

# COLBY ECONOMIC OUTLOOK

*Current Macroeconomic Conditions & Outlook  
through the COVID-19 Pandemic in the U.S.  
and Maine*

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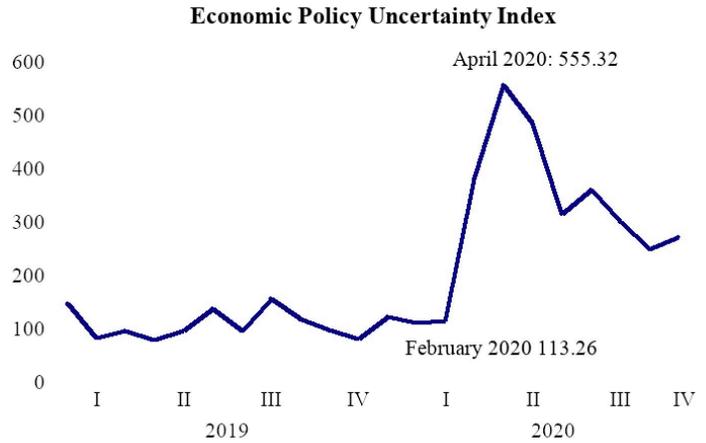
The Forecasts and analysis in the CEO represent the views of the authors and do not necessarily represent the opinions of the faculty and staff at Colby College.

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. With an emphasis on time series data, this course teaches multiple forecasting methods and statistics diagnostics. The first issue of the CEO was released in 1989 and remains an important translation of classroom teachings to applicable post-graduate skills. This newsletter will capture 11 sectors of the economy through 60 equations that combine to build a macroeconomic model of the U.S. Economy, as well as a supplementary structural model that focuses specifically on Maine. All equations in this model have been carefully examined and specified to produce the most accurate and substantive forecast possible.

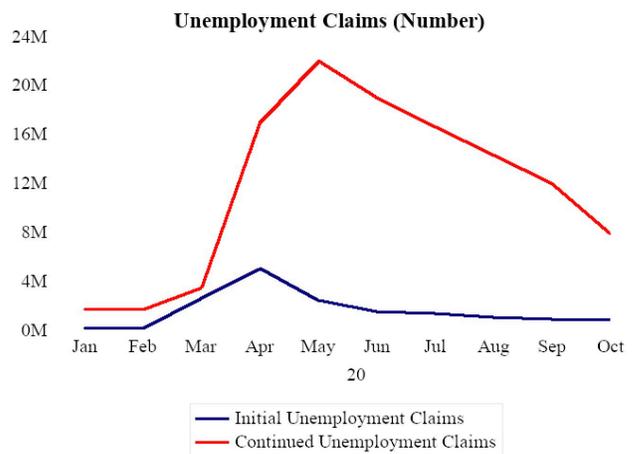
**Current State of the U.S. Macroeconomy**

The model-based forecasts in this CEO use equations with parameters estimated through the fourth quarter of 2019, a decision made because of the COVID-19 Pandemic. While data for most of the variables used was available through 2020Q3, the volatility made for a tricky data set. Therefore, the team concurred that the cost of sacrificing two more recent data points was justified by increased validity and decreased error. The economic patterns of 2020 have been unpredictable, to say the least, and this report is coming right in the middle of the recovery. It is unclear what the true path of recovery will be, so a few assumptions have been incorporated into our forecast. Earlier this year, the Federal Open Market Committee (Fed) announced that their benchmark Federal Funds interest rate will remain near 0% until 2023, and their target for inflation will be averaged at 2%. Being at the Zero Lower Bound (ZLB) through 2023 will cause the fed to continue with unconventional monetary policy through quantitative easing, as well as a plea for a fiscal stimulus package from Congress. Currently, economic policy

uncertainty is at extremely high levels, as shown by the figure below.



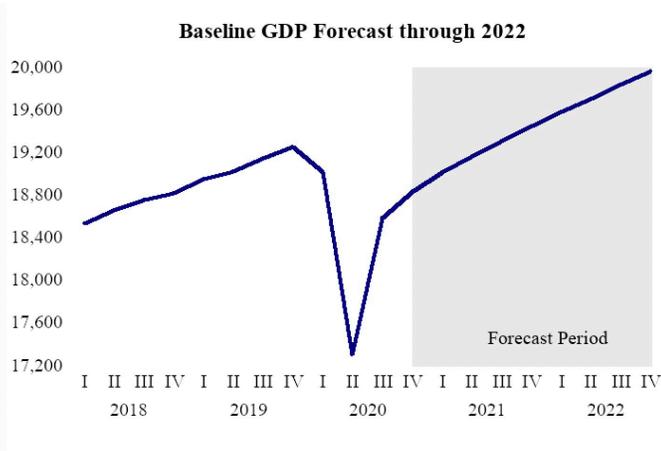
There has not been much assistance from the federal government after the initial stimulus package in 2020Q2. Support from this package is running out, with the last straw of Pandemic Unemployment Assistance (PUA) expiring December 26<sup>th</sup>. Columbia University researchers estimated that the CARES act lifted 18 million people out of poverty in early to mid 2020, but that the poverty rate is now higher than it was before the pandemic. Unemployment claims have also climbed exponentially in 2020, with a peak for initial claims in April with 5.04 million new claims. The peak for continued claims was May with 22.03 million claims.



