

Unmasking and Managing Uncertainty: The Role of Volatility in Portfolio Management

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Motivation

- There are critical issues facing portfolio management today
- The role of volatility
- There are opportunity costs of ignoring volatility

Volatility Basics

Volatility refers to the amount of **uncertainty or risk** about the size of changes in a security's value.

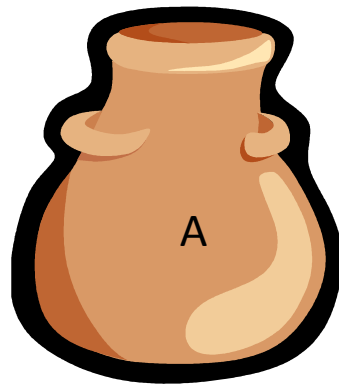
- **Risk** is defined as the possibility that an outcome will not turn out as you expect it.
- **Uncertainty** is a situation where the consequences, extent or magnitude of circumstances, conditions, or events is unknown.

Risk vs. Uncertainty?

Consider the following game. Urn A is filled with colored balls

- 50 red balls and 50 black balls
- Select a color red or black
- If your color is selected I will pay you \$10,000
- What would you pay to play this game?

50/50

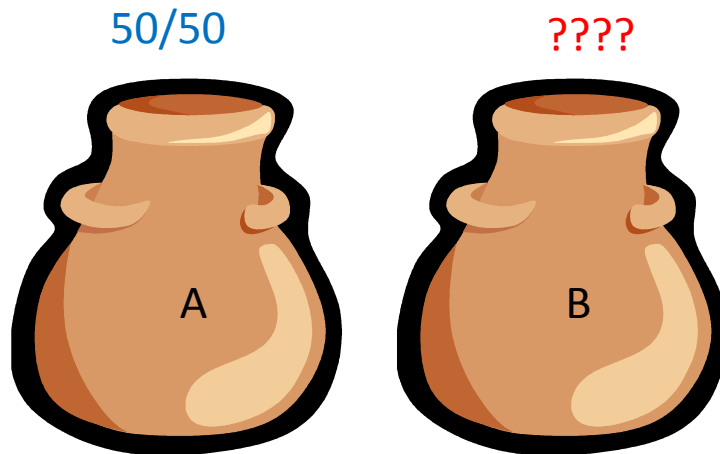


Risk vs. Uncertainty?

Consider the following game. Urn B is filled with colored balls

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- Select a color red or black
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Why?

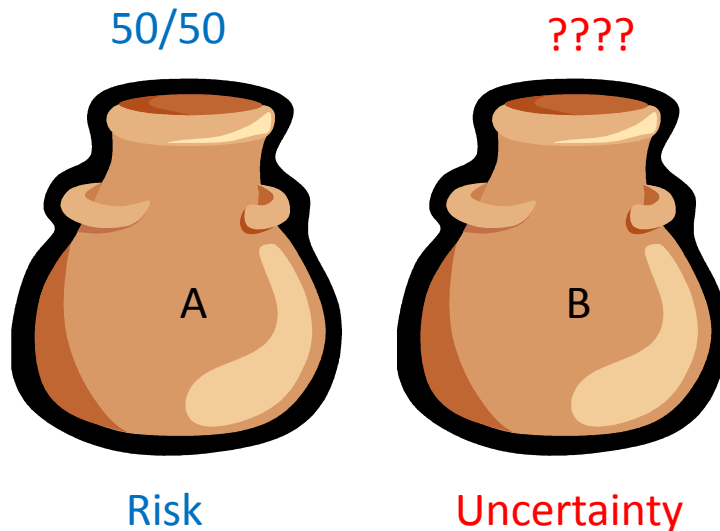


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Why?



Conceptualizing Volatility

Past volatility tells us about the risks we faced.

The current value of **future volatility** is governed by our perceptions of uncertainty going forward.

As market participants buy and sell assets as well as buy or sell contracts dependent on future volatility, they incorporate their views on or perception of future uncertainty.

