The Beacon Hill Institute

# The Consequences of Inflation for Massachusetts


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## EXECUTIVE SUMMARY

Inflation is an increase in the average level of prices. When inflation takes hold, money loses its value, and consumers face a loss of purchasing power for goods and services. This loss in nominal income has consequences. Sustained inflation leads to reduced consumer spending and, in turn, results in lower economic growth – or if high enough, an economic contraction. Moreover, inflation changes consumer expectations about the future.

Inflation has three main adverse effects. First, it distorts price signals, making it hard to distinguish between relative prices and general price level changes. Second, it distorts the behavior of firms and individuals and thus reduces economic efficiency. By its nature, inflation is unpredictable, which dampens investment. Third, inflation redistributes income from creditors to borrowers.

Inflation also influences wages; as prices rise, workers demand more pay to match the increase in the prices of goods and services. This adds to the upward spiral. Between 1990 and 2020, inflation in the United States averaged only between 2 and 3 percent.[1] Today, year-over-year inflation in the United States has surpassed 8 percent.[2] Inflation grinds away and erodes real economic growth. According to the Bureau of Economic Analysis (BEA), U.S. real gross domestic product (GDP) contracted by 1.5 percent in the first quarter of this year.[3] Sustained inflation is threatening to bring the national economy into recession.

[1] United States Bureau of Labor Statistics, CPI for All Urban Consumers, (Retrieved June 8, 2022), https://data.bls.gov/cgi-bin/surveymost

[2] Ibid.

[3] Bureau of Economic Analysis, Gross Domestic Product, (Retrieved June 8, 2022), https://www.bea.gov/data/gdp/gross-domestic-product.

While the focus on the effects of inflation center on prices nationwide, there are also local implications. Massachusetts already pays higher than the national average for electricity, road maintenance, and labor costs. At risk is the state's competitiveness.

Inflation in Massachusetts currently stands at a 40-year high.[4] The rise in prices for the Northeast region has been at the highest level since December 1990.[5] If we compute "core inflation" by removing food and energy prices from the calculation, prices increased at the highest annual rate since December 1991.[6]

Steep price increases are beginning to take their toll on the state's economy. MassBenchmarks, produced in coordination with the Federal Reserve Bank of Boston, estimates that Massachusetts GDP contracted by 1 percent in the first quarter of this year.[7]

The Beacon Hill Institute expects the current bout of inflation to persist throughout the remainder of this year, with prices expected to moderate by the end of next year (2023). Table E-1 displays the year-end BHI CPI forecast for the calendar year (CY) 2022 and 2023 in the Boston-Cambridge-Newton statistical area.

[4] Bureau of Labor Statistics, Consumer Price Index, Boston-Cambridge-Newton, (Retrieved June 8, 2022), https://www.bls.gov/regions/new-england/news-release/2022/consumerpriceindex_boston_20220413.htm.
[5] Ibid.
[6] Ibid.
[7] UMass Donahue Institute, MassBenchmarks, (Retrieved May 29, 2022), https://donahue.umass.edu/business-groups/economic-public-policy-research/massbenchmarks/notes-from-the-board-may-2022.

**Table E-1: BHI CPI Forecast for Boston-Cambridge-Newton (% change from one year ago (4Q/4Q))**

| Forecast | 2022 | 2023 |
|---|---|---|
| BHI (CPI) | 7.5 | 2.6 |

BHI estimates that CPI for Boston-Cambridge-Newton will increase by 7.5 percent (year-over-year) at the end of CY 2022 and by 2.6 percent at the end of CY 2023. Inflation in Massachusetts could very well run higher depending on the outcome of geopolitical events and supply chain shortages.

At the same time, the state is currently considering a proposal to revise the state constitution and impose an income surtax. If the proposal succeeds, an income surtax would bring unintended harm to the state economy that is likely facing an inflation induced recession. As tax revenues soar, the state must avoid further burdening its residents who are struggling to keep up with record inflation.

## INTRODUCTION

Why this surge in prices? Economists use three possibilities to appraise the causes of inflation: supply shocks (or cost-push), demand-pull, and the fiscal theory of the price level (TOPL).

One interpretation, the TOPL, lies in the massive budget deficits run by the federal government over the period 2020-2021, combined with the resulting volume of money creation.

State government policies relating to energy have also taken their toll. Take, for example, the Regional Greenhouse Gas Initiative (RGGI). RGGI members, including Massachusetts, rank at the top of the nation in electricity prices.[8]

In the first quarter of 2020, federal government current expenditures almost doubled.[9] This spending caused the federal deficit to reach $3 trillion in 2020 and almost as much in 2021.[10] A leading cause of the deficit was the trillions in federal money dispersed to businesses and individuals in the form of COVID-19 relief.[11]

The United States has a history of running deficits, but it has never run deficits of this magnitude over the last two years, even during wartime. [12] The size of the Federal Reserve balance sheet doubled from January 2020 to July 2021.[13] As a result, M2 – one measure of the money supply – has grown by 42% since January 2020.[14] In effect, the Federal Reserve chose money creation and inflation over the consequences of depending on the public to absorb the cost of massive sales of government bonds.

