Penserra U.S. Economic Watch

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Review of the Economic Indicators and Fed Funds Rate

Penserra periodically analyzes economic data and various economic indicators for signs that point towards an increased probability of an economic downturn and market stress. Our review for the most recent monthly period shows continued economic stability in the U.S. as exhibited by positive factors including steady unemployment levels, controlled inflation, a low probability of the Smoothed Recession Probability Index, and a favorable St. Louis Fed Financial Stress Index. However, surprisingly the U.S. economy grew less than expected in Q2, 2016, at an annualized rate of 1.2% versus a forecast of 2.5%.

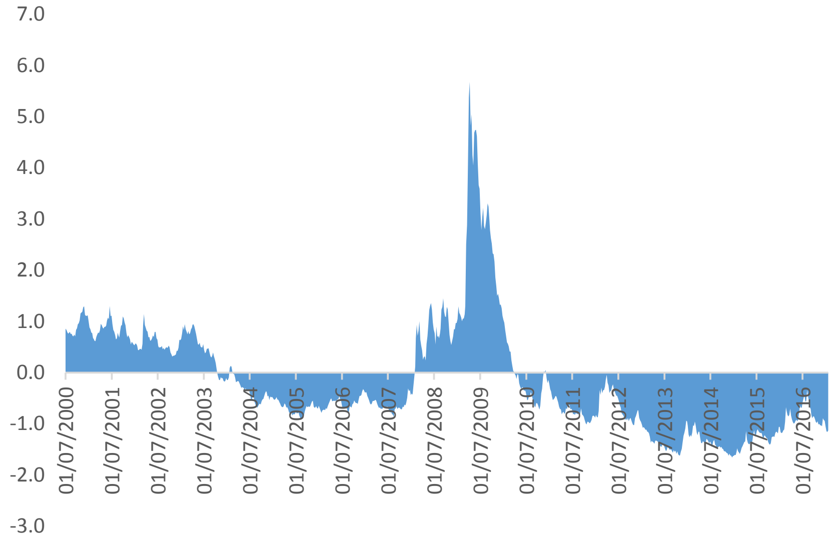
The most recent GDP figures are in some ways dissenting with other gauges of the economy. Most notably, the unemployment rate continues to remain strong at 4.9%. In addition, consumer spending was up 2.83% and inflation is in check with less than a percent growth this year. Another indicator also showing negative results is productivity growth. Quarter on quarter productivity growth continues to be sluggish with an average of 0.7% over the past four readings which is far below the long-term average of 2.2%. The continued low productivity may entail that business are not boosting capital spending to increase output.

Looking forward, the Atlanta Federal Reserve is currently forecasting a whopping 3.8% real GDP growth for Q3, 2016 using its GDPNow model. Even with a wide forecast error, growth in Q3 will likely beat that of Q2. Meanwhile, the interest rate environment has had U.S. Treasuries rallying in 2016 as the Fed held off on raising interest rates while central banks in Japan and Europe maintained unprecedented stimulus. The current probability of a Fed Funds increase on September 21st ranges from 18-26%.