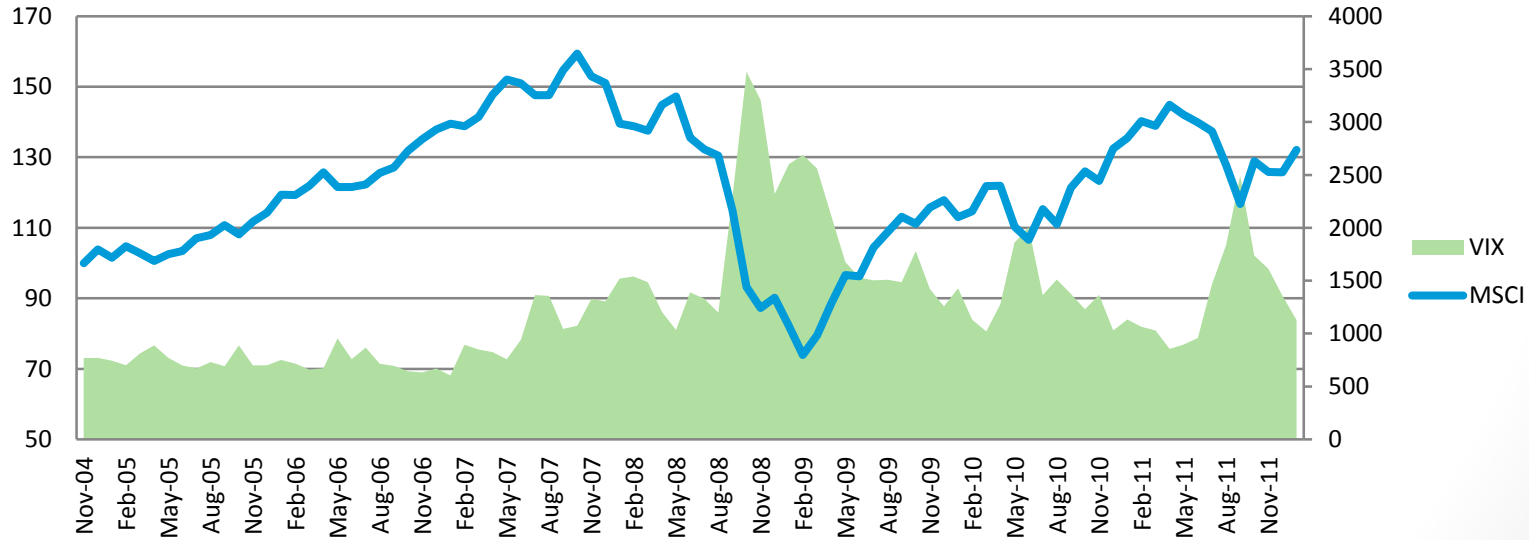
Volatility As An Asset Class?

Asset Class	Past	Future
Equity	Past prices represent the <i>realized value</i> of corporations	Future expectations for value
Fixed Income	Past values represent the <i>realized return on money</i> over different horizons	Future expectations for the return on money over different horizons
Volatility	Realized volatility represents the <i>realized risk</i> faced in markets	Future expectations for level of uncertainty going forward

Behavioral Connections

Since volatility is really about market participants perceptions of future uncertainty or risk, the level of volatility in markets can be linked to behavioral finance.

Inverse Equity Volatility Relationship



Investing in Volatility

All investments are subject to volatility.

Vega is a simple way of estimating how much your position will change if there is a change in volatility.

- Equity positions have negative vega i.e. they will lose money than gain “on average” when volatility increases.

Volatility risk premium can be documented empirically by the fact that implied volatility often trades at a premium to realized volatility. This means that there is an inherent demand for future uncertainty and owning it is similar to owning insurance against future increases in volatility.

