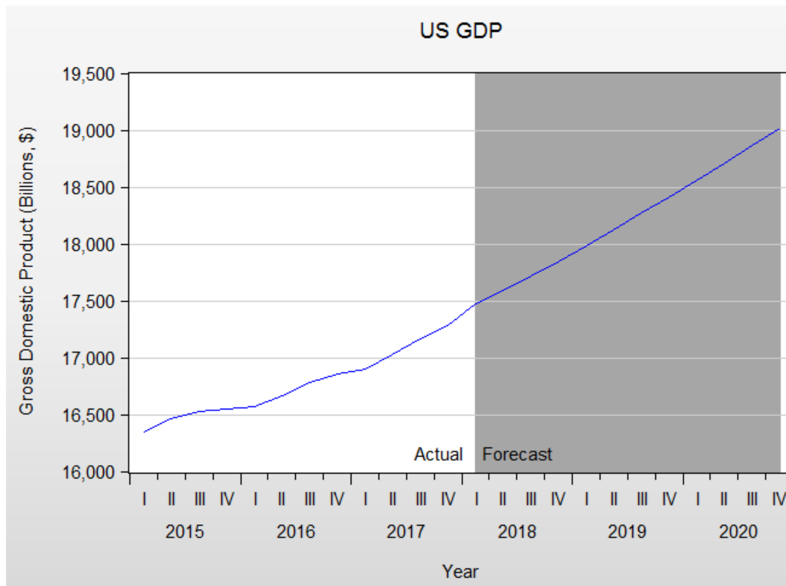
COLBY ECONOMIC OUTLOOK

CURRENT ECONOMIC CONDITIONS & OUTLOOK FOR THE U.S. MACROECONOMY

Colby College, Waterville, Maine May 2018

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 policy makers in Washington, DC. The forecasts presented in this newsletter represent the results of approximately 100 equation macroeconometric models of the U.S. economy. The Colby Quarterly Econometric Model of the US Economy (CQEM) is maintained by the student in EC473 and encompasses several sectors of the U.S. macroeconomy and underlying variables that we believe are crucial to forecasting the future of the U.S. macroeconomy through 2020.



Current State of the U.S. Macroeconomy

The forecasts contained in this version of the CEO use data through the last quarter of 2017. The way the economy has been going in the last year or so sets our forecasts up to fit a "goldilocks scenario," meaning most major economic indicators are growing at rates or staying at levels that are 'just right' for peak economic output. Inflation has finally hit the Federal Reserve Board of Governor's target that they believe is consistent with sustained GDP growth, as seen in the graph below, with our model forecasting it to continue to grow at a healthy and sustainable rate of 2.86% annually through 2020. For these reasons we predict a tightening of monetary policy in the form of the Fed increasing the Federal Funds Rate up to almost 4% by 2020Q4. Also, the recent Trump tax cuts will help to encourage stable and continued growth in all sectors of the economy. These are the largest tax cuts for both businesses and individuals the U.S. has experienced since the Bush Era tax cuts back in the early 2000s. They are expected to spur economic growth through higher personal income, as well as stronger corporate profits which spillover to the stock market. The headwind that is effecting the forecasts are the concerns regarding a potential trade war and changes in tariff policy between the U.S. and China. This has lead to slower growth forecasted for the trade-weighted exchange value of the dollar as well as an increase in the trade deficit at a rate of 5.42% annually. The impact of the potential trade war are seen in the international aspects of our model.

Inside the *Colby Economic Outlook*

Current State of the Macroeconomy........................ 1
Government Sector.. 2
Prices & Consumption... 2
Housing & Labor Sectors....................................... 3
Tariffs & Trade Wars... 3
Monetary Policy.. 4
The Yield Curve... 4
Financial & Wealth.. 5
Oil & Gas Highlight... 6

Government Sector

There has been a general upward trend in government subsidies over the last 50 years, which cannot be defined by any strong seasonal component nor cyclical trends. The data series has several irregularities all of which can be attributed to natural disasters in the United States. This is important to note because our model aligned with the governments subsidies growth rate over the last 50 years. The growth projections are expected to remain at a 4.7% growth rate through 2020Q4.

