



Massachusetts Tax Revenue Forecasts for FY 2016 and FY 2017

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The Beacon Hill Institute is pleased to offer its revenue forecast for Fiscal Year (FY) 2016 and FY 2017 for the annual Consensus Revenue Hearing.¹ We divide our report into three sections, in which we provide (1) a summary of our latest forecast, (2) background information on the national and state economies and (3) a summary of the methodology used to provide our forecast.

(1) Current Forecast

BHI predicts that tax revenues will be:

- \$25.9 billion in FY 2016, 4% over FY 2015, and
- \$27.3 billion in FY 2017, 5.6% over FY 2016.

The 4% increase for FY 2016 and the 5.6% increase in FY 2017 are largely driven by a stronger recovery in the growth of state personal income. The New England Economic Partnership projects state personal income to increase by 6.0% and 5.1% in Calendar Year (CY) 2016 and 2017, respectively.²

¹Prepared by the staff of the Beacon Hill Institute at Suffolk University, including Paul Bachman, Frank Conte and David G. Tuerck. The authors would like to thank BHI Fall 2015 interns Brittany Turner (Suffolk University, Class of 2016) Lien Tran (Suffolk University, Class of 2016) and Mary Ann Garland (Suffolk University, Class of 2016) for their assistance.

²New England Economic Partnership, *Fall 2015 Massachusetts Economic Outlook*, "Fall 2015 Forecast: Summary Tables." (October 15, 2015):47. Available upon request.

(2) Background on the National and State Economies

The U.S. Economy

Real U.S. Gross Domestic Product (GDP) grew by 2.1% in the third quarter of 2015, according to the most recent estimate by the Bureau of Economic Analysis.³ In the second quarter of 2015, growth finished at a revised 3.9%. The latest revision for GDP growth for all of 2014 arrived at 2.4% and 1.5% for 2013. Growth remains slightly below the 3.5% annualized average of the 1990s and is considered by some economists to be still underperforming against the postwar benchmark of 3.0%.⁴

Most economic signs are continue to be positive, however. The unemployment rate is down to 5.0%. Over the past year more than 2 million new jobs were created. Wages are beginning to pick up. Energy prices are down significantly.

In 2015, consumer confidence, as tracked by Bloomberg, declined slightly but stabilized in early December. Last year the measure rose to its highest level in seven years.⁵

Gallup's U.S. Economic Confidence Index has drifted downward since the beginning of the calendar year when it was at its highest level since 2008.⁶

The Gallup Good Jobs (GGJ) rate in the U.S. was 44.9% in November. This is down slightly from the rate measured during the past three months (45.3%), but still the highest Gallup has measured for any November since tracking began in 2010.⁷ Another Gallup survey, the U.S. Job Creation Index registered +31 for November. This is similar to the record high of +32 recorded in each of the previous six months.⁸

The Conference Board Consumer Confidence Index which had decreased moderately in October (99.1), declined further in November (90.4).⁹ The 2014 readings for October and November were 94.10 and 91.00, respectively.

³ U.S. Department of Commerce, Bureau of Economic Analysis, "Gross Domestic Product: Third Quarter 2015 (Second Estimate); Corporate Profits: Third Quarter 2015 (Preliminary Estimate) (November 23, 2015) <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>.

⁴ OECD, Economic Outlook Annex Tables. (November 2015) <https://www.oecd.org/eco/outlook/economicoutlookannextables.htm>. The long term 3.5% GDP benchmark is based on the years 1990-2001.

⁵ Sho Chandra, "Consumer Comfort in U.S. Steadies as Views of Economy Improve," *Bloomberg*, (December 10, 2015). <http://www.bloomberg.com/news/articles/2015-12-10/consumer-comfort-in-u-s-steadies-as-views-of-economy-improve>.

