

MINNESOTA  
STATE  
BOARD OF  
INVESTMENT



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DATE: November 19, 2010

FROM: State Board of Investment

SUBJECT: **Report on Investment Consultant Activities**

The provisions of Minnesota Statutes, Section 11A.27 require the State Board of Investment to file with the Legislative Reference Library a report on investment consultant activities.

The State Board of Investment (SBI) contracts with Nuveen Investment Solutions, Inc., formerly Richards & Tierney, Chicago, Illinois and PCA, Studio City, California for certain investment consulting services. Nuveen serves as the SBI's general consultant, and PCA serves as the SBI's special projects consultant. The current contracts with these consultants, effective July 1, 2007 to June 30, 2012, call for payment of \$370,000 to Nuveen annually and \$40,000 to PCA annually.

During the period November 1, 2009 through October 31, 2010, Nuveen was involved in the following projects:

- Availability to the Board, staff and Investment Advisory Council to provide perspective, counsel and input on relevant investment related issues.
- Periodic background information for evaluating SBI investment manager.

During the period November 1, 2009 through October 31, 2010, PCA was involved in the following projects:

- Availability to staff to provide perspective, counsel and input on relevant investment related issues.

Attached is an example of the work product provided by each.

STATE OF MINNESOTA

GE INVESTMENTS

JUNE, 2010

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STATE OF MINNESOTA  
GE INVESTMENTS

JUNE, 2010

EQUITY MARKET INVESTMENT RETURNS (%)

MARKET INDICES	3 MOS	12 MOS	36 MOS	60 MOS	120 MOS	180 MOS
S&P 500	-11.40	14.47	-9.75	-.75	-1.50	6.33
S&P 500 GROWTH	-11.28	12.59	-6.90	.09	-3.97	6.03
S&P 500 VALUE	-11.57	16.40	-12.82	-1.81	.74	6.11
S&P 400 MIDCAP	-9.53	24.98	-5.92	2.23	5.50	10.51
S&P 600 SMALL	-8.79	23.60	-7.33	1.11	5.84	8.94
S&P 900	-11.25	15.32	-9.44	-.50	-.98	6.61
S&P 1500	-11.16	15.61	-9.36	-.44	-.76	6.67
R&T INSTITUTIONAL EQUITY INDEX	-11.04	16.49	-8.90	.41	-.53	6.54
WILSHIRE 5000 INDEX	-11.21	16.20	-9.08	-.08	-.67	6.51
RUSSELL 3000	-11.32	15.72	-9.47	-.48	-.92	6.42
RUSSELL 1000	-11.44	15.24	-9.54	-.56	-1.22	6.47
RUSSELL 2000	-9.92	21.48	-8.60	.37	3.00	6.63
RUSSELL 1000 GROWTH	-11.75	13.62	-6.91	.38	-5.14	5.01
RUSSELL 1000 VALUE	-11.15	16.92	-12.32	-1.64	2.38	7.27
RUSSELL 2000 GROWTH	-9.22	17.96	-7.54	1.14	-1.72	3.80
RUSSELL 2000 VALUE	-10.60	25.07	-9.85	-.51	7.48	8.87
RUSSELL 3000 GROWTH	-11.55	13.95	-6.97	.44	-4.89	4.86
RUSSELL 3000 VALUE	-11.09	17.57	-12.13	-1.56	2.74	7.35
R&T LARGE CAP GROWTH	-13.19	11.98	-10.00	-2.20	-7.16	4.51
R&T LARGE CAP VALUE	-9.44	23.53	-9.84	.64	6.00	7.70
R&T SMALL CAP GROWTH	-10.88	20.36	-8.81	.98	-3.28	3.28
R&T SMALL CAP VALUE	-8.25	33.40	-6.30	2.20	11.37	12.31
CLIENT PORTFOLIOS						
ACTUAL PORTFOLIO	-13.55	8.85	-7.68	.43	-.02	7.44
BENCHMARK PORTFOLIO	-11.40	14.47	-9.75	-.75	-1.50	6.33

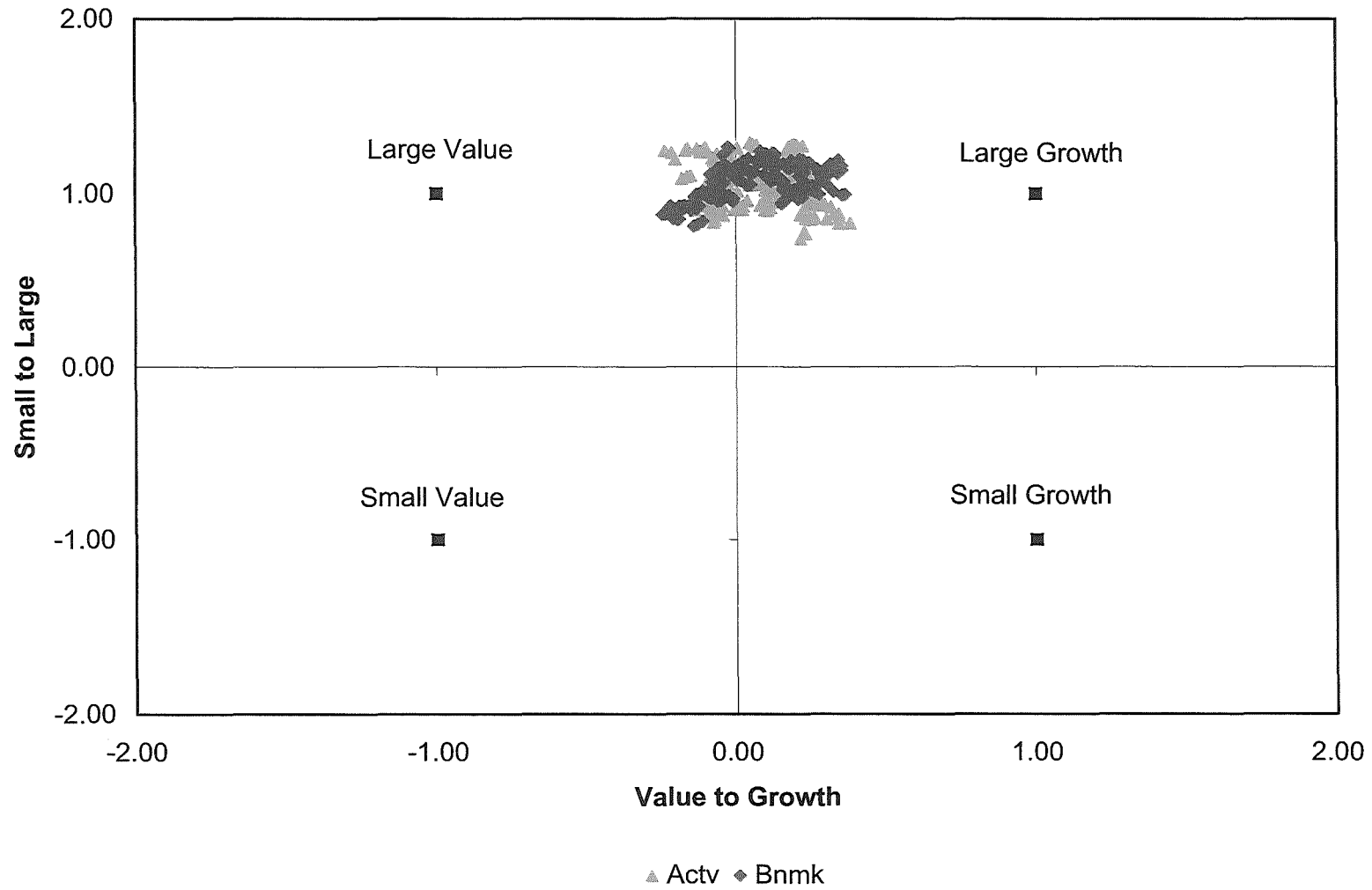
STATE OF MINNESOTA  
GE INVESTMENTS

JUNE, 2010

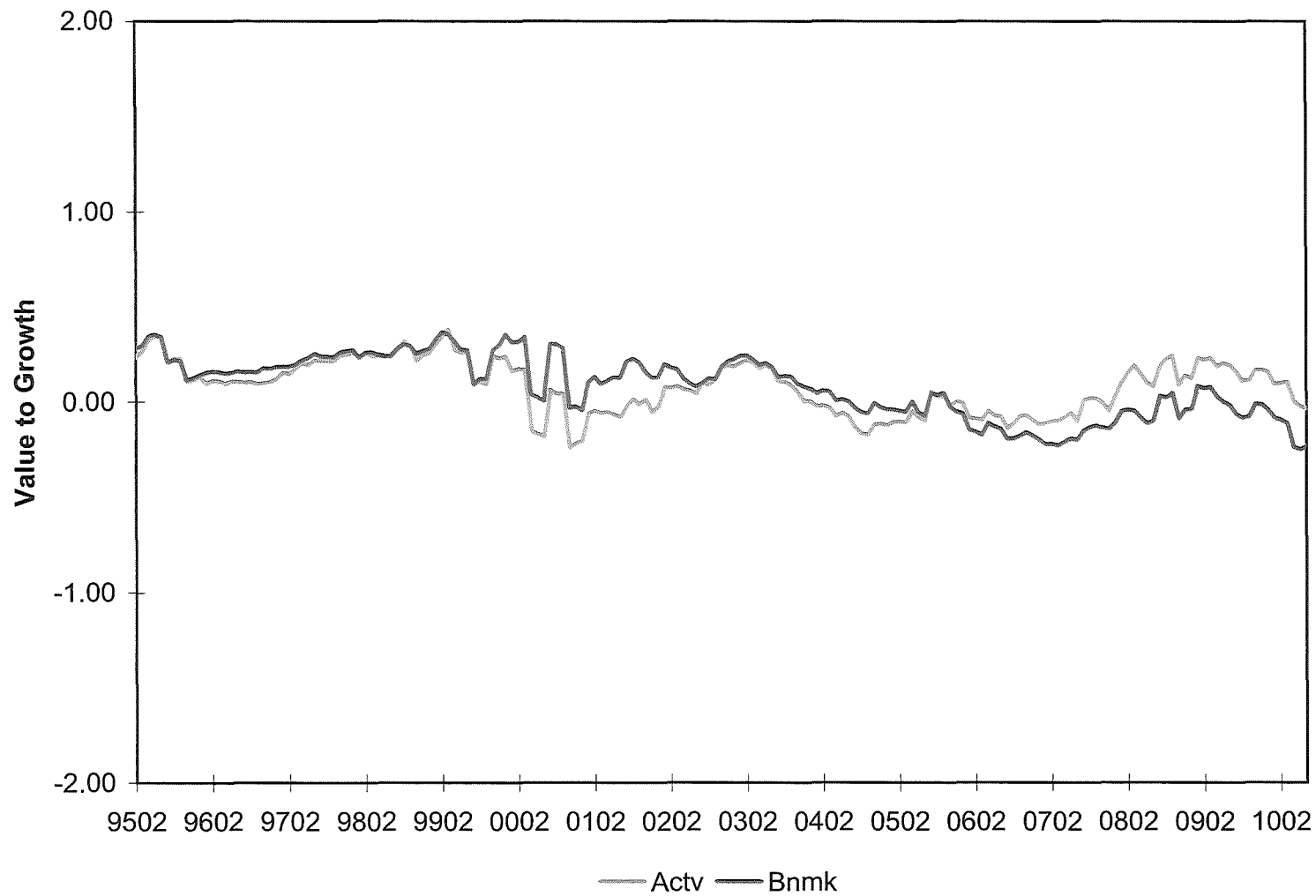
EQUITY MARKET INVESTMENT RETURNS (%)