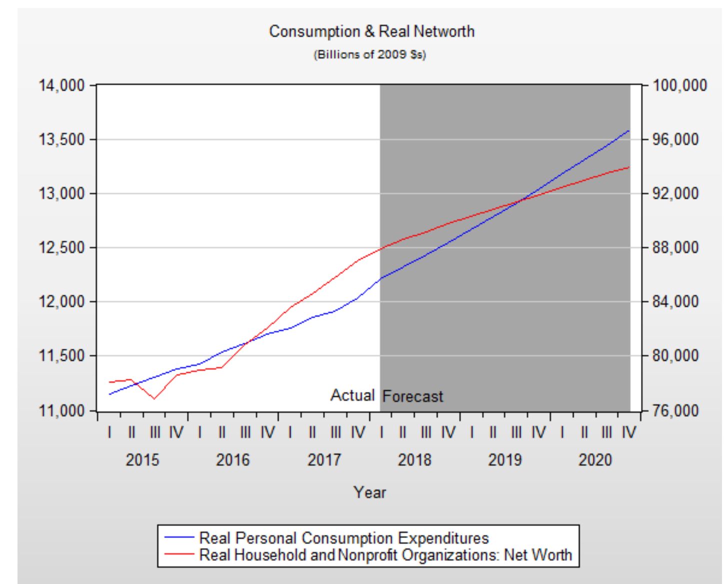
There has been an upward trend in government transfer payments over the last 50 years as well, which we forecasted to increase by 4.6% from 2018Q1 through 2020Q4, irrespective of the agreement to cut corporate taxes in the fiscal year of 2017 by the Trump administration and U.S. Congress. Furthermore, as the government increases their spending, the budget deficit is predicted to increase. The budget deficit is forecasted to grow to be over one trillion dollars through 2020 as a byproduct of transfer payments and government subsidies rising as well as decreased tax revenue.

Under the Trump administration's policies the corporate tax cuts foresee a bright future for corporate profits. Financial Analyst believe that the reduction of the U.S. corporate tax rate from 35% to 21% will lead to one of the highest earning seasons (about a 16% rise) since 2011, which increased 19%.

Prices & Consumption

Consumer sentiment has been on the rise post financial crisis and has surpassed the peak prior to the economic downturn. In fact it is at its highest level since 2004. This is in line with our forecast that the economy will sustain moderate growth through the unemployment rate decreases and tax cuts being implemented consumers confidence about the economy's overall health as well as their individual economic standing increases. The forecast indicates a strong increase of 3.2% compounded annually.

Consumer spending is a critical player in the economy and represents over two-thirds of the U.S. economic output. Supported by the other forecasts highlighted in the Colby Economic Outlook, like personal income, consumption will continue to rise in the future as it has been over the last few months. The positive correlation between income growth and consumption is explained by the power of the increase in incomes to influence individuals into spending more. It is a clear indicator that consumers have the potential to increase economic growth through 2020Q4 as it is directly correlated to the output of the economy. Personal consumption expenditures rose a seasonally adjusted 0.4% in the month of March, which measures household spending on all goods and services. This slight increase in consumer spending can be attributed to a let up in January and February because of an expected lull after holiday spending in the fourth quarter. As individual income increased, spending on durable goods increased 0.8% throughout the month of March. Looking to the future, real personal consumption is predicted to continue to experience



positive growth and reach 13,552.43 billions of dollars in 2020.

Inflation in our model is captured through the rate of change in various price indices. In particular, we utilize the Consumer Price Index (CPI) (without food and energy) for urban consumers as our principal price index. Other price indices include an index of personal consumption expenditures in both durables and nondurables, as well as gross value added by total businesses.