COVID-19 has resulted in simultaneous GDP decline and unemployment increases through the greater part

of 2020. It appears that the only way to get a handle on the economy is to handle the pandemic. Different sectors have reacted differently to the pandemic, with the service sector being the hardest hit.

## GDP and Consumption

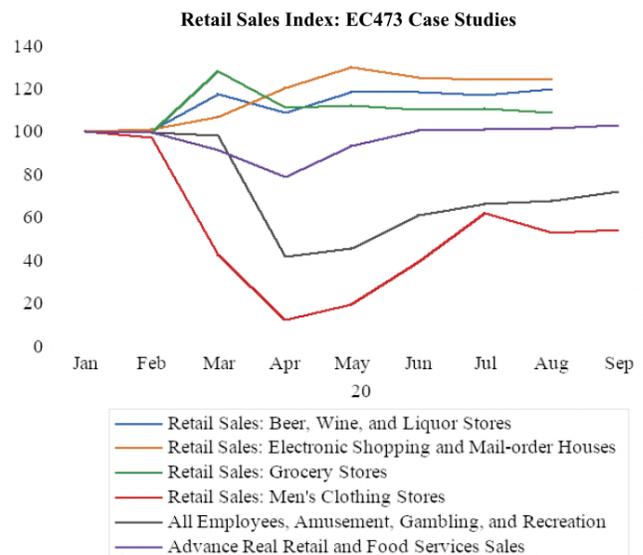


Our baseline real gross domestic product forecast shows a sharp V-shaped recovery with a return to pre-pandemic levels coming in the first quarter of 2021. The model predicts a continued improvement following from a historic 31.4% drop in real GDP in 2020Q2 and partial recovery in 2020Q3. We forecast an annualized rate of growth of 4.34% through 2021 and predict that GDP will grow an additional 2.79% from 2021 to 2022. Nearly two thirds of GDP comes from consumption and the service sector has been most severely impacted during the pandemic. Given extended lockdowns and ongoing restrictions, the consumption of services such as tourism, retail, and hospitality have had the harshest impact. Demand fell towards the end of 2020Q1 and plummeted into Q2. Such severe economic and health concerns have created significant uncertainty, erasing much of the improvement in consumer sentiment since 2008.

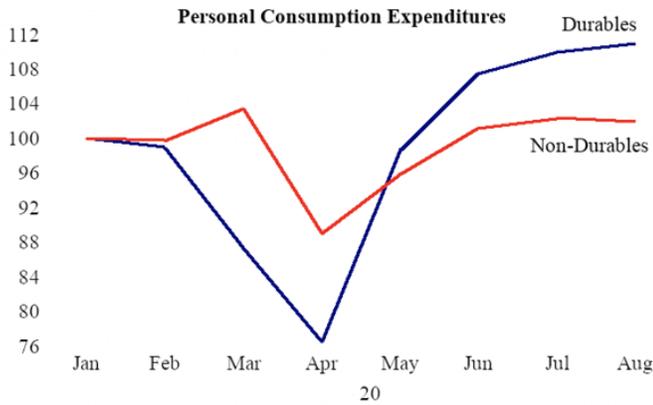
The Colby EC473 seminar began the semester with case studies of time series representing the changes in retail sales (and employment) by industries particularly affected by the pandemic. As businesses

closed and people stayed at home to prevent the spread of the virus, all tourism-related activities took a significant hit, represented by employment in the amusements, gambling, and recreation, which fell by 60% in April. This sector of the economy has had a very slow recovery thus far. The only series we looked at that declined even more in percentage terms was men’s retail sales, falling nearly 60% between February and March and a further 20% into April. The recovery up until July was significant, but it has leveled out at around a 40% loss since.

Increases in grocery store sales, alcohol sales, and electronic shopping in 2020 stand in stark contrasts to such dismal levels of sales and employment. Grocery sales spiked in March as we prepared for quarantine, and sales at liquor stores remained around 20% higher than “normal” as the perils of 2020 started taking a toll. Households were forced to substitute toward electronic shopping from traditional retail shopping and, supported in part by stimulus payments, we saw an approximate 30% increase through May, and has remained 20% above “normal.” On an aggregate level, real retail and food services sales experienced an approximately 20% decline between February and April but rebounded and leveled out at pre-pandemic levels by June; the pandemic’s effects have not weighed equally across the consumption sector.

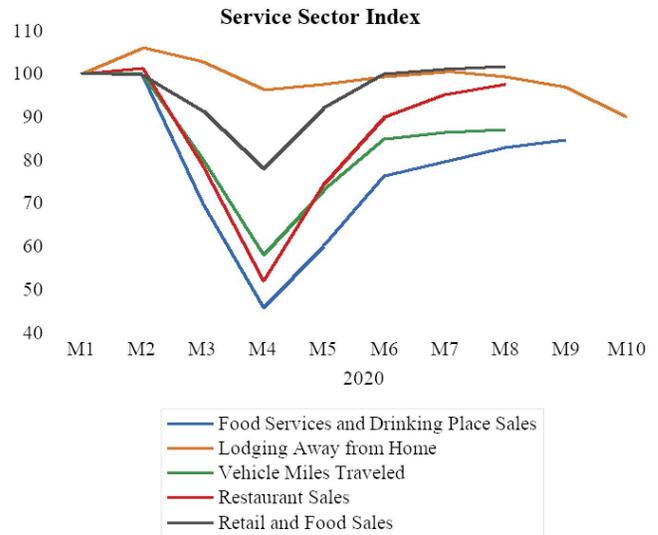


Consumption of durable goods bounced back surprisingly well in 2020Q3 after declining through April, hitting the series peak at over \$2 trillion compared to \$1.8 trillion in 2019Q4. The pandemic’s effect, given this recovery, is not negative on the year, contrasting a decline in 2008 and 2009. We expect it to continue to rise above pre-pandemic levels, growing at an annual rate of 13.89% in 2021 and 4.39% in 2022. Consumption of nondurables, on the other hand, increased between February and March as we prepared for quarantine, but fell significantly in April, and has since recovered to pre-pandemic levels. We expect a 5.73% annual growth rate in 2021, followed by 2.29% in 2022.



