STATE STREET GLOBAL ADVISORS.

Developing Investment Strategies

An Overview

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SSgA

Agenda

1. A Quick Introduction to SSgA and Asset Management Basics
2. What we see in the Market These Days …
3. A Systematic Approach to Asset Allocation
4. Appendix
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   - b. Biography
   - c. Disclaimer

STATE STREET GLOBAL ADVISORS.

A Quick Introduction to SSgA and Asset Management Basics

SSgA

A Leading Provider of Financial Services to Institutional Investors

STATE STREET.

SSgA is a global leader in asset management relied on by 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 £1.25 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 £193 billion* in AUM

State Street Global Services
A global leader in asset servicing

SSgA
State Street Global Advisors
A global leader in asset management

State Street Global Markets
A global leader in research and trading

As of 31 March 2012
* This AUM includes the assets of the SPDR Gold Trust (approx. £43 billion as of 31 March 2012), 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/GBP is as of 31 March 2012.

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

Xxxx xxxx

Source: SSgA, as of May 31, 2012

Key Definitions (II)

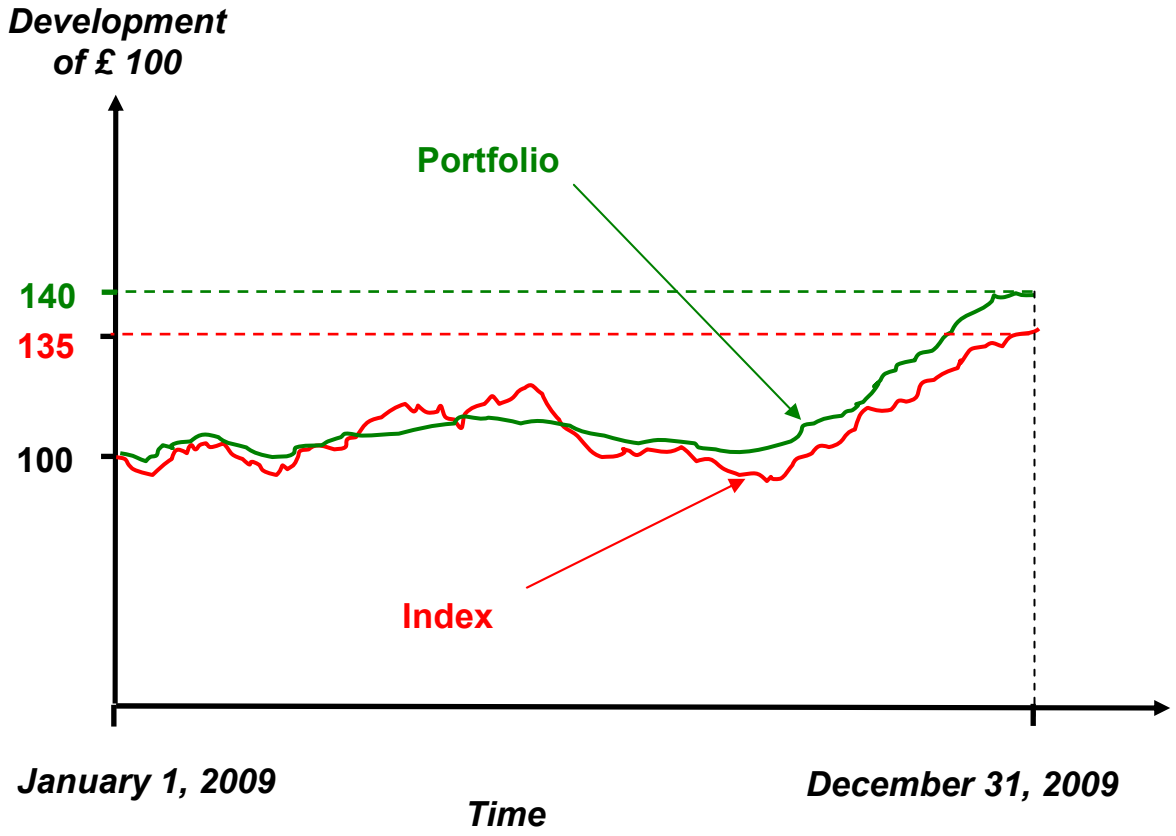
Passive Management:	• The portfolio aims to deliver the same return than the benchmark
Active Management:	• The portfolio aims to deliver a higher return than the benchmark
Fundamental Asset Management:	• The asset manager uses primarily fundamental analysis and balance sheet investigations to reach the buy/sell decisions
Quantitative Asset Management:	• The asset manager uses mathematical algorithms to reach the buy/sell decisions

Xxxx xxxx

Source: SSgA, as of May 31, 2012

Return of a Portfolio

Development of a portfolio and an index within 1 year



Absolute Return in 2009:

Index return:	35%
Portfolio return:	40%

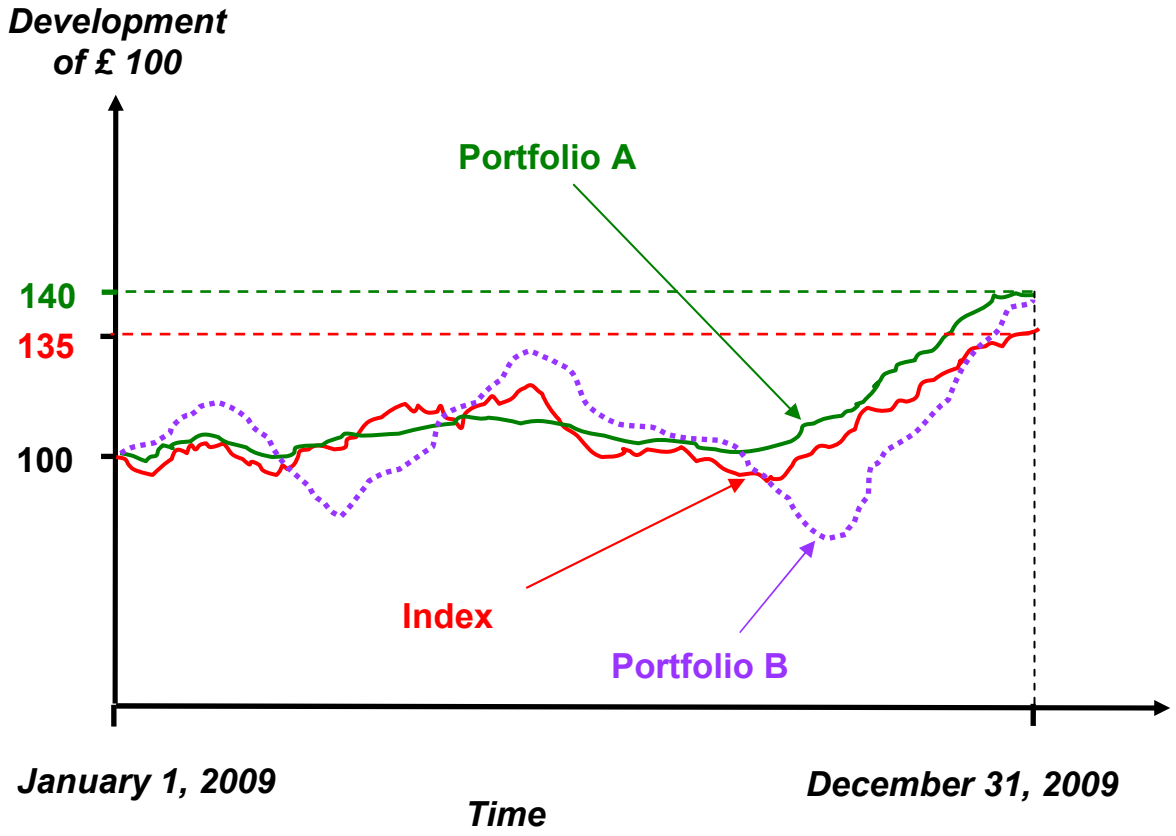
Relative Return in 2009:

Alpha of portfolio:	5%

Source: SSgA, as of May 31, 2012. For illustrative purposes only.

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%

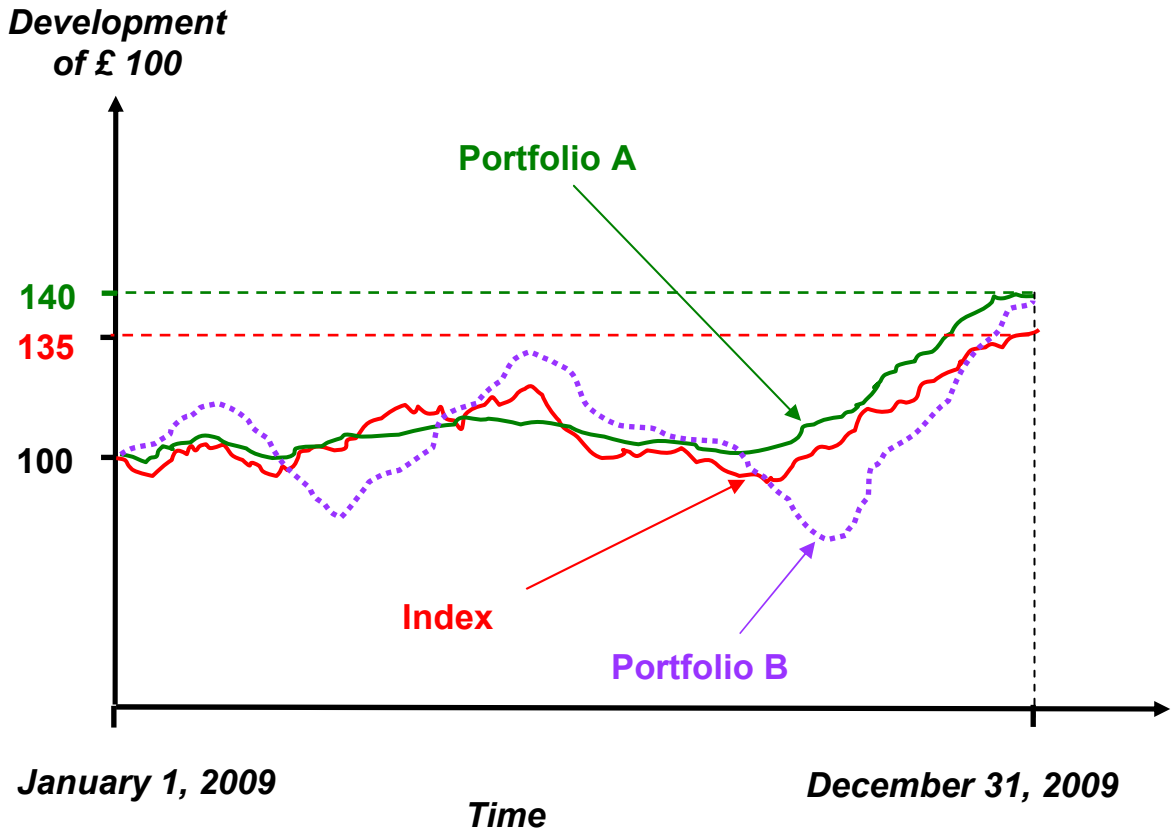
Relative Risk in 2009:

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

Source: SSgA, as of May 31, 2012. For illustrative purposes only.

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%

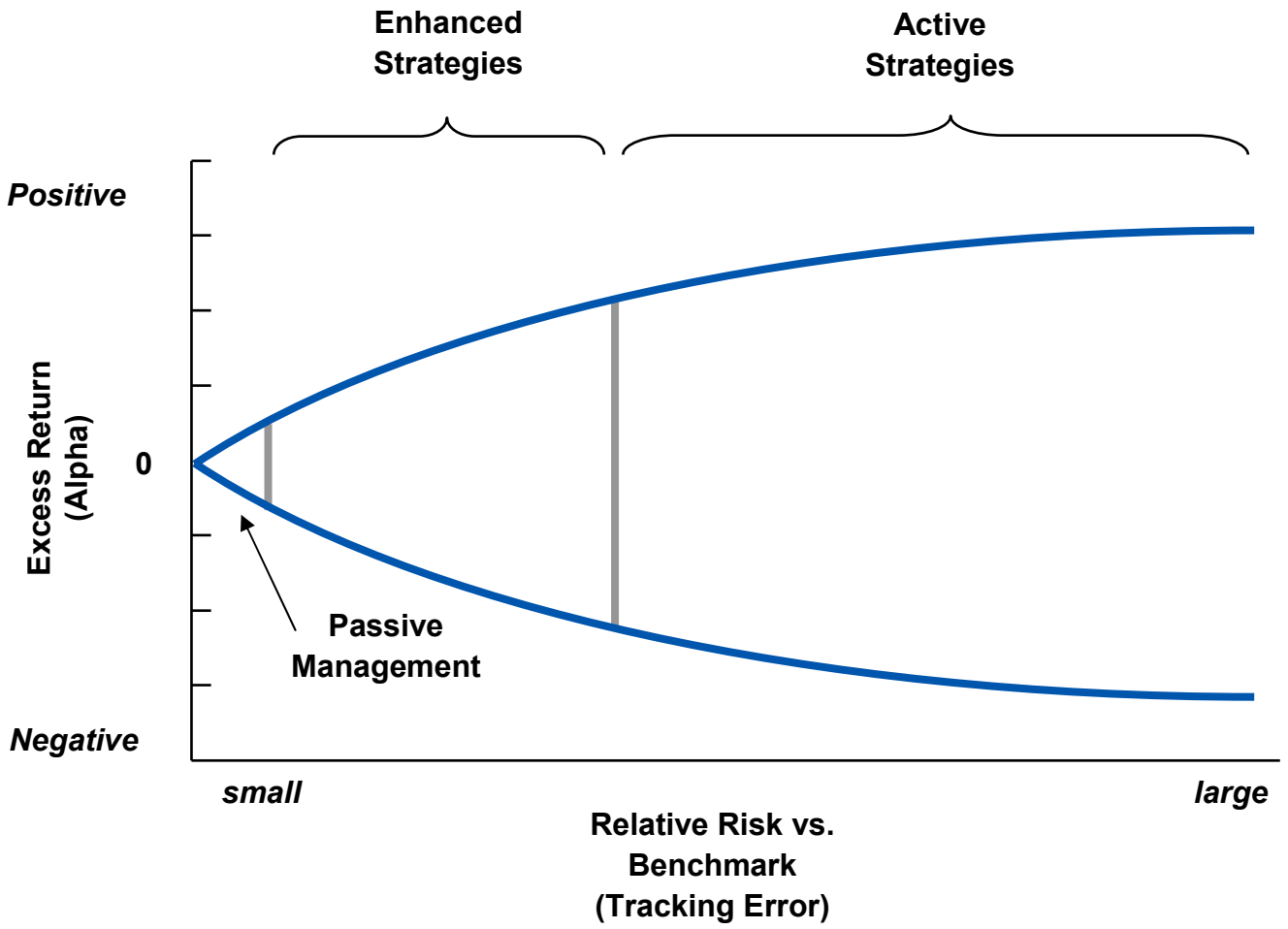
Relative Risk-Adjusted Return in 2009:

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

Source: SSgA, as of May 31, 2012. For illustrative purposes only.

