Office of the Treasurer of The Regents

University of California

UCRP and GEP
Quarterly Investment Risk Report

Quarter ending September 2010

Committee on Investments/
Investment Advisory Group

November 2, 2010

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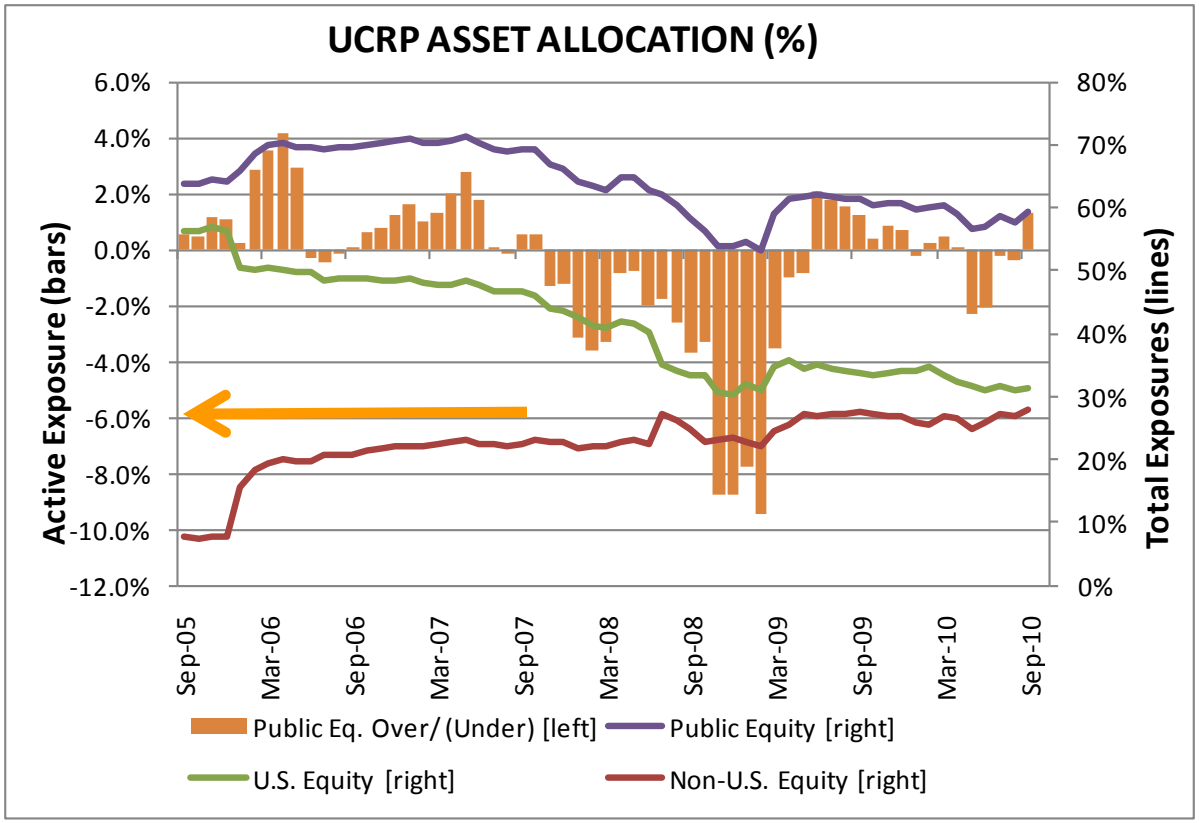
Risk Metrics for UCRP

Asset Allocation

- Total Risk is largely related to the allocation between equity and bonds
- The portfolio ended Q3 2010 slightly overweight public market equities



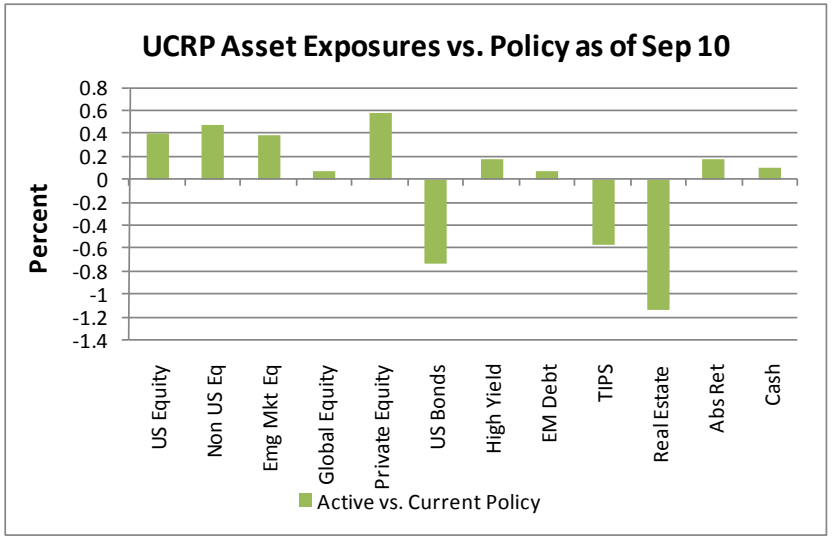
Asset Allocation and Risk

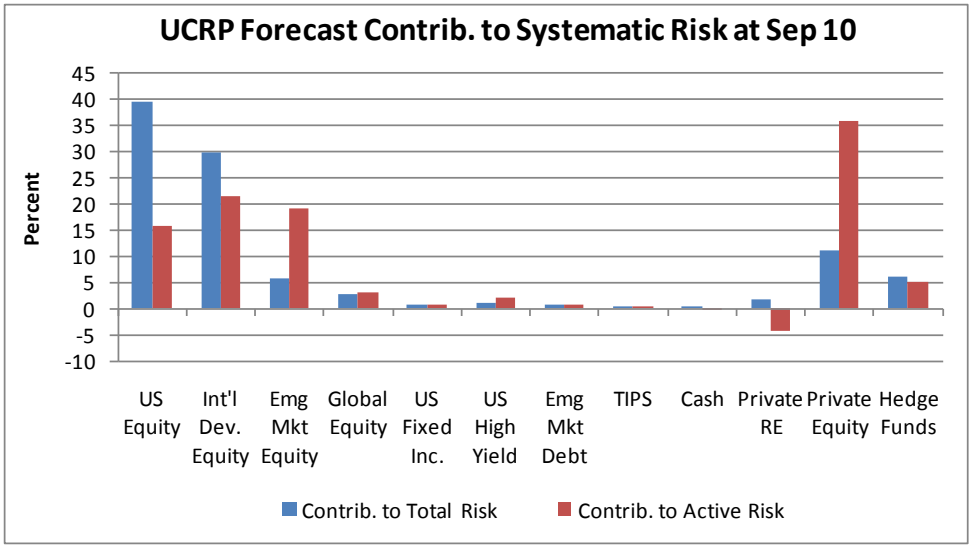
Note: Exposures and Risk charts below are shown using April 1, 2010 target asset weights. Systematic risk is estimated using long term forecasts [from Mercer Investment Consulting, March 2010], **not** recent realized volatility.

(Lower Left) Asset weights are measured relative to **Current** Policy. The fund has an overweight in all equity classes and underweight in Core Bonds, TIPS, and Real Estate.

(Lower Right)

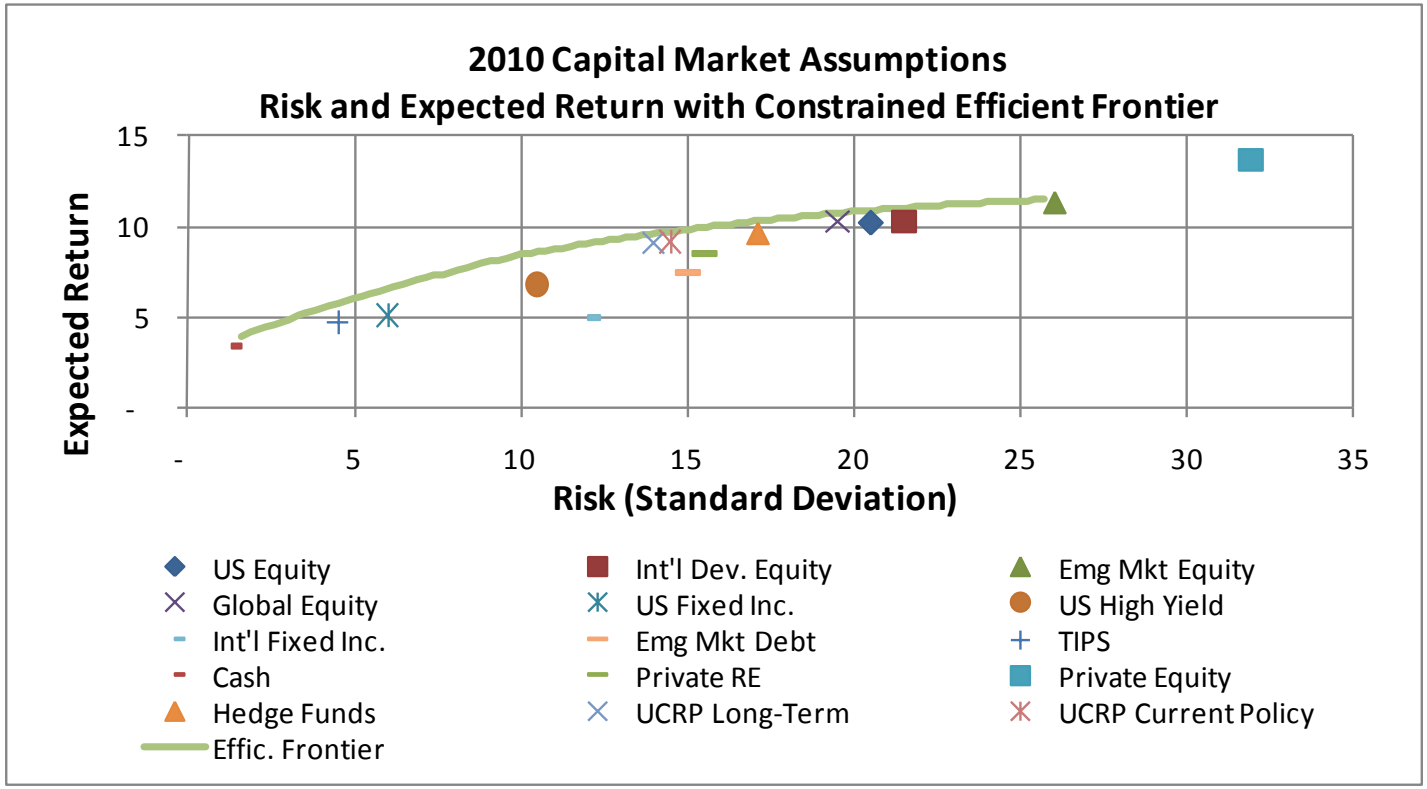
- The fund's forecast total systematic risk (blue bars) is 14.8% annualized standard deviation. It is heavily weighted to US and Non-US developed equity (69% of total).
- Forecast active systematic risk is up slightly at 40 bp. The public and private equity overweights accounted for almost100% of this amount (red bars).