Over the past 20 years, core CPI-inflation has hovered around the Federal Reserve's target rate of 2%, apart from swings during especially drastic economic shocks. In recent years, apart from a dip in

a rate of 2.4%, slightly above the Fed's preferred target rate of 2%. This rate is the highest seen in 2018, and is viewed as an indication that the Federal Reserve will continue to raise interest rates over the coming year.

Housing & Labor Sector

Housing stats have seen steady recovery since the mortgage crisis during the Great Recession. New housing unit authorizations expanded 18% and housing permits are up 6.5% over the last 12 months. The major headwinds that may constrain this growth going forward are the current rising interest rate environment, the landscape of high prices and relatively low inventory that exists in private residential housing. Mortgage rates are projected to reach around 4.5% by the end of 2018, which is consistent with our model's projections. Overall, the 30-year mortgage interest rate is forecasted to reach 5.87% by the fourth quarter of 2020.

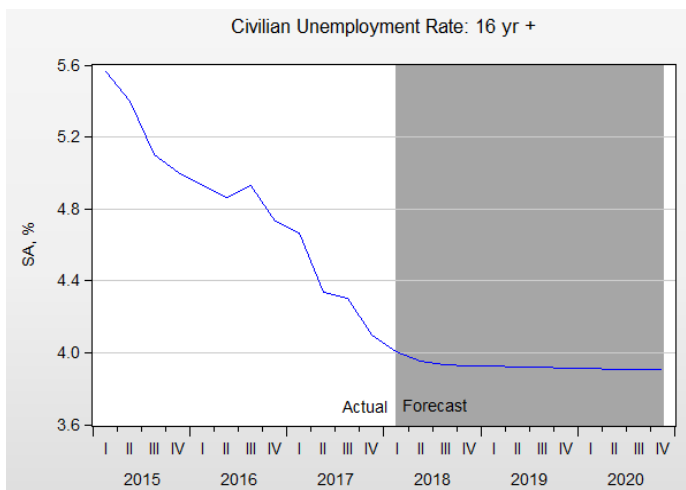
Our model forecasts an annualized rate of growth for the price index of 1-family homes of 4.33% over the next two years. Price expenditures will most likely increase with a stimulated economy so that will cause the price of housing to increase. This increase in price is supported by the belief that millennial demand will boost this growth as they continue to marry and buy houses in larger numbers. Housing starts in the U.S. are estimated to decrease by 0.15% over the next two years and the dwindling numbers of homes for sale should push prices upward in major metropolitan areas.

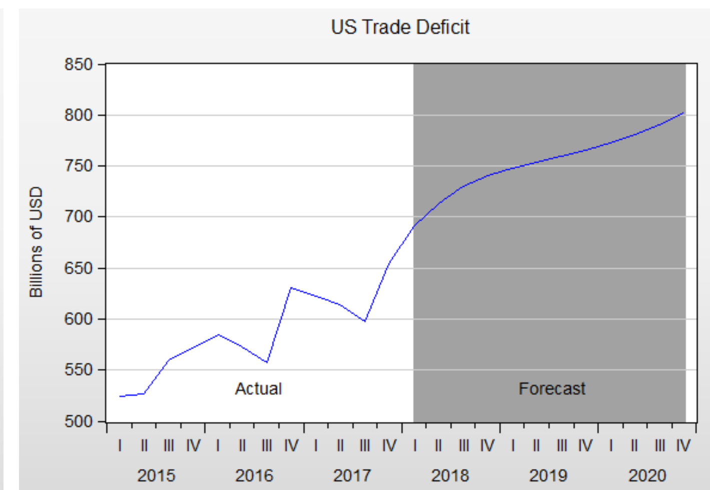
The unemployment rate has experienced a negative trend, decreasing from 4.7% in December 2016 to 4.1% in December 2017. This is the lowest the unemployment rate has been since 2000 and is responsible for civilian employment reaching 154.9 million in Q4 of 2017. The unemployment rate is forecasted to steadily decline until reaching 3.9% in 2020. This historical low can be attributed to the strong increasing labor force and positive overall trends in the economy.

