

**Basics of Asset Allocation
&
Developing Investment Strategies**
An Overview

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Dr. Marcus Schulmerich, CFA, FRM
Global Portfolio Strategist



Contents

- 1. A Quick Introduction to SSgA and Asset Management Basics**
- 2. What we saw in the Markets ...**
- 3. A Systematic Approach to Asset Allocation**
- 4. Developing Investment Strategies**

Appendix: GIPS® Reports
 Disclaimer
 Biography

A Quick Introduction to SSgA and Asset Management Basics

A Leading Provider of Financial Services to Institutional Investors



STATE STREET.

***SSgA is a global leader
in asset management relied
on by sophisticated
institutions worldwide for
their investment needs***

- Subsidiary of State Street Corporation, one of the world's leading providers of financial services to institutional investors, with a heritage dating back over two centuries
- Entrusted with €1.8 trillion* in assets worldwide
- Clients include governmental entities, corporations, endowments and foundations, third party asset gatherers, multi employer plans, pension funds and sovereign wealth funds
- ETF industry pioneer and leader since 1993 with over €300 billion* in AUM

**State Street
Global Services**

A global leader in
asset servicing



**State Street
Global Advisors**

A global leader in
asset management

**State Street
Global Markets**

A global leader in
research and trading

As of June 30, 2014.

* This AUM includes the assets of the SPDR Gold Trust (approx. €24.4 billion as of 30 June 2014), for which State Street Global Markets, LLC, an affiliate of State Street Global Advisors, serves as the marketing agent. The currency exchange rate of USD/EUR is as of June 30, 2014.

STATE STREET GLOBAL ADVISORS.

Key Definitions (I)

Asset Management Firm:

Firm that manages the client's assets, e.g., pension assets.

Portfolio:

A combination of assets with certain weights, e.g., a portfolio of UK stocks.

Index:

A special portfolio that represents a certain security market, e.g., the FTSE All Share index represents the UK stock market.

Benchmark:

An index that is used as a comparison, e.g., a UK stock portfolio is compared to the FTSE All Share index.

Key Definitions (II)

Passive Management:

The portfolio aims to deliver the same return than the benchmark.

Active Management:

The portfolio aims to deliver a higher return than the benchmark.

Fundamental Asset Management:

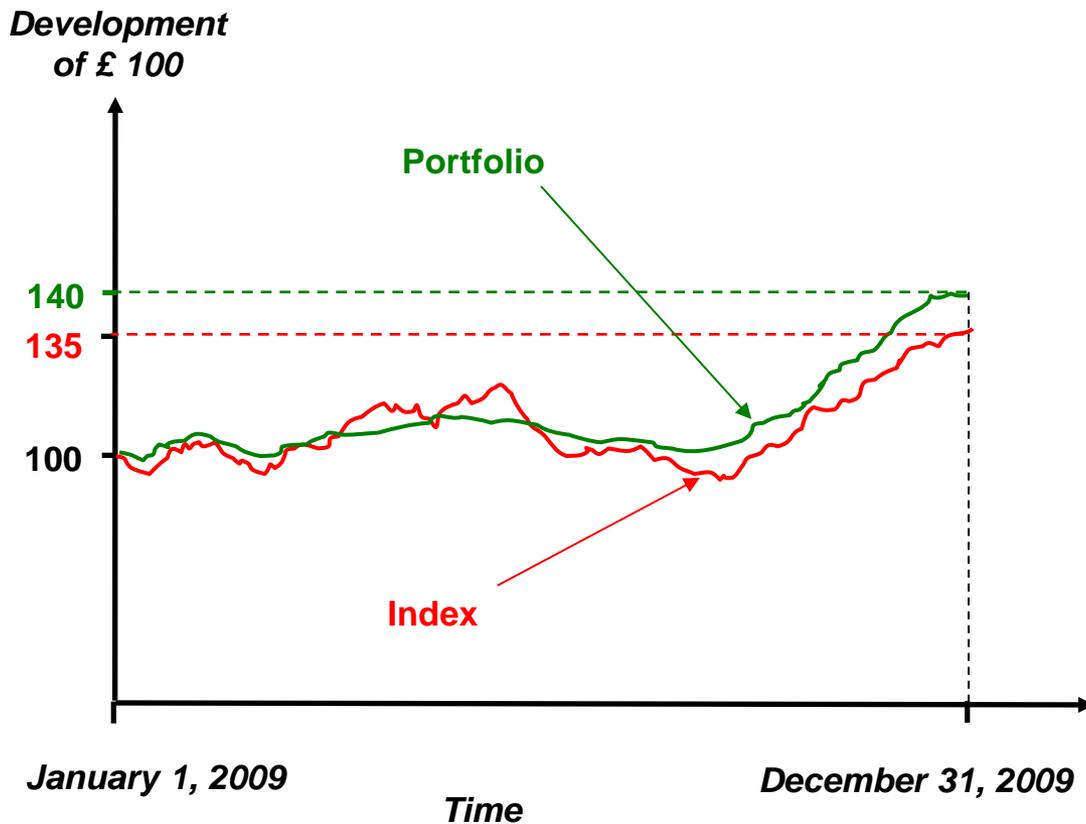
The asset manager uses primarily fundamental analysis and balance sheet investigations to reach the buy/sell decisions.

Quantitative Asset Management:

The asset manager uses mathematical algorithms to reach the buy/sell decisions.

Return of a Portfolio

Development of a portfolio and an index within 1 year



Absolute Return in 2009:

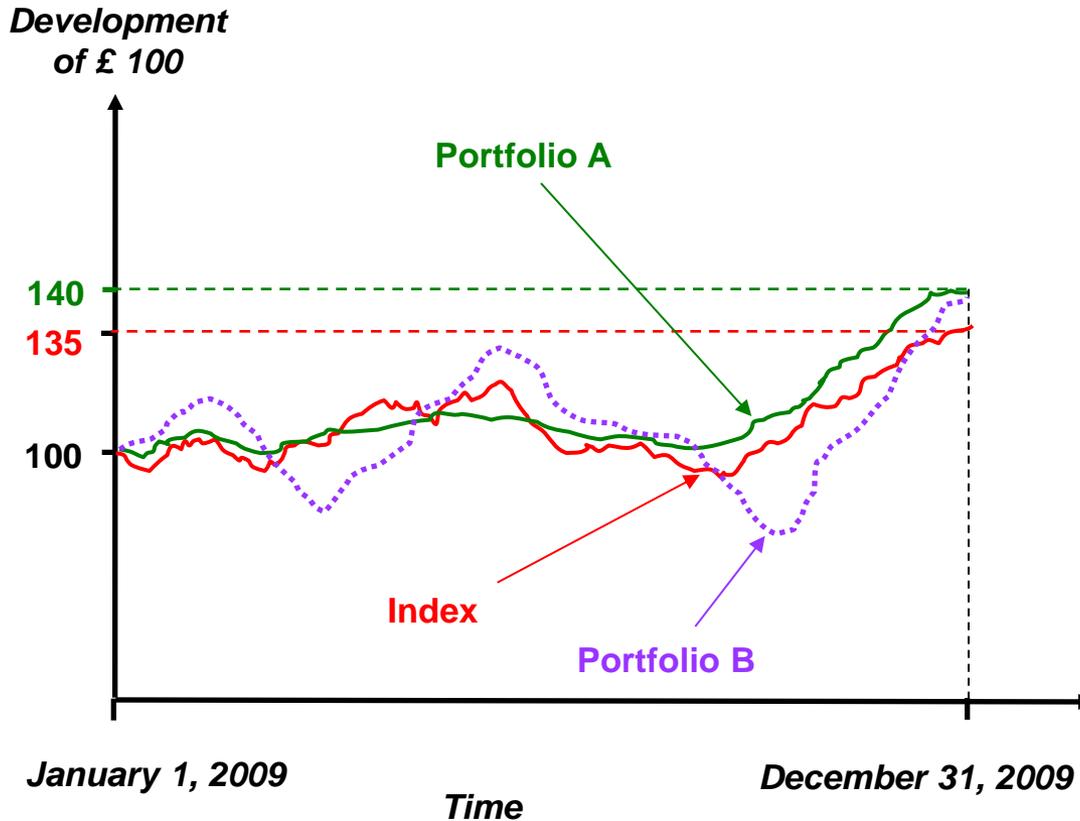
Index return:	35%
Portfolio return:	40%

Relative Return in 2009:

Alpha of portfolio:	5%
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Risk of a Portfolio

Development of a portfolio and an index within 1 year



Absolute Risk in 2009:

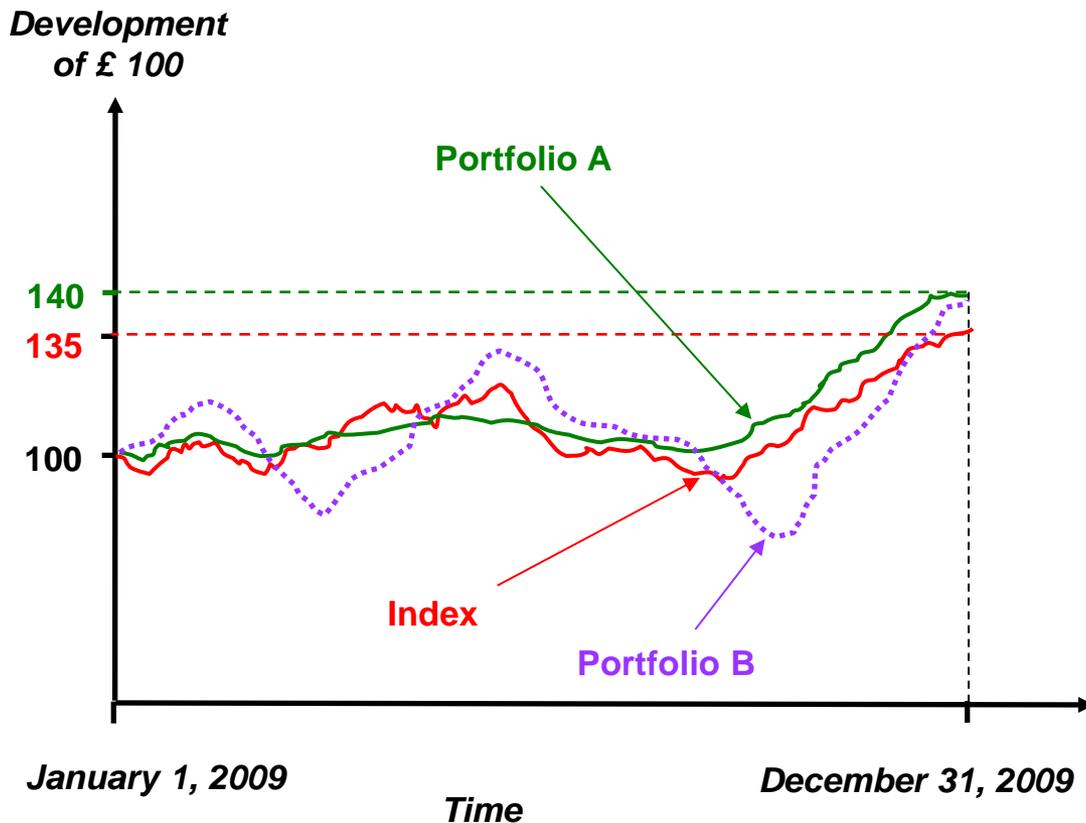
Volatility of index:	20%
Volatility of portfolio A:	21%
Volatility of portfolio B:	30%