Expected Risk and Return

Forecast risk and return (using Mercer's April 2010 capital markets assumptions) lies near the constrained efficient frontier; long-term forecast return of 8.1%* is close to the actuarially required return of 7.5%.

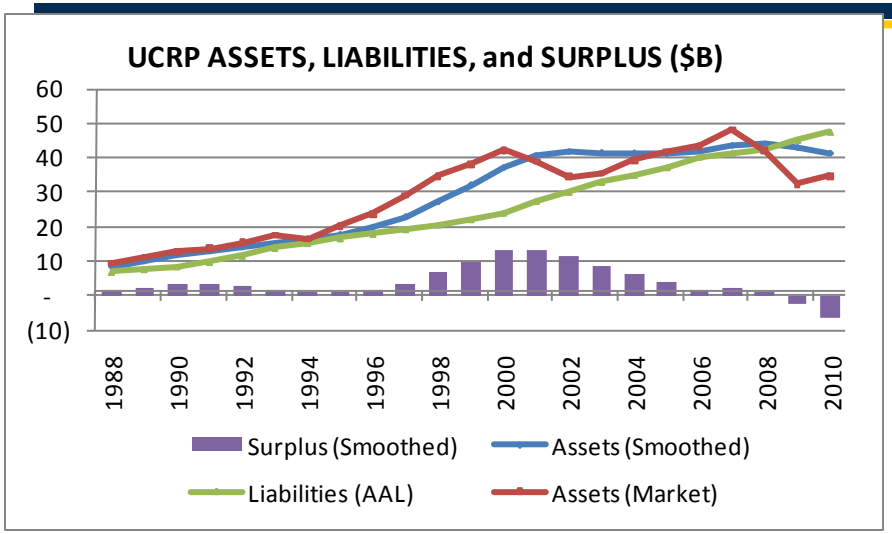


*Asset Class returns and efficient frontiers are shown in the chart as arithmetic (i.e., average) expected returns.

The projected compound annual return over multi-year horizon is 8.1% for the **Current Policy** weights.

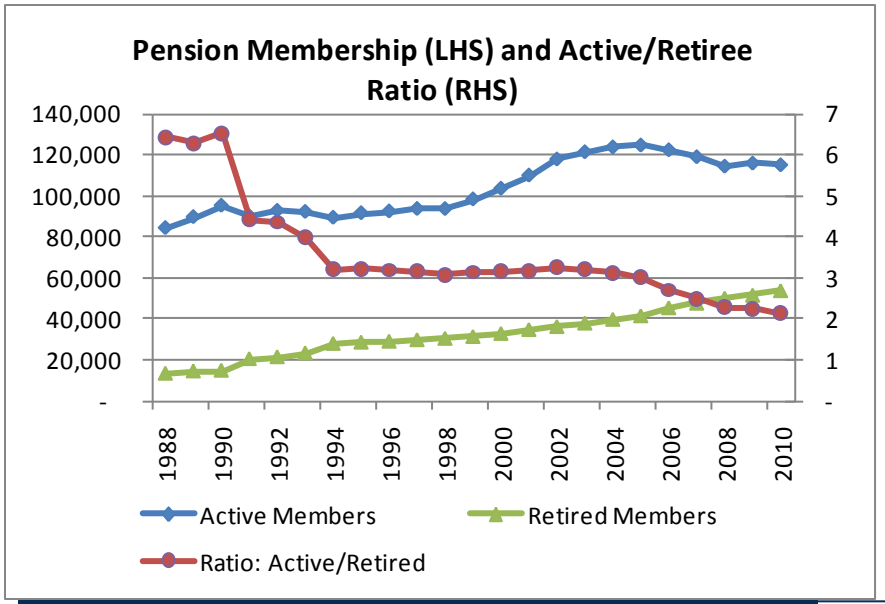
Forecast volatility is 14.5%.

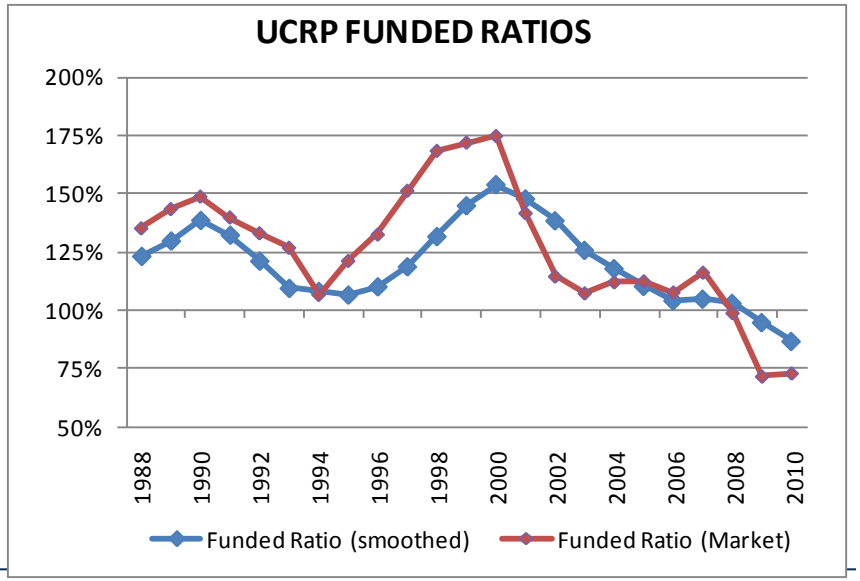
Historical Funded Status



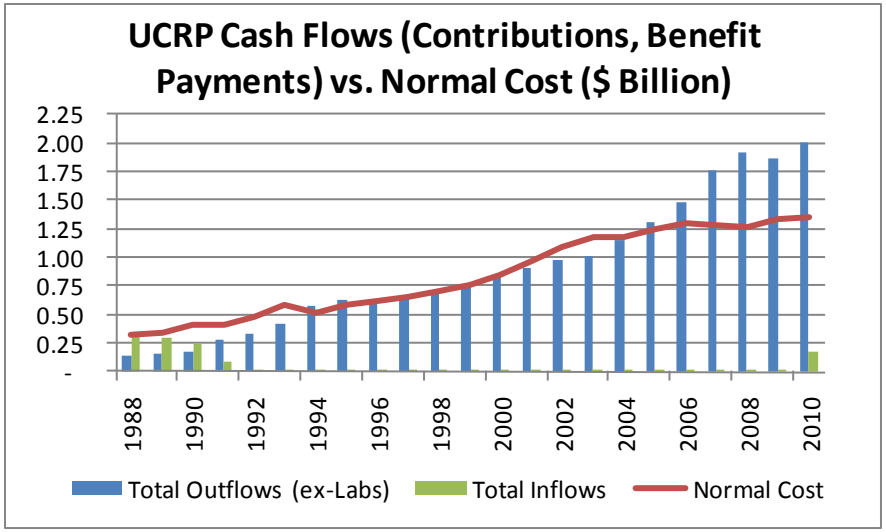
The Pension Fund's liabilities have been growing steadily (**upper left**) with University employment, while the assets have grown (and fallen) with the equity markets. The ratio of actives to retirees has recently fallen from 3x to 2x (**lower left**).

The Funded Ratio (= the ratio of assets to liabilities), is an overall metric of the financial health of a pension plan. This ratio has fluctuated considerably over the past (**lower right**), and has recently fallen below 100% with the bear market of 2007-09

