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Economic Answers to Question 4

On November 7, Massachusetts voters will decide whether they want to reduce the state income tax in stages to 5% by 2003. Question 4 would lower the rate, which currently stands at 5.85% and is scheduled to fall to 5.75% in 2003.

Debate over the feasibility of the tax cut centers on three issues:

- Will the tax cut boost output and employment?
- Is the tax cut "affordable," in the sense that it will not force the state to cut services and programs?
- Is it prudent to cut taxes, given the possibility of a recession in the years ahead?

The Beacon Hill Institute used its State Tax Analysis Modeling Program (STAMP) to examine each of these issues. In summary, our findings are:

- By the time it is fully implemented in 2003, the tax cut will create 79,354 new jobs, expand payrolls by $6.166 billion and expand the capital stock (the stock of privately owned factories, equipment, computers and other capital) by $800 million. The "cost" in terms of lost tax revenue, taking dynamic feedbacks into account, will be a little more than $1 billion.

- *Under current law and without any tax cut*, state spending can be expected to rise by 8.1% annually, from $21.4 billion in calendar year 2000 to $31.6 billion in 2005. Given inflation of 3%, the state will expand services and programs by 27.5% over the five-year period without any tax cut.

- *With the tax cut* and no recession, the state will still be able to expand spending at an average annual rate of 6.5% over the next five years. In no year will the increase in spending fall below 5%. The state will be able to expand services and programs by 22.5% over the five-year period.

- *With the tax cut and a recession*, the state will have to slow spending growth only to 6.2% annually over the five-year period. The state can expand services and programs by 17.3% over the five-year period and do so without depleting its reserves.

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Will the tax cut be economically productive?

Proponents of tax reduction argue that past tax cuts have stimulated the state economy and further cuts will do so in the future. Opponents downplay the economic benefits, claiming that the tax cut will add only a few cents a day to taxpayers' disposable incomes.

The Beacon Hill Institute finds that, when fully implemented, the tax cut will permanently create almost 80,000 jobs, raise the capital stock by $800 million, and increase wages and salaries in the state by over $6 billion annually. Further details are shown in Table 1. These results reflect the fact that lower taxes reduce the cost to Massachusetts employers of attracting labor from other states.

Table 1.
Economic Effects of the Question 4 Cut in Individual Income Tax

	Tax rate							
	Status quo	Pro-posed	Change in Number of Workers	Change in Capital Stock ($ million)	Change in Payroll ($ million)	Change in Static Tax Revenue ($ million)	Change in Dynamic Tax Revenue ($ million)	Change in Net Tax Revenue ($ million)
2000	5.85	5.85	-	-	-	-	-	-
2001	5.80	5.60	20,425	184	1,404	-340	93	-247
2002	5.75	5.30	46,780	445	3,419	-820	220	-600
2003	5.75	5.00	79,354	800	6,166	-1,471	384	-1,087
2004	5.75	5.00	80,415	862	6,644	-1,585	413	-1,172
2005	5.75	5.00	81,491	929	7,158	-1,707	444	-1,236

Source: From simulations based on Massachusetts STAMP 2000.

Is the tax cut affordable?

Proponents of the tax cut argue that when the state income tax was increased from 5% in 1989, it was intended as a temporary measure to help solve an immediate fiscal crisis. That crisis is now over, tax revenue is buoyant – up 14% from September 1999 to September 2000. A billion-dollar tax cut is thus affordable. Tax cut supporters also argue that tax revenues drive spending and "the only way to control the growth of state government is to keep the surplus money away from the Legislature and instead leave it with its rightful owners." [1]

Opponents argue that the tax cut will limit the ability of the state to get funds needed for education, health care and other services and programs. The tax, they say, will "make it harder to reduce class size, expand early childhood education, fix crumbling schools or increase access to health care." [2]

In fact, the tax cut will, given continued economic expansion, permit the state to increase spending at a rapid clip and in excess of inflation. Table 2a shows our forecasts of state revenue, spending and surplus through 2005. The "status quo" forecast shows how we expect revenues and spending to evolve if the tax cut is not adopted. Under this scenario, revenues and expenditures grow by about 8% annually from 2001 to 2005, or by 2 2/3 times the inflation rate (which averaged 3% per year over the period 1995-2000).