Relative Risk in 2009:

Tracking error of portfolio A:	4%
Tracking error of portfolio B:	9%

Key Definitions – Risk-Adjusted Return

Development of a portfolio and an index within 1 year



Absolute Risk-Adjusted Return in 2009:

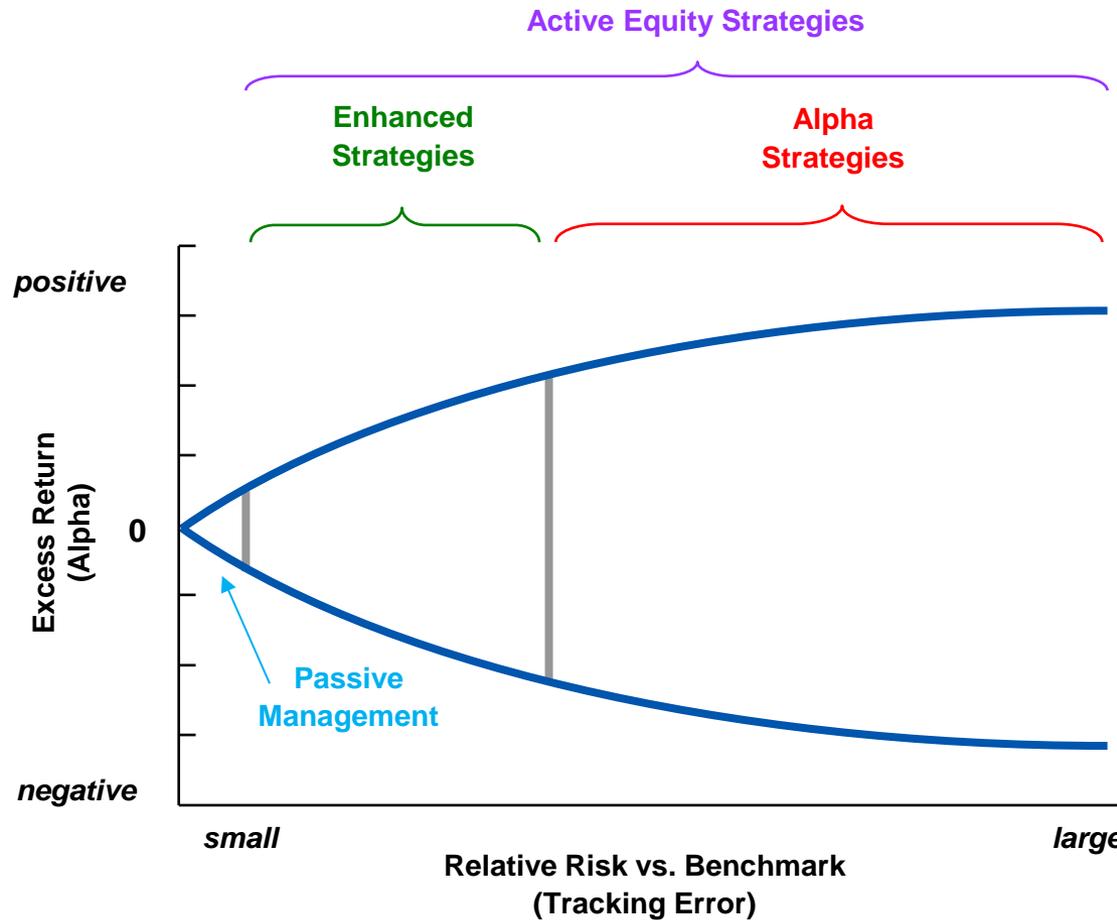
Sharpe ratio of the index:	1.75 = 35%/20%
Sharpe ratio of portfolio A:	1.90 = 40%/21%
Sharpe ratio of portfolio B:	1.33 = 40%/30%

Relative Risk-Adjusted Return in 2009:

Information ratio of portfolio A:	1.25 = 5%/4%
Information ratio of portfolio B:	0.56 = 5%/9%

Passive and Active Equity Management at SSgA

Relationship of Risk and Return



What we saw in the Markets ...

The Reality in Finance: Emotions Lead To Mistakes

US Stock Market Performance 1994–2010 (S&P 500 Index)



Source: Barclays, SSgA and MSCI as of August 31, 2014.

Index returns are unmanaged and do not reflect the deduction of any fees or expenses. Index returns reflect all items of income, gain and loss and the reinvestment of dividends and other income.

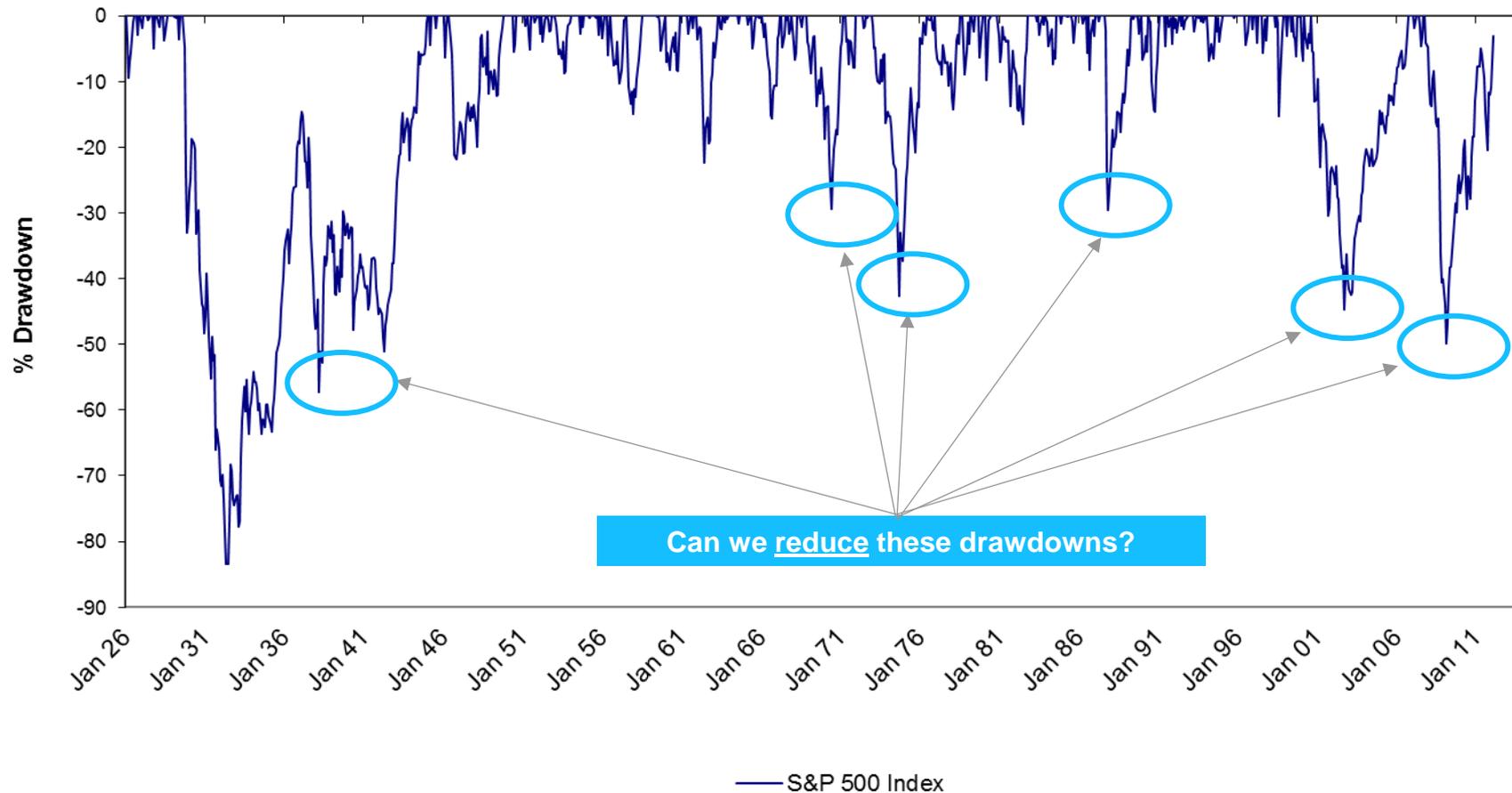
Past performance is not a guarantee of future results. Performance returns for periods of less than one year are not annualized.

And in September 2014 ...

Where are we now?