⁶ Rebecca Riffkin, "U.S. Monthly Economic Confidence Remains Level in November," December 1, 2015. http://www.gallup.com/poll/187373/monthly-economic-confidence-remains-level-november.aspx?g_source=ECONOMIC_CONFIDENCE&g_medium=topic&g_campaign=tiles

⁷ Ben Ryan "U.S. Gallup Good Jobs Rate 44.9% in November," Gallup, December 4, 2015, http://www.gallup.com/poll/187466/gallup-good-jobs-rate-november.aspx?utm_source=alert&utm_medium=email&utm_content=morelink&utm_campaign=syndication

⁸ Justin McCarthy, U.S. Job Creation Index for November 2015, Gallup Daily Tracking (December 2, 2015) <http://www.gallup.com/poll/187376/job-creation-index-steady-november.aspx>

⁹ The Conference Board, Consumer Confidence Survey (November 24, 2015) <https://www.conference-board.org/data/consumerconfidence.cfm>

Consumer sentiment rose 1.4% to 91.3 in November, according to final results from the University of Michigan Survey of Consumers.¹⁰ Noting the cross-currents of consumer caution chief economist Richard Curtin noted, “Other than for the past twelve months, the Sentiment Index was higher in November than any time since the start of 2007.” The University of Michigan also suggested that its data was consistent with growth in real personal consumption spending of 2.8% in 2016.

The Organization for Economic Cooperation and Development (OECD) is predicting 2.5% growth in 2016 and 2.4% in 2017 for the United States.¹¹ Europe is expected to trail the United States yet again. The OECD expects growth in the Euro zone to rise to only 1.8% in 2016 and 1.9% in 2017.¹²

The Wall Street Journal Economic Forecasting Survey for November 2015 estimates that the economy will grow by only 2.6% in calendar year 2016 and 2.5% in calendar year 2017. The 52 economists surveyed predict growth in the range of 3.7% on the high end and 0.8% on the low end for 2016.¹³

Meanwhile, *The Economist* poll of forecasters predicts that U.S. GDP growth will be 2.4% for 2015 and 2.5% for 2016 overall with predictions in the range of 2.1% and 1.6% on the low end for 2015 and 2016.¹⁴

The Bureau of Labor Statistics reported that the November 2015 unemployment rate remained at 5.0 percent. The economy generated 211,000 jobs. The labor force participation (LFP) rate at 62.5 percent changed very little from the previous month. The employment-population rate remained at 59.3 percent and according to BLS “has shown little movement since October 2014.” The number of persons employed part-time increased by 319,000 to 6.1 million following a two-month decline. There were 594,000 discouraged workers in November slightly less than October and little changed since last year. The number of persons considered long-term unemployed (greater than 27 weeks or more) was unchanged at 2.1 million representing 25.7 percent of all unemployed. This indicator has not changed much since June 2015. Employment in construction was exceptionally strong: In November jobs rose by 46,000; for the past year more than a quarter of a million jobs have been created. Employment in mining continued to decline in November (-11,000). Mining, which includes oil extraction industries, has shed 123,000 jobs since the sector’s peak in December 2014.¹⁵

¹⁰ University of Michigan, Survey of Consumers, “Shopping for Discounts,” http://www.floordaily.net/flooring-news/Consumer_Sentiment_Rose_in_14_in_November.aspx.

¹¹ OECD, Economic Outlook Annex Tables. (November 2015) <https://www.oecd.org/eco/outlook/economicoutlookannextables.htm>

¹²*Ibid.*

¹³ *The Wall Street Journal*, “Economic Forecasting Survey,” (November 2015). <http://projects.wsj.com/econforecast/-r=5&ind=gdp>.

¹⁴ *The Economist* poll of forecasters, November averages (December 2, 2015). <http://www.economist.com/news/economic-and-financial-indicators/21679444-economist-poll-forecasters-december-averages>. See also <http://www.economist.com/indicators>

¹⁴ BLS, Employment Situation, November 2015. www.bls.gov.

¹⁶ S&P/Case-Shiller Home Price Index. (November 24, 2015). <http://us.spindices.com/indices/real-estate/sp-case-shiller-us-national-home-price-index>.

