COLBY ECONOMIC OUTLOOK

CURRENT ECONOMIC CONDITIONS & OUTLOOK FOR THE U.S. MACROECONOMY AND THE STATE OF MAINE

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The forecasts and analysis in the CEO represent the views of the authors and do not necessarily represent the opinions of the faculty and staff at Colby College.

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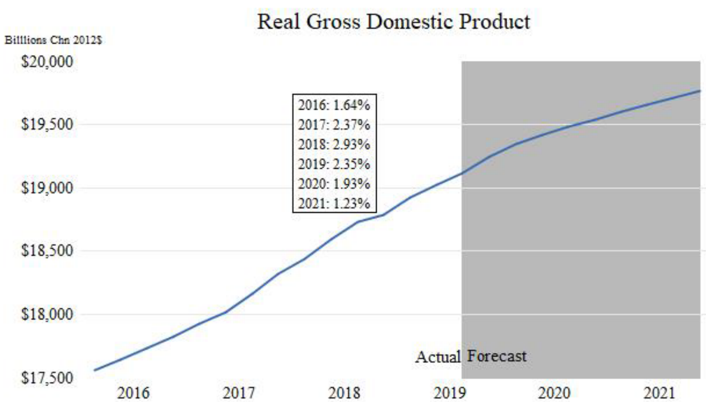
This edition of the Colby Economic Outlook (CEO) was constructed by the students in Economics 473 at Colby College. EC473 is a senior seminar under the instruction of Professor Michael Donihue that teaches multiple methods and approaches to forecasting time series. Starting in 1989, the CEO has provided a useful bridge between the experience students have in the academic classroom and the 'real world' of financial market analysts, policy makers, non-profit professionals, and economic developers. The forecasts presented in this newsletter represent the results of a sixty equation macroeconometric model of the U.S. and a somewhat smaller structural model for Maine. The Colby Quarterly Econometric Model of the US Economy (CQEM) is maintained by the students in EC473 and encompasses several sectors and underlying variables of the U.S. macroeconomy that we believe are important for forecasting future economic performance of the U.S. and Maine economies through 2021.

Current State of the U.S. Macroeconomy

The forecasts in this version of the CEO use time series of economic data through the third quarter of 2019. The U.S. economy continues to exhibit signs of a 'growth recession,' meaning that real GDP is underperforming relative to potential GDP. While the labor market continues to tighten and unemployment rates remain low, the Federal Open Market Committee (Fed) continued to implement monetary easing through the first three quarters of 2019 to stimulate the economy. Despite strong economic indicators, the Fed continues to cite modest rates of inflation and a negative GDP output gap as reasons to lower the Federal Funds Rate (FFR). We expect inflation to grow slightly above an annual rate of 1% through the end of 2021.



With relatively stagnant growth, we predict that the Fed will keep the target range for the federal funds rate between 1.50% and 1.75% through the end of 2021. Additionally, we expect GDP growth to slow significantly from current levels down to only about 1.15% in 2021Q4.

The U.S.-China trade war continues to adversely affect the U.S. economy, with negative effects on wages, full-time employment, and GDP. Additionally, the U.S. trade deficit remained relatively consistent throughout 2019 following a significant increase in 2018, despite experiencing slight decreases in exports. In Europe, stock markets have struggled in the last year and European manufacturing continues to struggle due to Brexit uncertainty and on-again-off-again trade talks. In general, the U.S. dollar has been strong this year and we expect this trend to continue.

Consumption continues to drive the U.S. economy, accounting for approximately two-thirds of GDP. The shift away from traditional brick-and-mortar shopping towards e-commerce remains a notable trend in this sector of the economy. During the current economic expansion, credit card debt increased to $4.3 trillion in 2019, and we expect it to continue to grow at a steady rate of approximately 3% through the end of 2021. Looking forward, consumer confidence will continue to be a main driver of the economy. If consumers begin to expect a recession in the near future, we may see a more pronounced slowdown in GDP growth.

