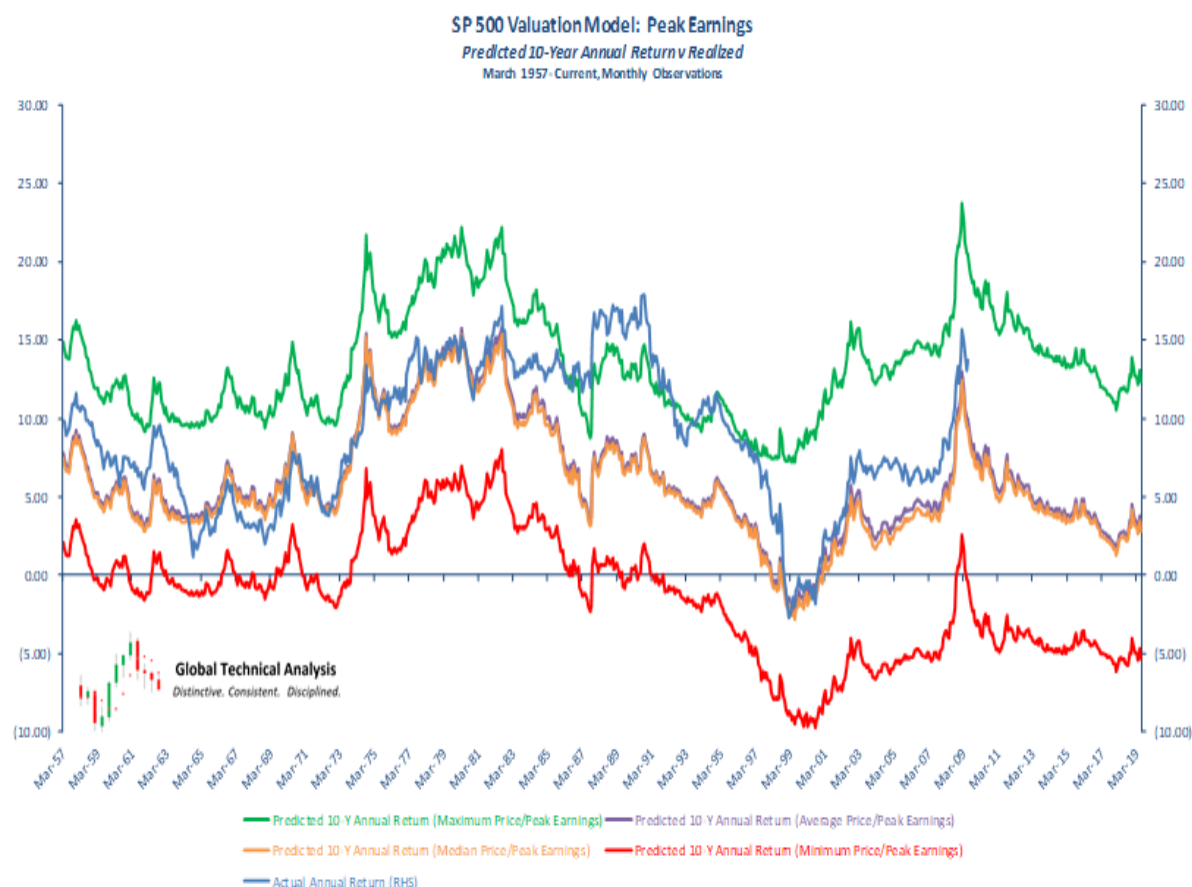# Macro: SP 500   June 30, 2019

We believe that the chief determinant of future total returns is the relative valuation of the index at the time of purchase. We measure valuation using the Price/*Peak* Earnings multiple as advocated by Dr. John Hussman. We believe the main benefit of using peak earnings is the inherent *conservatism* it affords: not subject to analyst estimates, not subject to the short-term ebbs and flows of business, and not subject to short-term accounting distortions. Annualized total returns can be calculated over a horizon period for given scenarios of multiple expansion or contraction.

Our analysis highlights expansion/contraction to the minimum, mean, average, and maximum multiples (our data-set begins in January 1900) . The baseline assumptions for nominal growth and horizon period are 6% and 10 years, respectively. We also provide graphical analysis of how predicted returns compare to actual returns historically.

We provide sensitivity analysis to our baseline assumptions. The first sensitivity table, ceterus paribus, shows how future returns are impacted by changing the horizon period. The second sensitivity table, ceterus paribus, shows how future returns are impacted by changing the growth assumption.