Passive, Enhanced and Active Equity Management at SSgA

Relationship of Risk and Return



Source: SSgA, as of May 31, 2012.
For illustrative purposes only

What we see in the Markets These Days …

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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, 2012

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.

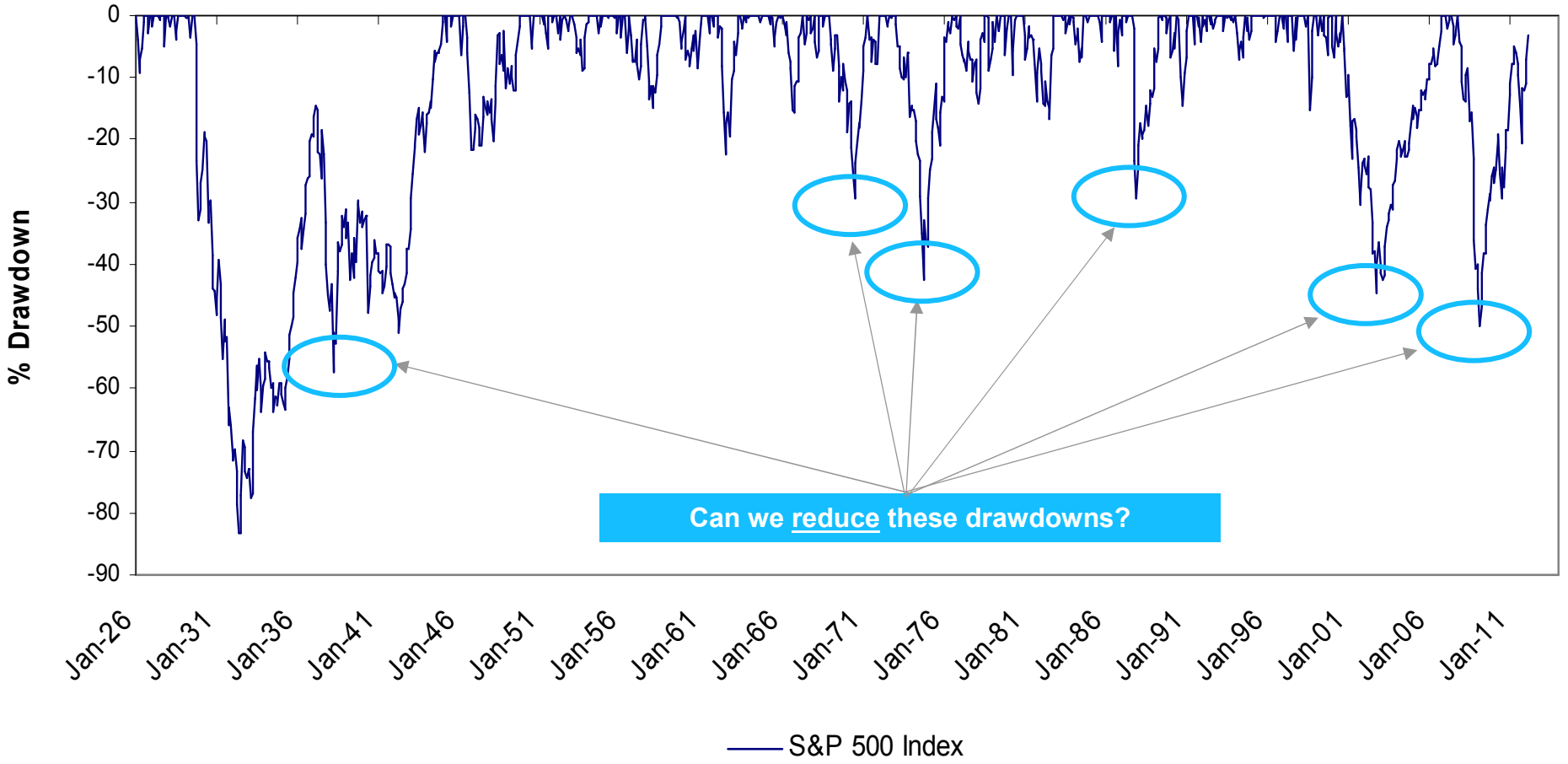
Past performance is not a guarantee of future results. Performance returns for periods of less than one year are not annualized.

