Benchmarking Volatility, Trend Following and Tail Risk Strategies:

A volatility and tail risk investment manager's perspective on what might be appropriate frameworks within which to evaluate these strategies.

What makes an effective benchmark?

Unambiguous

Investable

Measurable

Appropriate

Reflective of current investment opinions

Specified in advance

Courtesy CFA Institute

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Most benchmarks exist to create a risk-premia-return baseline upon which alpha generation may be evaluated.

Equities Benchmarking

Monetizing equity risk premia...

When an investor monetizes the risk premia attached to equities, they receive compensation for taking the risk as a combination of <u>capital gains</u>, <u>dividends</u> etc.

Good benchmarks reflect the cumulative build of an exposure to both.

It is not a straight line...

With the arrival of new information, a self-organized criticality phase, or both, the risk premia adjust, sometimes dramatically. Sometimes, wider, sometimes, narrower.

So what risk premia are volatility, trend following and tail risk strategies harvesting...?

There is some confusion...

What do these strategies do?

Most investment strategies are compromised of a range of methods used to “harvest” risk premia across asset classes, geographies and investment strategies (exotic risk premia).

The two things that volatility, trend-following and tail risk all have in common?

They monetize the <u>change</u> in risk premia, and the <u>uncertainty</u> around that change.

Each tends to be combination of a range of harvesting techniques...

