The Beacon Hill Institute is pleased to offer its revenue forecast for Fiscal Year (FY) 2020 and FY 2021 to the Executive Office of Administration and Finance and the Joint Ways and Means Committee. 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) an overview of the methodology used to provide our projections.

(1) Current Forecast

BHI predicts that tax revenues will be:

- $30.242 billion in FY 2020, 1.9% over FY 2019, and
- $30.476 billion in FY 2021, 0.8% over FY 2020.

The 1.9% increase for FY 2020 and the .8% increase in FY 2021 reflects moderate growth of state personal income. BHI projects state personal income to increase by 2.9% and 2.0% in calendar years 2020 and 2021, respectively.

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1 Preparing by the staff of the Beacon Hill Institute, including William F. Burke, Frank Conte, and David G. Tuerck. The Institute would also like to thank interns Nicholas Robert Sammarco and Matthew Richard Lewis for their assistance.
2 Based on BHI calculations.
(2) Summary of National and State Economies

(2a) The U.S. Economy

Despite worries about the global economy and trade disputes, the U.S. economy continues to expand albeit slowly. The unemployment rate is 3.6 percent—among the lowest rates recorded since 1969. Average hourly rates are up 3 percent while inflation remains below the elusive 2 percent goal of the Federal Reserve Bank. Year over year inflation is 1.8 percent. The U.S. equity markets continue to marvel: major stock indices have hit high record highs despite turbulence for most of the year.

According to the Bureau of Economic Analysis (BEA) preliminary estimate, U.S. real gross domestic product (GDP) increased 2.1 percent in the third quarter of 2019. Economists expected at 1.9 percent rate. Positive contributions from consumers, federal government spending, residential investment, private inventory investment, and exports. Nonresidential fixed investment and imports negated some of the positive developments in the report.

Personal income increased $3.3 billion, mostly unchanged in October according to BEA estimates in late November. Disposable personal income (DPI) decreased $12.6 billion (-0.1 percent) and personal consumption expenditures (PCE) increased $39.7 billion (0.3 percent). Corporate profits, however, are down 0.8 percent from a year ago.

According to the IHS Markit U.S. Composite PMI, U.S. private sector output increased at a faster pace in November, with the rate of expansion quickening to a four-month high. Growth was supported by stronger increases in activity across both the manufacturing and service sectors. IHS noted, “The improvement in the health of the manufacturing sector was supported by sharper and solid expansions in production and new orders. The rate of increase in the former reached a ten-month high amid reports of stronger client demand.”

The National Retail Federation reported that sales in October increased 0.2 percent seasonally adjusted over September and were up 4.2 percent unadjusted year-over-year. The numbers exclude automobile, gasoline and restaurant sales. “Despite the gradual slowdown in the U.S. economy, consumers are in a good place and October’s retail sales are a step forward into the all-important holiday season,” NRF Chief Economist Jack Kleinhenz said. NRF is also optimistic about the current holiday sales season despite its off-year length. Observers note that there are six days fewer but shoppers have already hit the stores before Black Friday.

The National Federation of Independent Business survey for November suggests that owners, supported by record levels of optimism, will continue to expand and invest in inventory.

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4 IHS Markit Flash U.S Composite PMI. (November 22, 2019) https://tinyurl.com/wuwgomq
A continued focus on a recession by policymakers, talking heads, and the media clearly caused some consternation among small businesses in previous months, but after shifting their focus to other topics, it’s become clear that owners are not experiencing the predicted turmoil,” said NFIB President and CEO Juanita D. Duggan. “Small business owners are continuing to create jobs, raise wages, and grow their businesses, thanks to tax cuts and deregulation, and nothing is stopping them except for finding qualified workers.”

The equity markets saw historic gains in 2019 as a result of the tax code overhaul and deregulation under the Trump administration. 7 However, the markets have been plagued by uncertainty generated by the president’s stance on tariffs, increasing inflation and the fear of the Federal Reserve hiking interest rates.

