

STATE STREET GLOBAL ADVISORS.

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

London, June 26, 2013

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Global Portfolio Strategist



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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 over \$2.1 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 \$353.8 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 March 31, 2013

* This AUM includes the assets of the SPDR Gold Trust (approx. \$62.7 billion as of March 31, 2013), for which State Street Global Markets, LLC, an affiliate of State Street Global Advisors, serves as the marketing agent.

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:

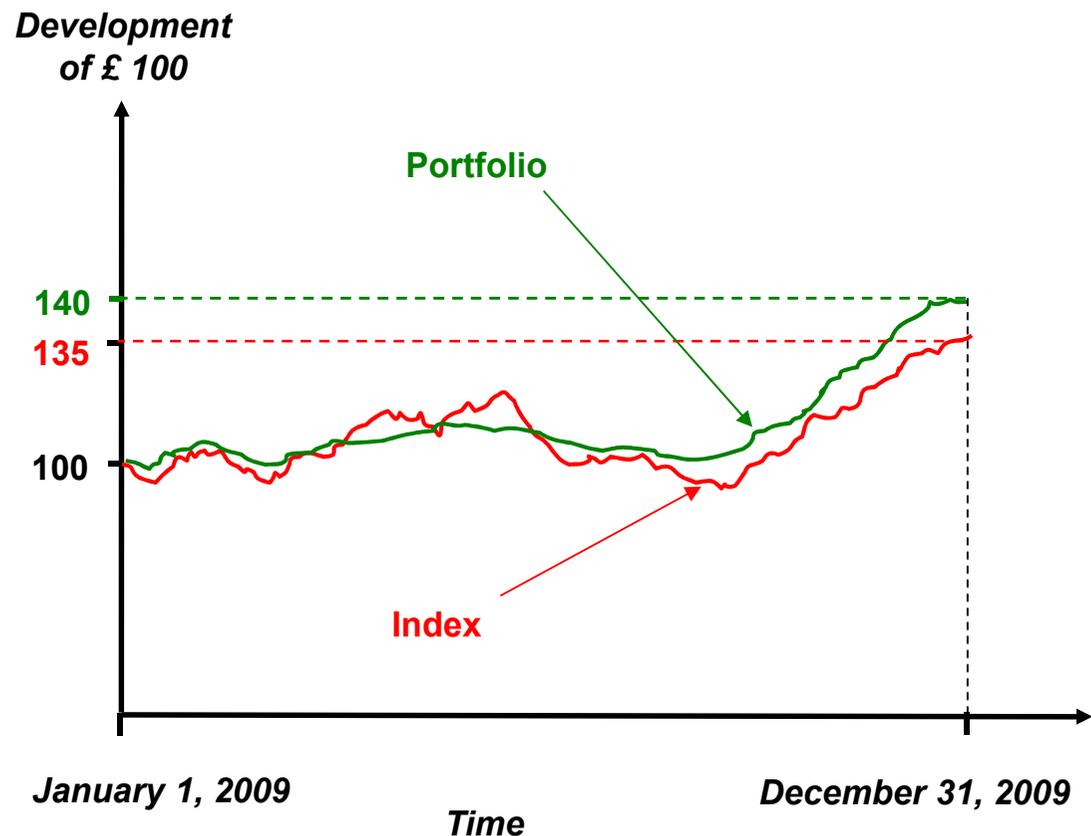
The asset manager uses primarily fundamental analysis and balance sheet investigations to reach the buy/sell decisions.

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:

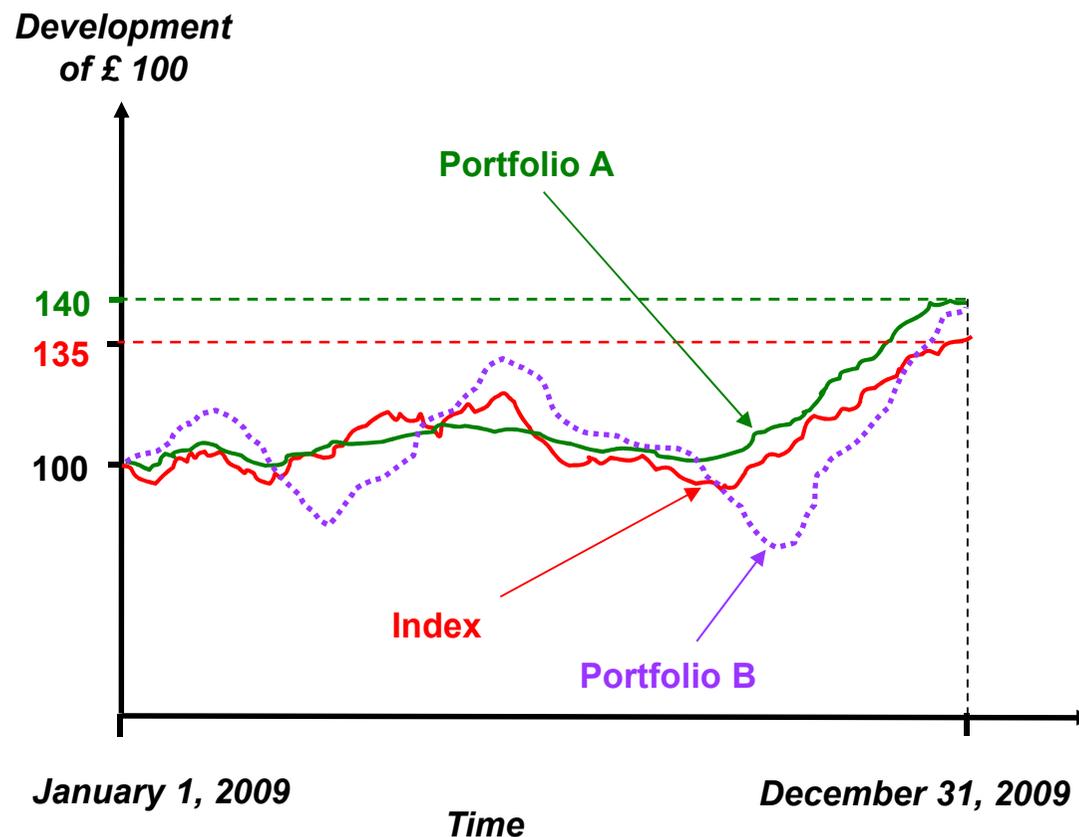
Index return:	35%
Portfolio return:	40%

Relative Return in 2009:

Alpha of portfolio:	5%
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Key Definitions – Risk-Adjusted Return

Development of a portfolio and an index within 1 year



Absolute Risk-Adjusted Return in 2009:

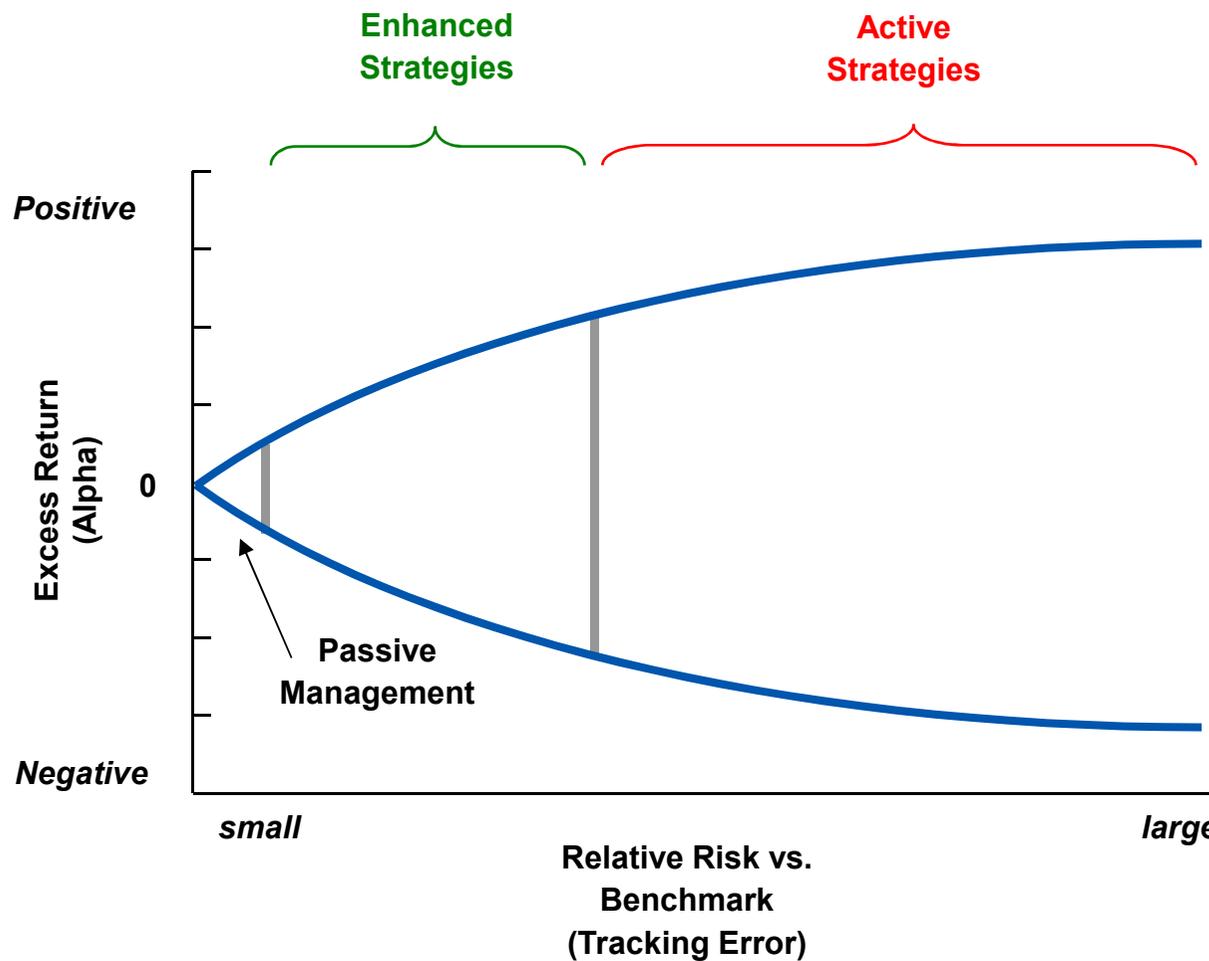
Sharpe ratio of the index:	1.75 = 35%/20%
Sharpe ratio of portfolio A:	1.90 = 40%/21%
Sharpe ratio of portfolio B:	1.33 = 40%/30%

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, Enhanced and Active Equity Management at SSgA

Relationship of Risk and Return



What we see in the Markets These Days ...

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 March 31, 2013

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.

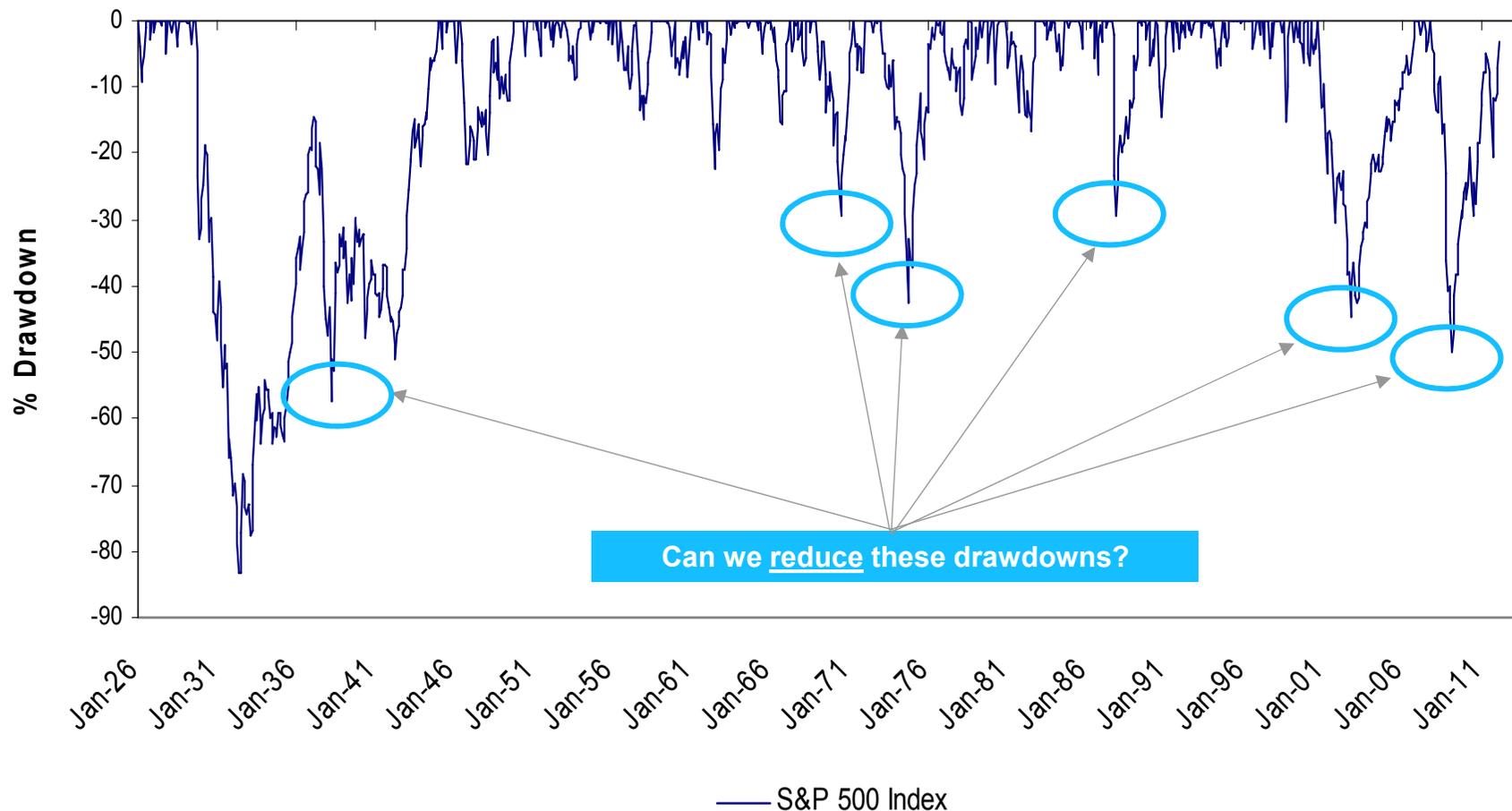
Past performance is not a guarantee of future results. Performance returns for periods of less than one year are not annualized.

... or Stated Differently ...



