Performance Risk Advisors

Plan Sponsor Example:

Risk Education and Asset Allocation Review

This plan sponsor is governed by professionals from non-investment fields. They are concerned with the risks of their portfolio and want education along with ideas for how a different asset allocation might modify the risk of their portfolio.

Kent M. Baur, CFA

Principal

Why Does Diversification Work…Except When It Matters Most?

During “normal” market environments, a well-diversified portfolio mitigates the volatility of individual assets

- Å Fundamentals dominate
- Å Correlations behave as expected

But diversification benefits evaporate during periods of market or economic distress

- Å Correlations increase dramatically
- Å Volatilities jump

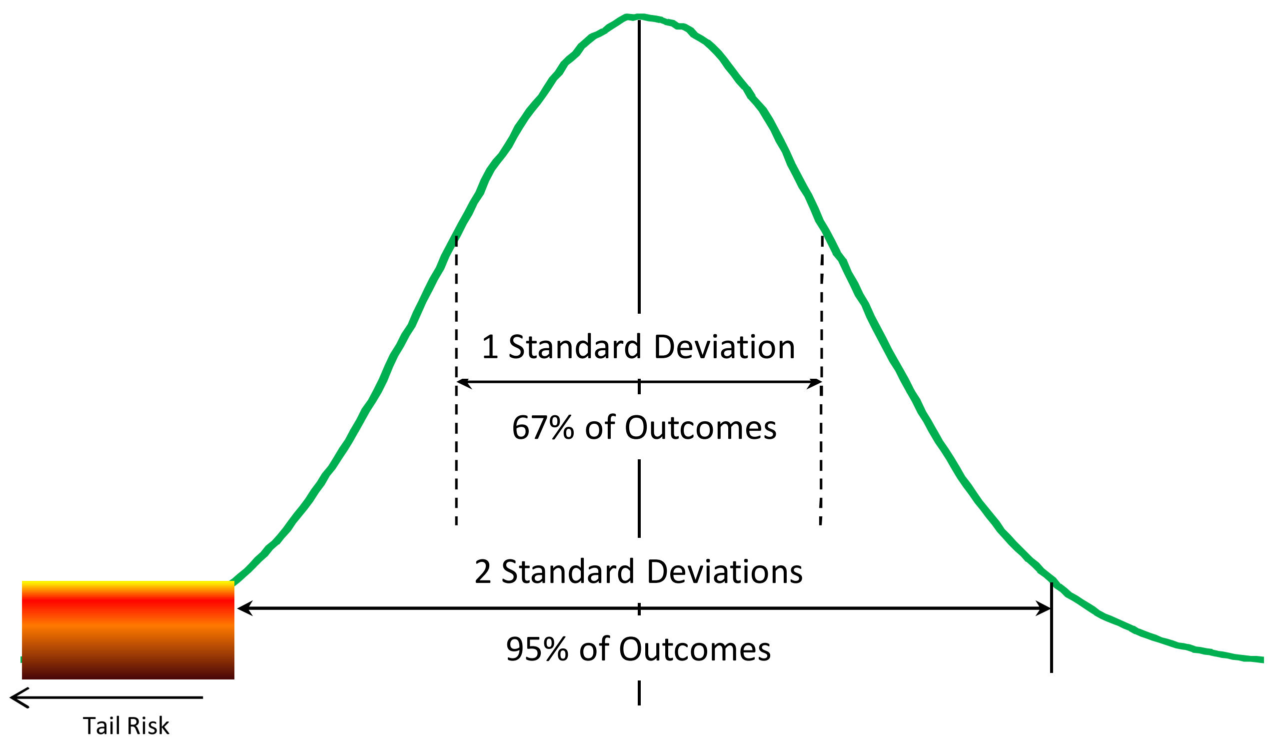
What can be done?