The Wall Street Journal Economic Forecasting Survey for November 2019 predicts growth of 2.1%, 1.7% and 2.0% for 2019, 2020 and 2021 respectively.8 The economists in the survey also predict that the unemployment rate for December 2019 will be 3.6%. The Economist poll of forecasters for November predicts that U.S. GDP growth will be between 1 percent and 1.6 percent in 2019 and 2020.9 In its annual Monetary Report, The Federal Reserve Bank reports a median estimate of 2.1% for 2019, falling to 2.0% in 2020 and going lower in 2021 to 1.8%.10 In its long-term outlook, the OECD notes the positive expansion in output, labor markets and wages but also noted in its analysis that “On the other hand, in addition to intense trade tensions, the combined effects of a waning fiscal impulse, weaker growth in trading partners, and demographic pressures are weighing on confidence and activity.”11

### Table 1

Economic Forecasts for the United States, 2019 through 2021

<table>
<thead>
<tr>
<th>Forecasters</th>
<th>Date of Forecast</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
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<tr>
<td>Federal Reserve Bank (Median)</td>
<td>July 5, 2019</td>
<td>2.1</td>
<td>2</td>
<td>1.8</td>
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<tr>
<td>OECD</td>
<td>November 1, 2019</td>
<td>2.3</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Wall Street Journal Survey (Avg)</td>
<td>November 2, 2019</td>
<td>2.1</td>
<td>1.7</td>
<td>2.0</td>
</tr>
<tr>
<td>The Economist</td>
<td>November 26, 2019</td>
<td>1</td>
<td>1.6</td>
<td>N/A</td>
</tr>
</tbody>
</table>

The American jobs machine more than just muddles on. After revisions to the two previous months, a key indicator of momentum, job gains have averaged 176,000 over the last three months. Both workers who are “marginally attached to the labor force” and “discouraged workers” are down from a year ago: 262,000 and 165,000 respectively. While the BLS reported that the Labor Force Participation (LFP) rate remained unchanged, approximately 325,000 workers entered the workforce. Job growth is a pronounced topic in discussion about the strength of the U.S. economy and the good news often has analysts second-guessing predictions. “Over the past decade, the labor market has demonstrated surprising strength

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many times even as other measures of the economy cast a shadow of doubt. It’s doing so again,” said Jim Baird, chief investment officer at Plante Moran Financial Advisors. The BLS reported a gain of 129,000 private sector jobs nearly matching the ADP National Employment Report estimate of 125,000 jobs.

Unemployment continues to decline across all educational attainment groups. The rate for workers with less than a high school diploma is now 4.8 percent—far lower than the pre-recession rate of 7.0 percent in January 2006 (See Figure 1). The college educated cohort current enjoys an unemployment rate of 2.0 percent. In the last 12-month period, the average unemployment rate is as follows: for those with less than a high school education (5.5 percent); high school graduates-no college (3.7 percent); Some college or associate’s degree (3.1 percent) and bachelor’s or higher (2.1 percent.)

Figure 1
Unemployment Rates by Educational Attainment

Across the nation, state and local government revenue continues to grow. Revenue for state and local governments in all 50 states increased by 9.0 percent to $398.7 billion in the second quarter, from $365.7 billion in the same quarter of the previous year. The second quarter recorded revenue increases in the individual income tax, the general sales and gross receipts tax, and the corporation net income tax. The U.S. Census Bureau noted that for state governments, corporation net income tax collections ($25.9 billion) increased 18.4 percent from $21.8 billion collected in the same quarter in 2018.

(2b) The Massachusetts Economy

As estimated by the BEA, the size of the Massachusetts economy is $592.5 billion. However, with its 1.5 percent growth rate, the state ranked 34rd in the nation in percentage change of growth. The BEA reported that Massachusetts GDP grew by 4.4% in the first quarter of 2019.