Historical Drawdown — S&P 500® Index

S&P 500 Total Return Drawdown 1926 – March 2012



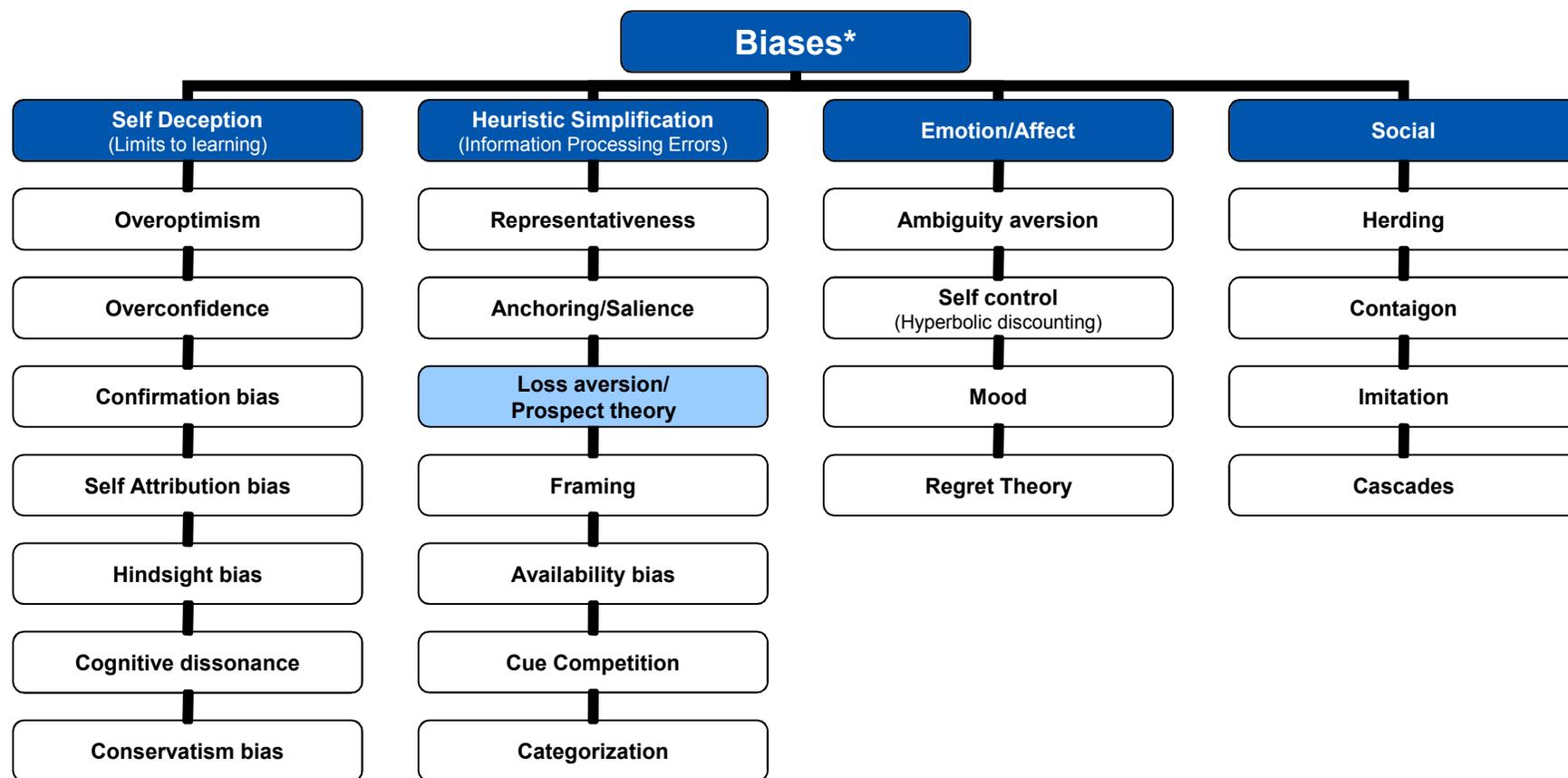
Source: Zephyr StyleADVISOR, as of March 31, 2013

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.

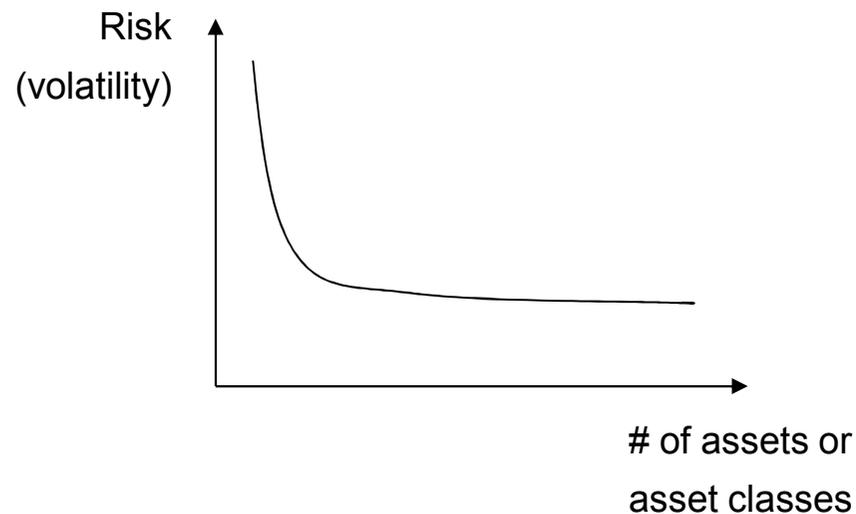
* Nofsinger, J.R., “The psychology of investing”, Upper Saddle River, NJ: Prentice Hall, 2002.

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} .

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

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

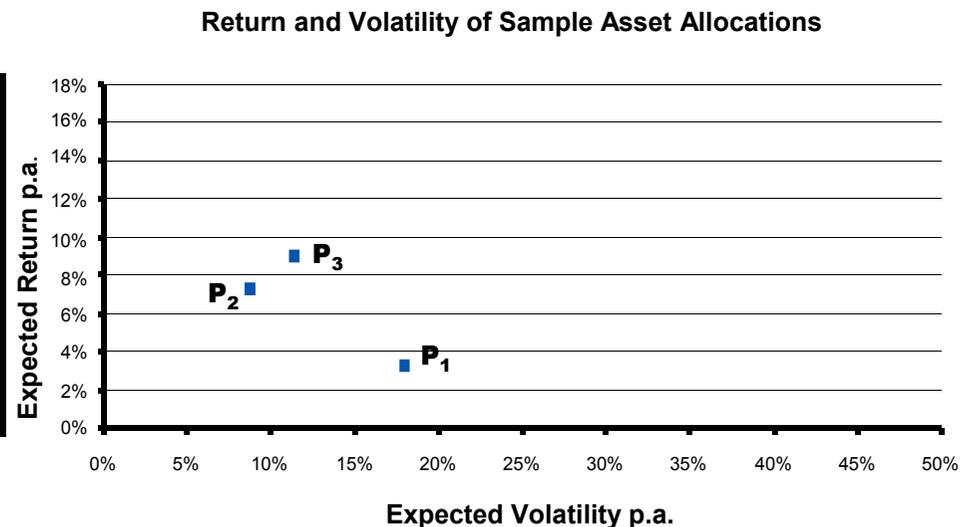
The Efficient Frontier

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%

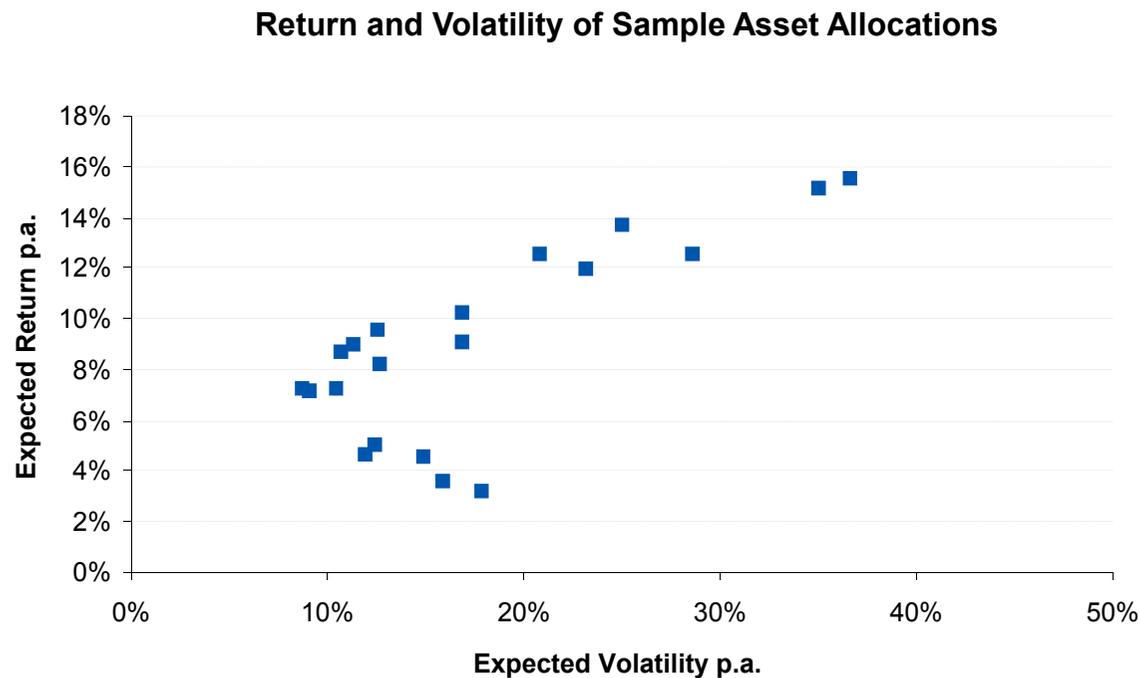


The Efficient Frontier

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.



