

# Smart Indices How Smart Are They?

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**Allianz**   
Global Investors

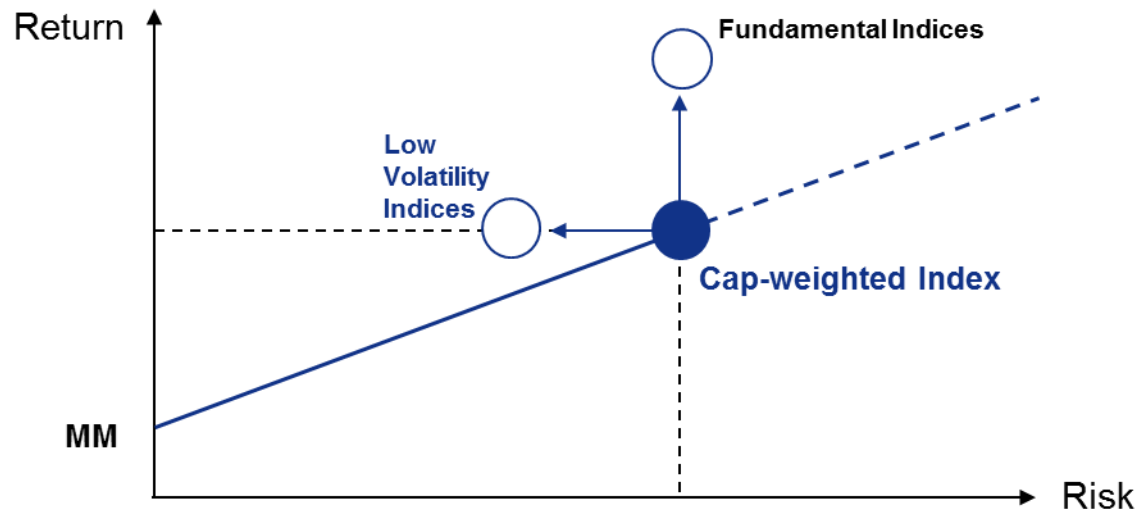
Understand. Act.

## Smart Indices

– Can Investors Do Better Than Cap Weighted Indices?

- Smart Beta proponents argue that **cap-weighted indices are inefficient**, and that a more efficient portfolio can be constructed by applying some **alternative stock weighting scheme**.
- Smart Beta indices are also referred to as **alternative betas**, **strategy indices** or smart indices.
- **RAFI Fundamental Indices (2005)** and **Minimum Volatility Indices (2008)** were the first indices called *Smart Beta*, and are still the **most prominent Smart Beta indices**. However, non-market cap weighting schemes have been explored earlier on.

### Capitalization-weighted Indices are not efficient



# Strong Demand For Smart Beta Strategies

– Recent News Flow

ft.com > markets > ftfm >  
June 16, 2013 4:14 am

## Large spike in 'smart beta' investments

In 2013, smart beta ETFs attracted \$65.1 billion, double the \$34.2 billion hauled in 2012

That momentum is coming roughly a year or two after a number of investment consultants - including Mercer, Wilshire Associates, Tower Watson, Russell Investments and Segal Rogers Casey – began recommending that clients consider these strategies.

Investment consultant **bfinance** in a survey in late January and early February found **37% of 82 institutional investors, ... were considering moving some of their passive assets ... to smart-beta strategies.**