This has largely been a services sector recession, setting it apart from past recessions in its catastrophic effects on tourism and hospitality, retail, and professional services as travel was severely limited and local economies shut down. While durables and nondurables have recovered, consumer services will experience a longer recovery period heavily dependent on whether we experience new shutdowns, and whether (and when) a successful vaccine becomes available. Airlines and recreational activities will be among the last areas continuing to struggle with capacity limits in place. We see services consumption coming back to normal towards the end of 2021 and into 2022. We project an annual growth rate of 5.42% in 2021 after a nearly 7% decline in 2020, followed by 3.29% growth in 2022. Overall, we

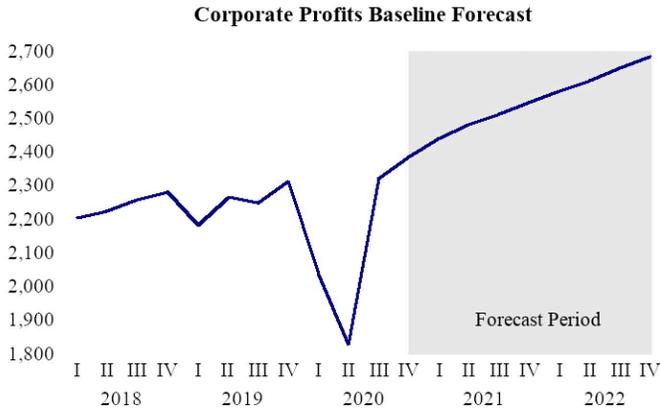
can expect the historical trend to return sometime in 2021 to reach pre-pandemic consumption of services in early to mid 2022.



### Income and Corporate Profits

In 2017 the Tax Cuts and Jobs Act lowered the corporate tax rate from 35% to 21% in an effort to continue to stimulate the economy. However, between 2018 and 2019, the annual rate of growth was just 2.38% for corporate profits. Corporate Profits fell a dramatic 20% due to COVID-19, making it the sharpest decline since 2008Q4. Due to shutdowns and reduced hours, companies have seen sharp drops in revenue and increasing costs due to mandatory expenditures on protective equipment (PPE). This was damaged further by increased income insecurity and unemployment rates skyrocketing. In 2020Q3 with the introduction of the Federal stimulus checks and various funding mechanism, corporate profits rose 18% YoY which signaled to many a V-shaped recovery. At the time this report is coming out there has not been a subsequent relief bill passed by Congress, so eyes are turned to 2021Q1. We have assumed that the new administration will pass a new economic recovery package in the early part of President-Elect Biden’s

term that will help sustain the growth seen since the March lows. In our baseline scenario that includes such a relief package would increase corporate profits 16.5% from 2020-2021 and reach a historic high of \$2684 billion by the end of 2022.



Following similar trends to previous sectors of the economy, housing starts were hit harshly in 2020Q2 with a 27.3% decline but rebounded rather well in 2020Q3 with a 32.5% recovery. While the negative shock of the pandemic was large, it was quickly offset by a combination of government stimulus packages, decreasing 30-year mortgages, and general adaptation to the “new normal”. This period of huge growth is likely to be sustained through 2021 at a forecasted growth rate of 13.44% through 2021. Private residential investment shows similar trends, reinforcing the V-shaped recovery observed thus far post-COVID. Both are expected to exceed their pre-pandemic levels in the next two years and assume their modest but steady growth.

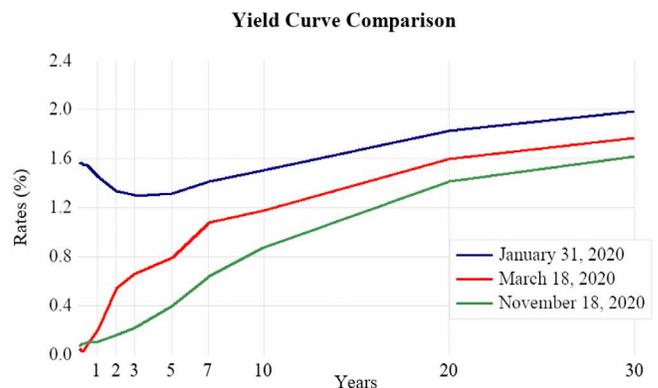
### Trading in a Pandemic

Prior to the pandemic, trade was perhaps the largest economic story of the Trump administration. The president renegotiated NAFTA into a new United States-Mexico-Canada Agreement (USMCA) that went into effect on July 1<sup>st</sup> of this year and reinstalled tariffs on goods imported from the European Union

and China. Phase one of the trade deal was completed in January 2020, resulting in an agreement from China to increase US imports in exchange for the removal of key tariffs.