Despite the Tax Cuts and Jobs Act passed by Congress and signed by President Trump in 2017, which lowered the corporate tax rate, corporate profits were stagnant in 2018 and 2019. Decreasing the corporate tax rate from 35% to 21% was supposed to provide an incentive for companies to reinvest in human capital and R&D. However, as corporations seek to appeal to their shareholders, stock buybacks have become increasingly popular. 2019 is set to be a record year for stock buybacks, which are expected to fall just short of $1 trillion. Other factors underlying the lack of growth in corporate profits may include uncertainty regarding the U.S.-China trade war, companies missing earnings expectations, and wage growth outpacing inflation.

The 2017 Tax Cuts and Jobs Act cuts are contributing to an increasing government deficit by decreasing government revenues significantly. We expect government consumption expenditures and gross investment to increase by approximately 1.5% year over year and the deficit to increase to $1.3 trillion in FY2021.

For much of 2019, the yield curve was inverted with 3-and 6-month Treasury bills trading at higher yields than 2- and 10-year Treasury bonds. Over the last four decades, a recessionary period occurred approximately four to six quarters following the inversion of the yield curve. By November the inversion of the yield curve was gone, nonetheless financial market uncertainty remains high.

Trade Troubles and International Sector

The U.S. trade deficit has been on the rise since 2014 and recent trade policy has only exacerbated this trend. President Trump strongly believes that a trade deficit signals a weak economy and, in an attempt to decrease the deficit and protect domestic producers, he has engaged in a series of tariffs and trade wars most notably with China. The U.S. operates in a highly globalized economy and relies on the import of foreign goods for both consumption and production of domestic goods, and the Administration's policies have increased the cost of imports, which naturally have been passed down to the consumer. Economic theory suggests that these actions actually work to increase the trade deficit by increasing the price of imports and making exports less attractive due to retaliatory tariffs and this theory has been supported by empirical evidence. The President began implementing these policies in early 2018, and between Q2 and Q3 of that year the deficit increased from $850 to $962 billion.

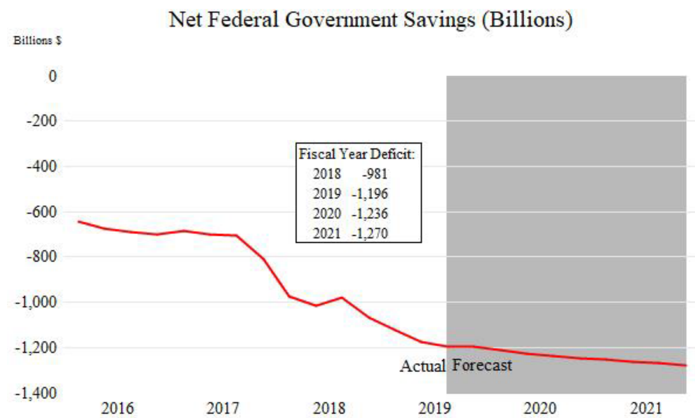
The impact of these policies has been far-reaching across the U.S. economy. To date $87 billion in new taxes on American corporations have been levied due to tariffs, which amounts to one of the largest tax increases in decades. The nonpartisan Tax Foundation estimates that currently implemented tariffs have reduced long run GDP by 0.25%, wages by 0.16%, and full-time employment by 195,600 jobs.

To reduce the impact of adverse trade policy, the Administration has been forced to increase subsidy transfers to American corporations. Subsidies increased from $58 to $81 billion last year, most of which went to the farming industry which was hardest hit by the trade war. While subsidies allow relief in the short run, farmers believe that the long run impact of the tariffs will be negative and significant. This is due to the fact that China has been forced to find other trade partners, like Russia, Brazil, and Canada, and once the trade war is resolved farmers fear that China will continue to trade with these alternate partners.

The trade war has generally been viewed unfavorably by Americans, and therefore we would not be surprised if President Trump reaches a trade agreement with China in mid to late 2020 as a political maneuver leading up to the Presidential Election. Recent developments, particularly U.S. legislation in support of pro-democracy protests in Hong Kong, may jeopardize a potential agreement. Due to the tight deadline, domestic attitude towards the policies, and lack of leverage, if an agreement is reached, we would not expect it to be particularly effective in achieving the President's trade goals. Trade policy with China would likely resemble its pre-trade war status, perhaps with minor concessions from China. The most significant impact of these policies will be the negative effects on GDP, wages, and jobs, as well as the loss of established trade routes, particularly for domestic farmers.