… or Stated Differently …

Source: SSgA, as of March 31, 2012

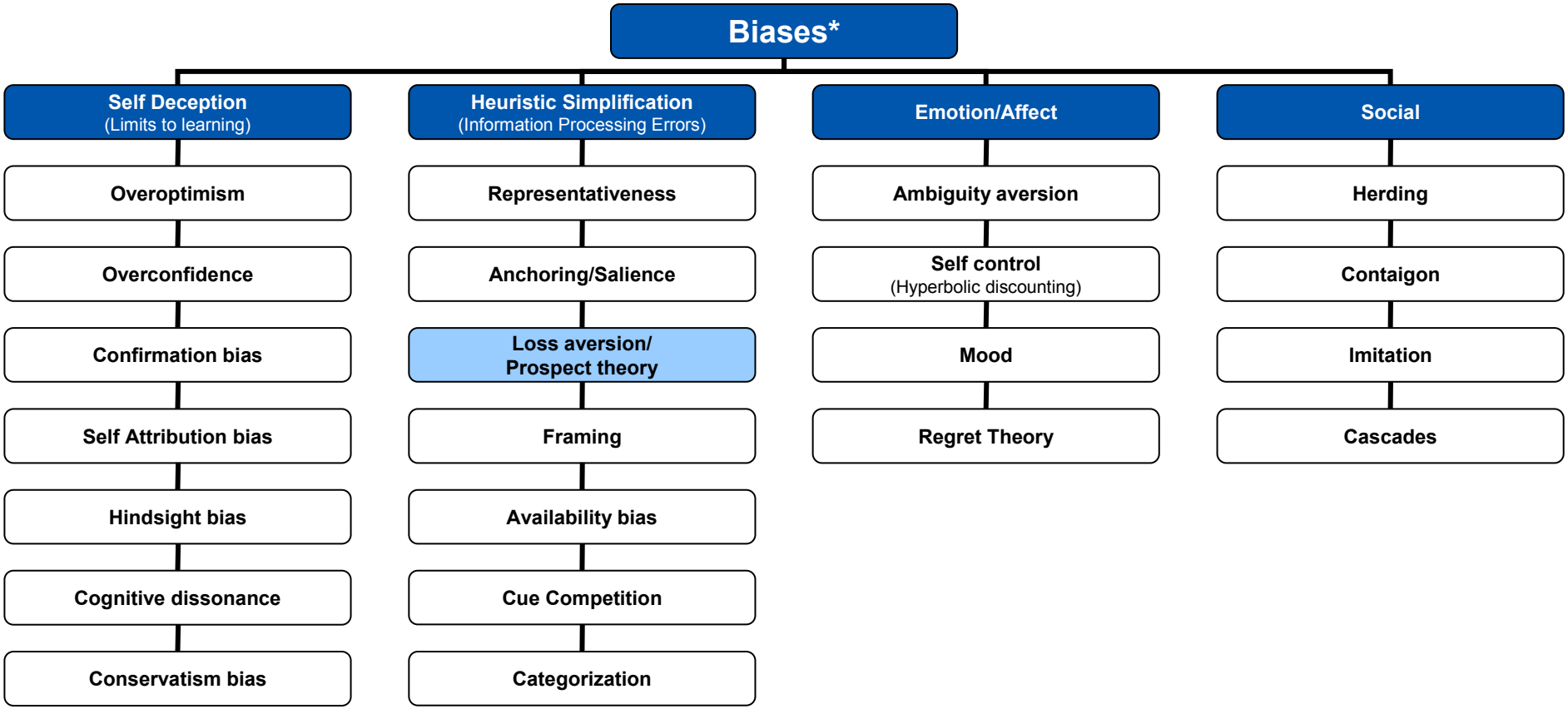
Historical Drawdown — S&P 500® Index

S&P 500 Total Return Drawdown 1926 – March 2012



Source: Zephyr StyleADVISOR, as of March 31, 2012
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:

1A: Receive £4000 with probability 0.8

1B: Receive £3000 with certainty

Problem #2:

2A: Pay £4000 with probability 0.8

2B: Pay £3000 with certainty

Source: Kahneman, D., and A. Tversky, "Prospect theory: an analysis of decision under risk," Econometrica 47, 1979, pp. 263-291.

Prospect Theory
Idea

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

Source: SSgA as of March 31, 2012

Prospect Theory
Implications for Investment Business

- 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.