- Å Use the best risk tools possible
- Å Carefully manage exposure to assets with significant “fat-tails”
- Å Win by not losing
    - Å Set a risk budget and stay disciplined…even if your expected return is temporarily below your long-term objective

Volatility and Tail Risk

Volatility and Standard Deviation have become synonymous

Both assume a "normal distribution"

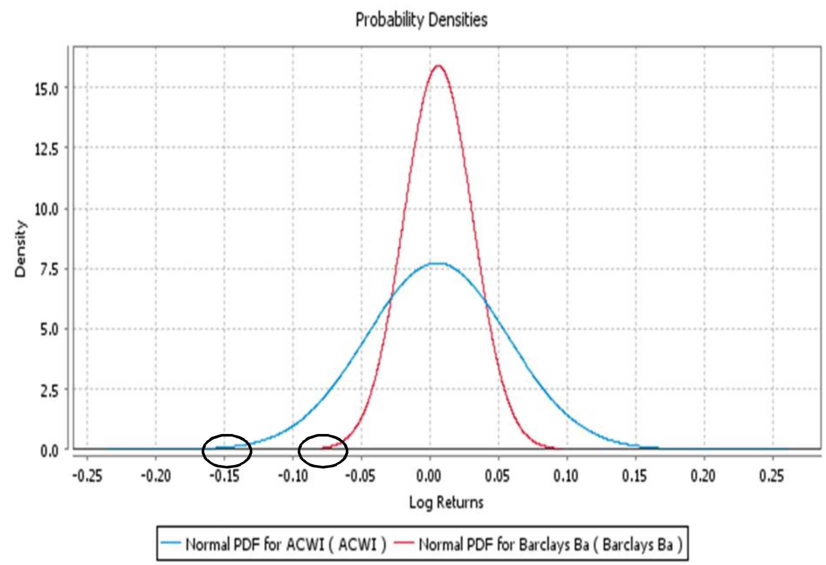


Key Assumptions for the Normal Distribution

Å Really good and really bad things are equally likely

Å Relationships between assets (correlations and volatility) don’t change very much

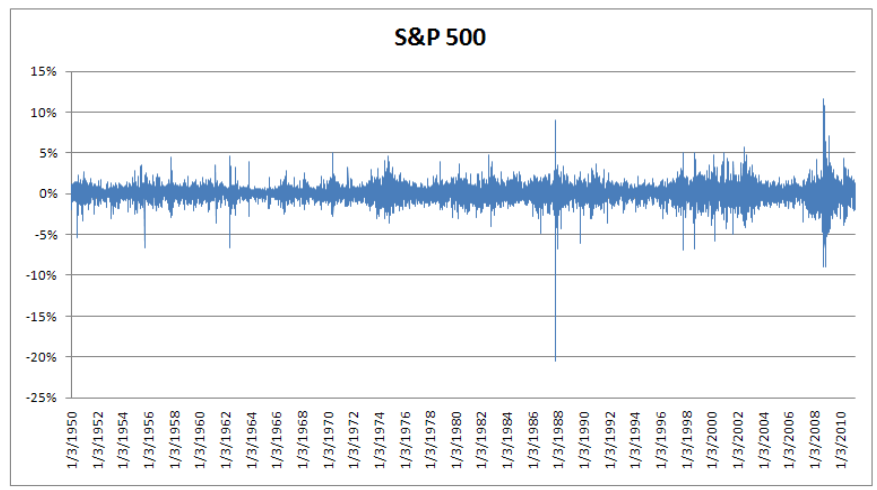
Å Bad things for one asset class don’t have any impact on the likelihood of bad things for other asset classes



If returns were "normal“…

Statisticians would expect the S&P 500 to move up or down by 4% or more in one day only ***once every 100,000 years***, but it happened:

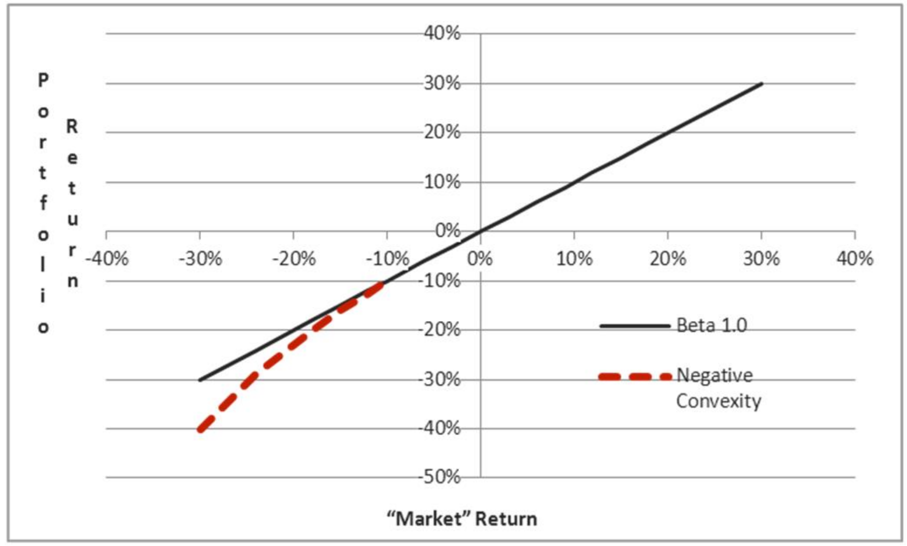
84 times since 1950
6 times in August, 2011



