business cycle effects and effective tax cuts discussed in the paper. **Table F.3** presents the results (the figures discussed in the paper) as well as the results using unadjusted effective tax rates. The recession estimates are close, though the effective tax cut estimates show a large difference. Using the changes in the statutory rate yields a much bigger estimate of effective tax cuts: \$1 billion versus the \$108 million using unadjusted rates. The primary reason is timing. Although the difference in the total decline in unadjusted versus adjusted rates (20 percent versus 16 percent) does not lead one to expect such a difference, the decline in adjusted rates is more evenly spread out between 1999 and 2002. Conversely, the decline in unadjusted rates is concentrated in 2001 and 2002, confirming the conclusion that this measure is closely associated with economic change for personal income.<sup>24</sup>

***Economic growth and the capital gains tax***

One would expect less of a problem with capital gains income because changes in realizations do not push people into different tax brackets. Still, the bivariate regression detailed in **Table F.4** suggests some relationship, though not a very strong one in light of the very low adjusted R-squared.

***Economic growth and the corporate income tax***

The effective corporate income tax rate could change as a result of economic factors. Increasing income for corporations outside of Massachusetts coupled with little change in their Massachusetts income could be reflected in a decline in the effective corporate tax rate for Massachusetts. This issue is partly addressed in the discussion in Appendix C, which shows the close relationship between total corporate profits and Massachusetts corporate profits. A bivariate regression of the growth of effective corporate tax rates and growth of total profits offers a further test. The regression results for the years 1991-2002 and 1996-2002 are reported in **Table F.5**. The

**TABLE F.6: Impact of sales taxes on state tax revenue**

	Using personal income as base	Using taxable consumption as base
Business cycle effect (1996-2002)	\$5.1 billion	\$4.1 billion
Recession (2001-02)	-\$13 million	\$86 million
Effective tax cuts (1996-2002)	-\$673 million	-\$886 million

Source: Author's calculations based on data described in Appendix A and in the appendix text.

relationship between the two measures is not statistically significant. Clearly, changes in total profits are not driving effective tax rates for corporations.

**Economic growth and the sales tax**

Purchases of consumer durables, the types of purchases subject to the sales tax, tend to be more sensitive to changes in the economy than personal income. Thus, in a recessionary period, fall-offs in taxable consumer spending could be greater than changes in personal income. The resulting effective tax rate change would thus look like a structural decline when it is actually the result of a swing in the business cycle.

To see if this was the case in Massachusetts, detailed consumption data from the National Income and Product Accounts were assembled to develop a taxable consumption base for Massachusetts. The logic here is that taxable consumption changes in ways similar to sales tax revenue, and thus using taxable consumption provides a control for the impact of the economy on the effective tax rate. The results of this exercise, and the results cited in the paper, are presented in **Table F.6**.

Using taxable consumption as a base increases the tax cut estimate and decreases the business cycle estimate, the opposite of what one might expect based on the history of the relative volatilities of consumption spending and personal income. Clearly, consumers are maintaining the same level of taxable consumption relative to personal income, as evidenced by the constant ratio of taxable consumption to personal income during 2001 and 2002 in **Figure F.1**. Record low interest rates have enabled consumers to borrow to maintain their consumption patterns. The implication for the effective tax rate, at least, is that sales tax revenue is less sensitive to economic change than one might expect.

Why not use taxable consumption as the base? While taxable consumption provides a good control for

**TABLE F.7: Relationship between the growth in effective sales tax rates and personal income**

Years	Coefficient	t-statistic	Adjusted R <sup>2</sup>
1996-2002	-0.46	-1.76**	0.26
1994-2002	-0.45	-2.10*	0.30

Source: Author's calculations based on data described in Appendix A.