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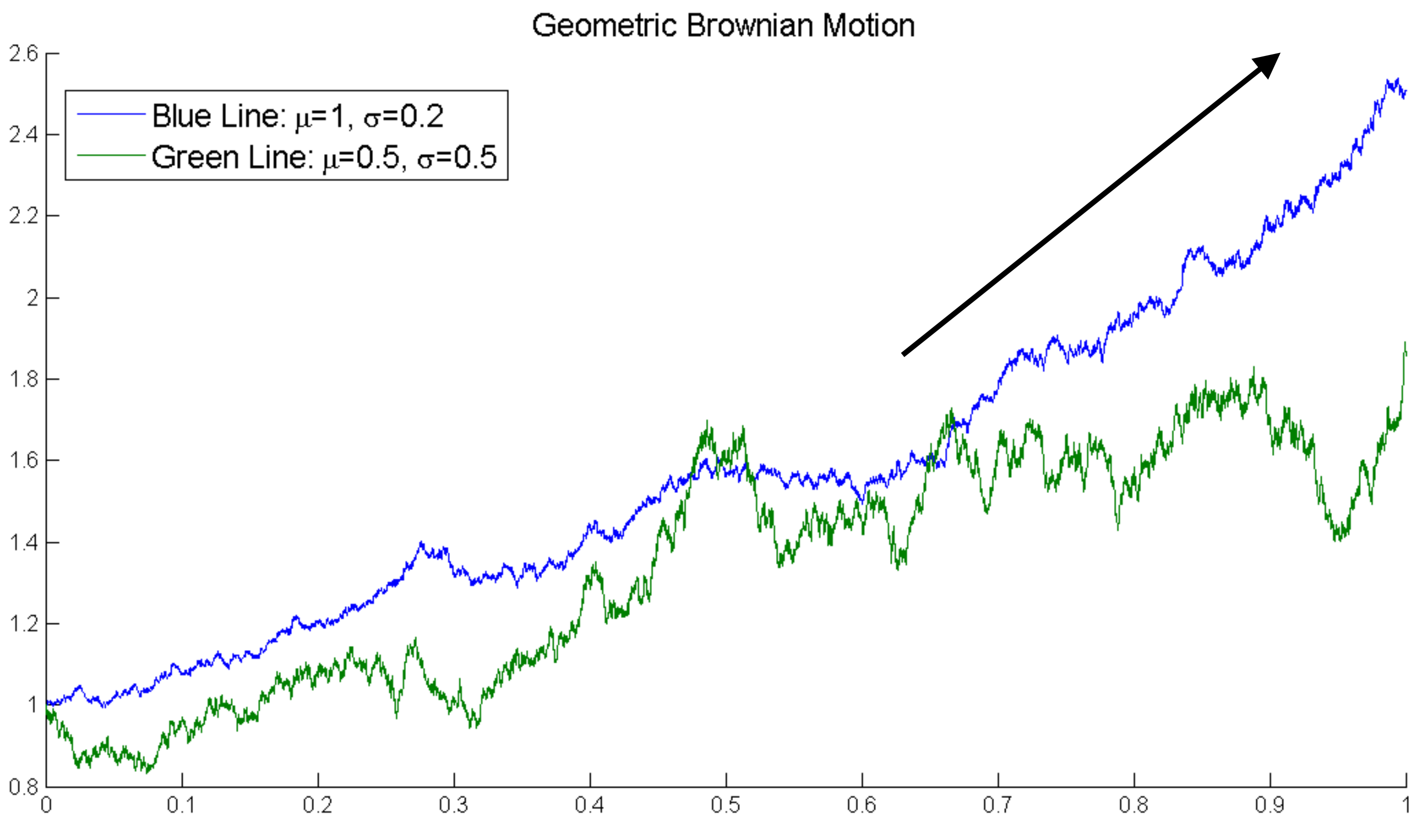
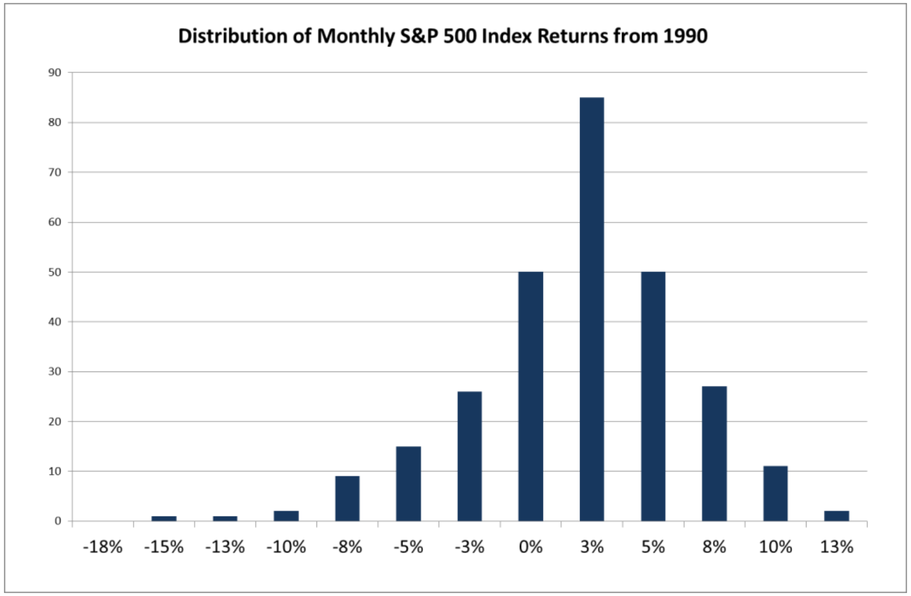
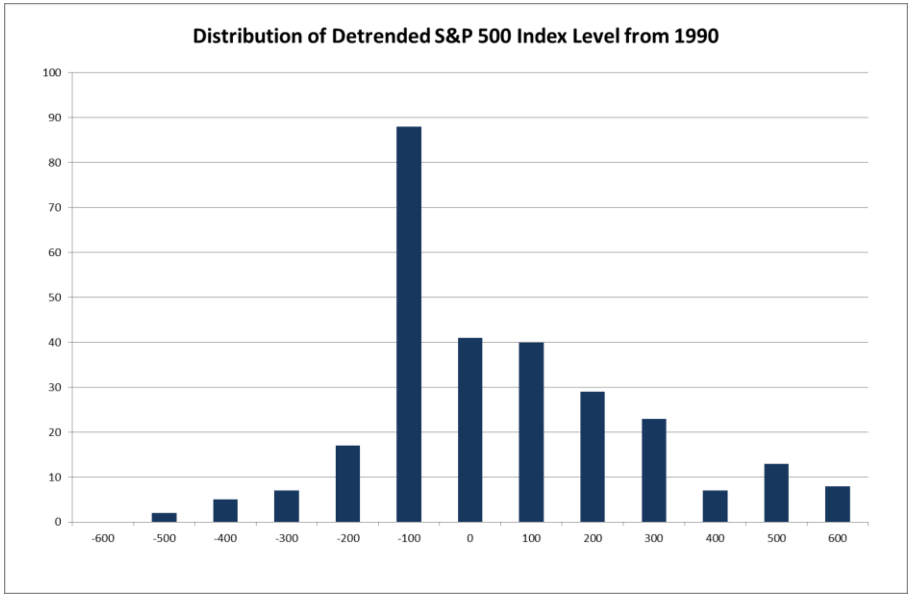
Let’s gets some clarity...

The blue line is smoother but goes further.
The green line does not go as far...and is “noisier”.



Source: http://en.wikipedia.org/wiki/Geometric_Brownian_motion





Same index, different-looking distributions.

It is important to distinguish between:

The 'tails' in terms of price. (drift-related)

The 'tails' in terms of change-in-price. (volatility-related)

Source of charts: Bloomberg accessed on 12th May 2013

Drift

$$dP_t(\omega_t) = \mu_t(\omega_t)dt + \sigma_t(\omega_t)dW_t$$

Brownian Process

The standard description of price dynamics in financial mathematics – the stochastic process.