We also include the following information: duration, over(under)-valuation, inflation adjusted price/10-year real earnings, dividend yield, option-implied volatility, skew, realized volatility, historical relationships between inflation and p/e multiples, and historical relationship between p/e multiples and realized returns.

Our analysis is not intended to forecast the short-term direction of the SP500 Index. The purpose of our analysis is to identify the relative valuation and inherent risk offered by the index currently.

SP 500 Valuation Model: Peak Earnings
Predicted 10-Year Annual Return v Realized
March 1957 - Current, Monthly Observations

Predicted 10-Y Annual Return (Maximum Price/Peak Earnings)   Predicted 10-Y Annual Return (Average Price/Peak Earnings)
Predicted 10-Y Annual Return (Median Price/Peak Earnings)   Predicted 10-Y Annual Return (Minimum Price/Peak Earnings)
Actual Annual Return (RHS)

As of 06/30/2019: If current Price/Peak Earnings of 21.5 expands or contracts to:

Maximum Price/Peak Earnings of 33.5, Predicted Return = 12.35%, Capital Gain 10.82%   Dividend 1.53%
Minimum Price/Peak Earnings of 3.0, Predicted Return = -5.34%,   Capital Gain -13.04%   Dividend 7.70%
Average Price/Peak Earnings of 12.8 Predicted Return = 3.14%,   Capital Gain 0.63%   Dividend 2.51%
Median Price/Peak Earnings of 12.2, Predicted Return = 2.79%,   Capital Gain 0.22%   Dividend 2.57%

Predicted Returns: Sensitivity Analysis

June 30, 2019

Time Horizon	Price / Peak Earnings															
	3.0	7.0	9.0	11.0	12.2	12.8	14.0	16.0	18.0	21.0	23.0	25.0	27.0	29.0	31.0	33.5
10	(5.34)	(1.44)	0.34	1.90	2.79	3.14	3.93	5.12	6.20	7.66	8.54	9.37	10.14	10.87	11.55	12.35
9	(7.24)	(2.61)	(0.60)	1.17	2.16	2.56	3.45	4.78	6.00	7.63	8.63	9.55	10.42	11.23	12.00	12.90
8	(9.54)	(4.05)	(1.75)	0.26	1.39	1.84	2.85	4.37	5.74	7.60	8.73	9.78	10.76	11.69	12.57	13.59
7	(12.42)	(5.88)	(3.21)	(0.90)	0.40	0.92	2.09	3.83	5.42	7.56	8.86	10.07	11.21	12.28	13.30	14.48
6	(16.10)	(8.26)	(5.13)	(2.42)	(0.89)	(0.29)	1.08	3.13	4.99	7.51	9.04	10.47	11.81	13.08	14.28	15.68
5	(20.96)	(11.48)	(7.75)	(4.51)	(2.68)	(1.96)	(0.31)	2.14	4.39	7.43	9.29	11.02	12.66	14.21	15.67	17.38
4	(27.69)	(16.09)	(11.54)	(7.55)	(5.30)	(4.41)	(2.37)	0.69	3.49	7.32	9.66	11.86	13.94	15.91	17.79	19.99
3	(37.52)	(23.23)	(17.49)	(12.41)	(9.51)	(8.36)	(5.70)	(1.69)	2.02	7.13	10.28	13.27	16.11	18.82	21.41	24.46
2	(52.92)	(35.66)	(28.19)	(21.35)	(17.36)	(15.75)	(12.02)	(6.28)	(0.87)	6.75	11.55	16.15	20.58	24.85	28.99	33.90
1	(77.67)	(61.63)	(52.38)	(42.91)	(36.95)	(34.46)	(28.48)	(18.78)	(9.04)	5.62	15.42	25.23	35.05	44.88	54.71	66.84