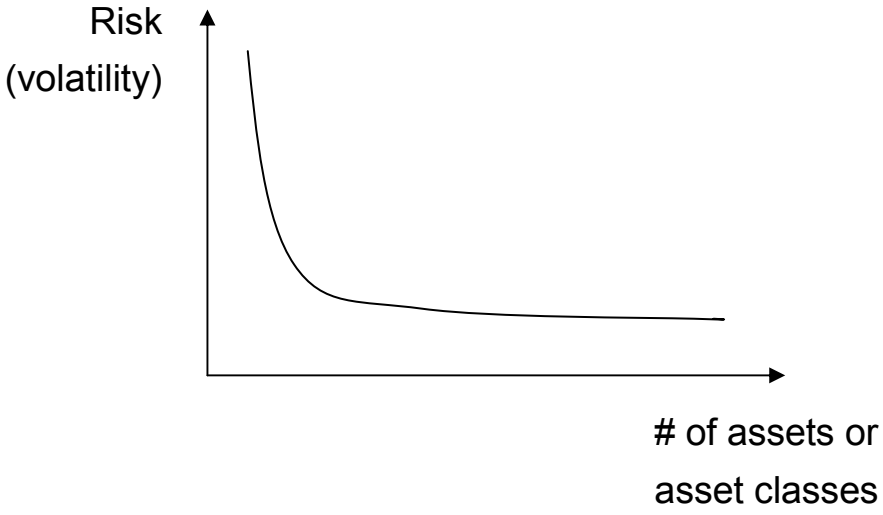
A Systematic Approach to Asset Allocation

SSgA

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 choose?
- 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.

Source: SSgA as of March 31, 2012. Diversification does not ensure a profit or guarantee against loss.

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}.

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

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

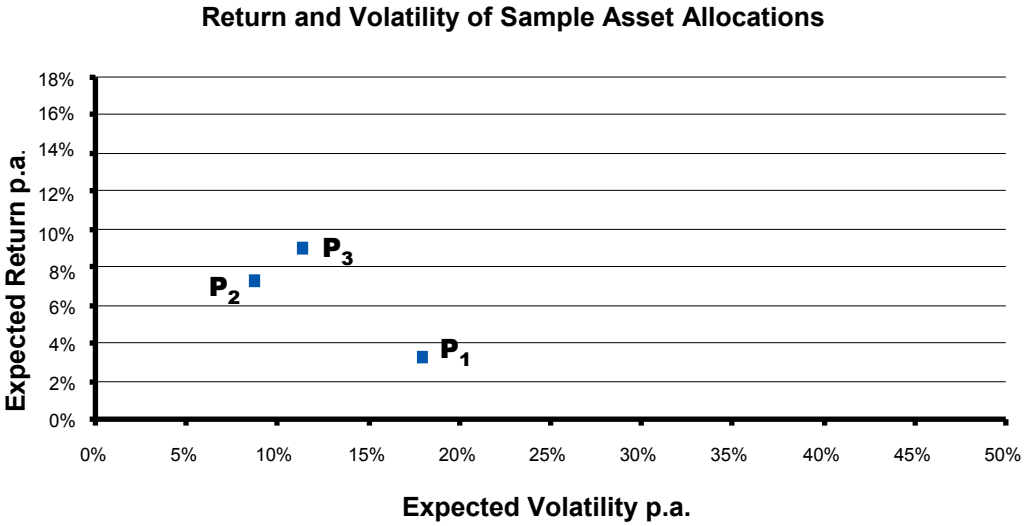
Source: SSgA as of March 31, 2012. Diversification does not ensure a profit or guarantee against loss.