While the tax cut will require a temporary reduction in spending growth and will bring about temporary deficits, the impact will be so small as to be almost unnoticeable. The Beacon Hill Institute finds that the state could continue to increase spending provided that it limited the increase in spending to 5% (or 1 2/3 times the inflation rate) in 2003 and reduced the growth in spending the next year by half a percentage point. The state would manage the resulting temporary deficits by drawing on the stabilization (or "rainy day") fund and other funds. It should be noted that our

[1] Commonwealth of Massachusetts, *Information for Voters: The 2000 Ballot Questions,* p. 9.
[2] Ibid., p. 8.

estimates of tax revenue are conservative; recent evidence suggests that the tax cut may be even more affordable than our projections indicate.

Table 2a.
State revenue, spending and surpluses, status quo and tax cut scenarios

	1999	2000	2001	2002	2003	2004	2005
Forecast, based on status quo							
Tax revenue, $m	14,426	15,869	16,966	18,278	19,764	21,371	23,109
Non-tax revenue, $m	5,594	5,728	6,202	6,716	7,262	7,852	8,490
Expenditure, $m	20,289	21,370	23,107	24,984	27,015	29,210	31,584
Budget surplus, $m	-269	227	61	10	12	14	16
Balance in funds, $m, end of year	1,884	2,110	2,172	2,182	2,194	2,207	2,223
Forecast, when tax cut to 5%							
Tax revenue, $m	14,426	15,869	16,702	17,638	18,603	20,120	21,760
Non-tax revenue, $m	5,594	5,728	6,239	6,805	7,422	8,025	8,677
Expenditure, $m	20,289	21,370	23,107	24,984	26,234	28,234	30,352
Budget surplus, $m	-269	227	-166	-542	-209	-90	85
Balance in funds, $m, end of year	1,884	2,110	1,944	1,402	1,193	1,103	1,189

Source: From simulations based on Massachusetts STAMP 2000. Data refer to calendar years. Data for 1999 and part of 2000 come from Federal Reserve Bank of Boston and New England Economic Project.

Is the tax cut fiscally prudent?

Proponents argue that the state income tax can safely be cut, because Massachusetts has accumulated a "rainy day fund" and other surpluses that total more than $2 billion. These, they say, are enough to tide the state over any rocky period that might lie ahead.

Opponents argue that, once fully implemented, the tax cut will reduce state revenue by just over $1 billion annually. They believe that it "lacks the necessary prudence of safely predicting the strength or weakness of the economy." [3] It would "repeat the folly of the late 1980s by irresponsibly embracing a fiscal policy in which the Commonwealth spends beyond its ability to pay." [4] They would prefer tax cuts to be contingent on buoyant tax revenues, limiting tax cuts to times of economic expansion.

We find that if Massachusetts were to face a recession as early as 2003, it would have the resources needed to avoid a fiscal crisis, while at the same time maintaining spending. Table 2b shows our forecasts of state revenue and spending on the assumption that the U.S. goes into a recession in 2003. If the growth of spending were kept to the inflation rate (expected to be 2.5%) in 2003 and to 5% in 2004, the budget would return to a surplus by 2005 and there would be no budgetary crisis. The entire impact would be absorbed by the "rainy day" fund, created for the very purpose of permitting the state to weather a recession, and by other fund balances. This represents less restraint on spending than occurred when Massachusetts went through a recession in the early 1990s.

Table 2b. ***State Revenue, Spending and Surpluses: Tax Cut Scenarios with Recession in 2003***

	1999	2000	2001	2002	2003	2004	2005
Forecast, tax cut + 2003 recession							
Tax revenue, $m	14,426	15,869	16,702	17,638	17,677	18,995	20,743
Non-tax revenue, $m	5,594	5,728	6,239	6,805	6,975	7,467	8,175
Expenditure, $m	20,289	21,370	23,107	24,984	25,609	26,890	28,906
Budget surplus, $m	-269	227	-166	-542	-957	-428	11
Balance in funds, $m, end of year	1,884	2,110	1,944	1,402	444	16	28

[3] Ibid.
[4] Ibid.