Ballooning Government Deficit

Despite sustained growth in the economy, the U.S. government budget deficit has increased for the fourth consecutive year. It surpassed $1 trillion in 2019, a 26% increase in the past year alone. This surge in the deficit is largely due to the Administration's Tax Cuts and Jobs Act enacted by Congress in 2017 which decreased both individual and corporate tax rates. These tax cuts were intended to spur long term economic growth by increasing consumer spending and corporations' bottom line profits, but as a result have decreased government revenue inflating the deficit.



Government expenditures have been growing, including a $150 billion annual increase to military spending in 2019. Additionally, as mentioned above, foreign policy has forced the government to increase subsidies. We forecast normal growth of government spending of 3.7% through 2021Q4. We also expect to see increases in the government budget deficit through the end of 2021, although growing at a much slower rate than we observed over the past year.

However, both the deficit and future government expenditures are largely dependent on the results of the 2020 presidential election. President Trump claims that he will prioritize cutting government spending if elected for a second term, while Democratic candidates plan to increase government spending and offset the effect on the deficit with increased taxes.

Consumption

Consumer sentiment has been on the rise since the Great Recession, but has recently plateaued since peaking in the first quarter of 2018. As we forecast that GDP will experience diminished growth through the end of 2021, we expect consumer sentiment to slightly decrease over the

same period. The expected decline is minimal, as we forecast a consumer sentiment index value of 94.7 in the 2021Q4, falling from a peak of 99.0 in the 2018Q1. For context, this index reached a trough of 57.7 in 2008Q4. Our consumer sentiment forecast lines up with other forecasts in the CEO as we predict unemployment to slightly increase and income to increase at a diminishing rate through the forecast horizon.

Aggregate consumption represents roughly two-thirds of total domestic GDP and is therefore critical to the economic health of the United States. In fact, over the last several months the stable growth in real output has largely been credited to a healthy consumer market as other inputs have faltered over that time period. We predict that consumption will remain strong in the U.S. through the forecast period, which is supported by our positive income forecast. Real personal consumption expenditures reached $13,344 billion in 2019Q3 and, looking to the future, we predict it to reach $14,311 billion by 2021Q4 corresponding to annual rates of growth of 3.5% in 2020 and 2.9% in 2021.

Special Report: The Amazon Effect

Traditional economic theory states that in periods of low unemployment we should expect to experience high inflation due to wage growth and price increases. However, over the last decade, roughly since the beginning of the current economic expansion period, the U.S. has experienced falling unemployment and low inflation. In 2019Q3 unemployment stood at 3.6%, the lowest level since the 1970s, and inflation was 1.5%. Many experts argue that this phenomenon is due to the 'Amazon Effect.'

The Amazon Effect is relatively simple. Because Amazon is primarily an online retailer with a minimal physical presence, it has low overhead costs and therefore has the ability to undercut competitors' prices and operate on razor thin margins. This means that a consumer can walk into a store, find a product they like, and price check that exact product on Amazon or other sites in real time. If they find a better deal, they will purchase the product through an alternate channel to save money. This forces retailers to keep prices low, which, when operating on a total economic scale, works to keep inflation low.

To reflect the importance of online shopping across the country, this edition of the Colby Economic Outlook debuts our first forecast of U.S. e-commerce sales. Online sales have been growing rapidly over the last two decades, and double-digit annual growth has been the case more often than not. 2019Q3 saw $178,192 million in total sales, and we project that value to reach $225,865 million by 2021Q4. Our projections indicate growth of 13% in 2020 and 10.9% in 2021. The shift towards e-commerce sales is of particular note due to the Amazon effect on inflation. As online shopping increasingly becomes the norm in the U.S., expect economists and observers to keep a close eye on its effect on inflation.

The Outlook for Inflation

The primary measure of inflation in our model is captured through annual rates of change in consumer prices measured by the chain price index for total personal consumption expenditures. According to this measure, inflation has hovered around the Federal Reserve's target rate of 2% since the mid-1990s, with the exception of swings due to unexpected economic shocks. However, since the Great Recession inflation has been, on average, slightly below the target rate, and fell to 1.5% in 2019Q3. We project this trend to continue and forecast inflation to remain between 1.1% and 1.7% through 2021Q4.

