



# Massachusetts Tax Revenue Forecasts for FY 2008 and FY 2009

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December 13, 2007

The Beacon Hill Institute at Suffolk University is pleased offer its revenue forecast for FY 2008 and FY 2009 to the Joint Committee on Ways and Means.<sup>1</sup> Our report is divided into four sections, beginning with a presentation of our current forecast and a summary of the forecasts that we and others offered over the past two years. We follow with background information on the U.S. and Massachusetts economies, and conclude with a description of the methodology used to generate our forecasts.

## Current and Past Forecasts

BHI predicts that tax revenues will be

- **\$20.201 billion in FY 2008, an increase of 2.4% over FY 2007, and**
- **\$21.038 billion in FY 2009, an increase of 4.1% over FY 2008.**

The forecast for FY 2008 is an update of the forecast we offered in January 2007. At that time we forecast revenue of \$20.265 billion for FY 2008, which we have now revised down very slightly in the light of the revenue data that have become available since then, but may now be overly conservative.

We have been presenting forecasts to this committee since December 2003, and these numbers are shown in Table 1, along with the forecasts made by the Massachusetts Taxpayers Foundation and the Department of Revenue. These figures show that forecasting is still an imprecise art, even if our forecasts have consistently been the closest to the mark so far.

**Table 1: Projected vs. Actual Tax Revenue for Massachusetts**

	FY 2005	FY 2006	FY 2007	FY 2008
	<i>billions of dollars</i>			
Actual tax revenue (\$ billion)	17.09	18.49	19.74	
Projections				
Date of projection	Dec '03	Dec '04	Dec '05	Jan '07
Revenue (\$ billion) as projected by:				
The Beacon Hill Institute	16.15	17.56	18.95	20.27
The Massachusetts Taxpayers Foundation	16.09	17.37	18.92	19.85
Department of Revenue (average)	15.90	17.39	18.83	19.71

<sup>1</sup> The staff of the Beacon Hill Institute at Suffolk University, including Paul Bachman, Sarah Glassman, Jonathan Haughton, Frank Conte and David G. Tuerck, assisted in the preparation of this report.

## **Background: The U.S. Economy**

This year began badly. After growing by 3.1% in 2005 and 2.9% in 2006, U.S. real GDP rose by just 0.6% (at an annualized rate) in the first quarter of 2007. The most striking explanation for the slowdown was a sharp drop in residential investment, a direct result of the sub-prime mortgage crisis that has restrained access to credit for housing. Since then, the residential sector has not rebounded – the month of October marked the lowest rate of home sales in 8 years<sup>2</sup> – but the worst may be over. Even though foreclosures are at record highs in 2007 according to RealtyTrac they leveled off in September and October.<sup>3</sup>

Perhaps surprisingly, the problems of the housing sector have had limited effects on the rest of the economy, which has remained resilient. Real GDP grew at an annualized rate of 3.8% in the second quarter and 4.9% in the third quarter, driven by an increase in exports, solid personal consumption expenditures, and some recovery in investment. Disposable consumer spending has responded with a lag, rising by just 0.6% in the second quarter and then expanding by 4.4% in the third quarter.<sup>4</sup>

The labor market continues to create jobs at a moderate pace. The number of payroll jobs rose from 136.9 million in November 2006 to 138.5 million in November 2007, a rise of 1.1%.<sup>5</sup> During this period, job growth was not quite enough to keep up with demand, so the unemployment rate rose from 4.5% to 4.7% during this period; however, the demand for labor was strong enough to pull up earnings by 3.7% and to maintain the number of hours worked per production worker.<sup>6</sup>

Looking forward, we project the U.S. economy to continue the pattern of moderate growth in real GDP, and we do not expect a recession in 2008 or 2009. Although consumers may be jittery, as the housing sector remains weak, exports will be particularly buoyant, helped by a weak dollar and strong economic growth in the rest of the world, particularly in emerging markets. There are risks too; significantly higher oil prices, or new findings of weaknesses in the financial sector, could spook investors and consumers and push the economy into a downturn.