With the added complication of the pandemic, trade has been relatively volatile in 2020. The U.S. trade deficit in 2020Q1 reached its lowest level since 2016 (\$494B), and then increased rapidly to its highest levels since 2008 by 2020Q3 (\$732B). This volatility was driven by relatively high exports and low imports during the first quarter of the year when other economies experienced COVID-related shutdowns that pre-dated those in the U.S. Imports rebounded dramatically as a result of the stimulus payments and generous unemployment insurance benefits. Exports lagged in 2020Q2 before showing signs of a modest recovery in 2020Q3. It should be noted that according to the Peterson Institute for International Economics, China is only importing half of the agreed upon target value as of October. There is still lots of room for volatility in this sector of the economy. Our forecast predicts that, after the narrowing of the trade gap in 2020 it gap will continue to expand in 2021 as it reaches over \$6 trillion on the year (\$6.035T) and then will remain relatively flat through 2022 (\$6.206T). These results are driven by steady, albeit moderate, increases in both imports and exports based on their baseline levels at the end of 2020Q3.

### Monetary Sector



The FOMC has had a challenging landscape to operate in during this pandemic. With interest rates close to zero, they have been urging for expansionary fiscal policy to help offset the macroeconomic impacts of this year. While they have done their best to combat this slowdown with unconventional policy and forward guidance, they are pleading for external help. To capture the changes in expectations about future interest rates and the risk premium that individuals require to keep their money in these assets, we chose to include 3 yield curves from different points of 2020.

The yield curve from January 31st shows an inversion in the short end, implying that market participants expected future short-term interest rates to drop below current short-term rates. This did not come from any structural changes by the Fed, but rather the pandemic beginning to unfold around the world. This was not an isolated event, as the yield curve was inverted in the short end for much of February – reaching a negative spread between yields on short- and medium-term securities of more than 60 basis points by the end of the month. On March 18<sup>th</sup> there was a steepening in the short end of the market which could reflect an increase of the risk premium during an incredibly unpredictable environment. Then lastly, the most recent yield curve at the time of this publication was on November 18<sup>th</sup>. This took on a much more normal shape, and different than the first two is relatively flat in the short end. The Fed has announced that interest rates will stay near zero through 2023, but the yield curve has remained upward sloping. This is relevant because investors typically correlate an upward sloping yield curve and real future economic growth. Over the last four decades when the yield curve inverted, a recessionary period often occurred about a year and a half later.

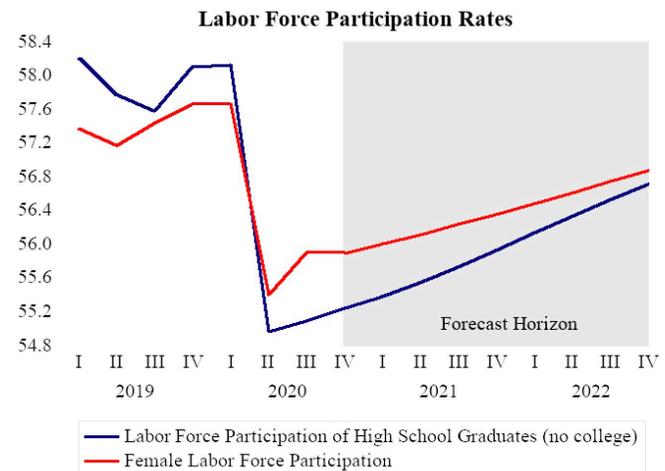
Our forecast includes a federal funds reaction function to estimate future monetary policy behavior. Over the forecast horizon, the average federal funds

rate is 23 basis points. We expect it to stay near zero through 2022Q4 until they are certain that the economy has fully recovered from the pandemic.

## Unprecedented Unemployment: Labor Sector

2020 began with record high employment before a startling decline as the pandemic response required significant shutdowns, along with layoffs and furloughs of nonessential workers. Similar to other sectors of the economy, however, employment experienced a significant recovery in 2020Q3 despite virus surges across the country as businesses reopened. More recently, employment has continued on an upward trend but is growing at a slower rate. Job growth has slowed down each month since June. This trend is unlikely to change in the short run with COVID-19 cases continuing to rise and federal stimulus packages wearing off. We expect job growth to return to pre-pandemic levels by the end of 2022.

Our model predicts that hourly wages will increase at an annual rate of .84% in 2021 and 2.29% in 2022. While productivity measured in real output per hour fell by 0.08% in 2020Q1, it increased by 2.55% in 2020Q2. We anticipate that productivity will continue to rise at an annual rate of 2.96% in 2021 and 1.77% in 2022.



One of the most distinguishing features of the labor market as we recover from the pandemic has been a systematic change in labor force participation. Thus, we have incorporated female labor force participation and labor force participation of high school graduates with no college education into the model this year. Female labor force participation fell from 57.7% to 55.4% between 2020Q1 and 2020Q2 and rebounded slightly to 55.9% in 2020Q3. There could be a long road ahead for many females to return to the labor force, especially if schools cannot fully reopen and women may increasingly choose to stay at home if their financial security allows. With an overall annual decline of 2.12% in 2020, we forecast a continued decline, at a slower rate, of -.06% in 2021 and then a slight increase of 0.89% in 2022.