MARKET INDICES	185 MOS -----
S&P 500	7.25
S&P 500 GROWTH	7.02
S&P 500 VALUE	6.97
S&P 400 MIDCAP	11.31
S&P 600 SMALL	9.76
S&P 900	7.52
S&P 1500	7.58
R&T INSTITUTIONAL EQUITY INDEX	7.44
WILSHIRE 5000 INDEX	7.40
RUSSELL 3000	7.31
RUSSELL 1000	7.36
RUSSELL 2000	7.47
RUSSELL 1000 GROWTH	5.99
RUSSELL 1000 VALUE	8.09
RUSSELL 2000 GROWTH	4.84
RUSSELL 2000 VALUE	9.51
RUSSELL 3000 GROWTH	5.84
RUSSELL 3000 VALUE	8.15
R&T LARGE CAP GROWTH	5.50
R&T LARGE CAP VALUE	8.43
R&T SMALL CAP GROWTH	4.27
R&T SMALL CAP VALUE	12.77
CLIENT PORTFOLIOS	
ACTUAL PORTFOLIO	8.38
BENCHMARK PORTFOLIO	7.25

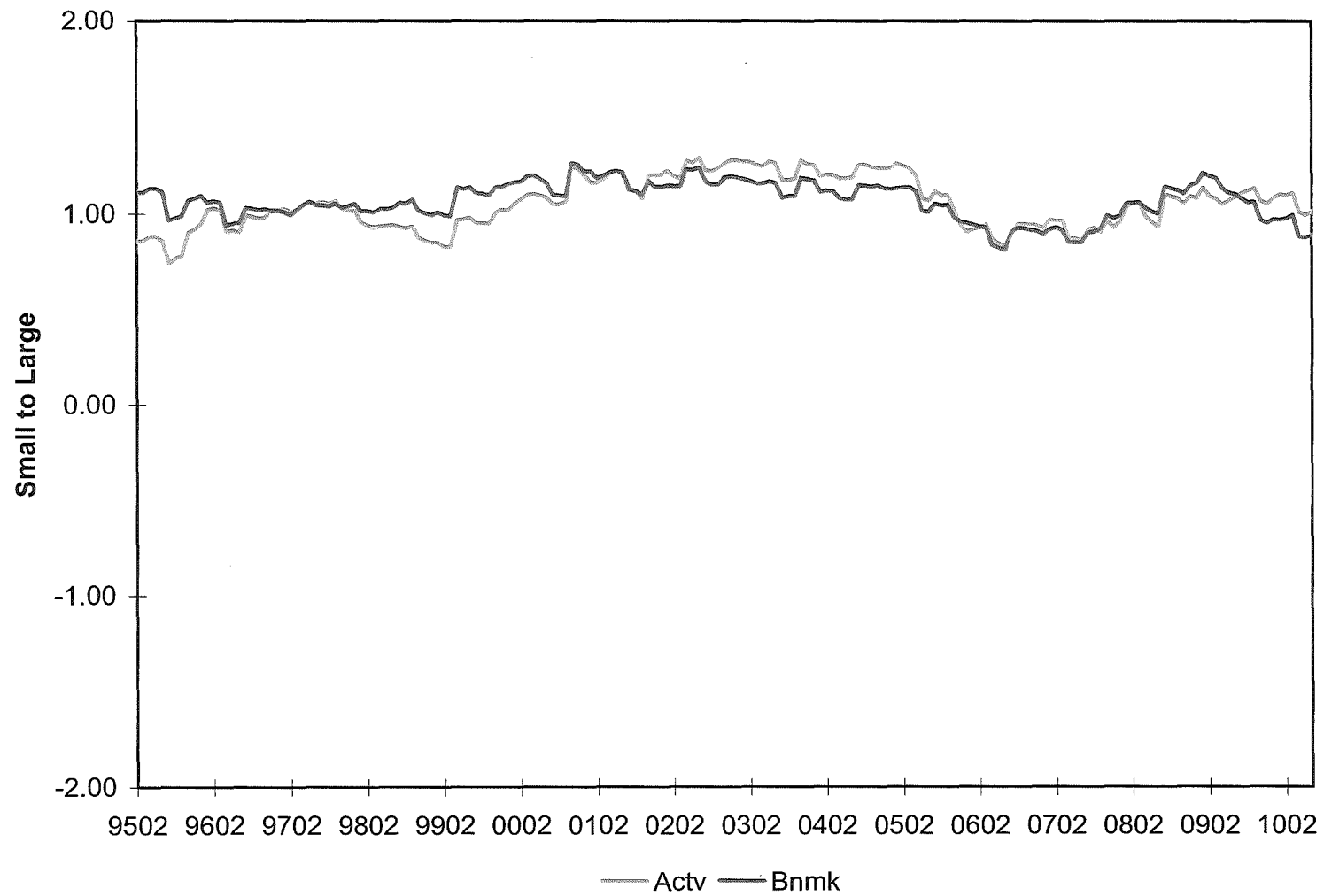
# GE Investments Style Coordinates (199502 - 201006)



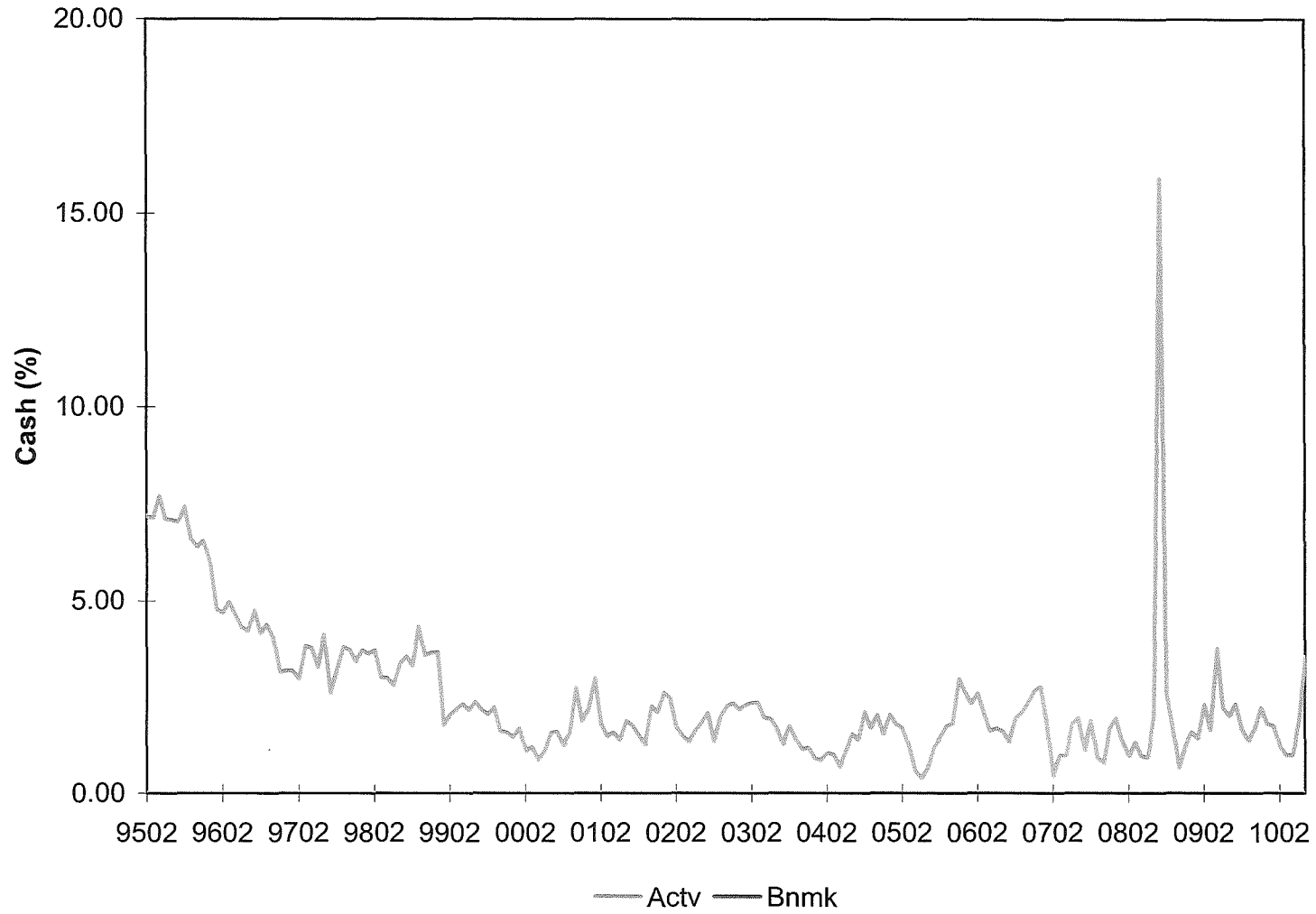
### GE Investments Style Coordinates (199502 - 201006)