The Fat-Tailed Reality

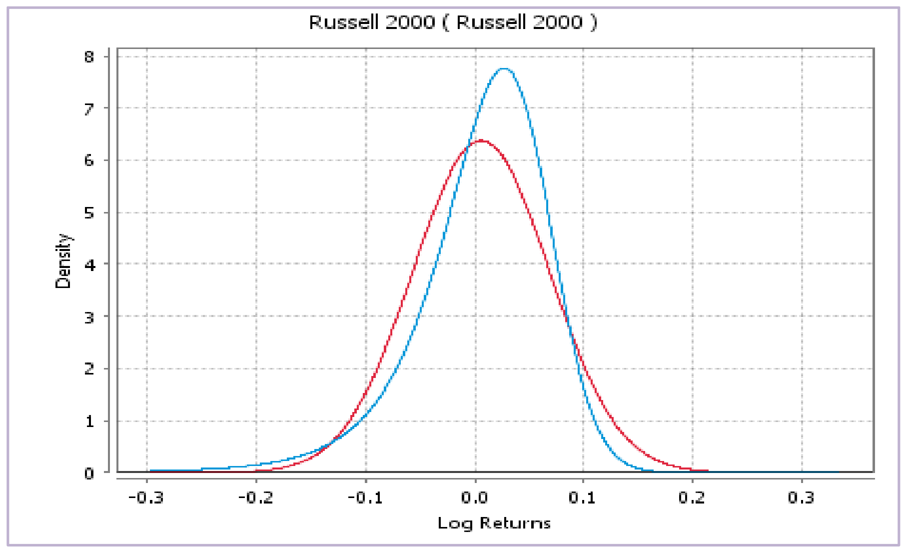
Higher volatility and increasing correlations cause "Fat Tails" and Negative Convexity

- Downside risk is magnified and worsens as the market drops further
- Small returns and extreme returns occur more frequently than "normal"
- The frequency and magnitude of large losses is much greater than large gains