## **Background: The Massachusetts Economy**

In 2005, the GDP of Massachusetts grew by just 1% in real terms, lagging well behind the 3% growth of the national economy. Since then, economic growth in Massachusetts has recovered, reaching 2.9% in 2006, which was essentially the same rate as for the U.S. overall. This trend has continued into 2007, when personal income is expected to rise as quickly in Massachusetts (6.2% in nominal terms) as in the country (also 6.2%).

As elsewhere in the U.S., the Commonwealth has been hurt by a slowdown in residential investment. But this has been offset by solid growth in other sectors, most notably education, and medical services, which help insulate the economy from shocks that affect manufacturing-dominated states like Michigan.<sup>7</sup> And

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<sup>2</sup> Bloomberg.com, “Home Sales May Drop, Durable Orders Stall: U.S. Economy Preview”, available from <http://www.bloomberg.com/apps/news?pid=20601103&sid=akRLw5MJjlQ&refer=news>.

<sup>3</sup> See Realtytrac.com, “[Massachusetts Foreclosure Activity Down 17 percent in October](http://www.realtytrac.com/states/Massachusetts.html),” available from <http://www.realtytrac.com/states/Massachusetts.html>.

<sup>4</sup> BEA, available from <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>.

<sup>5</sup> U.S. Department of Labor, Bureau of Labor Statistics, “The Employment Situation: October 2007,” Internet; available from [http://www.bls.gov/news.release/archives/empsit\\_12082006.pdf](http://www.bls.gov/news.release/archives/empsit_12082006.pdf)

<sup>6</sup> Bureau of Labor Statistics, Internet; available from <http://www.bls.gov/news.release/pdf/empsit.pdf>.

<sup>7</sup> NEEP, Massachusetts Economic Outlook, available at <http://www.neepecon.org/documents/MassachusettsOutlook2007to2012.doc>.

should consumer spending falter, Massachusetts is well positioned because the state's technology products and services are sold disproportionately to business customers.

Foreign interest in Massachusetts-based services will also help alleviate the strain of the weak domestic market, especially as the dollar is expected to remain weak, ensuring that US goods and services continue to be appealing in foreign markets.

The recent strength of the Massachusetts economy is reflected in the labor market, where the unemployment rate fell to 4.3% in October 2007, down from 5.1% a year earlier.<sup>8</sup> Employment in the state has now risen for four consecutive years, and the number of residents who are employed, at 3.27 million, is approaching the previous peak of 3.29 million that was observed in January, 2001. Wages remain high; by the end of 2006, wage and salary payments per employee in Massachusetts were 22% above that the level of the rest of the nation.

We are somewhat more optimistic than the New England Economic Partnership (NEEP) about the prospects for growth in the near future, and expect personal income to rise (in nominal dollars) by 4.9% in 2008 and a further 4.3% in 2009. Even these figures may be low, particularly for 2009. Employment is expected to rise by 0.6% per year, or somewhat faster than population growth; recent moderation in housing prices will make it easier for people to stay in the state. The education, healthcare and high technology sectors are robust enough to continue to support continued employment and income growth.

## **Methodology**

The on-going expansion of the Bay State economy will translate into higher tax revenues for the state. BHI revenue forecasts assume that there will be no additional changes in Massachusetts tax policy for the forecast period, which runs through the end of fiscal year 2009 (i.e. through June 2009).

Table 2 shows the forecasts by year and by major tax. Revenue for the first four months of FY 2008 grew by 4.0%, compared to the same period of FY 2007, driven mainly by robust income tax revenues (up 7.2%). We do not expect this pace to last, as employment and income gains decelerate, which is why, based on our forecasting model, we estimate that total revenue will rise by 2.4% for the full fiscal year. It is quite possible, however, that our revenue projection is too conservative.