# GE Investments Style Coordinates (199502 - 201006)



# GE Investments Cash Percentage (199502 - 201006)





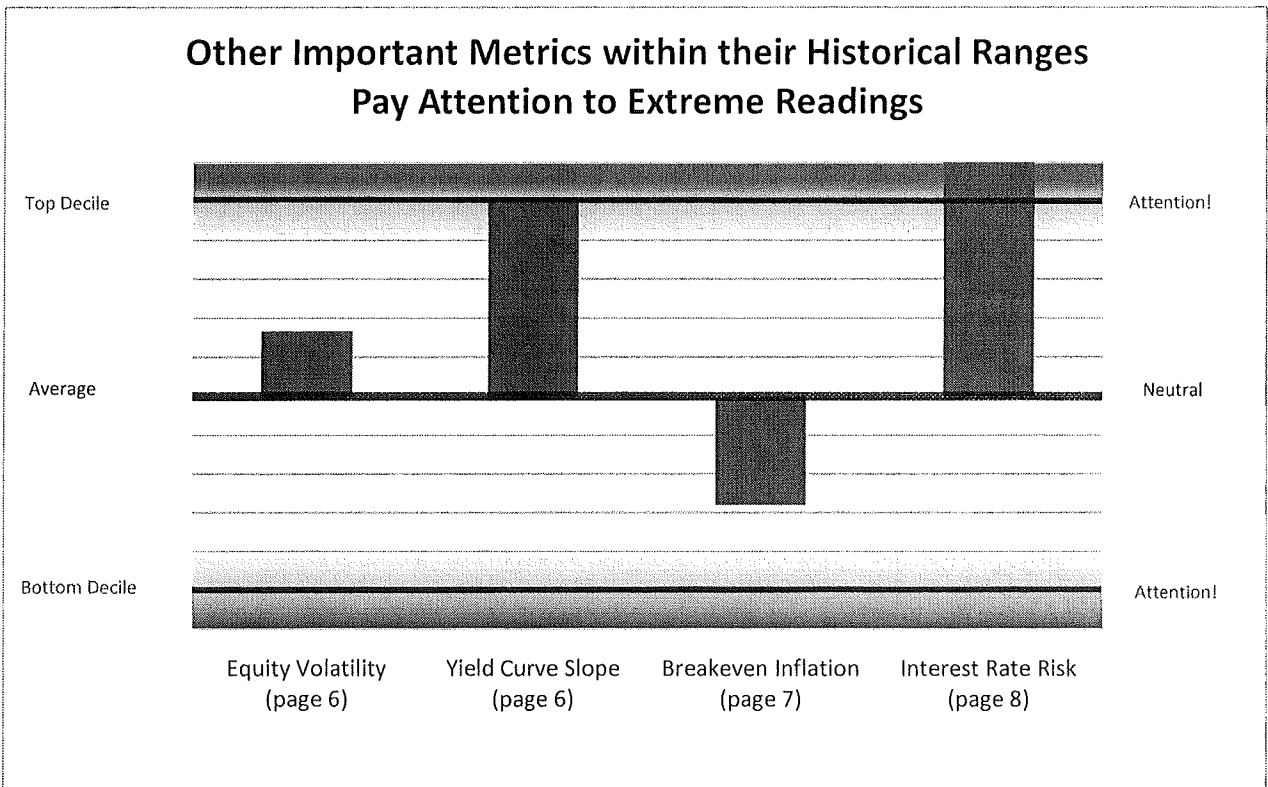
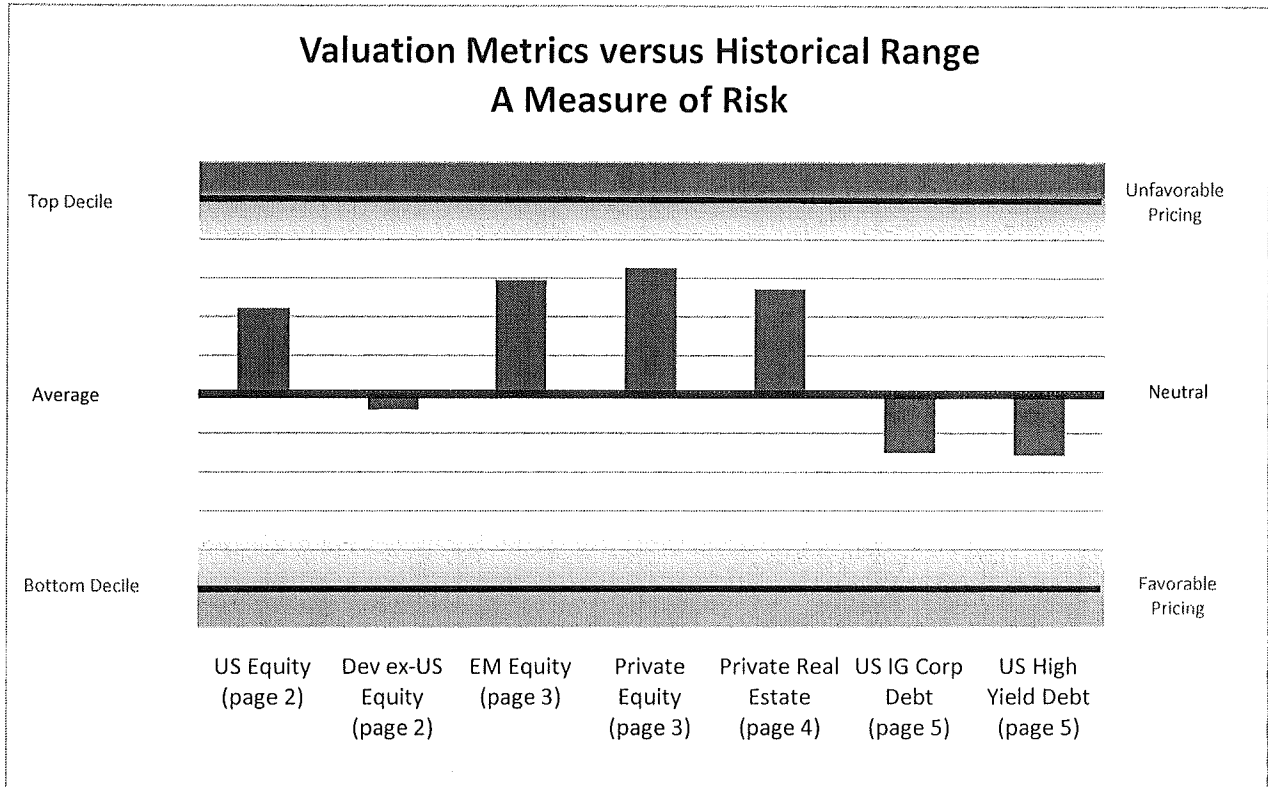
## Investment Market Risk Metrics – Oct 2010

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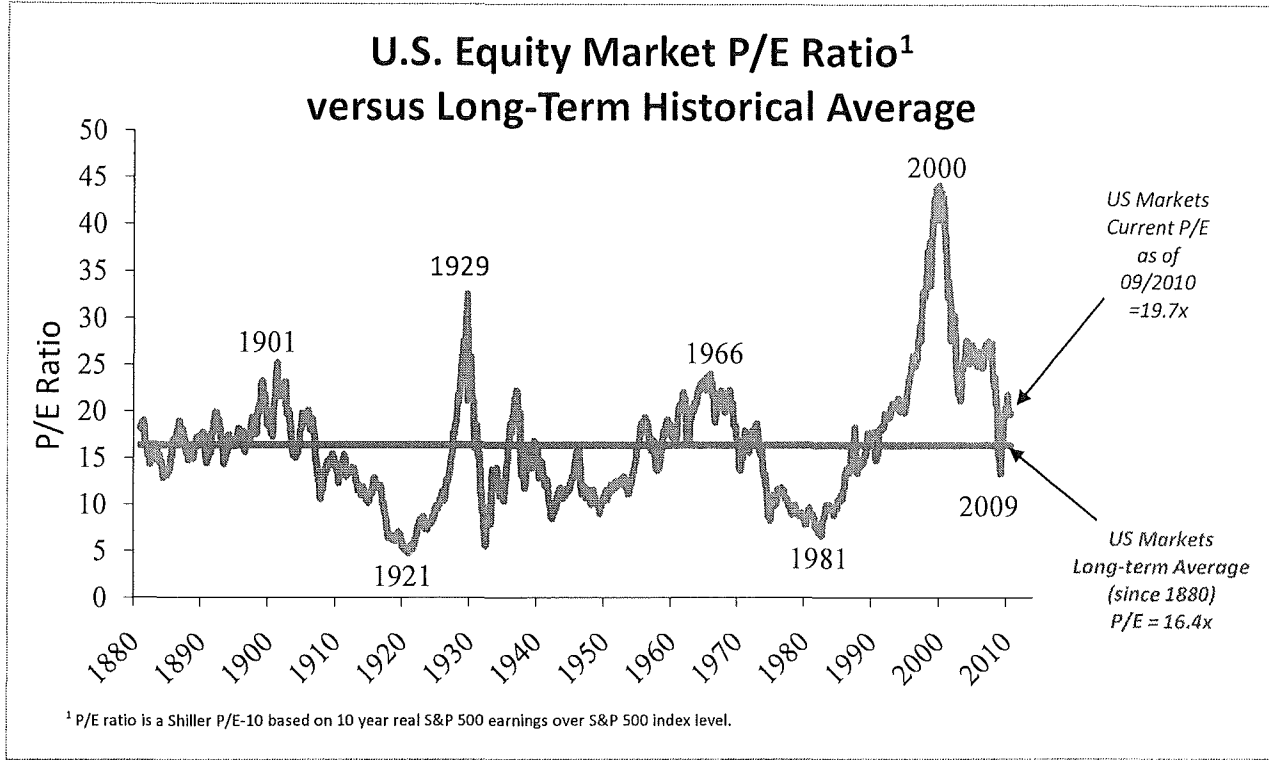
### Takeaways

- US public equity market valuations remain above their historical average. International equity valuations are in line with their historical average.
- EM equity valuations have risen relative to developed markets, owing mainly to declines in developed market PE's.
- Private equity and private real estate valuation metrics indicate these sectors never got cheap. Few transactions are occurring.
- Credit spreads have narrowed from summer levels, and are slightly above historical average levels.
- Equity volatility has come down from May highs.
- While still steep, the yield curve pitch has declined relative to earlier this year due to a drop in the 10-year Treasury yield, a sign of pessimism about economic growth.
- In the past, the yield curve slope has declined mainly because short-term rates rise, not because long-term rates decline.
- Market measures of inflation expectations have ticked up as real rates have dropped faster than nominal interest rates, and commodity prices in dollar terms have risen on dollar weakness.
- Treasury yields are historically low, with 10-year expected real yields dropping below 0.35%, a 30 year low.
- Duration of the 10-year Treasury is near a 30 year high.