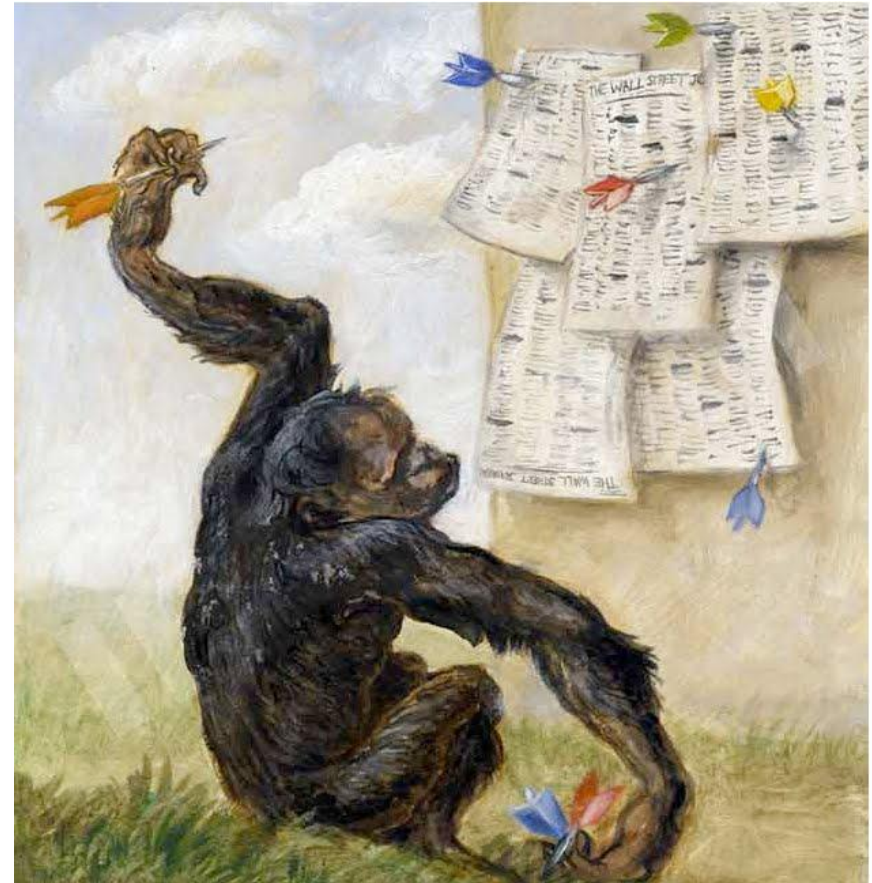
Towers Watson clients **added \$11 billion to new smart beta strategies** in 2013.

## Smart Beta Investing

### – How it all started

- The chimp throws darts at stocks listed on the pages of the Wall Street Journal.  
Someone reads the names hit by the darts and creates an equal-weighted **portfolio of say fifty names**.  
The portfolio outperforms the broad market!
- The chimp selects **another fifty names** and someone creates another equal-weighted fifty-stock portfolio out of this.  
The portfolio outperforms again!
- The chimp selects another **fifty names** and someone attaches **weights to them according to the inverse of their volatility**.  
The portfolio outperforms the broad market!
- Someone attached **weights** that are **proportional to the stock volatilities**, so the opposite of the previous weighting scheme.  
You guessed it -- the portfolio outperforms!

