Massachusetts Tax Revenue Forecasts for FY 2018 and FY 2019

The Beacon Hill Institute is pleased to offer its revenue forecast for Fiscal Year (FY) 2018 and FY 2019 to the Executive Office of Administration and Finance and the Joint Ways and Means Committee.[1] We divide our report into three sections: (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:

- **$26.744 billion in FY 2018, 4.2% over FY 2017, and**
- **$27.581 billion in FY 2019, 3.1% over FY 2018.**

The 4.2% increase for FY 2018 and the 3.1% increase in FY 2019 reflect the projected growth of state personal income. NEEP projects state personal income to increase by 4.5% and 4.2% in calendar years 2017 and 2018, respectively.[2]

---

[1] Prepared by the staff of the Beacon Hill Institute including Paul Bachman, David G. Tuerck, and Xhulia Kanani. The authors would like to thank Frank Conte, past director of communications at the Beacon Hill Institute, for his assistance.

[2] New England Economic Partnership, Economic Forecast, October 31, 2017.

(2) Summary of National and State Economies

(2a) The U.S. Economy

The national economy is approaching a sweet spot with the residue of the Great Recession now a distant memory. The nine-year expansion has been slow and steady but below expected post-war standards. The upsurge —eight years in coming — seems to be finally and firmly underway. Consumer spending, business investment, home sales and a rising stock market are all signs of general optimism. For now, the economy is discounting any political "chaos" in Washington D.C. though there is always uncertainty. "Not only do I think the economy's in good shape today, I think the economic expansion is going to continue for some time," New York Fed President William Dudley told *The Wall Street Journal* last month.[3]

According to the "second" estimate released by the Bureau of Economic Analysis, real Gross Domestic Product increased at an annual rate of 3.3% in the third quarter (July-August-September of 2017). At the same time the BEA, in its final measure for the second quarter, reported real GDP increased 3.1%. If the third quarter figure holds up through later revisions, the U.S. economy would realize two consecutive periods of growth greater than 3%. The latest figure is a welcome sign that growth may, at last, be approaching the 3.5% annualized average of the 1990s and is settling slightly above the postwar benchmark rate of 3.0%.[4]

Figure 1
U.S. and Massachusetts GDP

Shaded areas indicate U.S. recessions   Source: U.S. Bureau of Economic Analysis   myf.red/g/ga23
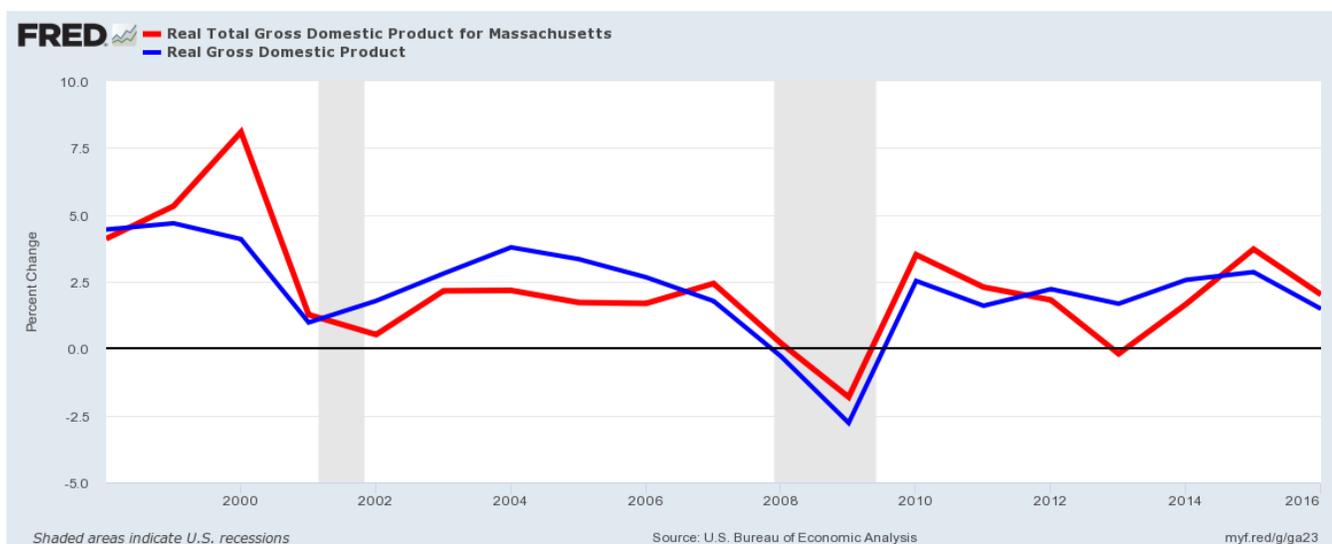
Positive contributions from personal consumption expenditures (PCE), private inventory investment, nonresidential fixed investment, and exports drove growth for the third quarter. A key indicator in the