The Federal Reserve believed the better course was to tolerate inflation, maintaining at first that inflation would be transitory. But the Federal Reserve

[8] United States Energy Information Administration, State Electricity Profiles, (Retrieved June 8, 2022), https://www.eia.gov/electricity/state/.
[9] Bureau of Economic Analysis, Federal Government Current Expenditures, (Retrieved June 8, 2022), https://www.bea.gov/data/gdp/gross-domestic-product.
[10] United States Debt Clock, (Retrieved June 8, 2022), https://www.usdebtclock.org/.
[11] USA Spending, (Retrieved June 8, 2022), https://datalab.usaspending.gov/federal-covid-funding/.
[12] Ibid.
[13] Board of Governors of the Federal Reserve System, Balance Sheet Trends, (Retrieved June 8, 2022), https://www.federalreserve.gov/monetarypolicy/bst_recenttrends.htm.
[14] Board of Governors of the Federal Reserve System, H.6 Money Stock Measures, (Retrieved June 8, 2022), https://www.federalreserve.gov/releases/h6/.

has changed course. It is now attempting to combat record inflation by increasing interest rates and cutting its balance sheet, further threatening the economy.

However, deficits are not the only cause of inflation. Various other factors have contributed to the current bout of inflation faced by Massachusetts and, more broadly, the United States. A major supply chain crisis – shortages of available ships, workers, shipping containers, and manufacturing inputs– has led to rising prices. The COVID-19 pandemic initially brought about a shift in demand toward online shopping. Now that the economy has reopened without restrictions, demand has returned to its pre-pandemic levels, outpacing supply, leading to shortages, and leaving businesses to increase prices. Geopolitical matters, such as the ongoing war between Russia and Ukraine, threaten to exacerbate the issue of inflation. The likely answer is that the combination of all factors has contributed to record inflation.

## TYPES OF INFLATION

Economists maintain that there are various types of inflation. First, demand-pull inflation occurs when the economy expands, and aggregate demand outpaces aggregate supply. For example, firms are forced to pay higher wages to attract workers during a tight labor market. Second, structural inflation is caused by changes to both supply and demand. For example, the current bottlenecks that are disrupting global supply chains and the factors of production around the world are structural in nature. Third, there is imported inflation resulting from rising prices for imported goods. And fourth is cost-push inflation, which is when prices increase due to rising labor and material costs.

Small inflation levels do not pose a problem and, in most cases, are favorable. However, higher levels of inflation concern economists for the following reasons:[15]

1) As inflation rises, people pay more on returns such as interest, dividends, and capital gains.
2) Shoe leather costs, which is when high inflation causes people to hold less cash (they may even rush to the bank to place the cash in an interest-bearing account.)
3) Menu costs, which is when high inflation forces firms to expend resources such as time and effort to change prices.
4) And borrower-leader redistribution, which is when inflation exceeds expectations and wealth is transferred from lenders to borrowers. Borrowers then repay loans in cash which has less purchasing power.

## THE CONSUMER PRICE INDEX VS. THE PERSONAL CONSUMPTION EXPENDITURES INDEX

The two most widely used measures of inflation are the consumer price index (CPI) from the Bureau of Labor Statistics (BLS) and the personal consumption expenditures index (PCE) from the Bureau of Economic Analysis (BEA). The BLS describes the CPI as the "measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services." As described by the BEA, the PCE index is "a measure of the prices that people

[15] Scott Sumner, *The Money Illusion: Market Monetarism, the Great Recession and the Future of Monetary Policy*, (Chicago: University of Chicago Press, 2021): 148-150. See also Dean Karlan and Jonathan Morduch, *Macroeconomics*, (New York: McGraw Hill, 2018):427-439.

living in the United States, or those buying on their behalf, pay for goods and services." The PCE is the preferred measure used by the Federal Reserve.

While the two measures are similar, there are important differences between them. The main difference is that the PCE index accounts for all U.S. households and non-profits while the CPI accounts for all urban households.[16] The data source used to compute each index set is also different – the CPI retrieves data from consumers, and the PCE index retrieves data from businesses.[17] The PCE index also considers a broader range of goods, whereas the CPI does not consider changes in preferences as prices change.[18] For example, CPI measures price changes for "out-of-pocket" expenditures, while the PCE index measures the change in all goods and services consumed by households.