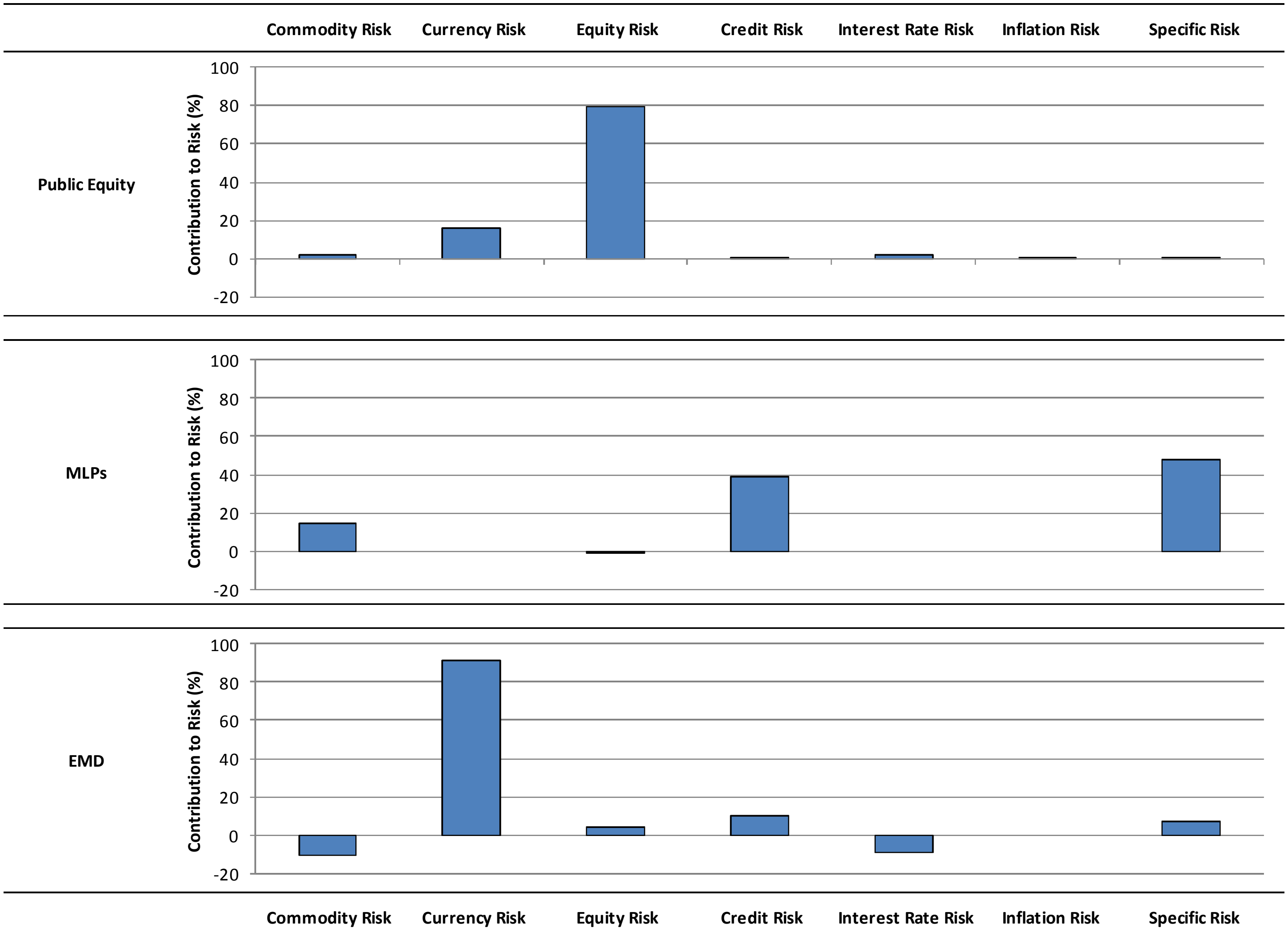


The chart at right shows the Russell 2000 index

- The red line shows a normal distribution
- The blue line is reality



Asset Classes are Bundles of Different Sources of Risk



Cognity Risk Software– A Better Set Of Risk Tools

Benefits and uses of a Fat-Tailed risk model

- More precise estimates of potential downside losses
- Better understanding of the sources of risk and how they are evolving
- Better insight to asset behavior during times of stress

Near-term…"Given current and recent market conditions"

- How much risk am I taking?
- What are the key sources?
- How is it changing with market conditions?
- How can I improve portfolio construction?

Longer-term…How might assets behave in a different economic regimes (separate research)

- Stagflation?
- Inflation?
- Boom?

Risk Modeling Process

Å Data collection

Å Qualitative review of objectives, strategy and managers

Å Quantitative analysis of asset classes and managers

Å Risk factor profiling – customized risk factors for each asset class and manager