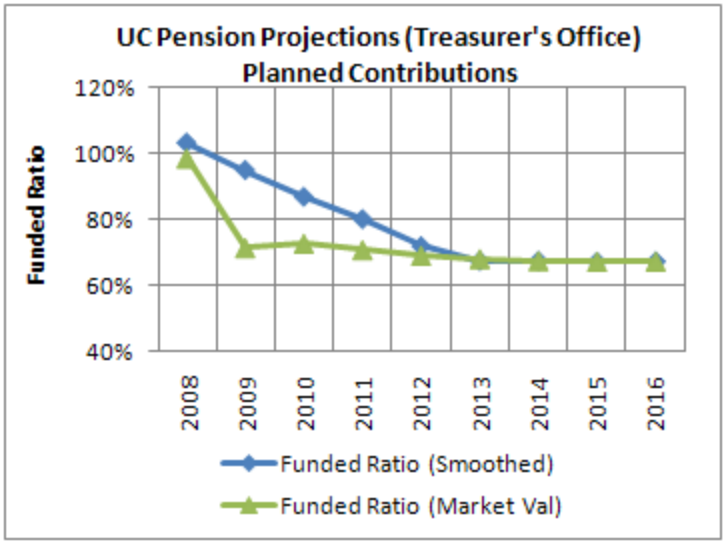


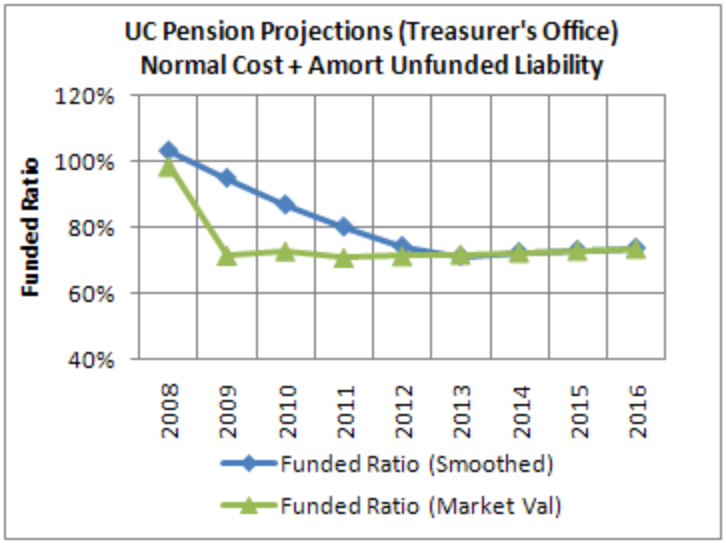


Forecast Funded Status



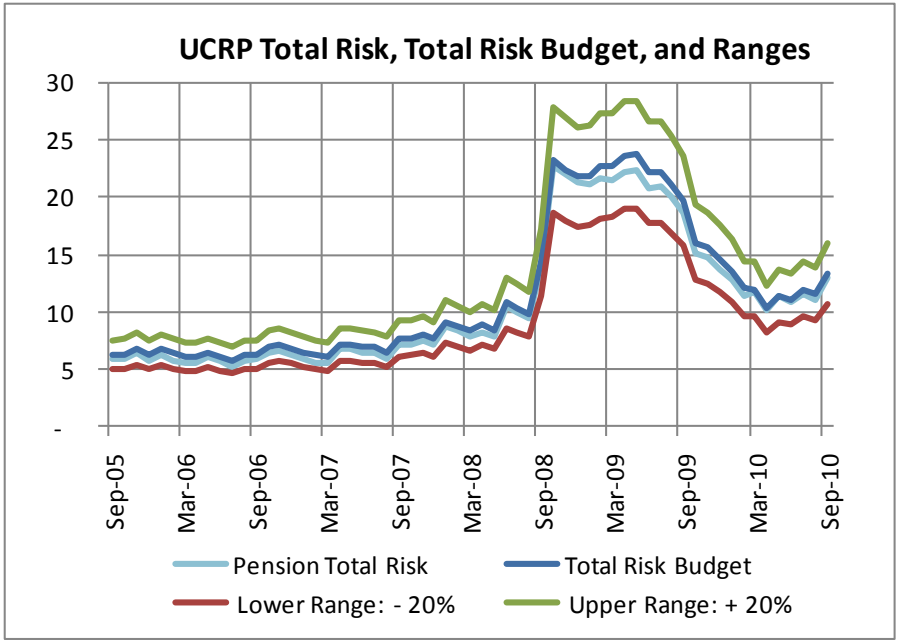
- Contributions were suspended in 1990, but annual benefit payments have grown in line with and recently exceeded, Normal Cost over the last decade (**upper left**).
- The **bottom** two charts show projected funded ratio with planned contributions (left) and with contributions equal to Normal Cost + amortization of unfunded liability (right), assuming a **constant 7.5% investment return beginning FY 2011**.





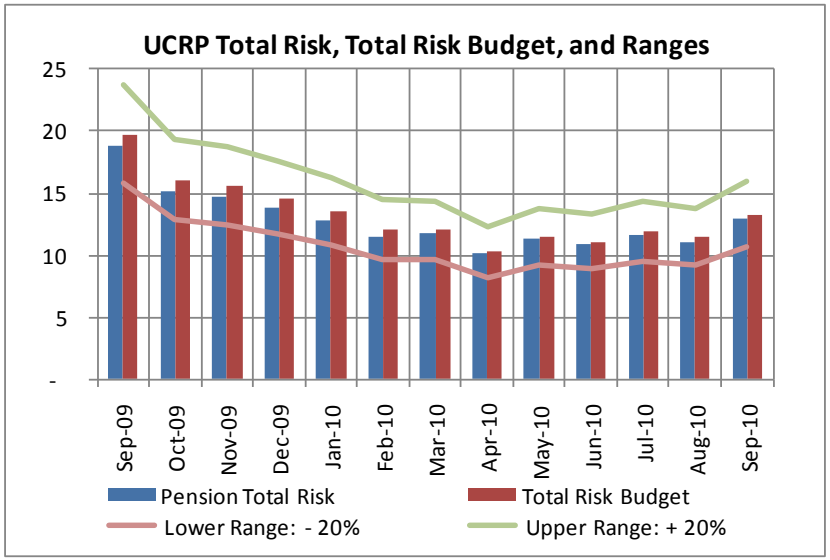
- Note that even a maximum level of contributions barely increase the funded ratio over this forecast period
- These projections are approximations only, developed by Treasurer's Office, not Segal Co.

Risk Measures: Total



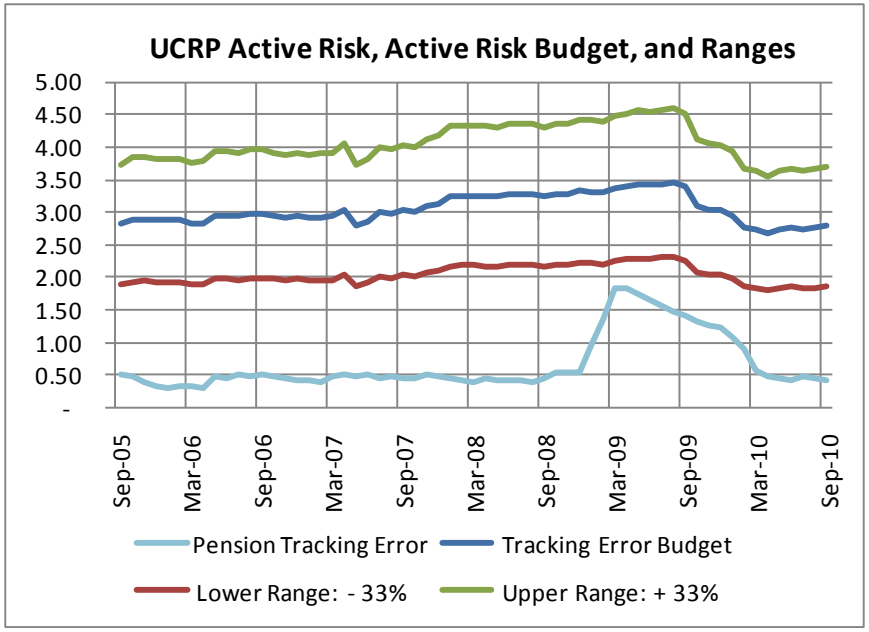
Total risk trend quite similar to benchmark; recently Plan volatility has been slightly less than the Budget, but well within ranges. Total volatility has resumed a historically normal range, higher than the mid 2000's but lower than the 2008-09 crash.

Total Risk budget equals Benchmark risk plus the Active risk budget. The ranges are +/- 20% around the budget.



Risk is measured by standard deviation of monthly **total** returns; each point or bar shows a 12 month measurement period. All risk calculations done using exponentially declining weights. (This and following charts show risk budgets as if they had been in place during entire historical period.)

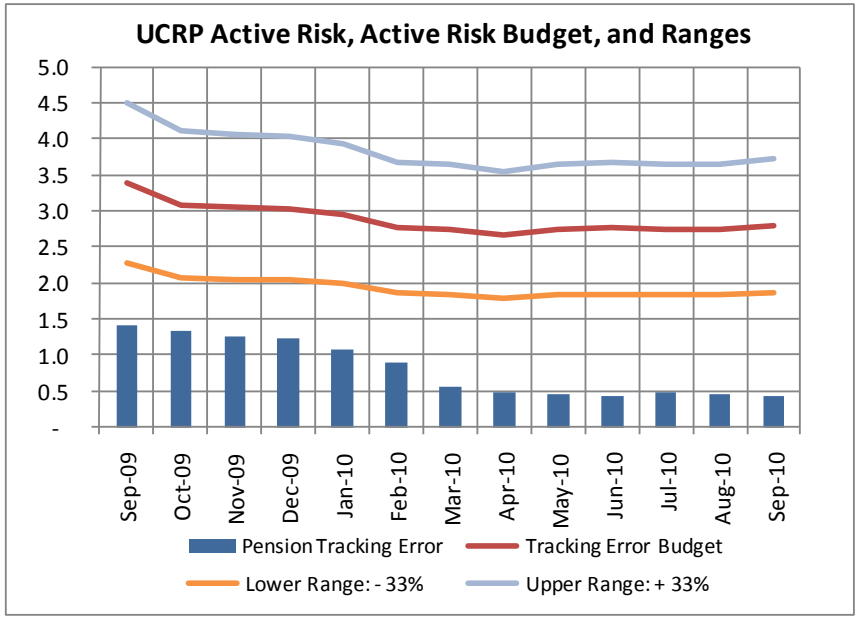
Risk Measures: Active



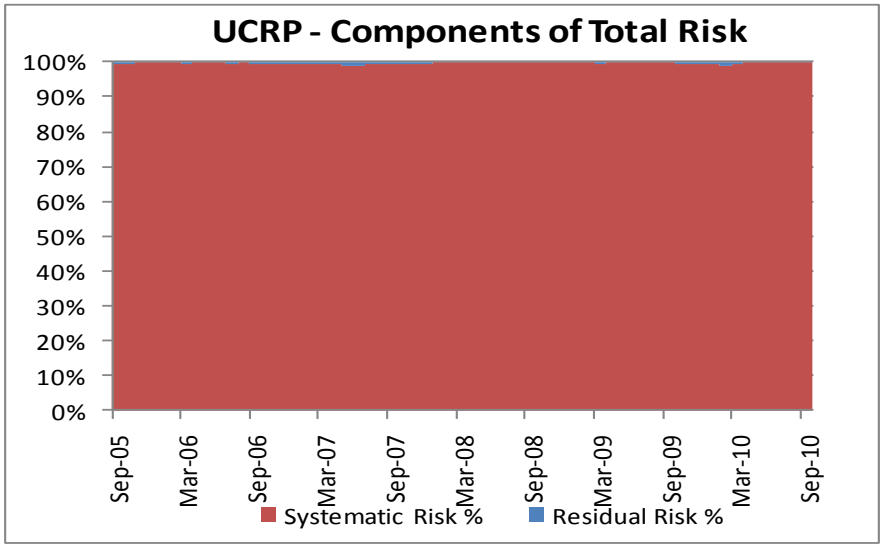
The spike in Active Risk in Q1 09 resulted from the underweight in equity as the market fell and then rallied. Active risk has currently resumed its low level of the mid 2000's (about 0.50% annualized standard deviation). It is still well below long term expectations for active return, but is well diversified.

The Active risk budget is 3% annualized Tracking Error (adjusted for market volatility), with ranges of +/- 1 pct. point around Budget

Risk is measured by standard deviation of monthly **active** returns; each point or bar shows a 12 month measurement period. All risk calculations done using exponentially declining weights.