***What's going on here?***

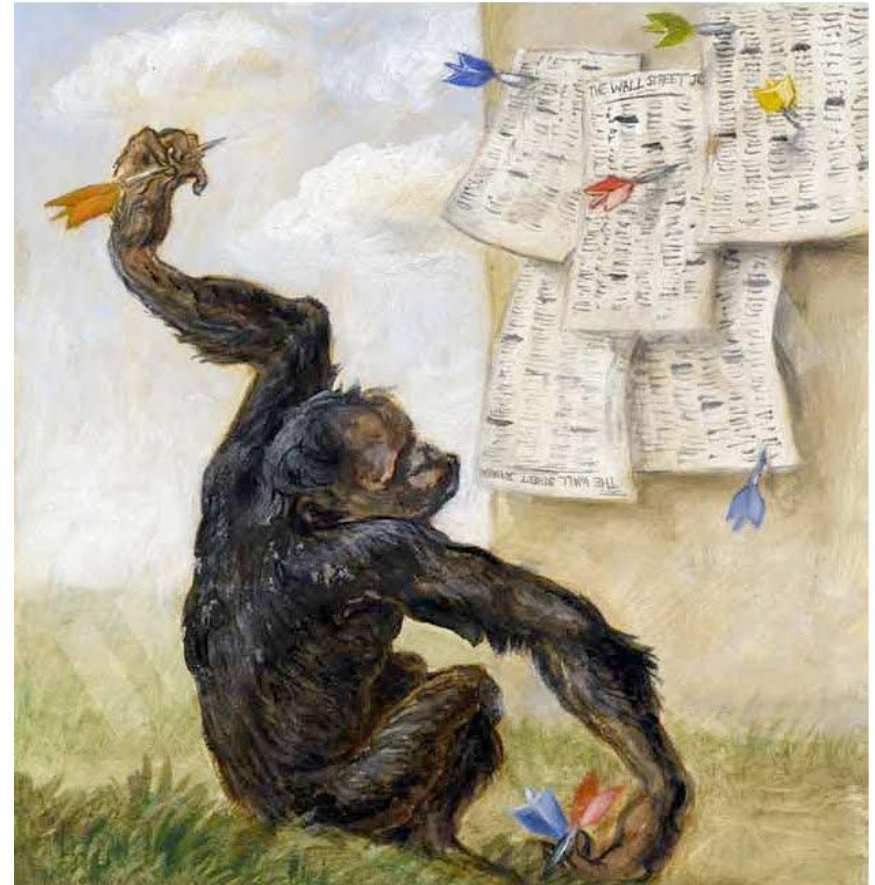


Source: Index Fund Advisors, copyrighted material



## What's Going On? Preliminary Answers

- Outperformance is **not driven by stock selection** only
- Outperformance is **not driven by weighting scheme** only
- Outperformance **is driven by investment style exposures** such as **Small Cap** and **Value**
- ***Similar exposures in Value and Small Caps can result from very different stocks and very different weighting schemes!***



Source: Index Fund Advisors, copyrighted material

# The Outperformance of Selected Investment Styles

– Academic Research on Anomalies/Premiums

## A Short History of Style Investing

1934



B. Graham

### Value Investing

Graham/Dodd's book *Security Analysis* is published, the groundwork of Value Investing. Nicholson (1960) was the first to demonstrate that low Price/Earning strategies outperform over time.

1968



R. Ball

### Earnings Revisions

Stocks with positive earnings surprises tend to outperform for several weeks or even months.

1981



R. Banz

### Size-Effect

Small caps outperform beta-adjusted large caps (USA).

1991



R. Haugen

### Low Risk Anomaly

Haugen/Baker showed, that a minimum variance portfolio was able to beat the US market from 1973-1989 at lower levels of risk.

1993



Jegadeesh

Titman

### Momentum Anomaly

US stocks with above-average performance over the last 3-12 months retain their momentum for the next ~12 months.

# Why Are There Anomalies/Premiums?

**Mark Twain: “If we remember that we are all mad, life stands explained.”**

## ■ **Behavioral Explanation**

If I assume that everybody else is mad except me, my investment strategy stands explained. I will be rewarded for being more clever, less constrained until the anomaly is arbitrated away in a risk free way by me and a few other clever guys. Until then we do what the chimp does but we deem ourselves more clever when doing it, at least more clever than other market participants as they clearly underperform the dumb chimp.

## ■ **The Noisy Market Hypothesis**

Independence from market cap weights is all you need, no matter in which way you are non-market cap weighted. Market-cap weights suffer from "biased valuation noise", there is no need to be clever, just be a happy chimp ignoring market-cap noise.

## ■ **Risk Premium Explanation**

There is more than one risk premium out there. Positive exposure to those is all you need. You get rewarded for bearing extra risk. There is actually no anomaly, it is just that there have been some risk factors missing in the consideration. The chimp, unknowingly, takes on extra small cap and value risk and is rewarded with extra bananas. That's fair.