For FY 2009, we forecast a 4.1% increase in tax revenue, an increase that is below its historical average rate of 6.4%. The major taxes will reflect this slowdown – personal income tax receipts will expand by 5.8%, sales tax revenue by 2.4% and other tax revenue by 0.2%. Consistent with historical experience, the growth of overall tax revenues will be restrained by slower growth in revenue from the major excise taxes (cigarettes, alcohol, motor fuel, and business excises). This projection is farther in the future, and inherently subject to greater uncertainty than our forecasts for FY 2008.

We prepared tax revenue forecasts for eleven categories for every month through June 2008. Three steps were needed to develop these forecasts.

1. Information on personal income in Massachusetts is available on a quarterly basis. Monthly estimates were obtained by interpolation. We then used our own projections of personal income to derive month-by-month growth rates of personal income, allowing us to project personal income on a monthly basis out through June 2009.

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<sup>8</sup> BLS, "Regional and State Employment and Unemployment," available from <http://www.bls.gov/news.release/laus.nr0.htm>.

<b>Table 2</b>					
<b>Revenue Forecasts for Massachusetts, FY 2008 and FY 2009</b>					
<b>Date of forecasts: October 2007</b>	<b>Actual</b>	<b>Actual</b>	<b>Actual</b>	<b>Forecast</b>	<b>Forecast</b>
	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
<b>US economy (calendar year)<sup>1</sup></b>					
Personal income (\$ million)	10,300	10,980	11,670	12,000	12,800
% change p.a.	5.9	6.6	6.2	4.6	4.8
CPI inflation, % p.a.	2.0	2.1	2.1	1.9	1.9*
Employment ('000)	133,696	136,175	137,899	138,816	140,333
% change p.a.	1.7	1.9	1.3	0.7	1.1
Unemployment rate, %	5.1	4.6	4.6	4.9	4.7
<b>Massachusetts (calendar year)<sup>1</sup></b>					
Personal income <sup>2</sup> (\$ million)	279,860	296,620	314,950	330,380	344,590
% change p.a.	4.4	6.0	6.2	4.9	4.3
Real Personal income (\$ billion)	250.78	258.66	268.21	273.82	279.35
% change p.a.	1.4	3.1	3.7	2.1	2.0
Employment ('000)	3,211	3,243	3,279	3,299	3,320
% change p.a.	0.52	1.0	1.1	.6	.6
Unemployment rate <sup>2</sup> (%)	4.8	5.0	4.7	4.7	4.6
Population ('000)	6,433	6,437	6,453	6,467	6,478
% change p.a.	0.0	0.1	0.2	0.2	0.2
<b>BHI forecast, MA taxes (fiscal year)<sup>2</sup></b>					
Personal income tax (\$ million)	9,690	10,483	11,399	11,950	12,639
% change p.a.	9.7	8.2	8.7	4.8	5.8
Sales Tax	3,886	4,004	4,065	4,166	4,266
% change p.a.	3.7	3.0	1.5	2.5	2.4
Corporation Income	1,063	1,391	1,588	1,648	1,529
% change p.a.	6.5	30.8	14.1	3.2	-7.2
Business Excises	643	865	888	601	736
% change p.a.	-5.0	34.5	2.7	-32.3	22.4
Motor Fuels	686	672	676	709	739
% change p.a.	0.3	-2.0	.60	4.8	4.3
Other	1,119	1,072	1,118	1,127	1,129
% change p.a.	10.1	-4.2	4.3	0.8	0.2
<b>Total Taxes</b>	<b>17,087</b>	<b>18,487</b>	<b>19,736</b>	<b>20,201</b>	<b>21,038</b>
<b>% change p.a.</b>	<b>7.1</b>	<b>8.0</b>	<b>6.8</b>	<b>2.4</b>	<b>4.1</b>

Notes: <sup>1</sup> From New England Economic Partnership, *Economic Outlook 2007-2011*, fall 2007.

<sup>2</sup> BHI Forecasts. \*Monetary Policy Report to Congress July 2007, and The Sprague Outlook, November 2007.