Growth Rate	Price / Peak Earnings															
	3.0	7.0	9.0	11.0	12.2	12.8	14.0	16.0	18.0	21.0	23.0	25.0	27.0	29.0	31.0	33.5
0.06	(5.34)	(1.44)	0.34	1.90	2.79	3.14	3.93	5.12	6.20	7.66	8.54	9.37	10.14	10.87	11.55	12.35
0.05	(6.16)	(2.33)	(0.58)	0.97	1.84	2.19	2.98	4.15	5.22	6.66	7.54	8.35	9.12	9.84	10.51	11.30
0.04	(6.98)	(3.23)	(1.49)	0.03	0.90	1.24	2.02	3.18	4.24	5.66	6.53	7.34	8.09	8.80	9.48	10.26
0.03	(7.80)	(4.12)	(2.41)	(0.90)	(0.05)	0.29	1.06	2.21	3.25	4.67	5.52	6.32	7.07	7.77	8.44	9.21
0.02	(8.63)	(5.01)	(3.33)	(1.84)	(1.00)	(0.66)	0.10	1.24	2.27	3.67	4.52	5.31	6.05	6.74	7.40	8.17
0.01	(9.45)	(5.91)	(4.25)	(2.77)	(1.94)	(1.61)	(0.86)	0.26	1.29	2.67	3.51	4.29	5.02	5.71	6.36	7.12

Valuation Date	6/30/2019
Current Price / Peak Earnings	21.5
Growth Rate	0.06
Time Horizon (Years)	10
Current Dividend Yield	0.0187

SP 500 Valuation Model
Price / Peak Earnings
March 1957 - Current, Monthly Observations

Global Technical Analysis
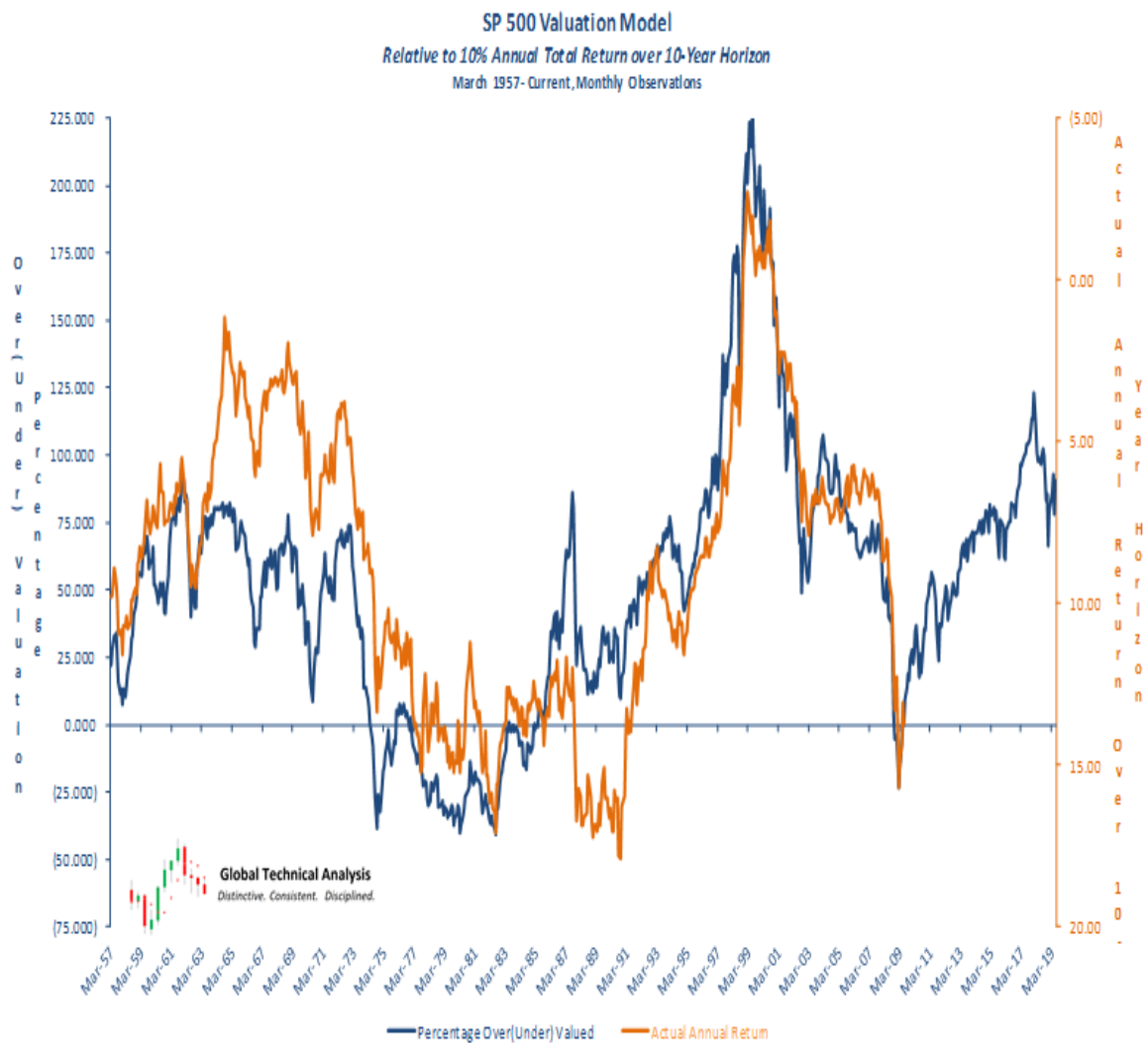*Distinctive. Consistent. Disciplined.*