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5 Plante Moran Financial Advisors
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Finance and insurance; retail trade; and health care and social assistance were the leading contributors to the increase in U.S. economic growth in the first quarter of 2019.

State output mirrored the growth in the same sectors. Year over year, however, tells a different story. Massachusetts grew at a torrid rate of 4.4 in the first quarter of 2019 before slowing down to 1.5 percent. In the most recent survey, Massachusetts growth by and large lags expansions in other high technology states. The state of Washington grew by 3.2 percent (5th rank) Virginia by 1.9 percent (21) while the Utah economy grew by 3.0 percent (6). Meanwhile, California slowed to 2.7 percent (20), Colorado by 2.9 percent (7); North Carolina grew by 1.6 percent (32) as Minnesota expanded by 2.6 percent (37).

The state’s October total unemployment rate remained at 2.9 percent, the Executive Office of Labor and Workforce Development. The Bureau of Labor Statistics’ (BLS) preliminary job estimates indicate Massachusetts added 10,300 jobs in October. Over the month, the private sector added 10,800 jobs as gains occurred in Education and Health Services; Professional, Scientific and Business Services; Trade, Transportation and Utilities; Manufacturing; Other Services; Leisure and Hospitality; Information; and Construction. The one loss occurred in Financial Activities. Government lost jobs over the month. From October 2018 to October 2019, BLS estimates Massachusetts added 51,700 jobs. The statewide unemployment rate has remained at or below three percent for nine consecutive months and the twelve-month average unemployment rate for Black residents of the Commonwealth dropped below four percent for the first time since the recession,” Labor and Workforce Development Secretary Rosalin Acosta said.

At the local level, lagging indicators on unemployment rates showed further declines. BLS found that the unemployment rate dropped to 2.6% for the Boston-Cambridge-Newton area in August 2019. The city of Springfield saw an unemployment rate of 3.7% in July 2019 while the Worcester area saw a rate of 3.3%. The Cape Cod region, identified by the Barnstable Town area saw a decline to 2.7 percent from 3.2 percent a year ago.

According to its September Employment Outlook Survey, ManpowerGroup, the human resources consulting firm, found hiring sentiment in good health for Massachusetts. “Compared to last quarter’s Net Employment Outlook of 23%, Massachusetts employers have reported a weaker hiring pace of 20%,” said Betty Gooding, spokesperson for Manpower, a Manpower Group brand. “When looking at expectations from this time last year of 19%, hiring managers anticipate the upcoming season’s payrolls to remain stable.”

The Federal Reserve Bank’s November 2019 “Beige Book” on New England reports a moderate to strong pace of growth among staffing firms, manufacturers and retailers. The bank notes, that labor market remained tight.” The Boston Fed noted that “passenger traffic to Logan International was up 2.3 percent

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for domestic travel and up 11.1 percent for international travel through September compared with a year earlier”. 26 The Beige Book also noted concern about current and potential tariffs.

According to the Retailers Association of Massachusetts (RAM) the state can expect a solid 3% gain in retail sales during the holiday period over the same period in 2018. RAM reports that “An increase of that level would represent sales growth on top of the strong 2018 Massachusetts increase of 4%.” 29 Historically the holiday shopping season represents on average 20 percent of all annual retail sales, with some stores seeing 25-30% of their sales during the period says the trade association.

As a proxy for economic sentiment, a WBUR survey of voter outlook noted that 58 percent of respondents believe the state is moving in the right direction. 7 The finding is consistent with trends identified by other polling organizations in the state over the past two years. 8

As with the nation, Massachusetts faces uncertainty with the current disputes over trade. Exports are critical to the state’s industries with Canada, Mexico and China reigning as the top three destinations for the bulk of $27 billion in Massachusetts goods. These top three nations have been at the center of trade deal restructuring in the form of the United States-Mexico-Canada Agreement USMCA (the “new” NAFTA) and the recent imposition of tariffs on Chinese goods. A study by the Beacon Hill Institute for the National Foundation for American Policy found that most of the nationwide gains from the Trump administration’s regulatory reforms have been erased in light of the new tariffs (See Table A-1). 9