Labor force participation of high school graduates with no college similarly fell from 58.1% in 2020Q1 to 55% in 2020Q2. This sector of the labor force has not rebounded at all as of 2020Q3, remaining at 55.1%, leading us to a bleak forecast that relies on a forecast of manufacturing employment. Employment in manufacturing began its decline in 2020Q1 before dropping by an annual rate of 29.5% in Q2, from 12.83 million to 11.76 million jobs. With an overall annual decline of 3.66% in 2020, we expect manufacturing employment to begin to grow again, at an annual rate of 2.37% in 2021 and 2.23% in 2022. After falling by 3.54% in 2020, we expect the participation of non-college graduates to continue to decline by 0.37% in 2021 but return to 1.39% growth in 2022. The unemployment rate jumped from just 3.5% at the end of 2019 to 13% in 2020Q2. The number of jobs lost due to COVID-19, over 20 million in 2020Q2 alone, still dwarfs the number of jobs that we have gained in the recovery thus far, at only about 8.5 million in 2020Q3. Because many businesses have not survived the shutdowns, employment will not be able to bounce back immediately. Many workers still have not been

rehired, and job growth is already slowing month-to-month. However, as pandemic restrictions fade and our daily lives largely return to normal, the unemployment rate will return to its downward trajectory. We predict that between 2020 and 2021 the unemployment rate will decrease by 1.02 percentage points. Between 2021 and 2022, we expect the unemployment rate to decrease by an additional 1.52 percentage points to 4.93% in 2022Q4. Thus, total employment will reach 2019 levels in 2022Q4.



### Inflation

The substantial increase in the Federal Reserve’s Quantitative Easing program to combat the pandemic-led recession has provoked an uptick in concerns about inflation and price stability. Despite those concerns, prices have remained relatively stable. Our primary measure of inflation for our forecast is the Consumer Price Index of the volatile energy and food sectors. There was a slight decrease in the index during 2020 as the economy contracted, however the change in the index, the rate of inflation, through the first three quarters of the year is still positive at 0.67%. The Personal Consumption Expenditures price index shows similar price stability over 2020; a one-point decrease in the index from March to May that was erased by gains in the following months. Our model predicts that increases in inflation will

materialize in the coming years. Inflation for 2021 is estimated at 2.02% and 3.08% for 2022; these predictions are consistent with our forecasts for consumer spending (7.49% and 3.16% respectively) as well as the expected increase in the money supply over the forecasted period.

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## Other Possible Scenarios

As mentioned earlier, this forecast assumed a modest fiscal stimulus package in 2021Q1. While this is one plausible scenario in the federal government's response to the economic impact of the pandemic, it would be remiss not to mention the other paths to recovery.

Perhaps the most daunting and damaging scenario, which we named the "Doomsday Scenario", is one in which there is no readily available, or poorly coordinated rollout of a COVID-19 vaccine in the early/mid part of 2021; there is no fiscal stimulus package; and that the current state of emergency continues with the virus continuing to rage across the country and states are forced into stay-at-home orders. If this were to happen it is likely that all of the aforementioned sectors would experience a second negative shock and we'd see a 'double-dip' recession early in 2021 lasting possibly into 2022. Our reading of the current state of the economy is that we're witnessing a fragile recovery, and no stimulus would absolutely threaten the current path we are on. Employment and consumption would be highly volatile and likely experience significant drop offs from the recovery we have seen thus far. Furthermore, with the Fed currently sitting at the ZLB, the economic policy uncertainty index that started this report would experience a substantial upward spike similar to 2020Q2. This would be a highly unproductive response to the pandemic and would leave America in a nasty recession that would likely take years to get out of.

On the other hand, we could be underestimating the amount of involvement the federal government will have in responding to the pandemic. Since it is now clear that the recovery from COVID-19 will require a comprehensive plan that combines politics, economics, science, and welfare benefits, it is equally likely that a more robust recovery package is passed through Washington. We've chosen to name such an alternative scenario the "Pandemic Protection Package". This would require mass testing, contact tracing, and social distancing through the foreseeable future. Similar to the way in which our small Colby College was able to keep its doors open and classes in person during the fall 2020 semester, this would require a buy-in of huge numbers of Americans. Doctors, scientists, and disease experts will weigh in on how exactly to carry this out, but it is thought that a second round of shutdowns may be necessary.

The second piece of this recovery, of course, is the economic response. There is an enormous need for fiscal stimulus to states, local governments, and small businesses right now that will only be exacerbated by a second round of COVID induced shutdowns. Not to mention the current budget deficit is already three times what it was in 2019 at a whopping \$3.1 Trillion. To combat the negative effects of such a large budget deficit, the government could mirror what President Roosevelt did during World War II and issue a sort of war time bond designed to help finance the cost of the stimulus. During WWII over 85 million Americans purchased War Bonds to help finance the cost of war, which totaled nearly \$186 Billion USD by 1946. Following the same vein, then, the US could fund the necessary aid to states and small businesses by issuing "Pandemic Bonds" that pay just above treasury securities. This would get money out of the stock market and entice investors in their search of a secure yield. Not to mention, similar to the 1940s, there is plenty of space for a patriotic marketing campaign to bring together our divided nation. The hope is that by combining science and economic

recovery packages, that the US could be performing much better than it is right now. As this report is being written there were 194,979 new cases in the United States just yesterday (November 27, 2020). The situation is dire, and there are many avenues through which the US can combat this pandemic. We see this as an opportunity to bring together Americans from all walks of life to accept that this crisis is real, it is serious, but that we can overcome it.