Volatility Instruments

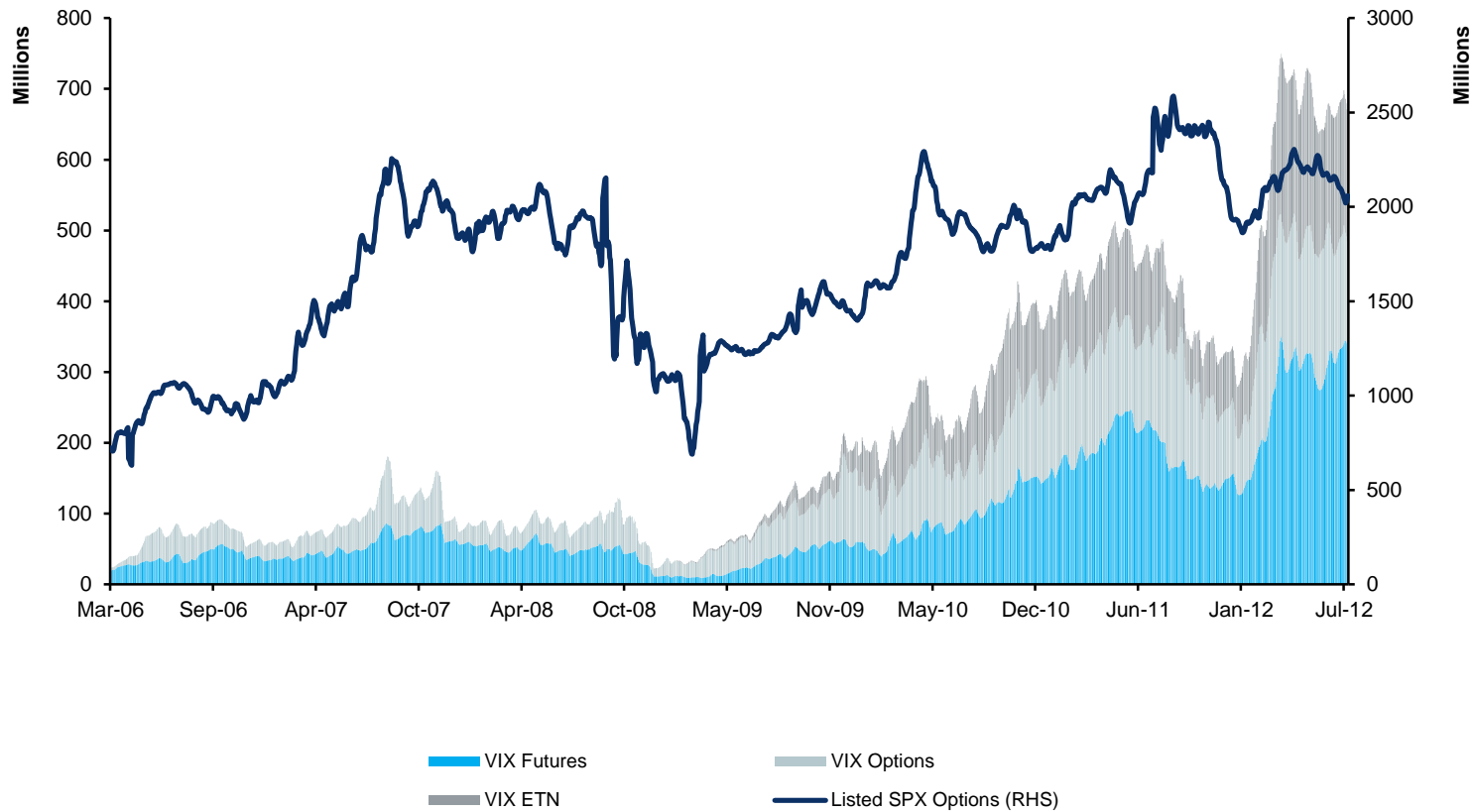
- Options (Straddles and Strangles)
- Volatility and Variance Swaps
- Volatility Futures
- Options on Volatility Futures

Key issues to think about with each type of contract

- Nature of either volatility exposure (Linear or convex? Possible use for tail exposure? Time horizon?)
- Relevant contribution to downside risk reduction