CEO Inflation Monitor

Year	Consumer Prices	Gas Prices	Core CPI†	Imports	Home Prices	Oil‡
2016	1.0%	-11.3%	2.2%	-3.6%	7.2%	$41
2017	1.8%	13.1%	1.8%	2.2%	4.8%	$51
2018	2.1%	13.4%	2.1%	2.9%	4.2%	$64
2019ᶠ	1.4%	-4.3%	2.1%	-1.2%	1.6%	$59
2020ᶠ	1.4%	-0.1%	1.3%	0.2%	2.7%	$56
2021ᶠ	1.4%	2.2%	1.1%	1.8%	1.4%	$57

†Excluding food & energy ‡$/BBL ᶠforecast

The Labor Market

Unemployment rates continued to remain low over the last few months, hovering around 3.5% during September and October. The private economy created a net 131,000 jobs in October and job growth averaged 176,000 in the last three months. The continued low unemployment and strong job growth indicates a healthy labor market. Most wage growth is occurring in the unskilled labor market; whereas, wage growth is relatively stagnant in the skilled labor market.

In August, labor force participation rates among prime-age workers aged 25 through 54 reached its highest level of 82.6% since April 2010. In addition, 3rd quarter wages in the private sector increased 3% from a year earlier. Despite this, the employer cost index, a common indicator used by the Fed, indicates that wage and salary pressure is modest. Weaker pressure on wages will likely help keep inflation in check but could slow consumer spending, a main driver of the economy in recent quarters.

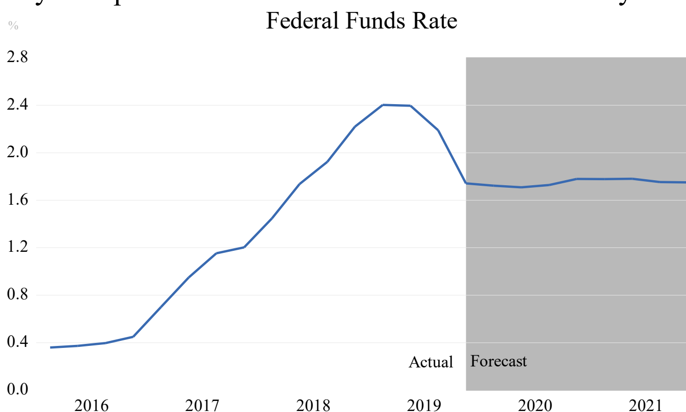
Our model predicts a 2.35% annual increase in the average hourly earnings over our forecast horizon. Labor productivity is forecast to remain quite sluggish, increasing by less than 1% year over year through 2021.

Monetary Policy

The Fed's behavior over the last year has been somewhat controversial. Strong pressure from President Trump to cut rates made the Fed's rate cut decisions increasingly political. The Fed cut rates three times through the third quarter of 2019 even though some of its officials were opposed. However, many Fed officials claim to be confident in the current state of monetary policy. The federal funds rate (FFR) target range is anywhere between 1.5% and 1.75%. This target range will remain indefinitely until new data suggests need for reactionary policy.

One of the features of our model is a Federal Funds reaction function predicting the behavior of the Fed and monetary policy. Given the current strength of the economy, our reaction function indicates the Fed should not have implemented rate cuts in the first two quarters of 2019. Despite strength in the labor market and moderate economic growth, the Fed continues to cite inflation below their two-percent target as reason to cut rates.

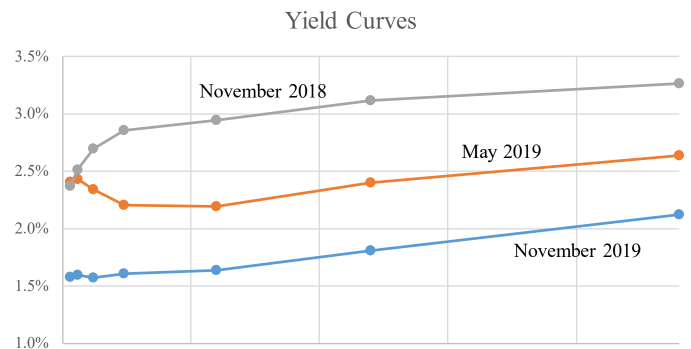
Our model predicts that the FFR will remain in the Fed's current target range through 2021Q4. This is reflective of the current growth recession in the economy. In addition, it is unlikely that the Fed will implement any drastic monetary policy changes in 2020 since it's an election year. As the Fed continues to monitor the economy, it will be interesting to see what types of reactionary policy they implement if any unexpected shocks influence the macro economy.



