



Economics Group

Interest Rate Weekly

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Identifying Change, Evolution and Regression

For decision makers, identifying the evolution of the economy and financial markets is essential for business success. After four years of moderate economic growth, there is a sense of change and evolution. Why?

Identifying Change

How can we identify a break in the behavior of economic and financial drivers? Often analysts make anecdotes about a change or break in behavior; however, in our research we have focused on the implementation of state-space techniques to provide a mathematical basis for identifying change. As illustrated in the top graph, the shift outward in the Beveridge curve provides evidence of a break in the link between job vacancies and the available workers as measured by the unemployment rate. We first identified this break in a paper published in 2006 (Domestic Implications of a Global Labor Market, Business Economics, V. 41, No. 3, July 2006). Identification of the change in the labor market has been critical to understanding the break in the unemployment rate and the inflation rate that is central to many traditional inflation forecast models.

In addition, we applied the econometric techniques on the unemployment rates (both U-3 and U-6) and we found that unemployment rate measures are not mean-reverting and have a non-linear trend. Basically, our analysis suggests that we should not be looking for a constant equilibrium unemployment rate and expect that the economy will go back to that equilibrium (mean) rate. As economies are evolving over time, so do the mean rates for the different sectors of the economy.

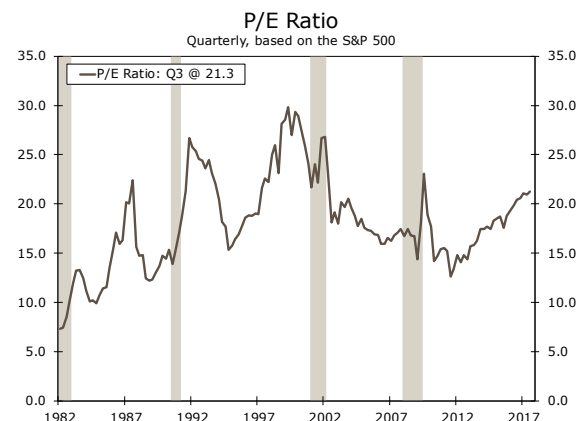
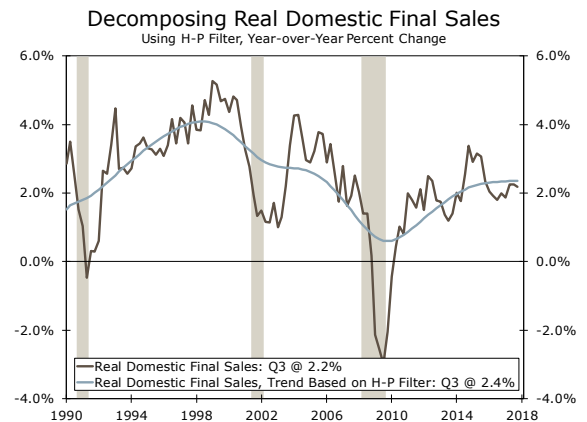
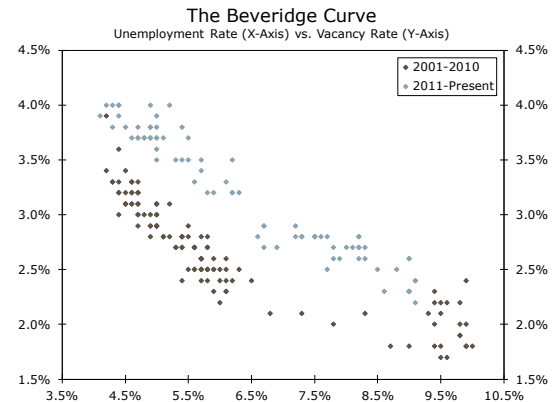
Evolution of the Economy

During the current economic expansion, there has been a sense that the economy continues to evolve over time, but that the economy also experiences periods of over and under activity. To identify this evolution, we have employed a Hodrick-Prescott filter, which allows us to differentiate between a trend and cycles of that trend. As illustrated in the middle graph with year-over-year percent change of the real domestic final sales and its long-run trend. We can see in the graph, the acceleration in domestic demand was evident from 1998 to 1999 as the actual series stayed above the long-run trend during that time period.