The Standard & Poor/Case-Shiller Home Price Indices, the leading measure of the U.S. housing market, showed that national home prices increased by 0.42%. The index recorded an 8.14 point annual gain in September 2015 over September 2014.¹⁶

An estimated 1,150,000 housing units were authorized by building permits in October 2015. This is 3.0% above the 2014 figure of 1,120,000, according to the latest release from the U.S. Census Bureau.¹⁷ In October, total existing-home sales fell 3.4% over the previous month. The National Association of Realtors reported "Total existing-home sales fell 3.4 percent to a seasonally adjusted annual rate of 5.36 million in October from 5.55 million in September. Despite last month's decline, sales are still 3.9 percent above a year ago (5.16 million)."¹⁸

Retail trade sales were up 0.2 percent (+/-0.5%) from October 2015, and up 0.7 percent (+/-0.7%) above last year. As a percentage of disposable personal income, households are carrying below average (5.6%) low debt service ratios compared to historical data dating back to 1980 (5.7%).¹⁹ Mortgage debt is also below historical averages. Consumer prices are especially tame; prices increased by 0.2% (seasonally adjusted) in October 2015.²⁰ According to research firm ShopperTrak, Black Friday spending fell 11.9% to \$10.21 billion from 2014.²¹ Consumer online spending Thanksgiving Day through Cyber Monday totaled \$11 billion, a 15% increase from 2014.²²

State governments are in good fiscal order. State tax revenues grew by 6.8 percent in the second quarter of 2015, according to the most recent State Revenue Report of the Nelson A. Rockefeller Institute of Government.²³ Personal income tax growth was robust at 14.2 percent, which was driven by strong payments with final returns up 20.0 percent and estimated taxes up 18.2 percent. This trend is not expected to continue, the report states, as this year's revenue figures were bolstered by the strong stock market of 2014.

The federal budget deficit for this past fiscal year was \$439 billion, the smallest since 2007. The budget sequester along with rising federal revenues have improved the deficit picture. The deficit at 2.5 percent

¹⁶ S&P/Case-Shiller Home Price Index. (November 24, 2015). <http://us.spindices.com/indices/real-estate/sp-case-shiller-us-national-home-price-index>.

¹⁷ U.S. Census Bureau News, "New Residential Construction in October 2015." (November 18, 2015). <http://www.census.gov/construction/nrc/pdf/newresconst.pdf>.

¹⁸ National Association of Realtors, "Existing-Home Sales Dial Back in October," (November 23, 2015). <http://www.realtor.org/news-releases/2015/11/existing-home-sales-dial-back-in-october>

¹⁹ The Federal Reserve Board, "Household Debt Service and Financial Obligations Ratio," (December 29, 2014). <http://www.federalreserve.gov/releases/housedebt/default.htm>.

²⁰ U.S. Census Bureau, "Consumer Price Index October 2015," (November 17, 2015). <http://www.bls.gov/news.release/pdf/cpi.pdf>.

²¹ ShopperTrak, "In-Store Retail Sales Decline on Black Friday Weekend," (December 1, 2015). <http://www.shoppertrak.com/media/press-release/in-store-retail-sales-decline-on-black-friday-weekend/>.

²² Adobe, "Adobe Data Shows Cyber Monday Largest Online Sales Day in History with \$3 Billion," (November 30, 2015). <http://www.adobe.com/news-room/pressreleases/201511/113015AdobeDataCyberMondaySales.html>.

²³ Lucy Dadayan and Donald J. Boyd, "Another Strong Tax Quarter for the States, But Less Promising Forecasts for Fiscal 2016," State Revenue Report, Nelson A. Rockefeller Institute of Government (November 2015) http://www.rockinst.org/pdf/government_finance/state_revenue_report/2015-11-16-SRR_101.pdf.

of GDP is below the 40 year average.²⁴ However, Congress and the Administration must work to return to normal budget writing cycles.

Forward-looking market indices disappointed in 2015. Year over year, the Dow Jones Index is up 1.0% and the S&P is up 1.0%.²⁵ Meanwhile, the tech-heavy NASDAQ is up 7.0%.²⁶

There are some warning signs in the national economy. U.S. companies during the third quarter posted their largest annual decline in profits since the recession mostly due to a strong dollar and weak global demand.²⁷ Both factors could slow growth. According to the *Wall Street Journal*, "Compared with a year earlier, profits fell 4.7%, the biggest annual decline since the second quarter of 2009." Last October manufacturers like 3M Co. said they are facing downward pressures that may force layoffs.²⁸ The energy industry, by some measures, accounted for most of the rise in capital expenditures since the Great Recession.