Historical Drawdown — S&P 500[®] Index

S&P 500 Total Return Drawdown 1926 – March 2012



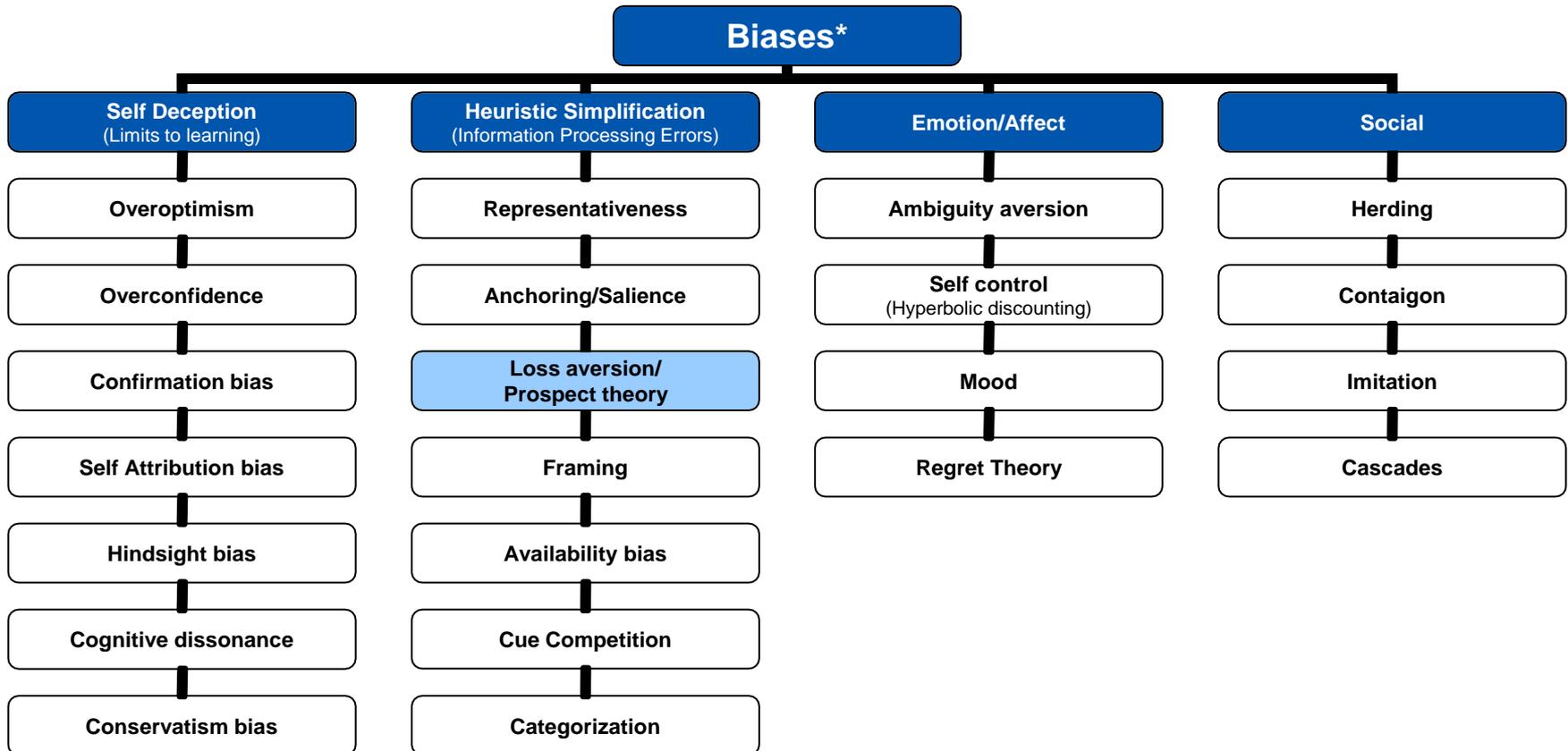
Source: Zephyr StyleADVISOR, as of August 31, 2014.

Index returns are unmanaged and do not reflect the deduction of any fees or expenses. Index returns reflect all items of income, gain and loss and the reinvestment of dividends and other income. Investors cannot invest directly in an index.

Standard & Poor's S&P 500 Index is a registered trademark of Standard & Poor's Financial Services LLC.

Past performance is not a guarantee of future results.

Behavioral Finance in the Driver Seat These Days ... ?!



* Source: Hirschleifer, D., "Investor psychology and asset pricing", Journal of Finance No. 56, 2001.

Let's do an example

Problem #1:

		<u>Expected Value</u>	<u>Participants</u>
1A:	Receive £ 4000 with probability 0.8	3200	20%
1B:	Receive £ 3000 with certainty	3000	80%

Problem #2:

2A:	Pay £ 4000 with probability 0.8	-3200	92%
2B:	Pay £ 3000 with certainty	-3000	8%

Definition:

People value gains and losses differently. This value is calculated from a reference point.

Notes:

- In short, the Prospect Theory states that people are loss averse. They consider a realized loss more damaging than a missed gain.
- Therefore, investors are risk averse when faced with the prospect of gains while risk seeking when faced with the prospects of losses.

- Investors tend to hold on to losing positions too long. They hope that a stock will recover and that they will therefore not realize a loss.
- On the other hand, investors sell stocks too early. Once a gain is obtained they are not willing to lose it.
- Even investors with long-term investment horizons fall victim to loss aversion and will change their investment plan at the prospect of short-term losses*.
- Also, the rule “when in trouble, double” can be explained with the prospect theory: investors prefer gambling to accepting a sure loss.

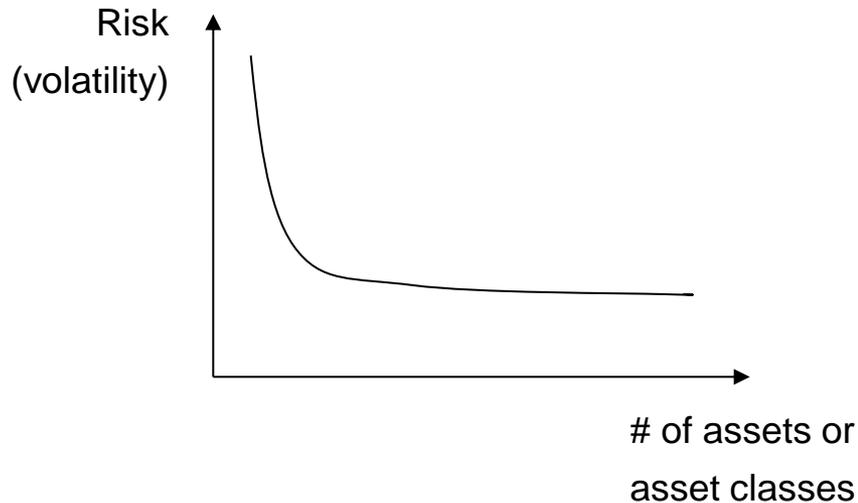
* Nofsinger, J.R., “The psychology of investing”, Upper Saddle River, NJ: Prentice Hall, 2002.

A Systematic Approach to Asset Allocation

Principle of Diversification

Putting together an optimal portfolio involves answers to the following two questions:

- Which asset classes (equity, fixed income, cash, commodities, gold, real estate, hedge funds etc) should I chose?
- What is the quantity (portion in whole portfolio) for each asset class?



Observation:

The more assets / asset classes a portfolio contains the less the portfolio's risk (volatility) is.

The Efficient Frontier

Example: a Three-Asset Class Portfolio (I)

The three-asset class portfolio with return R_p and volatility σ_p :

Asset Class	Expected Return p.a.	Expected Volatility p.a.	Correlation		
			A	B	C
A	5%	10%	1	0,3	0,1
B	8%	12%	0,3	1	0,4
C	10%	15%	0,1	0,4	1

What portfolios do we get when combining asset classes A, B and C ?

- Asset class weights are denoted by X_A , X_B and X_C .
- Expected return of the asset classes are R_A , R_B and R_C .
- Expected volatility of the asset classes are σ_A , σ_B and σ_C ; covariance are σ_{AB} , σ_{AC} and σ_{BC} .

$$R_p = X_A \cdot R_A + X_B \cdot R_B + X_C \cdot R_C$$

$$\sigma_p = \sqrt{X_A^2 \cdot R_A^2 + X_B^2 \cdot R_B^2 + X_C^2 \cdot R_C^2 + 2X_A X_B \sigma_{AB} + 2X_A X_C \sigma_{AC} + 2X_B X_C \sigma_{BC}}$$

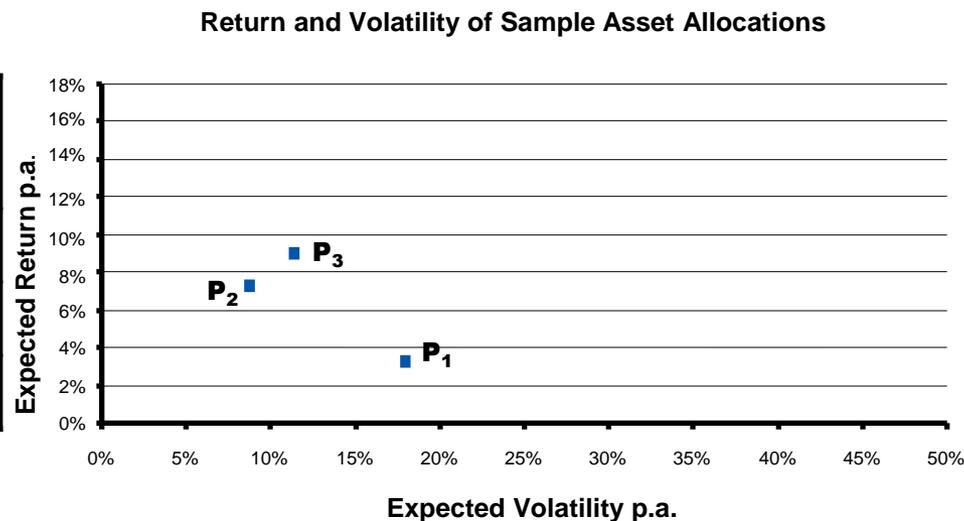
The Efficient Frontier

Example: a Three-Asset Class Portfolio (II)

Step 1: Three sample asset allocations

- In the table we computed the returns and volatilities of three randomly selected asset allocations.
- Remember that any combination of X_A , X_B and X_C with $X_A + X_B + X_C = 1$ is a portfolio.
- There is no obvious relationship in the pattern of portfolio weights, asset returns and volatilities.