---

[3] Josh Mitchell, "Economy, Markets Rev Up: Consumer spending, home sales and business investment show rising optimism," Wall Street Journal, November 30, 2017.
https://www.wsj.com/articles/americans-spending-incomes-rose-briskly-in-october-1512048708?tesla=y
[4] OECD, Economic Outlook Annex Tables. (November 2017) http://www.oecd.org/eco/outlook/economic-forecast-summary-united-states-oecd-economic-outlook.pdf. The 3.5% GDP benchmark is based on the years 1990-2001.

GDP data, equipment spending, increased at a 10.4% annual rate in the third quarter.[5] These were offset by decreases in residential fixed investment.

The manufacturing sector is growing robustly, according to the *Markit U.S. Manufacturing Purchasing Managers Index*, a key indicator of business confidence.[6] According to the index, "The level of outstanding business at manufacturing firms increased at an accelerated pace that was the most marked since April. Employment levels, meanwhile, grew at the second-strongest rate seen since June 2015 in November." Growth is being led by producers of business equipment and machinery, indicating investment spending is on the rise.

Consumer confidence rose again for the 5th straight month in November, according to the Conference Board.[7] "Consumers' assessment of current conditions improved moderately, while their expectations regarding the short-term outlook improved more so, driven primarily by the optimism of further improvements in the labor market."

The National Retail Federation reported that October sales increased 4.3% over the previous year.[8] The trade group also expected strong Black Friday and Cyber Monday sales. "All the fundamentals were in place for consumers to take advantage of incredible deals and promotions retailers had to offer," NRF President and CEO Matthew Shay said. "From good weather across the country to low unemployment and strong consumer confidence, the climate was right, literally and figuratively, for consumers to tackle their holiday shopping lists online and in stores."[9]

The October NFIB Index of Small Business Optimism rose for the 12th month. "Owners became much more positive about the economic environment last month, which suggests a longer-run view," said NFIB Chief Economist Bill Dunkelberg. "In the nearer term, they are more optimistic about real sales growth and improved business conditions through the end of the year." Small business owners worry about hiring qualified help. The NFIB survey noted, "Fifty-nine percent of owners said they tried to hire in October, with 88 percent of them reporting no or few qualified applicants."[10]

All told the U.S. economy closed the output gap in recent months.[11] According to the Congressional Budget Office, total actual GDP exceeded potential GDP for the first time since the fourth quarter of 2007. In April 2017, the economy regained the number of jobs it lost in the Great Recession, but this

---

[5] Brian Wesbury, "Real GDP revised UP to a 3.3% Annual Growth Rate in Q3," Data Watch, FT Advisors, November 30, 2017. http://tinyurl.com/y75gjd74.

[6] IHS Markit News Release " November PMI signals robust manufacturing growth," (December 1, 2017) https://www.markiteconomics.com/Survey/PressRelease.mvc/9f58c0e52e65422c9ab9a71b22d96d20

[7] The Conference Board, Consumer Confidence Index,
The Conference Board Consumer Confidence Index Rebounds Strongly in November, (November 30, 2016) https://www.conference-board.org/data/consumerconfidence.cfm.

[8] National Retail Federation, "October Retail Sales Up 4.3 Percent Over Last Year," November 15, 2017 https://nrf.com/media/press-releases/october-retail-sales-43-percent-over-last-year

[9] National Retail Federation, "Consumers and Retailers Win Big Over Thanksgiving Holiday," November 28, 2017 https://nrf.com/media/press-releases/consumers-and-retailers-win-big-over-thanksgiving-holiday.

