



Office of the Treasurer of The Regents

University of California

# UCRP and GEP Quarterly Investment Risk Report

Committee on Investments/  
Investment Advisory Group  
Quarter ending March 2010

May 17, 2010

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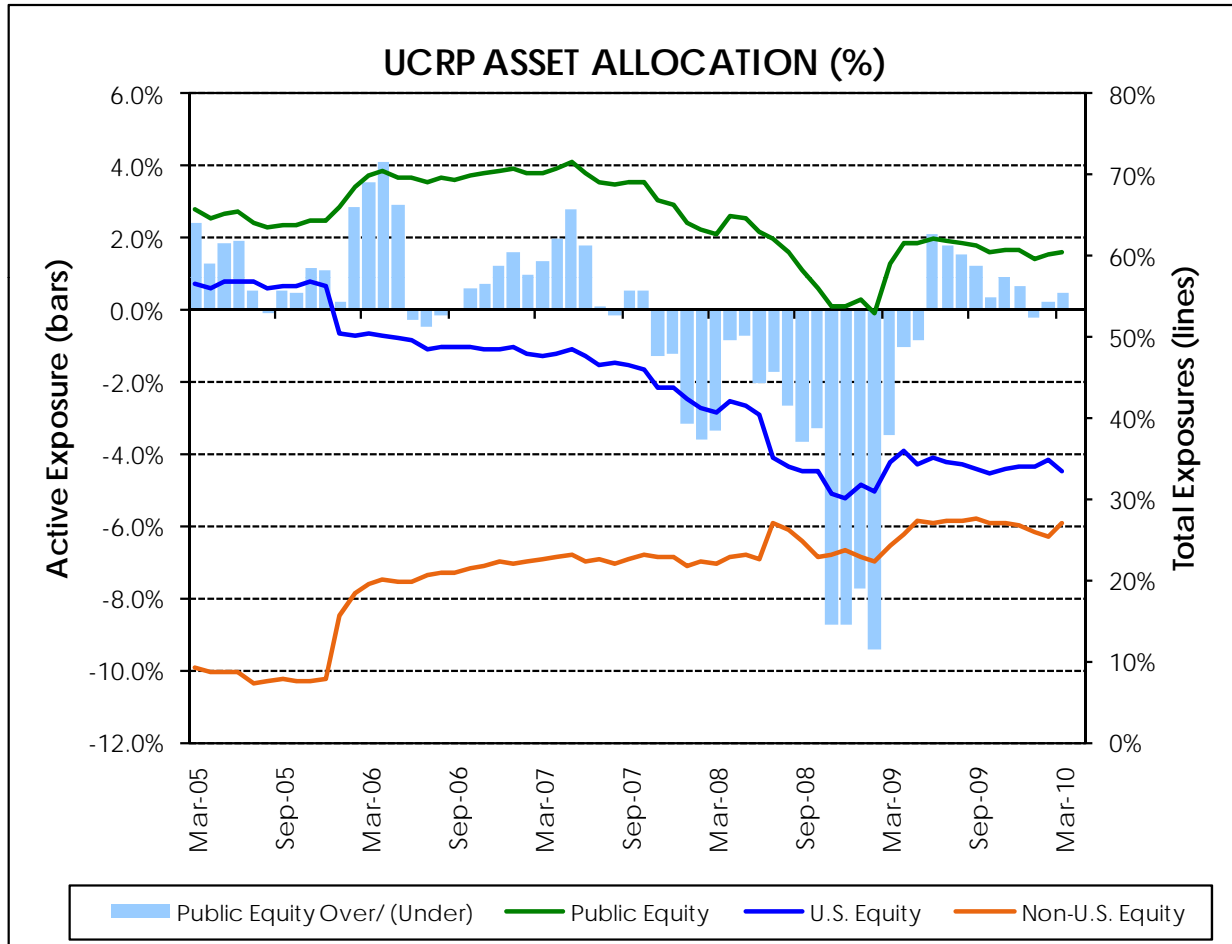
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# Risk Metrics for UCRP



# Asset Allocation

- Total Risk is largely related to the allocation between equity and bonds
- The portfolio's exposures were similar to the benchmark during Q1 2010



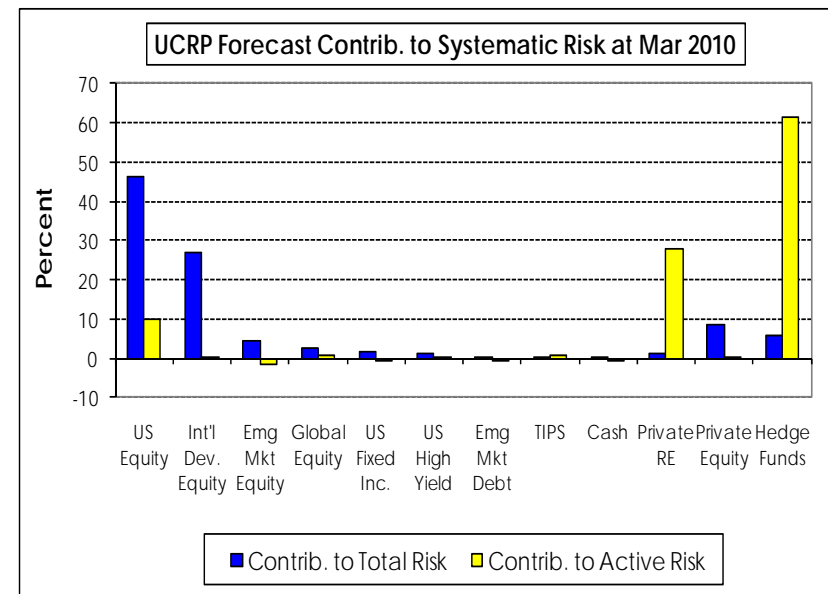
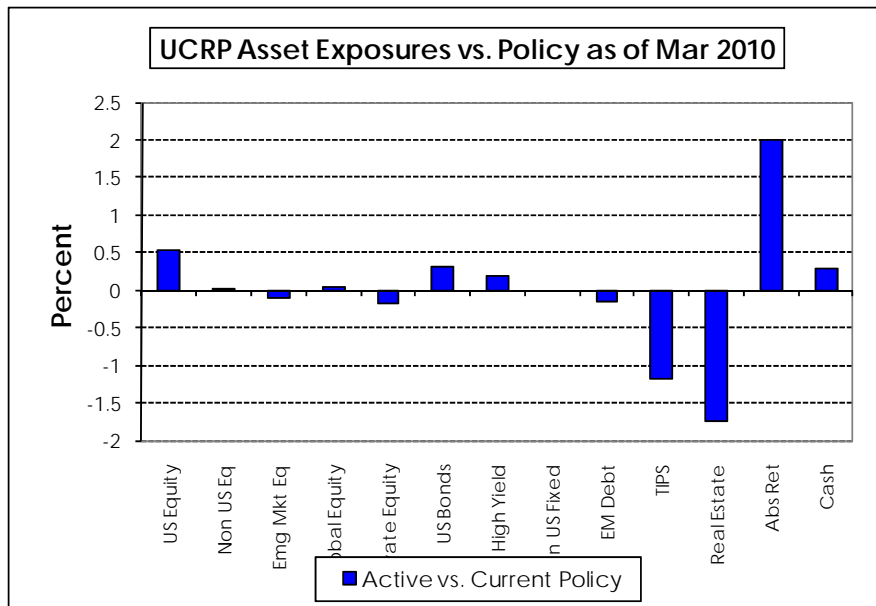
# Asset Allocation and Risk

**Note:** Exposures and Risk charts below are shown using June 1, 2009, target asset weights. Systematic risk is estimated using long term forecasts [from Mercer Investment Consulting, March 2009], **not** recent realized volatility.

**(Lower Left)** Asset weights are measured relative to **Current** Policy. The fund has an overweight in Absolute Return, and an underweight in TIPS and Real Estate.

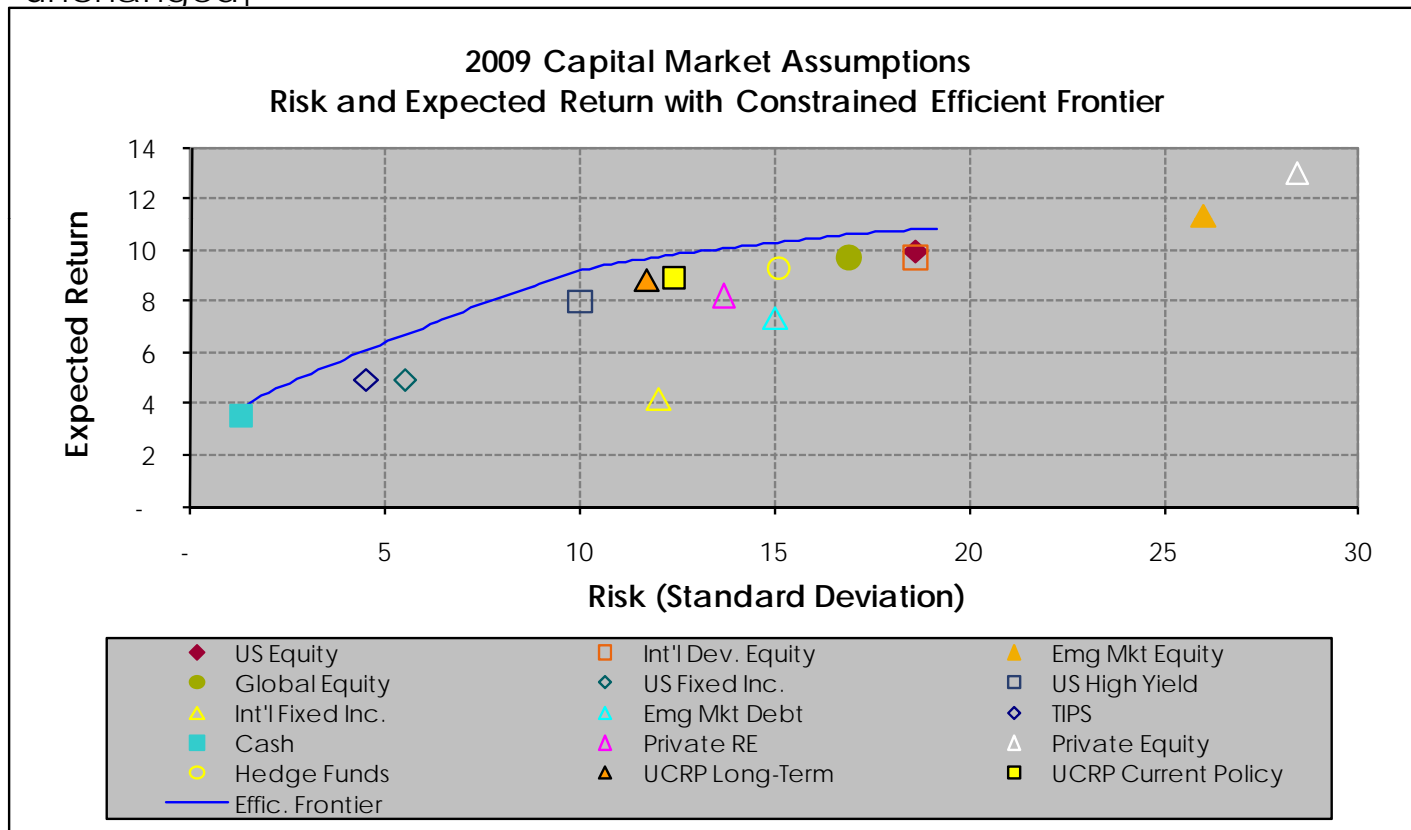
## (Lower Right)