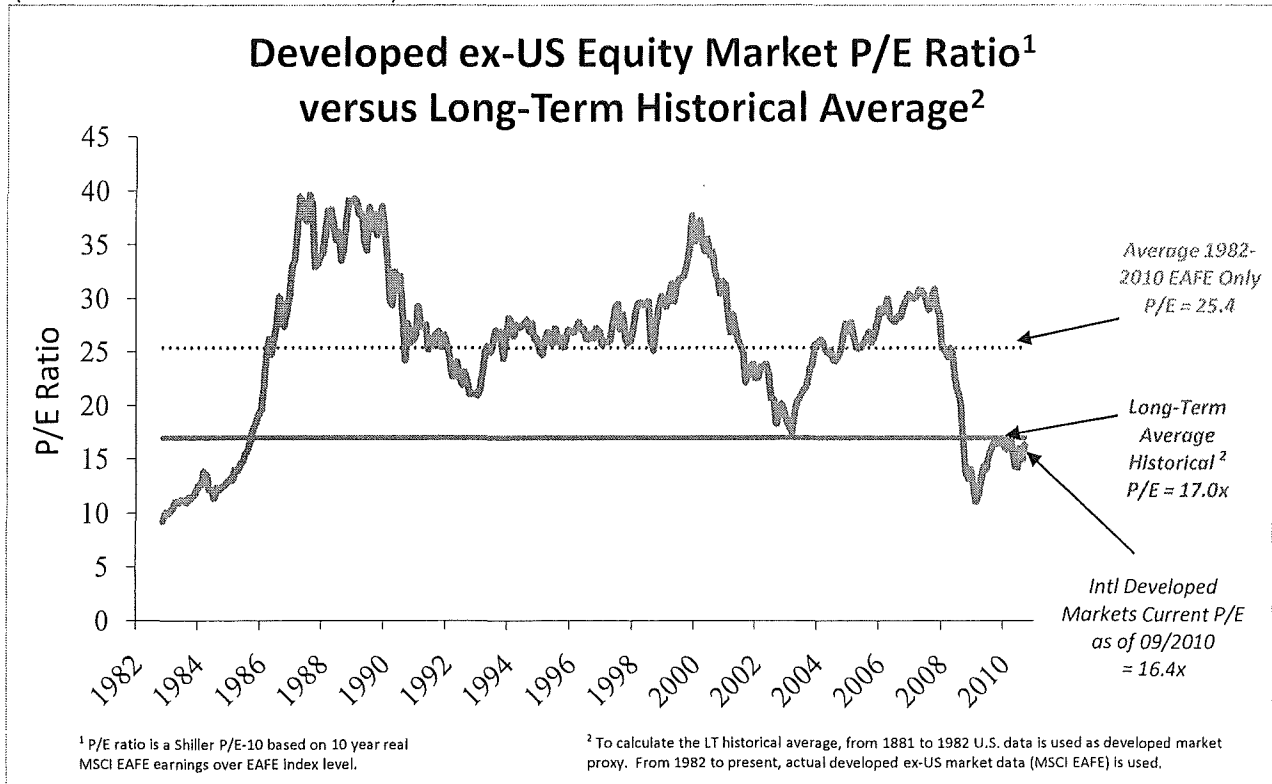
**Risk Overview**



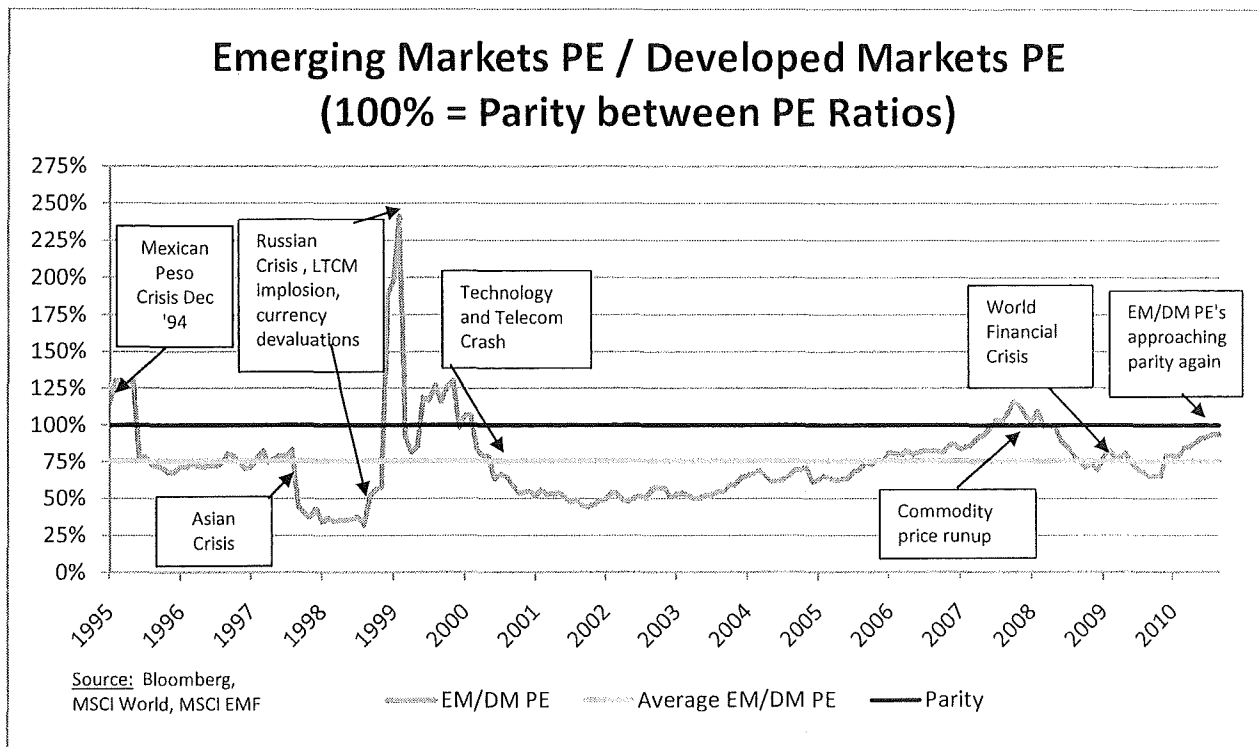
**Developed Public Equity Markets**



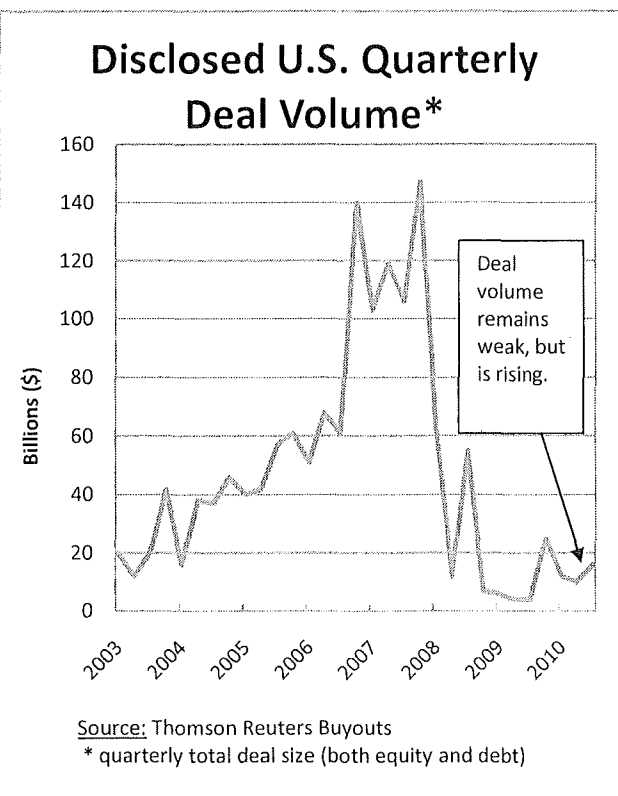
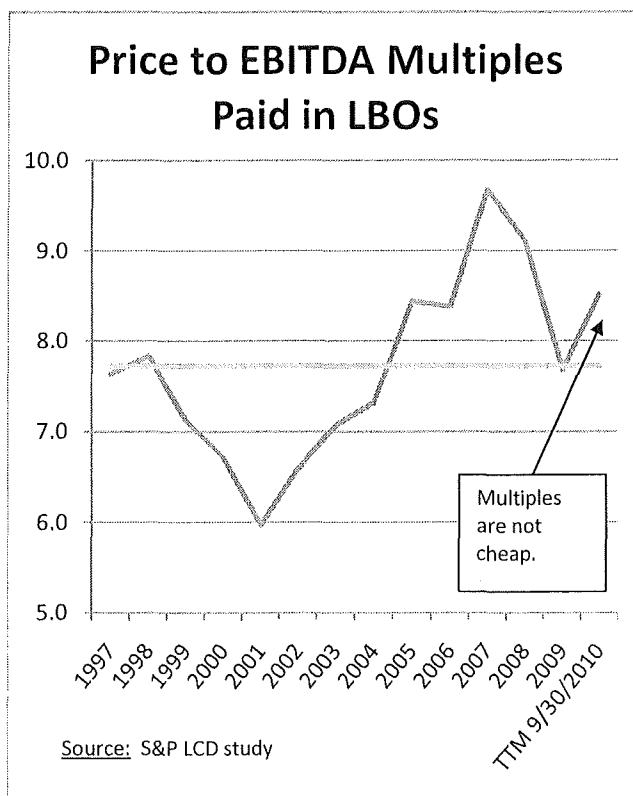
(Please note the different time scales)