[10] National Federation of Independent Business, "Small Business Optimism Maintains Lofty Level," November 14, 2017, http://www.nfib.com/surveys/small-business-economic-trends/

[11] Ben Leubsdorf, "U.S. Economy Reaches Its Potential Output for First Time in Decade," *Wall Street Journal*, (November 30, 2017), https://www.wsj.com/articles/u-s-gdp-growth-revised-up-to-3-3-rate-in-third-quarter-1511962566

nominal measure didn't capture real labor market conditions. According to the Hamilton Project, the U.S. economy closed the "jobs gap" in demographically-adjusted terms during August 2017.[12]

Expected future global growth in 2018 will also help the U.S. going forward according to leading investment banks.[13] Outlooks provided by Goldman Sachs and Barclays predict global growth "will reach 4%, with G7 economies expected to beat projections for the first time since 2010."[14]

Despite the recent surge in GDP, most forecasters do not see passage through the threshold of 3.0% growth over the next few years. *The Wall Street Journal* Economic Forecasting Survey for November 2017 predicts an average increase of 1.8%, 2.2% and 2.3% for 2017, 2018 and 2019 respectively.[15] The latest *Economist* poll of forecasters suggest that U.S. GDP growth will be between 2.0% and 2.4% in 2017 and 1.9% and 3.0% in 2018 with averages for each year not exceeding 2.5% (see Table 1).[16] The Federal Reserve Bank reports a median range of 2.2% for 2017, 2.1% for 2018 before declining in 2019 to 1.9%.[17] The OECD estimates also fit with the forecasting band made by other economists. The OECD stated, "The economic expansion is projected to continue in 2018 and 2019. Buoyant asset prices and strong business and consumer confidence will support consumption and investment growth. The impact of slowing employment growth on consumption will be partly offset by wage growth acceleration as the labor market tightens further."[18]

Table 1
Economic Forecasts for the United States, Selected Years

Calendar Year	WSJ Survey of Economists	Federal Reserve Bank (Median Range)	*The Economist* (Average)	OECD	NEEP (U.S./FRB)
Forecast date	November-17	July-17	November-17	November-17	November-17
2017	2.5%	2.2%	2.2%	2.2%	2.2%
2018	2.5%	2.1%	2.4%	2.5%	2.3%
2019	2.1%	1.9%	N/A	2.1%	2.0%
2020	2.0%	N/A	N/A	N/A	1.9%

[12] Diane Whitmore Schanzenbach, Ryan Nunn, Lauren Bauer and Audrey Breitwieser, "The Closing of the Jobs Gap: A Decade of Recession and Recovery," Brookings Institution-Hamilton Project (August 4, 2017) http://www.hamiltonproject.org/papers/the_closing_of_the_jobs_gap_a_decade_of_recession_and_recovery.

[13] Keshia Hannam, "Global Growth in 2018 Will Be 'As Good As It Gets,' Goldman, Barclays Say," *Fortune*, November 28, 2017, http://fortune.com/2017/11/28/goldman-barclays-morgan-stanley-world-economy-2018/

[14] Ibid.

[15] *Wall Street Journal* Economic Forecasting Survey (November 2017), http://projects.wsj.com/econforecast/#r=10&ind=gdpa.

[16] *The Economist* poll of forecasters, November 2017 averages (November 11, 2017). http://tinyurl.com/ycmyqdo5. See also http://www.economist.com/indicators.

[17] Federal Reserve Bank, (July 2017),https://www.federalreserve.gov/monetarypolicy/files/20170707_mprfullreport.pdf.

[18] Organization for Economic Co-operation and Development, "United States - Economic forecast summary (November 2017)," http://www.oecd.org/eco/outlook/united-states-economic-forecast-summary.htm.