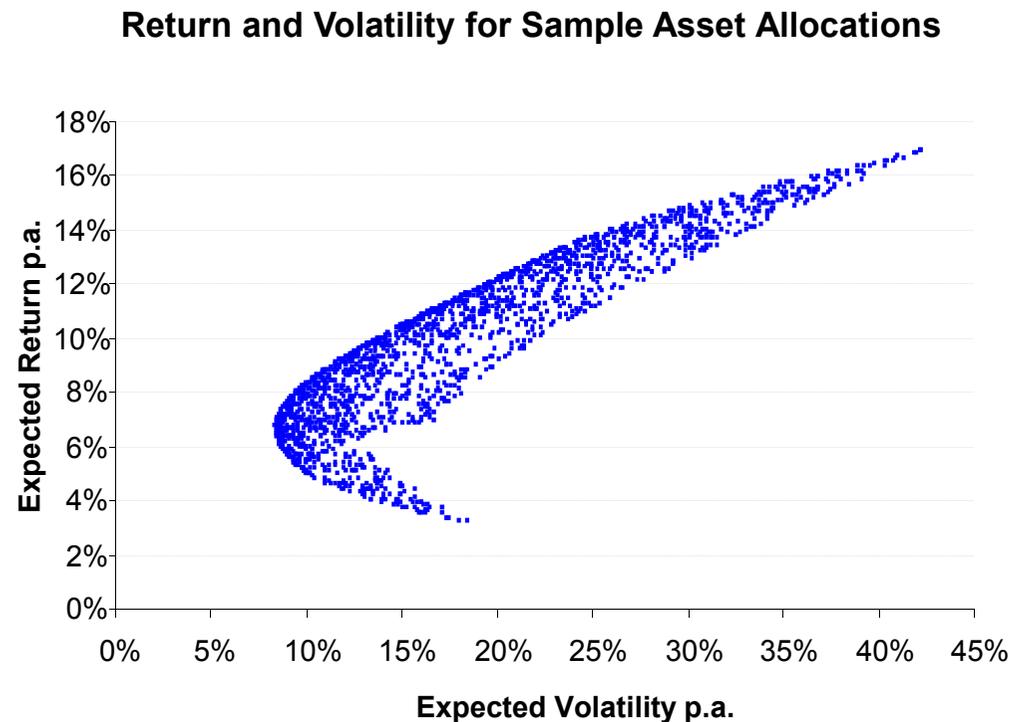
Source: SSgA as of March 31, 2013. Diversification does not ensure a profit or guarantee against loss.

The Efficient Frontier

Example: a Three-Asset Class Portfolio (IV)

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.

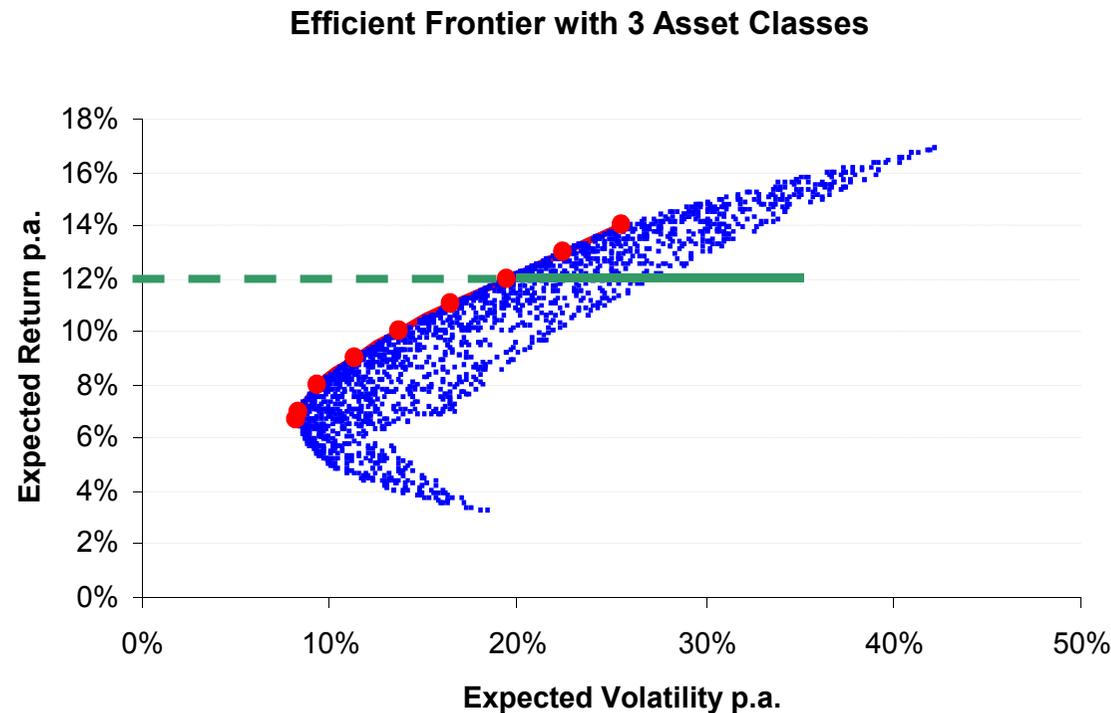


The Efficient Frontier

Example: a Three-Asset Class Portfolio (V)

Step 4: Finally ... the Efficient Frontier

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



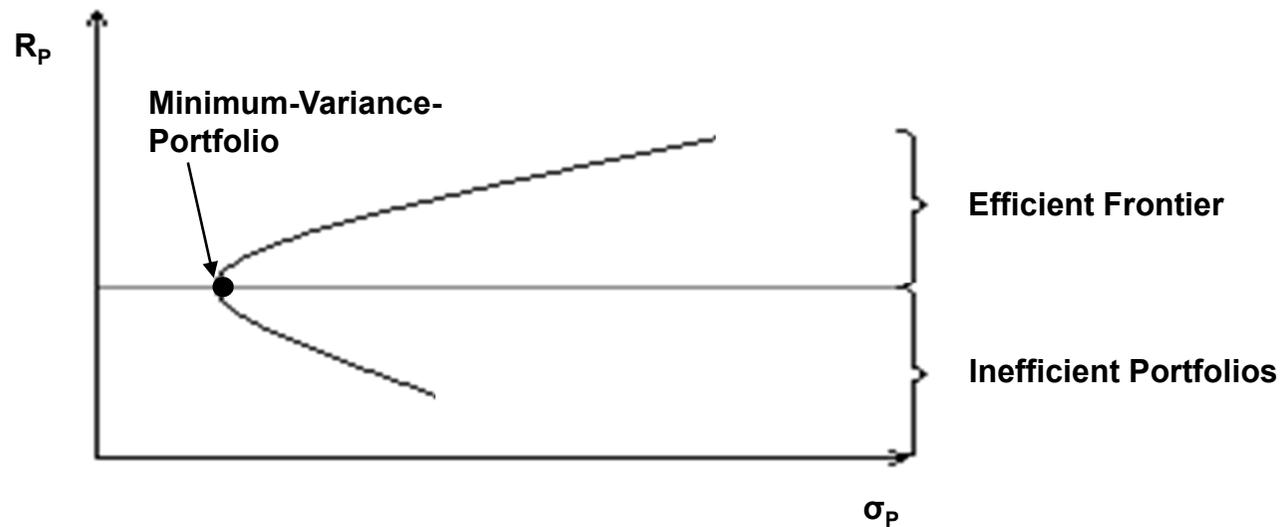
- The red dot on the green line represents the less risky portfolio for a return of 12%.
- Such a portfolio is called “efficient portfolio” as there is no portfolio with less risk at the same return level.