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The Department of Revenue indicates that tax law changes will alter revenue collections for a variety of taxes. According to DOR, the tax law changes will decrease revenue by $141 million in FY 2020 and reduce revenue by $246 million in FY 2021. The DOR estimates the Marijuana tax on recreational sales will increase revenues by $110 million in FY 2020 and $13 million in FY 2020. The excise tax on vaping products and ban of flavored tobacco products will reduce revenues by $1.49 million in FY 2020 and decrease revenues by $93 million in FY 2021. DOR expects the Income Tax Part-B personal income tax cut from 5.1% to 5.05% to reduce revenues by $91 million in FY 2020. The DOR estimates an additional Income Tax Part-B phased in personal income tax cut from 5.05% to 5% in 2020 will reduce revenues by $88 million in FY2020 and $96 million in FY 2021. As a result, we reduce our FY 2021 revenue estimate by $246 million due to tax law changes.

For FY 2021, we forecast a .8% increase in tax revenues over FY 2019. Personal income tax revenues will increase by 1.4% and sales tax revenues by 1.5%. Corporate income tax revenues will fall by 1%, and business excise tax revenues will increase by .7%. 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 fall by 4.3%, and alcohol taxes will rise by 0.6%. Motor fuels taxes will increase by 1.1%, and cigarette taxes will increase by 0.9%.

We prepared tax revenue forecasts for 11 categories for every month through June 2021. 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 2021. 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 represent the effect of significant 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 procedure 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 2019 as well as the BHI projections for FY 2020 and FY 2021. 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.\(^\text{10}\)

\(^{10}\) A complete breakdown of revenue forecasts by month and by the eleven tax headings is available upon request.
## Table 3
Revenue forecasts, disaggregated, for FY2020 and FY2021, including technical estimation details