The unemployment rate fell to 4.1% in October 2007. Since January, the unemployment rate has declined by 0.7 percentage point, and the number of unemployed persons has decreased by 1.1 million. In October, the number of long-term unemployed (those jobless for 27 weeks or more) was little changed at 1.6 million and accounted for 24.8% of the unemployed. The labor force participation rate decreased by 0.4 percentage point to 62.7% in October but has shown little movement on net over the past 12 months. The economy created 4.256 million jobs in 2016 and is on pace to match that number in 2017.[19]

Economic conditions will always challenge the ability of state revenue forecasters. Revenue for all 50 state governments grew by 3.01% in the first quarter of 2017 according to the Rockefeller Institute of Government.[20] Nationally, sales tax revenues increased while the corporate tax revenues declined 26.9%. Early data for the second quarter of 2017 indicate "substantial weakness and declines in income tax collections. Revenue forecasts for 2018 "remain relatively weak for both personal income and sales tax collections." On the other hand, local government revenue has increased due to increasing housing prices and stable revenues generated from property taxes. This is expected to continue. The emerging tax reform bill from Washington will most certainly weigh on the minds of state taxpayers who face the loss of deductions. As the Rockefeller Institute authors note: "behavioral incentives can have powerful effects on state tax revenue even if federal tax reform is not enacted or is substantially different than expected. The possibility of reform is enough to change behavior and some taxpayers will continue gaming nonwage income."[21]

In November, The Beacon Hill Institute applied its CGE (Computable General Equilibrium) national tax model to the Tax Cuts and Jobs Act passed by the House of Representatives and found that the plan would increase real GDP by 2.3%, personal income by 2.5% and investment by 5.7%.[22] The model also showed that the plan would reduce federal tax revenues by $407 billion over the 10-year period 2018-27. (See Tables A1 and A2 in Appendix). When dynamic effects are factored, all income deciles would gain as a result of the passage of the Act. We have not yet scored the Senate Act.

---

[19] Bureau of Labor Statistics, https://data.bls.gov/timeseries/CES0000000001?output_view=net_1mth.

[20] Lucy Dadayan and Donald J. Boyd, "State Revenue Report #108: Volatility in State Tax Revenues; Mounting Fiscal Uncertainties," Rockefeller Institute of Government, (September 2017), http://www.rockinst.org/pdf/government_finance/state_revenue_report/2017-09-19-srr_108.pdf.

[21] Ibid.

[22] Paul Bachman, Keshab Bhattarai, Jonathan Haughton, and David G. Tuerck, "The Economic Effects of the Tax Cuts and Jobs Act," The Beacon Hill Institute, http://www.beaconhill.org/BHIStudies/TrumpRyanTaxReform2017-1118/2017-1117BHI-Trump-RyanTaxProposal.pdf.

(2b) The Massachusetts Economy

The size of Massachusetts's economy, measured by nominal GDP, is more than $523.3 billion and comprises 2.7% of the U.S. economy.[23] In 2016, the Massachusetts economy grew by 2.0%. However, the state's economy grew 1.1% and 2.0% in the first two quarters of 2017 respectfully. Compared to the rest of the nation Massachusetts's second-quarter growth ranked 36th — well behind New England leaders New Hampshire and Vermont.[24] Contributions by professional, scientific, and technical services (0.59 percentage points); information (0.45); health care and social assistance (0.42) real estate and rental and leasing (0.30) and retail trade (0.26) led the way in the second quarter.

In its fall 2017 forecast, the latest available, the New England Economic Partnership (NEEP) predicts steady, but slow growth through 2021: namely: 2.6% (2017); 2.2% (2018); 1.9% (2019) 2.0% (2020) and 2.1% (2021).[25]

The state's total unemployment rate dropped to 3.7 percent in October 2017 and added 4,800 jobs. Gains took place mostly across the board.[26] The September estimate was revised to a gain of 10,300 jobs. From October 2016 to October 2017, BLS estimates Massachusetts has added 69,000 jobs. The October unemployment rate was four-tenths of a percentage point lower than the national rate of 4.1 percent. The city of Cambridge posted the lowest unemployment rate of 2.4% according to BLS regional estimates.[27]

The state's Labor Force Participation (LFP) was 65.5% in October 2017, lower than the 69% peak reached at the height of the dot.com boom.[28] This, however, once again compared favorably to the national average of 62.7% for October 2017 and has shown little movement on net over the past year.

In July 2017, Massachusetts regained all the jobs it lost in the Great Recession. Particularly noteworthy is the relative stability of the state's jobs composition. Except for the dramatic losses in manufacturing jobs, the composition remains dominated by the professional services and health and education sectors. (See Table 2). While Massachusetts lost approximately 46,000 jobs over the last ten years in the manufacturing sector, the gain in the education and health sector was 3.4 times as large. Overall, structural changes have been minimal for most of the state's employment sectors.