- For each tax series, we estimated a regression equation that relied mainly on the past movements in the series, in order to permit us to extrapolate into the future. For the major taxes (sales, income) we included personal income as an independent variable. In some cases (noted in Table 2) we included dummy variables in the regression equations in order to pick up the effects of major changes in the tax code.
- In estimating the regressions we paid particular attention to the structure of the errors, in order to pick up the effects of seasonal, quarterly, and monthly variations in tax collections. This was done by estimating the equations with autoregressive (AR) and moving average (MA) components. The number and nature of AR and MA lags was determined initially by examining the autocorrelation and partial correlation coefficients in the correlogram, and fine-tuned after examining the structure of the equation residuals. The details are given in Table 3.

A more detailed breakdown of the forecasts, by individual tax categories, is shown in Table 3. The left-hand side of the table shows the revenues, which are actual values for FY 2007, and our forecasts for FY 2008 and FY 2009. The right-hand side of the table provides the model specification used to forecast each tax, and the time frame for each data series used in the model.<sup>9</sup>

<b>Table 3</b>									
<b>Revenue forecasts, disaggregated, for FY08 and FY09, including technical estimation details</b>									
	\$ million			% change		AR	MA	Vars/Dummies	Dates
	FY07	FY08	FY09	FY08	FY09				
<b>Income tax</b>									
Estimated payments	2,484	2,217	2,276	-10.8	2.7	12	1,3,4,11	01:1, 02:1	79:6-07:10
Tax Withheld	8,623	9,021	9,412	4.6	4.3	1,12	1,12	01:1, 02:1, PI	79:6-07:10
Returns & Bills	1,966	2,078	2,333	5.7	12.3	PIT(-12),12	1,12		79:6-07:10
Refunds	1,672	1,367	1,381	-18.2	1.0	1,2,11,12	1		79:6-07:10
<b>Income Net</b>	<b>11,399</b>	<b>11,950</b>	<b>12,639</b>	<b>4.8</b>	<b>5.8</b>				
<b>Sales &amp; Use taxes</b>									
Sales & Use taxes	4,065	4,166	4,266	2.5	2.4	12	1,3,6,9	PI	79:6-07:10
Corporation Excise	1,588	1,648	1,529	3.8	-7.3	1,12	1,3,12	06:01	79:6-07:10
Business Excises	888	601	736	-32.3	22.5	3,12	1,12	-	79:6-07:10
Alcoholic Beverages	71	69	69	-2.3	-0.05	1,12	1,12	-	93:6-07:10
Cigarettes	438	437	426	-0.2	-2.5	12,23		83:7, 93:1, 96:10, 02:8	79:6-07:10
Motor Fuels	676	709	739	4.9	4.2	1,12	1	90:9, PI, C	79:6-07:10
Other taxes	588	621	634	5.6	2.1	1,12	1,12	-	79:6-07:10
<b>Total Taxes</b>	<b>19,736</b>	<b>20,201</b>	<b>21,038</b>						
<i>Notes:</i> AR refers to Autoregressive lags used in the regression. MA refers to Moving Average lags used in the regression. "Dummies" gives starting dates of each Dummy variable used (e.g. 01:1 is a dummy that is set equal to 1 from January 2001 onwards and to 0 otherwise). "Dates" refers to period of data used in regression estimates." PI refers to Personal Income and C, a Constant term.									

To help get a better intuitive sense of the trends in tax revenues, we have also included a number of graphs that show the dollar value of tax revenue for each month from September 2001 through October 2007, for tax revenue overall and for four of the individual taxes. Since the monthly data are highly variable, we have also included summary trend lines – actually fourth-degree polynomials – for each graph. On the main graph, which shows overall tax revenue, the rise since 2002 is clearly visible, as is the slower pace of increase over the past year.

<sup>9</sup> A complete breakdown of revenue forecasts by month and by the 11 tax headings is available on request.