The Efficient Frontier

Some General Definitions

Efficient Frontier

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



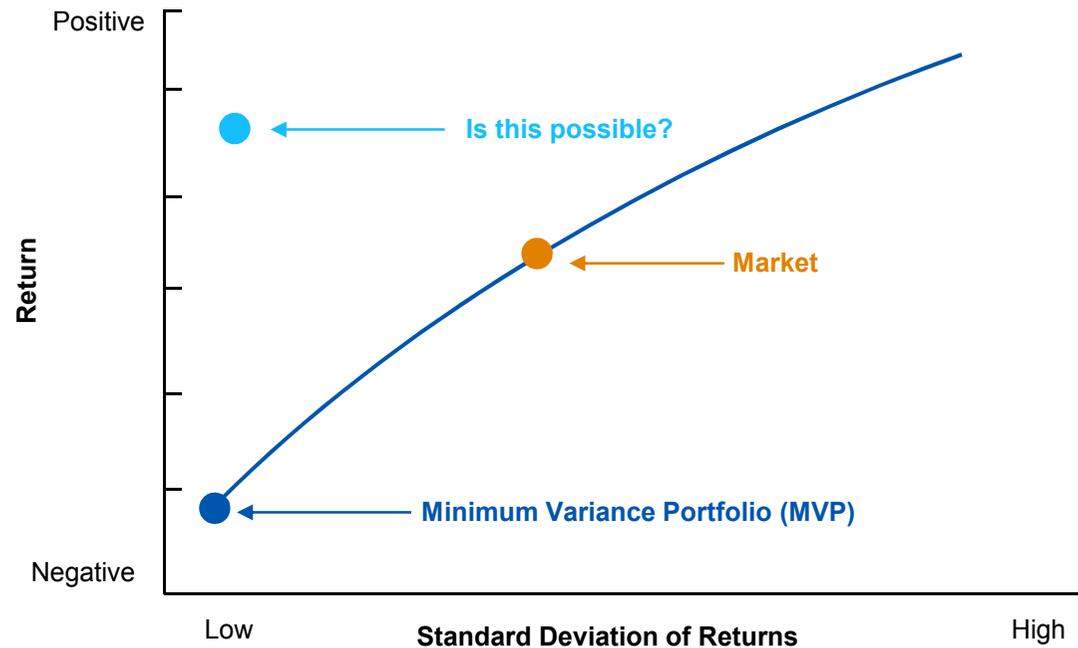
Summary

- **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

Idea 1: 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

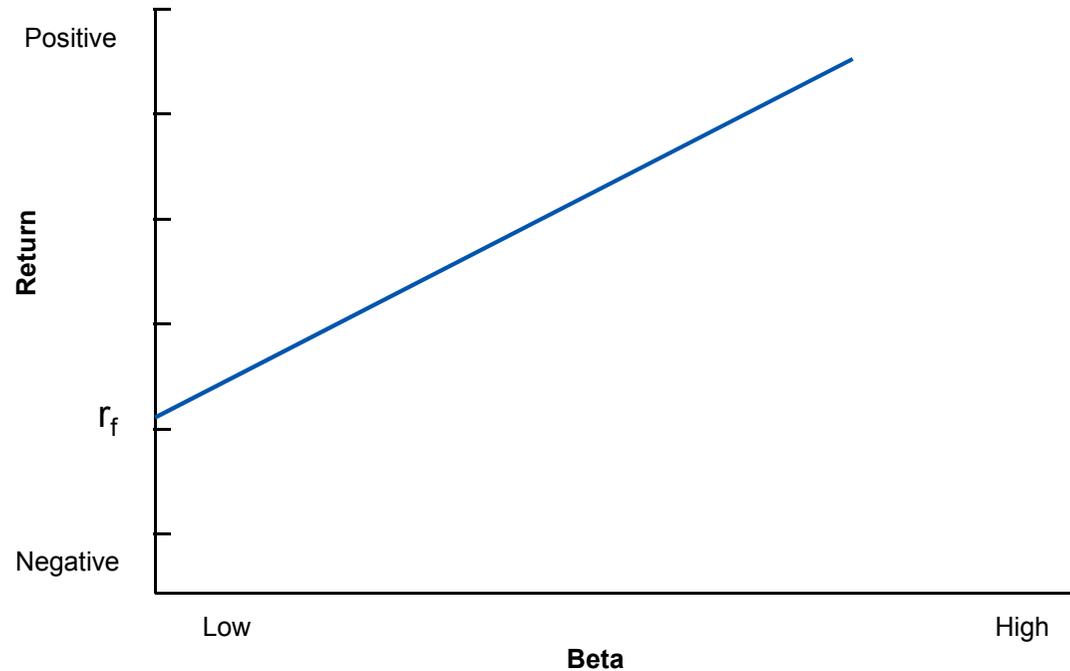
But what if the Minimum Variance Portfolio performed well?

This information is for illustrative purposes only.

Idea 1: Low Volatility Long-Only Equities

Test of the Capital Asset Pricing Model

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



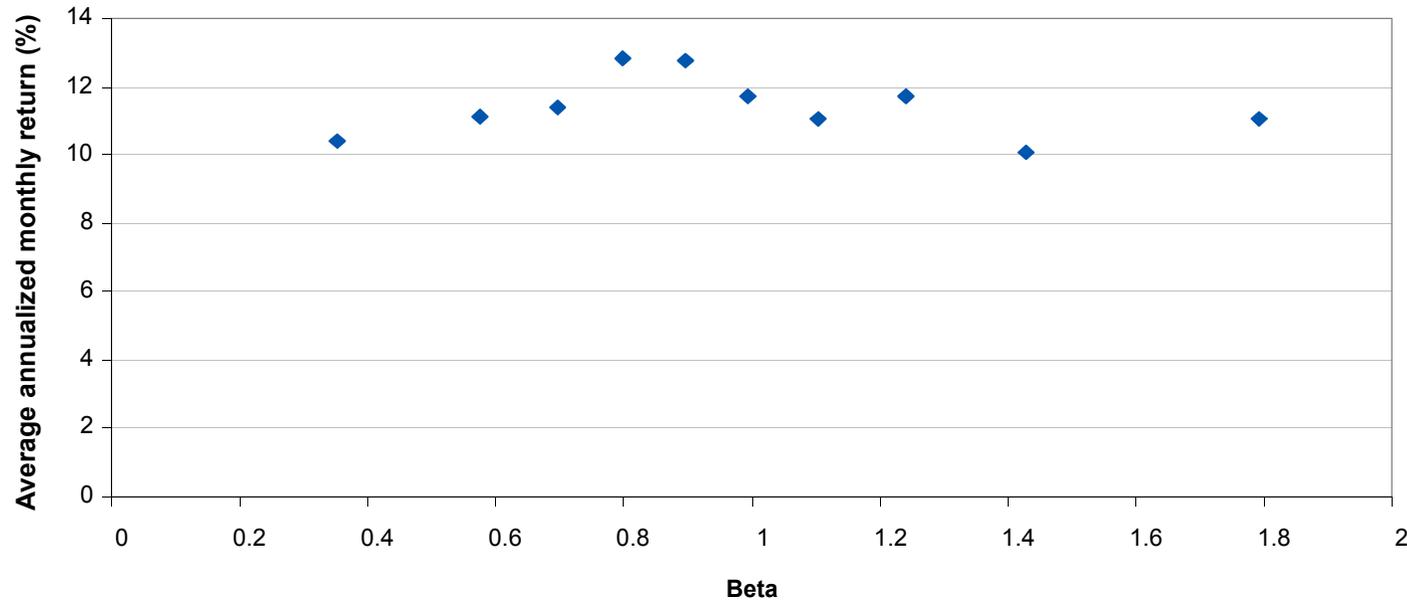
Assumptions

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

Idea 1: 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.