Å Model specification and construction

Å Risk decomposition

Å Stress testing

Å What-If analysis

Å Report design

Å Presentation of results

Allocation Weights – Current vs. New Target

Details Omitted to Preserve Confidentiality

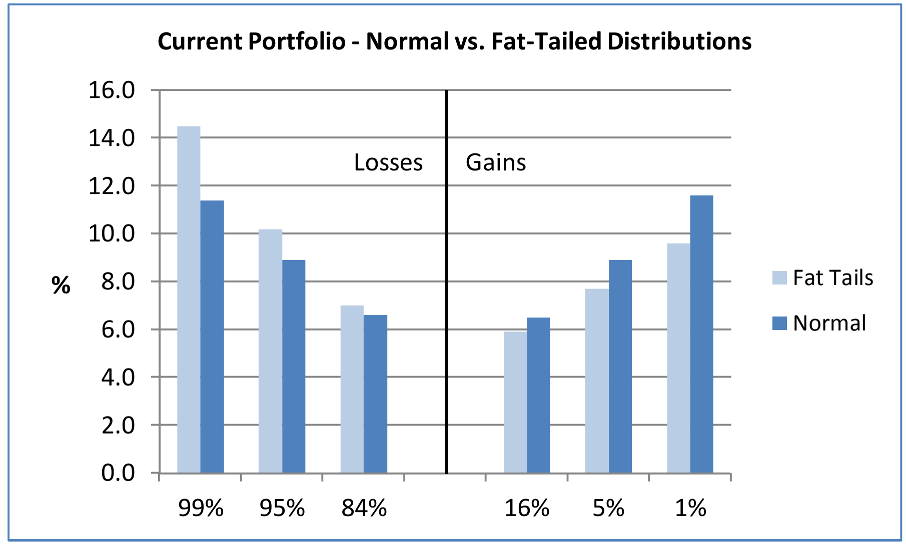
Comparing Models – Current Portfolio

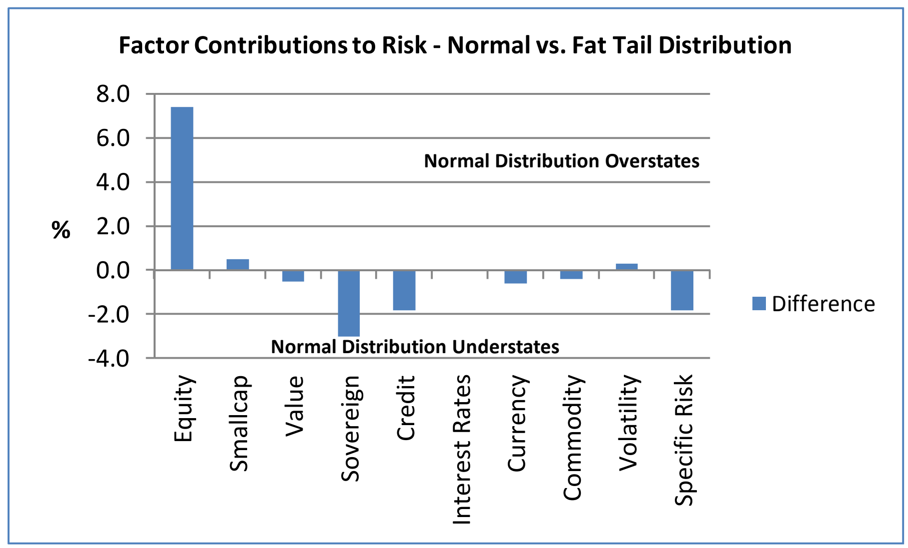
The Normal Distribution:

Å Significantly understates risk in the left tail

Å Significantly overstates “risk” in the right tail

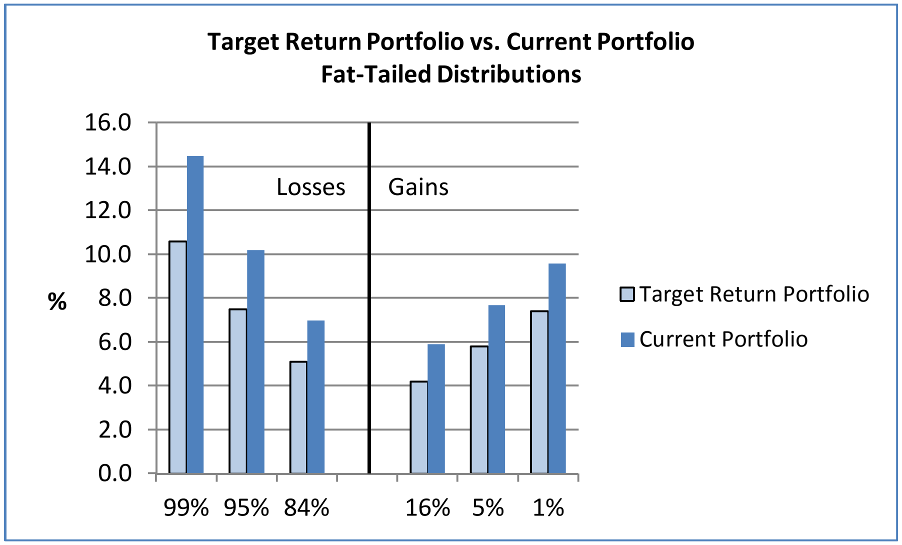
Å And misallocates the sources of risk from underlying factors