---

[23] Bureau of Economic Analysis, "Gross Domestic Product by State: Second Quarter 2017," (November 21, 2017) https://www.bea.gov/newsreleases/regional/gdp_state/2017/pdf/qgsp1117.pdf.

[24] Bureau of Economic Analysis, "Gross Domestic Product by State: First Quarter 2016: Construction Led Growth across States in the First Quarter, (July 27, 2016), http://www.bea.gov/newsreleases/regional/gdp_state/qgsp_newsrelease.htm. http://www.bea.gov/newsreleases/regional/gdp_state/2016/qgsp0716.htm

[25] New England Economic Partnership, November 2017 Economic Outlook Conference "Charting Economic Policy: The New Normal in Non-normal Times (November 28, 2017): 35-36.

[26] Executive Office of Labor and Workforce Development, "Massachusetts Adds 4,800 Jobs in October - Unemployment Rate at 3.7%," November 16, 2017, https://www.mass.gov/news/massachusetts-adds-4800-jobs-in-october-unemployment-rate-at-37-percent.

[27] Bureau of Labor Statistics, http://www.bls.gov/regions/new-england/summary/blssummary_boston.pdf.

[28] Bureau of Labor Statistics, "Employment status of the civilian non-institutional population, seasonally adjusted," (October 2017), https://www.bls.gov/web/laus/ststdsadata.txt.

During the same period, the financial sector remained comparatively flat losing only a mere 700 jobs. As a proportion of all jobs, the government sector shrunk by 0.5 percentage points over ten years. The composition of the labor force will partly determine growth in personal income which in turn drives state tax revenue with higher wage jobs in professional services, education and health are leading the way. On the other hand, personal income in low-wage, low-productivity sectors could drag down income tax revenues.

Table 2:
Change in Massachusetts Jobs Composition 2007 – 2017

INDUSTRY SUPER SECTOR	October-17	October-07	Net Change 10-yr	% Workforce 2017	% Workforce 2007	10-year diff
EDUCATION AND HEALTH SERVICES	804,500	649,700	154800	22.1%	19.6%	2.5%
PROFESSIONAL, SCIENTIFIC & BUSINESS SERV	572,800	484,500	88300	15.7%	14.6%	1.1%
LEISURE AND HOSPITALITY	367,600	304,500	63100	10.1%	9.2%	0.9%
OTHER SERVICES	143,700	120,800	22900	3.9%	3.6%	0.3%
MINING, LOGGING, AND CONSTRUCTION	153,400	139,100	14300	4.2%	4.2%	0.0%
INFORMATION	89,200	89,100	100	2.4%	2.7%	-0.2%
GOVERNMENT	459,800	434,000	25800	12.6%	13.1%	-0.5%
FINANCIAL ACTIVITIES	228,600	229,300	-700	6.3%	6.9%	-0.6%
TRADE, TRANSPORTATION, AND UTILITIES	578,600	570,600	8000	15.9%	17.2%	-1.3%
MANUFACTURING	245,300	291,200	-45900	6.7%	8.8%	-2.1%
TOTAL NONFARM	3,643,500	3,312,800	330,700	100.0%	100.0%	0.0%
Source: Bureau of Labor Statistics, BHI calculations						

According to the latest ManpowerGroup Employment Outlook Survey, employers in Massachusetts were expected "to hire at a respectable pace during Quarter 4 2017." The staffing agency noted that 21% of the companies in its survey planned to hire more employees, while only 5% expected to reduce their payrolls. Another 72% expected to maintain their current workforce levels and 2% were not certain of their hiring plans. Employment growth was predicted to take place across all employment sectors except for construction and information services.[29]

The Federal Reserve Bank's most recent "Beige Book" noted that business activity in New England "continued to expand at a modest to moderate pace in recent weeks."[30] The bank also cited growth in the retail and manufacturing sectors. And, in a sign that underscores tight labor markets, staffing agencies reported revenue gains even as the labor pool diminishes. In this climate, employers are offering generous compensation packages to draw top-flight engineers. Approaching the peak of its cycle, semi-conductor manufacturing firms in states like Massachusetts point to sales growth in

---

[16] ManpowerGroup, " "Healthy Job Market Expected for Massachusetts,"September 12, 2017, http://press.manpower.com/reports/2017/healthy-job-market-expected-for-massachusetts-4/
[30] Federal Reserve Bank, "Beige Book," November 29, 2017, https://www.federalreserve.gov/monetarypolicy/beige-book-default.htm.