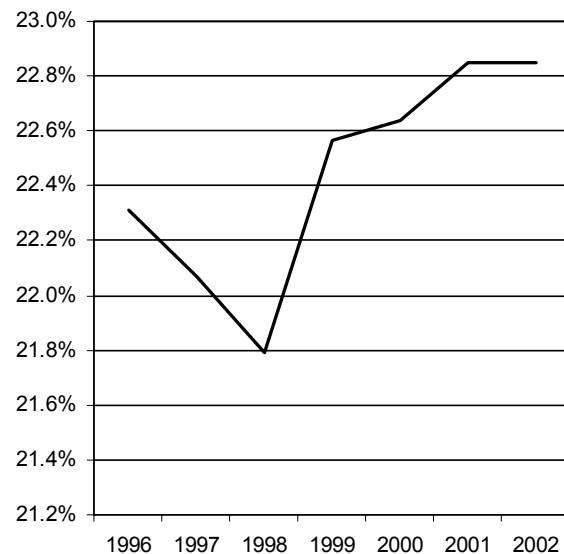
\* Significant at the 95 percent level.  
 \*\* Significant at the 90 percent level.

Notes: The dependent variable is annual effective tax rate (measured as sales tax revenue as a percent of personal income) growth, and the independent variable is the growth in personal income.

the economy, it misses the impact of increased consumption of those items that are not subject to sales taxes, such as services and Internet commerce. Since part of the intent of this investigation is to account for these effects, it seemed better to use personal income, especially in light of the results discussed in this appendix.

**Table F.7** presents the bivariate regression results for the effective sales tax rate and personal income growth as a comparison for correlations for other rates. There is a strong relationship between the two measures, but it does not significantly bias the estimates used in the paper.

**FIGURE F.1: Ratio of taxable consumption to personal income in Massachusetts, 1996-2002**



Source: Author's calculations based on data cited in appendix text; consumption data from Table 2.6 of National Income and Product Accounts, accessible on the web at [www.bea.gov](http://www.bea.gov).