With seven years of novel experimentation, higher interest rates are necessary to restore credibility to the Federal Reserve Bank. At this writing the consensus points to a small increase long signaled by the Fed chairwoman. The long wait has had consequences. Nobel Laureate Michael Spence and economist Kevin Warsh recently argued that current Fed policies has increasing led to a greater "financialization" of the economy at the expense of capital investment.²⁹ This has had secondary effects on labor markets and productivity.

Nonetheless headline labor markets statistics are close to normal even though labor force participation and the number of part-time workers is problematic. Still the economy is approaching full employment rendering the Fed's 2.0% inflation threshold as an obsolete measure. The uncharted territory of zero-bound is risky. As St. Louis Fed President James Bullard noted earlier this month, the current zero bound policy rate remains 325 basis points below the Fed's long-run level while its balance sheet is \$3.5 trillion larger.³⁰

Tax policy may be one of the best routes out of the sluggish recovery. U.S. opinion leaders and policy makers have turned their focus to the corporate income tax, which is now the highest in the developed world. Using a dynamic computable general equilibrium model (the "NCPA-DCGE Model"), we simulate alternative policies for reducing the U.S. corporate income tax. We find that all hypothesized policies result in significant positive impacts on output, investment, capital formation, employment

²⁴ Nick Timiraos, "Deficit shrinks but spending fight goes on," *Wall Street Journal*, October 15, 2015
<http://www.wsj.com/articles/u-s-posts-smallest-annual-budget-deficit-since-2007-1444937616>

²⁵ Year over year (12/14/2014 – 12/14/2015) calculations based on Yahoo Finance historical data for DJIA and S&P
<http://tinyurl.com/q4bxyu>.

²⁶ Ibid, <http://finance.yahoo.com/q/hp?s=XIC+Historical+Prices>.

²⁷ Kate Davidson and Theo Francis "Falling Corporate Profits Blur U.S. Growth Outlook," *Wall Street Journal*, (November 24, 2015)
<http://www.wsj.com/articles/u-s-gdp-expands-at-2-1-pace-in-third-quarter-1448372098>

²⁸ Theo Francis and Kate Linebaugh, "U.S. Companies Warn of Slowing Economy," *Wall Street Journal*, October 25, 2015, <http://www.wsj.com/articles/u-s-companies-warn-of-slowing-economy-1445818298?tesla=y>

²⁹ Michael Spence and Kevin Warsh, "The Fed has hurt business investment," *The Wall Street Journal*, October 27, 2015: A13, <http://www.wsj.com/articles/the-fed-has-hurt-business-investment-1445899627>.

³⁰ James Bullard, "Permazero as a Possible Medium-term Outcome for the U.S. and G-7," presentation before FRB of Philadelphia Policy Forum, "The New Normal for the U.S. Economy." (December 4, 2015).

and household wellbeing. All of the hypothesized reforms also result in a more streamlined public sector.³¹ Government revenue declines because of the reduction in the corporate income taxes, but it begins to recover in the following years as the bases of other taxes rise because of the expansion in the economy. Overall, a corporate tax rate cut of 50% would increase GDP by 2.2 percentage points in 2020.

The Massachusetts Economy

Based on new statistics for 2014, the Massachusetts economy grew by 2.3%, according to the Bureau of Economic Analysis. Massachusetts was ranked the 15th best state for 2014 growth with a real GDP value of \$424.9 billion (2009 dollars). (The size of Massachusetts's economy, measured by nominal GDP, is more than \$459.9 billion).³² MA GDP State figures for 2012 and 2013 were revised to 1.7% and 1.2% respectively.³³ A more recent estimate released last week — and subject to revision — paints a robust state economy estimating that growth rang in at 4.0% in the second quarter of 2015 but that growth puts the state 23rd in the nation.³⁴

Emerging, as it has, out of the Great Recession in better shape than most states, the Massachusetts economy is expected to move steadily. In its most recent forecast, the New England Economic Partnership (NEEP) suggests a return to moderate growth that eventually will slowdown: namely: 3.1% (2016); 2.2% (2017) and 1.5% (2018).³⁵

A decomposition of latest growth rate of 2.3% shows that professional, scientific and technical services contributed 0.05 percentage points of that growth with health and social services contributing 0.2 percentage points. Meanwhile, educational services and construction were flat. In the 2014 ranking of real GDP state, Massachusetts trails both well performing resource-rich states such as first place North Dakota (6.3%) and second place Texas (5.2%) and other high tech competitors such as ninth ranked California (2.8%) and fifth place Colorado (4.7%).