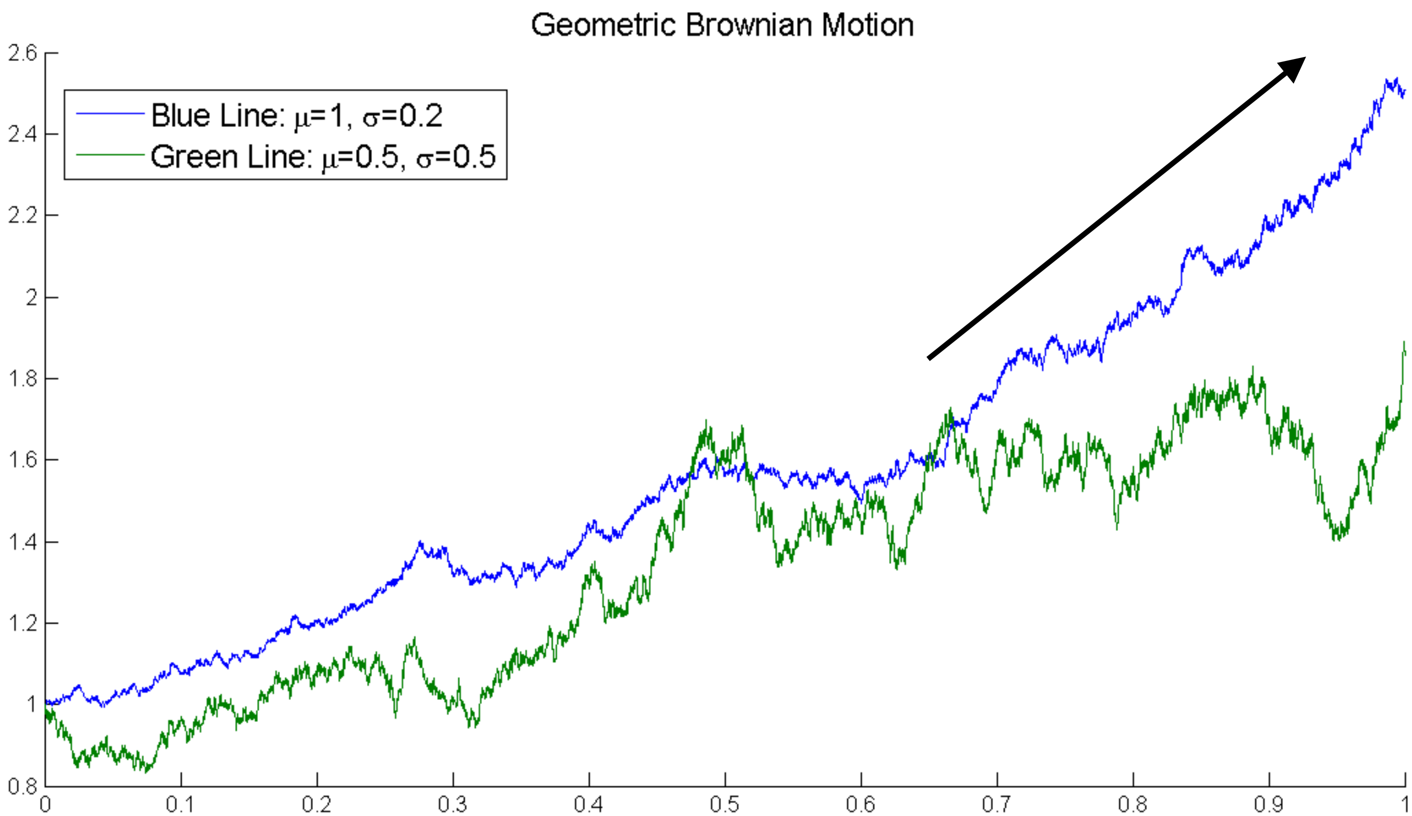
Trends

$$dP_t(\omega_t) = \mu_t(\omega_t)dt + \sigma_t(\omega_t)dW_t$$

Volatility

The standard description of price dynamics in financial mathematics – the stochastic process.

The blue line has lower volatility, but greater drift. This could be a tail event also (in price terms).



Source: http://en.wikipedia.org/wiki/Geometric_Brownian_motion

What differentiates these strategies?