As of 06/30/2019: Price/Peak Earnings 21.5

To get at the significance of the P/E, you have to start by understanding that stocks are not a claim to earnings anyway. Stocks are a claim to a future stream of free cash flows – the cash that can actually be delivered to shareholders over time after all other obligations have been satisfied, including the provision for future growth. Knowing this already tells us a lot. For example, price/earnings ratios based on operating earnings are inherently misleading, since that "earnings" figure does not deduct interest owed to bondholders nor taxes owed to the government.   This isn't to say that P/E ratios are useless, *but it's important for the "E"* *chosen by an investor to have a reasonably stable relationship to what matters, which is the long-term stream of free cash flows.* For that reason, our favored earnings measure for market valuation (though it can't be used for individual stocks) is "peak earnings" - the highest level of net earnings achieved to date. *(Excerpted from Dr. John Hussman)*

SP 500 Valuation Model
Duration in Years (Price / Dividend)
March 1957-Current, Monthly Observations

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As of 06/30/2019: Duration 53.5 years

In the case of equities, *duration measures the percentage change in stock prices in response to a 1% change in the long-term return that stocks are priced to deliver.* So we have a basic financial planning concept. If a buy-and-hold investor with no particular view about market conditions or future returns wishes to have a fairly predictable amount of wealth at some future date, that investor should hold a portfolio with a duration that is roughly equal to the investment horizon. *(Excerpted from Dr. John Hussman)*

SP 500 Valuation Model
Relative to 10% Annual Total Return over 10-Year Horizon
March 1957- Current, Monthly Observations

Percentage Over(Under) Valued   Actual Annual Return

As of 06/30/2019: Overvalued by 90.5%

SP500 Valuation Model
Real Price to 10-Year Real Earnings
March 1957 - Current, Monthly Observations

As of 06/30/2019: Real Price to 10-Year Real Earnings 29.6x

SP 500 Valuation Model
Dividend Yield
March 1957 - Current, Monthly Observations

As of 06/30/2019: Dividend Yield 1.87%

CBOE VIX Index
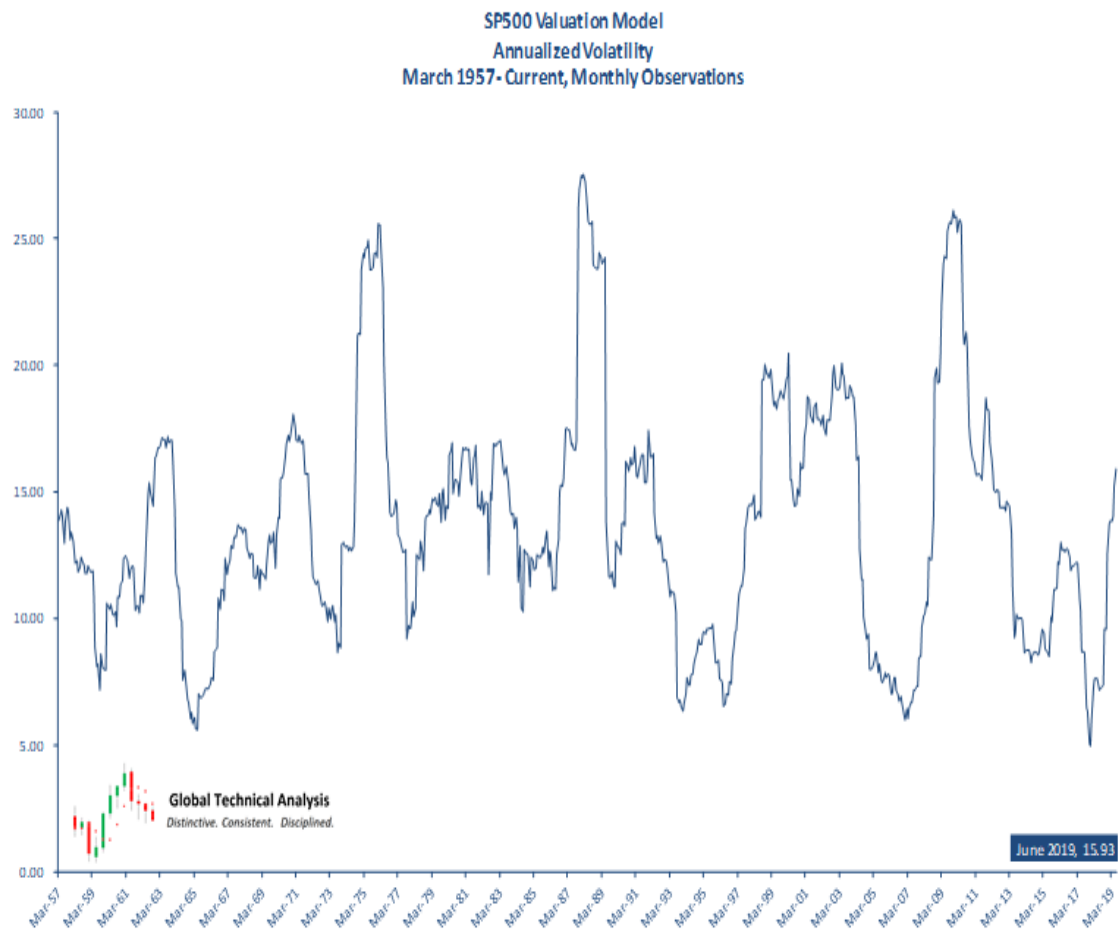**10-Day Exponential Moving Average**