Asset Allocation Portfolio	X_A	X_B	X_C	Expected Return p.a.	Expected Volatility p.a.
P ₁	0,995	0,911	-0,906	3,20%	17,96%
P ₂	0,374	0,476	0,150	7,18%	8,74%
P ₃	0,138	0,201	0,661	8,91%	11,39%



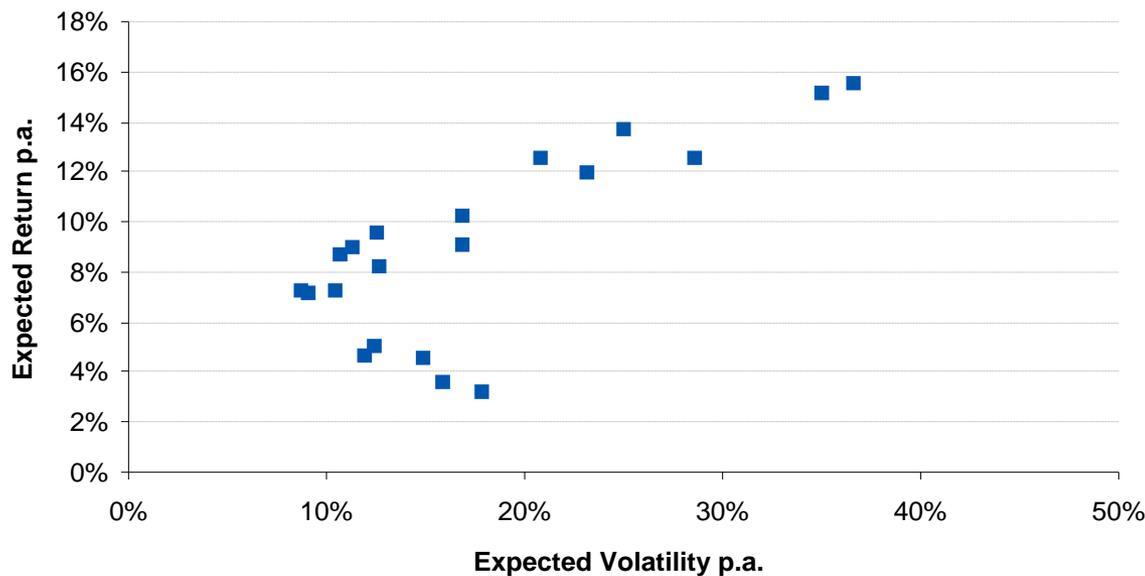
The Efficient Frontier

Example: a Three-Asset Class Portfolio (III)

Step 2: 20 sample asset allocations ... a first pattern

With 20 sample portfolios there already seems to be a slight pattern in the diagram and we can clearly see that the portfolios do not lie on a single curve.

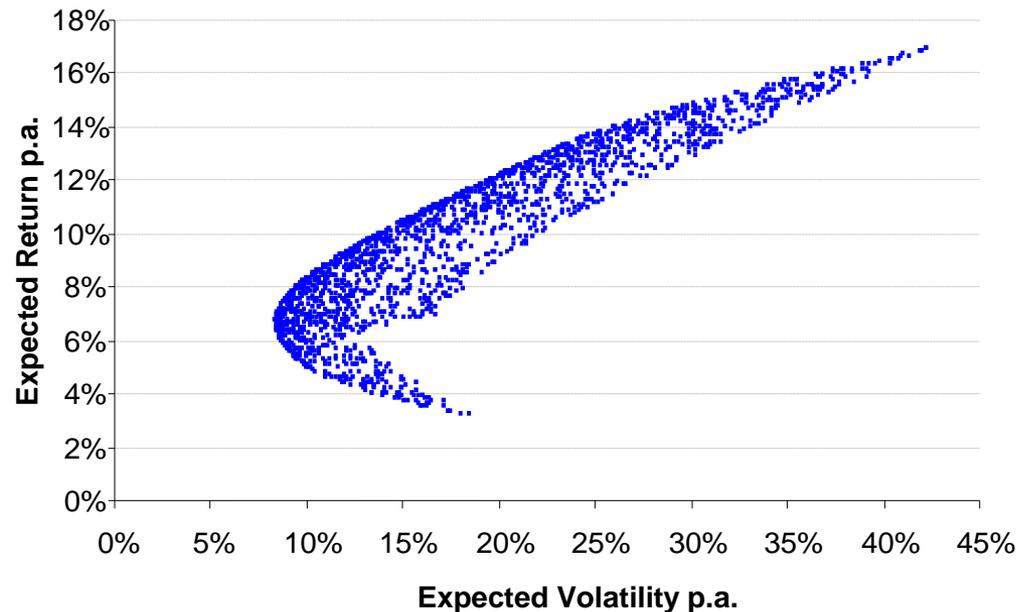
Return and Volatility of Sample Asset Allocations



Step 3: 2000 sample asset allocations ... here we go

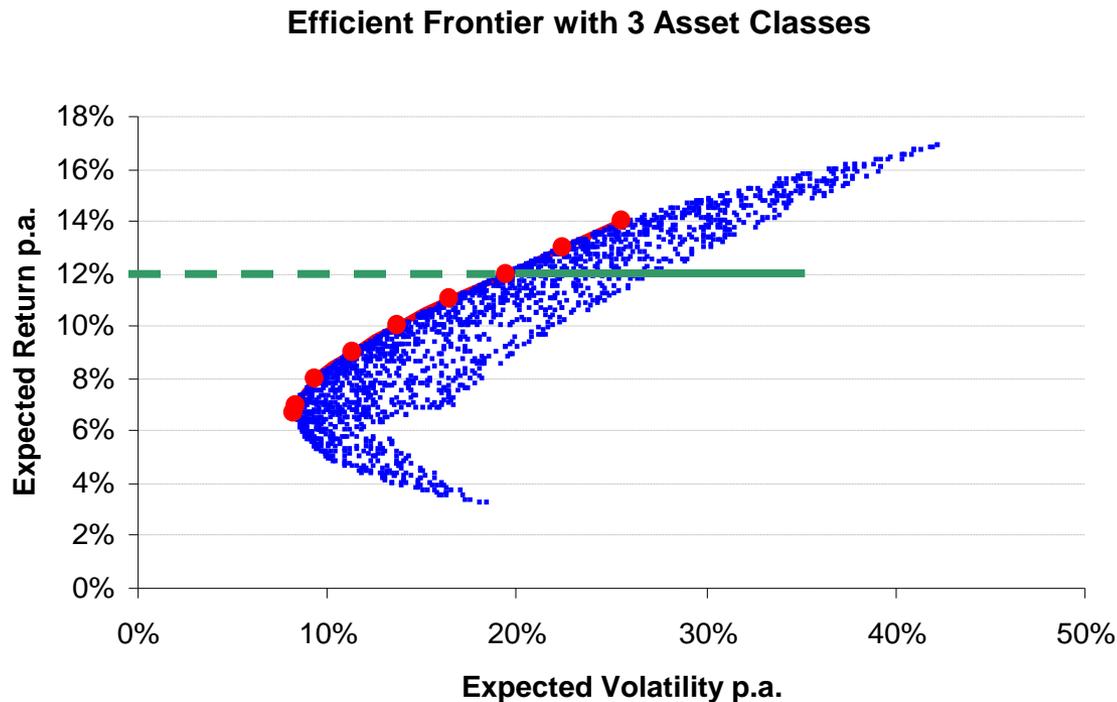
- Now, with 2000 sample asset allocations we see a clear pattern.
- All portfolios are in a hyperbola-shaped area.
- This means that it is not possible to achieve all types of risk and return combinations in an asset allocation but only certain combinations.

Return and Volatility for Sample Asset Allocations



Step 4: Finally ... the Efficient Frontier

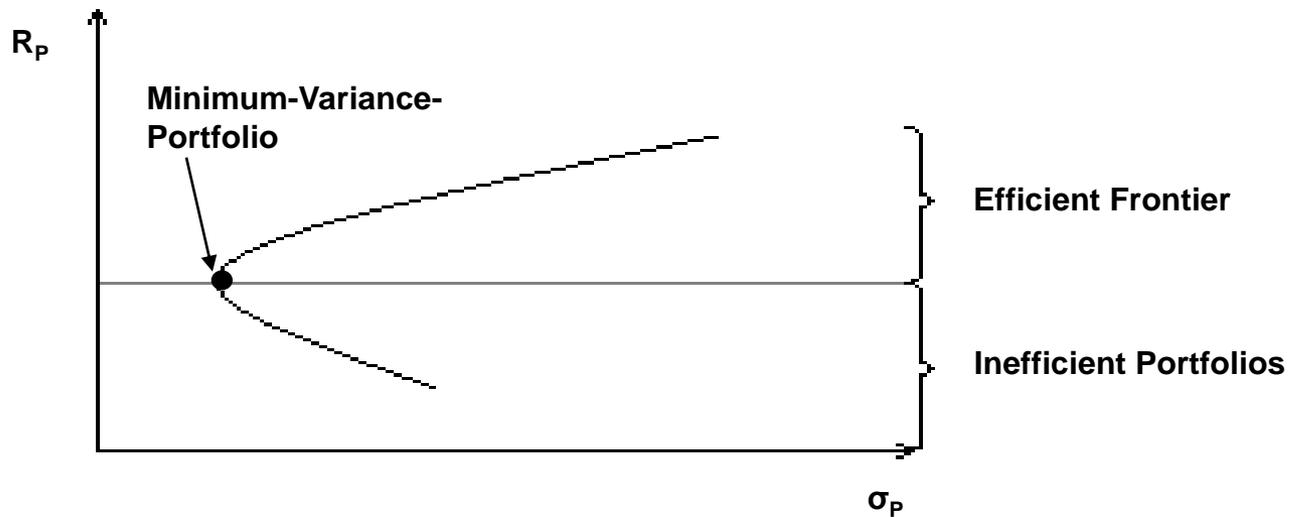
In this chart, we can see a frontier that “embraces” all possible asset allocations.



- The red dot on the green line represents the less risky portfolio for a return of 12%.
- Such a portfolio is called “efficient portfolio” as there is no portfolio with less risk at the same return level.

Efficient Frontier

The curve defined by the set of all efficient portfolios is called the Efficient Frontier.

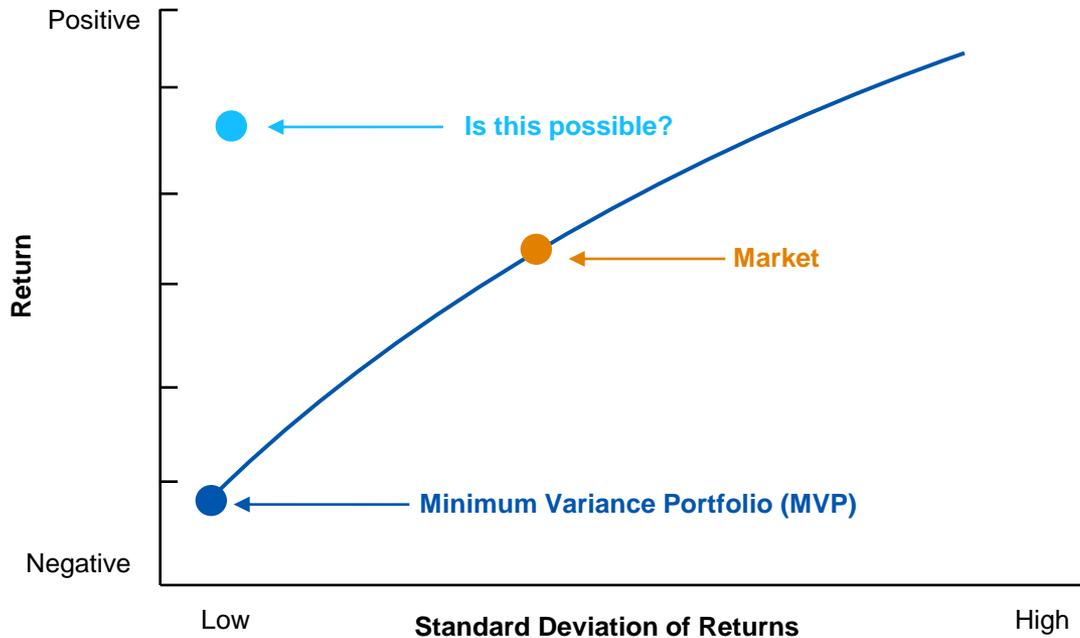


- The efficient frontier idea (Markowitz, 1952) offers a systematic approach how to select the asset classes in an asset allocation decision.
- Markets nowadays is often driven by Behavioral Finance: the psychology of investing plays an important role when managing money.
- SSgA's quantitative approach to managing active equity strategies is an example where behavioral bias problems are eliminated.