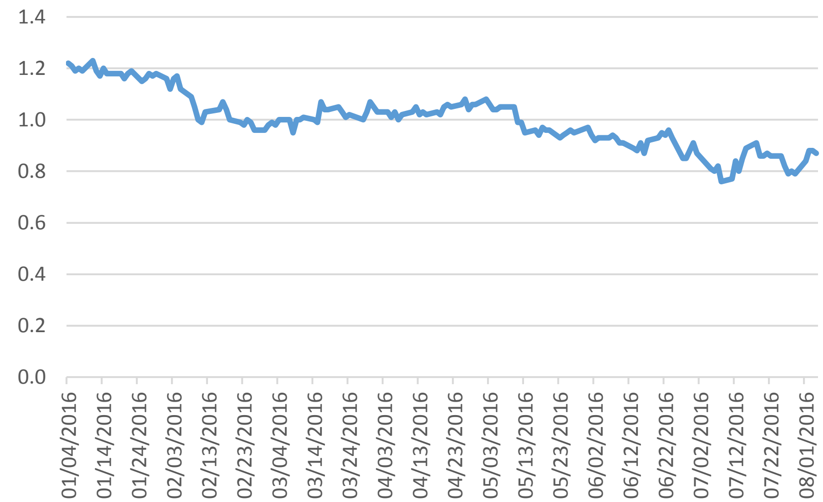
Summary of Economic Indicators

Indicator/Index	Source Date	Indicator	Note
Treasury 2/10 Spread	8/5/2016	0.87	Positive territory; negative trend.
St. Louis Fed Financial Stress Index	7/29/2016	-1.13	Positive. Below average financial market stress.
Chicago Fed National Activity Index	6/1/2016	0.16	Neutral. Expanding at historical trend
U.S. Recession Probability Index	5/1/2016	3.60	Positive. 3 months below 20%
Bloomberg FedWatch	8/9/2016	26%	Probability of a September rate hike.
CME FedWatch	8/9/2016	18%	Probability of a September rate hike.
CPI (Rolling Annual)	6/1/2016	0.22%	Positive. Inflation in check.
Real GDP (Rolling Annual)	4/1/2016	1.23%	Positive. Slow growth.
Unemployement Rate	7/1/2016	4.90	Positive. Steady decrease.
Civilian Labor Force Participation	7/1/2016	62.80	Negative. Continued decreased participation.

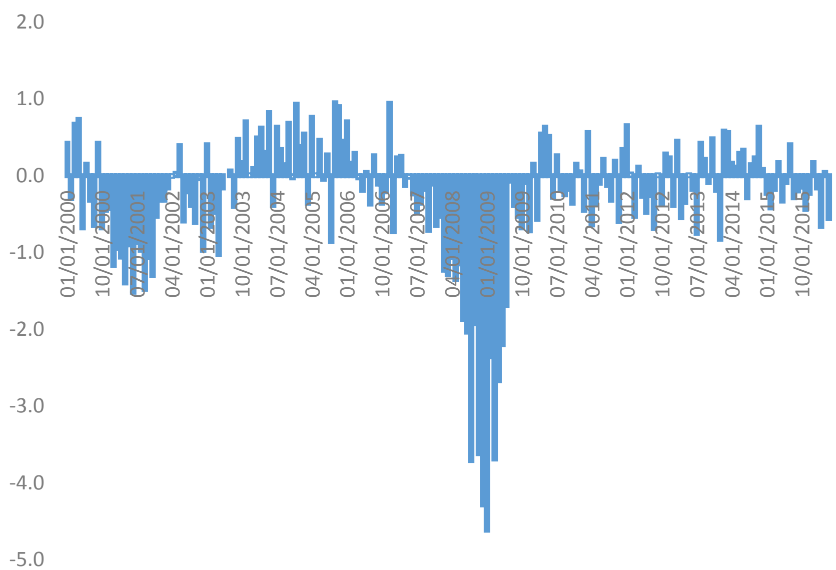
St. Louis Financial Stress Index



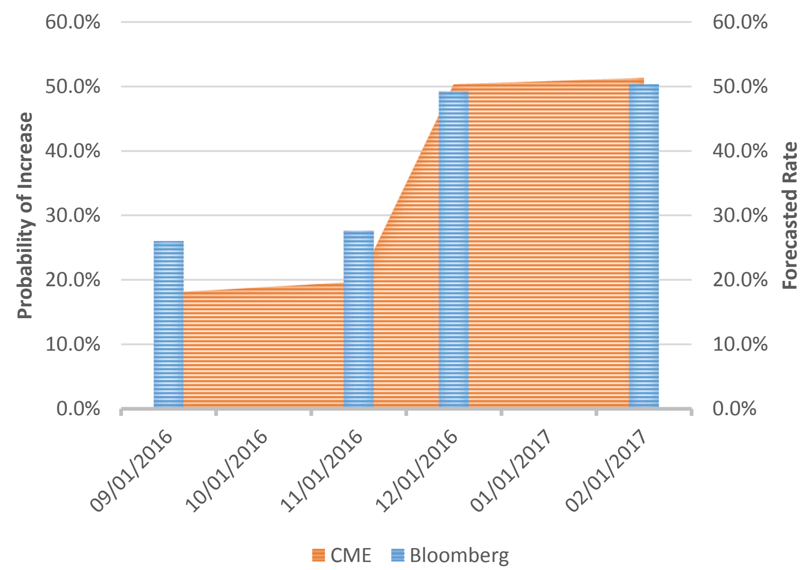
10-Year/2-Year Treasury Spread (Constant Maturity)