VIX measures 30-day expected volatility of the S&P 500 Index. The components of VIX are near- and next-term put and call options, usually in the first and second SPX contract months. "Near-term" options must have at least one week to expiration; a requirement intended to minimize pricing anomalies that might occur close to expiration.

As of 06/30/2019: 10-Day EMA 15.58

CBOE Skew Index
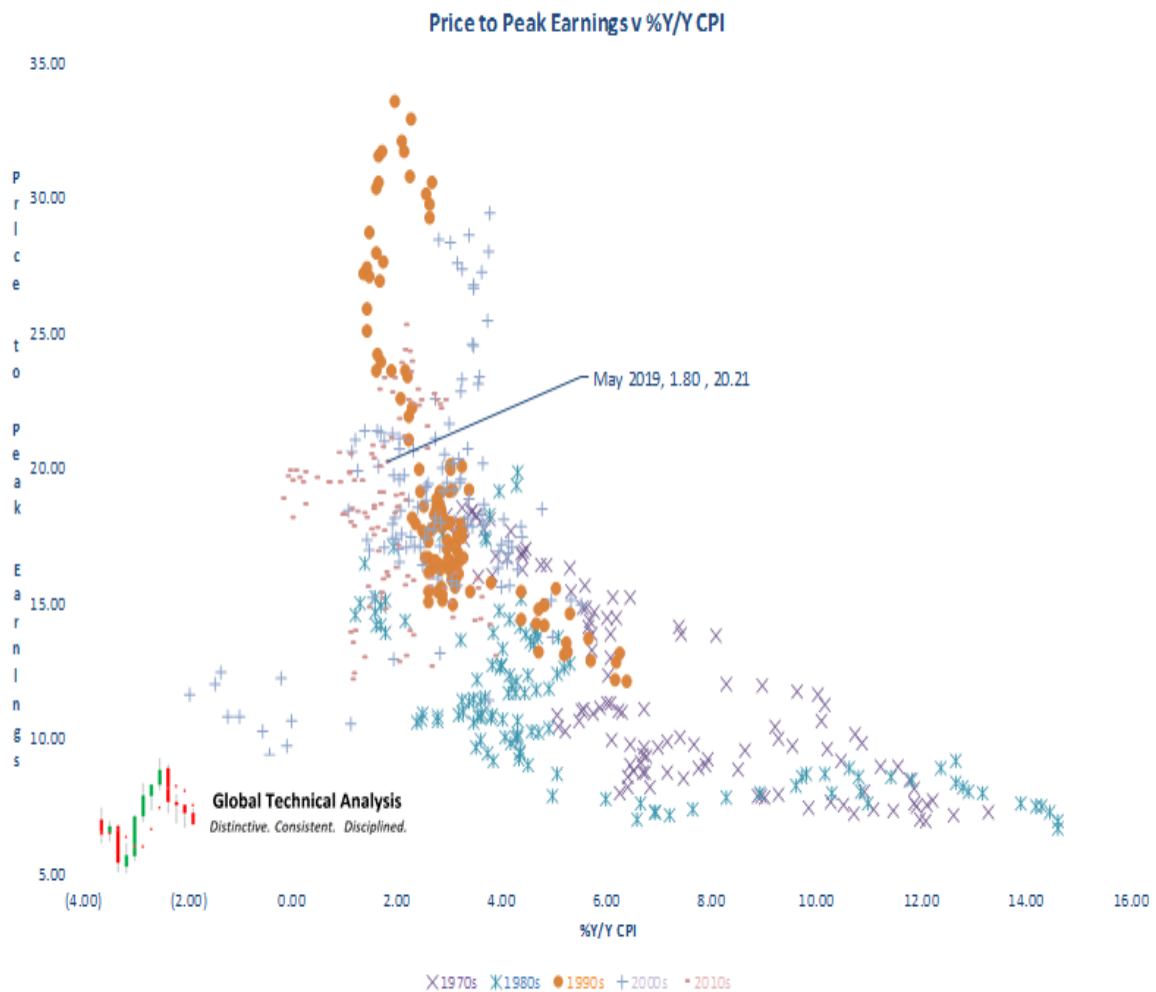**10-Day Exponential Moving Average**