Developing Investment Strategies

Low Volatility Long-Only Equities

So What About the Efficient Frontier in Practice?



Assumptions

- Market is mean-variance efficient
- MVP has low return and low risk

Implications

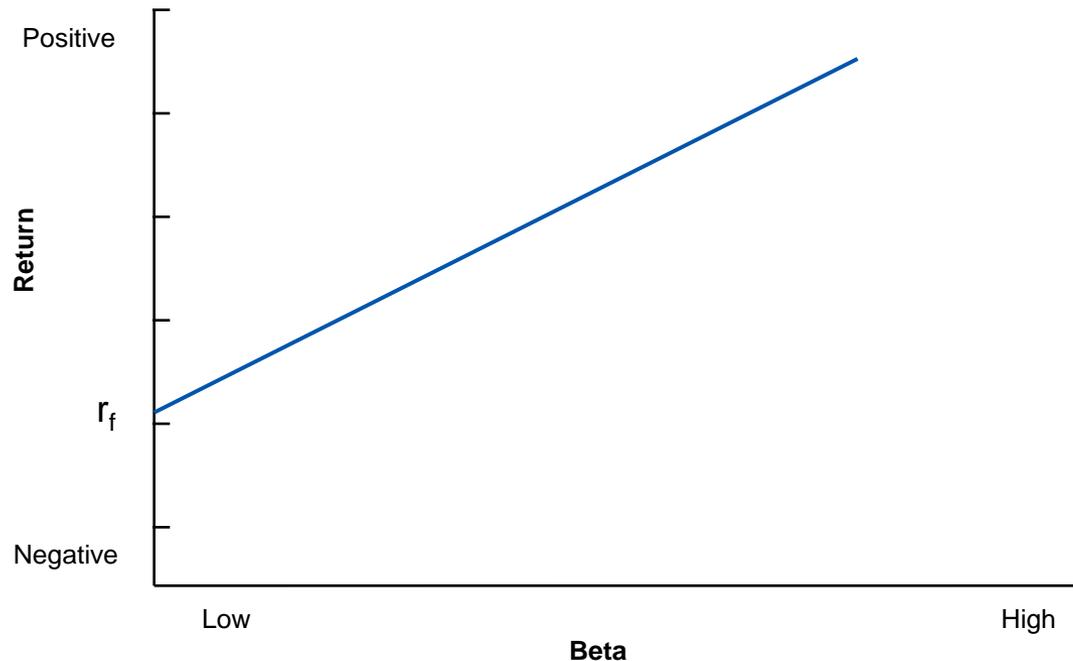
- Managers develop strategies around the market
- MVP portfolios are to be avoided

But what if the Minimum Variance Portfolio performed well?

Low Volatility Long-Only Equities

Test of the Capital Asset Pricing Model

We can test the CAPM to understand if the market appears efficient



Assumptions

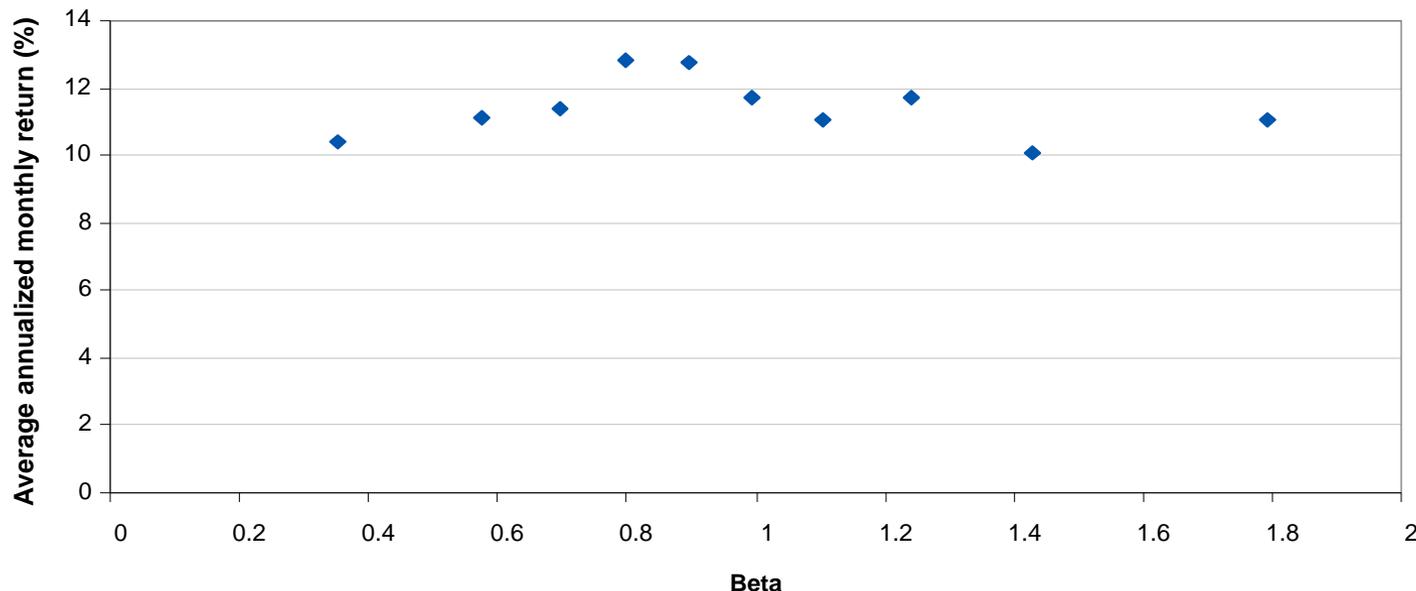
- Returns should increase with beta
- Returns should be linearly related to beta
- The zero-beta portfolio should equal the risk-free rate

Low Volatility Long-Only Equities

Does the Capital Asset Pricing Model Hold?

Average Annualized Monthly Return versus Beta For Equal Weighted Portfolio (Russell 3000)

January 1987 - December 2009



- Returns should be linearly increasing in beta but are flat or declining
- Low beta stocks have historically performed much better than expected
- High beta stocks have historically performed much worse than expected

Source: SSgA

Past performance is not a guarantee of future results

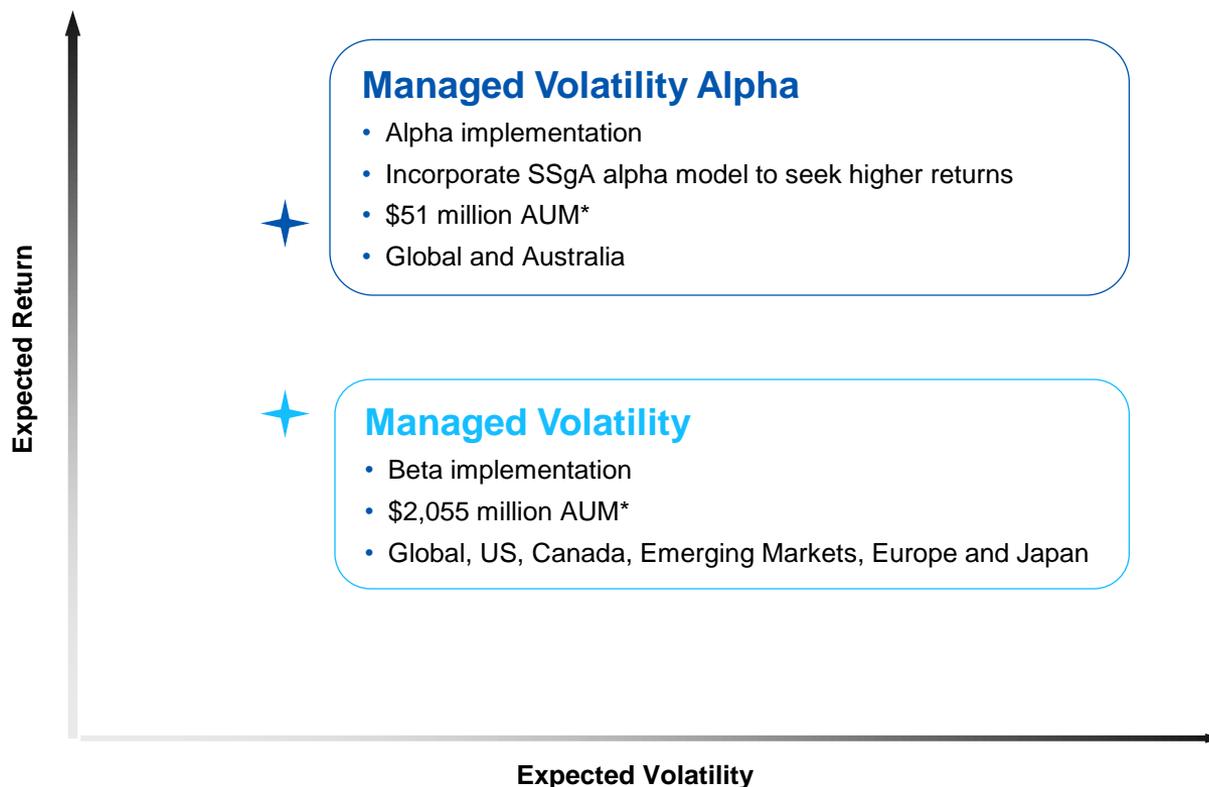
Russell Investment Group is the source and owner of the trademarks, service marks and copyrights related to the Russell Indexes.

The Russell 3000® Index is a trademark of Russell Investment Group.

Low Volatility Long-Only Equities

Two Ideas to Reduce Volatility

Objective: SSgA's Managed Volatility Strategies seek competitive returns, while maintaining low volatility, compared to the benchmark index over the long term



SSgA can implement Managed Volatility strategies across all equity regions

*As of December 31, 2013
This information is for illustrative purposes only.