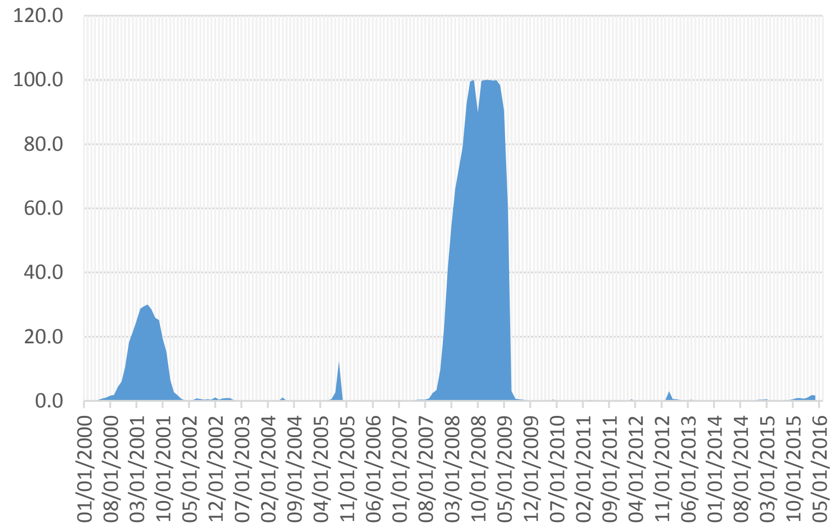
Chicago Fed National Activity Index



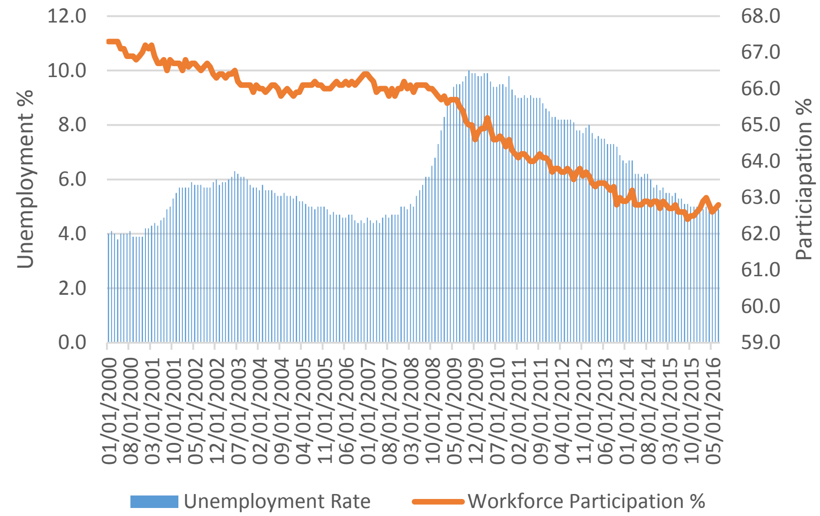
Fed Funds Watch



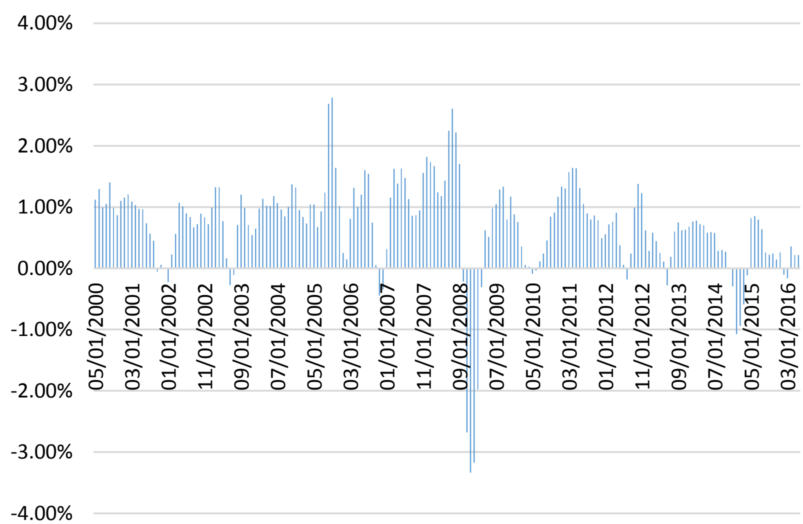
Smoothed U.S. Recession Probability Index



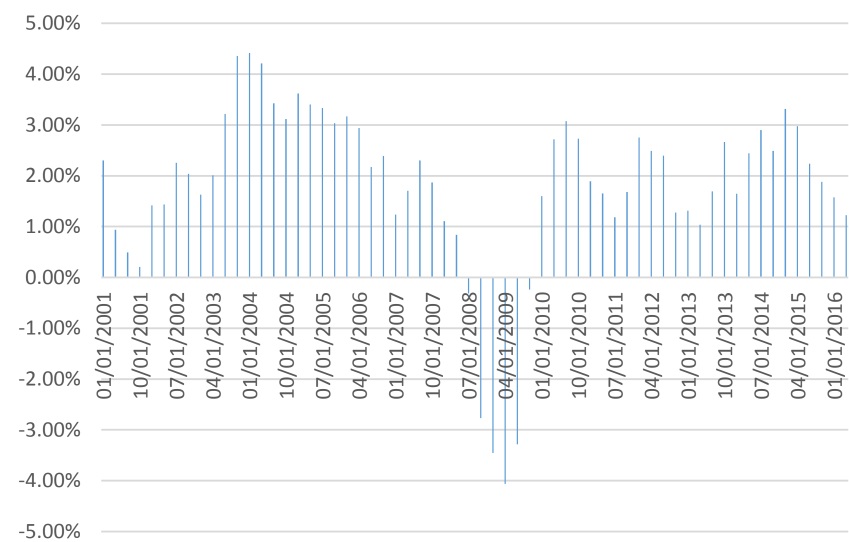
Unemployment & Workforce Participation



Consumer Price Index



Rolling Annual Real GDP Growth



* See Sources on Page 5

Overview of Economic Indicators

Treasury 2/10 Spread: This recession indicator is the spread (difference) between interest rates on 10-year U.S. Treasuries and 2-year U.S. Treasuries. This indicator has a decent track record of going negative before a recession starts. (Emphasis added.) In other words, it's a leading indicator.

St. Louis Fed Financial Stress Index: The average value of the index, which begins in late 1993, is designed to be zero. Thus, zero is viewed as representing normal financial market conditions. Values below zero suggest below-average financial market stress, while values above zero suggest above-average financial market stress.

Chicago Fed National Activity Index: A zero value for the index indicates that the national economy is expanding at its historical trend rate of growth; negative values indicate below-average growth; and positive values indicate above-average growth.

Smoothed U.S. Recession Probabilities: University of Oregon economist, Jeremy Piger, compiles a Recession Probability Index. It tracks the four monthly variables used by the National Bureau of Economic Research (NBER), the official organization tasked with declaring recessions. The four variables are: 1) nonfarm payroll employment, 2) the index of industrial production, 3) real personal income excluding transfer payments and 4) real manufacturing and trade sales. Historically, three consecutive months of smoothed probabilities above 80% has been a reliable signal of the start of a new recession, while three consecutive months of smoothed probabilities below 20% has been a reliable signal of the start of a new expansion.