The Massachusetts total unemployment rate remained at 4.6% in October 2015 according to the Executive Office of Labor and Workforce Development (LWD). The state's rate is below the national October 2015 rate of 5.0%. The state economy added 11,000 in October and year over year added 80,600 jobs.³⁶ The U.S. Bureau of Labor Statistics revised down the original job loss for September to show that the state only lost 2,200 rather than 7,100 jobs. There are 32,000 fewer unemployed workers in the Bay State compared to October 2014. The state's labor force participation (LFP) rate remains above the national

³¹ Keshab Bhattacharai, Jonathan Haughton, Michael Head and David Tuerck, *Simulating Corporate Income Tax Reform Proposals with a DCGE Model* (September 2015):25, http://www.beaconhill.org/NAT-MODEL/BHI-Suffolk-DCGE_report_Sept21_2015final.pdf.

³² BEA, <http://tinyurl.com/knep34d>.

³³ Bureau of Economic Analysis, "Broad Growth across States in 2014: Advance 2014 and Revised 1997 – 2013 Statistics of GDP by State", (June 10, 2015). http://www.bea.gov/newsreleases/regional/gdp_state/gsp_newsrelease.htm.

³⁴ BEA, Second Quarter Growth in Service Industries Widespread Across States; Quarterly Gross Domestic Product by State, 2005 Through 2nd Quarter 2015 (December 10, 2015), http://www.bea.gov/newsreleases/regional/gdp_state/qgsp_newsrelease.htm.

³⁵ New England Economic Partnership, Fall 2014, "Economic Outlook," (47), <http://www.neepecon.org>.

³⁶ Labor and Workforce Development, "Quick Stats," (November 2015), http://lmi2.detma.org/lmi/Quick_StatsCES.asp

rate checking in at 64.7 percent. The latest figures show that the education and health services; professional, scientific and business services; other services; and construction sectors led with gains. The state's labor force stands at 3.508 million. At the local level, the BLS found that unemployment rate dropped to 3.0 percent for the city of Cambridge in September.³⁷ Excluding Worcester County, the western part of the state lags in employment.

In its most recent Massachusetts survey, the Suffolk University Political Research Center found that 63.8% percent think that the Bay State is heading in the right direction.³⁸ The sentiment holds across all the geographic areas, party affiliations, age groups and races. The number of residents who believe the state is moving in the right direction increased from the last SURPRC survey in April by approximately 7 percentage points (56.60%).³⁹

According to a December Manpower Employment Outlook Survey, employers in Massachusetts expect maintain workforce levels in Quarter 1, 2016 not unlike the last quarter of 2015.⁴⁰ From January to March, 17% of the companies interviewed plan to hire more employees, while 6% expect to reduce their payrolls. Another 76% expect to maintain their current workforce levels and 1% are not certain of their hiring plans.

However, Manpower also reports the best prospects for hiring appear best in all sectors except for construction and other services. Meanwhile the agency says finance sector hiring is expected to be unchanged. The Boston Federal Reserve Bank reports that "labor demand is strong" in New England noting that "some firms are providing larger wages increases than in the past few years to most or to selective job categories to retain existing employees; others are not."⁴¹

Sustaining and expanding high tech jobs, given the sector's high wages, should be a priority. High tech employment comprises roughly 10% of all private sector employment in the Bay State. Between 2001 and 2014, Massachusetts high tech industries lost over 28,000 jobs. Supplementing BLS data used in a Massachusetts study, BHI found that high tech employment in the state declined by 8.8% between 2001 and 2014.⁴² Out of the 11 industries that make up the high tech sector, only four have shown positive growth from 2001 to 2014. On the other hand, scientific research has expanded by 56% since 2001, adding 18,659 jobs. The pharmaceuticals industry has expanded by 29.4% or 2,294 jobs. More modest gains of 19.9% and 10.2% were seen in computer systems design and software publishing, respectively.

³⁷ BLS Economic Summary Boston-MA-NH Metro Area (November 3, 2015), http://www.bls.gov/regions/new-england/summary/blsummary_boston.pdf.