- The fund's forecast total systematic risk (blue bars) is up slightly at 12.55% annualized standard deviation. It is heavily weighted to US and Non-US developed equity (73% of total).
- Forecast active systematic risk is up slightly at 39 bp. The Real Estate underweight and Absolute Return overweight accounted for almost 90% of this amount (yellow bars).



# Expected Risk and Return

Forecast risk and return (using Mercer's April 2009 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%. [Note: Mercer January 2010 capital mkt. assumptions largely unchanged]

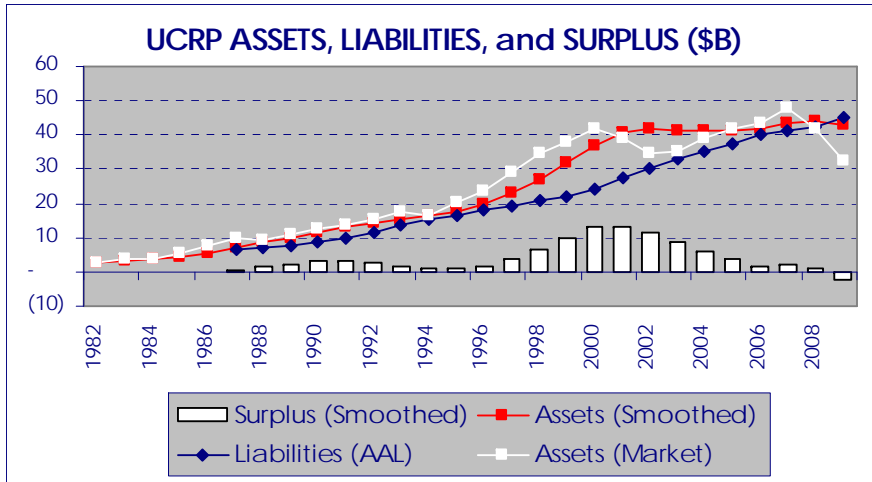


\*Asset Class returns and efficient frontiers are shown in the chart as arithmetic (i.e., average) expected returns.

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

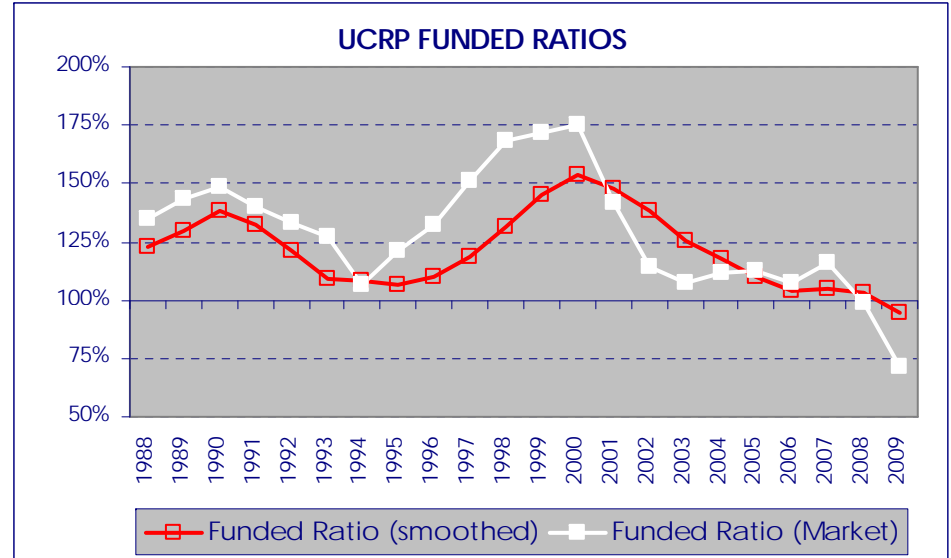
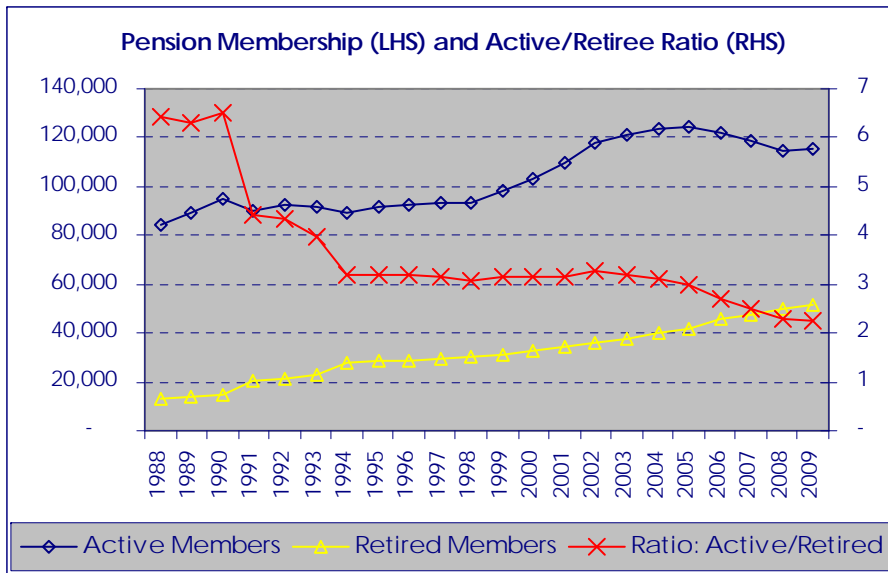
Forecast volatility is 12.4%.

# Historical Funded Status

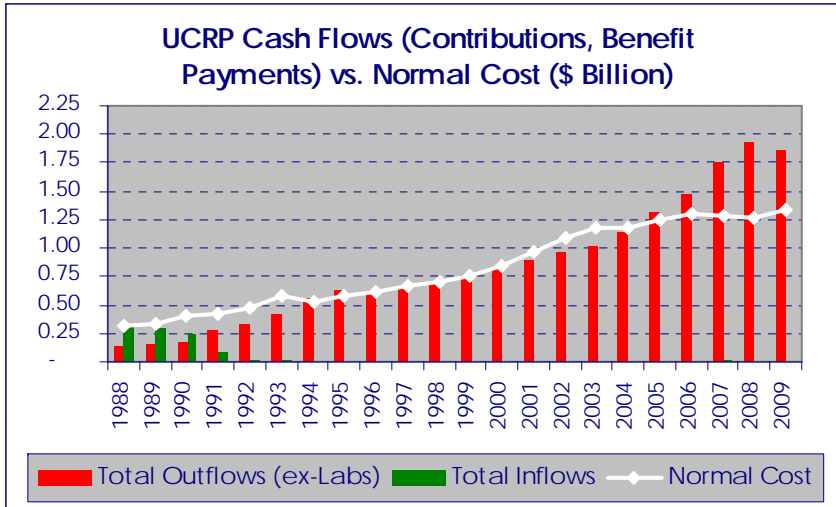


The Pension Fund's liabilities have been growing steadily (**upper left**) with University employment, while the assets have grown (and fallen) with the equity markets. The ratio of actives to retirees has recently fallen from 3x to 2x (**lower left**).

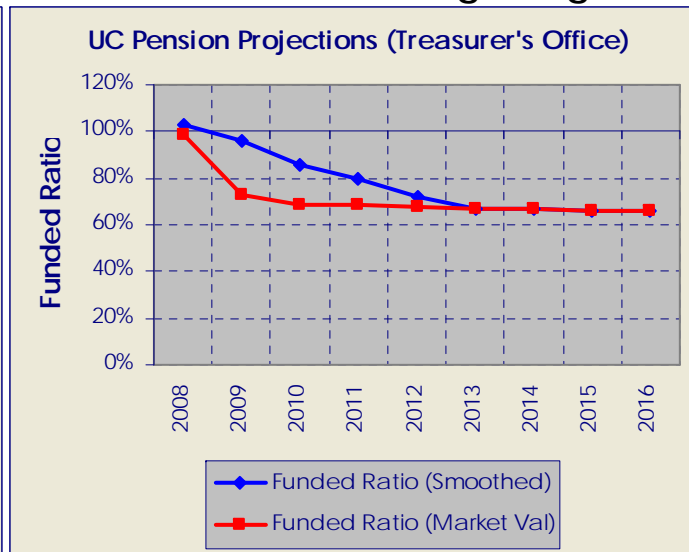
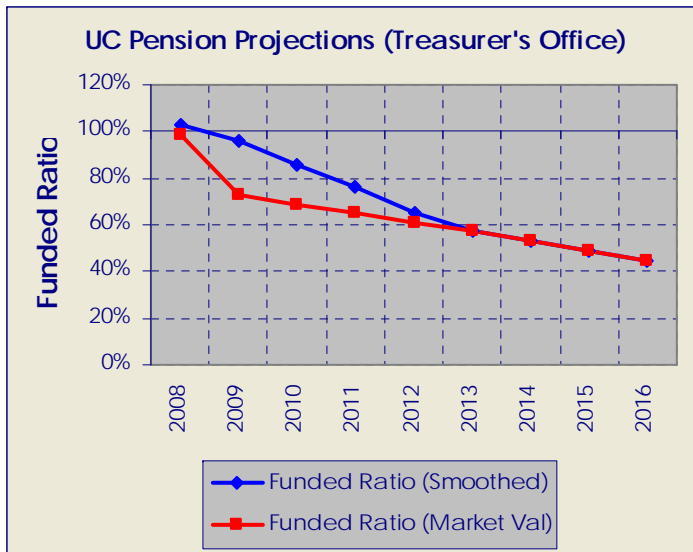
The Funded Ratio (= the ratio of assets to liabilities), is an overall metric of the financial health of a pension plan. This ratio has fluctuated considerably over the past (**lower right**), and has recently fallen below 100% with the bear market of 2007-09