The goal of presenting these two alternative scenarios is to show that every forecast is a guess, and our best guess at creating this US model through the pandemic was to make a modest assumption that there will be a response between these two extremes. In reality, we could see a recovery quicker than what we've predicted, or it could be many more years before we return back to pre-pandemic levels. At the time this report is being written it is unclear which direction the government will go.

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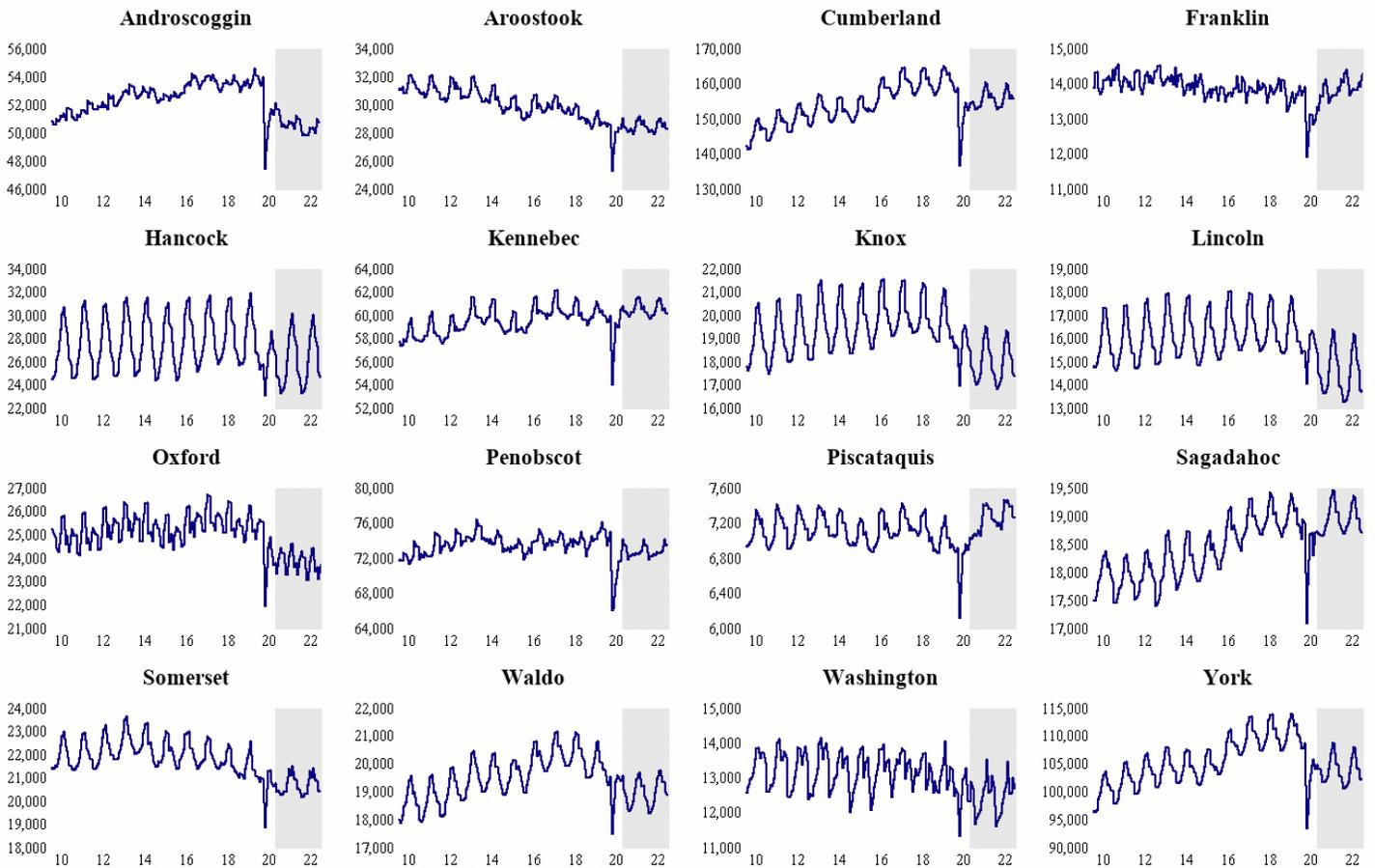
## Maine's Economy

This section of the Colby Economic Outlook focuses on the macroeconomic impact of the pandemic on Maine. Our forecasts for the Maine economy were developed from an econometric model of 11 equations that used both forecasts from our US model and state-level historical data. The Maine model includes employment in various sectors, income and wages, and other measures of economic activity unique to the structure of Maine's economy such as restaurant and lodging sales, retail sales, and turnpike traffic. Prior to the pandemic, Maine experienced a labor shortage with an aging population, a need for skilled workers, and a disconnect between job openings and job seekers. The manufacturing employment is a traditional indicator of Maine's economic stability, and it had shown promising growth of 1.96% in 2018 and 2.3% in 2019 which reversed a long-term downward trend. We expect the

pandemic to cause a continuous decline in manufacturing employment through 2021Q2, but then huge growth through 2022. Even though manufacturing decreased by 14.12% in 2020, we project a 20.17% recovery in 2021 which would bring the state back to pre-pandemic levels. Total employment in Maine, having fallen just over 7% in 2020, in this forecast to surpass pre-pandemic employment in 2022Q4, with 4% growth in 2021 and 3% growth in 2022.