Among both measures of inflation, the CPI is the measure that is more widely used and referenced as the "headline number."[19] Most economists argue that CPI overstates inflation in many cases.[20] However, the CPI can lead to estimates that both understate or overstate inflation since it is measured on a fixed basket of goods.[21] Since the 1990s, economists have tried fine-tuning the CPI measure to eliminate bias with a Chained Consumer Price Index for all Urban Consumers. This newer index adjusts for consumer substitution of goods and new products

[16] United States Bureau of Labor Statistics, Focus on Prices and Spending: Consumer Price Index, (May 2011), https://www.bls.gov/opub/btn/archive/differences-between-the-consumer-price-index-and-the-personal-consumption-expenditures-price-index.pdf.
[17] Ibid.
[18] Ibid.
[19] The Brookings Institution, "How does the government measure inflation?", (June 28, 2021), https://www.brookings.edu/blog/up-front/2021/06/28/how-does-the-government-measure-inflation/
[20] Federal Reserve Bank of San Francisco, "Bias in the CPI: Roughly Right or Precisely Wrong", (May 23, 1997), https://www.frbsf.org/economic-research/publications/economic-letter/1997/may/bias-in-the-cpi-roughly-right-or-precisely-wrong/.
[21] Ibid.

that enhance quality. In 2006 an update to the revision estimated that a bias of 0.8 percentage points per year remains.[22]

The Federal Reserve's Federal Open Market Committee (FOMC) used the CPI as its main measure of inflation before 2000 but now focuses solely on the PCE index when gauging inflation.[23] On the other hand, the federal government uses the CPI to adjust Social Security benefits.[24] This report looks at the most recent data for both measures. We also estimate future CPI levels for the state and national economies.

## FISCAL THEORY OF THE PRICE LEVEL

An important mode of economic analysis of current inflation is centered around the "fiscal theory of the price level" (FTPL).[25] The "fiscal theory of the price level" (FTPL) maintains that price levels are determined by government debt and future taxation and expenditures. According to the theory, inflation occurs when the government runs deficits without possibly paying down the resulting debt. Under the theory, monetary policy has little or no bearing on the levels of prices.

According to the "fiscal theory of the price level" (FTPL)," goods and services across the economy get more expensive as federal government surpluses decline. If Uncle Sam doesn't credibly commit to raising taxes tomorrow to pay for

[22] Libby Rittenberg and Timothy Tregarthen, Principles of Macroeconomics, (Boston: 2018) Flatworld, p. 129.
[23] Board of Governors of the Federal Reserve System, "Comparing Two Measures of Core Inflation: PCE Excluding Food & Energy vs. the Trimmed Mean PCE Index," (August 2, 2019), https://www.federalreserve.gov/econres/notes/feds-notes/comparing-two-measures-of-core-inflation-20190802.htm.
[24] Ibid.
[25] American Institute for Economic Research, "Fiscal Policy and Inflation", (February 10, 2022), https://www.aier.org/article/fiscal-policy-and-inflation/.

spending splurges today, the most likely outcome is debt monetization. Anticipated money printing causes the price level to rise, thus causing the dollar's purchasing power to fall. Thus, the act of running deficits too large ever to be paid off is the principal source of the current inflation.

The fiscal policy measures undertaken by the federal government have contributed to current price levels. However, current inflation is a result of a combination of other factors –monetary policy, supply chain shortages, and demand shifts – and cannot be solely blamed on fiscal policy.

## INFLATION IN THE UNITED STATES

Table 1 displays the one-year percentage change for the CPI (all items) and the PCE index (all items) readings from October 2021 through March 2022.[26]

In October 2021, CPI for all items (including food and energy) increased by 6.2 percent from the previous year.[27] For the same month, the PCE index (including food and energy) increased by 5.1 percent from the previous year. In March, the CPI for all items increased 8.5 percent from the previous year, the largest 12-month increase since December of 1981. For the same month, the PCE index for all items increased 6.6 percent from the previous year, the largest 12-month increase since February 1981.

[26] Ibid.
[27] United States Bureau of Labor Statistics, CPI for All Urban Consumers, (Retrieved June 8, 2022), https://data.bls.gov/cgi-bin/surveymost; Bureau of Economic Analysis, Personal Consumption Expenditures Price Index, (Retrieved June 8, 2022), https://www.bea.gov/data/personal-consumption-expenditures-price-index.

**Table 1: CPI and PCE index Inflation in the United States**
**(% change from month one year ago)**

| Month / Year | CPI | PCE index |
|---|---|---|
| October 2021 | 6.2 | 5.1 |
| November 2021 | 6.8 | 5.6 |
| December 2021 | 7.0 | 5.8 |
| January 2022 | 7.5 | 6.0 |
| February 2022 | 7.9 | 6.4 |
| March 2022 | 8.5 | 6.6 |

In March, the CPI for all urban consumers increased by 1.2 percent from the previous month. The largest contributors to the increase were gasoline, shelter, and food prices. Gasoline had one of the largest monthly increases, with prices soaring by 18.3 percent. Fuel oil had the largest increase, up 22.3 percent from the previous month. Electricity prices, up 2.2 percent from the previous month, also increased significantly. Food prices increased by 1.0 percent from the previous month. Prices for used cars and trucks fell by 3.8 percent after increasing by over 35 percent in the past year.