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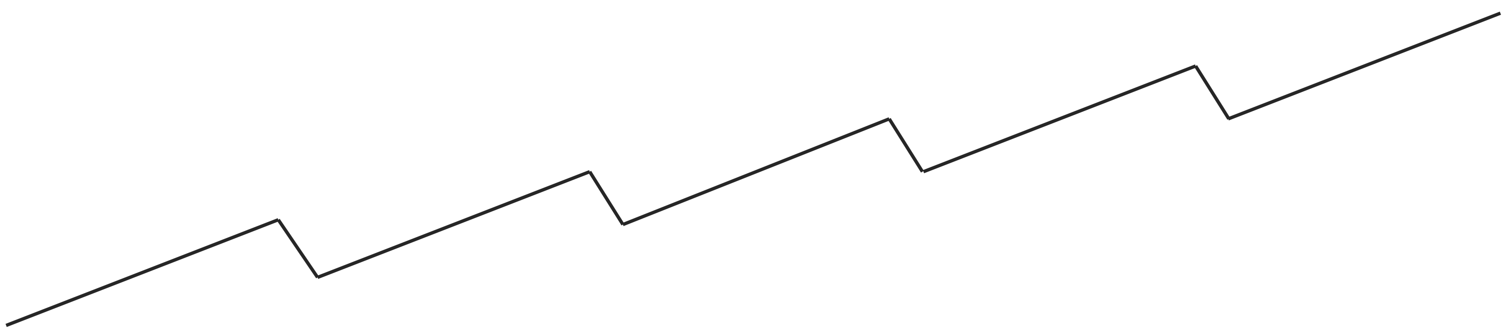
Trend-following strategies (CTAs) monetize the drift of markets, either that generated as a result of risk-premia monetization (e.g. equity bull markets), or changes in risk premia (e.g. extended equity bear markets).



What differentiates these strategies?

Volatility strategies monetize the <u>random (Brownian) process</u> around the markets' <u>indecision</u> as to the <u>appropriate level of the risk premia</u>, and the <u>uncertainty</u> around that randomicity.

What differentiates these strategies?

Tail risk strategies, when implemented using options, contain elements of both.

What drives their performance?

Risk premia monetization – the trend associated with capital gains.

Changes in the risk premia – directional moves <u>outside</u> the long cycle drift expected of the risk premia.

The market changes its view of the long run expected return.

<u>Indecision</u> around the appropriate level of risk premia e.g. should it be 5%, or 6%, or 4%?

Market oscillations creating <u>realized volatility</u> of the underlying.

Uncertainty around the change pathway of risk premia.

e.g. implied volatility

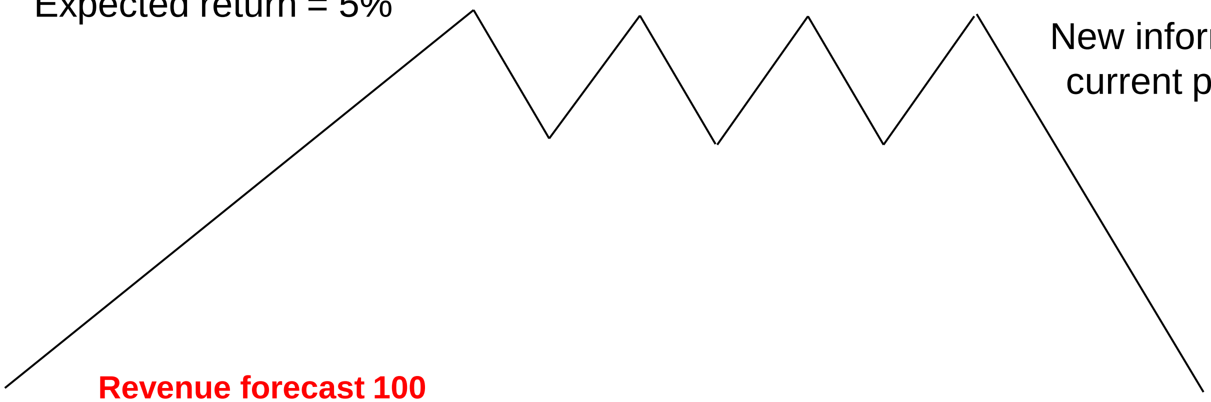
Indecision + Uncertainty

Should the expected return be 5%, or 6%?