**Emerging Market Public Equity Markets**

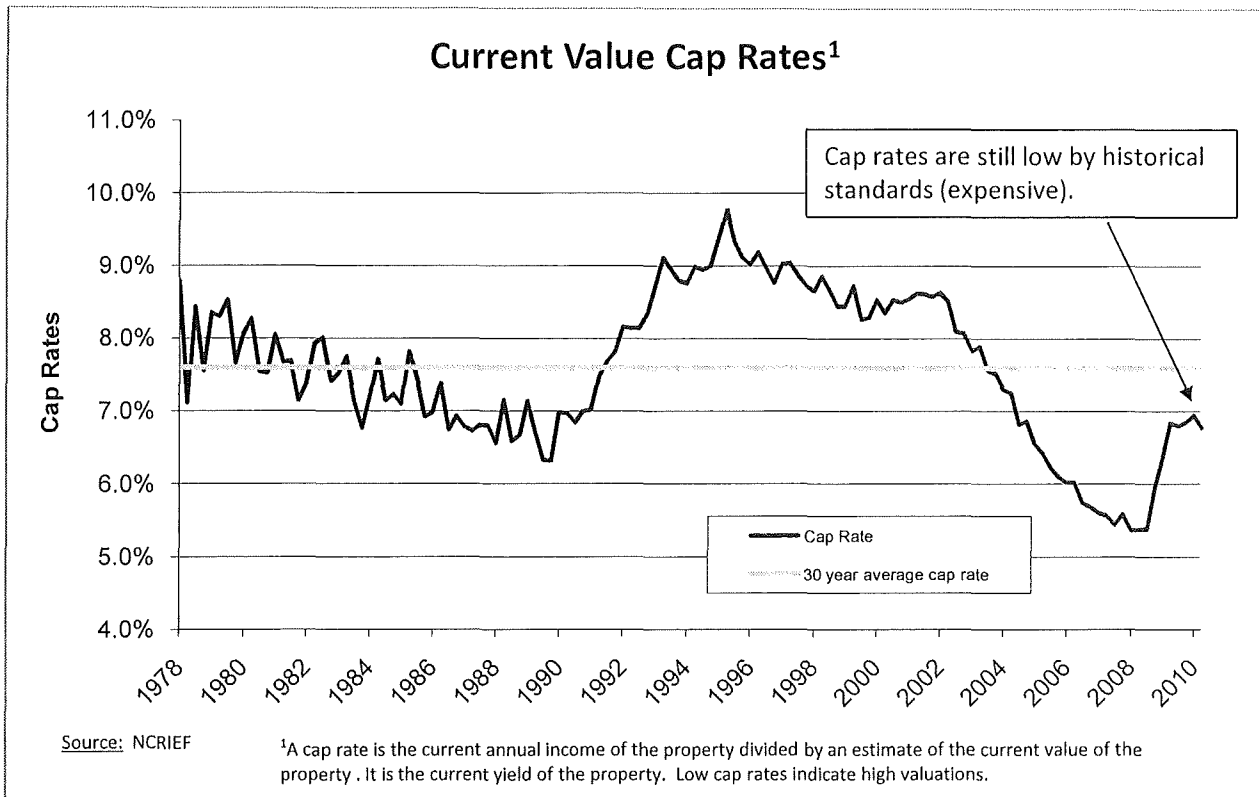


**US Private Equity**

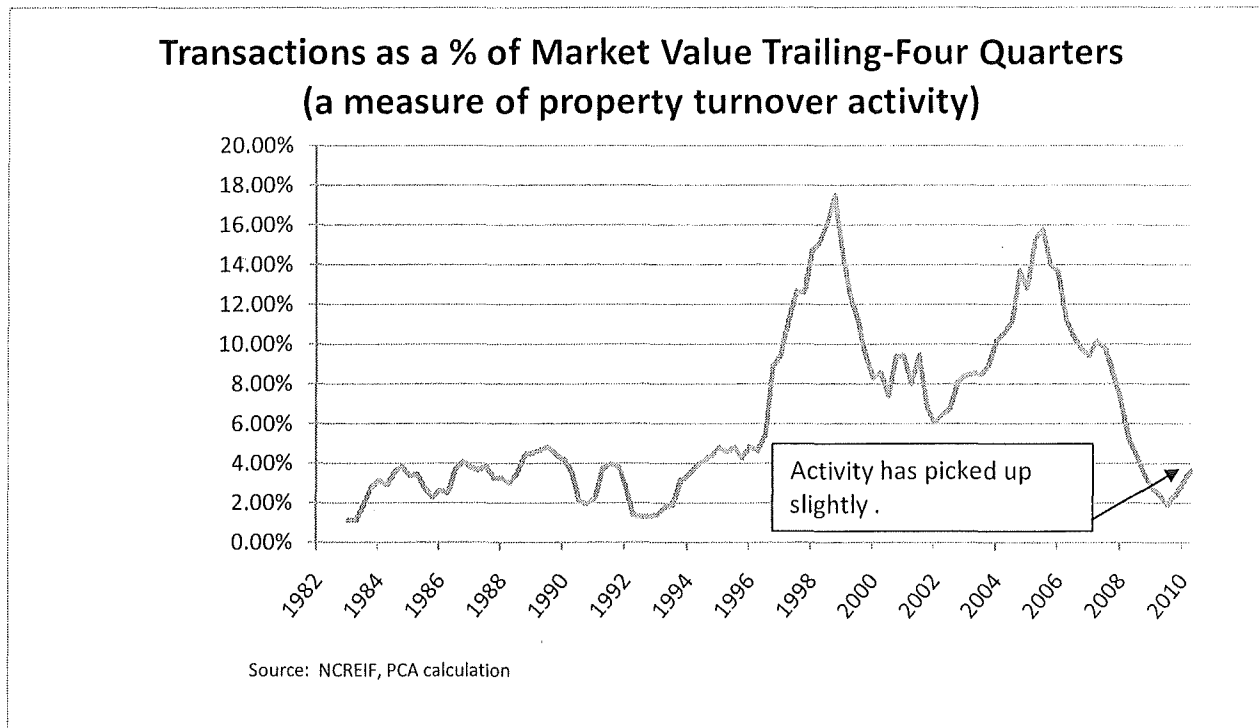


**Private Real Estate Markets**

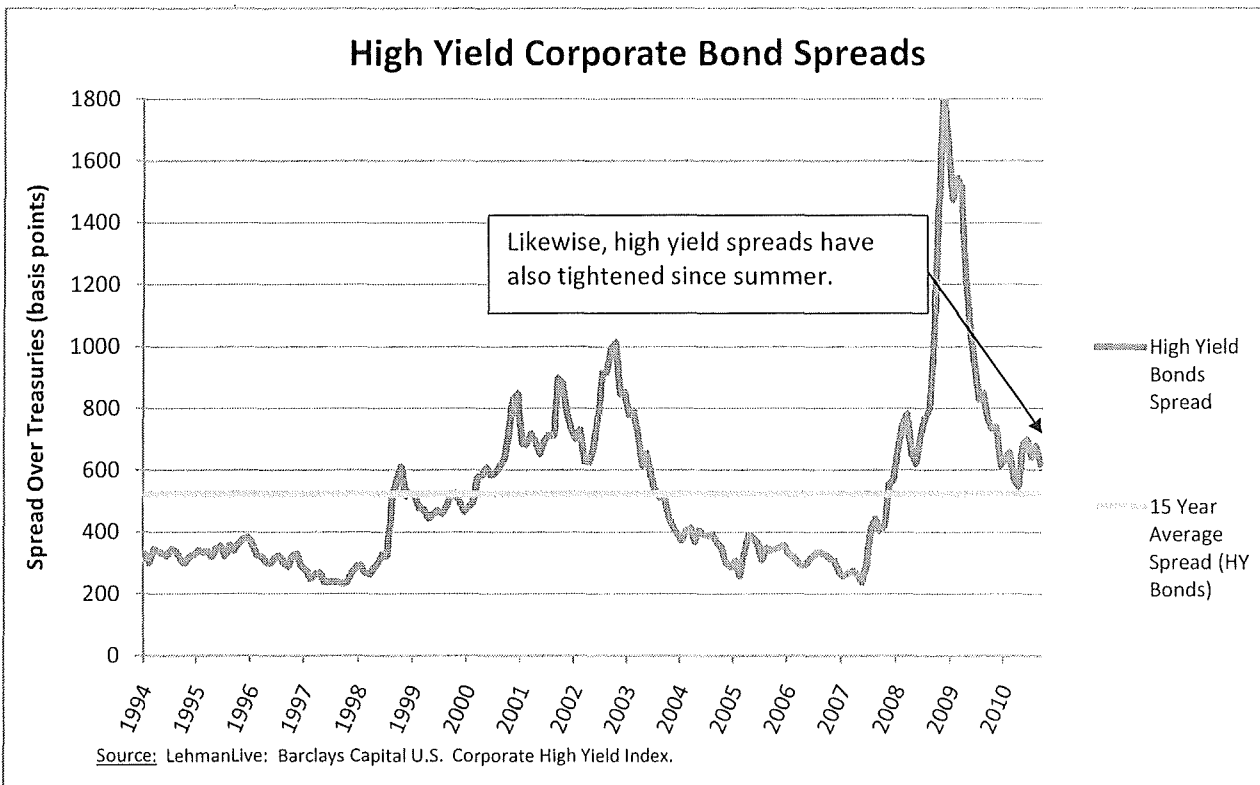
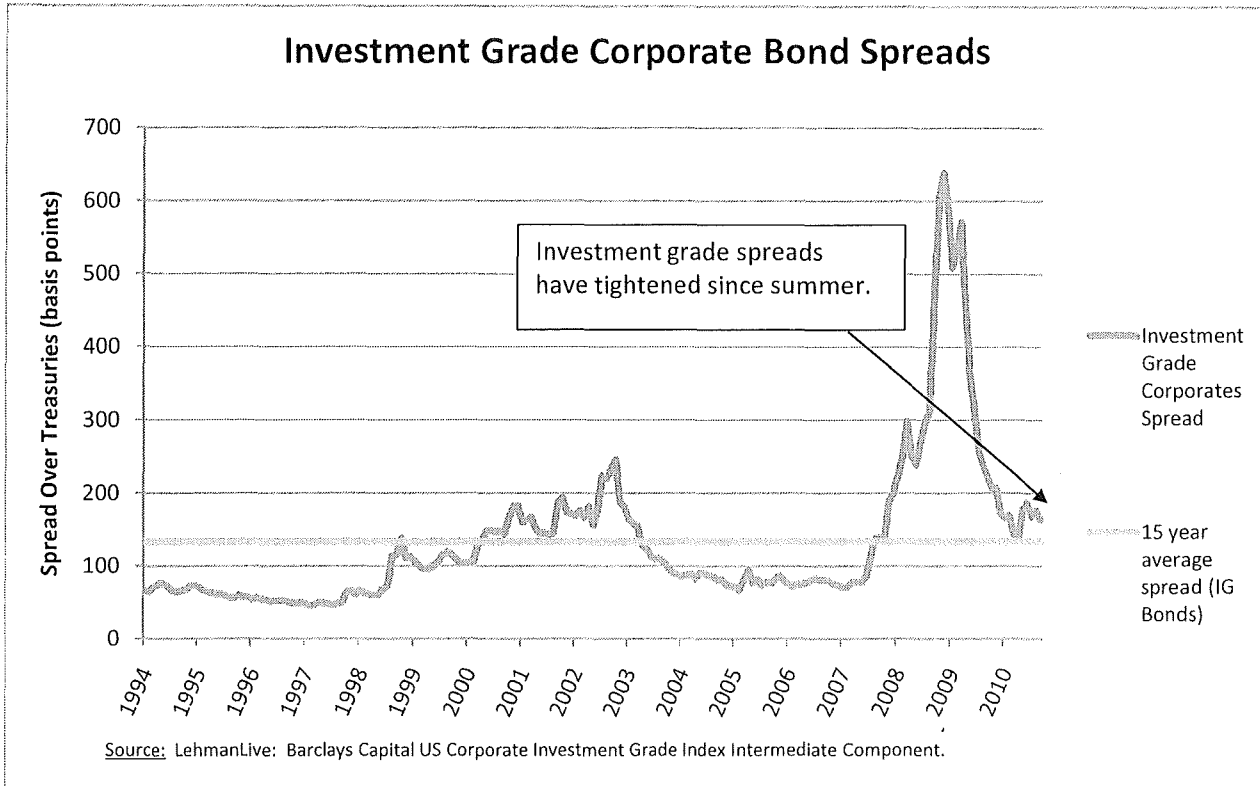
June 30 Data