Table 2 displays the year-over-year price increases in March for CPI items.[28] Food prices have increased by 8.8 percent since March last year, the largest 12-month increase in the food index since May of 1981. Gasoline prices have increased by 48.0 percent since March of last year. Fuel oil prices experienced the largest increase, up 70.1 percent since March last year. Electricity prices have increased by 11.1 percent since March of last year. Since March last year, utility (piped) gas

[28] Ibid.

service prices have increased by 21.6 percent. New vehicle prices have increased by 12.5 percent since March of last year. Used car and truck prices have increased by 35.3 percent since March last year. Apparel prices have increased by 6.8 percent since March of last year. Medical care commodity prices have increased by 2.7 percent since March last year. Shelter prices have increased by 5.0 percent since March of last year. Transportation service prices have increased by 7.7 percent since March of last year. Medical care service prices have increased by 2.9 percent since March last year.

**Table 2: March CPI by Item (% change from month one year ago)**

| Item | CPI |
|---|---|
| Food | 8.8 |
| Gasoline | 48.0 |
| Fuel Oil | 70.1 |
| Electricity | 11.1 |
| Utility Gas Service | 21.6 |
| New Vehicles | 12.5 |
| Used Cars and Trucks | 35.3 |
| Apparel | 6.8 |
| Medical Care Commodities | 2.7 |
| Shelter | 5.0 |
| Transportation Services | 7.7 |
| Medical Care Services | 2.9 |

Table 3 displays the year-over-year price increases for PCE index goods and services in March.[29] According to the PCE index, the prices for goods have increased by 10.6 percent since March of last year. Since March of last year, the prices for durable and nondurable goods increased by 10.2 and 10.7 percent, respectively. Services prices have increased by 4.5 percent since March of last year. The PCE index for food has increased by 9.2 percent since March last year. Energy goods and services prices increased significantly in the past year, rising by 33.9 percent. The PCE index for market-based expenditures (excluding imputed transactions and expenditures by non-profits) increased by 6.8 percent since March last year.

**Table 3: March PCE index by Item (% change from month one year ago)**

| Item | PCE Index |
|---|---|
| Goods | 10.6 |
| Durable Goods | 10.2 |
| Nondurable Goods | 10.7 |
| Services | 4.5 |
| Food | 9.2 |
| Energy Goods and Services | 33.9 |
| Market-Based PCE index | 6.8 |

BHI estimates that U.S. CPI will increase by 7.9 percent (year-over-year) in CY 2022 and 3.0 percent in CY 2023. BHI estimates that the U.S. PCE index will increase 5.3 percent in CY 2022 and 2.5 percent in CY 2023. The Wall Street Journal (WSJ) Economic Forecasting Survey predicts that the U.S. PCE index will

[29] Personal Consumption Expenditures Price Index, (Retrieved June 8, 2022), https://www.bea.gov/data/personal-consumption-expenditures-price-index.

increase by 4.8 percent and 2.8 percent for CY 2022 and 2023, respectively. The Federal Open Market Committee (FOMC) estimates that the U.S. PCE index will increase by 4.7 percent in CY 2022 and 2.7 percent in CY 2023. The International Monetary Fund (IMF) expects U.S. CPI to increase by 7.7 percent in CY 2022 and 2.9 percent in CY 2023. The Conference Board estimates that the U.S. PCE index will increase by 4.2 percent in CY 2022 and 2.7 percent in CY 2023.

Table 4 displays various forecasts of inflation in the United States for the remainder of calendar years (CY) 2022 and CY 2023.[30]

**Table 4: U.S. Inflation Forecasts (% change from one year ago (4Q/4Q))**

| Forecast | 2022 | 2023 |
|---|---|---|
| BHI (CPI) | 7.9 | 3.0 |
| BHI (PCE Index) | 5.3 | 2.5 |
| WSJ Economic Survey (PCE Index) | 4.8 | 2.8 |
| FOMC (PCE Index) | 4.7 | 2.7 |
| IMF (CPI) | 7.7 | 2.9 |
| CB (PCE Index) | 4.2 | 2.7 |

[30] The Wall Street Journal, Economic Forecasting Survey, (Retrieved June 8, 2022), https://www.wsj.com/articles/economic-forecasting-survey-archive-11617814998; Board of Governors of the Federal Reserve System, Federal Open Market Committee, FOMC Projections materials, accessible version, (March 16, 2022), https://www.federalreserve.gov/monetarypolicy/fomcprojtable20220316.htm; International Monetary Fund, World Economic Outlook, (April 2022), https://www.imf.org/en/Publications/WEO/Issues/2022/04/19/world-economic-outlook-april-2022; The Conference Board, United States Economic Forecast, (May 11, 2022), https://www.conference-board.org/research/us-forecast.