6/28/2019, 116.95
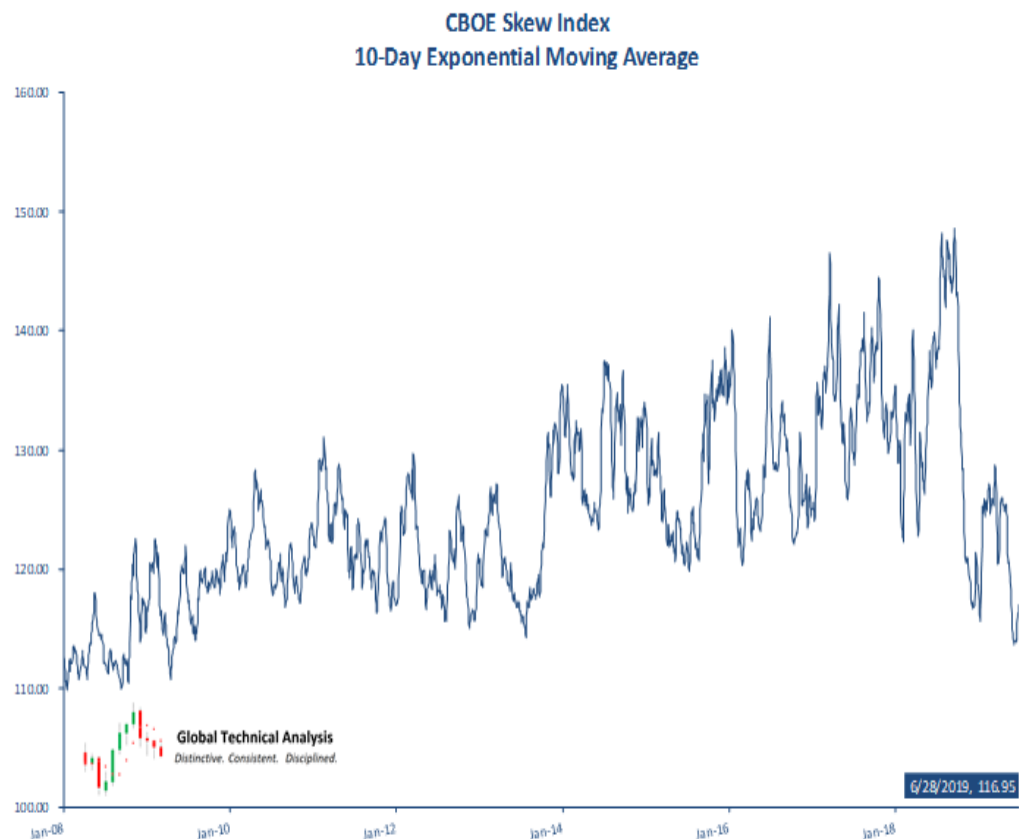
The CBOE SKEW Index ("SKEW") is an index derived from the price of S&P 500 tail risk. The price of S&P 500 tail risk is calculated from the prices of S&P 500 out-of-the-money options. SKEW typically ranges from 100 to 150. A SKEW value of 100 means that the perceived distribution of S&P 500 log-returns is normal, and the probability of outlier returns is therefore negligible. As SKEW rises above 100, the left tail of the S&P 500 distribution acquires more weight, and the probabilities of outlier returns become more significant.