# What Drives the Performance of **Smart Beta** Indices?

## – Smart Beta Indices Harvest Well-Known Risk Premiums

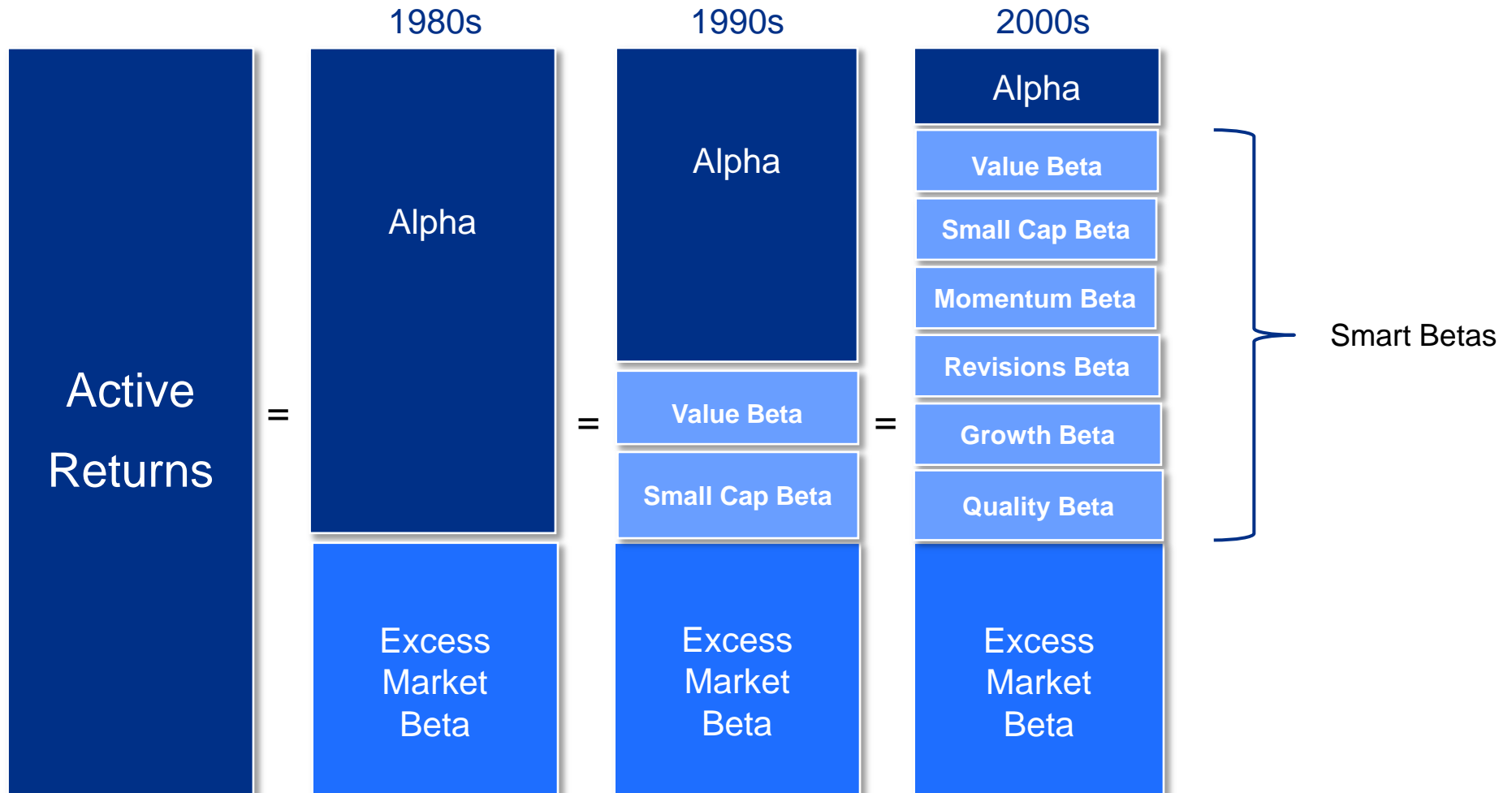
- **The performance of Smart Beta indices is not driven by anything novel, but can be explained fully by the exposures to well-known risk premiums like the value or the small cap premium.**

Towers Watson Classification	Smart Beta Index	Performance Drivers
Economically Weighted	RAFI Fundamental Indices MSCI Value Weighted Indices	value and small cap risk premium
	Stoxx Dividend Indices	value and small cap risk premium
Risk Weighted	MSCI Minimum Volatility Indices	low risk anomaly, value and small cap premium
	MSCI Risk Weighted	value and small cap premium, low risk anomaly
Factor Weighted	MSCI Value Indices	value risk premium
	MSCI Growth Indices	momentum risk premium, duration risk
	MSCI Momentum Indices	momentum risk premium
Equally Weighted	Equally Weighted Indices	value and small cap risk premium