In comparison, wage growth has remained relatively flat since recovering from the recession. In 2017Q4 the nominal wage for private industries increased 2.1%. Despite, the positive nominal numbers real wages have remained essentially flat, due to inflation throughout the recovery. This disappointing wage growth undermines the strong economic indicator provided by the historically low unemployment level. Nominal wage growth is estimated to remain consistent with its past performance and grow approximately 2% through the end of 2020, while real wage growth is expected to decline 0.5%.

Tariff & Trade Wars

The U.S. trade deficit has been on the rise since 2014. President Trump has a strong conviction that a trade deficit is bad for the U.S. economy and has threatened trade wars and tariffs in order to create more favorable U.S. trade conditions. However, economic theory suggests that trade wars and tariffs will actually make the U.S. trade deficit worse. The proposed tariffs will work to make foreign goods more expensive in an attempt to protect U.S. industries. However, economic theory suggests that trade wars, which is the other half of Trump's threat, will actually make the U.S. trade deficit worse through increasing the prices of imports and making exports less attractive due to retaliatory tariffs.

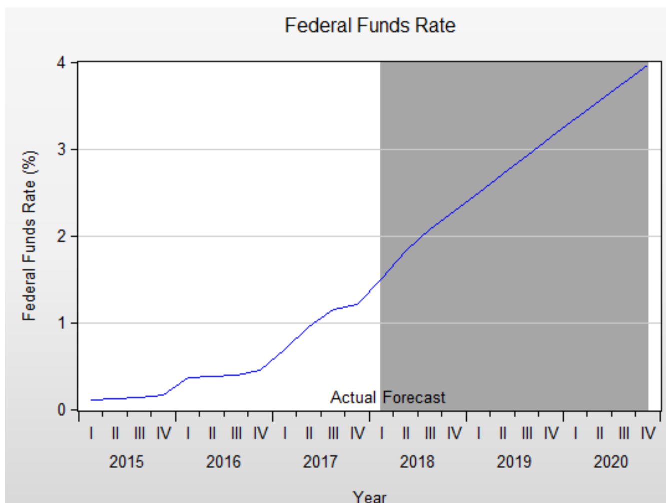




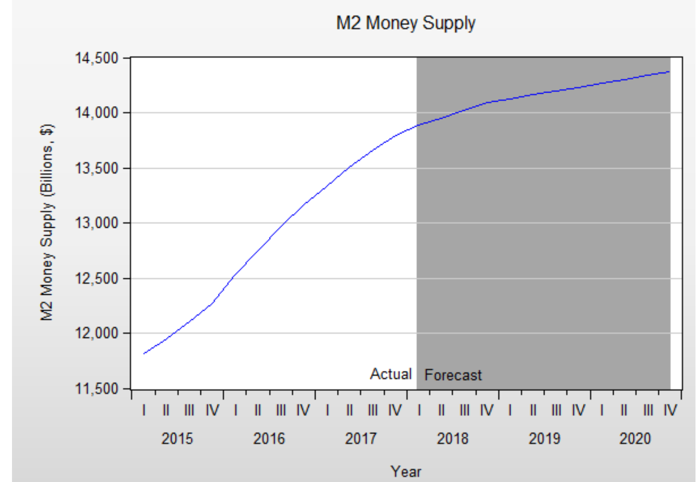
The Trump administration has recently implemented tariffs of 25% on steel and 10% on aluminum against Japan, Russia and China.