Europe. Office leasing remains strong in Boston. However, housing inventory is low. The Fed's Beige Book noted that condo sales were down in Massachusetts. [31]

Massachusetts continues to rank atop the Beacon Hill Institute's measure of competitiveness which is based on the productivity of its firms and workers. The state continues to benefit from abundant human capital driven in part by immigration, technology, and a substantial ability not only to draw domestic and foreign investment but venture capital. Its ability to cultivate and retain a base of scientists and engineers adds to its strength as a patent hub.[32] However, this latest edition shows that Massachusetts remained below the median in the Government and Fiscal Policy sub-index at number 37, due to the high ratio of state and local taxes over per capita of income and generous unemployment benefits. Year-after-year, the index shows consistently that the state has not made any progress in addressing infrastructure (i.e., travel time to work), energy and housing problems (rental costs and access to competitively priced energy). Still, the state's strengths in human capital make it an attractive candidate for technology giants such as Amazon that consider expansion into the Bay State.[33]

Based on a survey of its 4,000 members that excludes large chain stores, the Retailers Association of Massachusetts predicts a 3.1% gain in retail sales in November and December compared with 2016.[34] Massachusetts sales trailed national growth last year declining by 1% as U.S. sales increased by 4.7%. But improving conditions and consumer confidence will drive better sales say the retailers group. Employment in the state's retail sector, which has grown for seven straight years has reached pre-recession levels in 2007.

Changing demographics for Massachusetts could cause long-term changes to the state's revenue mix.[35] The effect of the first wave of baby boom retirements on state budget is a topic of discussion among public finance economists who have only begun to study the implications on state tax revenue. Labor force growth is expected to decline. Older workers tend to spend less while having less of their income exposed to taxation.[36]

One essential element to understand is the state's recent labor force participation rate. The New England region's labor force (including the critical prime-age cohort) decreased less than the national labor force, a trend that began in 2009. Massachusetts' moderate decline outstripped predictions about a shrinking workforce.[37] Massachusetts saw a 1.2 percentage point decline in LFP, the lowest in New

---

[31] Ibid.

[32] Beacon Hill Institute, *State Competitiveness Report* (16), http://www.beaconhill.org/Compete16/2016Competitiveness_report_dgt.WebVersion.pdf.

[33] Frank Conte and David G. Tuerck, "Why Amazon should one-click Massachusetts for its second HQ," *Boston Business Journal*, November 5, 2017 https://www.bizjournals.com/boston/news/2017/11/05/viewpoint-why-Amazon-should-one-click.html.

[34] Retailers Association of Massachusetts, "RAM predicts local holiday sales increases of 3.1%: Stable Consumer Confidence and Year to Date Trends Should Help Massachusetts Retailers Boost Sales. Press Release (November 17, 2016) http://www.retailersma.org/assets/2017%20Holiday%20Press%20Release.pdf

[35] Alison Felix and Kate Watkins, "The Impact of an Aging U.S. Population on State Tax Revenues," Economic Review, Federal Reserve Bank of Kansas City, (Fourth Quarter 2013):95-127, https://www.kansascityfed.org/publicat/econrev/pdf/13q4Felix-Watkins.pdf.

[36] Felix and Watkins. 2013.

[37] Mary A. Burke, "Labor Force Participation in New England vs. The U.S. 2007-2016: What Was the Regional Decline More Moderate?", Presentation to the BLS Boston Data Users Group Conference, (December 1, 2017). See also Burke, (October 2016), http://tinyurl.com/ybd866cf.

England.[38] While population aging explains much of the drop, the number of workers ages 55 and over declined less in New England than the nation. In other words, the demographic drag is offset by the number of older workers who are postponing retirement. What is unclear at this point is whether older workers remain in the workforce out of necessity or other reasons.

While more research is necessary to forecast workforce participation and overall spending of aging populations, state governments should examine whether the current reliance on the mix of income and sales taxes are sufficient to meet future expenditures.