# Forecast Funded Status



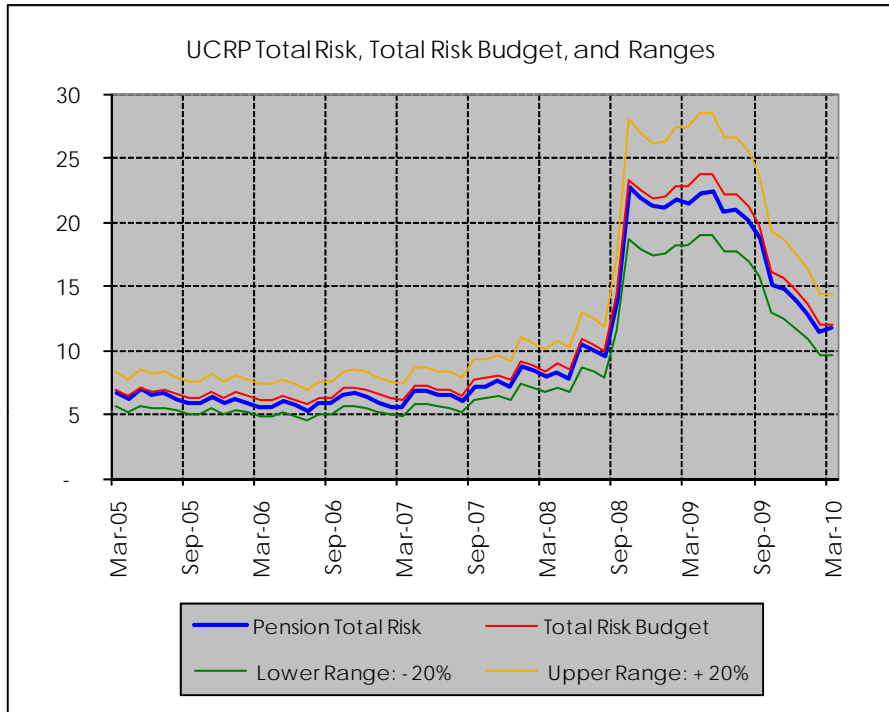
- Contributions were suspended in 1990, but annual benefit payments have grown in line with and recently exceeded, Normal Cost over the last decade (**upper left**).
- The **bottom** two charts show projected funded ratio **without and with contributions**, assuming a **-19% return for FY 2009** and a **constant 7.5% investment return beginning FY 2010**. (For this example, **contributions were set to be equal to forecast Normal Cost, beginning FY 2011.**)



- LEFT: Assumes **no contributions**, 7.5% annual investment return after FY 2009
- RIGHT: Assumes **Normal Cost contributed annually** beginning FY 2011; 7.5% return after FY 2009
- **These projections are approximations only, developed by Treasurer's Office, not Segal Co.**



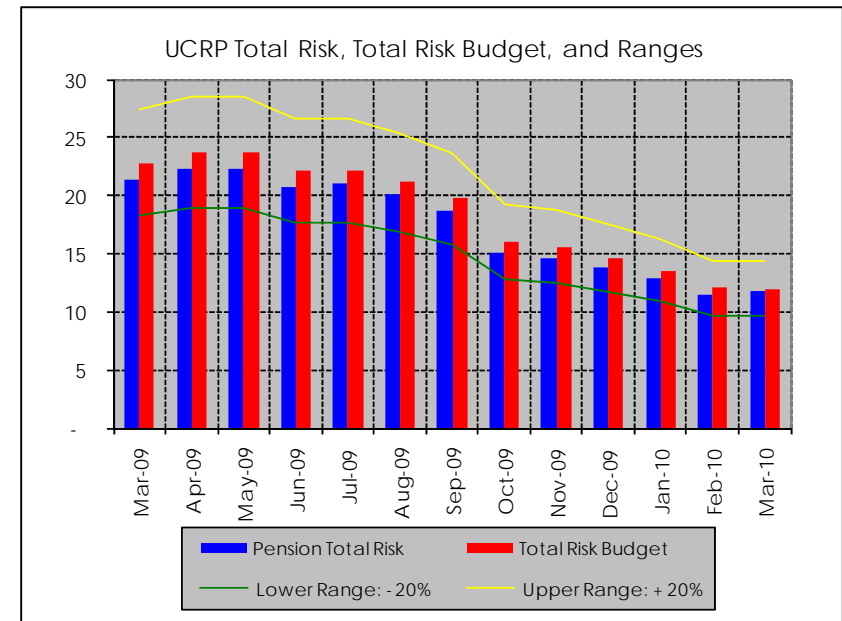
# Risk Measures: Total



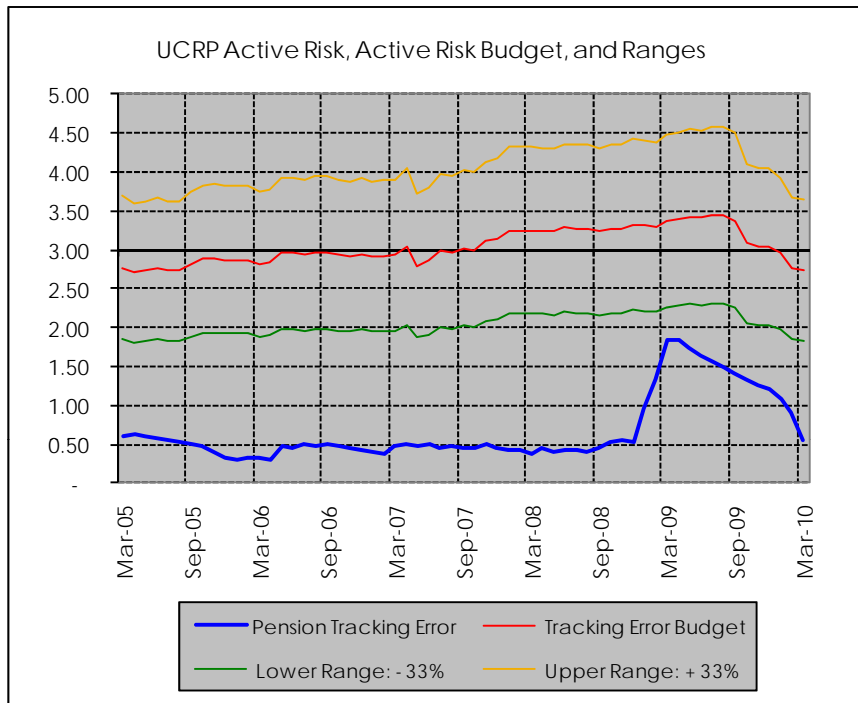
Total risk trend quite similar to benchmark; recently Plan volatility has been slightly less than the Budget, but well within ranges. Total volatility has resumed a historically normal range, higher than the mid 2000's but lower than the 2008-09 crash.

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.)



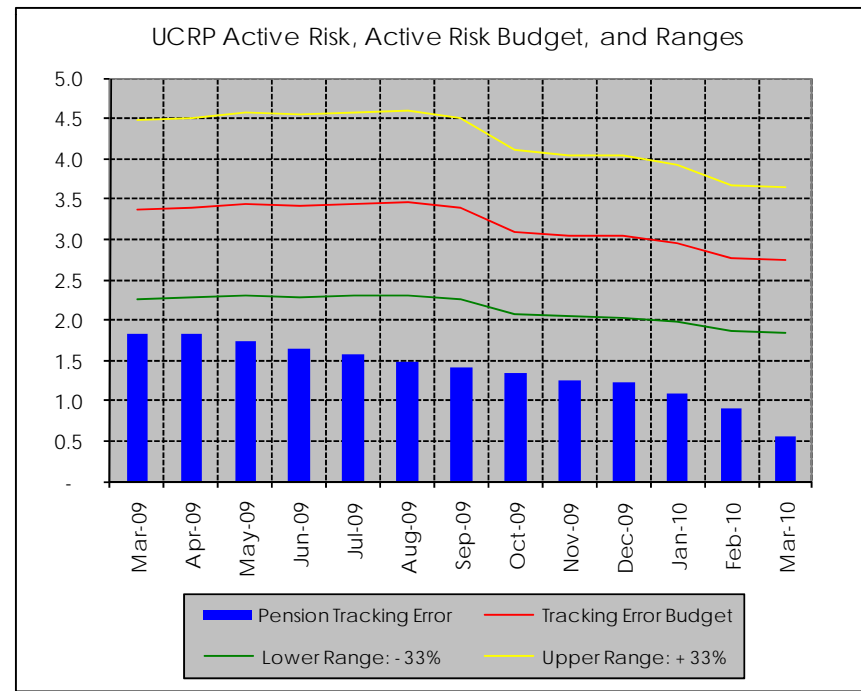
# Risk Measures: Active



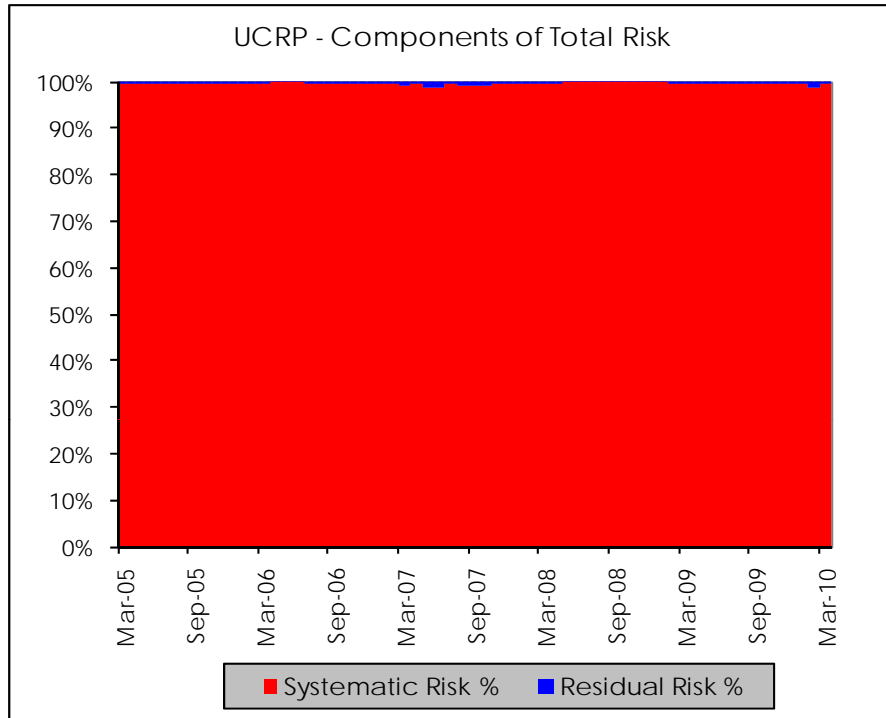
The Active risk budget is 3% annualized Tracking Error (adjusted for market volatility), with ranges of +/- 1 pct. point around Budget

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.