The Yield Curve

Investors often look to the yield curve as an indicator of oncoming recession. Over the last four decades, every time the yield curve inverted (when the yield on Treasury bonds with longer maturity fall below the yield on shorter term Treasury securities), a recessionary period occurred approximately a year and a half later. The general intuition behind using an inverted yield curve as a recession indicator involves demand for safer assets and an understanding of the inverse relationship between bond price and yield. The theory is that when investors become wary of the economy, they begin to invest in risk free assets, such as Treasuries, rather than 'riskier' stocks. The increased demand for risk free assets results in a decrease in yields. Thus, longer term Treasuries begin to provide lower yields to investors.

The yield curve was inverted for the majority of 2019. In addition, the 10-to-2-year Treasury spread was negative for about a week in the late days of August. However, by November, the yield curve re-normalized for the first time since November 2018. Investor sentiment seems to be positive after the yield curve renormalized; however, it is important to note that the yield curve was briefly normal prior to the 2008 Great Recession.



Our model forecasts short term rates as a function of the Federal Funds rate and the long-term rates are term-linked and adjusted for inflation factors. We don't foresee another inversion of the yield curve over our forecast horizon. We are forecasting the three-month and ten-year Treasury yielding 1.64% and 1.98% respectively in 2021Q4.

Investment Outlook

Although still well below pre-recession levels, housing starts have generally been increasing since 2011. They recently recovered from a brief low at the end of 2018, expanding by 8.2% over the past 12-month period. Homebuilder confidence hovers around an 18-month high and the current low mortgage rates indicate that housing starts is due for further growth. We forecast continued growth into early 2020, where they will remain flat through the remainder of the year and begin slightly declining through 2021. We expect private residential investment to mirror this trend, growing through the beginning of 2021 and a subsequent slight decline through the remainder of the year.

Nonresidential fixed investment peaked in 2019Q1 and has been declining ever since. This indicates that the 2017 tax cuts may not have translated into a prolonged period of increase in business investment as promised. Additionally, the declining investment may be the result of the uncertainty surrounding the US-China trade war and the U.S. 2020 presidential election. Firms tend to hold off on fixed investment until they are more certain of the general direction of the economy. We expect many firms to hold off on large investment decisions until a trade deal is reached and a clearer election picture emerges, and we forecast a continuing decline of nonresidential fixed investment.

The Economic Outlook for Maine

This section of the Colby Economic Outlook focuses specifically on the Maine economy. The following forecasts represent the results of a ten equation econometric model that utilized both Maine variables and U.S. macroeconomic variables and their forecasts from the CQEM. These U.S. economy variables include real disposable personal income, real GDP, wages, employment, and consumer prices.

Maine has been experiencing a labor shortage. Currently, there are not enough skilled workers to fill the job openings and the state is brainstorming strategies to grow the number of skilled workers. Additionally, Maine is a large state and there is a mismatch in geographical location of those who are unemployed in the labor force and job openings. Another worry is that Maine is currently the oldest state in the nation, and when this population begins to retire there will be fewer people to take their jobs.

Addressing the labor shortage will be imperative for the future of Maine's economy, which has shown strong performance in the past year. Maine is heavily reliant on its tourism sector and lodging and restaurant sales increased by 6.6% in 2019Q2, while total retail sales increased by 3.9%. This growth is reflected in turnpike traffic, an indictor in our forecasting model which has posted consistent increases since 2013. We expect traffic, and tourism activity in the state, to continue to grow over the next two years. In 2019, Maine also saw increases in both personal income and wages.

Since the great recession, total employment in Maine has steadily increased and the unemployment rate has decreased to an all-time low. As of October 2019, Maine's unemployment rate was 2.8%. It has remained under 4% since the beginning of 2016 and we expect it to remain low going forward. We disaggregate total employment by sector and forecast a slight increase in total employment through 2021.