Idea 1: Managed Volatility Alpha

Investment Philosophy of the Global Managed Volatility Alpha Strategy

Seek to maximize returns by focusing on our best investment ideas

- Invest only in highest conviction stocks

Benchmark agnostic portfolio construction is key

- Helps us to execute on our best ideas
- Build more efficient and diversified portfolios

But what about risk?

- Seek to manage *Total Portfolio Risk*, not tracking error



Features

- Targets 3% outperformance relative to cap-weighted index over market cycle
- Expected long-term total volatility reduction of approximately 25%
- Strong downside protection
- Strong performance potential in up markets
- Strong Sharpe Ratio
- Long only

As of June 30, 2014

Source: SSgA.

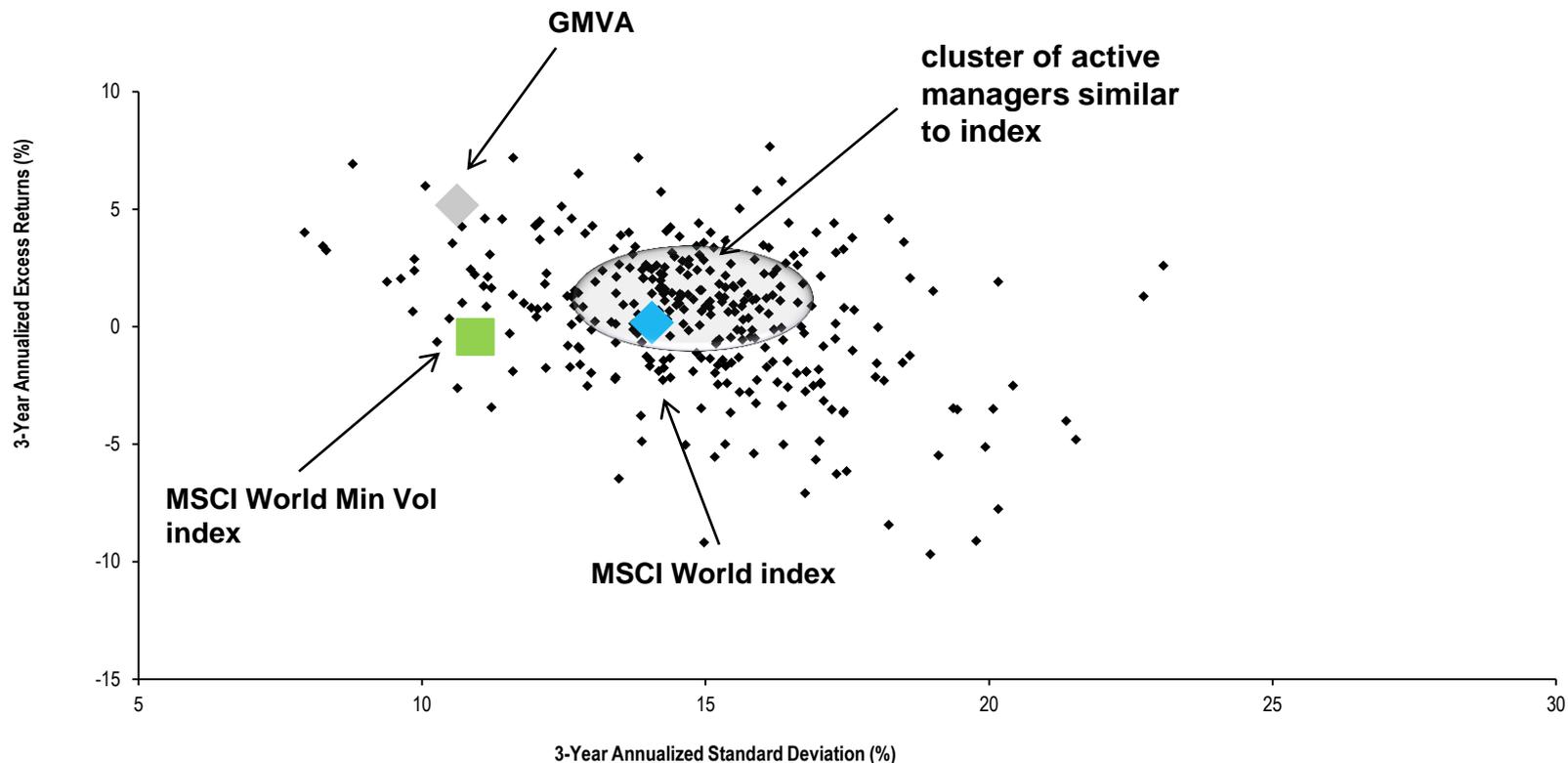
The above targets are estimates based on certain assumptions and analysis made by SSgA. There is no guarantee that the estimates will be achieved.

Idea 1: Managed Volatility Alpha

Superior Position in Risk/Return Space of the Global Managed Volatility Alpha Strategy

Greater efficiency — higher return, lower realized risk....

Three-year risk & return



Source: eVestment global all cap universe. As of March 31, 2014. Past performance is not a guarantee of future performance. The performance figures contained herein are provided on a gross of fees basis and do not reflect the deduction of advisory or other fees which could reduce the return.

Index returns are unmanaged and do not reflect the deduction of any fees or expenses. Index returns reflect all items of income, gain and loss and the reinvestment of dividends and other income.

The above information is considered supplemental to the GIPS presentation for this Composite, which can be found in the Appendix or was previously presented.

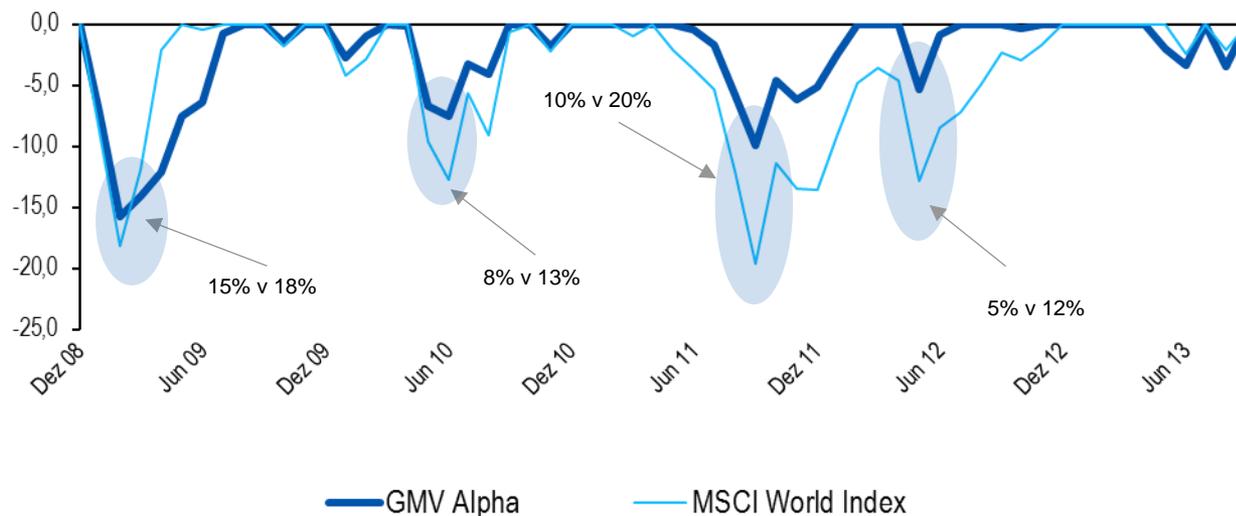
A GIPS presentation is also available upon request. The calculation method for value added returns may show rounding differences.

The performance includes the reinvestment of dividends and other corporate earnings and is calculated in US dollars.

Idea 1: Managed Volatility Alpha

Significant Drawdown Reduction of the Global Managed Volatility Alpha Strategy

Historical drawdown from January 2009 (inception) to December 2013:



- Lower total risk delivers lower drawdowns, while also participating in rising markets

- With lower drawdowns in falling markets, the strategy benefits from compounding effects over the long-term

Source: SSgA

The above information is considered supplemental to the GIPS® presentation for this Composite, which can be found in the Appendix or was previously presented. A GIPS® presentation is also available upon request. Index returns are unmanaged and do not reflect the deduction of any fees or expenses. Index returns reflect all items of income, gain and loss and the reinvestment of dividends and other income. The information contained above is for illustrative purposes only. Past performance is not a guarantee of future results.

Idea 2: Managed Volatility

Overview of the Europe Managed Volatility Strategy

Objective	<ul style="list-style-type: none">• Seeks to provide competitive returns, while maintaining low volatility, compared to the benchmark over the long term by constructing a portfolio of <u>stocks with low expected volatility</u> relative to the benchmark
Benchmark	<ul style="list-style-type: none">• MSCI Europe Index
Investment Universe	<ul style="list-style-type: none">• Equity securities of MSCI Europe Index
Risk Management	<ul style="list-style-type: none">• Focus on managing total risk of portfolio, not benchmark-relative risk
Risk Parameters*	<ul style="list-style-type: none">• Maximum security weight of 2.0% (grandfathering allowed up to 2.5%)• Maximum sector weight of 25%• Maximum industry weight of 10%• Maximum active country weight of 3%• Control for size
Expected Turnover**	<ul style="list-style-type: none">• 25% per annum (one way)
Trading	<ul style="list-style-type: none">• SSgA's global trading desks focus on cost minimization and trade effectiveness• Seeks to be fully invested

* At time of trade

** The above targets are estimates based on certain assumptions and analysis made by SSgA. There is no guarantee that the estimates will be achieved.

Idea 2: Managed Volatility

Significant Drawdown Reduction of the Europe Managed Volatility Strategy

Historical Drawdown

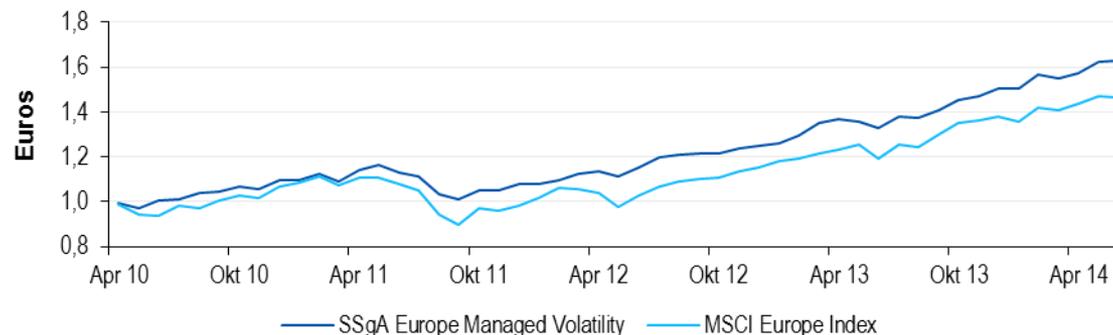
April 2010 – June 2014



- Seeks to deliver downside protection, while also participating in rising markets
- Low exposure to higher volatile, higher beta (glamour) stocks

Cumulative Growth of €1

April 2010 – June 2014



- By limiting downside in falling markets, the strategy seeks to benefit from compounding effects over the long term

Source: SSGA

The Europe Managed Volatility Strategy was inceptioned on April 1, 2010.