Until 2009, active risk for the total fund has held steady at 0.50% annualized standard deviation. The spike up in Q1 09 resulted from the underweight in equity as the market fell and then rallied. Active risk has resumed its low level of the mid 2000's, but is still well below long term expectations for active return, and is well diversified.



# Risk Attribution

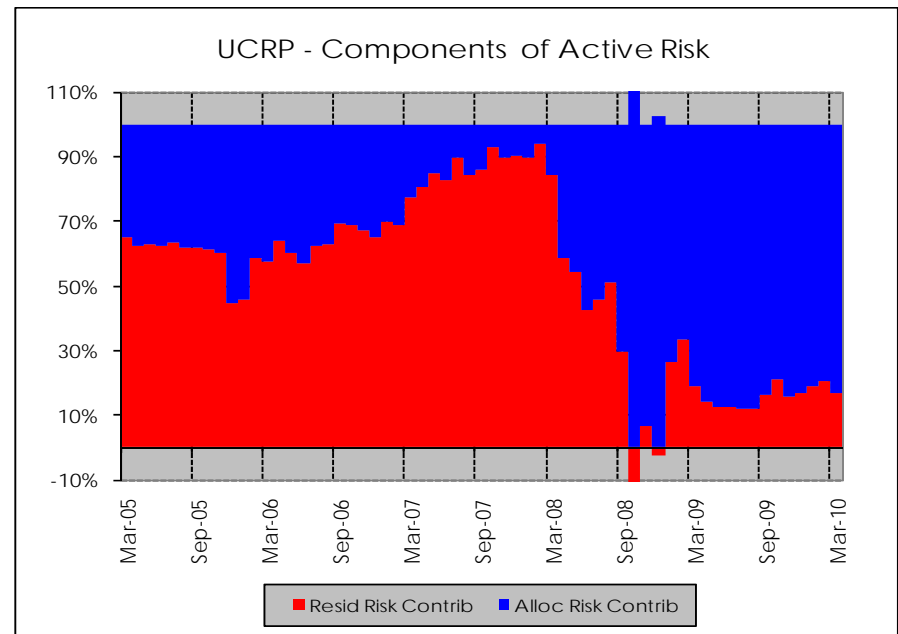


**(Upper Left)** Almost all of **Total Risk** is attributed to systematic (market) factors.

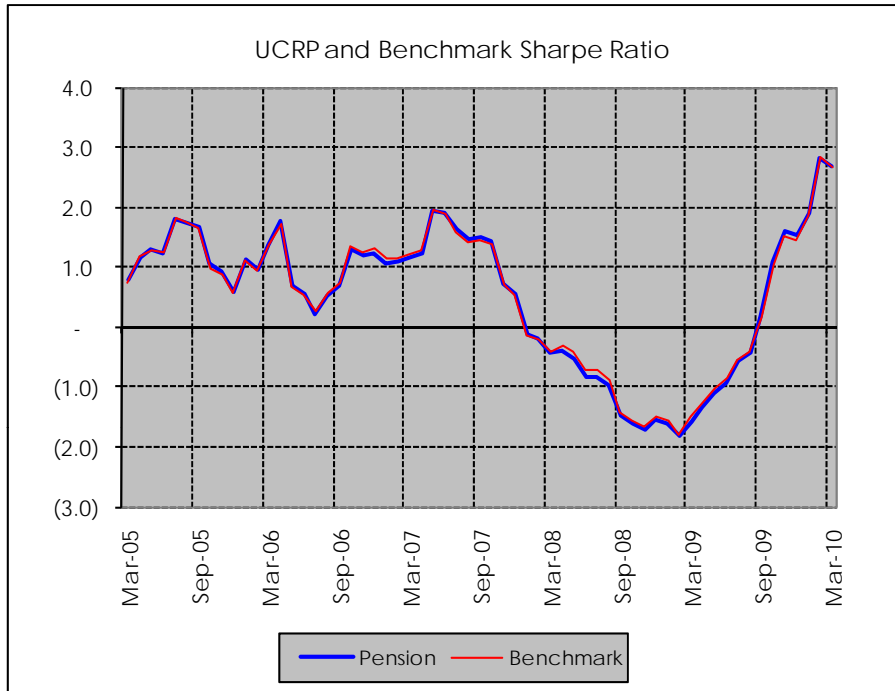
**(Lower Right)** Normally, the majority of **Active Risk** is attributed to security selection. When active management is reduced, or when asset allocation transitions are implemented, allocation risk increases. In the last 12 months, the equity over / underweight dominated all other decisions.

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)

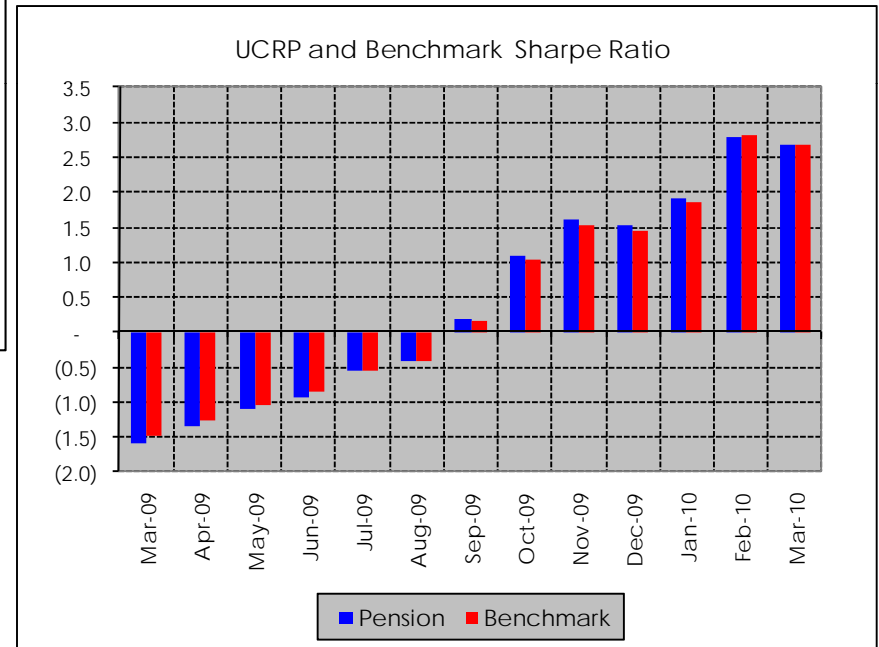


# Risk Adjusted Return: Total

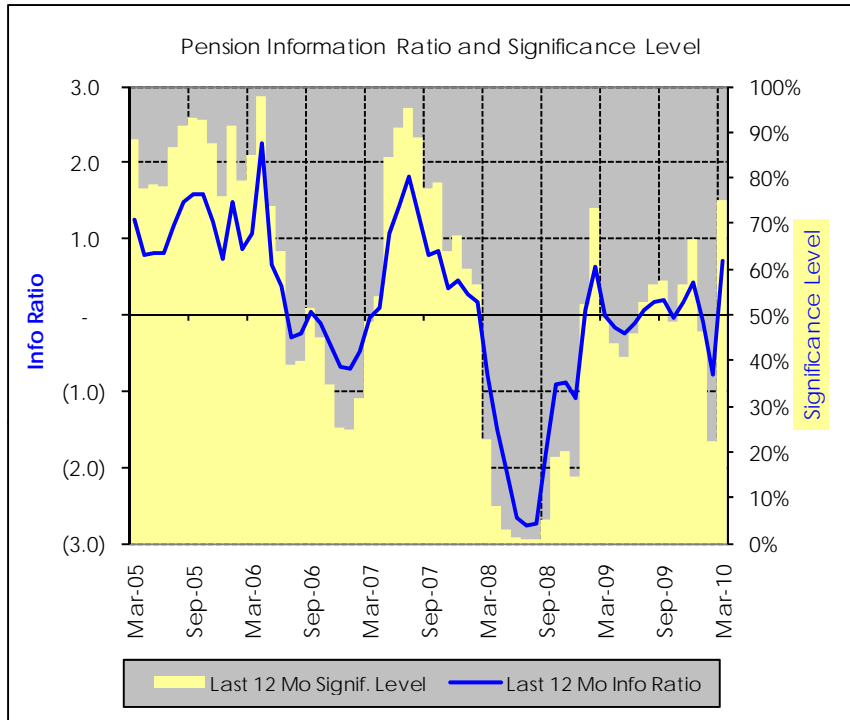


Sharpe Ratio (risk adjusted total return) trend has been quite similar to the benchmark for the past 5 years. The 12 month return on risky assets has finally turned positive as the March 2009 rally continues.

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.