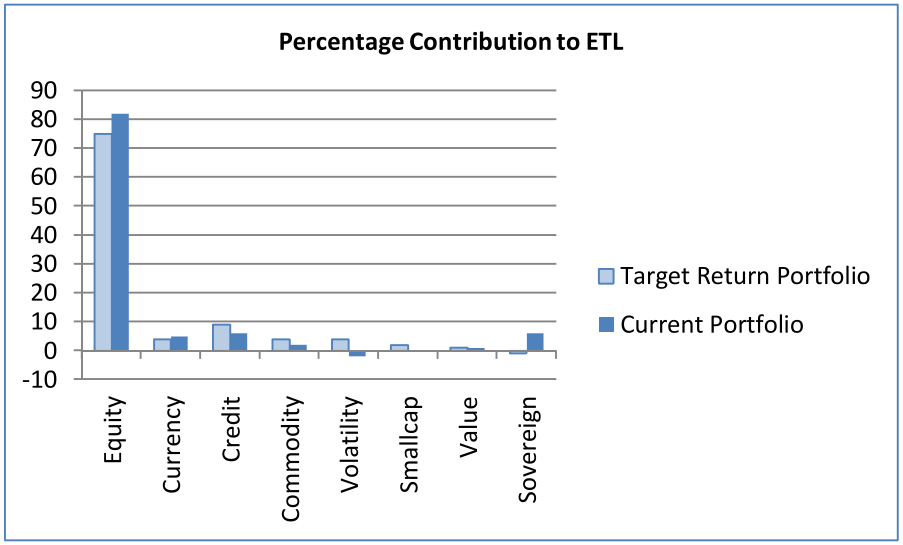


Comparing Portfolios – Fat-Tailed Model

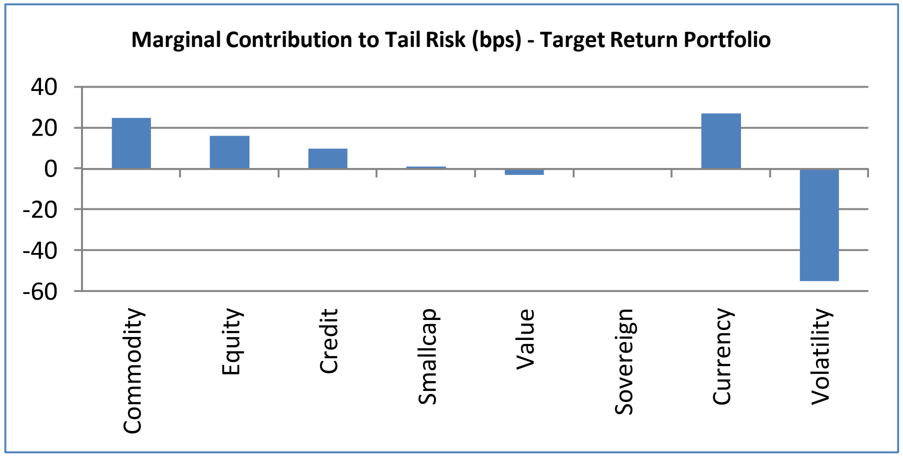
The Target Return portfolio reduces tail risk by approximately 25%



Despite the existing large allocation to private equity, the new portfolio also has better diversification to risk factors