Monetary Policy

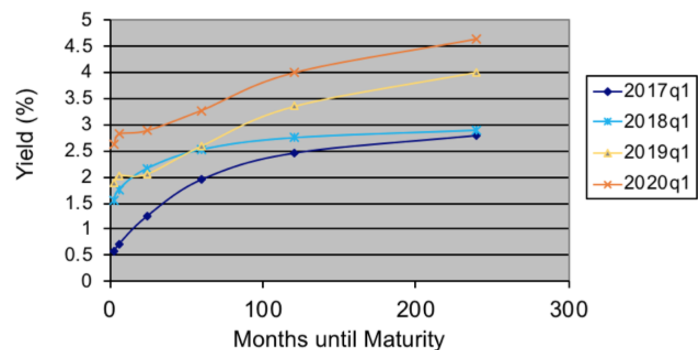
There is a clear shift in the norm for interest rates following the 2008 financial crisis with years of near-zero interest rates. All signs point to the fact we're at the beginning of another paradigm shift in the Fed's monetary policy as the economy has recovered significantly since the trough in 2008. The new Federal Reserve Chairman Jerome Powell has made clear his intention to steadily raise rates. Our model, which is an endogenous reaction function, has projected a relatively aggressive policy in rate hikes by the Fed which matches the projections of the St. Louis Fed for the most part. Our forecast projects the federal funds rate at 2.28% by the end of Q4 2018, a median rate of 2.95% in 2019, and a median rate of 3.68% in 2020.



The end of quantitative easing and the aggressive interest rate policy will lead to growth in the M2 money supply below the historic average and significantly lower than what the U.S. experienced during quantitative easing. Most estimates predict an average of 2% M2 growth over the next four quarters as the fed gets more aggressive in raising rates. The 2% estimated rate of growth was implemented exogenously for the next four quarters in the model followed by a conservative estimate of 1% growth over the eight quarters following.



The Yield Curve



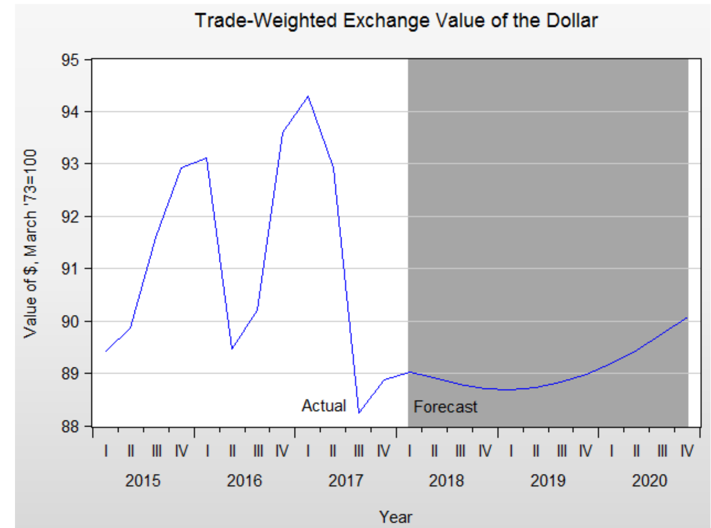
The yield curve forecast is built off of the 3-month Treasury Bill, the 6-month, 2-year, 5-year and 10-year Treasury Note yields, and the 20-year Treasury Bond yields. One key monetary policy lever that influences short-term interest rates is the federal funds rate (FFR). After the 2008 recession, the FFR was slashed to virtually 0 but has since been slowly increasing, with the greatest total annual increase occurring in 2017. During 2017, the Fed raised the target FFR by 25 basis points three times and another 25 basis points so far in 2018, increasing the level from .75-1.00 in early 2017 to 1.50-1.75 today. The rate increases have driven up the short-end of the curve as short-term rates tend to track the FFR, inducing a flattening of the curve. The Fed further enabled this flattening through other monetary policy mechanisms such as their reversal of quantitative easing (QE) that began in October 2017. QE is the purchase of large scale assets by the Fed which inflates the balance sheet, so the reversal of this process represents an unwinding of the Fed's balance sheet. Notably, tighter monetary policy through reduced QE tends to flatten the yield curve on the long-end. Despite monetary tightening, 10-year yields fell to 2.1% in September 2017, representing

the lowest spread between 2-year and 10-year rates since November 2007. 10-year yields have since risen to and have been hovering around the 3.0% level (shown by the shift up in 2017Q1 yield curve to 2018Q1).