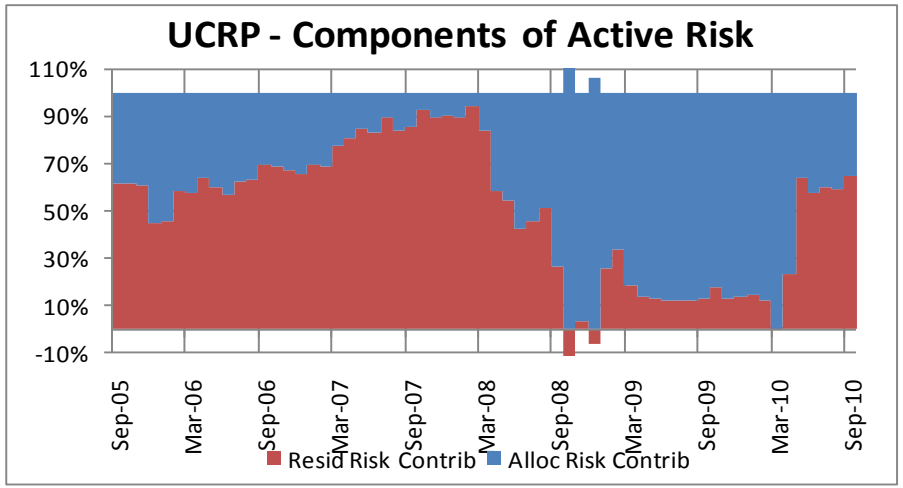


Risk Attribution



(Upper Left) Virtually all of **Total Risk** is attributed to systematic (market) factors (red bars).

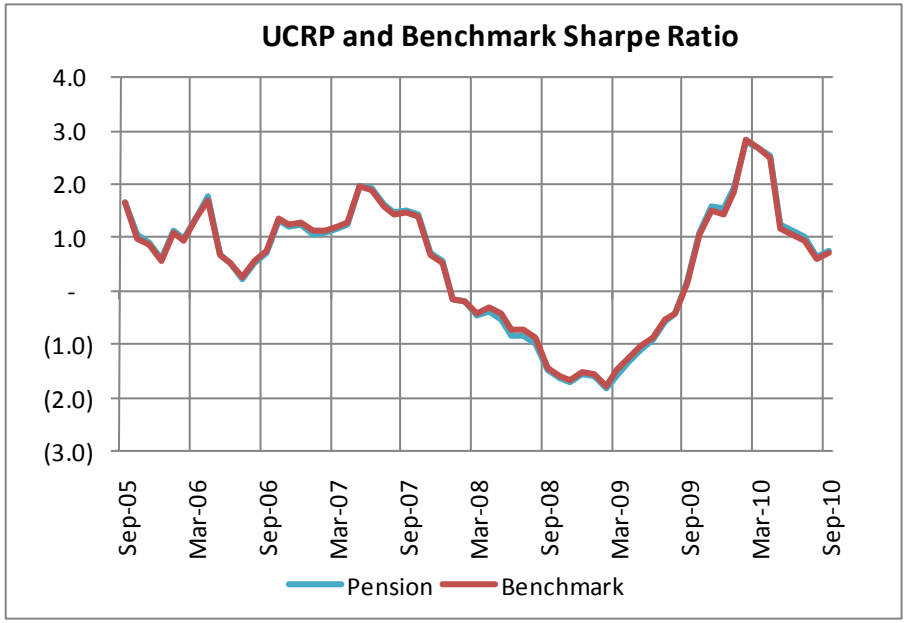
(Lower Right) Normally, the majority of **Active Risk** is attributed to security selection. When active management is reduced, or when asset allocation transitions are implemented, allocation risk increases. In the last 6 months, the equity over / underweight dominated all other decisions, but now residual risk is resuming its normal contribution.



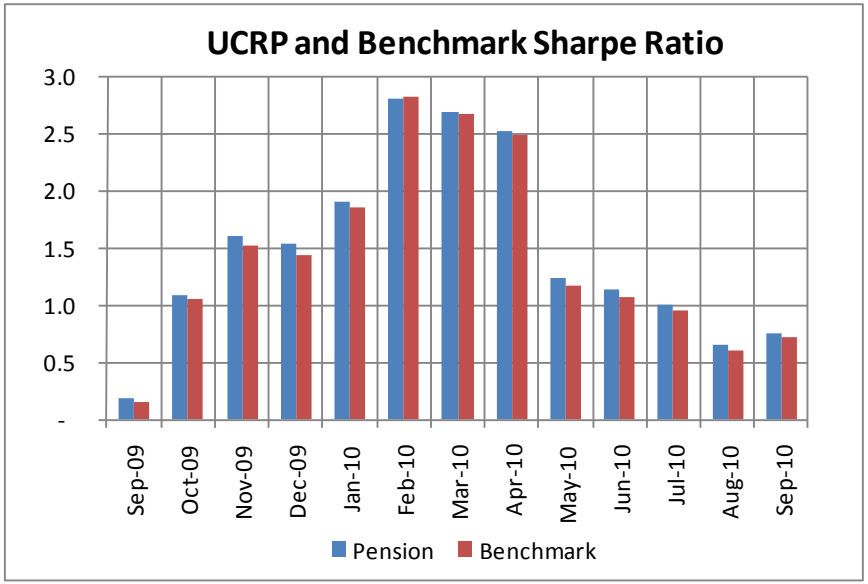
Risk is measured here by variance (standard deviation squared) of monthly returns; each bar shows a 12 month measurement period

Systematic Risk is associated with benchmark exposures; residual risk is associated with non benchmark decisions (security selection)

Risk Adjusted Return: Total

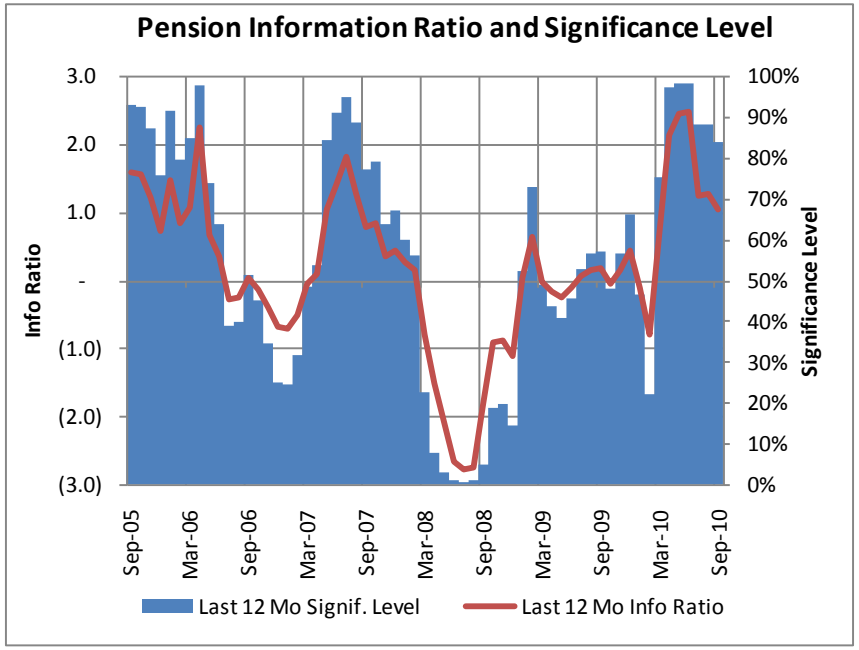


Sharpe Ratio (risk adjusted total return) trend has been quite similar to the benchmark for the past 5 years. The 12 month return on risky assets is positive but diminished after the May 2010 market decline.

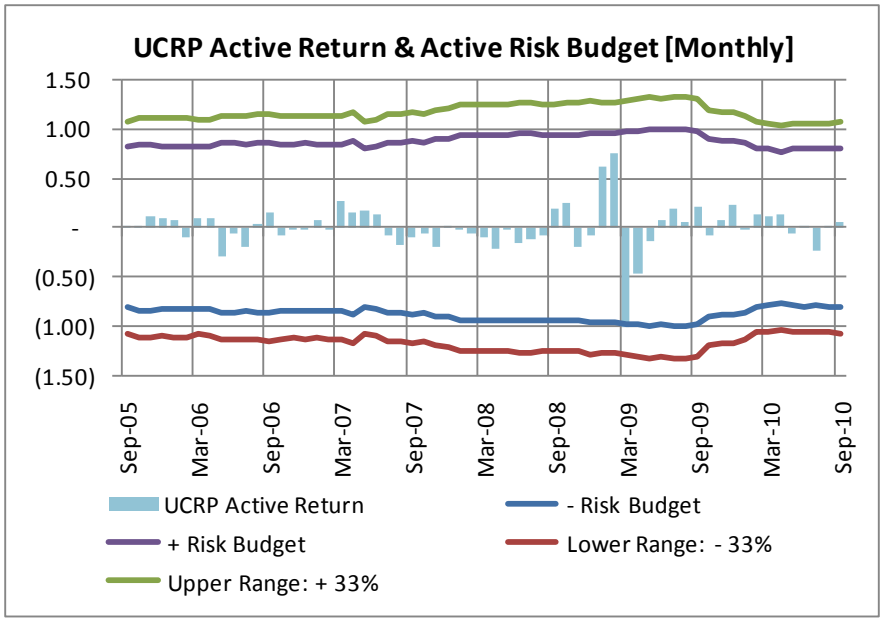


Sharpe ratio is "excess" return (total return less risk-free rate) divided by total risk; each point or bar shows a 12 month measurement period. All risk calculations done using exponentially declining weights.

Risk Adjusted Return: Active

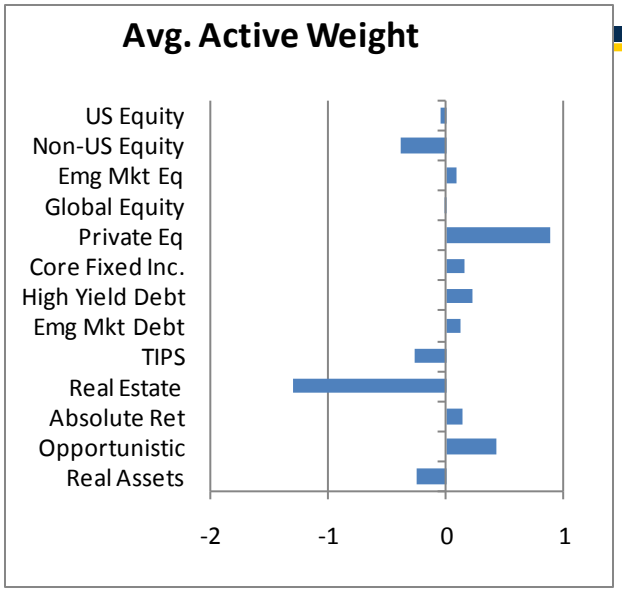


Information ratio (risk adjusted active return) is the result of both asset weighting decisions and active performance. It is higher when the returns are positive and more consistent (less volatile). The Info. ratio has been positive for the past 7 months; from the graph below, active returns for the past 12 months have been small but positive.