Idea 1: Low Volatility Long-Only Equities

US Managed Volatility Strategy

Gross annualized composite returns for the period ending March 31, 2013 (USD)

	YTD	2012	2011	2010	2009	(Apr-Dec) 2008	1 Year	3 Years	Since Inception†	Standard Deviation*	Volatility Reduction	Sharpe Ratio
US Managed Volatility Composite	13.01%	10.24%	10.19%	13.60%	10.09%	-10.00%	19.72%	14.59%	9.09%	12.61%	-36%	0.70
Russell 3000® Index	11.07	16.42	1.03	16.93	28.34	-30.71	14.56	12.97	6.32	19.66		0.31
Difference**	1.94	-6.18	9.16	-3.33	-18.25	20.71	5.16	1.62	2.78	-7.05		0.39



Source: SSgA

† Inception: 4/2008; Partial year performance not annualized.

* Annualized standard deviation of monthly returns since inception.

** The value added returns may show rounding differences.

The performance shown is of a composite consisting of all discretionary accounts using this investment strategy. There is no minimum account size required for inclusion in the composite. New funds or accounts are added to the composite upon the first full month of operation and closed funds or accounts are removed from the composite upon the last full month of operation. 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.

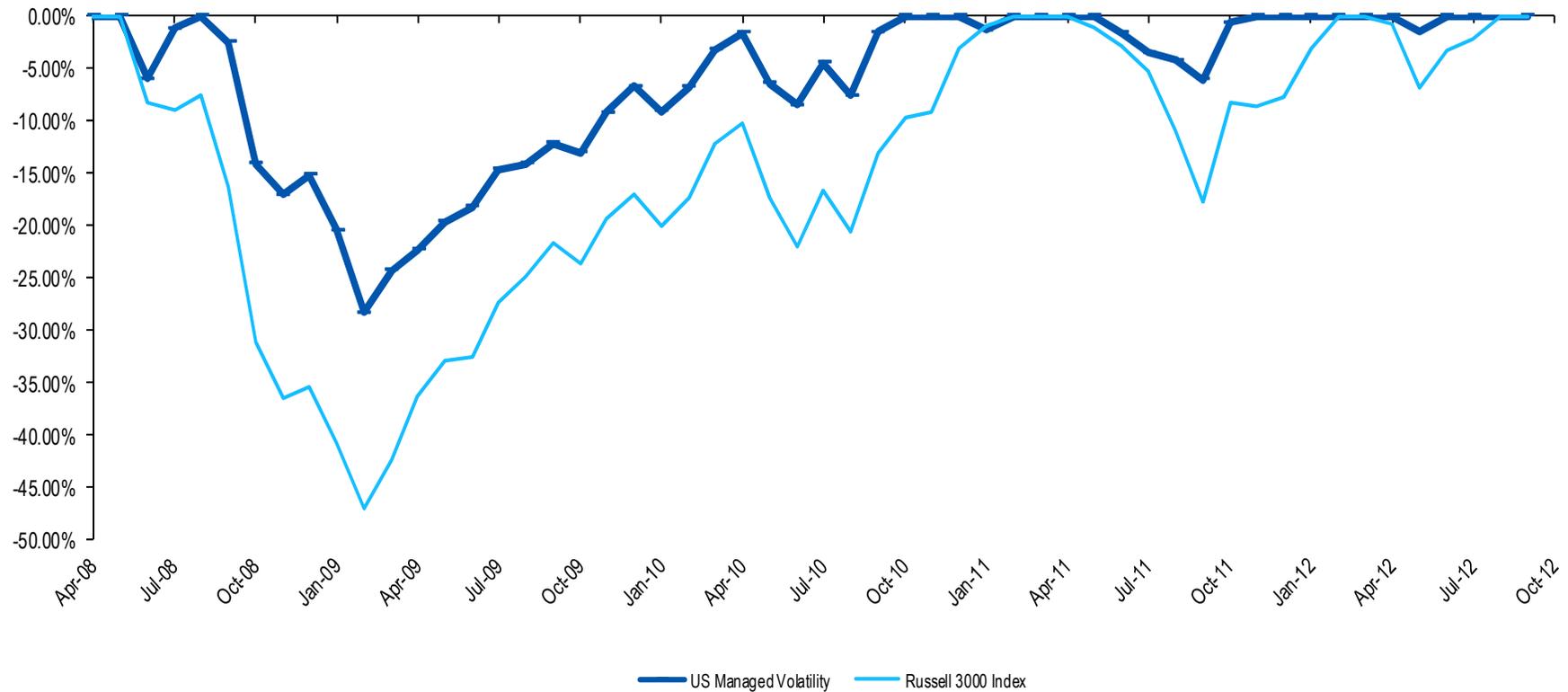
Past performance is not a guarantee of future results. Performance returns for periods of less than one year are not annualized. Returns are expressed gross of management fees. Some members of the composite may accrue administration fees. The performance includes the reinvestment of dividends and other corporate earnings and is calculated in USD.

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 and the reinvestment of dividends and other income.