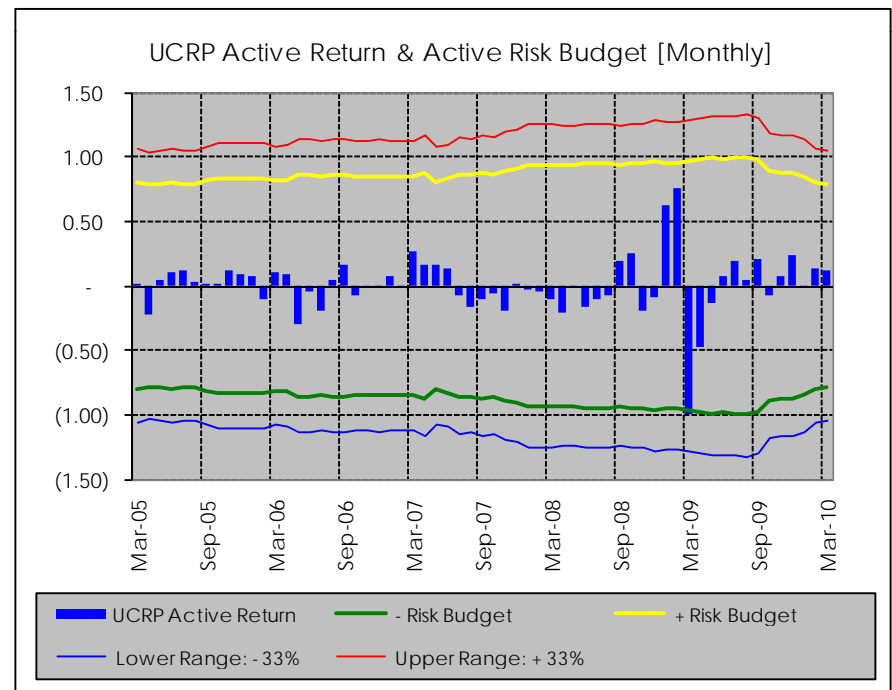


# Risk Adjusted Return: Active



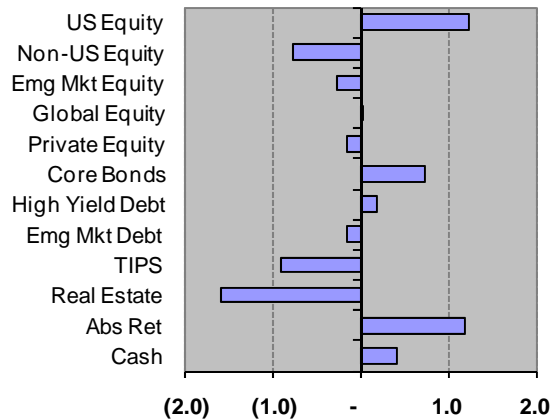
Information ratio is active return (total return less benchmark) divided by active risk; each point shows a 12 month measurement period. The Significance level is the probability that results are due to skill, with 50% being a neutral measure. All risk calculations done using exponentially declining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

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 at quarter end was positive; from the graph below, active returns for the past nine months have been small but positive.



# Performance Attribution

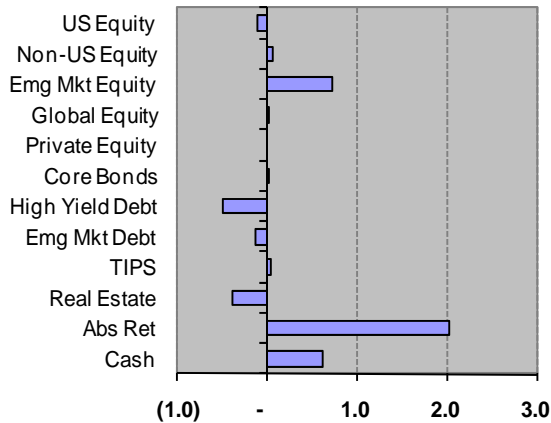
**Avg. Active Weight**



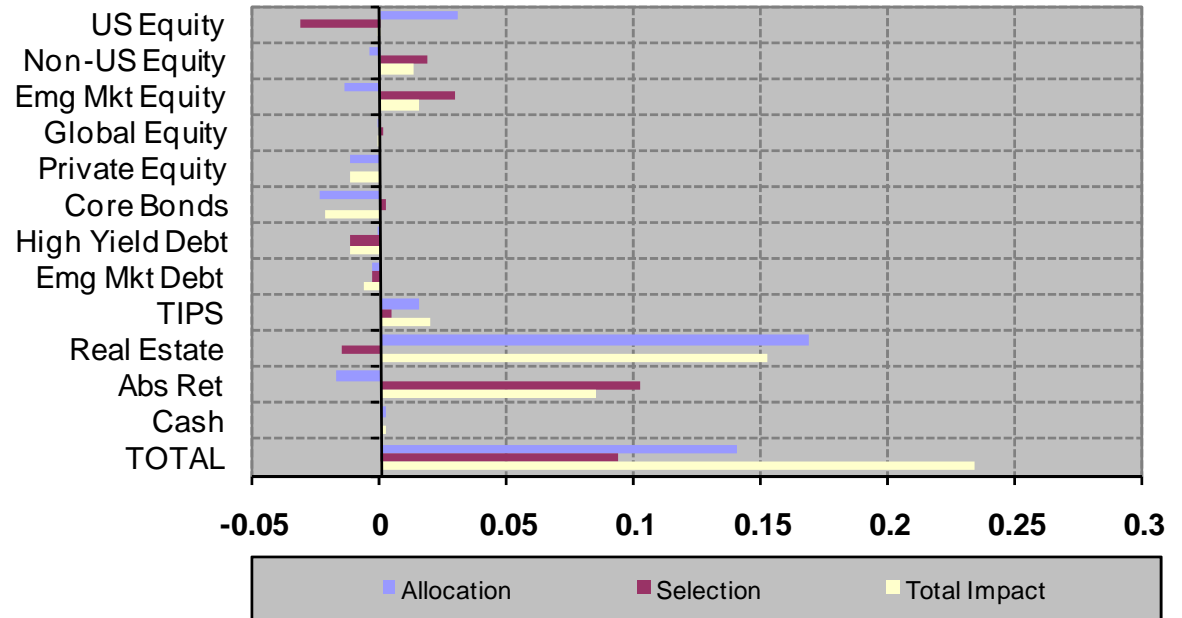
Active Return for the Quarter was +0.23% (Fund return of 3.16% vs policy benchmark of 2.92%).

**[BELOW]** Asset allocation decisions (**blue bars**) added 0.14% (primarily the underweight in Real Estate) and Security selection (**red bars**) decisions added 0.09% (primarily Absolute Return)

**Avg. Active Return**



**UCRP Attribution for 3 mo. ending Mar-31-10**



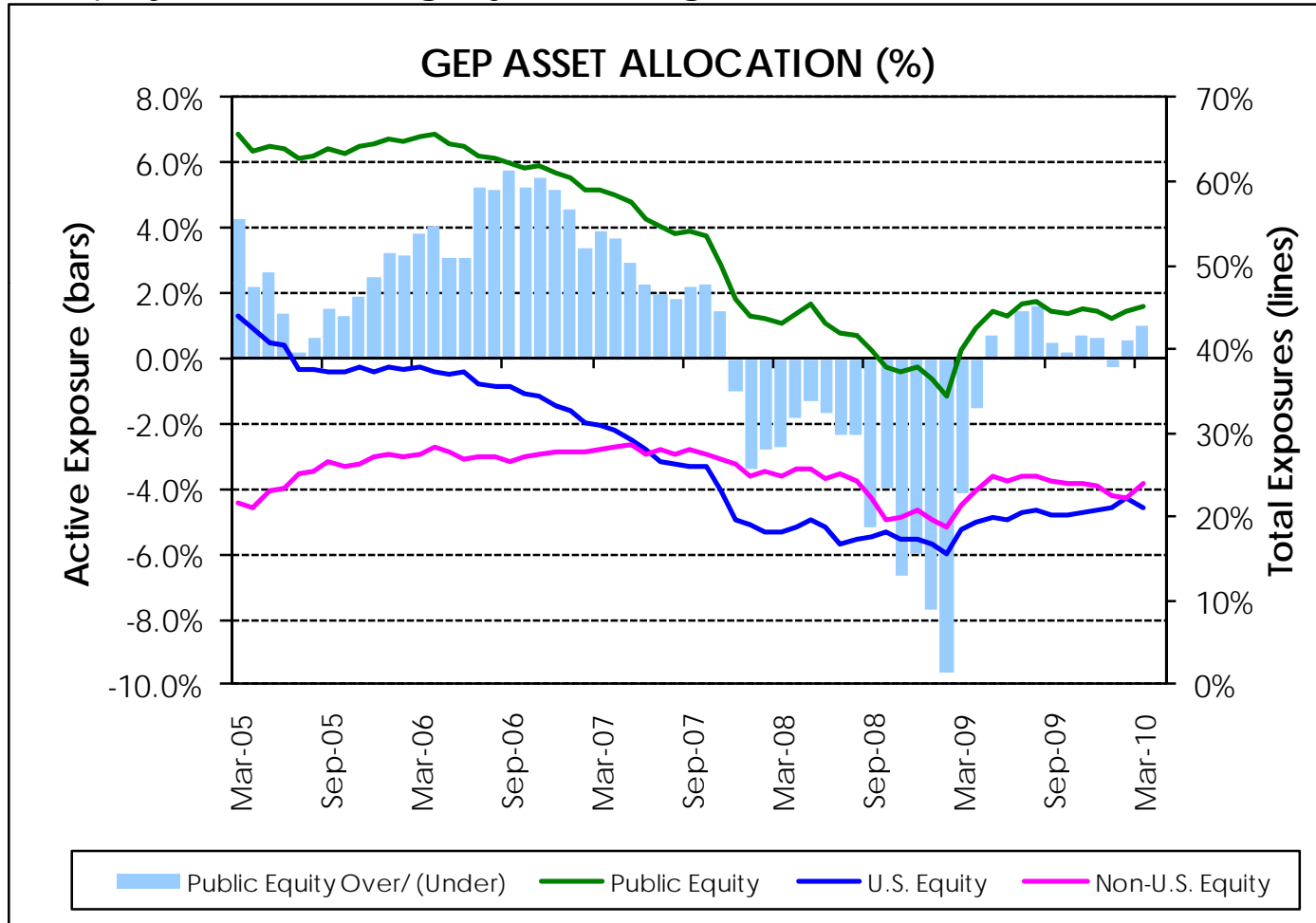
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# Risk Metrics for GEP