The information contained above is for illustrative purposes only.

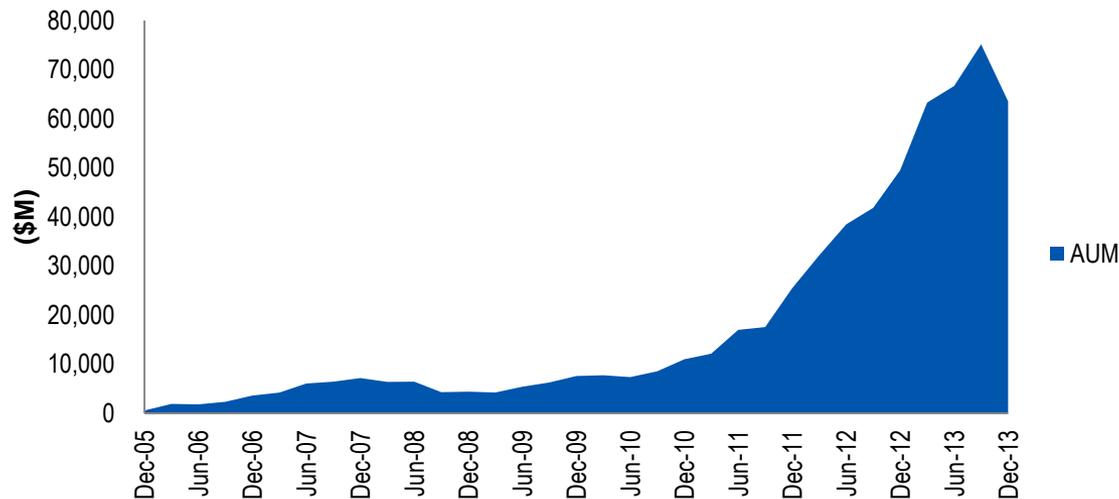
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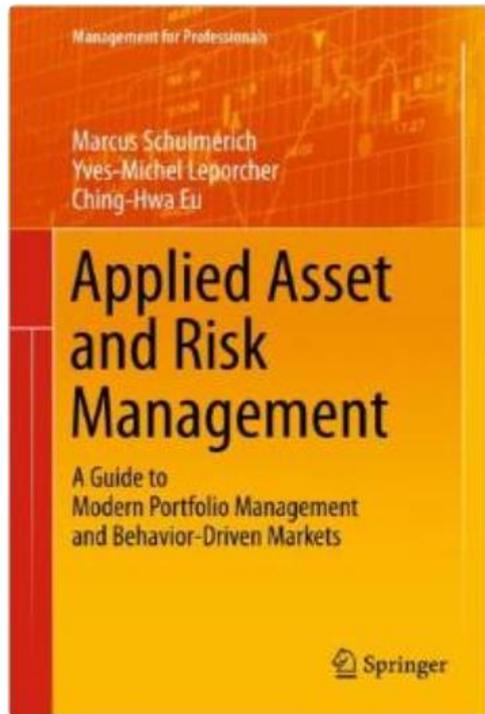
Low Volatility Strategies in Practice – A Summary

Low Volatility Equities, AUM



- Long-only low volatility equity strategies allow to manage tail risk and reduce drawdowns but with the potential to achieve growth in bull markets
- Assets under management has been steadily growing in recent years
 - Some estimates suggest AUM could be in range of \$50 - \$100 billion*
- Assets under management still remains small relative to all equity funds
 - AUM estimated to be 0.15% of all active equity funds*

Tests of the CAPM and the Impact of Behavioral Finance ...



This book is a guide to asset and risk management from a practical point of view. It is centered around two questions triggered by the global events on the stock markets since the middle of the last decade:

- Why do crashes happen when in theory they should not?
- How do investors deal with such crises in terms of their risk measurement and management and as a consequence, what are the implications for the chosen investment strategies?

The book presents and discusses two different approaches to finance and investing, i.e., modern portfolio theory and behavioral finance, and provides an overview of stock market anomalies and historical crashes. It is intended to serve as a comprehensive introduction to asset and risk management for bachelor's and master's students in this field as well as for young professionals in the asset management industry.

A key part of this book is the exercises to further demonstrate the concepts presented with examples and a step-by-step business case. An Excel file with the calculations and solutions for all 17 examples as well as all business case calculations can be downloaded at extras.springer.com.

Appendix

GIPS® Reports

GIPS® Report: Global Managed Volatility Alpha Composite

As of December 31, 2013

Gross Returns

	Quarter	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception Jan 2009
Global Managed Volatility Alpha Composite	8.29	29.32	29.32	16.59	14.58	N/A	14.58
MSCI World Index	8.00	26.68	26.68	11.49	15.02	N/A	15.02

Year	Global Managed Volatility Alpha Composite	MSCI World Index
2013	29.32	26.68
2012	16.42	15.83
2011	5.28	-5.54
2010	12.81	11.76
2009	10.45	29.99
2008	—	—
2007	—	—
2006	—	—
2005	—	—
2004	—	—

Year	No. of Portfolios	Composite Dispersion	3 Yr Annualized Standard Deviation - Composite	3 Yr Annualized Standard Deviation - Benchmark	Total Assets at End of Period (USD)	% of Firm's Assets	Total Firm Assets (USD mil)
2013	*	N/A	10.03	13.54	45,527,567	0.00	2,279,237
2012	*	N/A	10.91	16.74	1,149,521	0.00	2,023,842
2011	*	N/A	13.36	20.15	987,443	0.00	1,768,142
2010	*	N/A	**	**	8,154,892	0.00	1,518,977
2009	*	N/A	**	**	10,131,871	0.00	1,360,125
2008	—	—	—	—	—	—	—
2007	—	—	—	—	—	—	—
2006	—	—	—	—	—	—	—
2005	—	—	—	—	—	—	—
2004	—	—	—	—	—	—	—

Investment Objective: The Strategy seeks to provide excess total investment returns and maintain low volatility, in each case, as compared to its benchmark index (the "Index"), over the long term.

Investment Strategy: The Strategy invests in the equity securities of companies in the Strategy's investable universe at the time of purchase, as described above. SSgA utilizes a proprietary quantitative investment process to select a portfolio of securities that it expects to exhibit lower volatility relative to the Index, and that SSgA believes has the potential to provide an excess return relative to the Index over the long term. In selecting securities for the Strategy, SSgA seeks to favor securities with low exposure to market risk factors, such as beta, and will also favor securities with low security-specific risk. Within this framework, SSgA seeks to generate an excess return relative to the Index by utilizing a stock selection model to identify securities that SSgA believes will provide the greatest opportunity for favorable investment returns over the long term. As an additional element of the investment process designed to achieve portfolio diversification, SSgA implements risk constraints at the security, industry, country, sector, and, in certain instances, size exposure levels; SSgA may also, in some cases, limit a portfolio's exposure to "value" stocks. These risk constraints are implemented on an absolute basis or a benchmark-relative basis. Through this quantitative process of security selection and portfolio diversification, SSgA expects that the Strategy will be subject to a low level of absolute risk (as defined by standard deviation of returns), and thus should exhibit lower volatility relative to the Index over the long term, with the potential of providing an excess return relative to the Index over the long term. Because the Strategy seeks to exhibit lower volatility and excess returns relative to the Index over the long term, both its portfolio investments and its returns will differ, potentially greatly, from those of the Index. There can be no guarantee that the Strategy will in fact be subject to lower volatility than the Index. The application of our active stock selection model may lead to a degree of added risk in return for the potential outperformance relative to the benchmark index, even while maintaining a low level of absolute risk, when compared to a strategy that is not actively managed.

gGLALMAX

* 5 portfolios or less

** Less than 3 years

Quarterly and YTD returns are not annualized

Footnotes

Firm Definition: For the purpose of complying with the Global Investment Performance Standards (GIPS®), the firm ("SSgA-Global") is defined as all portfolios managed across the global offices of State Street Global Advisors (SSgA) and SSgA Funds Management, Inc., with the exception of business units which are held out to the market place as distinct business entities – Fiduciary Advisory Solutions (formerly known as the Office of the Fiduciary Advisor [OFA]) and Charitable Asset Management (CAM). Prior to 1/1/2011, SSgA-Global also excluded its wrap fee business (Intermediary Business Group [IBG]) and assets accounted for on a book value basis (global cash and stable value assets). In January 2011, SSgA acquired the Bank of Ireland Asset Management Limited (now known as SSgA Ireland Limited), a GIPS® Compliant firm. On 1/1/2012 SSgA Ireland Limited assets were merged into SSgA-Global.

List Available: A complete list of the firm's composites and their descriptions is available upon request.

Compliance Statement: SSgA-Global claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with GIPS. SSgA-Global claims compliance with the GIPS standards from January 1, 2000. The period prior to January 1, 2000 is not in compliance, as not all actual fee-paying portfolios are in a composite. SSgA-Global has been independently verified for the periods January 1, 2000 through December 31, 2012. The verification report is available upon request. Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS standards on a firm-wide basis and (2) the firm's policies and procedures are designed to calculate and present performance in compliance with the GIPS standards. Verification does not ensure the accuracy of any specific composite presentation.

Creation Date: The composite was created on 1 Jul 09.

Currency: Performance is presented in US Dollar.

Benchmark Description: The benchmark for the composite is the MSCI World Index. The index returns are unmanaged and do not reflect the deduction of any fees or expenses. The index returns reflect all items of income, gain and loss.

Currency: Performance is presented in USD.

Fees: Returns are expressed gross of management fees. Some members of this composite may accrue administration fees.

Fee Schedule: Management fees are 0.45% of the first \$50,000,000; 0.40% of the next \$50,000,000; and 0.35% thereafter. The annual minimum management fee for commingled funds is \$35,000, and for separately managed accounts the minimum fee is \$175,000. Management fees may be adjusted based upon specific client requirements. The composite contained 100% non-fee paying portfolios as of 12/31/2011 and 12/31/2012.