Appendix A: The Massachusetts STAMP model

The results of this study are based on the specification and estimation of a formal model of the economy of Massachusetts, designed specifically to address the question of how tax changes affect economic activity.[5] The State Tax Analysis Modeling Program (STAMP) was first developed for Massachusetts in 1994, and has since been refined and re-estimated almost annually. Since then the Beacon Hill Institute has built STAMP models for ten other states; all are based on the same theoretical foundations, although they differ slightly in the details.

At the core of the STAMP models are two simple premises. First, households maximize their utility, so that they look at their after-tax earnings when deciding how much time to spending working, and how much at leisure. Second, firms maximize their profits. To achieve this they consider their need to hire labor and employ capital, but these decisions too are influenced by the taxes that are in place in the state.

From these first principles we develop a structural model, which we then transform into a set of "reduced form" equations that may be estimated using annual data stretching back to 1970. There is one reduced form equation for each of the variables of interest – employment, the capital stock, the wage rate – and in each equation the independent variables are policy levers such as the sales tax, the property tax rate, and the average marginal tax on labor income. The equation estimates serve as inputs in the subsequent simulations.

Two steps are needed in order to simulate the effect of the tax changes on the variables of interest. First we must establish baseline values for the variables, projecting them out through 2005 (see Table 3). Then we have to use our estimated reduced form equations to determine how cutting the income tax to 5% affects the variables of interest. By comparing the projections with, and without, the tax cuts we are able to identify the net effect of the tax reductions themselves. For instance, from the estimates of the reduced form equations we know that when the tax on labor income, t_{sl}, falls by one percentage point, employment rises by 2.79%. Then the change in employment, due to cutting the tax rate from 5.8% to 5.6% in 2001, would be

$$\Delta L_{2001} = L_{\text{baseline}} * (-0.0279)*(\Delta t_{sl}) = 3.666\text{m} \times (-0.0279)*(-0.20) = 20{,}425,$$

which means that the tax reduction will boost employment by 20,425. Employment growth now continues as before, but from a larger base. The effect of tax changes in subsequent years is computed in similar fashion, yielding the results presented in Table 1 above.

Table 3
Baseline projections for 2000-2005

	Status quo tax rate (%)	Proposed tax rate (%)	Employment	Wage Rate ($ p.a.)	Capital Stock ($ million)	Working Age Population
1999	5.95	5.95	3,554,464	60,821	203,514	4,051,427
2000	5.85	5.85	3,612,070	64,663	219,350	4,100,477
2001	5.80	5.60	3,665,502	68,747	236,371	4,149,250
2002	5.75	5.30	3,719,726	73,090	254,713	4,198,603
2003	5.75	5.00	3,769,493	77,706	274,426	4,247,651
2004	5.75	5.00	3,819,925	82,615	295,664	4,297,272
2005	5.75	5.00	3,871,033	87,833	318,545	4,347,473

Notes:

- Working age population is assumed to grow by 1.168%, in line with experience for 1994-97, with adjustment for effects of tax changes envisaged under the status quo.
- Employment grows at 1.34% (as experienced for 1995-2000) plus an adjustment for the effects of the status quo tax changes.
- Nominal annual wage growth of 6.32% is derived from growth of wages and salaries of 7.74% adjusted for employment growth of 1.34%, as experienced for 1995-2000. Source of historical figures on employment and payroll: Federal Reserve Bank of Boston.
- Capital stock grows in line with payroll, with adjustment for effects of status quo tax changes.

How will the proposed cuts in the income tax rate affect state tax revenue? In answering this question it is helpful to distinguish between static and dynamic revenue effects. The static revenue effect measures the change in tax revenue that results directly from the change in the tax rate, assuming that firms and households do not react to the tax change by altering

[5] Beacon Hill Institute, *Massachusetts STAMP and Question 4,* 2000.

their behavior. Thus the static revenue effect is measured by the change in the tax rate times the tax base. Most analyses of tax changes only compute the static revenue effects.

Of course tax changes do affect behavior. For example, our regression results show that a cut in the tax rate on labor income leads to an increase in the number of workers and the total payroll. This in turn expands the tax base, leading to more tax revenue (the "dynamic" revenue effect), offsetting in part the static revenue effects. The full tax effects of the income tax cut are presented in Table 4, and show that when it is fully implemented, revenue will be cut by a little over $1 billion annually.