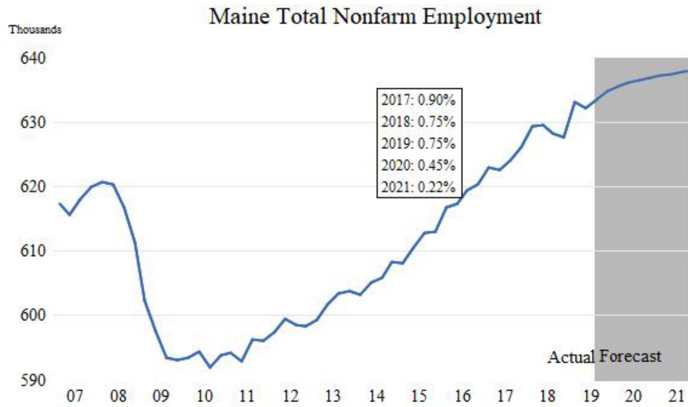
Employment

Over the last ten years of economic expansion, Maine has seen growth in nonfarm jobs, which we define as total employment. These increases are paralleled by Maine's low unemployment rates, which hovered around three percent with a 2019Q3 rate of 2.93%, lower than that of the U.S. economy. However, the median age of the labor force has increased to over 45 in the last decade. Additionally, the various labor sectors within Maine are experiencing different outcomes. Our model includes forecasting equations for total (nonfarm) employment, health and education employment, leisure and entertainment employment, and all other employment, with manufacturing employment solved for as the difference between total employment and the sum of the component forecasts.

Manufacturing employment has declined since the 1980s when a series of factory closures began in Maine, specifically in shoe and textile manufacturing. Since the 2000s, Maine manufacturing employment has seen continued closures in wood and paper factories. We predict a continued mild decrease in manufacturing jobs through 2021, which is reflective of the state of existing factories in Maine and manufacturing's increased reliance on technological advancements.

Employment in health and education has historically grown in Maine, however, over the last few years has had an annualized growth rate hovering around 1% every quarter. This differs from the trend in the overall U.S., where health and education employment continues to grow more strongly. We forecast slowing growth in health and education employment: starting 2020Q1 at 1.25% growth and ending 2021Q4 at 0.93%. This is largely due to the aging population of Maine and labor supply constraints, suggesting that the health and education sector is experiencing replacement of workers, rather than growth in numbers.

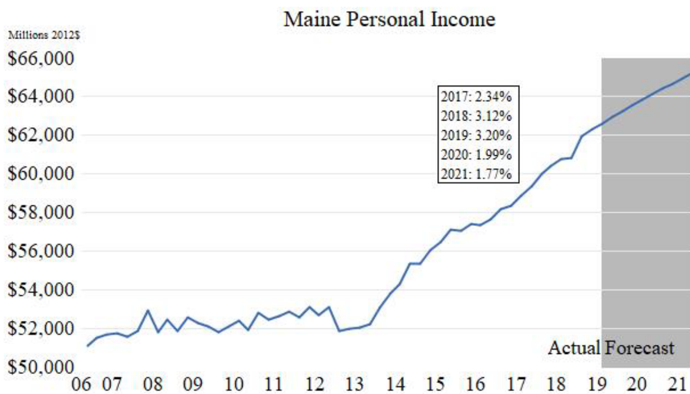
The leisure and entertainment sector, which encompasses tourism, has seen relatively steady growth in employment over the last ten years. In comparison to other states, a much larger portion of Maine's tax dollars are going towards the tourism advertising, thus making it a valued and important industry in Maine. We forecast a 1.48% growth in 2020Q1 and slowing growth to 1.07% in 2021Q4.



Despite the past growth of Maine's employment, the labor shortage is preventing significant future growth. However, with the state implementing new policies to increase labor force participation we predict a slight increase in total employment, with a predicted annualized growth rate of 0.22% by 2021. However, the composition of total employment will change as new opportunities arise in alternative energy jobs and the growing tourism industry. Additionally, we forecast a slight increase in the unemployment rate, reaching 3.39% by 2021Q4 from the current 2.93%. Our forecasts for unemployment and slowing growth rate of total employment mirror our forecasts of slowdown at the U.S. level.