Derivatives Use: SSgA may use futures and other derivatives from time to time in the management of the Strategy generally as a temporary substitute for cash investments or for hedging purposes and not with the purpose of creating investment leverage.

Calculation Methodology: Additional information regarding the firm's policies and procedures for calculating and reporting performance results is available upon request.

Annualized Returns: All returns for periods greater than one year have been annualized.

Withholding Taxes Differences: None.

Exchange Rates Differences Between Composite & Benchmark: None.

Minimum Asset Level for Inclusion: 0.

Dispersion: Asset-Weighted standard deviation is calculated using the annual returns of the accounts that were included in the composite for all periods of the year.

Composite Description: The Composite seeks to achieve the Investment Objective described below using the Investment Strategy described below.

Significant Events: In November 2007, on the departure of the North America CIO Sean Flannery, Global asset class CIOs were appointed (Alistair Lowe, Asset Allocation and Currency CIO; Mark Marinella, Fixed Income CIO; Steve Meier, Cash CIO and Arlene Rockefeller, Equities CIO). In June 2010, Alistair (Ali) Lowe assumed the role of Global Equities CIO, taking over from Arlene Rockefeller, who retired from SSgA after almost 30 years with the firm. Dan Farley was named CIO for Multi Asset Class Solutions replacing Ali Lowe. In December 2011, on the departure of Brad Aham, Michael Ho was appointed as CIO of Emerging Markets Equities and Global Macro. In June 2013, Theodore Gekas was appointed as CIO and Global Head of Quantitative Equities upon the departure of Alistair Lowe. Steve Meier, CIO of Cash, replaced Kevin Anderson, Ph.D. as the CIO of Fixed Income, Currency and Cash.

Past and Future Performance: Historic performance is not necessarily indicative of actual future investment performance, which could differ substantially.

Significant Events: Mark Rosenberg retired as CEO of SSARIS effective 12/31/2013. Paul Lucek has expanded his responsibilities as CIO of the Hedge Fund Group and has been named chief executive officer succeeding Mark, effective January 1, 2014. Rob Covino has been named president of SSARIS in addition to his existing responsibilities as head of business development. Mark stays on as co-chairman of the SSARIS Board of Directors through 2014 in order to allow for a smooth transition of leadership.

GIPS® Report: Europe Managed Volatility Composite EUR

As of December 31, 2013

Gross Returns

	Quarter	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception Apr 2010
Europe Managed Volatility Composite EUR	6.86	20.52	20.52	11.19	N/A	N/A	11.49
MSCI Europe Index	5.98	19.82	19.82	8.91	N/A	N/A	8.93

Year	Europe Managed Volatility Composite EUR	MSCI Europe Index
2013	20.52	19.82
2012	15.52	17.29
2011	-1.26	-8.08
2010 (Apr-Dec)	9.37	6.70
2009	—	—
2008	—	—
2007	—	—
2006	—	—
2005	—	—
2004	—	—

Year	No. of Portfolios	Composite Dispersion	3 Yr Annualized Standard Deviation - Composite	3 Yr Annualized Standard Deviation - Benchmark	Total Assets at End of Period (EUR)	% of Firm's Assets	Total Firm Assets (EUR mil)
2013	*	N/A	8.60	12.24	78,187,480	0.00	1,654,078
2012	*	N/A	**	**	48,566,080	0.00	1,535,084
2011	*	N/A	**	**	43,641,516	0.00	1,362,053
2010 (Apr-Dec)	*	N/A	**	**	6,534,540	0.00	1,132,261
2009	—	—	—	—	—	—	—
2008	—	—	—	—	—	—	—
2007	—	—	—	—	—	—	—
2006	—	—	—	—	—	—	—
2005	—	—	—	—	—	—	—
2004	—	—	—	—	—	—	—

Investment Objective: The Strategy seeks to provide competitive returns and maintain low volatility, in each case, as compared to the specified benchmark index (the "Index"), over the long term by constructing a portfolio of stocks with low expected volatility relative to the Index.

Investment Strategy: The Strategy invests in the equity securities of companies in the Strategy's investable universe at the time of purchase, as described above. SSgA utilizes a proprietary quantitative investment process to select a portfolio of securities that it expects to exhibit lower volatility than the Index and that SSgA believes has the potential to provide competitive returns relative to the Index over the long term. In selecting securities for the Strategy, we seek to favor securities with low exposure to market risk factors, such as beta, and will also favor securities with low security-specific risk. Additionally, in order to seek to achieve appropriate levels of diversification, SSgA implements one or more risk constraints at the security, industry, country, sector or size exposure levels. These risk constraints are implemented on an absolute basis or a benchmark-relative basis. Through this quantitative process of security selection and portfolio diversification, we expect that the portfolio will be subject to a low level of absolute risk (as defined by standard deviation of returns) and thus should exhibit lower volatility relative to the Index over the long term. Due to the Strategy's "rules-based" investment process, its portfolio of assets will differ from that of the Index and its returns will likely differ from the Index's return.

gEUMVC

* 5 portfolios or less

** Less than 3 years

Quarterly and YTD returns are not annualized

Footnotes

Firm Definition: For the purpose of complying with the Global Investment Performance Standards (GIPS®), the firm ("SSgA-Global") is defined as all portfolios managed across the global offices of State Street Global Advisors (SSgA) and SSgA Funds Management, Inc., with the exception of business units which are held out to the market place as distinct business entities – Fiduciary Advisory Solutions (formerly known as the Office of the Fiduciary Advisor [OFA]) and Charitable Asset Management (CAM). Prior to 1/1/2011, SSgA-Global also excluded its wrap fee business (Intermediary Business Group [IBG]) and assets accounted for on a book value basis (global cash and stable value assets). In January 2011, SSgA acquired the Bank of Ireland Asset Management Limited (now known as SSgA Ireland Limited), a GIPS® Compliant firm. On 1/1/2012 SSgA Ireland Limited assets were merged into SSgA-Global.

Composite Description: The Composite seeks to achieve the Investment Objective described below using the Investment Strategy described below.

Compliance Statement: SSgA-Global claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with GIPS. SSgA-Global claims compliance with the GIPS standards from January 1, 2000. The period prior to January 1, 2000 is not in compliance, as not all actual fee-paying portfolios are in a composite. SSgA-Global has been independently verified for the periods January 1, 2000 through December 31, 2012. The verification report is available upon request. Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS standards on a firm-wide basis and (2) the firm's policies and procedures are designed to calculate and present performance in compliance with the GIPS standards. Verification does not ensure the accuracy of any specific composite presentation.

List Available: A complete list of the firm's composites and their descriptions is available upon request.

Creation Date: The composite was created on 04/01/10.

Benchmark Description: The benchmark for the composite is the MSCI Europe Index. The index returns are unmanaged and do not reflect the deduction of any fees or expenses. The index returns reflect all items of income, gain and loss.

Currency: Performance is presented in EUR.

Use of Sub-advisors: None.

Fees: Returns are expressed gross of management fees. Some members of this composite may accrue administration fees.

Fee Schedule: For Commingled funds, management fee is 0.50% of the first EUR 50,000,000; 0.45% of the next EUR 50,000,000; and 0.40% thereafter. The annual minimum management fee for these accounts is EUR 10,000. For separately managed accounts, management fee is 0.50% of the first EUR 50,000,000; 0.45% of the next EUR 50,000,000 and 0.40% thereafter. The minimum annual management fee for separately managed accounts is EUR 100,000. Management fees may be adjusted based upon specific client requirements.

Derivatives Use: SSgA may use futures and other derivatives from time to time in the management of the Strategy generally as a temporary substitute for cash investments or for hedging purposes and not with the purpose of creating investment leverage.

Calculation Methodology: Additional information regarding the firm's policies and procedures for calculating and reporting performance results is available upon request.

Annualized Returns: All returns for periods greater than one year have been annualized.

Withholding Taxes Differences: None.

Exchange Rates Differences Between Composite & Benchmark: None.

Minimum Asset Level for Inclusion: 0.

Dispersion: Asset-Weighted standard deviation is calculated using the annual returns of the accounts that were included in the composite for all periods of the year.

Significant Events: In November 2007, on the departure of the North America CIO Sean Flannery, Global asset class CIOs were appointed (Alistair Lowe, Asset Allocation and Currency CIO; Mark Marinella, Fixed Income CIO; Steve Meier, Cash CIO and Arlene Rockefeller, Equities CIO). In June 2013, Theodore Gekas was appointed as CIO and Global Head of Quantitative Equities upon the departure of Alistair Lowe. Steve Meier, CIO of Cash, replaced Kevin Anderson, Ph.D. as the CIO of Fixed Income, Currency and Cash.

Past and Future Performance: Historic performance is not necessarily indicative of actual future investment performance, which could differ substantially.

Appendix

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Important Risk Information and Disclaimer

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The views expressed in this material are the views of the SSgA Active Quantitative Equity Team through the period ended August 31, 2014 and are subject to change based on market and other conditions. This document contains certain statements that may be deemed forward-looking statements. Please note that any such statements are not guarantees of any future performance and actual results or developments may differ materially from those projected.

Projected characteristics are based upon estimates and reflect subjective judgments and assumptions. There can be no assurance that developments will transpire as forecasted and that the estimates are accurate.

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Appendix

Biography



Dr. Marcus Schulmerich, CFA, FRM

Dr. Marcus Schulmerich is a Global Portfolio Strategist with State Street Global Advisors GmbH (SSgA), Munich. As a Vice President he is responsible for all active quant equity portfolio strategies as well as Hedge Fund and Absolute Return strategies in Europe, Middle East and Africa (EMEA) . Before joining SSgA he was a Senior Product Specialist with PIMCO in London and Munich for many years, responsible for actively managed fixed income and commodity portfolios. Dr. Schulmerich started his career with ADIG Investment (now part of Allianz Global Investors) as a Financial Engineer and Risk Manager. He works with SSgA since 2006 and has fourteen years of work experience.

Dr. Schulmerich holds a Bachelor and Master degree in mathematics, an MBA (M.I.T. Sloan School of Management) and a doctoral degree in quantitative finance from the European Business School (EBS) in Wiesbaden/Germany . He also earned the Chartered Financial Analyst (CFA) designation and is a Certified Financial Risk Manager (FRM). Since 2005 he is a guest lecturer in Finance at the EBS where he regularly gives lectures in financial engineering, derivatives as well as portfolio and risk management. Besides his professional and academic work Dr. Schulmerich publishes on portfolio and risk management, behavioral finance, interest rate modelling and real options valuation.