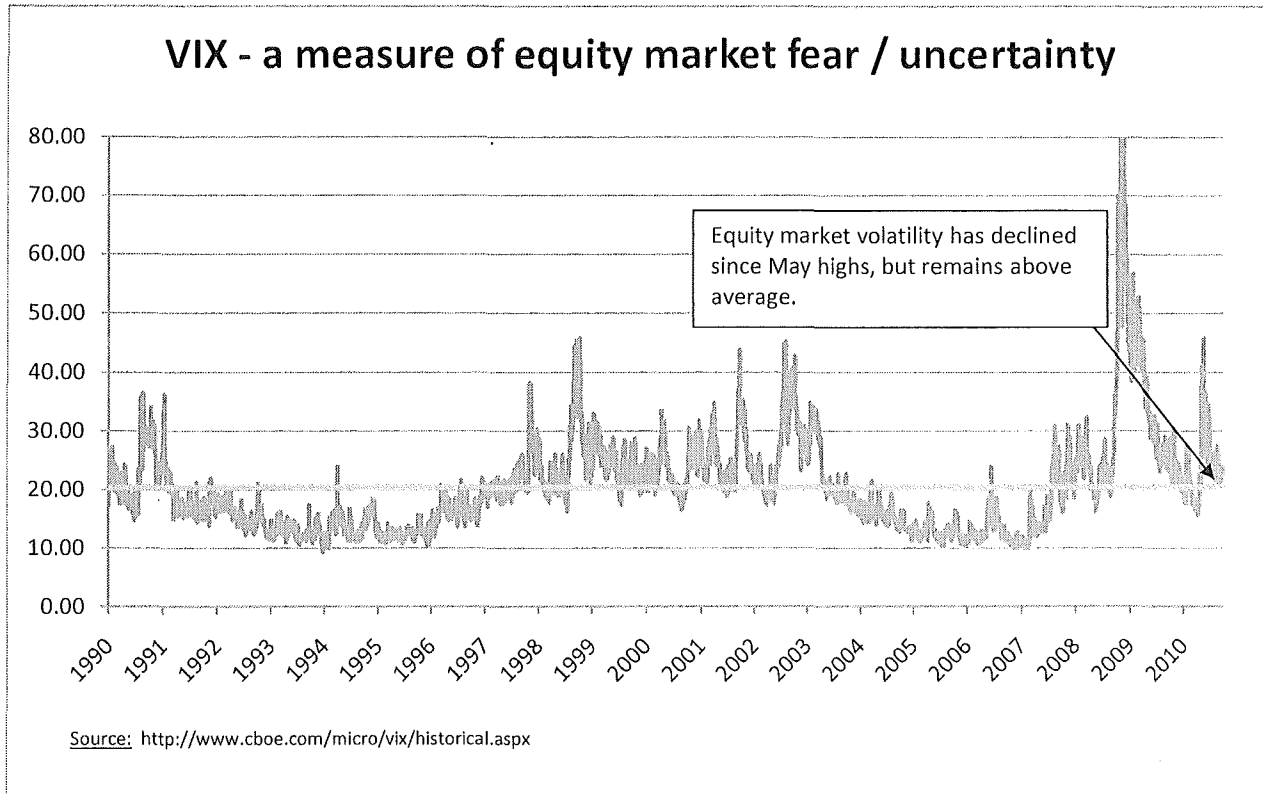
June 30 Data



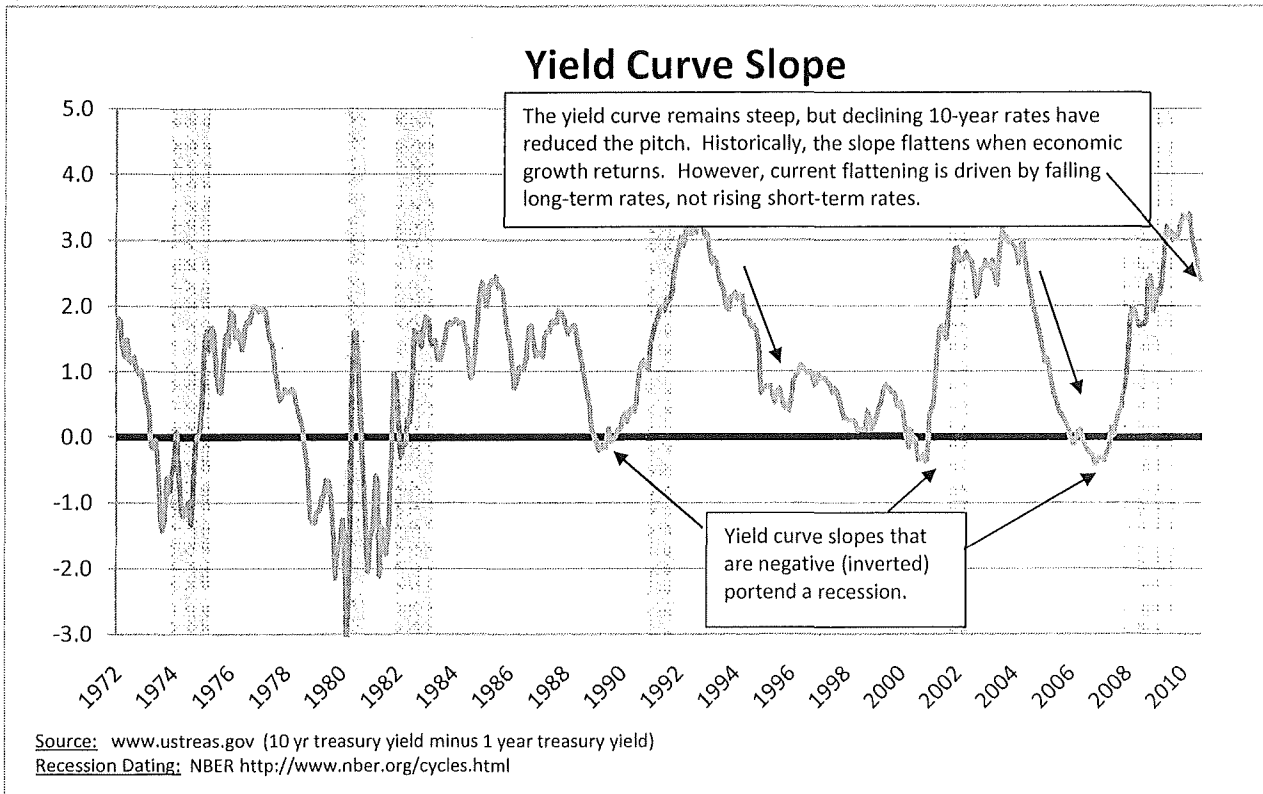
### Credit Markets US Fixed Income



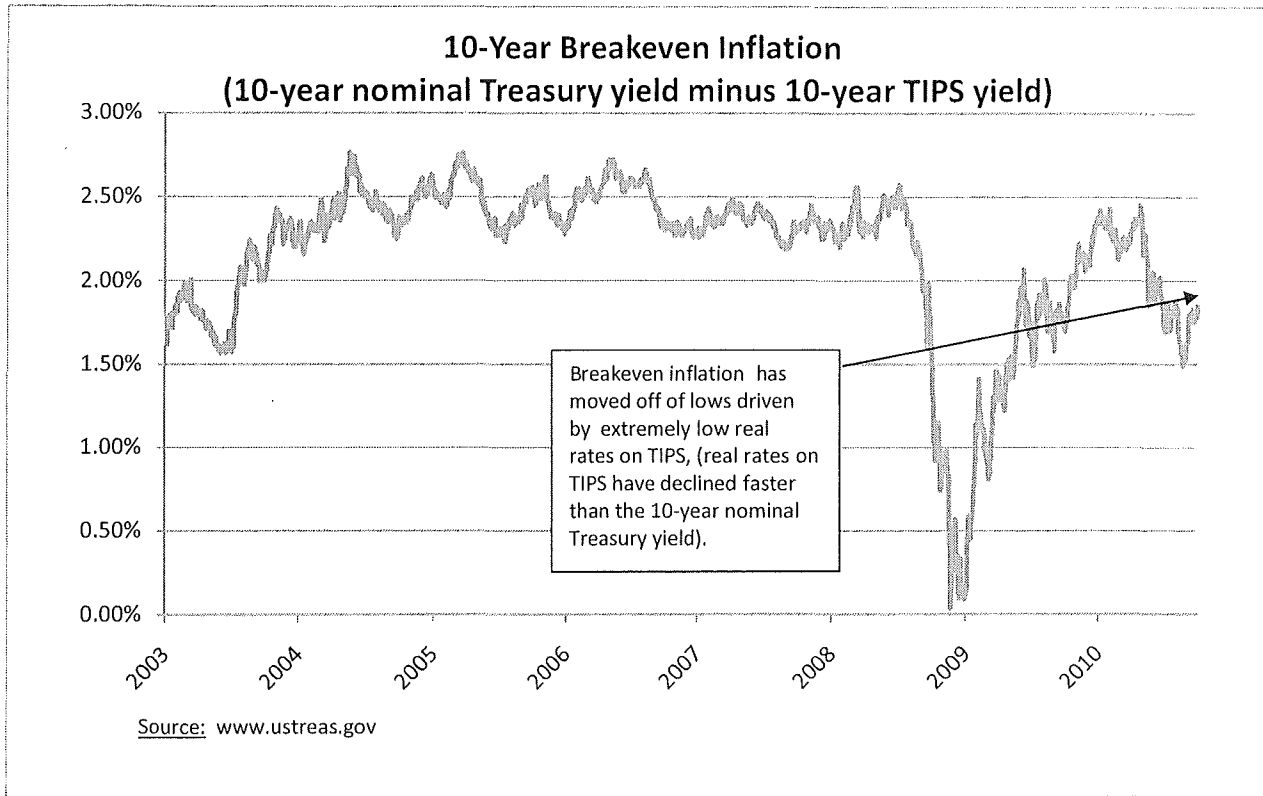
**Other Market Metrics**