## INFLATION IN MASSACHUSETTS

Inflation at the national level has generally outpaced inflation at the state level. Table 5 displays the one-year percentage change for the CPI (all items) in March for the Boston-Cambridge-Newton region.[31]

In May 2021, the CPI for all items (including food and energy) in the Boston-Cambridge-Newton statistical area increased by 3.2 percent from the previous year. In July 2021, the CPI for all items increased by 4.3 percent from the previous year. In September 2021, the CPI for all items increased by 4.0 percent from the previous year. In November 2021, the CPI for all items increased by 5.3 percent from the previous year. In January, the CPI for all items increased by 6.3 percent from the previous year. In March, the CPI for all items increased by 7.3 percent from the previous year, the largest annual increase in the Boston area since January 1989.

[31] Ibid.

**Table 5: CPI in Boston-Cambridge-Newton (% change from month one year ago)**

| Month / Year | CPI |
|---|---|
| May 2021 | 3.2 |
| July 2021 | 4.3 |
| September 2021 | 4.0 |
| November 2022 | 5.3 |
| January 2022 | 6.3 |
| March 2022 | 7.3 |

In May 2021, the CPI for all items (including food and energy) in the Boston-Cambridge-Newton statistical area increased by 3.2 percent from the previous year. In July 2021, the CPI for all items increased by 4.3 percent from the previous year. In September 2021, the CPI for all items increased by 4.0 percent from the previous year. In November 2021, the CPI for all items increased by 5.3 percent from the previous year. In January, the CPI for all items increased by 6.3 percent from the previous year. In March, the CPI for all items increased by 7.3 percent from the previous year, the largest annual increase in the Boston area since January 1989.

Table 6 displays the year-over-year price increases in March for CPI items in the Boston-Cambridge-Newton statistical area.[32] Food prices have increased by 7.1 percent since March of last year. Gasoline prices experienced the largest increase, up 53.6 percent since March last year. Electricity prices have increased by 14.5 percent since March of last year. Since March last year, utility (piped) gas service prices have increased by 27.0 percent. New vehicle prices have increased by 8.1

[32] Ibid.

percent since March of last year. Used car and truck prices have increased 36.7 percent since March last year. Apparel prices have increased by 12.6 percent since March of last year. Commodity prices have increased by 13.2 percent since March of last year. Housing prices have increased by 6.3 percent since March of last year. Transportation prices have increased by 6.3 percent since March of last year. And services prices have increased by 4.5 percent since March of last year.

**Table 6: March CPI by Item in Boston-Cambridge-Newton (% change from month one year ago)**

| Item | CPI |
|---|---|
| Food | 7.1 |
| Gasoline | 53.6 |
| Electricity | 14.5 |
| Utility Gas Service | 27.0 |
| New Vehicles | 8.1 |
| Used Cars and Trucks | 36.7 |
| Apparel | 12.6 |
| Transportation | 20.7 |
| Commodities | 13.2 |
| Housing | 6.3 |
| Services | 4.5 |

Although inflation in Massachusetts is lower than the nationwide average, the state has experienced higher inflation in the housing and energy sectors.

Massachusetts housing prices have experienced steep increases in the past two years, exacerbating the state's affordability issue. According to the Zillow Home Value Index for Massachusetts, the median home value is $577,000 as of April.[33] From April 2021, the median home value in Massachusetts is up 15.9 percent. From April 2019 (before the pandemic), the median home value in Massachusetts is up by 35 percent (from $426,000.)[34]

The housing market in Boston has also experienced a steep climb (albeit smaller) in prices over the same period compared with the state. According to the Zillow Home Value Index for Boston, the median home value is $739,000 as of April.[35] From April 2021, the median home value in Boston is up 8.5 percent. Since April 2019, the median home value in Boston is up by 16 percent (from $639,000.)[36]

The steep increase in home values in Massachusetts has translated into higher rental prices. A recently released study from Apartment Lists estimated the median rent for one- and two-bedroom apartments in cities throughout Massachusetts.[37] According to the report, rental prices in Massachusetts have increased by 15.2 percent since May 2021.[38] Over the same period, rental prices in Boston have increased by 14.4 percent.[39]

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[33] Zillow Home Value Index, Massachusetts Home Values, (Retrieved June 8, 2022), https://www.zillow.com/ma/home-values/.
[34] Ibid.
[35] Zillow Home Value Index, Boston Home Values, (Retrieved June 8, 2022), https://www.zillow.com/boston-ma/home-values/.
[36] Ibid.
[37] Apartment List, Boston Rent Report, (June 2022), https://www.zillow.com/boston-ma/home-values/.
[38] Ibid.
[39] Ibid.

Rental and mortgage costs represent a large portion of personal expenses. Soaring costs for renting and purchasing homes in the state are especially prohibitive to lower-income earners. Renters are left with few options except to pay significantly higher prices.