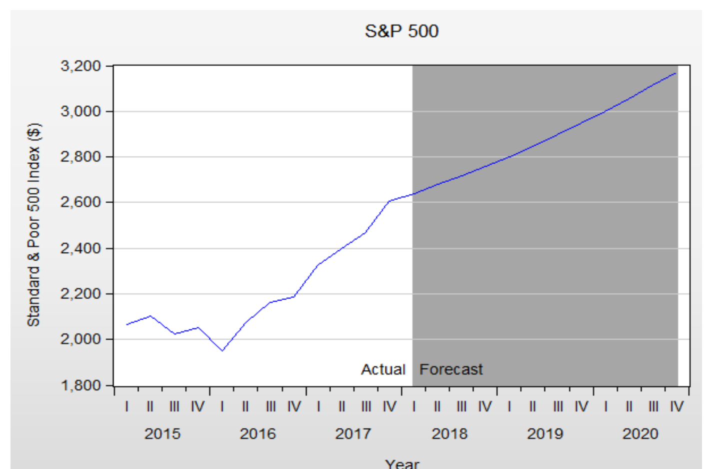
On the long-end of the curve an inflation term premium was included, and given our predicted increase in inflation, we believe long-term yields will increase to reflect this premium. Although there is consensus among investors that inflation expectations for the coming years is low, our forecast provides an alternative case that suggests higher levels of inflation. This inflation case is in line with the Federal Open Market Committee's goal of "gradual" increases in the FFR as this will allow inflation to rise above 2%. Additionally, this inflation increase is consistent with the comprehensive tax cuts, which will primarily impact the front end of the curve by increasing short-term yields; inflation impacts from the cuts will likely be delayed, hence the increase in long-term yields that reflect the inflation premium. This notion explains the shift upward in both the short and long-end of the curve from 2018Q1 to 2019Q1 and then to 2020Q1, the end of the ex ante forecast range. By the end of the first quarter of 2020, we forecast the yield on 20-year securities to rise above 4.5% as the demand for shorter -term securities lowers the price of 20-year Treasury Bonds and drives the yield up. We also forecast the 3-month Treasury Bill and 6-month Treasury Note to rise above 2.5% (nearing 3% for the 6-month) due to expected rate hikes by the Fed. The rates on 2-year, 5-year, and 10-year Treasury Notes are expected to rise to roughly 3%, 3.25%, and 4%, respectively. This represents an upward shift of the curve and a steepening from 2018Q1 to 2019Q1, followed by a subsequent upward shift with no notable change in the slope of the curve as it effectively mirrors the 2019Q1 curve.

Financial & Wealth

The strength of the dollar against other major world currencies saw a significant increase in the wake of the Great Recession from 2010 to 2015. This is due in part to the faster recovery seen in the U.S. as compared to that of most of Europe. Between 2015 and the end of 2017 there has been a lot more volatility in the strength of the dollar. This is due largely to the mounting fears about possible trade wars as well as uncertainty about how aggressive U.S. monetary policy will be in the coming year or two. These two factors will work to cancel a lot of the volatility in the future leaving the growth in the strength of the dollar at 0.4% annually and pretty smoothly over the forecast horizon.