# Asset Allocation

- Total Risk is largely related to the allocation between equity and bonds
- Total equity remained slightly **overweight at the end of Q1 2010**

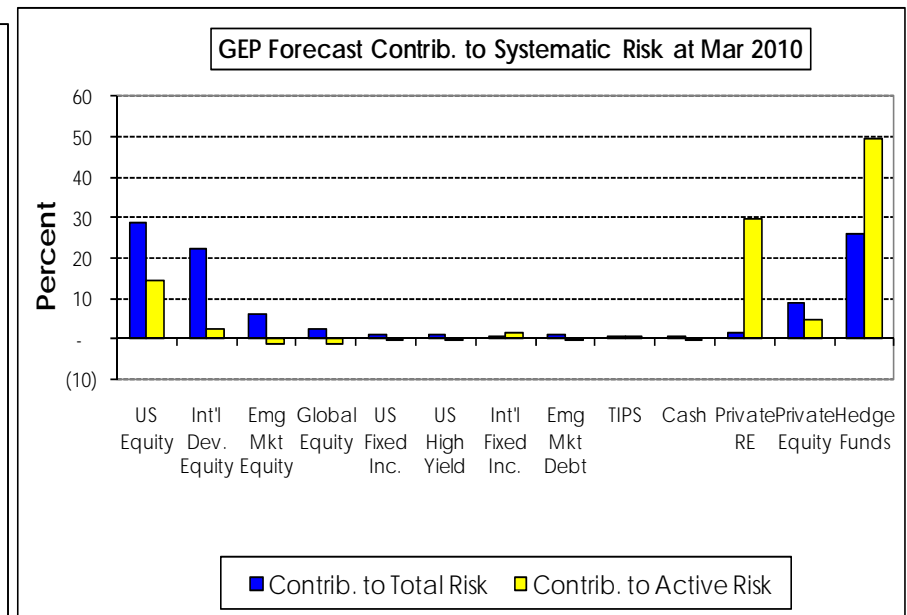
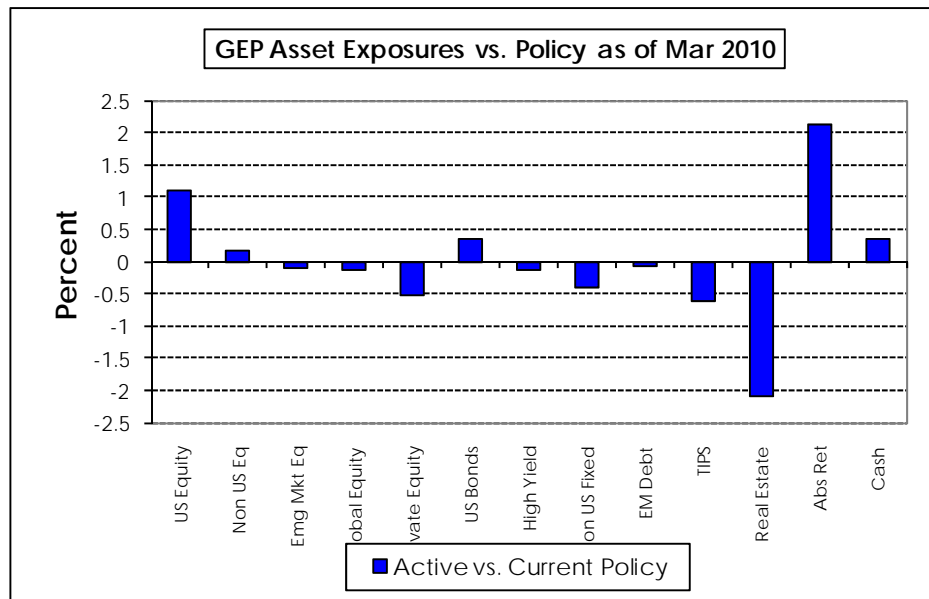


# Asset Allocation and Risk

**Note:** Exposures and Risk charts below are shown using October 1, 2008 target asset weights. Systematic risk is estimated using long term forecasts [from Mercer Investment Consulting, March 2009], not recent realized volatility.

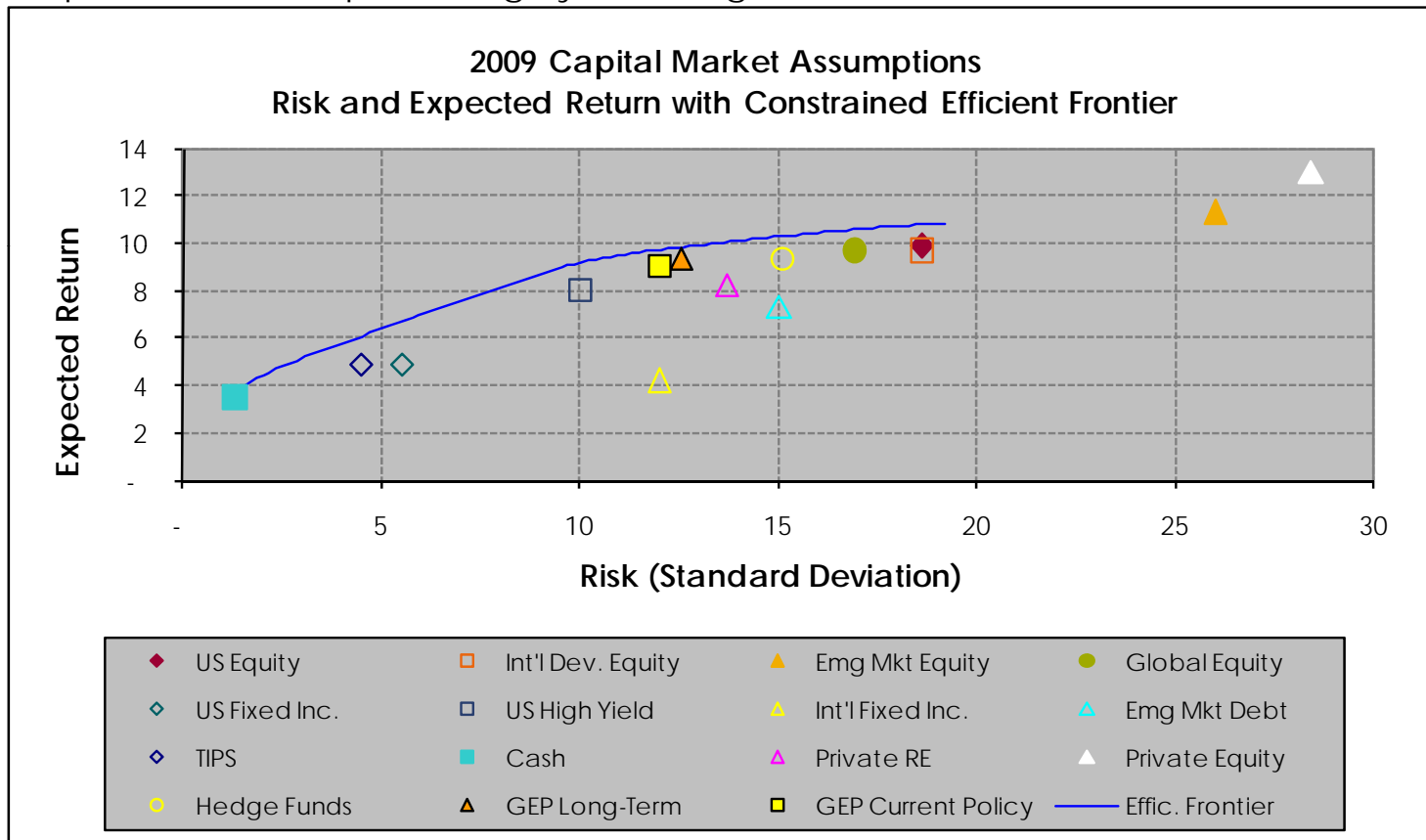
**(Lower Left)** Asset weights are measured relative to Current Policy. The fund is overweight in US Equity and Absolute Return, and underweight in Real Estate and TIPS.

**(Lower Right)** The fund's forecast **total systematic risk** (blue bars) is unchanged at 12.2% annualized standard deviation. It is evenly balanced among US equity, Non US developed equity, and Absolute Return (over 75% of total). Forecast **active systematic risk** is unchanged at 48 bp. The R.E. underweight and Absolute Return overweight accounted for almost 80% of this amount (yellow bars).



# Expected Risk and Return

Forecast risk and return (using Mercer's April 2009 capital markets assumptions) lies near the constrained efficient frontier; forecast return of 8.3%\* is close to the nominal return needed to maintain a constant real payout per student (estimated at 8.5%) [Note: Mercer January 2010 capital mkt. assumptions largely unchanged]



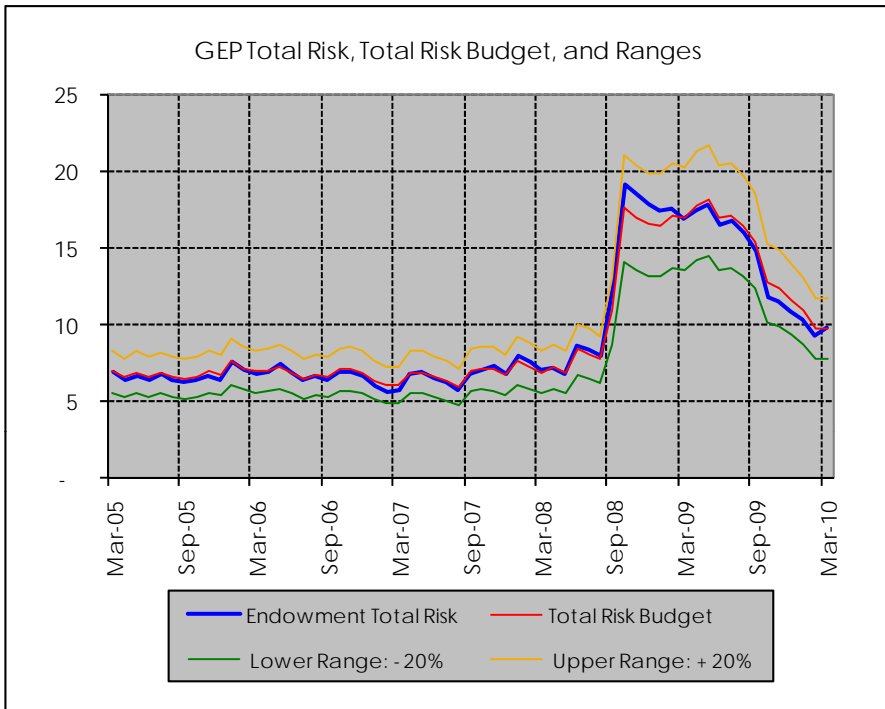
\* Asset Class returns and Efficient frontiers are shown in the chart as arithmetic (average) expected returns.