Idea 1: Low Volatility Long-Only Equities

Significant Drawdown Reduction

Drawdown — Live Performance

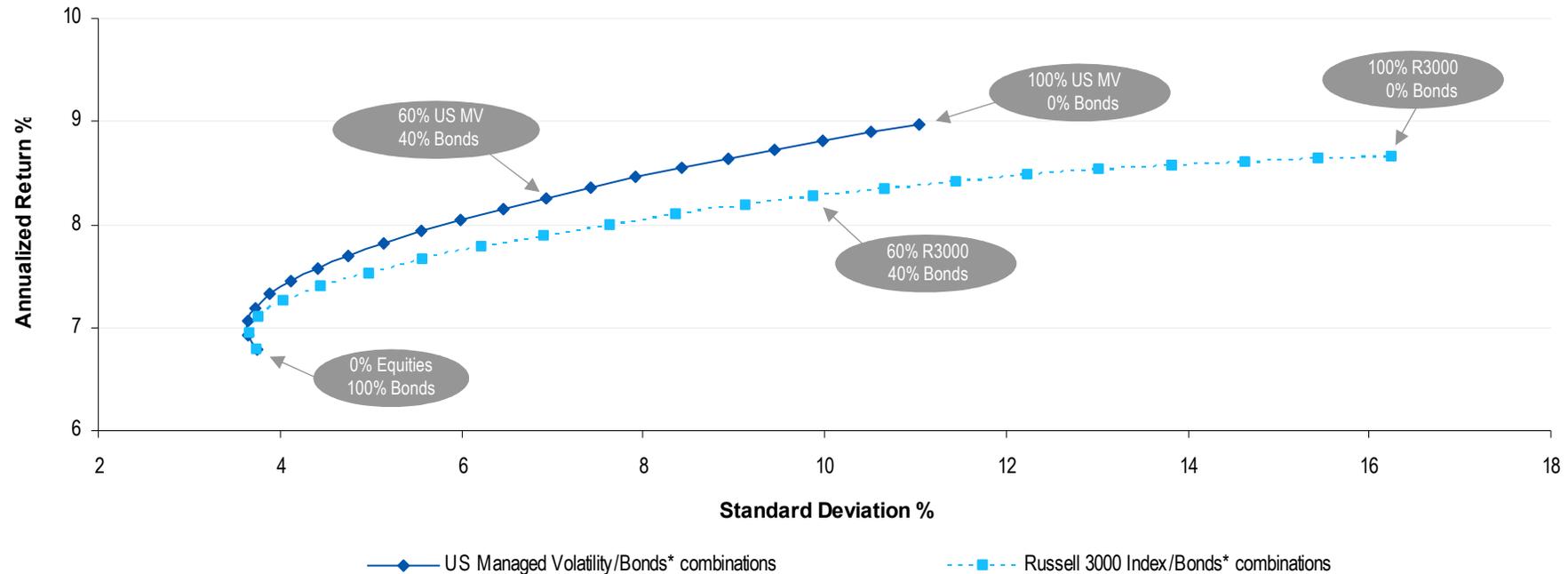


Source: Russell 3000 Index, SSgA
 As of September 30, 2012
 Russell 3000 is being used for illustrative purposes only in this material.
 Past performance is not a guarantee of future results.
 Index returns are unmanaged and do not reflect the deduction of any fees or expenses. Index returns reflect all items of income, gain and loss and the reinvestment of dividends and other income.

Idea 1: Low Volatility Long-Only Equities

Potential Diversification Benefits within Asset Allocation Framework

Efficient Frontier



* US Managed Volatility simulated returns. The Barclays US Aggregate Index is used for the Bonds proxy. Period: January 1987 – March 2008

US Managed Volatility's potential benefits over the long term:

- Lower volatility than broad equity market, with competitive equity returns
- Enhanced risk/return profile can help improve performance of equity/bond portfolio mix
- US Managed Volatility can help reduce volatility of assets without sacrificing returns

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without SSgA's expressed written consent. Simulated past performance figures are not a guarantee of actual future returns, which could differ substantially, and SSgA makes no representation in relation to future performance or returns. Please see Appendix for additional Simulation Disclosure.

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.

Idea 1: Low Volatility Long-Only Equities

Potential Benefits within Overall Asset Allocation

What happens to overall portfolio when Managed Volatility is included?

Baseline portfolio consists of 60% Equity, 30% Fixed Income and 10% Real Assets/Alternatives.

Simulation period: January 1999 — December 2010

	Baseline Portfolio*	Global Managed Volatility, % of Overall Portfolio^		
		10%	20%	30%
Volatility of Returns	12.5%	11.8%	11.2%	10.6%
Max Drawdown	-42.5%	-40.6%	-38.5%	-36.4%
Sharpe Ratio	0.24	0.30	0.36	0.42
Tracking Error**	N/A	1.0%	2.0%	3.0%
Return	5.8%	6.3%	6.8%	7.2%

A 30% allocation to Managed Volatility in overall portfolio has potential to materially improve performance

- Performance is defined as risk-adjusted performance, or Sharpe Ratio
- Volatility of returns of Managed Volatility is expected to be materially lower than market over long term
- Returns of Managed Volatility are not expected to be materially different than market over long term

* The Equity allocation is 50% MSCI World, 5% MSCI World Small Cap and 5% MSCI Emerging Markets. The Fixed Income Allocation is 25% Barclays Global Aggregate, 5% Barclays Global Treasury ex US Index and 10% in the FTSE EPRA/NAREIT Developed Index.

^ Portfolio weight in Managed Volatility, with weight allocated away from MSCI World Index.

** Tracking error vs. the Baseline Allocation Portfolio

Source: SSgA

The simulated performance shown is not indicative of actual future performance, which could differ substantially.

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.

Please see the Appendix for additional Simulation Disclosure. 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.

Idea 2: Combining Divergent/Convergent Strategies

The SSARIS Multi-Strategy Program

SSARIS Multi-Strategy Program

Feeder Level

Multi-Strategy Program

Master Level

Convergent Strategies

SSARIS Relative Value Fixed Income

SSgA Global Long/Short Equity Program

80% of Allocated Assets

50% of Allocated Risk

Divergent Strategies

SSARIS Managed Futures Program

20% of Allocated Assets

50% of Allocated Risk

SSARIS 

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¹ Cayman Islands exempted company with limited liability. Allocations are approximate and subject to change.

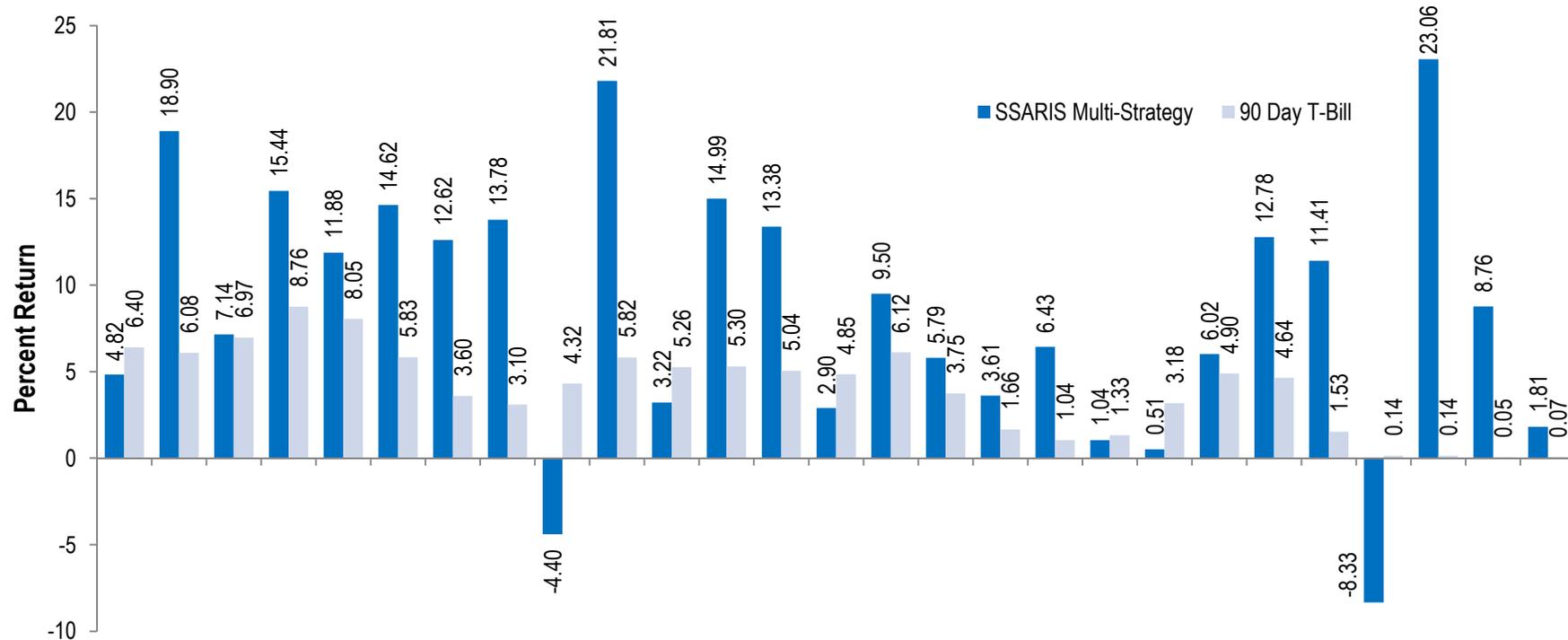
Idea 2: Combining Divergent/Convergent Strategies

The SSARIS Multi-Strategy Program: Live Performance

Net annualized return for the periods ending December 31, 2012 (USD)