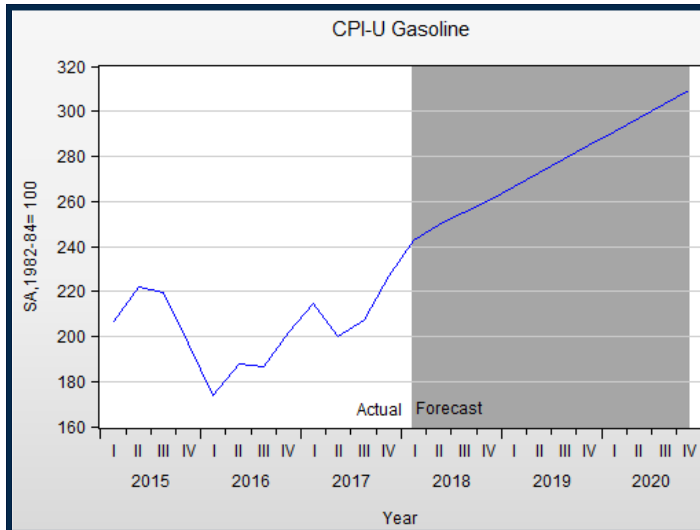


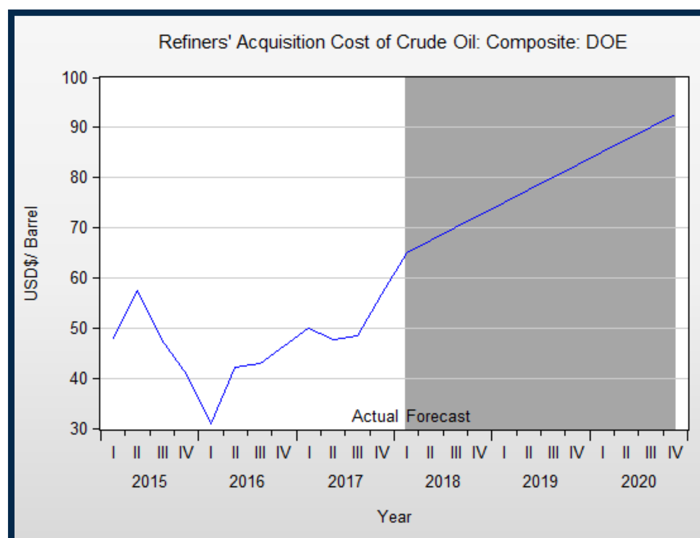
Our forecast for the S&P 500 is one of strong, yet rational growth. Since 1928, the market has grown by around 10% annually, on average. This isn't a perfect benchmark because it doesn't account for the cyclical downturns in our economy. Nonetheless, our forecast holds that the stock market will grow at compounded annual growth rate of 6.77% over the next three years through 2020 to around $3170. The keys catalysts for growth are corporate profit growth from the Trump administration tax cut, a strong labor market wage growth, and increased consumer spending.



This outlook on the market is more positive than the general consensus, but is rational for the following reasons. The U.S. just saw one of the tax reform in history, leaving big corporations with a decrease in their tax burden and allowing for increased profitability. Additionally, as consumers benefit from the larger tax return, analysts expect consumer

spending to skyrocket in the second half of the year also helping to drive up profitability and share prices.





Oil & Gas Highlight

There has been large growth in the cost of a barrel of oil over the past few years; specifically, in 2017 there has been over 40% of growth. There remains a fair amount of uncertainty about the future of oil prices. Partially this is due to the uncertain conditions surrounding the future of the Iran deal. However, we are still comfortable continuing to project aggressive growth over the next few quarters. The U.S. is facing attenuated oil inventory, representative of a decrease in supply of oil globally. OPEC has signaled that they intend to continue to cap oil production. Decreased supply will result in a continued increase in the prices. Additionally, Saudi Arabia purportedly intends to target a price of anywhere from $80-100 per barrel.

We expect that rising prices of crude oil will have a significant impact on gas prices. While prices are currently around $2.80 per gallon, we're comfortable forecasting a 7-10% increase over the next four quarters, eventually settling around $3.00 per gallon.

Following recent trends, our forecasts for oil and gasoline price indices are bullish and relatively aggressive. The effect of this forecasted increase in prices is a mixed bag for the US economy. Both the sign and magnitude of the effect of these price increases will depend on if the US continues to move towards being a net exporter of crude oil. This will be a boon for states with high levels of oil production, since lower global supply will allow them to sell at higher prices. However, low income households, and by extension lower income states like Maine, would be the ones most hurt by rising gas prices. This in turn could stifle growth. While the magnitude varies across estimates, many economists forecast the effect of rising oil prices to hurt the overall economy.

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