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Economics Group

Interest Rate Weekly

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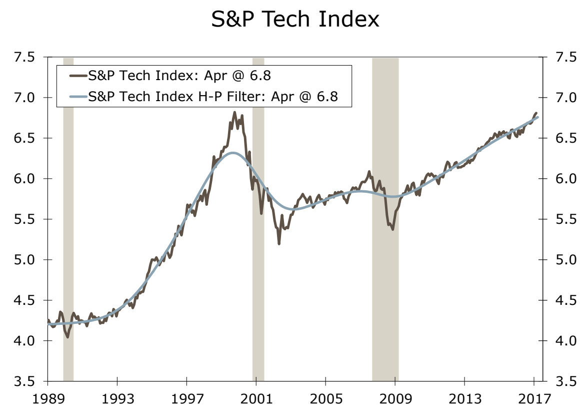
Measure Twice, Cut Once—Identifying Aberrations

Before any rush to judgment, a thoughtful approach includes identifying how a time series behaves and recognizing any aberrations that might suggest a mispricing of financial assets.

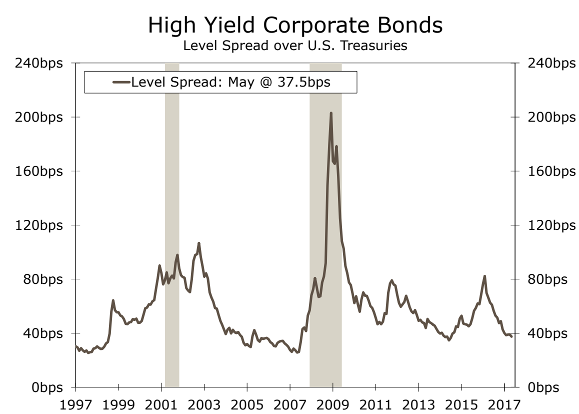
Identifying a Trend for the S&P Tech Index

In the world of econometrics, the H-P filter is a useful tool when attempting to identify an underlying trend in a data series. An H-P filter estimates a trend by removing the cyclical components of a time series from raw data, and thus provides a noise-free picture of the trend. For instance, the resultant trend line from the H-P filter can be used to compare the current peak (2017) of the S&P Tech index with its previous peak (1999) (top graph). As is evident from the graph, the current cycle/peak of the index is of a different nature than the one that occurred in the late 1990s. The growth rate of the index was notably faster (steeper) in the 1990s compared to the current rate of growth. Additionally, the average index level since the 1999-2000 peak is higher than before the 1999-2000 period. One major reason for the different average values in the pre and post-2000 eras is that the tech sector was in an emerging state in the 1990s and now it has reached relative maturity, characterized by a lower growth rate.



Identifying Changing Character of a Series Over Time

An important assumption in investment decision making (and many econometric methods) is that a series' past behavior can offer clues to its behavior in the future. One characteristic of such a series is mean-reversion, that is, the series' values drift back to the same mean over time. For instance, a series would move around a long-run average and the deviations from the mean would be transitory. To test this assumption, we apply an ADF[1] test on a high yield (level spread) series and find the high yield spread is non-stationary, i.e. not mean reverting. The high yield spread does not have a (statistically) static mean, that is, it moves around over time. Several different mean values may exist depending on the time period under analysis. Therefore decisions that assume a single average value for the high yield spread would be deceptive. Likewise, the ordinary least squares (OLS) method for estimating parameters of models can provide spurious results since OLS assumes the underlying data is stationary. Thus, if the data is non-stationary, the results are misleading.



Structural Break: When the Past Is No Indicator of the Future

In order to test for a structural break in a series, we use the state space approach. When we apply this to the price of gold, we find breaks in the series (bottom graph). A structural break suggests that the series' behavior is different for the post-break period compared to the pre-break era. In the present case, the average level of the price of gold is significantly higher for the post-break (April 2013) era. Again, the assumption that the series has consistent behavior overtime fails.

In this ever evolving world, we strongly suggest against assuming the present/future is the same as past. Conducting tests to determine whether a series exhibits mean-reverting behavior or has multiple means at different points in time is a useful process for predicting a series' behavior and thus necessary for effective decision making.

Source: Bloomberg LP and Wells Fargo Securities

[1]**Dickey, D. and Fuller, W. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of American Statistical Association*, vol 74, pp427-431.**

Wells Fargo U.S. Interest Rate Forecast

	Actual				Forecast							
	2016				2017				2018			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Quarter End Interest Rates												
Federal Funds Target Rate	0.50	0.50	0.50	0.75	1.00	1.25	1.50	1.50	1.50	1.75	2.00	2.25
3 Month LIBOR	0.63	0.65	0.85	1.00	1.15	1.45	1.70	1.70	1.70	1.95	2.20	2.45
Prime Rate	3.50	3.50	3.50	3.75	4.00	4.25	4.50	4.50	4.50	4.75	5.00	5.25
Conventional Mortgage Rate	3.69	3.57	3.46	4.20	4.20	4.19	4.33	4.36	4.41	4.45	4.49	4.58
3 Month Bill	0.21	0.26	0.29	0.51	0.76	1.02	1.30	1.40	1.45	1.50	1.75	2.00
6 Month Bill	0.39	0.36	0.45	0.62	0.91	1.19	1.45	1.55	1.60	1.65	1.90	2.15
1 Year Bill	0.59	0.45	0.59	0.85	1.03	1.35	1.60	1.70	1.80	1.90	2.10	2.30
2 Year Note	0.73	0.58	0.77	1.20	1.27	1.50	1.75	1.85	1.95	2.05	2.20	2.40
5 Year Note	1.21	1.01	1.14	1.93	1.93	2.00	2.30	2.35	2.45	2.50	2.60	2.75
10 Year Note	1.78	1.49	1.60	2.45	2.40	2.40	2.55	2.60	2.70	2.75	2.80	2.90
30 Year Bond	2.61	2.30	2.32	3.06	3.02	3.10	3.35	3.40	3.50	3.55	3.60	3.75

Forecast as of: June 7, 2017

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

	2017	2018
Change in Real Gross Domestic Product		
Wells Fargo	2.3	2.7
FOMC	2.1 to 2.2	1.8 to 2.2
Unemployment Rate		
Wells Fargo	4.2	4.1
FOMC	4.2 to 4.3	4.0 to 4.3
PCE Inflation		
Wells Fargo	1.8	2.1
FOMC	1.6 to 1.7	1.8 to 2.0
"Core" PCE Deflator		
Wells Fargo	1.8	2.2
FOMC	1.6 to 1.7	1.8 to 2.0

Forecast as of: June 7, 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.

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

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