Expected return = 5%

Revenue falls to 50

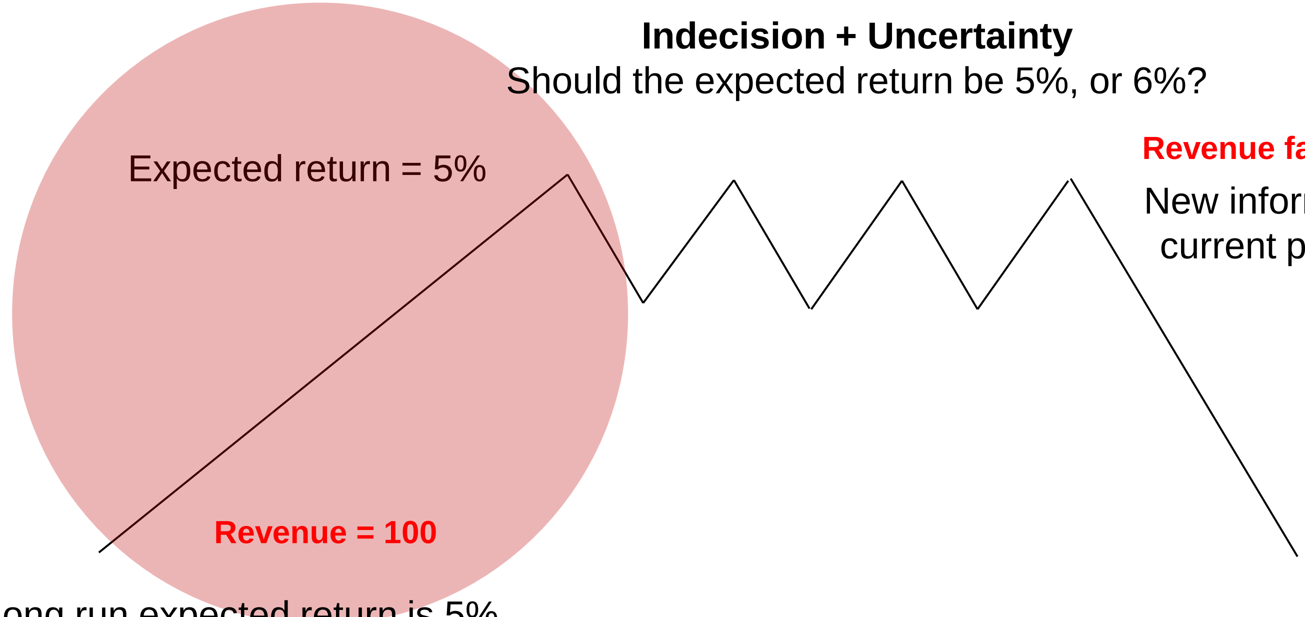
New information – expected return at current pricing is 2.5%. Market must fall.



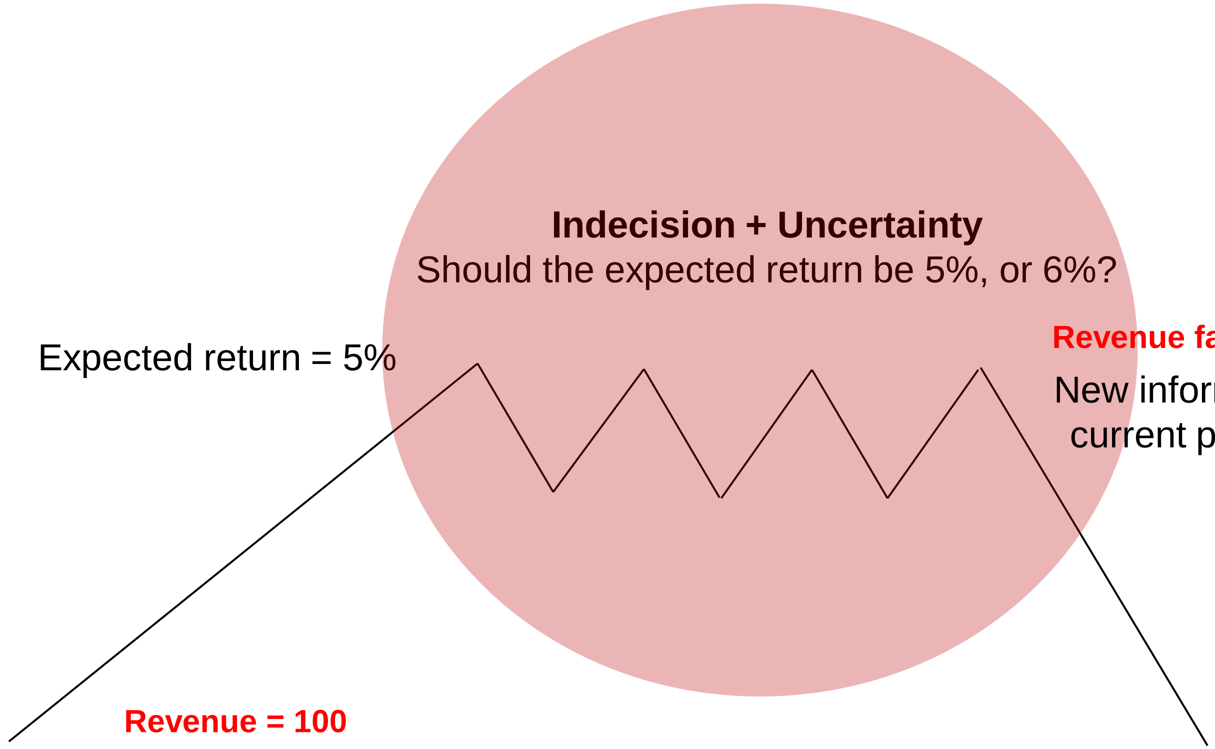
Revenue forecast 100

Long run expected return is 5%. Current expected return = 10%. Market must rally to equilibrium.