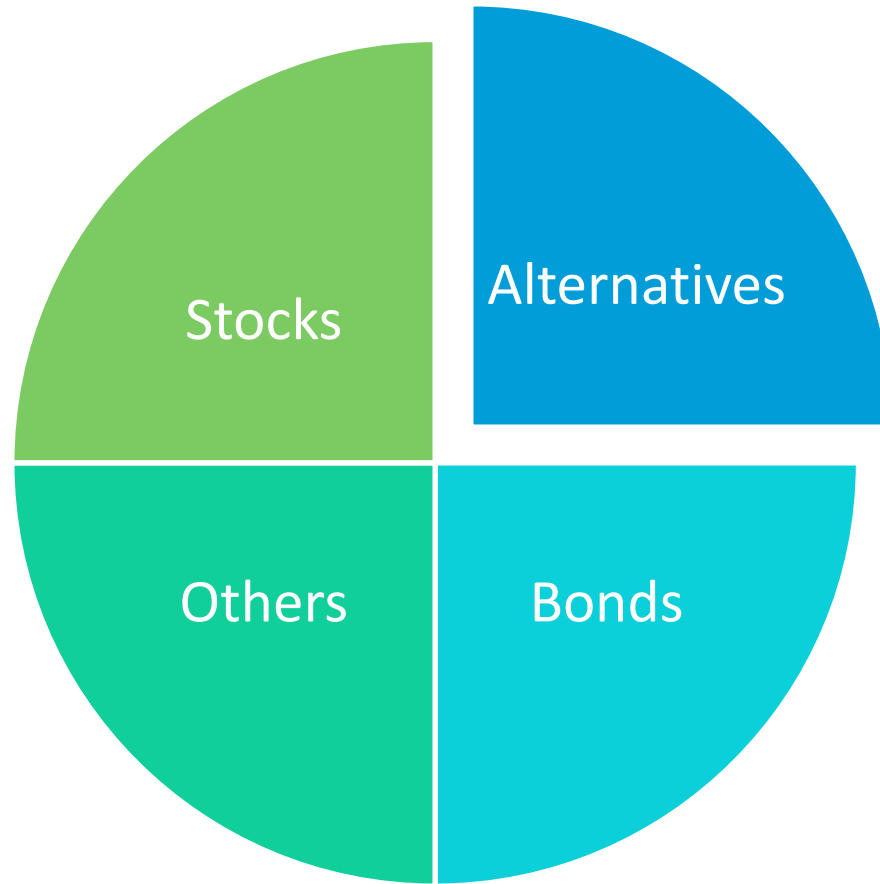
Exponential Growth

Volume in Volatility Contracts



Source: Barclays Research

Portfolio Management



The Role of Volatility

- Many traditional investments are short volatility
- Most alternatives have also been shown to be short volatility.

If one looks at the global portfolio, seeing volatility as a risk factor, most portfolios are locally optimized leaving large exposure to volatility.