Unique to this edition of the CEO, we decided to do a county-level employment analysis of Maine. Some counties were better prepared to take on the pandemic, so we wanted to explore which counties were hit hardest and what the "back to normal" trajectory might look like. We present here a data visualization of our forecasts for total employment for each of Maine's 16 counties. Clearly, the pandemic has exacerbated the already shrinking levels of employment in some counties, while others have fared relatively well.

Again, this is a service sector induced recession in a state that is heavily reliant on tourism. This is evident in the sharp decline in employment that occurred in York, Hancock, and Cumberland counties in 2020Q2, with Knox county and Lincoln county also standing out in Q3. This is likely because fewer tourists from in and out of state could visit these southern coastal hotspots this summer. While no decline was insignificant, the central and northern Maine counties, including Kennebec, Franklin, Piscataquis, Penobscot, and Aroostook counties sustained less of a decline. These economies were perhaps better insulated for this specific recession because they are more rural and receive fewer visitors that could've spread the virus, but also because their main streams of income are outside of the fallen tourism industry.



The graphic above shows a county-by-county breakdown of the total non-farm employment in Maine since 2010. The forecast period, as denoted by the light grey, is October 2020 through December 2022. The key takeaway from this analysis is that each county is facing their own “new normal” after this pandemic is over. Some counties, namely Aroostook, Knox, and Lincoln, are forecast to witness a more exaggerated decline in employment in their counties through 2022. Others will see rises in employment that signal a near full recovery within the next year or two (Cumberland, Franklin, and Piscataquis). Other counties fall somewhere in the middle and will experience a slight drop off in their regular employment levels, but that level will be sustained through the next few years (Somerset, Waldo, York). There is too much variance in Maine to simply look at state-wide data, so this county level

forecast gives us much more precise information on where to look going forward.

Wages in Maine have been gradually increasing each year as a result of inflationary pressures and a rising minimum wage. Between January 2017 and January 2020, the state minimum wage increased from \$7.50 to \$12.00. In 2020, wages decreased by 3.93%, which suffered most significantly in Q2. We expect annual growth of 0.12% in 2021 and 3.06% in 2022, which is comparable to the average growth rate of the past ten years. Nominally, personal income in Maine increased dramatically in 2020 as a result of the federal stimulus package, with growth of 8.85%. We don’t expect that fast-paced growth to continue, but are predicting a more moderate growth of 3.87% in 2021 and 5.44% in 2022.

Traffic on the Maine Turnpike is measured by the number of passenger cars that pass through the toll

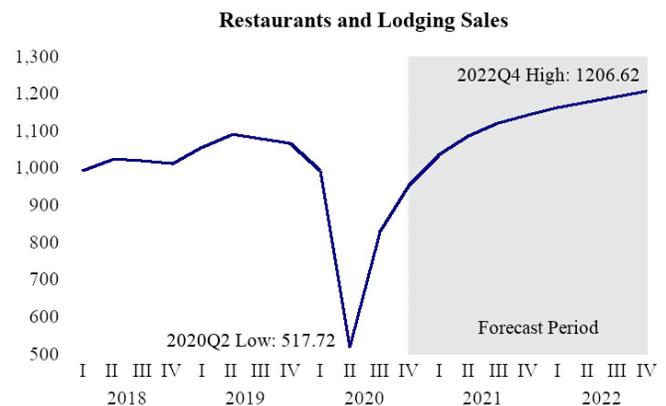
booths. From 2015 to 2019, turnpike traffic rose at an average annual rate of 3.8%. As a result of the pandemic, turnpike traffic decreased by 23.7% in 2020. We predict that this negative shock will be offset by 2022, with a recovery in turnpike traffic of 19.39% in 2021 and 4.37% in 2022, coinciding with a forecasted return of the tourism industry. As with other industries in this report, the negative shocks of 2020 will be offset in 2021, then return to much more steady and sustained growth through 2022.

Healthcare employment has risen all across the United States, but in Maine it has had a much slower increase of late. This year employment in this industry, despite the pandemic and health crisis, will fall by 5.22%. This was interesting given the high demand for healthcare workers, but it's important to remember that rural hospitals have been struggling for years in this country. It appears that even the higher demand for healthcare workers did not completely offset the struggle this industry has faced in Maine. We anticipate that this sector will surge back by 2022, with annual growth of 4.23% in 2021 and 1.56% in 2022.

Since the financial crisis retail sales had been experiencing strong growth. While personal income, wages, and a thriving tourism industry also had Maine performing well, retail sales had been driving the strength of the Maine economy. It's a similar story to the rest of the United States, over the last decade consumption of retail sales has reached all-time highs. While growth in 2020 slowed from 6.52% last year to 1.52% this year, it seems as though the ability to online shop triumphed over the dismal macroeconomic conditions. We still see positive growth through the pandemic, albeit weaker, but predict that growth will return with strength in 2021 at 4.79%, and then another respectable 2.04% in 2022.