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%

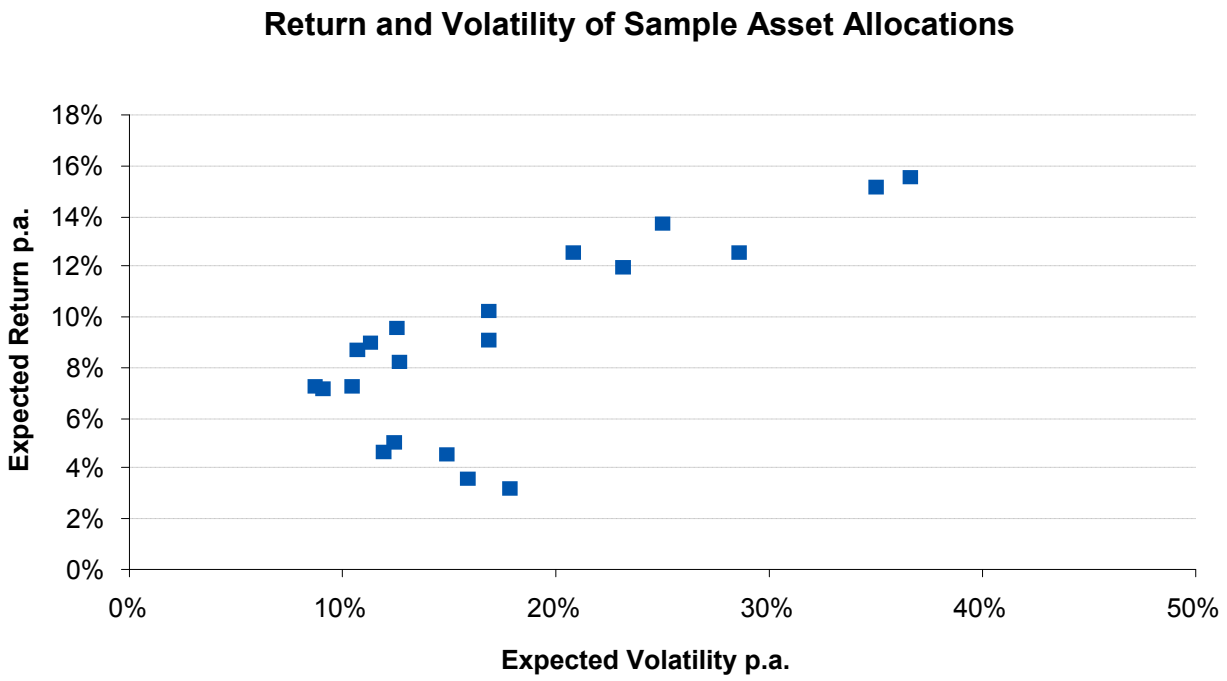


Source: SSgA as of March 31, 2012. Diversification does not ensure a profit or guarantee against loss.

Past performance is not a guarantee of future results.

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



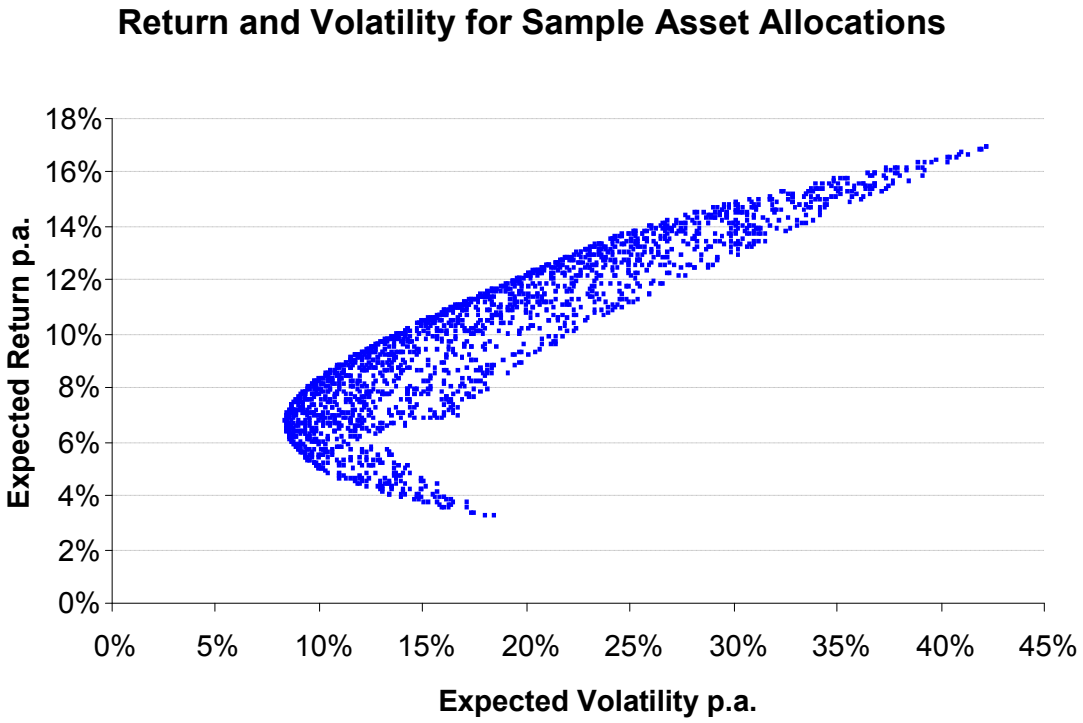
Source: SSgA as of March 31, 2012. Diversification does not ensure a profit or guarantee against loss.

Past performance is not a guarantee of future results.