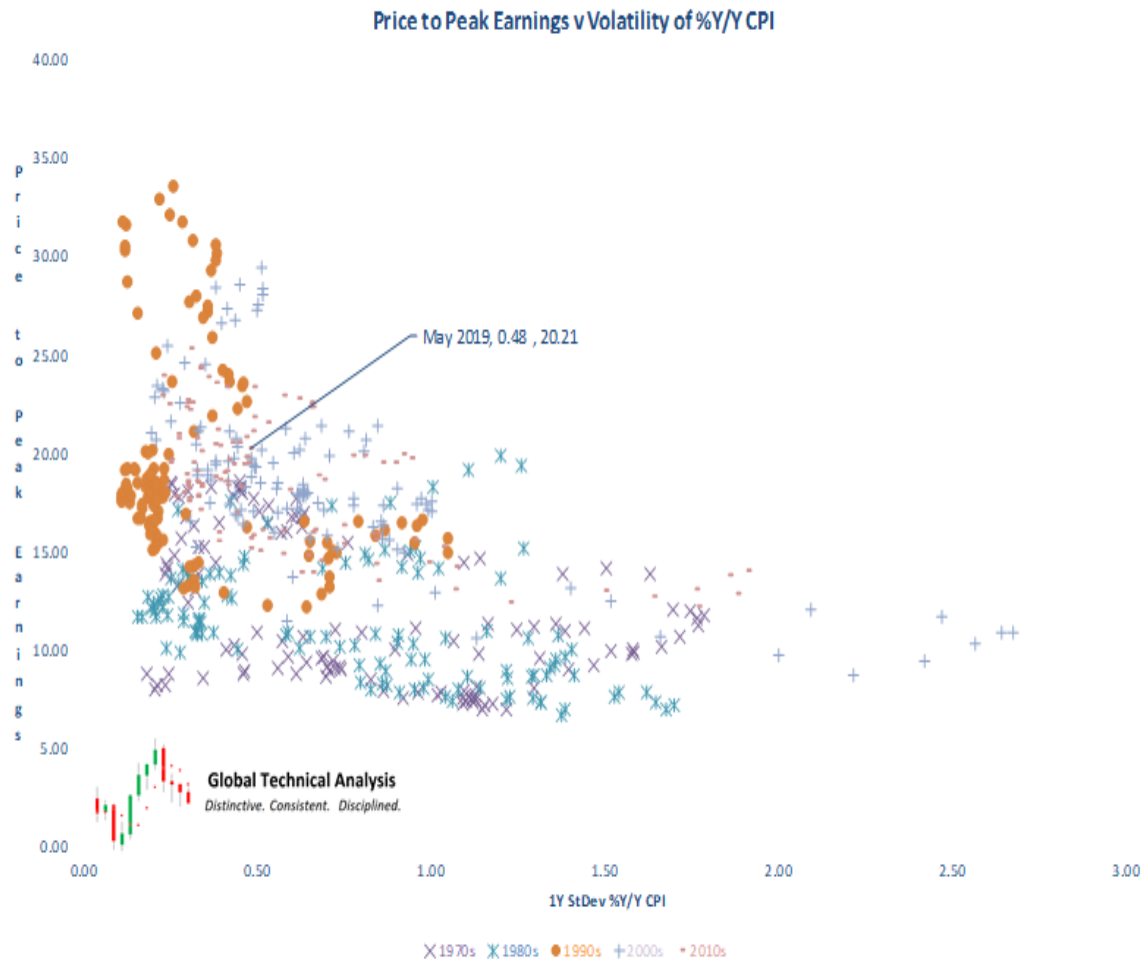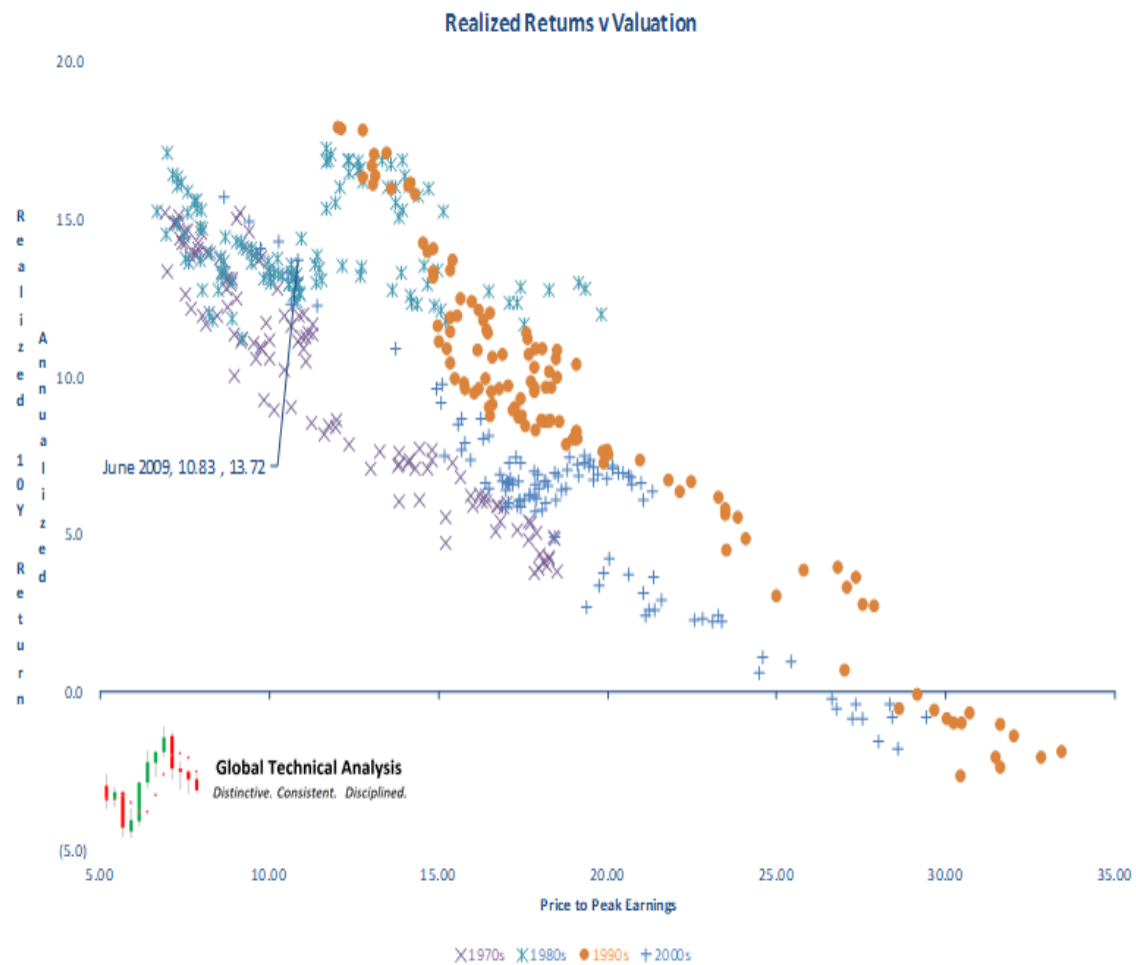As of 06/30/2019: 10-Day EMA 116.95