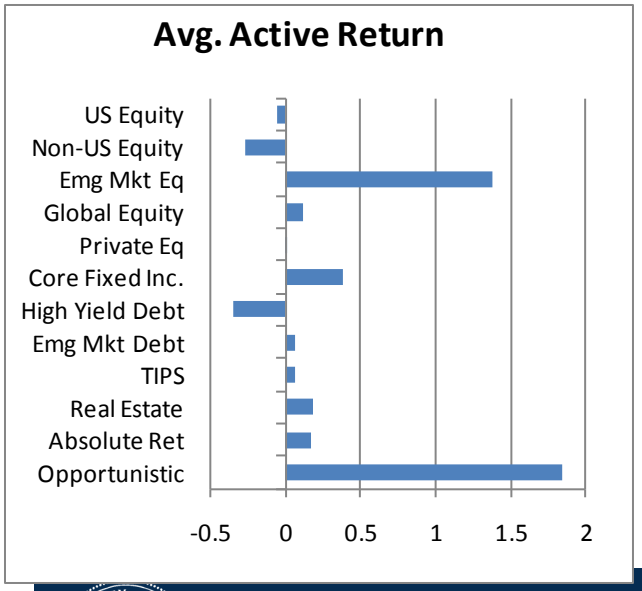


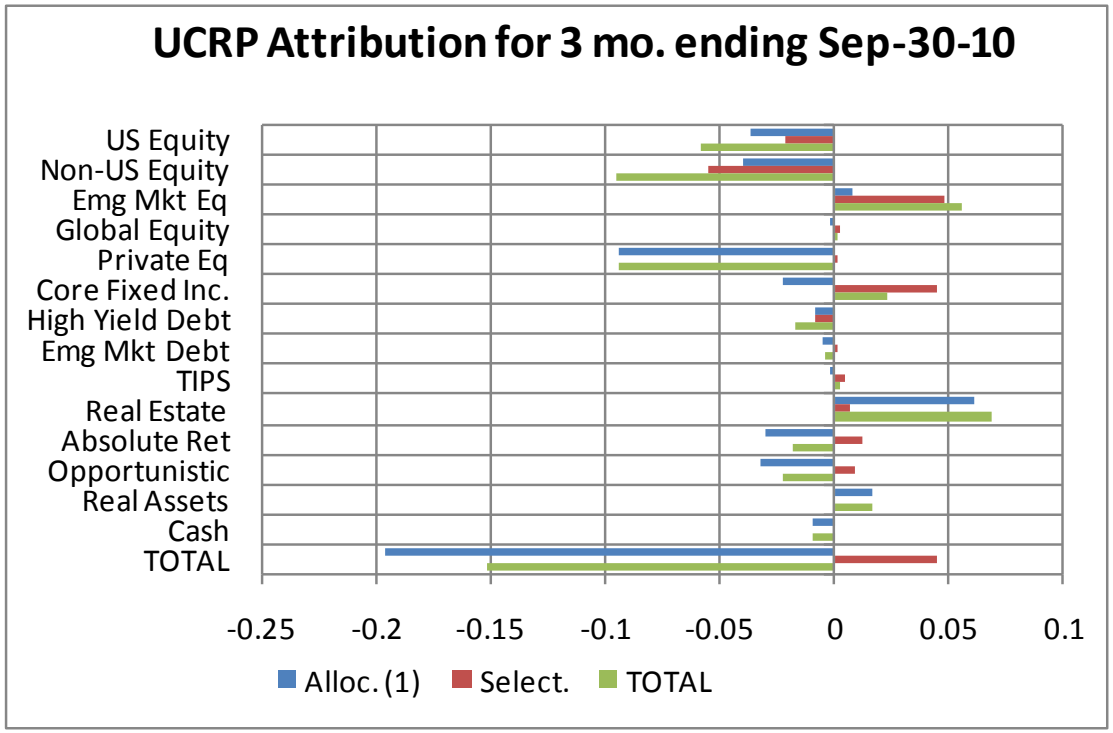
Information ratio is active return (total return less benchmark) divided by active risk; each point shows a 12 month measurement period. The Significance level is the probability that results are due to skill, with 50% being a neutral measure. All risk calculations done using exponentially declining weights.

Performance Attribution



Active Return for the Quarter was -0.15% (Fund return of 9.23% vs. policy benchmark of -9.39%).
[BELOW] Asset allocation decisions **(blue bars)** subtracted 0.20% (primarily the overweight in Priv. Eq. and underweight in Real Estate. Security selection decisions **(red bars)** added 0.04% (primarily Emg Mkt Equity and Core Bonds)

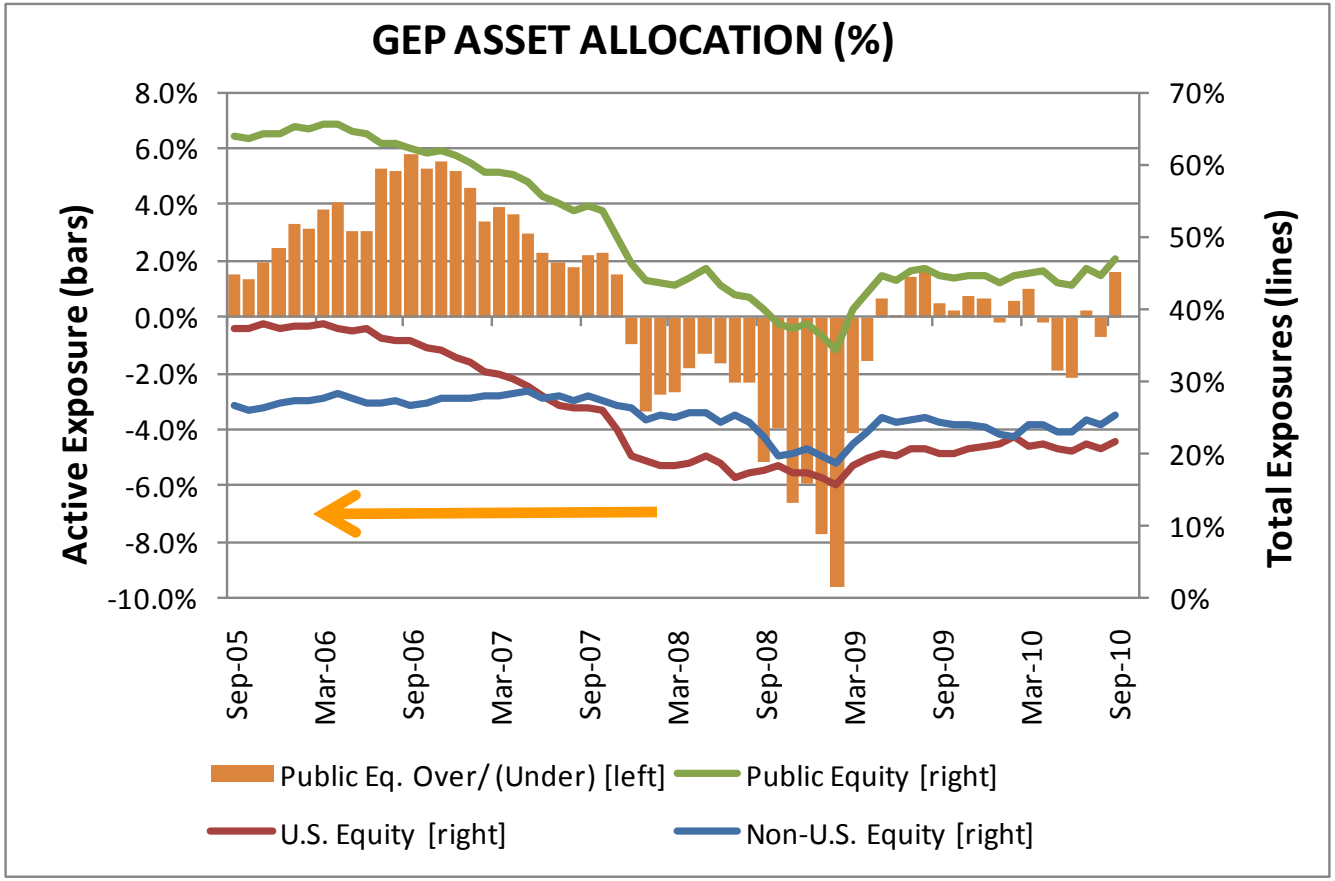




Risk Metrics for GEP

Asset Allocation

- Total Risk is largely related to the allocation between equity and bonds
- The portfolio ended Q3 2010 slightly overweight public market equities