State budget writers should be especially mindful of the Commonwealth's long-term obligations as identified by the Mercatus Center's measure of fiscal health. The reported noted, "On a long-run basis, a net asset ratio of −1.84 points to a heavy reliance on debt and large unfunded obligations. Long-term liabilities are 239 percent of total assets, for a per capita long-term liability of $9,919. Total primary government debt is $28.43 billion, or 6.9 percent of personal income, nearly twice the average in the states."[39]

---

[38] Ibid.

[39] Eileen Norcross and Olivia Gonzalez, "Ranking the States by Fiscal Condition," 2017 Edition, (July 11, 2017) https://www.mercatus.org/system/files/norcross-fiscalrankings-2017-mercatus-v1.pdf.

Methodology

Table 3
Economic Forecasts for Massachusetts, 2017 through 2019

Massachusetts (calendar year-end)[1]	Actual 2014	Actual 2015	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019
Gross State Product	421.9	437.6	446.5	458.1	468.1	477.2
% change p.a.	*1.7*	*3.7*	*2.0*	*2.6*	*2.2*	*1.9*
Personal income ($ billion)	400.2	426.4	437.6	459.3	480	500.1
% change p.a.	*4.4*	*6.5*	*2.6*	*5.0*	*4.5*	*4.2*
Employment ('000)	3,434	3,502	3,562	3,622	3,662	3,685
% change p.a.	*2.0*	*2.0*	*1.7*	*1.7*	*1.1*	*0.6*
Unemployment rate, %	5.7	4.8	3.7	3.9	3.7	3.7
BHI forecast, MA taxes, (fiscal year)	**Actual**	**Actual**	**Actual**	**Actual**	**Forecast**	**Forecast**
Personal income tax ($ million)	13,202	14,449	14,394	14,684	15,284	15,838
% change p.a.	*10.8*	*9.4*	*(0.4)*	*2.0*	*4.1*	*3.6*
Sales Tax	5495.8	5774.5	6054.6	6211.1	6,438	6,692
% change p.a.	*8.6*	*5.1*	*4.9*	*2.6*	*3.6*	*3.9*
Corporation Income	2049.0	2172.1	2312.0	2196.7	2,413	2,497
% change p.a.	*15.7*	*6.0*	*6.4*	*(5.0)*	*9.9*	*3.5*
Business Excises	461	388	391	358	379	351
% change p.a.	*(15.9)*	*(15.8)*	*0.7*	*(8.5)*	*5.8*	*(7.4)*
Motor Fuels	732	756	767	769	778	789
% change p.a.	*10.6*	*3.2*	*1.4*	*.4*	*1.4*	*1.5*
Total Taxes	23,369	24,932	25,425	25,662	**26,744**	**27,581**
% change p.a.	*10.7*	*6.7*	*2.0*	*0.9*	*4.2*	*3.1*

Notes: [1] From New England Economic Partnership, Fall *Economic Outlook*, 2017.

BHI revenue forecasts assume that there will be no major change in Massachusetts tax policy for the forecast period, which runs through June 2019. For FY 2018, we make adjustments for changes to the Earned Income Tax Credit (-$76 million, tax deduction for 529 accounts (-$9 million), the illegal tobacco task force (+$7 million), elimination of the tuition deduction for non-residents (+$6 million) and moving $10 million off budget. The total of these changes reduces revenues by $84 million.

We include these changes in FY 2019 and also include the Income Tax Part-B tax rate phase-in for $84 million in FY 2019 for a total revenue reduction of $168 million for FY 2019. Table 3 shows the forecasts by year and by major tax.

For FY 2018, we forecast a 4.2% increase in tax revenues over FY 2017. Personal income tax revenues will increase by 4.1% and sales tax revenues by 3.6%. Corporate income tax revenues will rise by 9.9%, and business excise tax revenues will increase by 5.8%. 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% and alcohol taxes will increase by 2.2%. Motor fuels taxes will increase by 1.4% and cigarette taxes will fall by 0.5%.

We prepared tax revenue forecasts for 11 categories for every month through June 2019. 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 2019. 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, 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 3.