³⁸ Suffolk University Political Research Center SUPRC, "Governor Baker – Year 1," (November 2015) http://www.suffolk.edu/documents/SUPRC/11_24_2015_final_marginals.pdf, (11/17 – 11/19).

³⁹ Suffolk University Political Research Center, SUPRC, "100 Day Poll," (April 2015), http://www.suffolk.edu/documents/SUPRC/4_22_2015_marginals.pdf. (4/16 – 4/21)

³⁷ ManpowerGroup, "Hopeful Job Market Expected for Massachusetts," December 8, 2015, <http://press.manpower.com/reports/2015/hopeful-job-market-expected-for-massachusetts/>

⁴¹ Federal Reserve Bank, "Beige Book," (December 2015) http://www.federalreserve.gov/monetarypolicy/beigebook/files/Beigebook_20151202.pdf

⁴² Numbers reflect BHI updated calculations for 2014. See Bureau of Labor Statistics, "Regional Report, High Tech Industries in Massachusetts: Employment and Wage Trends during the 2001 to 2009 period," (November 2011), http://www.bls.gov/opub/regional_reports/mass_hightech/201111_mass_hightech.pdf.

The manufacturing industries within the high-tech sector continue to lose jobs, with a total of 42,189 jobs lost between 2001 and 2014 in the computer equipment, communications equipment, semiconductor, and electronic instrument manufacturing sub-sectors.

Trade remains important to the Bay State economy and passage of Trans-Pacific Partnership supported by the President and passed by Congress this year could, upon implementation, expand markets for the state's goods and services. Massachusetts ranked 18th in the United States in 2014 and first in New England with \$27.4 billion in exports.⁴³ Exports increased 2.0% for Massachusetts while the U.S. export rate increased 2.8% over the previous year.

The Massachusetts housing picture brightened in the past year. The Boston component of the Case-Shiller 20-City Composite Index rose by .48% September 2015 over August 2015 and 5.0% September 2015 over September 2014.⁴⁴

Massachusetts continues to rank atop the Institute's measure of competitiveness with the state benefitting from abundant human capital, a low crime rate and a substantial ability to draw domestic and foreign investment.⁴⁵ With its diverse industrial sectors, the Commonwealth continues to be a leader in high tech, education and finance. However, the 2014 report shows that Massachusetts declined slightly in the Government and Fiscal Policy Sub-Index from 28th to 33^d.

New England business respondents to the Federal Reserve's Beige Book survey suggest that the local economic expansion is "somewhat slower" than the last quarter.⁴⁶ A recession in Canada, the state's leading foreign trading partner and a strong dollar could have dampening effects on Massachusetts firms. A significant part of any outlook depends on factors outside Massachusetts including worries about terrorism and a decline in oil prices which, while bringing benefits to consumers, may spell hurdles for the state's producers with exposure to resource extraction.

Future state tax policy appears to be predictably stable with no major rate increases planned. And immigration continues to rebound from past decades. Spending should be held in check and reliance upon drawn-downs during periods of economic recovery from the stabilization fund (which is dependent on volatile capital gains tax revenue) may be unwise.⁴⁷

⁴³ Massachusetts Benchmarks. "Due Diligence," FY 2015, First Quarter, <http://www.massbenchmarks.org/statedata/data/DueDiligence.pdf>.

⁴⁴ See Case-Shiller, <http://us.spindices.com/indices/real-estate/sp-case-shiller-20-city-composite-home-price-index>.

⁴⁵ Beacon Hill Institute at Suffolk University, *State Competitiveness Report* (14), (June 2015). <http://www.beaconhill.org/Compete14/PRCompete14StateFinal.html>.

⁴⁶ Board of Governors of the Federal Reserve System, "Beige Book," "Boston."

⁴⁷ Massachusetts Taxpayers Foundation, "Stabilization fund dip during recovery puts state at risk," (November 10, 2015) <http://tinyurl.com/o4no4uo>.