Regression to the Mean? The Past?

Often commonly cited is the argument that a series reverts to its mean, such that when a value is above the mean (or below) the argument is made that the series will return back to its average value. One figure most often cited as reverting to its mean is the Price/Earnings ratio. Yet, the P/E ratio is not mean-reverting, as our analysis finds several breaks in the series in the 1982-2017 period. As results of several economic factors whose values change drive the P/E ratio, the breaks in the series are consistent with the economic recessions (example of 1991 and 2001).

Summing up, we suggest decision makers should test and evaluate whether a series is mean-reverting instead of merely relying on past averages as a guide.



Wells Fargo U.S. Interest Rate Forecast

	Actual				Forecast							
	2017				2018				2019			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Quarter End Interest Rates												
Federal Funds Target Rate	1.00	1.25	1.25	1.50	1.75	2.00	2.25	2.25	2.50	2.50	2.75	2.75
3 Month LIBOR	1.15	1.30	1.33	1.65	1.90	2.15	2.40	2.40	2.65	2.65	2.90	2.90
Prime Rate	4.00	4.25	4.25	4.50	4.75	5.00	5.25	5.25	5.50	5.50	5.75	5.75
Conventional Mortgage Rate	4.20	3.90	3.81	3.89	4.06	4.20	4.30	4.35	4.45	4.50	4.62	4.67
3 Month Bill	0.76	1.03	1.06	1.35	1.60	1.85	2.10	2.15	2.35	2.40	2.60	2.65
6 Month Bill	0.91	1.14	1.20	1.48	1.70	1.95	2.20	2.25	2.45	2.50	2.70	2.75
1 Year Bill	1.03	1.24	1.31	1.65	1.80	2.05	2.25	2.30	2.50	2.55	2.75	2.80
2 Year Note	1.27	1.38	1.47	1.80	2.00	2.25	2.45	2.60	2.70	2.80	2.93	3.00
5 Year Note	1.93	1.89	1.92	2.20	2.39	2.58	2.75	2.85	2.90	2.97	3.10	3.17
10 Year Note	2.40	2.31	2.33	2.49	2.66	2.80	2.90	2.95	3.05	3.10	3.22	3.27
30 Year Bond	3.02	2.84	2.86	2.89	3.05	3.25	3.37	3.50	3.53	3.56	3.66	3.70

Forecast as of: December 21, 2017

Wells Fargo U.S. Economic Forecast and FOMC Central Tendency Projections

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Change in Real Gross Domestic Product			
Wells Fargo	2.5	2.6	2.7
FOMC	2.4 to 2.5	2.2 to 2.6	1.9 to 2.3
Unemployment Rate			
Wells Fargo	4.1	3.8	3.7
FOMC	4.1	3.7 to 4.0	3.6 to 4.0
PCE Inflation			
Wells Fargo	1.6	2.0	2.0
FOMC	1.6 to 1.7	1.7 to 1.9	2.0
"Core" PCE Deflator			
Wells Fargo	1.5	1.8	1.9
FOMC	1.5	1.7 to 1.9	2.0

Forecast as of: December 21, 2017

NOTE: Projections of change in real gross domestic product (GDP) and in inflation are from the fourth quarter of the previous year to the fourth quarter of the year indicated. PCE inflation is the percentage rate of change in the price index for personal consumption expenditures (PCE). Projections for the unemployment rate are for the average civilian unemployment rate in the fourth quarter of the year indicated.

Fed Data as of: December 13, 2017

Source: IHS Global Insight, Bloomberg LP, Federal Reserve Board and Wells Fargo Securities

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