Finally, we ask whether the tax cut would undermine the ability of Massachusetts state government to weather a recession. We proceed by supposing that the United States slips into a nine-month recession in 2003, and then trace the effects of the recession on the fiscal health of Massachusetts, assuming that the tax cut has been implemented. On average, in the last four recessions, U.S. GDP fell by 4.93% relative to its long term trend of 3.5% per year. This was associated with a rise in the unemployment rate of 2.28 percentage points. The national unemployment rate is included as a variable in our reduced-form equations. The combination of the tax cut (job creating) and recession (job destroying) would lead to a reduction of 34,000 in the number of jobs in Massachusetts between 2002 and 2003. Payroll would shrink by $13.1 billion over the same period.

Table 4
Static and Dynamic Revenue Effects of the Proposed Income Tax Cut

	Static Effects ($m)			Dynamic Effects ($m)						Net ($m)
	Labor Income Tax	Capital Income Tax	Total Static	Labor Income Tax	Sales Tax	Capital Income Tax	Resid. Prop. Tax	Comm. & Ind Prop. Tax	Total Dynamic	
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	-327.3	-13.0	-340.3	51.1	19.3	0.6	4.3	1.8	76.5	-263.9
2002	-794.6	-25.0	-819.6	117.7	47.1	1.5	9.9	4.3	179.0	-640.6
2003	-1,426.8	-44.6	-1,471.4	200.2	84.9	2.5	16.9	7.8	309.8	-1,161.6
2004	-1,537.2	-47.7	-1,584.9	215.7	91.4	2.7	17.3	8.4	332.9	-1,252.1
2005	-1,656.2	-51.0	-1,707.2	232.4	98.5	2.9	17.8	9.0	357.7	-1,349.5

Source: Derived from simulations based on Massachusetts STAMP model.

The effect of recession (plus a tax cut) on revenue is summarized in Table 5, while the implications for the budget balance and accumulated reserve funds are set out in Table 2b. In round numbers, the tax cut reduces revenue by about a billion dollars, and the recession lowers revenues by as much again. As tax revenues drop due to both the recession and the tax cut, revenue would have to be restrained. Since this is likely to occur with a lag, there would be a period of substantial budget deficits, but they would not exhaust the "rainy day" and other funds.

Table 5
Static and Dynamic Revenue Effects of the Proposed Income Tax Cut, with Recession in 2003

	Static Effects ($m)			Dynamic Effects ($m)						Net ($m)
	Labor Income Tax	Capital Income Tax	Total Static	Labor Income Tax	Sales Tax	Capital Income Tax	Resid. Prop. Tax	Comm. & Ind Prop. Tax	Total Dynamic	
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	-327.3	-13.0	-340.3	51.1	19.3	0.6	4.3	1.8	76.5	-263.9
2002	-794.6	-25.0	-819.6	117.7	47.1	1.5	9.9	4.3	179.0	-640.6
2003	-1,426.8	-44.6	-1,471.4	-423.9	-179.7	2.5	16.9	-29.4	-616.1	-2,087.5
2004	-1,537.2	-47.7	-1,584.9	-549.1	-232.8	2.7	17.3	-27.6	-792.2	-2,377.1
2005	-1,656.2	-51.0	-1,707.2	-466.8	-197.9	2.9	17.8	-12.5	-659.4	-2,366.6

Source: Derived from simulations based on Massachusetts STAMP model.

Here the key question is whether the expenditure restraint is likely to be damaging to the quality or quantity of the services provided by the state. The first point to note is that expenditure growth would need to be kept to 2.5% (i.e. in line with inflation) in the recession year of 2003, to 5% in 2004 and to 7.5% in 2005. This represents moderate restraint, particularly when set against the state's expenditure profile during the Massachusetts recession of the early 1990s. The pattern of spending and revenue in the state since 1982 shows clearly that spending did not even keep up with inflation in the Massachusetts recession years of 1990 through 1992. It is not unreasonable for spending to be restrained somewhat during a recession, as salary and hiring limits serve to share the pain of the recession more widely, without necessarily having much effect on the services provided by government. Unemployment insurance payments will rise during a recession, but are not included in the analysis here.