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

Forecast volatility is 12.0%.



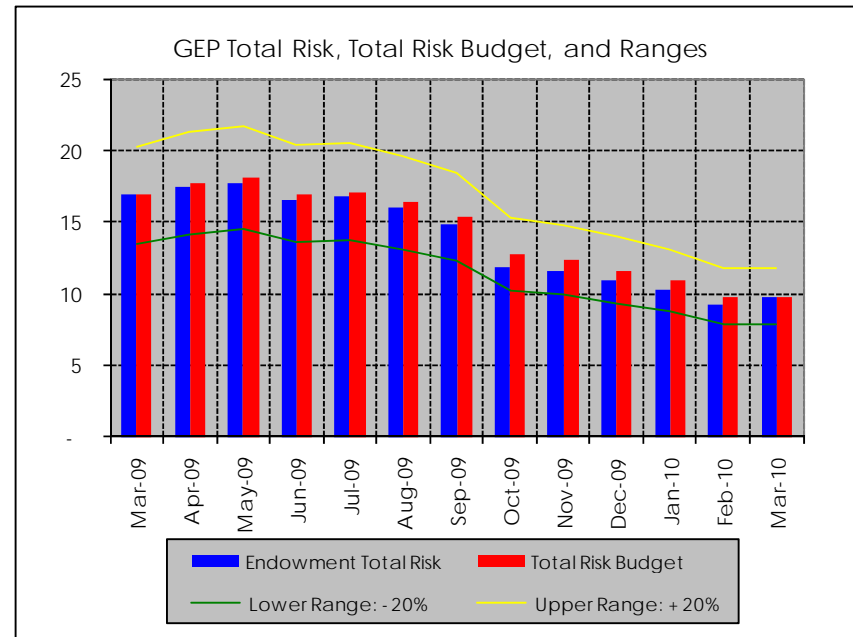
# Risk Measures: Total



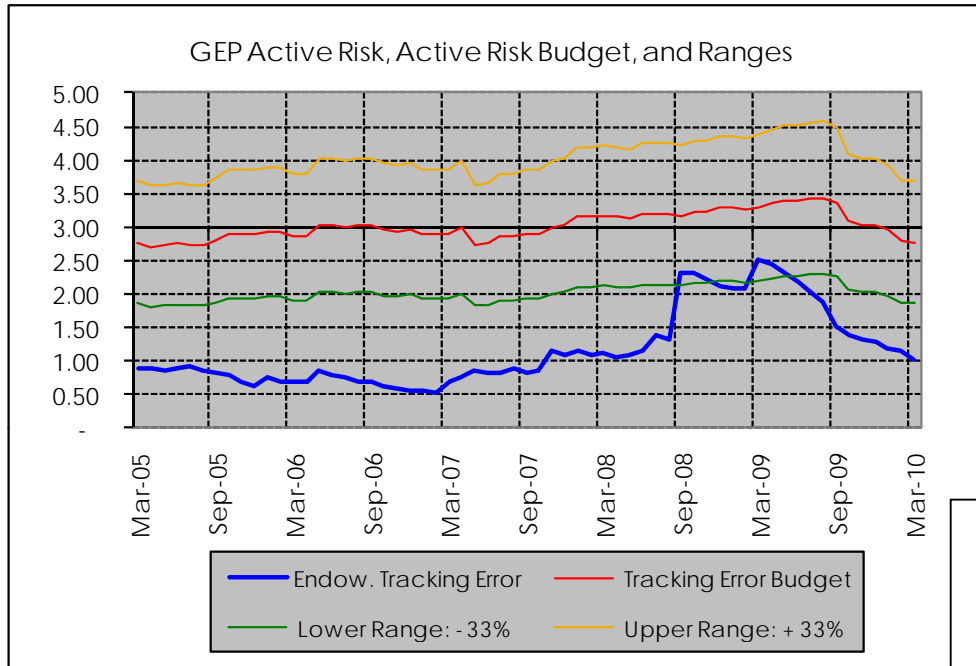
Total risk trend has been quite similar to benchmark; GEP volatility is quite close to its Budget. Total volatility has resumed a historically normal range, higher than the mid 2000's but lower than the 2008-09 crash.

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

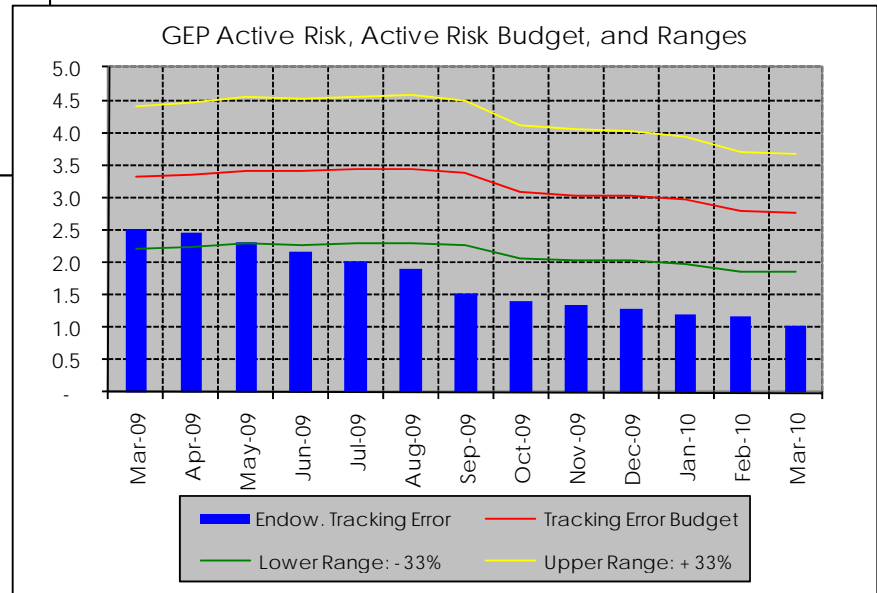


Active risk for the total fund has grown slowly over this period from 0.50% to 1.50% annualized standard deviation, up until the 2008 crash.

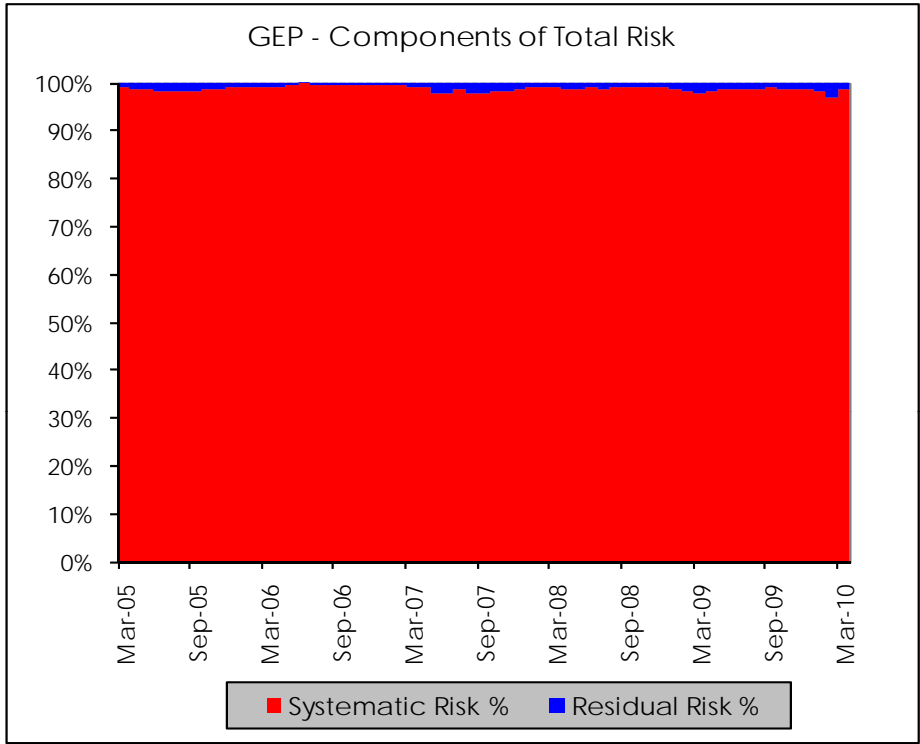
Active risk has resumed its low level of the mid 2000's, but is still well below long-term expectations for active return, and is well diversified.

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.