<table>
<thead>
<tr>
<th></th>
<th>FY18</th>
<th>FY19</th>
<th>FY20</th>
<th>FY21</th>
<th>FY19</th>
<th>FY20</th>
<th>FY21</th>
<th>AR</th>
<th>MA</th>
<th>Vars/Dummies</th>
<th>Dates</th>
</tr>
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<tbody>
<tr>
<td>Income tax</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated payments</td>
<td>3,141</td>
<td>2,467</td>
<td>2,561</td>
<td>2,576</td>
<td>-21.4%</td>
<td>3.8%</td>
<td>.5%</td>
<td>2,45,12</td>
<td>3</td>
<td>PI</td>
<td>79:6-16:08</td>
</tr>
<tr>
<td>Tax withheld</td>
<td>12,732</td>
<td>13,208</td>
<td>13,892</td>
<td>14,161</td>
<td>3.7%</td>
<td>5.2%</td>
<td>1.9%</td>
<td>1,2,3,9,10,12</td>
<td>12</td>
<td>PI</td>
<td>79:6-16:08</td>
</tr>
<tr>
<td>Returns &amp; bills</td>
<td>2,146</td>
<td>3,087</td>
<td>2,628</td>
<td>2,602</td>
<td>43.9%</td>
<td>14.5%</td>
<td>-1.4%</td>
<td>12</td>
<td>1,12</td>
<td>PI</td>
<td>79:6-16:08</td>
</tr>
<tr>
<td>Refunds</td>
<td>(1,779)</td>
<td>1,664</td>
<td>1,706</td>
<td>1,760</td>
<td>-6.8%</td>
<td>2.58%</td>
<td>3.1%</td>
<td>1,2,12</td>
<td>3,12</td>
<td>PI</td>
<td>79:6-16:08</td>
</tr>
<tr>
<td>Income Net</td>
<td>16,240</td>
<td>17,099</td>
<td>17,335</td>
<td>17,579</td>
<td>5.3%</td>
<td>1.4%</td>
<td>1.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales &amp; Use taxes</td>
<td>6,454</td>
<td>6,798</td>
<td>7,196</td>
<td>7,303</td>
<td>5.3%</td>
<td>5.9%</td>
<td>1.5%</td>
<td>1,12</td>
<td>1,3,12,13</td>
<td>PI</td>
<td>79:6-16:08</td>
</tr>
<tr>
<td>Corporation Excise</td>
<td>2,392</td>
<td>2,888</td>
<td>2,791</td>
<td>2,809</td>
<td>21.3%</td>
<td>-3.4%</td>
<td>.7%</td>
<td>12</td>
<td>1,3,12</td>
<td>CIT(-3)</td>
<td>79:6-16:08</td>
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<tr>
<td>Business Excises</td>
<td>380</td>
<td>420</td>
<td>426</td>
<td>440</td>
<td>10.3%</td>
<td>1.5%</td>
<td>3.3%</td>
<td>3,12</td>
<td>1,3,12</td>
<td>BUSEX(-4)</td>
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<tr>
<td>Alcohol Beverages</td>
<td>85</td>
<td>86</td>
<td>89</td>
<td>90</td>
<td>.6%</td>
<td>3.4%</td>
<td>.6%</td>
<td>1,12</td>
<td>1,3,12</td>
<td>PI</td>
<td>79:6-16:08</td>
</tr>
<tr>
<td>Cigarettes</td>
<td>471</td>
<td>439</td>
<td>432</td>
<td>436</td>
<td>-6.4%</td>
<td>-1.6%</td>
<td>.9%</td>
<td>1,12</td>
<td>1,24</td>
<td>83:7, 93:1, 96:10, 02:8, 08:7</td>
<td>79:6-16:08</td>
</tr>
<tr>
<td>Motor Fuels</td>
<td>769</td>
<td>775</td>
<td>797</td>
<td>806</td>
<td>1%</td>
<td>2.8%</td>
<td>1.1%</td>
<td>1,12</td>
<td>1,2,12</td>
<td>PI</td>
<td>79:6-16:08</td>
</tr>
<tr>
<td>Other taxes</td>
<td>996</td>
<td>1,185</td>
<td>1,314</td>
<td>1,258</td>
<td>19.1%</td>
<td>10.9%</td>
<td>-4.3%</td>
<td>1,12</td>
<td>2,12</td>
<td>PI</td>
<td>79:6-16:08</td>
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</table>

<table>
<thead>
<tr>
<th>Effect of Tax Law Changes</th>
<th>(141)</th>
<th>(246)</th>
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</thead>
<tbody>
<tr>
<td>Total Taxes</td>
<td>27,787</td>
<td>29,692</td>
</tr>
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</table>

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 a 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: Economic Effects of Trump Tariffs and Deregulatory Policy

<table>
<thead>
<tr>
<th>Item</th>
<th>2017-2018</th>
<th>January – June 2019</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dead Loss ($, 000s)</td>
<td>7,784,011</td>
<td>5,811,854</td>
<td>13,595,865</td>
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<tr>
<td>Savings from Deregulation ($, 000s)</td>
<td>37,500,000</td>
<td>9,000,000</td>
<td>46,500,000</td>
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<tr>
<td>Net Savings to U.S. economy ($, 000s)</td>
<td>29,715,989</td>
<td>3,188,146</td>
<td>32,904,135</td>
</tr>
<tr>
<td>Cost to Consumers ($, 000s)</td>
<td>47,718,933</td>
<td>40,517,700</td>
<td>88,236,634</td>
</tr>
</tbody>
</table>

Source: Office of Management and Budget 2018, Beacon Hill Institute calculations.
The Beacon Hill Institute for Public Policy Research focuses on federal, state and local economic policies as they affect citizens and businesses. The Institute conducts research and educational programs to provide timely, concise and readable analyses that help voters, policymakers and opinion leaders understand today’s leading public policy issues.

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