Market falls to take it back to equilibrium pricing of 5% long run expected return.



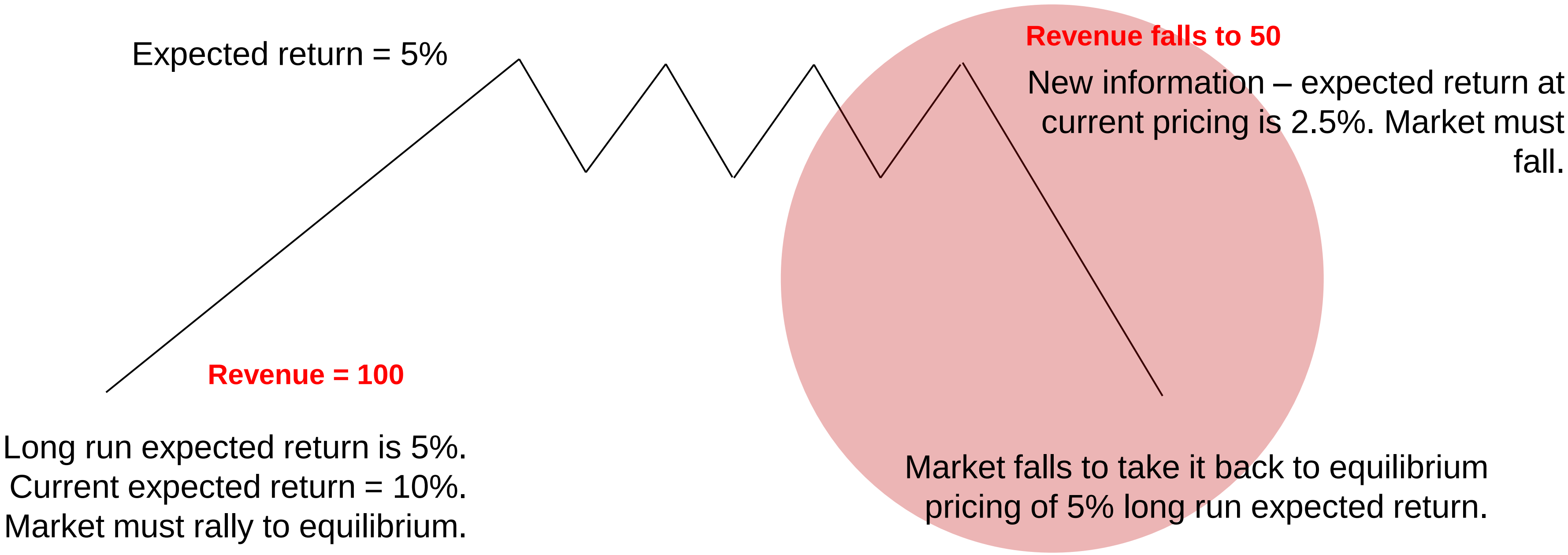
Standard risk premia monetization, trend following, and short volatility strategies do well as the risk premium contracts.



Short volatility strategies do well here but trend-following and long volatility strategies don’t.

Indecision + Uncertainty

Should the expected return be 5%, or 6%?



Long volatility strategies do well with the unexpected information. Long tail risk and trend-following strategies do well if the move extends. Risk premia harvesting strategies suffer.

The sensitivity of strategies to harvesting risk premia...

	"We call it..."	Short Volatility	Trend-Following (theoretical)	Short Tail Risk
Risk premia monetization	*Normal markets*	Positive	Positive/Negative	Positive
Change in risk premia	*Big trends*	Negative	Positive/Negative	Negative
Indecision around risk premia pricing	*Choppy markets*	Negative	Positive	Negative
Uncertainty of Indecision	*Increased Implied Volatility*	Negative	Negative	Negative
Gap Risk	*Sudden large price changes*	Negative	Positive	Negative

The sensitivity of strategies to being <u>short</u> risk premia...

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	"We call it..."	Long Volatility	Trend-Following	Long Tail Risk
Risk premia monetization	*Normal markets*	Negative	Positive + Negative	Negative
Change in risk premia	*Big trends*	Positive	Negative	Positive
Indecision around risk premia pricing	*Choppy markets*	Positive	Positive	Positive
Uncertainty of indecision	*Increased Implied Volatility*	Positive	Negative	Positive
Gap Risk	*Sudden Large Price Changes*	Positive	Negative	Positive

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Recognize which side of the risk premium distribution is being monetized...

Is the strategy long or short the risk premium?

Monetizing equity risk premia...

When an investor monetizes the risk premia attached to equities, they receive compensation for taking the risk as a combination of capital gains, and dividends.