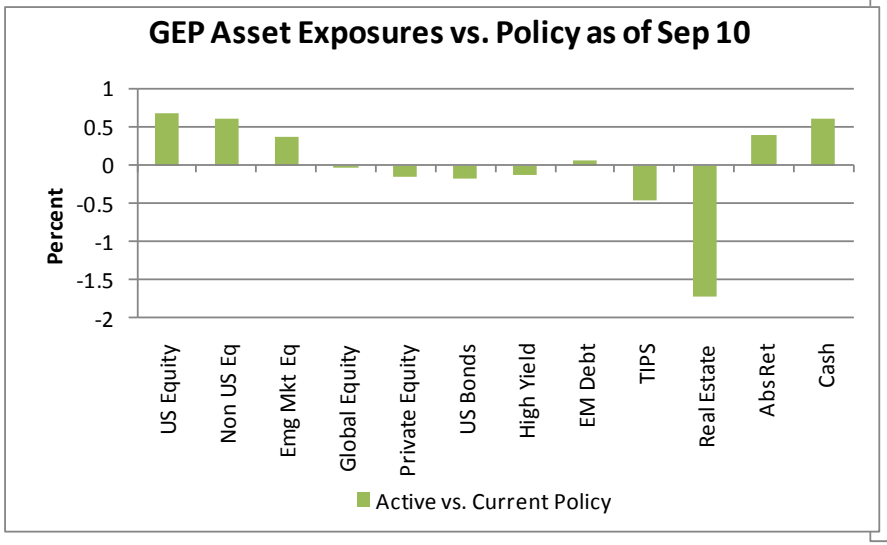


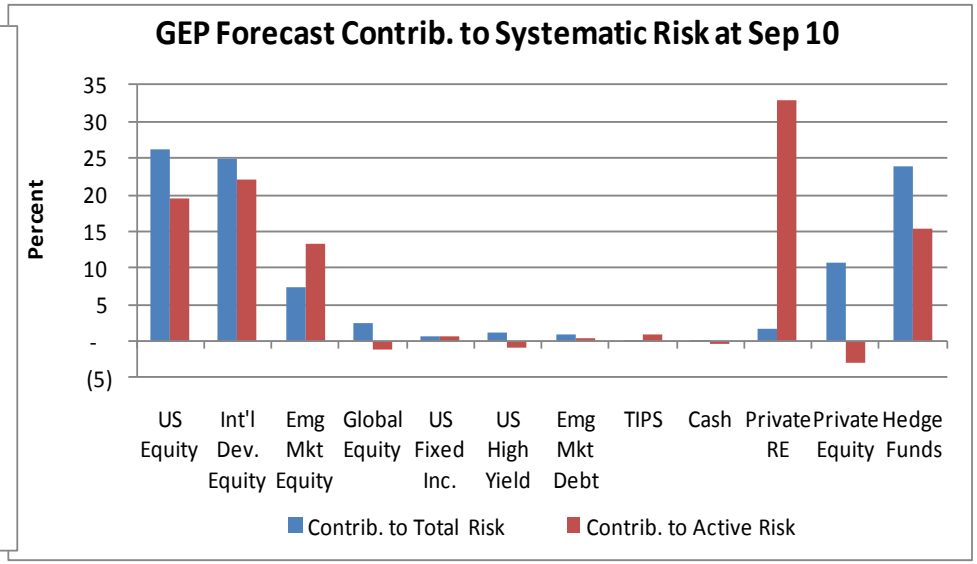
Asset Allocation and Risk

Note: Exposures and Risk charts below are shown using April 1, 2010 target asset weights. Systematic risk is estimated using long term forecasts [from Mercer Investment Consulting, March 2010], not recent realized volatility.

(Lower Left) Asset weights are measured relative to Current Policy. The fund is overweight in public equities, Absolute Return, and Cash, and underweight in TIPS and Real Estate.

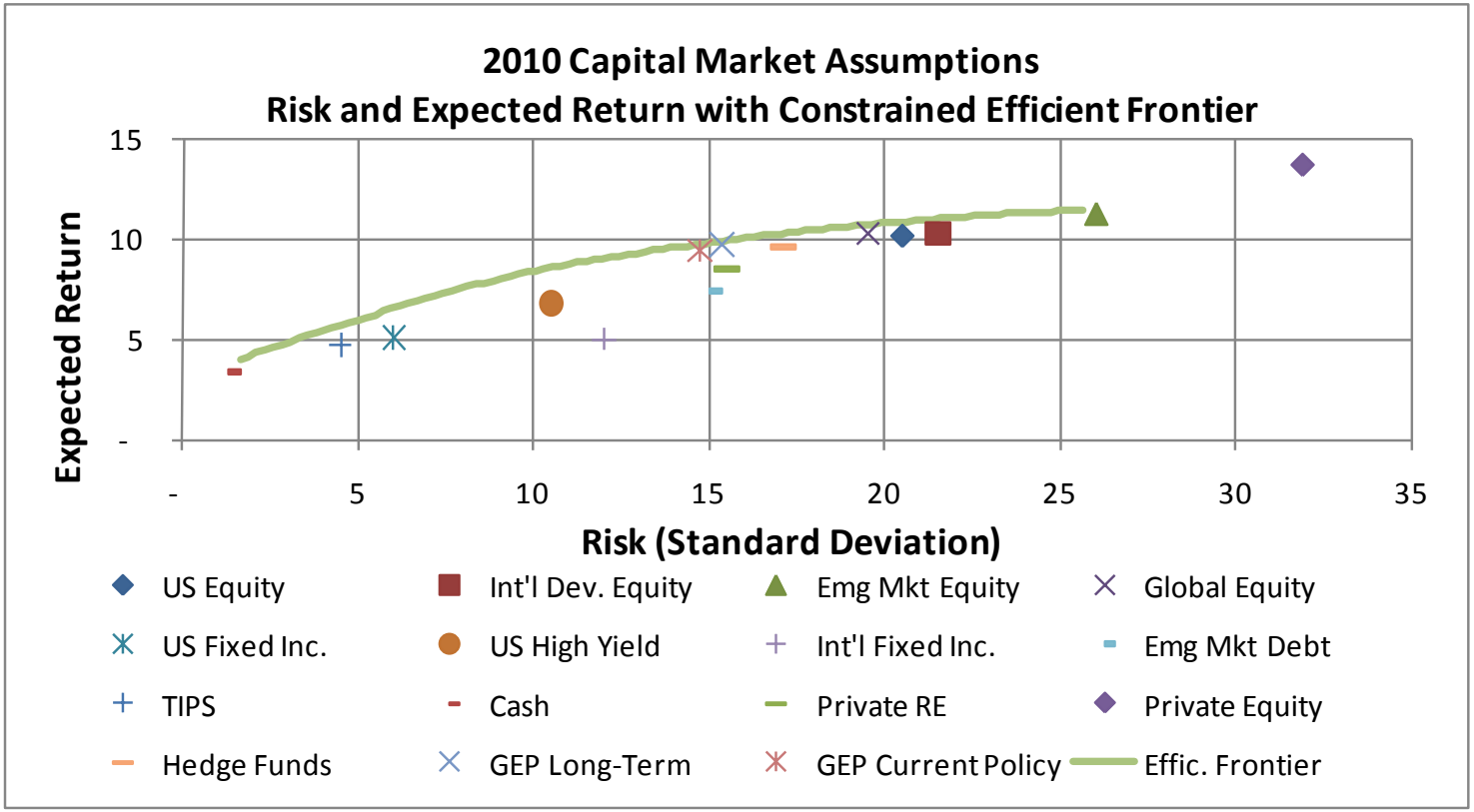
(Lower Right) The fund's forecast **total systematic risk** (blue bars) is 14.9% annualized standard deviation. It is evenly balanced among US equity, Non US developed equity, and Absolute Return (75% of total). Forecast **active systematic risk** is 33 bp. The Equity overweight accounted for more than 50% of this amount; the Real Estate underweight accounted for another 33% (red bars).





Expected Risk and Return

Forecast risk and return (using Mercer's April 2010 capital markets assumptions) lies near the constrained efficient frontier; forecast return of 8.4%* is close to the nominal return needed to maintain a constant real payout per student (estimated at 8.5%)

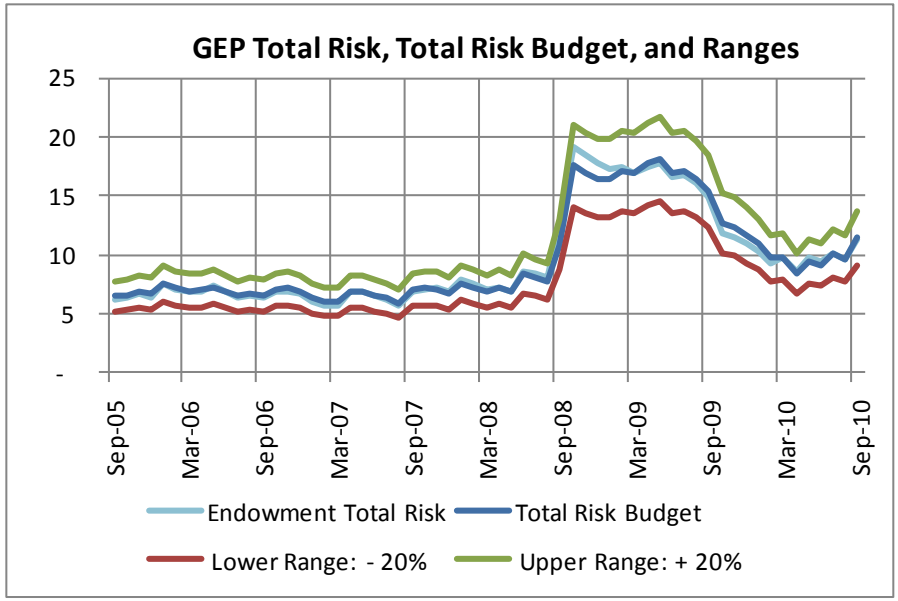


* Asset Class returns and Efficient frontiers are shown in the chart as arithmetic (average) expected returns.

The projected compound annual return over multi year horizon is 8.3% for the **Current Policy** weights.

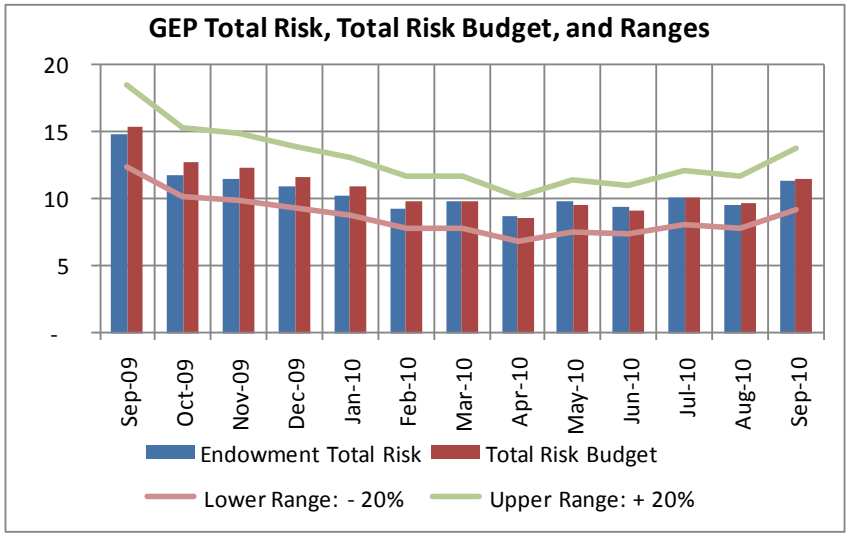
Forecast volatility is 14.7%.