Consumer Price Index: The Consumer Price Index for All Urban Consumers: All Items (CPIAUCSL) is a measure of the average monthly change in the price for goods and services paid by urban consumers between any two time periods.(1) It can also represent the buying habits of urban consumers. This particular index includes roughly 88 percent of the total population, accounting for wage earners, clerical workers, technical workers, self-employed, short-term workers, unemployed, retirees, and those not in the labor force. The CPIs are based on prices for food, clothing, shelter, and fuels; transportation fares; service fees (e.g., water and sewer service); and sales taxes.

Civilian Labor Force Participation Rate: The series comes from the 'Current Population Survey (Household Survey)' and measures the labor participation of the civilian workforce.

Bloomberg FedWatch Probability: The probabilities of various interest rate level outcomes as implied by the futures, options, and OIS markets, to quantify to what extent the markets are "pricing in" future central bank interest rate changes. This financial instruments allow for the calculation of probabilities for various interest rate levels on central bank announcement days. Based on Bloomberg World Interest Rate Implied Probability (WIRP).

CME Group FedWatch Probability: The probability of a rate hike is calculated by adding the probabilities of all target rate levels above the current target rate. Probabilities of possible Fed Funds target rates are based on Fed Fund futures contract prices assuming that the rate hike is 0.25% (25 basis points) and that the Fed Funds Effective Rate (FFER) will react by a like amount. FOMC meetings probabilities are determined from the corresponding CME Group Fed Fund futures contracts. Visit the CME Group website: http://www.cmegroup.com/trading/interest-rates/countdown-to-fomc.html.

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Indicator/Index	Frequency	Source Data
Treasury 2/10 Spread	Daily	Federal Reserve Bank of St. Louis, 10-Year Treasury Constant Maturity Minus 2-Year Treasury Constant Maturity [T10Y2Y], retrieved from FRED, Federal Reserve Bank of St. Louis
St. Louis Fed Financial Stress Inde	Weekly	Federal Reserve Bank of St. Louis, St. Louis Fed Financial Stress Index© [STLFSI], retrieved from FRED, Federal Reserve Bank of St. Louis.
Chicago Fed National Activity Index	Monthly	Federal Reserve Bank of Chicago, Chicago Fed National Activity Index [CFNAI], retrieved from FRED, Federal Reserve Bank of St. Louis
U.S. Recession Probability Index	Monthly (Delayed	Piger, Jeremy Max and Chauvet, Marcelle, Smoothed U.S. Recession Probabilities [RECPROUSM156N], retrieved from FRED, Federal Reserve Bank of St. Louis
Bloomberg FedWatch	Daily	Based on Bloomberg World Interest Rate Implied Probability (WIRP)
CME FedWatch	Daily	CME Group. http://www.cmegroup.com/trading/interest-rates/countdown-to-fomc.html
CPI (Rolling Annual)	Monthly	US. Bureau of Labor Statistics, Consumer Price Index for All Urban Consumers: All Items [CPIAUCSL], retrieved from FRED, Federal Reserve Bank of St. Louis
Real GDP (Rolling Annual)	Quarterly	US. Bureau of Economic Analysis, Real Gross Domestic Product [GDPC1], retrieved from FRED, Federal Reserve Bank of St. Louis
Unemployement Rate	Monthly	US. Bureau of Labor Statistics, Unemployment Level [UNEMPLOY], retrieved from FRED, Federal Reserve Bank of St. Louis https://research.stlouisfed.org/fred2/series/UNEMPLOY
Civilian Labor Force Participation	Monthly	US. Bureau of Labor Statistics, Civilian Labor Force Participation Rate [CIVPART], retrieved from FRED, Federal Reserve Bank of St. Louis