Portfolio Management

Local Optimal
Alternative
Portfolio

Global Optimal
Alternative
Portfolio



Most Alternatives Portfolios
are locally optimized and
short volatility

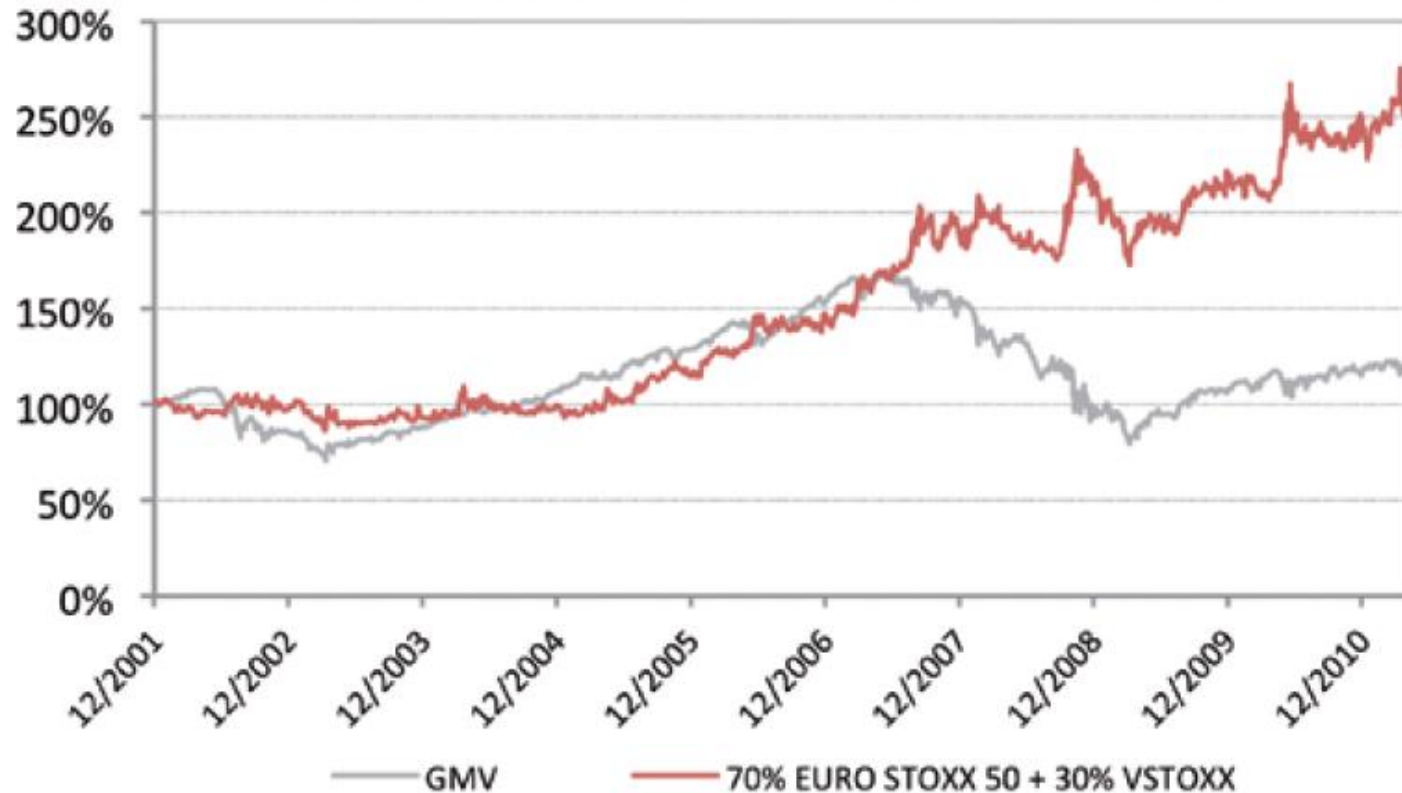
A crisis alpha or
“protection” portfolio
is closer to a global
optimal portfolio

Volatility in Portfolio Management

- Volatility has been historically negatively correlated with equity markets. This fact makes a long position in volatility a natural hedge.
- Even a modest allocation to volatility can have attractive downside risk properties and drawdown implications. (Recent EDHEC Volatility Study Guobuzaitė and Martinelli May 2012)
- Empirically long volatility strategies have performed well, and there are qualitative reasons for continued performance.

Adding Long Volatility

Figure 3: Performance of Diversified Portfolio with VSTOXX Exposure and Global Minimum Variance (GMV) Portfolio



Source: Guobuzaitė and Martinelli 2012

Conclusions

If you are really looking for diversification, find investments that like **crisis and volatility**.

Speaker Biography

Kathryn M. Kaminski, PhD, is the CIO and Founder of Alpha K Capital LLC, a thematic fund focused on “offensive strategies” for tail risk management. Prior to starting Alpha K Capital, Kathryn worked in investment management as a Senior Investment Analyst at RPM, a fund of hedge funds in Managed Futures. While at RPM, she coined the phrase "crisis alpha" to describe Managed Futures strategies with her work in Futures Magazine and for the CME Education Group as a market commentator. She also has quant experience in both emerging fixed income and credit markets. Kathryn’s work has been published in across a wide range of publications including IPE Magazine, Futures Magazine, SFO Magazine, etc.

Kathryn earned her PhD at the MIT Sloan School of Management where she did research on financial heuristics in collaboration with Professor Andrew W. Lo as part of the MIT Laboratory for Financial Engineering. Her research interests are in the area of portfolio management, asset allocation, financial heuristics, behavioral finance, and alternative investments. She holds and has held academic lecturing positions in the areas of derivatives, hedge funds, and financial management at the Stockholm School of Economics, the Swedish Royal Institute of Technology (KTH), and the MIT Sloan School of Management. In 2011/2012, she was awarded the honor of teacher of the year at the Stockholm School of Economics.

* In 2011, Kathryn was selected as a PAAMCO 100 Women in Hedge Funds CAIA Scholar.

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