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

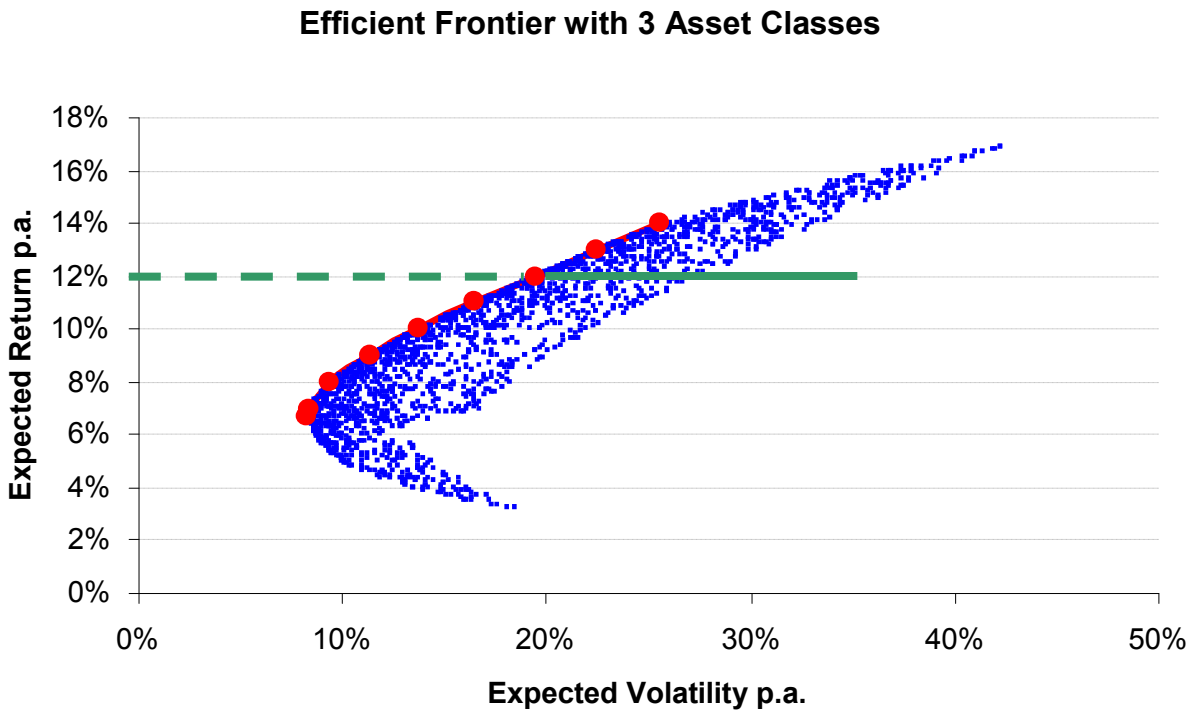


Source: SSgA as of March 31, 2012. Diversification does not ensure a profit or guarantee against loss.

Past performance is not a guarantee of future results.

Step 4: Finally … the Efficient Frontier

In this chart, we can see a frontier that "embraces" all possible asset allocations

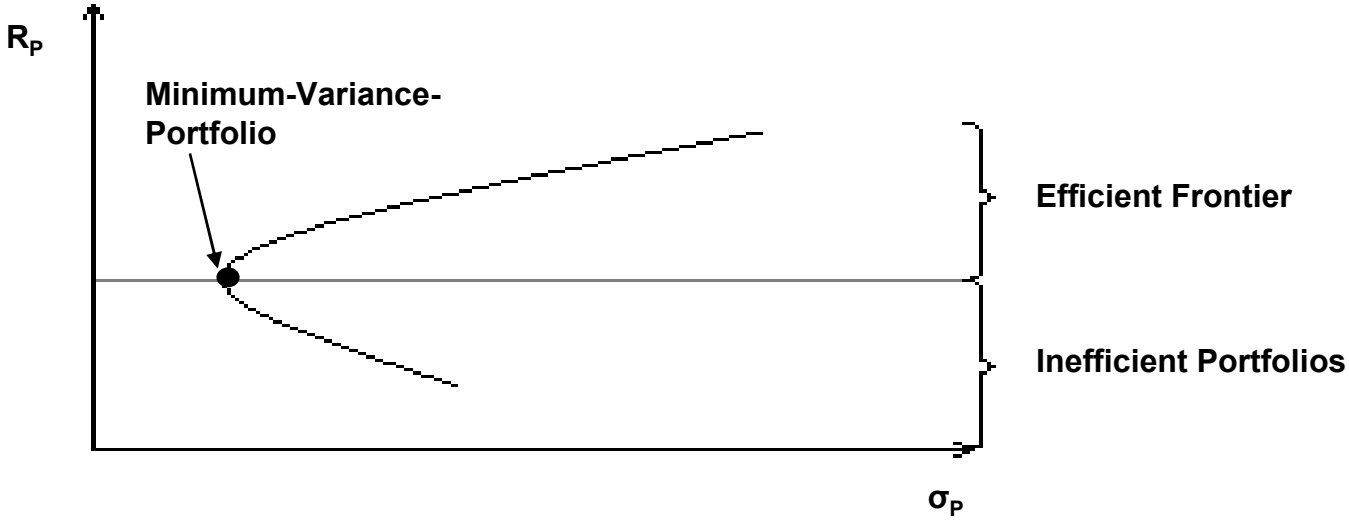


- The red dot on the green line represents the less risky portfolio for a return of 12%.
- Such a portfolio is called "efficient portfolio" as there is no portfolio with less risk at the same return level.

Source: SSgA as of March 31, 2012. Diversification does not ensure a profit or guarantee against loss.

Efficient Frontier

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



Source: SSgA as of March 31, 2012. Diversification does not ensure a profit or guarantee against loss.

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

Source: SSgA as of March 31, 2012.

Appendix A:

SSgA's Asset Under Management (AuM)

An Investment Manager That Institutions Rely On

47% of clients have two or more strategies*
78% of new business comes from existing clients*

Assets Under Management*

£77.4 Billion of Active/Enhanced
£878.4 Billion of Passive