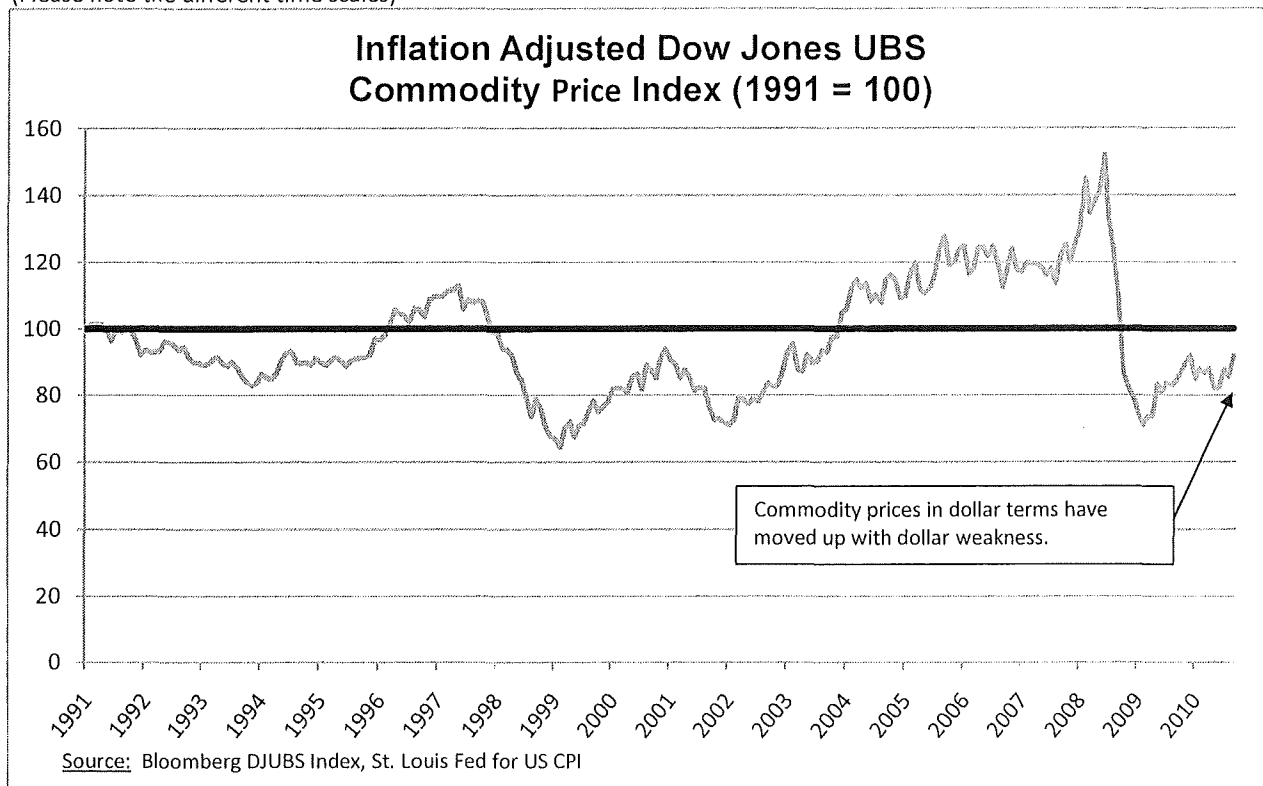
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### Measures of Inflation Expectations

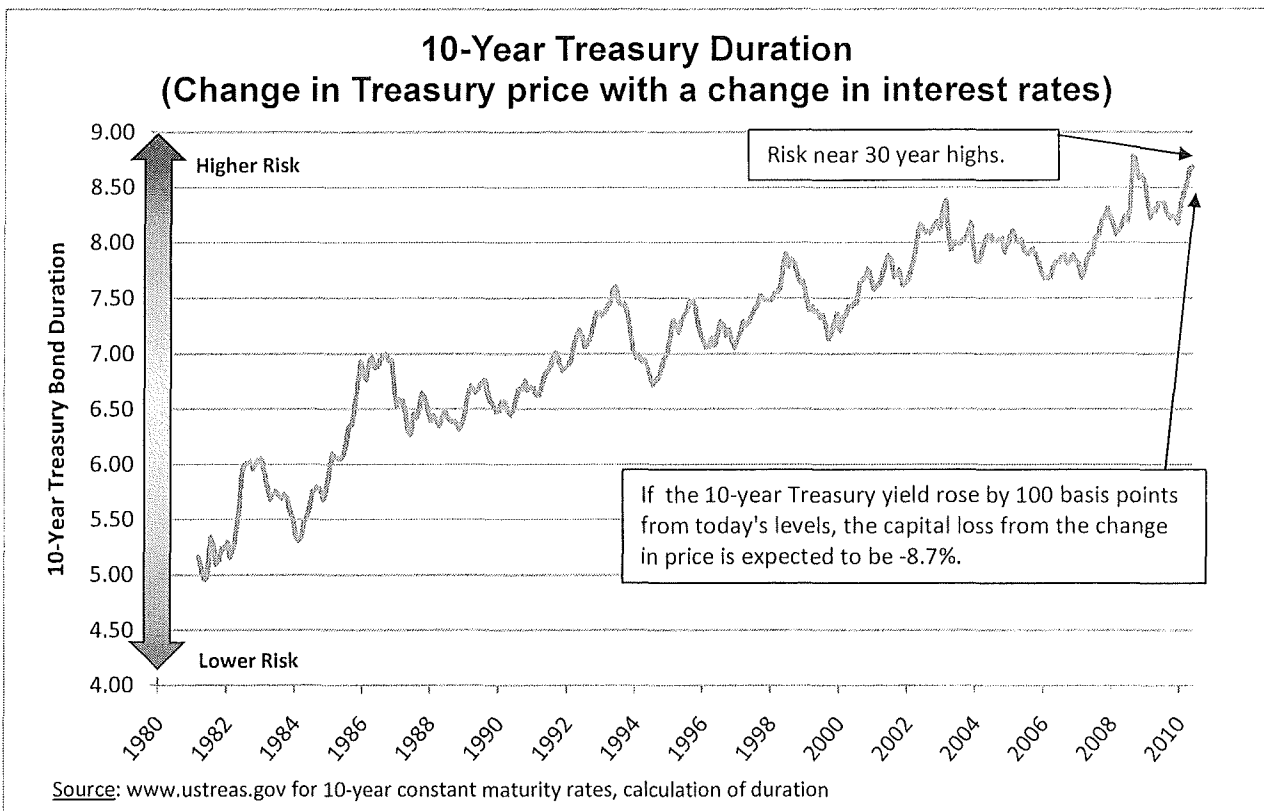
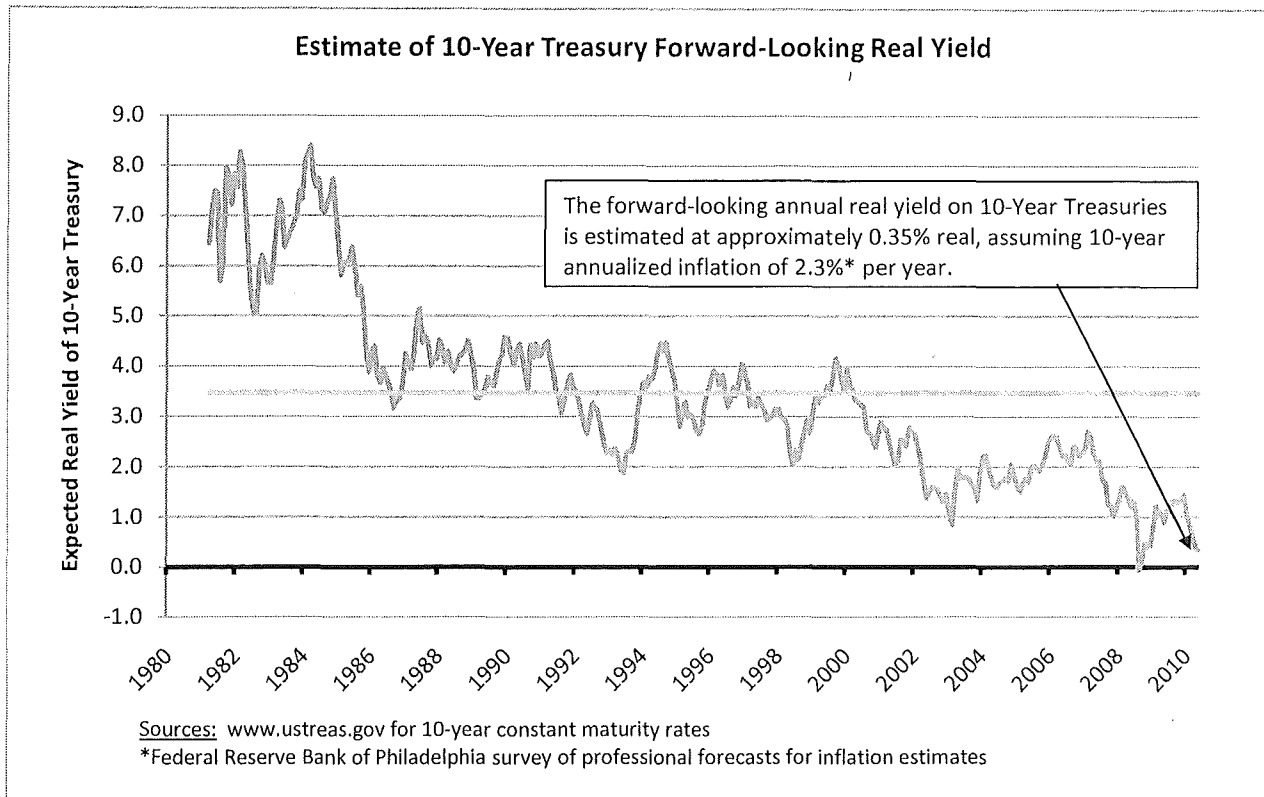