Risk Contributors and Diversifiers



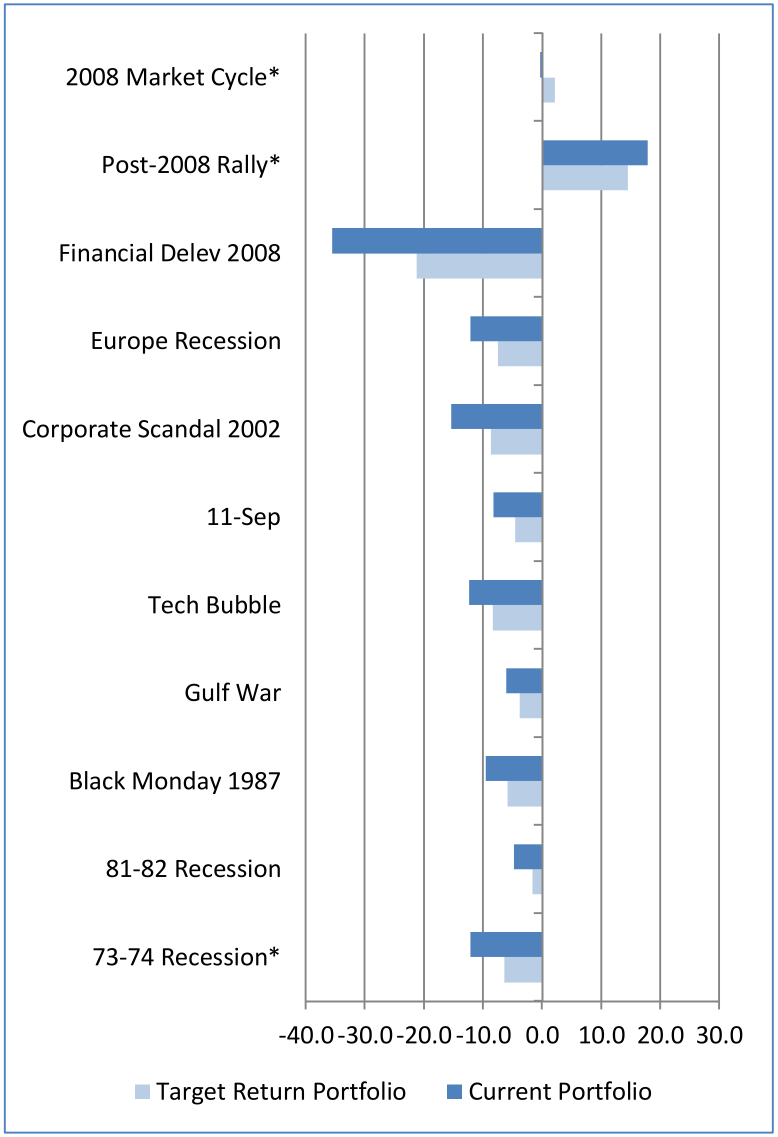
Marginal Contribution to Risk is based on the estimated impact of a 1% change in allocation to a strategy or risk factor

As with nearly every portfolio we see, the strongest diversifier is a strategy that does well when volatility increases

- Difficult to achieve without incurring negative expected returns (put options)
- The next best choices have positive expected returns, but are at best indifferent to volatility
  - Managed Futures
  - Global Macro
  - Risk Parity

Stress Test Scenarios

Scenario	Dates	Target Return Portfolio	Current Portfolio
73-74 Recession*	1/1/73 – 12/31/74	-6.4	-12.1
81-82 Recession	6/30/81 - 2/26/82	-1.6	-4.8
Black Monday 1987	8/31/87 - 11/30/87	-5.9	-9.5
Gulf War	6/29/90 - 11/30/90	-3.8	-6.1
Tech Bubble	6/30/00 - 3/30/01	-8.4	-12.4
11-Sep	8/1/01 - 10/31/01	-4.6	-8.3
Corporate Scandal 2002	5/31/02 - 9/30/02	-8.7	-15.4
Europe Recession	Europe down 20%	-7.5	-12.2
Financial Delev 2008	9/1/08 - 2/27/09	-21.2	-35.5
Post-2008 Rally*	3/1/09 – 3/31/12	14.5	17.9
2008 Market Cycle*	10/1/2007 – 3/31/12	2.1	-0.3
* Annualized			



Risk – 4 Key Questions

How much risk (and what kind)?

Å Volatility
Å "Tail-risk"
Å Tracking Error

Where is it coming from?

Å Risk Factors
Å Asset Classes
Å Active Managers

Do we like these answers?

Å Valuations (Expected Returns)
Å Time Horizon
Å Objectives/Requirements

What's the most efficient way to improve?

For a given strategic or tactical portfolio adjustment, how does it affect:

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