SP500 Valuation Model
Annualized Volatility
March 1957 - Current, Monthly Observations

Global Technical Analysis
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June 2019, 15.93

As of 06/30/2019: 15.93%

Price to Peak Earnings v %Y/Y CPI

May 2019, 1.80 , 20.21

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%Y/Y CPI

✕1970s ✲1980s ●1990s ＋2000s ▪2010s

Lower levels of inflation are rewarded with *higher* earnings multiples.
Higher levels of inflation are punished with *lower* earnings multiples.

Price to Peak Earnings v Volatility of %Y/Y CPI

May 2019, 0.48 , 20.21

Global Technical Analysis
Distinctive. Consistent. Disciplined.

1Y StDev %Y/Y CPI

✕ 1970s ✕ 1980s ● 1990s ＋ 2000s • 2010s

Lower levels of volatility are rewarded with *higher* earnings multiples.
Higher levels of volatility are punished with *lower* earnings multiples.

Realized Returns v Valuation

Global Technical Analysis
Distinctive. Consistent. Disciplined.

June 2009, 10.83 , 13.72

Price to Peak Earnings

✕ 1970s   ✕ 1980s   ● 1990s   ＋ 2000s

Lower valuations are rewarded with *higher* realized returns.
Higher valuations are punished with *lower* realized returns.
As of 06/30/2019: Price to Peak Earnings 21.5x Average: 12.8x