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 2017 as well as the BHI projections for FY 2018 and FY 2019. 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.[40]

---

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

Table 4
Revenue forecasts, disaggregated, for FY18 and FY19, including technical estimation details

	FY16	FY17	FY18	FY19	% change FY16	FY17	FY18	FY19	AR	MA	Vars/Dummies	Dates
Income tax												
Estimated payments	3,217	2,975	2,028	2,081	16.6%	-7.5%	-31.8%	2.6%	1,2,5,12	3	PI, PIEST(-12)	79:6-16:08
Tax Withheld	11,427	11,970	12,720	13,271	8.7%	4.8%	6.3%	4.3%	1,12	12	PI	79:6-16:08
Returns & Bills	2,043	1,941	2,114	2,190	5.2%	-5.0%	8.9%	3.6%	1,12	1,12	PI	79:6-16:08
Refunds	(2,293)	(2,202)	(1,578)	(1,705)	14.2%	-4.0%	-28.3%	8.0%	1,2,12	1,3,12	PI	79:6-16:08
Income Net	14,394	14,684	15,284	15,838	9.0%	2.0%	4.1%	3.6%				
Sales & Use taxes	6,055	6,211	6,438	6,692	10.2%	2.6%	3.6%	3.9%	4,12	1,13	C	79:6-16:08
Corporation Excise	2,312	2,197	2,413	2,497	12.8%	-5.0%	9.9%	3.5%	12	3,12	PI	79:6-16:08
Business Excises	391	358	379	351	-15.2%	-8.5%	5.8%	-7.4%	12	3,12	C	79:6-16:08
Alcohol Beverages	83	84	86	88	6.3%	2.2%	2.2%	2.3%	1,3,12	12	PI	79:6-16:08
Cigarettes	506	490	488	481	-2.9%	-3.0%	-0.5%	-1.4%	1,24	1, 12	83:7, 93:1, 96:10, 02:8, 08:7	79:6-16:08
Motor Fuels	767	769	778	789	4.7%	0.4%	1.0%	1.5%	1,13	1,12	PI	79:6-16:08
Other taxes	918	868	964	1,014	10.5%	-5.5%	11.0%	5.2%	1,12	2,12	PI	79:6-16:08
Effect of Tax Law Changes			(84)	(168)								
Total Taxes	25,425	25,662	26,744	27,581	8.8%	0.9%	4.2%	3.1%				

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 months. PI refers to Personal Income and C, a Constant variable. We directly incorporated into our estimates the cigarette and motor fuels tax increases.

Appendix

Table A1 - Beacon Hill Institute Previous Forecast Updates

Forecast Date	FY17($b)	% Change over previous period	FY18 ($b)	% Change over previous period
Sep-16	26.1	3.1	26.9	3.3
Jun-16	26.4	4	27.3	3.3
Dec-15	27.3	5.6	-	-

Table A2: Revenue Effects of the Tax Cuts and Jobs Act Relative to CBO Benchmark

	Change in revenue					
	2018		2027		Cumulative, 2018-27	
	$ billion	%	$ billion	%	$ billion	%
Payroll Tax	13	1.0	37	2.3	270	1.9
Personal Income Tax	141	8.2	221	8.2	1,797	8.2
Corporate Income Tax	-143	-44.2	-305	-68.8	-2,372	-60.7
Estate and Gift Taxes	1	1.0	-34	-100.0	-155	-55.1
Other Taxes and Fees	1	1.0	4	2.3	31	1.9
Total Federal Revenue	8	0.2	-73	-1.4	-407	-0.9

Source: Based on BHI-CGE model simulations.

Table A3: Economic Effects of the Tax Cuts and Jobs Act

	Change relative to CBO baseline			
	2018		2027	
	'000 jobs	%	'000 jobs	%
Total Employment	**2,512**	**1.66**	**3,162**	**1.61**
Private Employment	3,066	2.07	3,762	1.94
Public Employment	-554	-21.31	-601	-23.20
	$ billion	%	$ billion	%
Real GDP ($billion)	175	1.0	497	2.3
Personal Income	540	3.2	609	2.5
Business Investment	149	5.6	279	5.7
Imports	50	1.5	141	3.3
Exports	-49	-1.8	11	0.3

Source: BHI-CGE model.

THE BEACON HILL INSTITUTE

165 Main Street
Suite 306
Medway, MA 02053
Telephone & Fax : 855-244-4550

email: bhi@beaconhill.org
web site: www.beaconhill.org