PAST PERFORMANCE IS NOT NECESSARILY INDICATIVE OF FUTURE RESULTS

	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception†
SSARIS Multi Strategy ¹	0.31%	0.31%	10.32%	6.52%	5.89%	8.56%
90 Day T-Bill	0.07%	0.07%	0.09%	0.39%	1.69%	3.90%
Difference (Value Added)*	0.24%	0.24%	10.23%	6.13%	4.20%	4.66%



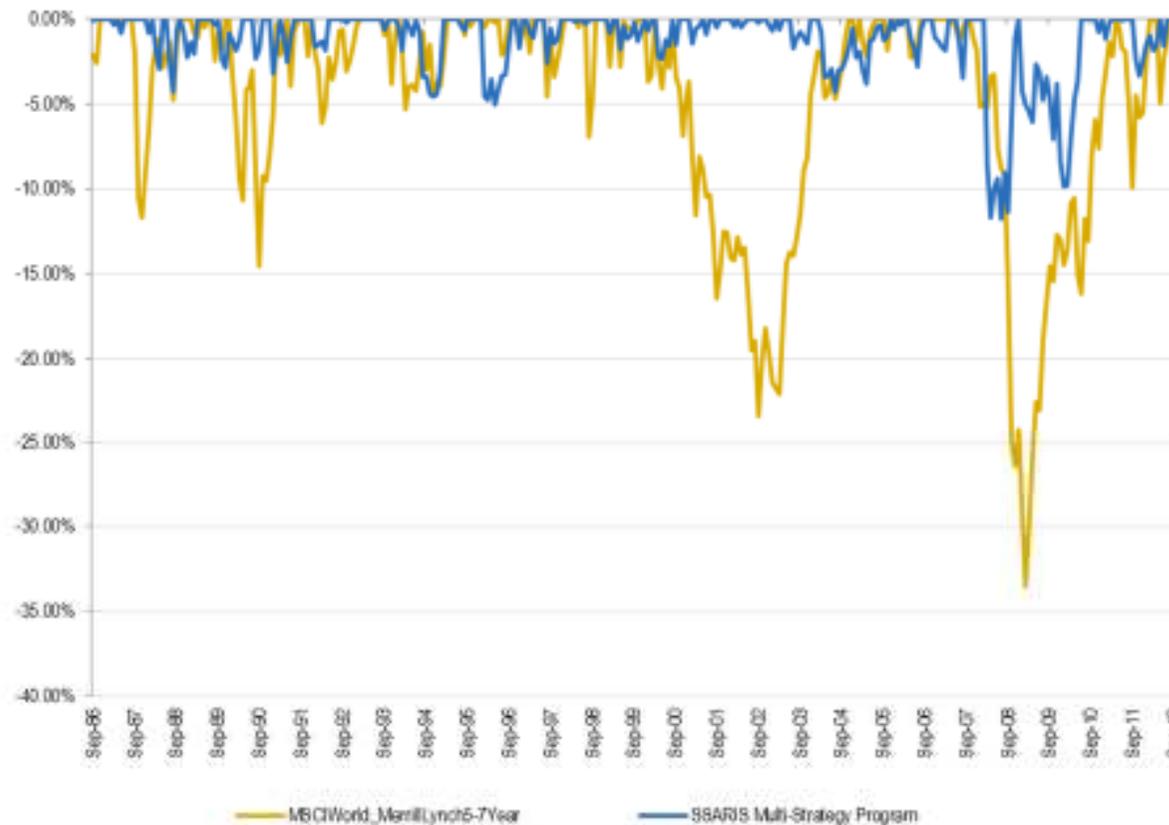
¹Compares SSARIS net performance against the indices shown. *The value added returns may show rounding differences. Performance returns for periods of less than one year are not annualized. Index returns are unmanaged and do not reflect the deduction of any fees or expenses. Index returns reflect all items of income, gain and loss and the reinvestment of dividends and other income. Investors cannot invest directly in an index.
 † Inception: September, 1986 Source: SSARIS

Idea 2: Combining Divergent/Convergent Strategies

Significant Drawdown Reduction

Global Blend* — 60% MSCI World Index / 40% Merrill Lynch 5-7 Year Bond Index (September 1, 1986 – December 31, 2012)

PAST PERFORMANCE IS NOT NECESSARILY INDICATIVE OF FUTURE RESULTS



*Source: MSCI, Merrill Lynch 5-7 Year bond index, SSgA, Zephyr StyleADVISOR. *Compares SSARIS net performance against the indices shown. Global Blend is a simulated benchmark composite consisting of 60% MSCI World Index/ 40% Merrill Lynch 5-7 Year bond index. Global Blend is not the actual benchmark for this strategy, it is being used for illustrative purposes only. See Disclosure pages for further information.

Summary

1. Managing Tail Risk allows you the potential to achieve growth
2. Understanding strategy return distributions is key
3. Divergence allows for upside potential during periods of distress
4. Convergence can potentially earn a premium in *most* years
5. Balancing convergence and divergence allows for potential growth with low tail risk
6. When drawdown reduction using a long-only equity strategy is the goal, the low volatility idea might suit you well.

The views expressed in this material are the views of the Alternative Investments Team and are subject to change based on market and other conditions. The information provided does not constitute investment advice and it should not be relied on as such. 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.

Appendix

Disclaimer



GIPS® Report: US Managed Volatility Composite

As of December 31, 2012

Gross Returns

	Quarter	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception Apr 2008
US Managed Volatility Composite	-1.73	10.24	10.24	11.33	N/A	N/A	6.81
Russell 3000® Index	0.25	16.42	16.42	11.20	N/A	N/A	4.33

Year	US Managed Volatility Composite	Russell 3000 Index
2012	10.24	16.42
2011	10.19	1.03
2010	13.60	16.93
2009	10.09	28.34
2008 (Apr-Dec)	-10.00	-30.71
2007	—	—
2006	—	—
2005	—	—
2004	—	—
2003	—	—

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)
2012	*	N/A	9.04	15.73	3,398,588	0.00	2,026,394
2011	*	N/A	12.24	19.35	3,082,834	0.00	1,768,142
2010	*	N/A	**	**	2,796,463	0.00	1,518,977
2009	*	N/A	**	**	2,462,570	0.00	1,360,125
2008 (Apr-Dec)	*	N/A	**	**	2,259,474	0.00	949,988
2007	—	—	—	—	—	—	—
2006	—	—	—	—	—	—	—
2005	—	—	—	—	—	—	—
2004	—	—	—	—	—	—	—
2003	—	—	—	—	—	—	—

gUSMVA

* 5 portfolios or less

** Less than 3 years

Quarterly and YTD returns are not annualized

Footnotes

Composite Description: The US Managed Volatility Composite seeks to provide attractive returns while controlling risk. The Composite's performance objective is to exceed the return of the Russell 3000 Index.

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 – 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. In July 2012, following the departure of the fixed income emerging markets team within Rexiter Capital Management (a GIPS® Compliant firm), the management of the SSgA Active Emerging Markets Local Currency Bond Strategy (the "Strategy") was transferred to the global fixed income team within SSgA. As such, the performance of the Strategy prior to July 2012 is attributable to a different team of portfolio managers and analysts.

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

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

Compliance Statement: SSgA-Global claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. SSgA-Global has been independently verified for the periods January 1, 2000 through December 31, 2011. 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.

Benchmark Description: The benchmark for the composite is the Russell 3000(R) 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.

Use of Subadvisors: None.

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

Fee Schedule: For Commingled funds, management fees are .20% of the first \$50,000,000; .18% of the next \$50,000,000; and .15% thereafter. The annual minimum management fee for these accounts is \$10,000. For separately managed accounts, as above. The minimum annual management fee for separately managed accounts is \$50,000. Management fees may be adjusted based upon specific client requirements. Presently, 100% of the assets in this composite are non-management fee paying assets, but net of custody and administration fees.

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).

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

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 June 19, 2013 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.

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Appendix

Biography



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 and enhanced 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 twelve 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.