Good benchmarks reflect the cumulative build of an exposure to both.

A strategy diversification to smooth out the returns...but has a negative expected return...

The Dow Jones Credit Suisse Dedicated Short Bias Hedge Fund Index. The strategy is to maintain net short as opposed to pure short exposure. Short biased managers take short positions in mostly equity and derivatives.

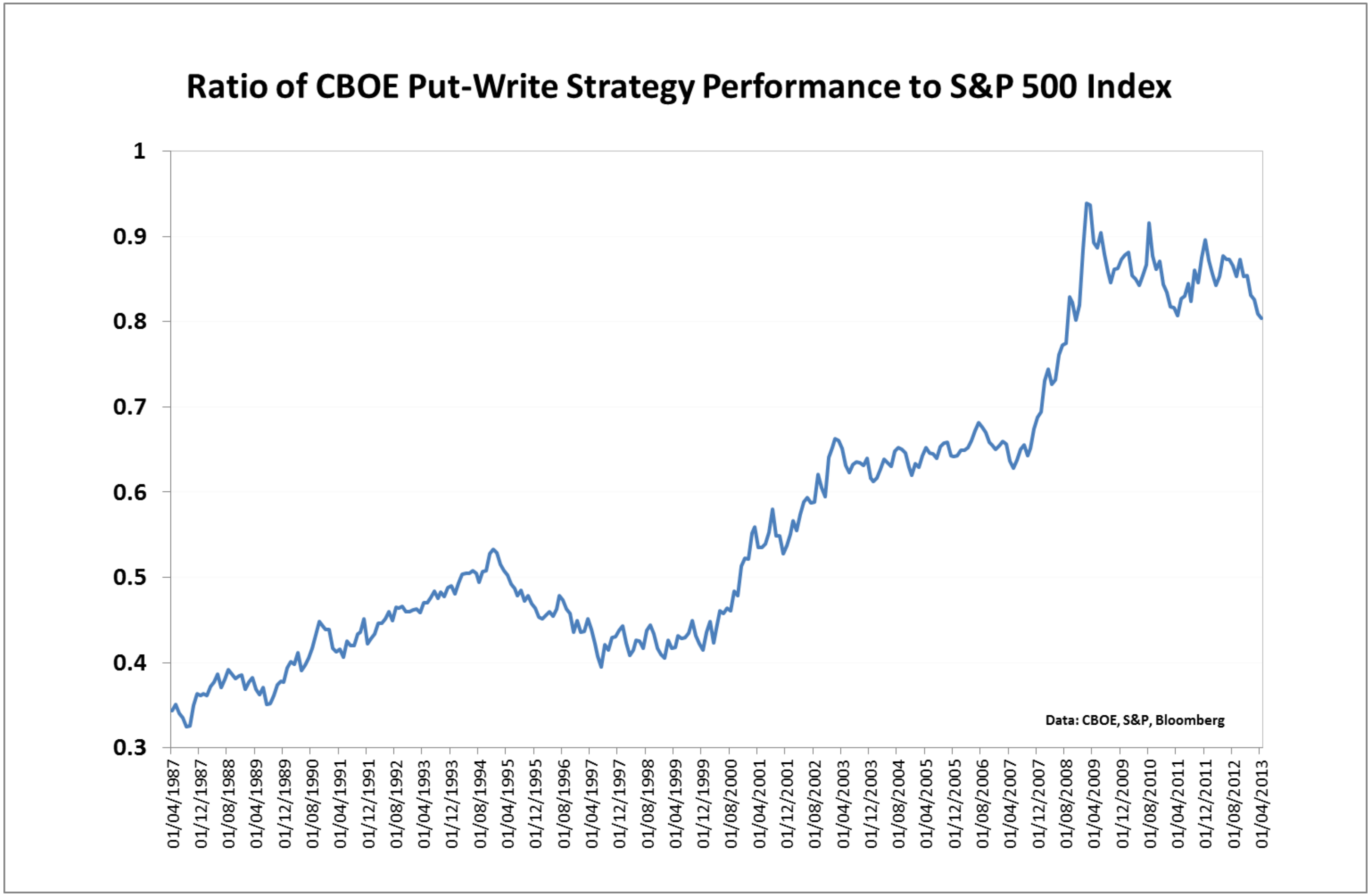
So what should the benchmark be for a volatility strategy...?

If a short volatility strategy, it should reflect the return generated from harvesting both the market's indecision as to the appropriate level of a risk premium, and the risk premium attached to that indecision (implied volatility).

Does a volatility risk premium exist?

Performance of the CBOE put-write strategy since 1987...

The outperformance of the put-write strategy against the S&P500 index indicates there is a risk premium to harvest.