Risk Measures: Total



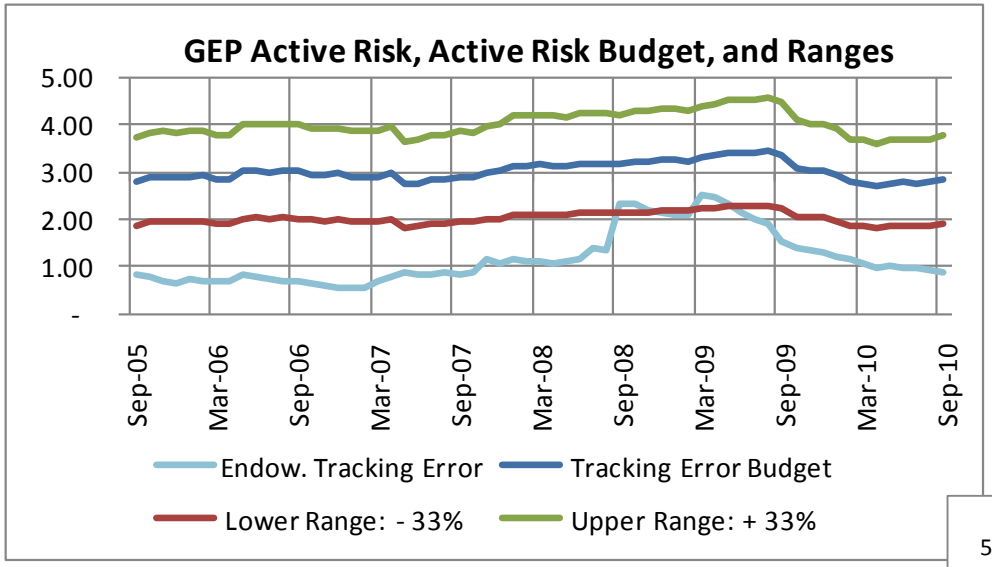
Total risk trend has been quite similar to benchmark; GEP volatility is quite close to its Budget.
Total volatility has resumed a historically normal range, higher than the mid 2000's but lower than the 2008-09 crash.

Total Risk budget equals Benchmark risk plus the Active risk budget. The ranges are +/- 20% around the budget.



Risk is measured by standard deviation of monthly **total** returns; each point or bar shows a 12 month measurement period.
All risk calculations done using exponentially declining weights. (Charts show risk budgets as if they had been in place during entire historical period.)

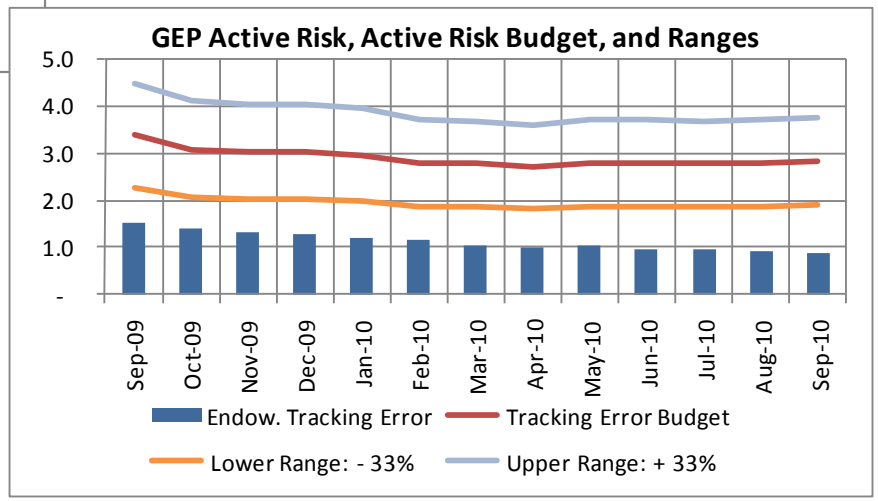
Risk Measures: Active



Active risk for the total fund has grown slowly over this period from 0.50% to 1.50% annualized standard deviation, up until the 2008 crash.

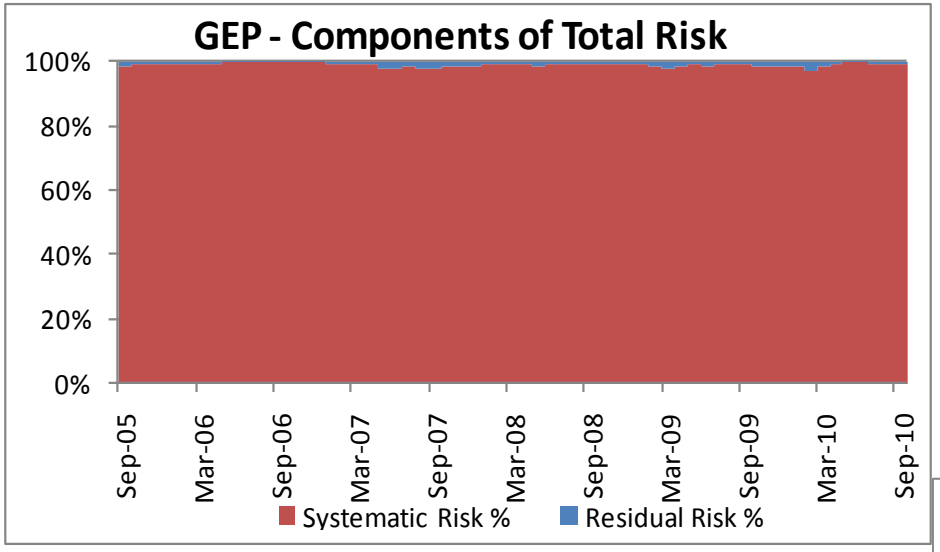
Active risk has resumed its low level of the mid 2000's (about 1.0%), but is still well below long-term expectations for active return, and is well diversified.

The Active risk budget is 3.0% annualized Tracking Error (adj. for market volatility), with ranges of +/- 1 pct. point around Budget



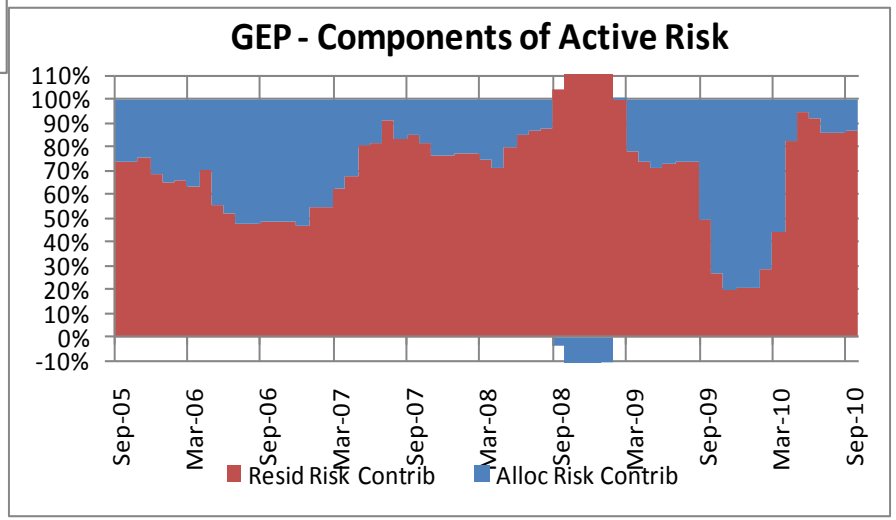
Risk is measured by standard deviation of monthly **active** returns; each point or bar shows a 12 month measurement period. All risk calculations done using exponentially declining weights.

Risk Attribution



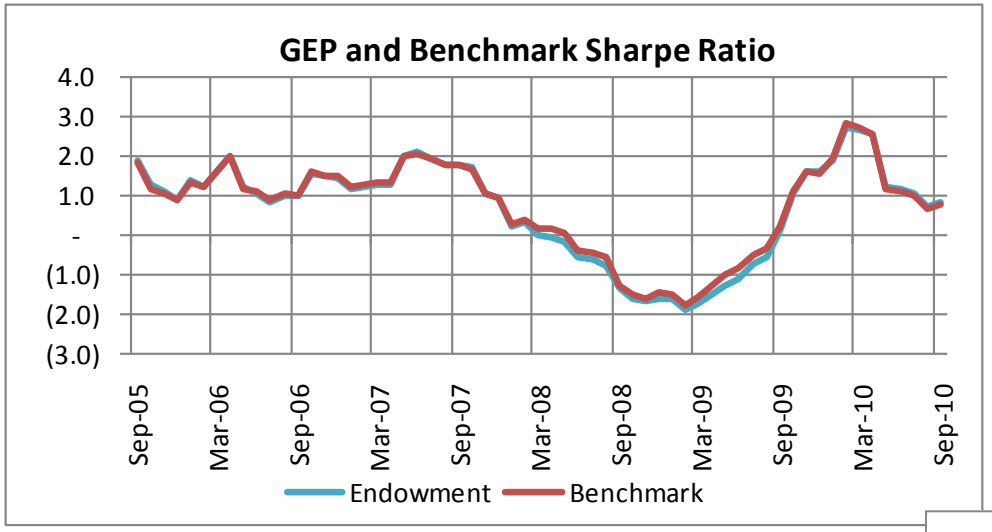
(Upper Left) Virtually all of **Total Risk** is attributed to systematic (market) factors (red bars).

(Lower Right) Normally, the majority of **Active Risk** is attributed to security selection. When asset allocation transitions are implemented, allocation risk tends to dominate. In late 2009, the equity overweight dominated all other active decisions. For the past 6 months, residual risk has resumed its normal contribution level.