Inflation in the state's energy sector has outpaced the national average. Massachusetts gasoline prices have increased by over 53.6 percent year over year, while gasoline prices have increased by 48.0 percent nationwide.[40] At the time of this writing, average gasoline prices in Massachusetts stand at $5.028 per gallon, while the nationwide average stands at $4.970.[41]

Massachusetts electricity prices have increased by over 14.5 percent compared to the increase in national electricity prices of just over 11.1 percent. According to the latest data from the US Energy Information Administration (EIA), Massachusetts ranks 5th in the nation in electricity rates.[42] The average retail price for electricity in Massachusetts is 18.19 cents per kilowatt-hour (kWh), nearly double the nationwide average of 10.59 cents per kWh.[43]

Meanwhile, wage inflation (i.e., the increase in wages) has failed to keep up with rising prices. As of March, wage inflation increased by 6.1 percent in the Boston-Worcester-Providence, MA-RI-NH-CT Combined Statistical Area (CSA).[44] Wage

[40] Ibid.
[41] AAA, Massachusetts Gas Prices, (Retrieved June 9, 2022), https://gasprices.aaa.com/?state=MA.
[42] Ibid.
[43] Ibid.
[44] United States Bureau of Labor Statistics, Changing Compensation Costs in the Boston Metropolitan Area, (Retrieved June 8, 2022), https://www.bls.gov/regions/new-england/news-release/2022/employmentcostindex_boston_20220509.htm.

inflation remains lower than the 7.3 percent increase in the Boston-Cambridge-Newton statistical area CPI (all items) over the same period.[45]

**Table 7: BHI CPI Forecast for Boston-Cambridge-Newton (% change from one year ago (4Q/4Q))**

| Forecast | 2022 | 2023 |
|---|---|---|
| BHI (CPI) | 7.5 | 2.6 |

Table 7 displays the year-end BHI CPI forecast for the Boston-Cambridge-Newton statistical area. BHI estimates that CPI for Boston-Cambridge-Newton will increase by 7.5 percent (year-over-year) at the end of CY 2022 and by 2.6 percent at the end of CY 2023. These estimates may underestimate future inflation because of ongoing geopolitical tensions and supply chain bottlenecks.

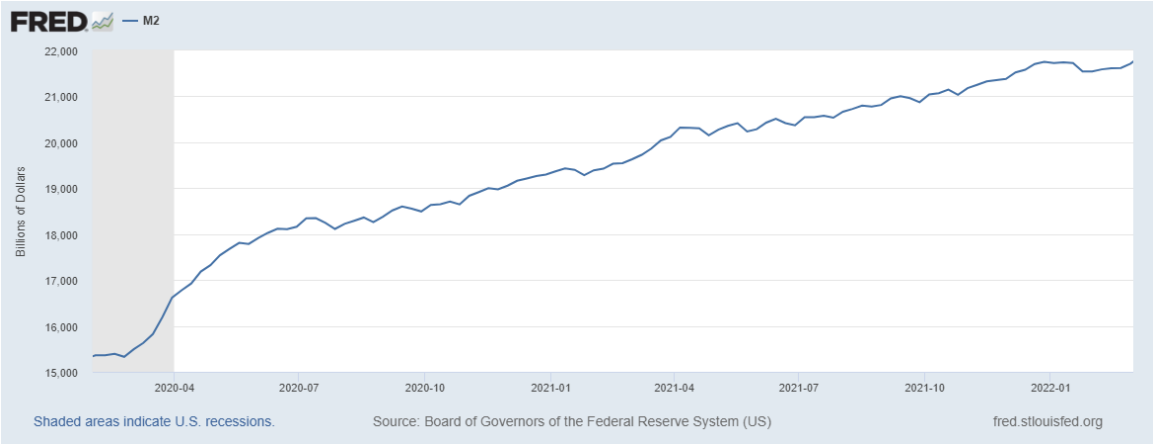
## MONETARY POLICY

The M-1 money, as defined by the Federal Reserve, is the "(1) currency outside the U.S. Treasury, Federal Reserve Banks, and the vaults of depository institutions; (2) demand deposits at commercial banks (excluding those amounts held by depository institutions, the U.S. government, and foreign banks and official institutions) less cash items in the process of collection and Federal Reserve float; and (3) other liquid deposits, consisting of other checkable deposits (or OCDs, which comprise negotiable order of withdrawal, or NOW, and automatic transfer service, or ATS, accounts at depository institutions, share draft accounts at credit unions, and demand deposits at thrift institutions) and savings deposits (including money market deposit accounts)." The M-2 money

[45] Ibid.

supply, a broader measure of the money supply, consists of the M-1 money supply in addition to (1) small-denomination time deposits while removing IRA and Keogh balances and (2) retail money market funds while removing IRA and Keogh balances.[46] Purchases of U.S. government bonds directly relate to the size of the money supply. For example, the money supply increases as the Federal Reserve purchases U.S. government bonds. Conversely, the money supply falls as the Federal Reserve sells bonds.