Maine has benefited from heavy state investment into advertising for tourism. Unfortunately, due to the

nature of this pandemic and resulting recession, restaurant and lodging sales were especially hard hit by the pandemic. These businesses rely on tourists, which struggled with state shutdowns and out of state travel restrictions. Maine was particularly strict in who was allowed into the state, and those crossing over state borders were asked to show proof of a negative test or demonstrate an intent to quarantine. All things considered, this resulted in a 23.26% drop in lodging and restaurant sales after 6 years of sustained annual growth. Due to the amount of saving individuals are currently doing by not spending as much of their disposable income, those who would have normally traveled to Maine in 2020, we hope, will return to Maine in 2021 and offset this massive drop in tourism. Our forecast predicts that restaurant and lodging sales will grow back 33.35% in 2021 and a strong 8.03% in 2022. We expect that sales will grow by 33.35% in 2021 and 8.03% in 2022, bringing the state back to pre-pandemic levels. The 2020-2021 ski season will not help to bring in as many tourists as the state is used to, but hopefully by summer 2021 the restrictions will lift and there will start to be some tangible growth in this industry.



The other side of this industry is the employees of restaurant and lodging businesses. Similar to the stories above, this was hit hard with the onslaught of COVID-19. Sales sunk by 33.35% and employment fell by 33,800 jobs (21.37%). This industry collapsed in the middle of the 2019-2020 ski season and with

travel restrictions allowed little to no activity during summer 2020. However, if not for this random negative shock to the tourism industry, it is unlikely that we would have seen a decline in lodging and restaurant employment this year. Therefore, we are optimistic about a strong return to normal for staff in this industry. We predict 2021 to completely offset the decline in 2020 with a 26.41% increase in tourism employees as businesses gear up for the new normal. Furthermore, 2022 looks to be positive too with another 3.66% annual growth in lodging and restaurant employees. This is consistent with the county level employment forecasts illustrated above.

This forecast is not meant to sound negative about the future of Maine, but rather should give readers a sense of confidence in the Maine economy. While it did experience a significant downturn that is consistent with the service sector decline nationwide, there are many growth drivers that will assume their position with an introduction of a vaccine. CNN and Moody’s have created a “Back to Normal Index” which is based on measures of output, labor, travel, housing, and consumption. As of this writing, they have deemed Maine’s economy to be 88% back to normal, or 88% of March 2020 levels. This is currently the highest ranking of any state, as Maine hit 100% of March 2020 levels in September 2020.

Unfortunately, with this second round of lock downs and restrictions, Maine very well may be hit with a second shock of economic hardship. While the summer months allowed outdoor restaurants, hiking, fishing, and other leisure activities to happen, the winter months will be harder to squeeze out much activity. Indoor restaurants, hotels, and other typical tourist attractions are preparing for a bleak winter. Our forecasts are still optimistic for the following two years, but one should not be surprised if Maine suffers a bit more through the end of 2020.

Forecasts for the Maine Economy

	2020	2021	2022
Total Employment	-7.11%	4.09%	3.13%
Restaurant and Lodging Sales	-23.25%	33.35%	8.02%
Retail Sales	1.25%	4.78%	2.04%
Turnpike Traffic	-21.45%	19.38%	4.36%

## Colby Coincident Index

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 to capture the manufacturing sector, which no longer represents a significant portion of the Maine Economy. Thus, the students of this year’s EC473 seminar have developed our own index that best represents the Maine economy.

There are four key measures of Maine’s economy in this CCI: 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 and is measured quarterly. The advantage of the CCI is the ability to use higher frequency data and make a more personalized measure for the state of Maine. The CCI has the same general trend historically as Maine’s GDP and is broadly consistent with Philadelphia’s index, however we feel like it more accurately reflects the structure of Maine’s economy. In addition, by forecasting the components of our index, we can

provide a projection for overall economic growth in Maine.

From our forecast we are predicting a strong recovery will persist through 2022 from the March 2020 lows. The V-shaped recovery, given our underlying assumptions consistent with the U.S. model, will in our baseline assumptions, be sustainable through 2022. While the shock of the pandemic was intense, Maine has found its way out of the pandemic lows and is on its way to see strong growth. The recovery was nearly fully complete according to our index by 2020Q3 and 2020Q4, a good sign that this shock was quick and painful but not defining.

The annual change in 2020 is a -0.68% drop, showing a near full recovery in the latter part of 2020. This is an impressive feat given the many negative shocks this year. In 2021 we project the annual growth for Maine to be 4.47%, showing a return to the strong growth seen since the recession. Lastly, our model shows modest growth through 2022 at 2.12%, signaling that Maine’s economy is healthy and given the current state of affairs, will recover from this pandemic in the next few years.

However, to add the same disclaimer, this forecast also includes the modest assumption of a Federal recovery package in 2021Q1. In reality, the health of Maine’s economy is equally vulnerable to the “Doomsday Scenario” discussed earlier. The winter surge in COVID-related infections, constraints on hospital capacity, a second wave of shutdowns, and insufficient vaccine distribution are all plausible negative shocks to the health of Maine’s economy. Any combination of these developments would significantly reduce the growth Maine has seen, and similar to the U.S. model, could induce a second recession. While our forecasted CCI predicts strong 2020 and 2021 growth that offsets the March 2020 lows, at this point it is unclear how robust this recovery truly is. At the same time, with the “Pandemic Protection Package” it appears that Maine’s impressive upturn would be able to sustain itself, and perhaps even produce stronger growth in the coming years. All eyes now turn towards Washington to see if any legislation will be passed before the Holidays.

### Colby Coincident Index for Maine