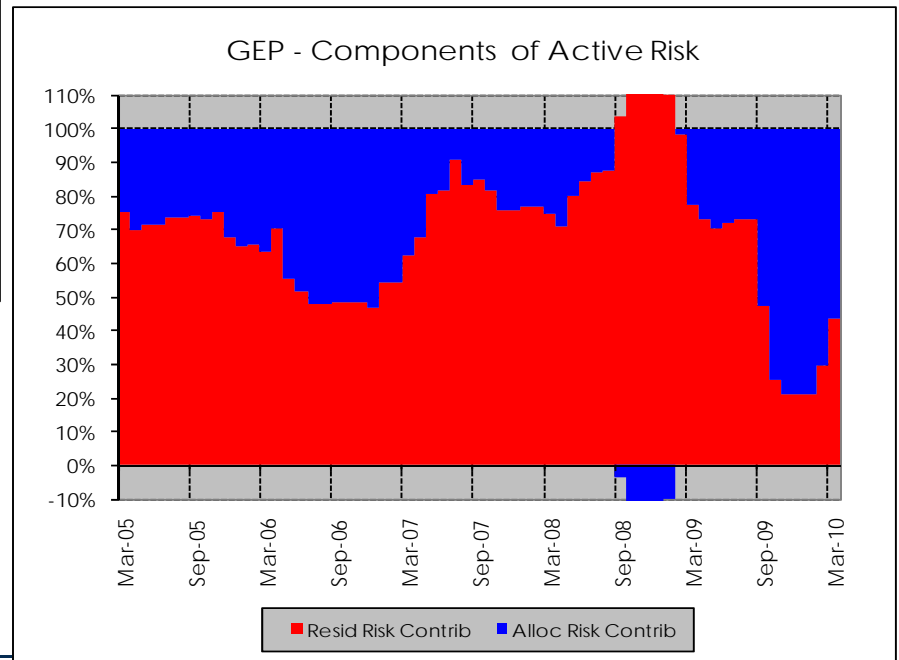
# Risk Attribution



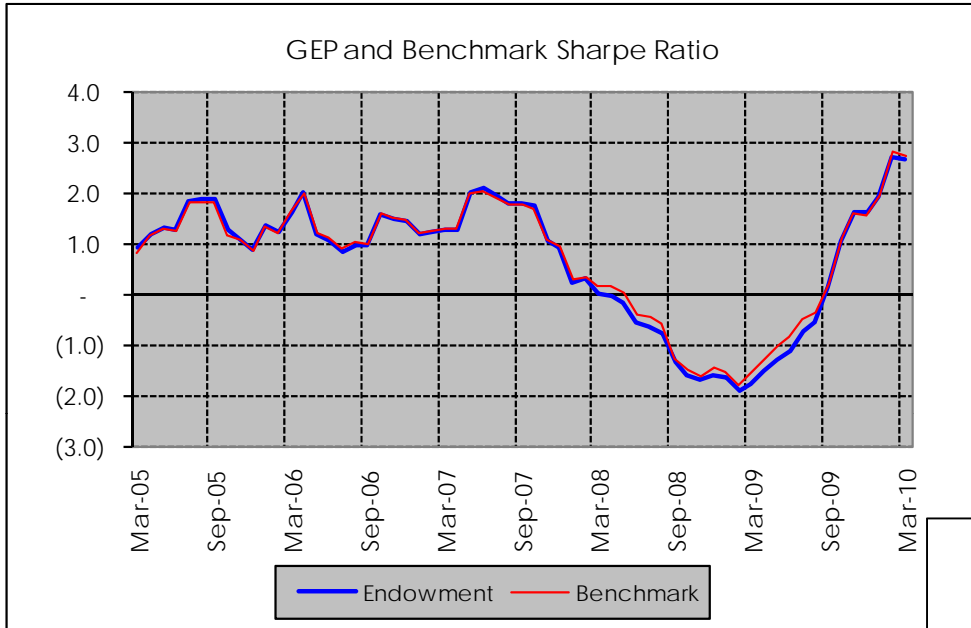
Risk is measured here by variance (standard deviation squared) of monthly returns; each bar shows a 12 month measurement period. Systematic risk is associated with benchmark exposures; residual risk is associated with non benchmark decisions (security selection).

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

**(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 the last 6 months, the equity overweight dominated all other active decisions.

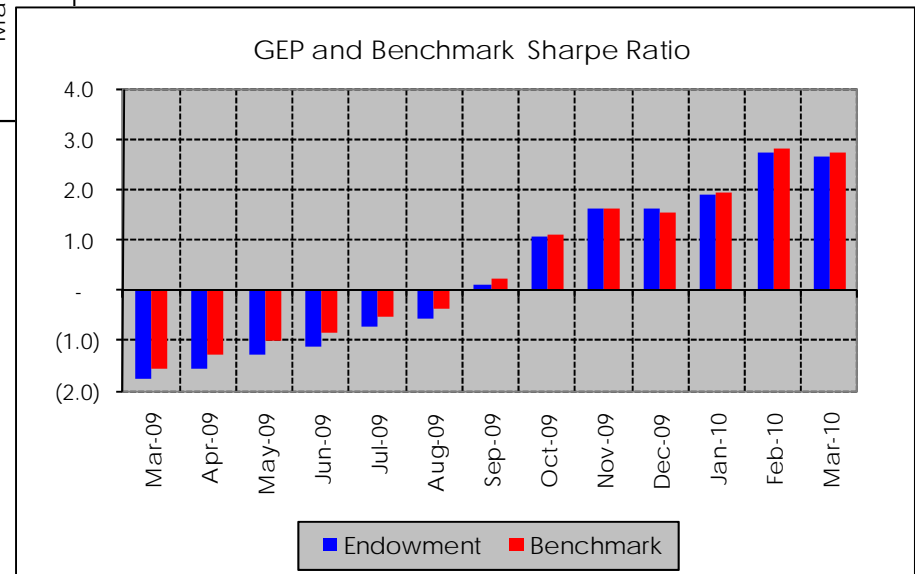


# Risk Adjusted Return: Total

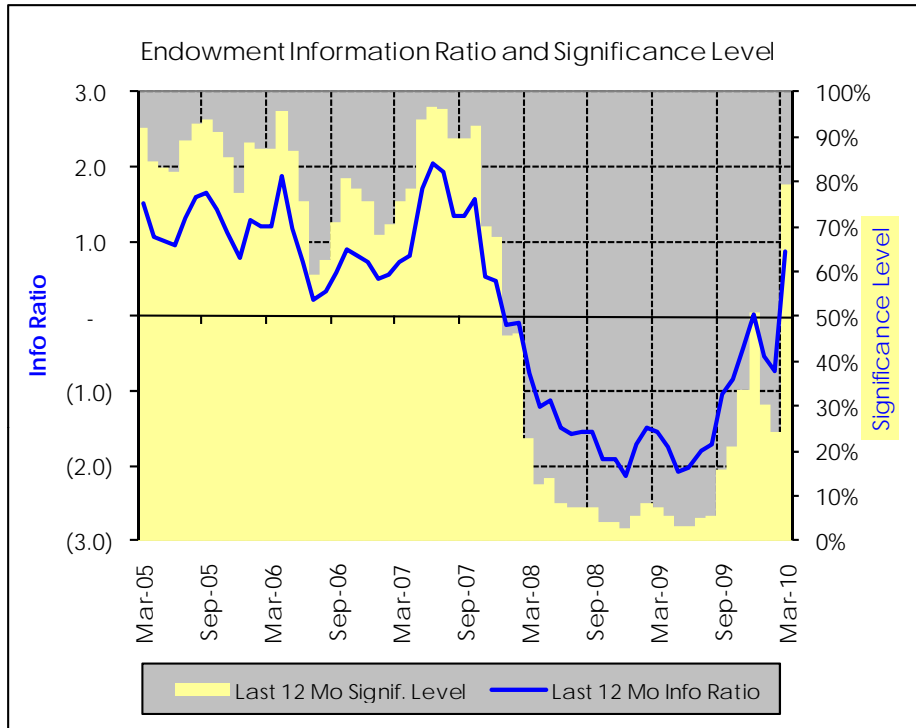


Sharpe Ratio (risk adjusted total return) trend has been quite similar to the benchmark for the past 5 years. The 12 month return on risky assets has finally turned positive as the March rally continues.

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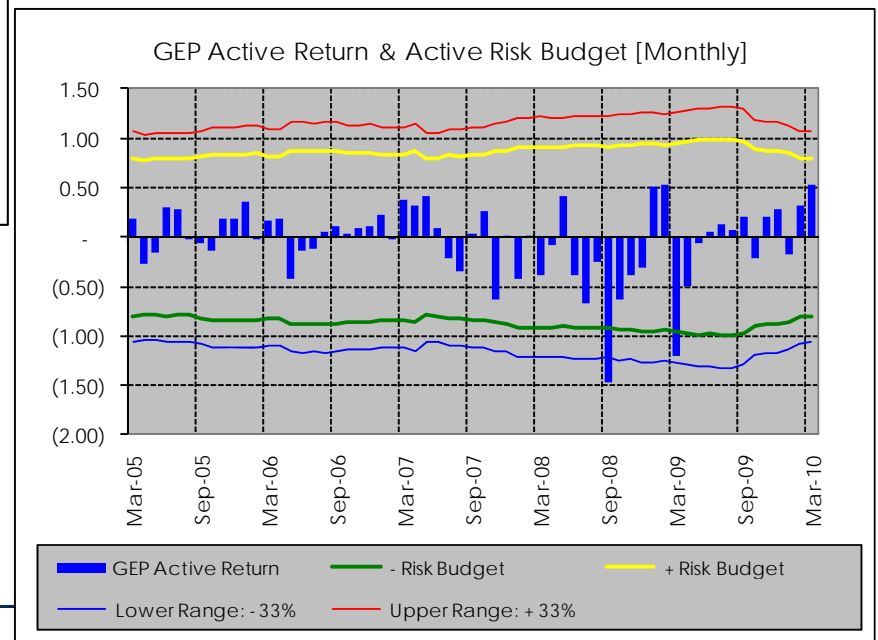


# Risk Adjusted Return: Active

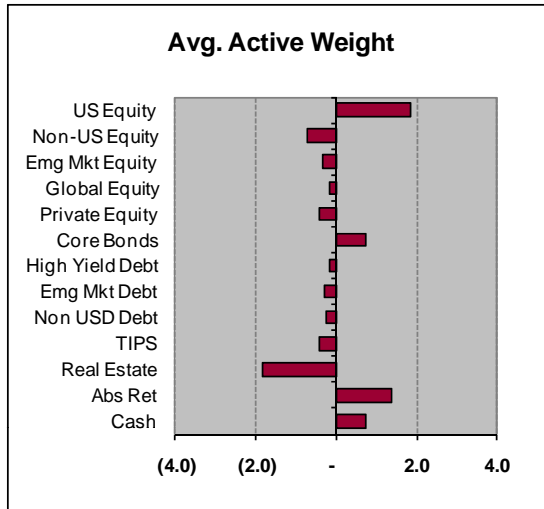


Information ratio is active return (total return less benchmark) divided by active risk; each point shows a 12 month measurement period. The Significance level is the probability that results are due to skill, with 50% being a neutral measure. All risk calculations done using exponentially declining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

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 active return has recently turned positive (see graph below), while active risk is decreasing (see page 20). In the last two quarters, both allocation and selection decisions have been positive.



# Performance Attribution



Active Return for the Quarter was +0.68% (Fund return of 2.64% vs policy benchmark of 1.96%).

[BELOW] Asset allocation decisions (**red bars**) added 0.24% (primarily the overweight in US Equity and the underweight in Real Estate) and Security selection decisions (**orange bars**) added 0.44% (primarily Absolute Return Strategies)