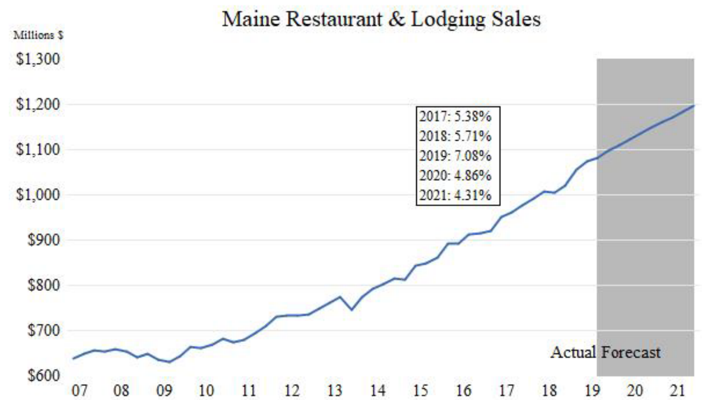
Personal Income and Wages

Maine has experienced shifts in both wages and personal income over the last few years. Besides the steady growth due to inflation, the state minimum wage has also influenced income and wages. Starting in January of 2017, minimum wage increased from $7.50 to $9.00 an hour. Since then it has increased by $1 every year until it reaches $12.00 an hour in January 2020. This change has impacted wage growth and income for Mainers, showing consistent growth since the change in 2017. After taking into consideration our forecast of total Maine employment and utilizing the U.S. variable of average hourly earnings, we predict continued wage growth of 1.92% in 2020Q1 and 2.28% in 2021Q4. We predict a similar trend for real personal income.



Retail Sales

Retail sales in Maine, like that of the US economy, have been the biggest driver of growth during the past decade. Retail sales in Maine have been growing steadily since the recession, largely due to the tourism industry and increased personal income and wages. Tourism in Maine has benefitted from significant investments by the state, with a large portion of the budget going towards advertising for Maine tourism. Restaurant and lodging sales have also been growing as a result of the growing tourism industry. We forecast that both retail sales and restaurant and lodging sales will continue to grow over the next two years. We expect retail sales to grow by 3.56%, ending 2021Q4 at $6659.5 million. We predict that tourism sales will increase at a higher rate than total retail sales ending 2021Q4 4.06% higher, at $1195.6 million.



Turnpike Traffic

Traffic on the Maine Turnpike is measured by the number of passenger cars who pass through the toll booths. After the recession, turnpike traffic hovered around 14 million passenger cars until mid-2012. Taking a drastic jump, turnpike traffic increased by almost 2 million passenger cars from 2012Q2 to 2013Q1. Since then, turnpike traffic has been steadily increasing and was just over 20 million passenger vehicles in 2019. Over the next two years, we forecast that just over 22 million passenger cars will pass through Maine Turnpike toll booths.

Colby Coincident Index of the Maine Economy

The Colby Coincident Index (CCI) provides a comprehensive measure of the health of the Maine economy. It is constructed using a modified algorithm based on the coincident index of economic indicators published for each of the 50 U.S. states by the Philadelphia Federal Reserve Bank. The Philadelphia Fed's coincident index uses variables that capture mainly the manufacturing sector, which no longer represents a significant portion of the Maine economy. The students in EC493 have developed and maintained our own coincident index using indicators that better reflect the Maine economy. These variables are then forecasted by our econometric model for Maine and thus provide a forecast for future economic performance.

The CCI uses four indicators: total retail sales, total employment, turnpike traffic, and real personal income. All of the variables are adjusted for seasonal variations to enable us to capture underlying trends in the data. These variables capture the tourism, education, and healthcare employment sectors which are the most important factors of the Maine economy. The index produces a series of quarterly changes for each variable using a symmetric percentage change formula. With 2009 as our base year for the index, all index values can be interpreted relative to the Great Recession as it had a significant impact on Maine.

One of the primary advantages of the CCI is the ability to use higher frequency data to assess the overall health of the Maine economy. State GDP is reported quarterly, but with a significant lag and, for rural states like Maine, can be subject to large revisions over time. The CCI has the same general trend historically as Maine's GDP and also is broadly consistent with the aggregate index reported by the Philadelphia Fed for Maine. As illustrated in the accompanying chart, the CCI shows a strong upward trend after 2009 indicating a healthy and growing economy after the recession. From our forecast, we are predicting that the strong, steady increasing trend will continue through 2021Q4. Specifically, we are predicting that the Maine economy will grow by 1.85% in 2019, 1.41% in 2020, and 1.35% in 2021.