The U.S. money supply has grown vastly since the pandemic's beginning in March 2020. In February 2020, the U.S. M-2 money supply stood at $15.548 trillion.[47] In March this year, the U.S. M-2 money supply had grown to $21.810 trillion.[48]




[46] Board of Governors of the Federal Reserve System, "What is the money supply? Is it important?", (Retrieved June 8, 2022), https://www.federalreserve.gov/faqs/money_12845.htm.
[47] Ibid.
[48] Ibid.

Table 8 displays the U.S. M-2 money supply, the U.S. CPI index (percentage change from month one year ago), and the Boston-Cambridge-Newton CPI index (percentage change from month one year ago) for selected months.[49]

In March 2020, the U.S. M-2 money supply was $15.989 trillion, while the CPI index for the U.S. and the Boston-Cambridge-Newton statistical area was 1.5 and 1.8 percent, respectively. By March of this year, the U.S. M-2 money supply had ballooned to $21.810 trillion, while the CPI for the U.S. and Boston-Cambridge-Newton increased by 8.5 and 7.3 percent (since March 2021), respectively.

The federal government dramatically increased spending to lift the U.S. from the pandemic-induced contraction of 2020. The annual federal deficit increased to its highest level in 2020, and total federal debt increased to its highest level since the fourth quarter of 2021.[50] Simultaneously, the U.S. Federal Reserve was forced to slash interest rates to near-zero while significantly increasing its asset sheet balance. These factors have brought about levels of inflation that have not occurred since the early 1980s.[51]

[49] Ibid.
[50] Ibid.
[51] Ibid.

**Table 8: U.S. M-2 Money Supply Compared to U.S. and Boston-Cambridge-Newton CPI**

| Month / Year | U.S. M-2 Supply ($, billions) | B-C-N CPI (% year-over-year) | U.S. CPI (% year-over-year) |
|---|---|---|---|
| March 2020 | 15,989 | 1.8 | 1.5 |
| May 2020 | 17,835 | 0.6 | 0.1 |
| July 2020 | 18,278 | 0.8 | 1.0 |
| September 2020 | 18,575 | 0.6 | 1.4 |
| November 2020 | 18,970 | 0.4 | 1.2 |
| January 2021 | 19,373 | 0.5 | 1.4 |
| March 2021 | 19,854 | 1.3 | 2.6 |
| May 2021 | 20,418 | 3.2 | 5.0 |
| July 2021 | 20,620 | 4.3 | 5.4 |
| September 2021 | 20,991 | 4.0 | 5.4 |
| November 2022 | 21,343 | 5.3 | 6.8 |
| January 2022 | 21,659 | 6.3 | 7.5 |
| March 2022 | 21,810 | 7.3 | 8.5 |

Table 9 displays U.S. government current expenditures, Federal Reserve total assets, the federal debt, and the Federal Reserve effective rate for selected periods.[52]

In the first quarter of 2020, U.S. government expenditures totaled $4.909 trillion, increasing to an all-time high of $9.107 trillion in the following quarter. In quarter one of 2020, the Federal Reserve asset balance totaled $4.303 billion. As of quarter one of 2022, the Federal Reserve asset balance totals $8.888 trillion. The

[52] Ibid.

U.S. federal debt was $23.224 trillion in quarter one of 2020. As of quarter one of this year, the U.S. federal debt stands at $29.617 trillion. The Federal Reserve's effective rate was 1.26 percent in quarter one of 2020. The rate was cut to .06 percent in the following quarter and is .12 percent as of quarter one of this year, still far below pre-pandemic levels.

**Table 9: U.S. Government Expenditures, Federal Reserve Total Assets, the Federal Debt, and the Federal Reserve Effective Rate**

| Quarter / Year | U.S. Government Expenditures ($, billions) | Federal Reserve Total Assets ($, billions) | Federal Debt ($, billions) | Federal Reserve Effective Rate (%) |
|---|---|---|---|---|
| Q1 2020 | 4,909 | 4,304 | 23,224 | 1.26 |
| Q2 2020 | 9,107 | 6,753 | 26,477 | .06 |
| Q3 2020 | 7,207 | 6,996 | 26,945 | .09 |
| Q4 2020 | 5,955 | 7,226 | 27,748 | .09 |
| Q1 2021 | 8,071 | 7,518 | 28,133 | .08 |
| Q2 2021 | 7,490 | 7,900 | 28,529 | .07 |
| Q3 2021 | 6,560 | 8,309 | 28,429 | .09 |
| Q4 2021 | 5,963 | 8,637 | 29,617 | .08 |
| Q1 2022 | 5,799 | 8,888 | * | .12 |

## STATE TAX REVENUES

While prices are increasing across the board, tax revenue collections have exceeded forecasts in Massachusetts. Like an individual income tax, inflation leads to the erosion of earnings. However, inflation is similar to an individual income tax in another way – it contributes directly to government coffers. When wages increase, such as they are now, personal income tends to fall under higher tax brackets (even if real income does not increase.) This is especially true for the 15 states (and the District of Columbia) that fail to adjust tax brackets for inflation.[53] Massachusetts, however, does not have a progressive income tax.[54]

Yet, Massachusetts is currently considering amending the state constitution and implementing an income surtax to raise additional tax revenue. Considering the current condition of state tax revenues and the impact that inflation is having on the state's constituents, an income surtax will only inflict further economic damage.