Methodology

The Department of Revenue indicates that tax law changes will reduce revenue collections for a variety of taxes. According to DOR, the tax law changes will increase revenue by \$137 million in FY 2016 and \$242 million in FY 2017. However, the largest portion comes from tax changes enacted in previous years, which we include is already included in the data set. We do include tax changes that were enacted for FY 2015 and FY 2016 and anticipated in FY 2017, including the personal income tax rate cuts and other smaller tax changes. As a result of these adjustments, we increase our estimates by \$9 million FY 2016 and reduce our estimates by \$179 million in FY 2017.

Table 1

Economic Forecasts for Massachusetts, 2016 through 2017

	Actual	Actual	Actual	Actual	Actual	Forecast	Forecast	Forecast
US economy CY (calendar year)	2010	2011	2012	2013	2014	2015	2016	2017
Personal income (\$ billion)	12,429	13,202	13,888	14,167	14,859	15,602	16,382	16,382
% change per .annum (p.a.)	2.8	6.2	5.2	2.0	4.9	5.0	5.0	-
Employment (millions)	139.3	140.9	143.3	144.7	147.4	150.4	153.4	153.4
% change p.a.	0.9	1.1	1.7	1.0	1.9	2.0	2.0	-
Unemployment rate, %	9.7	8.5	7.9	6.7	5.6	5.3	5.1	5.1
Massachusetts (calendar year end)¹								
Gross State Product	395	404	411	415	425	440	454	463
% change p.a.	20.7	2.3	1.7	1.1	2.3	3.5	3.1	2.2
Personal income (\$ billion)	338	358	377	383	400	422	447	470
% change p.a.	14.0	6.0	5.2	1.7	4.3	5.5	6.0	5.1
Employment ('000)	3,214	3,250	3,302	3,359	3,414	3,482	3,546	3,594
% change p.a.	1.1	1.1	1.6	1.7	1.6	2.0	1.8	1.4
Unemployment rate, %	8.3	7.2	6.7	6.6	5.7	4.7	4.4	4.2
BHI forecast, MA taxes, (fiscal year)								
Personal income tax (\$ million)	10,110	11,576	11,911	12,829	13,202	14,449	15,153	16,081
% change p.a.	(4.5)	14.5	2.9	7.7	2.9	9.4	4.9	6.1
Sales Tax	4,612	4,905	5,059	5,164.0	5,495.8	5,774.5	6,100	6,190
% change p.a.	19.2	6.3	3.2	2.1	6.4	5.1	5.6	1.5
Corporation Excise	1,600	1,951	1,771	1,821.6	2,049.0	2,172.1	2,060	2,487
% change p.a.	3.3	21.9	(9.2)	2.8	12.5	6.0	(5.2)	20.7
Business Excises	520	276	549	439	461	388	313	399
% change p.a.	(5.57)	(46.87)	98.71	(20.0)	5.0	(15.8)	(19.4)	27.4
Motor Fuels	655	661	662	652	732	756	804	832
% change p.a.	0.1	0.0	0.2	(1.6)	12.4	3.2	6.4	3.5
Total Taxes	18,544	20,517	21,115	22,121	23,369	24,932	25,924	27,560
% change p.a.	1.6	10.6	2.9	4.8	5.6	6.7	4.0	6.3

Notes: ¹ From New England Economic Partnership, Fall *Economic Outlook*, 2015.

BHI revenue forecasts assume that there will be no additional major change in Massachusetts tax policy for the forecast period, which runs through June 2017. Table 1 shows the forecasts by year and by major tax.

For the first six months of FY 2016 (July 2015 through December 2015), tax revenues grew by 4.4% over the first six months of FY 2015, led by a 8.6% increase in corporate income taxes, an 6.6% increase in other tax revenues (estate, room occupancy and deeds) a 4.2% increase in personal income tax revenue and a 5.9% increase in sales tax revenues. Motor fuels tax revenues saw an increase, while cigarette tax revenues decreased 1.7% and business excise taxes fell by 36.6%.

We see this trend continuing for the rest of the fiscal with sales tax revenues increasing by 5.6% and personal income tax revenues by 4.9%. Corporate income tax revenues will increase decrease by 5.2% and business excise taxes revenues decreasing 19.4%. For FY 2016, we expect total tax revenues to increase by 4.0% over FY 2015.