So a strategy based on taking a structurally-opposed position would have a <u>negative expected return?</u>

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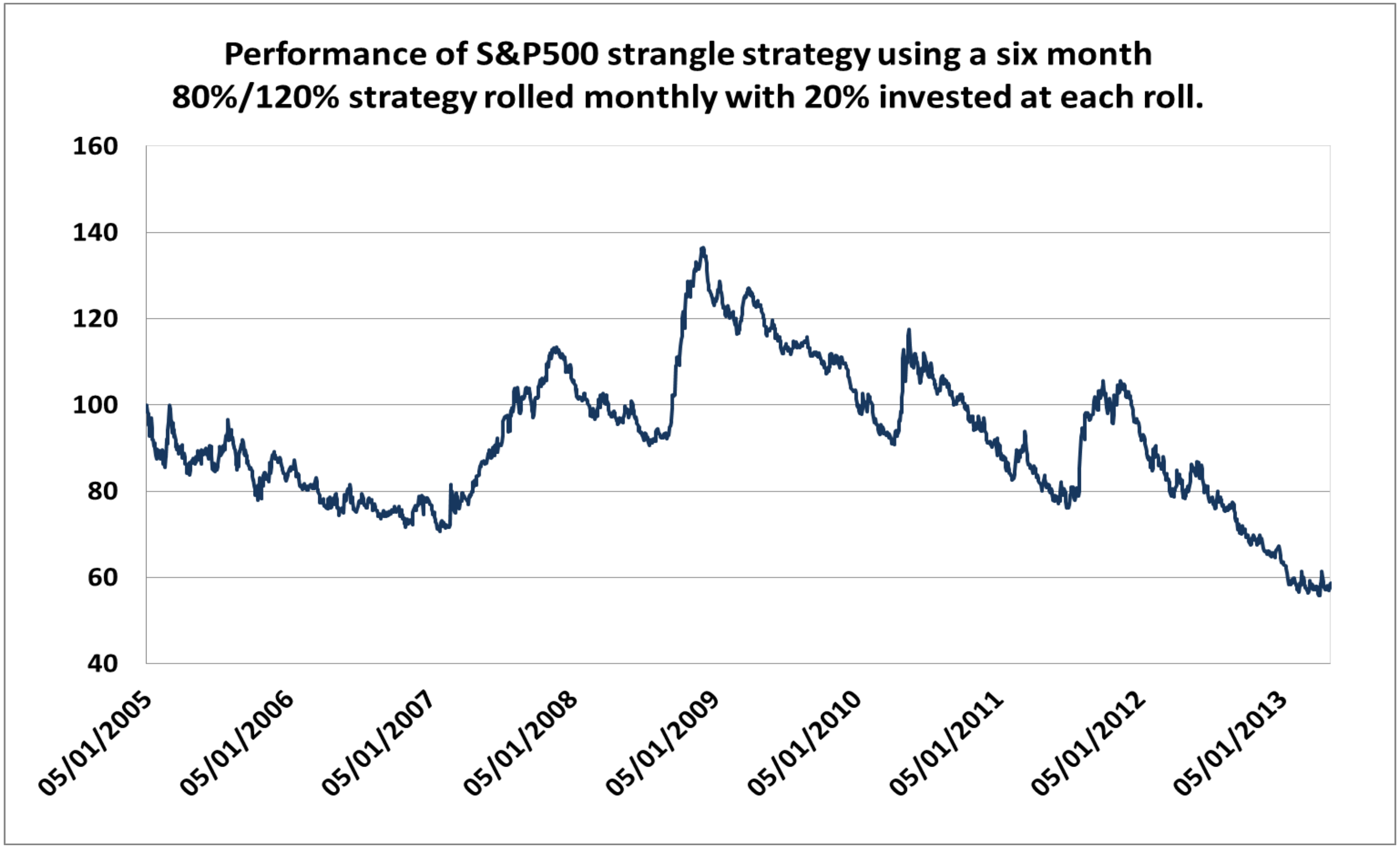
If a long volatility strategy, it should reflect the cost generated from paying the risk premium attached to volatility.

It is pretty clear there is a negative expected return for those strategies that are long the tails through volatility exposures....



Source of charts: Bloomberg accessed on 12th May 2013

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Benchmarking volatility, trend-following and tail risk strategies requires the creation of style benchmarks.

It is important to understand which components of the strategy are long or short the underlying risk premia.

The style benchmarks will be a composite of easily replicated strategies that replicate the payoff of each of the drivers of returns across these strategies.

These are:

Structural Expected Return (Drift)
Trend Magnitude (Change in Drift slope)
Realized Volatility (Indecision)
Implied Volatility (Uncertainty of Uncertainty)

TAIL RISK HEDGING: THEORY & PRACTICE

“Benchmarking Volatility, Trend Following and Tail Risk Strategies”

Risk Books/Incisive Media

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