Nonetheless, soaring inflation has played a role in state tax revenue collections that are well over the benchmark for the current fiscal year. Table 10 displays Massachusetts tax revenues for the current FY and their year-over-year percentage changes over actual and benchmark.[55] Out of the 11 months in FY 2022, the revenue collections for ten months have exceeded benchmark revenues (benchmark revenue collections in July were not available). Out of the 11 months in FY 2022, the revenue collections for nine months have exceeded actual FY 2021 revenues. May revenue collections, which are down 38.1 percent from actual

[53] The Tax Foundation, "Which States Have the Most Progressive Income Taxes?", (September 24, 2014), https://taxfoundation.org/which-states-have-most-progressive-income-taxes-0/.
[54] Ibid.
[55] Massachusetts Department of Revenue, Revenue Collection Announcements, (Retrieved June 8, 2022), https://www.mass.gov/orgs/massachusetts-department-of-revenue/news?page=0.

May 2021 revenue collections, were "impacted by the recently enacted elective pass-through entity (PTE) excise." Overall, state revenue collections year-to-date are up 21.4 percent from FY 2021 and up 7.8 percent over the benchmark. While the reasoning for state revenues growing well above benchmark cannot be solely explained by inflation, it has certainly been a contributing factor.

**Table 10: Massachusetts Tax Revenues Over Actual and Benchmark**

| Month | Tax Revenue ($, billions) | Actual (% year-over-year) | Benchmark (% year-over-year) |
|---|---|---|---|
| July 2021 | 2.252 | 5.1 | * |
| August 2021 | 2.493 | 26.9 | 0.4 |
| September 2021 | 3.992 | 27.0 | 14.3 |
| October 2021 | 2.445 | 17.0 | 8.7 |
| November 2021 | 2.416 | 13.6 | 8.7 |
| December 2021 | 4.235 | 49.2 | 40.9 |
| January 2022 | 4.026 | 20.3 | 27.0 |
| February 2022 | 1.801 | -3.9 | 19.4 |
| March 2022 | 3.858 | 26.2 | 12.5 |
| April 2022 | 6.941 | 79.6 | 42.1 |
| May 2022 | 2.478 | -38.1 | 5.9 |

*Benchmark revenues were not included in the July revenue collections release.

## CONCLUSION

With inflation in Massachusetts at a 40-year high, no quick fix is on the horizon for consumers. The price rise for the Northeast region has been at the highest level since December 1990. The current bout of inflation is eating away at real

economic growth, threatening to bring the state and national economy into recession.

The Federal Reserve is behind in taming inflation as current inflation price levels look like they are to stay for longer. Many factors have contributed to inflation at the federal and state level. Specifically, supply chain bottlenecks, geopolitical events, and shifts in demand as the economy reopened from the pandemic.

However, the federal government's reckless policy decisions have ballooned the federal debt and have heavily contributed to price levels spiraling out of control. The Federal Reserve is now pivoting from its earlier wait-around approach. It is undergoing policy decisions to combat vastly increasing inflation by increasing interest rates and cutting its balance sheet.

BHI estimates that price levels will not return to the Federal Reserve's targeted level until the end of next year. The war in Ukraine and recent shutdowns in China threaten to prolong elevated price levels. Going forward, sustained inflation and rising interest rates will inflict further economic harm on consumers.

Although real purchasing power has diminished for state government, inflation is no excuse for the Commonwealth to spend more. It is true that a dollar does not go as far as last year and that the state faces challenges in hiring during a tight labor market. But taxpayers face the same decline in purchasing power. The difference is that taxpayers do not possess the ability to levy taxes. And the state government has not slimmed down. The current surge in price levels may be the best signal for the state government to trim its overall spending.

The state stabilization fund was hardly drawn down to meet Covid-related expenses because the federal government stepped in to provide pandemic

economic relief to state governments. At the same time, Massachusetts state tax revenues have reached far above the current FY benchmark. The state is also considering an income surtax proposal, that if passed, would impose a 4 percent surcharge on incomes over $1 million. If current inflation levels persist, the implementation of such a tax will hurt the state's citizens and businesses as they try to stay afloat. With state coffers swelling, legislators must consider providing immediate relief in helping their constituents combat record inflation. One place to start is by abandoning the income surtax proposal.

## METHODOLOGY

BHI estimated future inflation using an autoregressive integrative moving average (ARIMA) model. ARIMA works by estimating a regression equation that extrapolates from historical data to predict future estimates. For estimated inflation, we included the percent change in the M-2 Money Supply and the percent change in the federal debt as an independent variable.

In estimating the regression, 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 by examining the autocorrelation and partial correlation coefficients in the correlogram and then fine-tuning after examining the structure of the equation residuals.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