For FY 2017, we forecast a 5.6% increase in tax revenues over FY 2016. Personal income tax revenues will increase by 6.1% and sales tax revenues by 1.5%. Corporate income tax revenues will rise by 20.7%, and business excise tax revenues will increase by 27.4%. Business excise taxes have experienced the most volatility in the year-over-year collections, and, as a result, remain the most difficult to forecast. Other tax revenues will rise by 11.0% and alcohol taxes will rise by 0.7%. Motor fuels taxes will rise 3.5%, while cigarette taxes will fall 4.5%.

We prepared tax revenue forecasts for 11 categories for every month through June 2017. Three steps were needed to develop these forecasts.

1. We used projections of personal income to derive month-by-month growth rates of personal income, allowing us to project personal income on a monthly basis through June 2017. Information on personal income in Massachusetts is available on a quarterly basis. Monthly estimates were obtained by interpolation.
2. For each tax series, we estimated a regression equation that extrapolates from historical data to predict the future. For estimated and withheld income taxes and other taxes, we included personal income as an independent variable. We used dummy variables to pick up the effect of major changes in the tax code.
3. 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 the AR and MA lags were determined initially by examining the autocorrelation and partial correlation coefficients in the correlogram, and then fine-tuning after examining the structure of the equation residuals. The details are given in Table 2.

Table 2
Revenue forecasts, disaggregated, for FY16 and FY17, including technical estimation details

	% change										Vars/Dummies	Dates	
	FY14	FY15	FY16	FY17	FY13	FY14	FY15	FY16	FY17	AR			MA
Income tax													
Estimated payments	2,759	3,174	3,242	3,343	13.8%	6.0%	15.0%	2.2%	3.1%	1,2,5,12	3	PI, PIEST(-12)	79:6-15:11
Tax Withheld	10,509	11,063	11,742	12,063	2.5%	4.9%	5.3%	6.1%	2.7%	1,12	12	PI	79:6-15:11
Returns & Bills	1,942	2,257	2,372	3,123	23.5%	-8.0%	16.2%	5.1%	31.6%	1,12	1,12	PI	79:6-15:11
Refunds	-2,008	(2,045)	(2,204)	(2,447)	2.6%	5.7%	1.9%	7.7%	11.1%	1,2,12	1,3,12	PI	79:6-15:11
Income Net	13,202	14,449	15,153	16,081	7.7%	2.9%	9.4%	4.9%	6.1%				
Sales & Use taxes	5,496	5,774	6,100	6,190	2.1%	6.4%	5.1%	5.6%	1.5%	4,12	1,13	C	79:6-15:11
Corporation Excise	2,049	2,172	2,060	2,487	2.8%	12.5%	6.0%	-5.2%	20.7%	12	3,12	PI	79:6-15:11
Business Excises	461	388	313	399	-20.0%	5.0%	-15.8%	-19.4%	27.4%	12	3,12	C	79:6-15:11
Alcohol Beverages	78	80	85	86	0.3%	1.9%	2.7%	6.6%	0.7%	1,3,12	12	PI	79:6-15:11
Cigarettes	521	510	497	474	-2.4%	18.3%	-2.0%	-2.6%	-4.5%	1,24	1, 12	83:7, 93:1, 96:10, 02:8, 08:7	79:6-15:11
Motor Fuels	732	756	804	832	-1.6%	12.4%	3.2%	6.4%	3.5%	1,13	1,12	PI	79:6-15:11
Other taxes	831	802	911	1,011	10.1%	18.9%	-3.4%	13.5%	11.0%	1,12	2,12	PI	79:6-15:11
Effect of Tax Law Changes			9	(179)									
Total Taxes	23,369	24,932	25,933	27,381	4.8%	5.6%	6.7%	4.0%	5.6%				

Notes:

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." (PIEST)-12 refers to the income tax estimated payments data lagged by 12 month. PI refers to Personal Income and C, a Constant variable. We directly incorporated into our estimates the cigarette and motor fuels tax increases.

The left side of the table contains the revenues and the percentage increases from the previous year broken out into the individual tax categories – the actual revenues for FY 2014 and FY 2015 as well as the BHI projections for FY 2016 and FY 2017. The right side of the table provides the model specification used to forecast each tax and the timeframe for each data series used in the model.⁴⁸



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⁴⁸A complete breakdown of revenue forecasts by month and by the eleven tax headings is available upon request.