(Please note the different time scales)





**Measures of U.S. Treasury Interest Rate Risk**



## Metric description, rationale for selection and calculation methodology

### US Equity Markets:

Metric:  $P/E \text{ ratio} = \text{Price} / \text{"Normalized" earnings for the S\&P 500 Index}$

To represent the price of US equity markets, we have chosen the S&P 500 index. This index has the longest published history of price, is well known, and also has reliable, long-term, published quarterly earnings. The price= $P$  of the P/E ratio is the current price of the market index (the average daily price of the most recent full month for the S&P 500 index). Equity markets are very volatile. Prices fluctuate significantly during normal times and extremely during periods of market stress or euphoria. Therefore, developing a measure of earnings power ( $E$ ) which is stable is vitally important, if the measure is to provide insight. While equity prices can and do double, or get cut in half, real earnings power does not change nearly as much. Therefore, we have selected a well known measure of real, stable earnings power developed by Yale Professor Robert Shiller known as the Shiller E-10. The calculation of E-10 is simply the average real annual earnings over the past 10 years. Over 10 years, the earnings shenanigans and boom and bust levels of earnings tend to even out (and often times get restated). Therefore, this earnings statistic gives a reasonably stable, slow-to-change estimate of average real earnings power for the index. Professor Shiller's data and calculation of the E-10 are available on his website at <http://www.econ.yale.edu/~shiller/data.htm>. We have used his data as the base for our calculations. Details of the theoretical justification behind the measure can be found in his book *Irrational Exuberance* [Princeton University Press 2000, Broadway Books 2001, 2nd ed., 2005].

### Developed Equity Markets Excluding the US:

Metric:  $P/E \text{ ratio} = \text{Price} / \text{"Normalized" earnings for the MSCI EAFE Index}$

To represent the price of non-US developed equity markets, we have chosen the MSCI EAFE index. This index has the longest published history of price for non-US developed equities. The price= $P$  of the P/E ratio is the current price of the market index (the average daily price of the most recent full month for the MSCI EAFE index). The price level of this index is available starting in December 1969. Again, for the reasons described above, we elected to use the Shiller E-10 as our measure of earnings ( $E$ ). Since 12/1972, a monthly price earnings ratio is available from MSCI. Using this quoted ratio, we have backed out the implied trailing-twelve month earnings of the EAFE index for each month from 12/1972 to the present. These annualized earnings are then inflation adjusted using CPI-U to represent real earnings in US dollar terms for each time period. The Shiller E-10 for the EAFE index (10 year average real earnings) is calculated in the same manner as detailed above.

However, we do not believe that the pricing and earnings history of the EAFE markets are long enough to be a reliable representation of pricing history for developed market equities outside of the US. Therefore, in constructing the Long-Term Average Historical P/E for developed ex-US equities for comparison purposes, we have elected to use the US equity market as a developed market proxy, from 1881 to 1982. This lowers the Long-Term Average Historical P/E considerably. We believe this methodology provides a more realistic historical comparison for a market with a relatively short history.

## Metric description, rationale for selection and calculation methodology

### **Emerging Market Equity Markets:**

Metric: Ratio of Emerging Market P/E Ratio to Developed Market P/E Ratio

To represent the Emerging Markets P/E Ratio, we have chosen the MSCI Emerging Market Free Index, which has P/E data back to January 1995 on Bloomberg. To represent the Developed Markets PE Ratio, we have chosen the MSCI World Index, which also has data back to January 1995 on Bloomberg. Although there are issues with published, single time period P/E ratios, in which the denominator effect can cause large movements, we feel that the information contained in such movements will alert investors to market activity that they will want to interpret.

### **US Private Equity Markets:**

Metrics: S&P LCD Average EBITDA Multiples Paid in LBOs and US Quarterly Deal Volume

The Average Purchase Price to EBITDA multiples paid in LBOs is published quarterly by S&P in their LCD study. This is the total price paid (both equity and debt) over the trailing-twelve month EBITDA (earnings before interest, taxes, depreciation and amortization) as calculated by S&P LCD. This is the relevant, high-level pricing metric that private equity managers use in assessing deals. Data is published monthly.

US quarterly deal volume for private equity is the total deal volume in \$ billions (both equity and debt) reported in the quarter by Thomson Reuters Buyouts. This metric gives a measure of the level of activity in the market. Data is published quarterly.

### **U.S Private Real Estate Markets:**

Metrics: US Cap rates and Transactions as a % of Market Value Trailing-Four Quarters

Real estate cap rates are a measure of the price paid in the market to acquire properties versus their annualized income generation before financing costs (NOI=net operating income). The date is published by NCREIF. We chose to use current value cap rate. These are capitalization rates from properties that were revalued during the quarter. While this data does rely on estimates of value and therefore tends to be lagging, (estimated prices are slower to rise and slow to fall than transaction prices), the data series goes back to 1979, providing a long data series for valuation comparison. Data is published quarterly.

Transactions as a % of Market Value Trailing-Four Quarters is a measure of property turnover activity in the NCREIF Universe. This metric is a measure of activity in the market. Data is published quarterly.

### **Credit Markets US Fixed Income:**

Metric: Spreads

The absolute level of spreads over treasuries and spread trends (widening / narrowing) are good indicators of credit risk in the fixed income markets. Spreads incorporate estimates of future default, but can also be driven by technical dislocations in the fixed income markets. Abnormally narrow spreads (relative to historical levels) indicate higher levels of valuation risk, wide spreads indicate lower levels of valuation risk and / or elevated default fears. Investment grade bond spreads are represented by the Barclays Capital US Corporate Investment Grade Index Intermediate Component. The high yield corporate bond spreads are represented by the Barclays Capital US Corporate High Yield Index.

## Metric description, rationale for selection and calculation methodology

### **Measure of Equity Market Fear / Uncertainty**

Metric: VIX – Measure of implied option volatility for U.S. equity markets

The VIX is a key measure of near-term volatility conveyed by implied volatility of S&P 500 index option prices. VIX increases with uncertainty and fear. Stocks and the VIX are negatively correlated. Volatility tends to spike when equity markets fall.

### **Measure of Monetary Policy**

Metric: Yield Curve Slope

We calculate the yield curve slope as the 10 year treasury yield minus the 1 year treasury yield. When the yield curve slope is zero or negative, this is a signal to pay attention. A negative yield curve slope signals lower rates in the future, caused by a contraction in economic activity. Recessions are typically preceded by an inverted (negatively sloped) yield curve. A very steep yield curve (2 or greater) indicates a large difference between shorter-term interest rates (the 1 year rate) and longer-term rates (the 10 year rate). This can signal expansion in economic activity in the future, or merely higher future interest rates.

### **Measures of US Inflation Expectations**

Metrics: Breakeven Inflation and Inflation Adjusted Commodity Prices

Inflation is a very important indicator impacting all assets and financial instruments. Breakeven inflation is calculated as the 10 year nominal treasury yield minus the 10 year real yield on US TIPS (treasury inflation protected securities). Abnormally low long-term inflation expectations are indicative of deflationary fears. A rapid rise in breakeven inflation indicates an acceleration in inflationary expectations as market participants sell nominal treasuries and buy TIPS. If breakeven inflation continues to rise quarter over quarter, this is a signal of inflationary worries rising, which may cause Fed action and / or dollar decline.

Commodity price movement (above the rate of inflation) is an indication of anticipated inflation caused by real global economic activity putting pressure on resource prices. We calculate this metric by adjusted in the Dow Jones UBS Commodity Index (formerly Dow Jones AIG Commodity Index) by US CPI-U. While rising commodity prices will not necessarily translate to higher US inflation, higher US inflation will likely show up in higher commodity prices, particularly if world economic activity is robust.

These two measures of anticipated inflation can, and often are, conflicting.

### **Measures of US Treasury Bond Interest Rate Risk**

Metrics: 10-Year Treasury Forward-Looking Real Yield and 10-Year Treasury Duration

The expected annualized real yield of the 10 year U.S. Treasury Bond is a measure of valuation risk for U.S. Treasuries. A low real yield means investors will accept a low rate of expected return for the certainty of receiving their nominal cash flows. PCA estimates the expected annualized real yield by subtracting an estimate of expected 10 year inflation (produced by the Survey of Professional Forecasters as collected by the Federal Reserve Bank of Philadelphia), from the 10 year Treasury constant maturity interest rate.

Duration for the 10-Year Treasury Bond is calculated based on the current yield and a price of 100. This is a measure of expected percentage movements in the price of the bond based on small movements in percentage yield. We make no attempt to account for convexity.

## Metric description, rationale for selection and calculation methodology

### Definition of "extreme" metric readings

A metric reading is defined as "extreme" if the metric reading is in the top or bottom decile of its historical readings. These "extreme" reading should cause the reader to pay attention. These metrics have reverted toward their mean values in the past.