## Endnotes

1. Changes in the economy can impact effective tax rates directly, as when, for instance, a recession induces consumers to spend less on taxable items relative to other nontaxable purchases, like food and housing. This shift would induce a decline in the effective tax rate that is reflective of economic change, not changes in the tax structure. This relationship could potentially muddy the distinction between business cycle effects and effective tax cuts used here; an explanation of why this is not a problem for these estimates is presented in Appendix F.
2. A significant exception is the distribution between earned and unearned income. Both capital gains and dividend and interest income (until 1999) were taxed at different rates than earned income. Capital gains are treated separately in the paper, but changes in the distribution between earned and dividend and interest income could have a significant impact on effective tax rates. To account for these changes, changes in the effective tax rate on personal income were based on changes in statutory rates, as explained in Appendix F.
3. Unless otherwise noted, all data cited are based on author's calculations. See Appendix A for details on sources and methodology. Also, all years are calendar years, unless otherwise noted, and all figures are in 2002 dollars.
4. The Massachusetts fiscal year runs from July 1 to June 30, and so, for instance, fiscal 2002 runs from July 1, 2001 to June 30, 2002.
5. The tax changes included a reduction in the personal exemption for all taxpayers; a freeze in the personal income tax rate at 5.3 percent; elimination of charitable deductions until at least 2015; taxation of long-term capital gains at the same rate as other income; an increase in tobacco taxes; and restoration of the Massachusetts estate tax, which would have disappeared in 2005 due to changes in the federal law (TEAM 2002a).
6. According to the National Bureau of Economic Research, the last two national business cycle troughs occurred in March 1991 and November 2001 (which is in fiscal year 2002). Hence, comparing state spending in fiscal years 1991 and 2002, both of which featured a business cycle trough, should capture state spending at similar points in its economic history.
7. Another 7 percent went to interest on the general debt, and the remaining 16 percent to "other and unallocable," which includes budget items like state military activities (militia, national guard, armories, civil defense, etc.); lump-sum contributions for employee benefits other than transfers to insurance trusts; judgments and compensation for injuries to persons or property; programs for senior citizens not based on need; voter registration and elections; job training and employment programs; and economic development.
8. Half of this increase was paid for by federal matching funds.
9. The "other" category includes licensing fees (such as for a driver's license), death and gift taxes, and documentary and stock transfer taxes. In 2002, licensing fees were 3.5 percent of total tax revenues, death and gift taxes were 1.4 percent, and documentary and stock transfer taxes were 1.3 percent.
10. According to legislation passed in 1994 and implemented in 1996, assets held less than a year were taxed at 12 percent; one to two years, 5 percent; two to three years, 4 percent; three to four years, 3 percent; four to five years, 2 percent; and six years or more, zero percent.
11. The formula doubled the proportion of a corporation's sales in Massachusetts, added that figure to the proportion of property and payroll, and then divided by four to calculate the proportion of corporate profits taxed in Massachusetts (McLynch and St. George 2003).
12. A significant drawback to this methodology is that some changes in corporate profits due to activities out of state, like the purchase of another corporation or an export contract for an out-of-state plant, will shift the effective rate. Such a shift could be misinterpreted as a change in the state's ability to collect corporate taxes. For this and other reasons, a multi-year average of effective tax rates is used in the simulations below. See Appendix C for a more extensive discussion of this issue.
13. In a like exercise, Knight, Kusko, and Rubin (2003), using national-level data from the National Income and Product Accounts, estimate the relative roles of what they term the "macroeconomy," "capital gains realizations," and "policy and other" in state and local budget deficits. They conclude that, at the national level, the recent recession explains about one-third of the shift from surplus to deficit between 1998 and 2002, while policy and other factors explain the balance.
14. There are two key reasons to use the span 1993-95. First, the main issue we are trying to understand is how changes in the state's tax structure in the late 1990s contributed to the current fiscal crisis. Thus, the relevant base for comparison should be the tax rates that prevailed at the time immediately preceding the period in question (since the counterfactual we are interested in is: what would have happened if tax rates had stayed the same?). Representing the prevailing tax rate as an average over some years, rather than choosing one particular year, smoothes out the annual volatility of some of the data. Secondly, tax-cutting momentum picked up in the latter half of the 1990s. According to figures produced by the Massachusetts Department of Revenue for the House Ways and Means Committee, of the 44 tax cuts enacted between 1991 and 2001, only eight applied to the period up through 1995.
15. If, however, state government had elected to bank the extra revenue, it would have had to raise the cap on the state's rainy day fund.
16. Higher rates would, of course, dampen asset sales and therefore lower capital gains tax revenue somewhat.

17. An excellent paper by Jeff McLynch and James St. George, "Gone With the Wind: Massachusetts Vanishing Corporate Income Tax" (2003), gives a detailed review of the types of tax reductions corporations now enjoy.

18. Data are from the National Income and Product Accounts.

19. These changes include a doubling of personal exemptions, fully phased in by 1999. And in tax year 1999, tax rates on interest and dividend income were reduced from 12.95 percent to 5.95 percent (the same as wage income). In 1999, legislation was passed to further reduce taxes on both wage and interest and dividend income: in 2000, the rate would decline to 5.85 percent; in 2001, to 5.8 percent; and in 2002, to 5.75 percent. In 2000, legislation lowered these rates even further: in 2001, they would decline to 5.6 percent; in 2002, to 5.3 percent; and in 2003, to 5.0 percent. As a result of the fiscal crisis, rates were frozen at 5.3 percent in 2002.

20. McLynch and St. George (2003) offers an exten-

sive discussion of the types of corporate tax reforms the state should consider.

21. For capital gains, the amount listed here is the difference between projected capital gains tax revenue after the 2002 rollback and revenue if rates were the same as in the base period, 1993-95.

22. I would like to thank Donald Boyd of the Rockefeller Institute of Government at SUNY Albany for pointing out the importance of this relationship, and for his careful comments overall.

23. Many personal income tax cuts were implemented during this period, but none of them changed the statutory rate applied to income.

24. We also conducted an analysis of the sensitivity of these estimates to the base years chosen. Small changes in the base year do not make a significant difference for the estimates discussed. The results are available from the author on request.

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