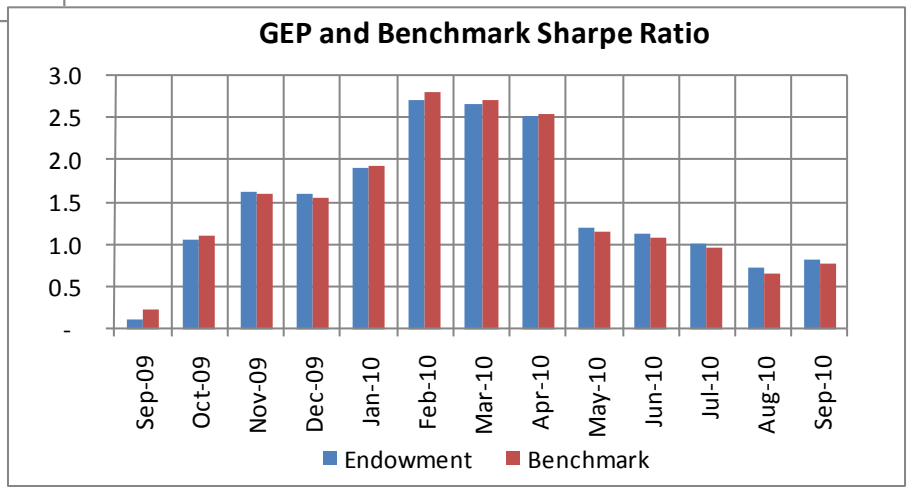
Risk is measured here by variance (standard deviation squared) of monthly returns; each bar shows a 12 month measurement period Systematic risk is associated with benchmark exposures; residual risk is associated with non benchmark decisions (security selection)

Risk Adjusted Return: Total

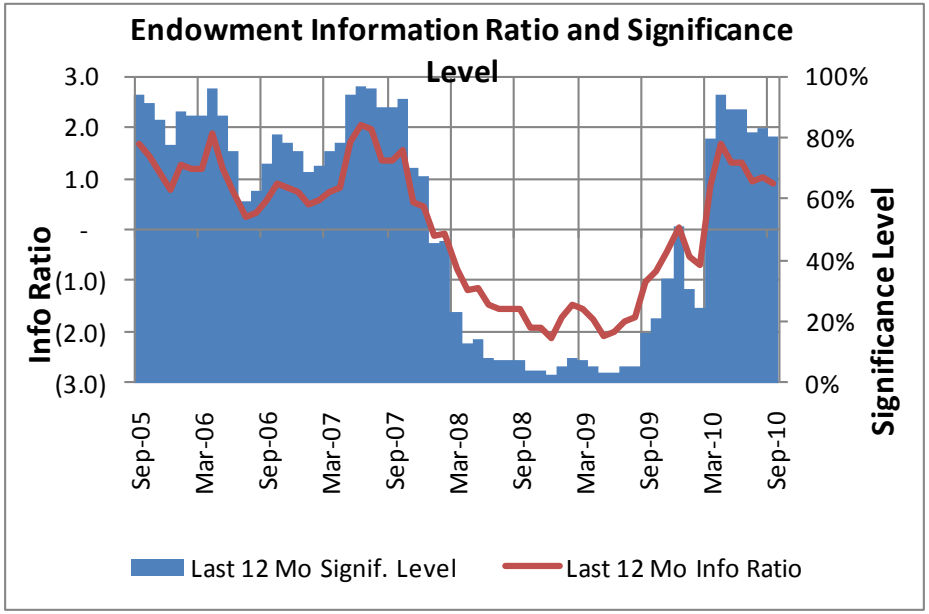


Sharpe Ratio (risk adjusted total return) trend has been quite similar to the benchmark for the past 5 years. The 12 month return on risky assets is positive but diminished after the May 2010 market decline.

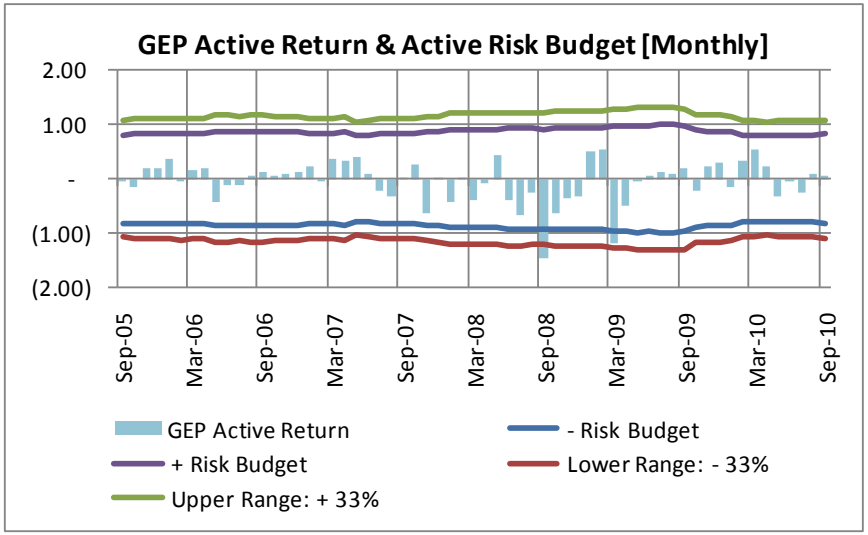
Sharpe ratio is "excess" return (total return less risk-free rate) divided by total risk; each point or bar shows a 12 month measurement period. All risk calculations done using exponentially declining weights.



Risk Adjusted Return: Active

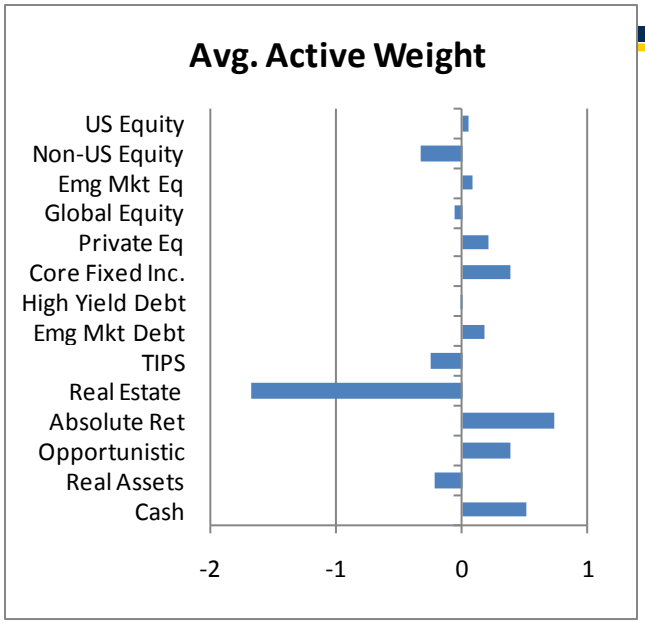
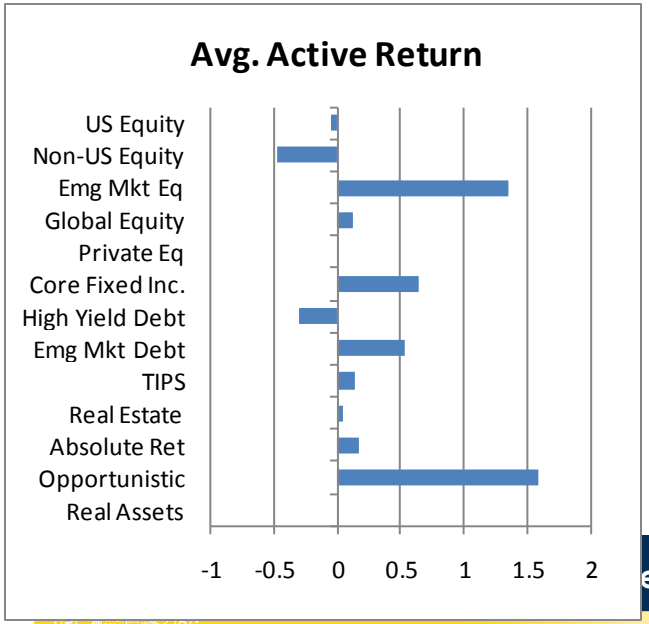
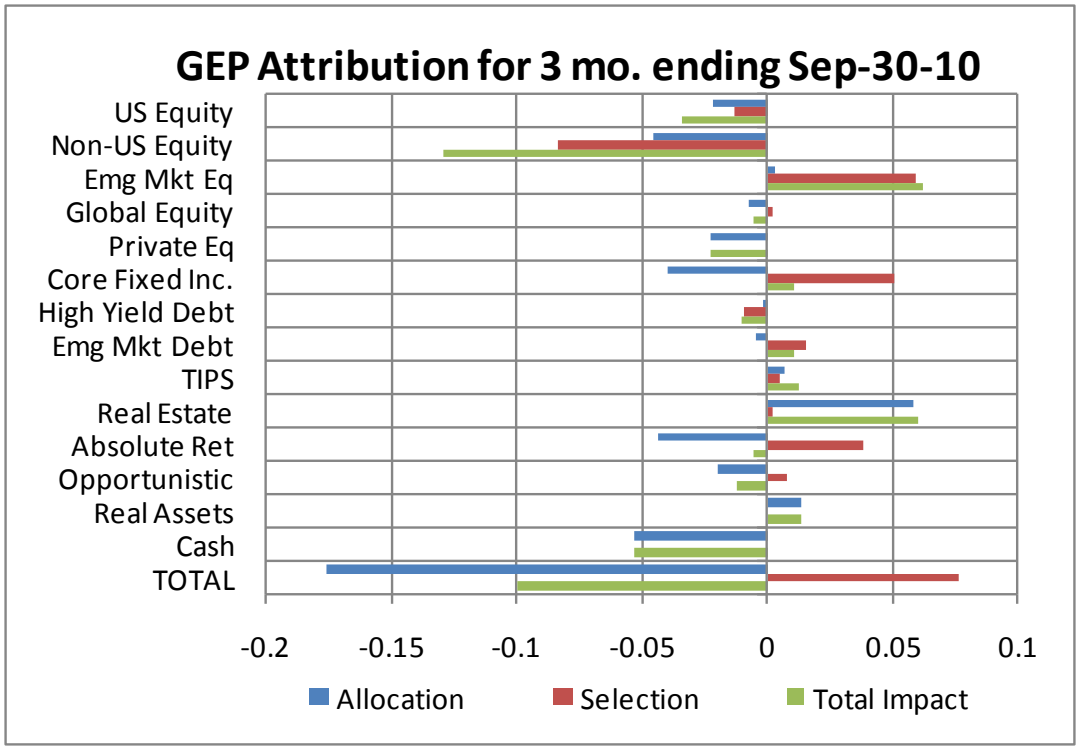


Information ratio (risk adjusted active return) is the result of both asset weighting decisions and active equity and bond performance. It is higher when the returns are more consistent (less volatile). The information ratio has been positive for the past 7 months; active return has been small but on average, positive in the past year.



Information ratio is active return (total return less benchmark) divided by active risk; each point shows a 12 month measurement period. The Significance level is the probability that results are due to skill, with 50% being a neutral measure. All risk calculations done using exponentially declining weights.

Performance Attribution



Active Return for the Quarter was -0.10% (Fund return of 8.51% vs. policy benchmark of 8.61%).
[BELOW] Asset allocation decisions **(blue bars)** subtracted -0.18% (primarily the overweight in Core Bonds, Absolute Returns, and Cash) and Security selection decisions **(red bars)** added 0.8% (Emg. Mkt Eq. and Core Bonds, offset by Non US Equity)