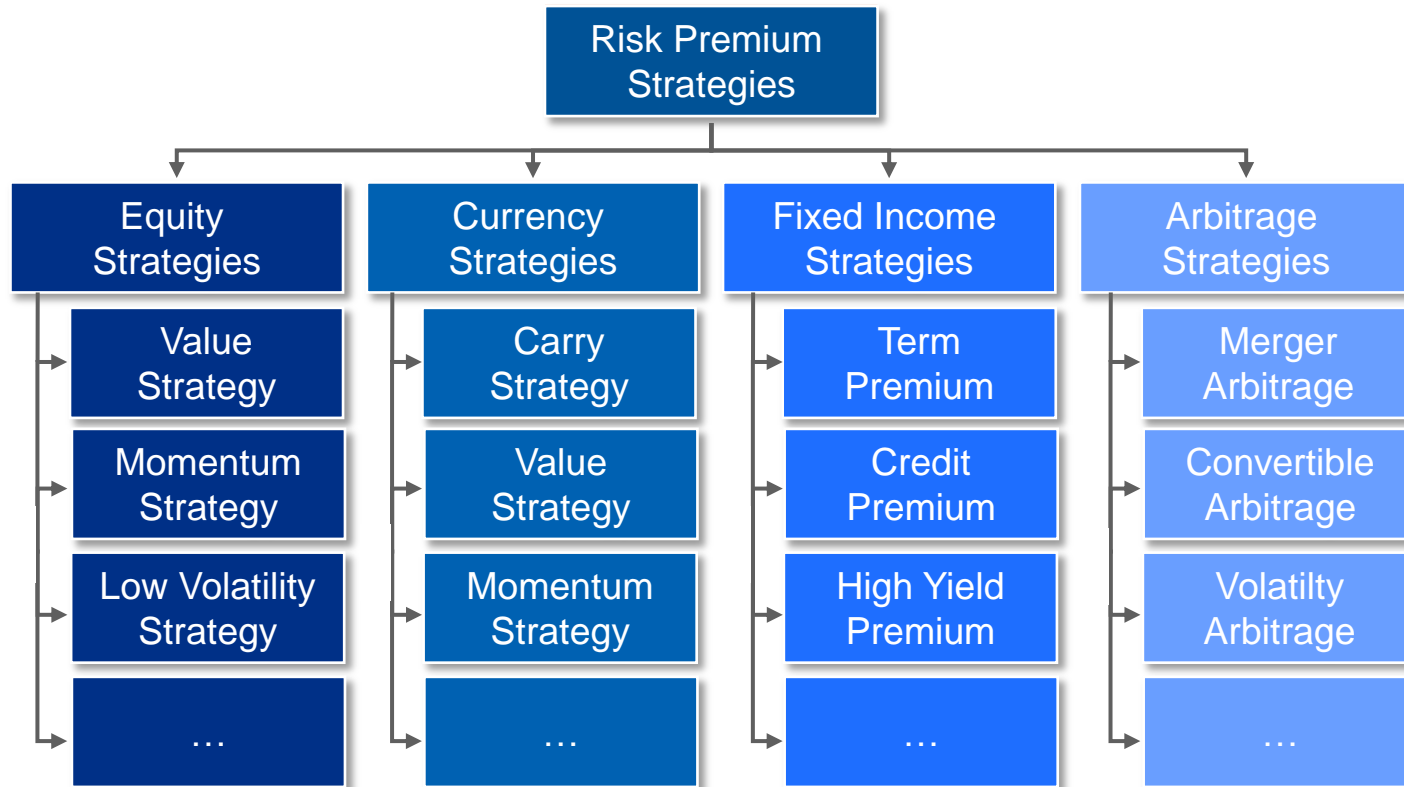
# Today's Alpha Is Tomorrow's Beta.

– Investment Style Risk Premiums Explain Active Equity Returns



Source: MSCI, Allianz Global Investors

# Harvesting Risk Premiums is a Common Investment Strategy for Many Asset Classes



**➤➤➤ Risk premiums are long-term sustainable sources of return**

## In The Following We Revisit All Three Explanations To Better Learn How To Construct An Outperforming Product

- **The Noisy Market Hypothesis**

We will see that it is circular reasoning, not proving anything. No lessons learned for an investable product.

- **Behavioral Explanation**

The behavioral explanation creates some urge to constantly find new anomalies and no urge at all to manage risk.

- **Risk Premium Explanation**

This fits well with other asset classes like fixed income (compare value premium with credit spread premium), urges the investment manager to diversify risk.

# The Noisy Market Hypothesis - What is it?

## ■ Noisy Market Hypothesis

« *Market Cap Indices Are Inferior  
As They Are Biased Towards Overvalued Stocks  
If The True Value of Stocks is Obscured by Noise* »

Jeremy Siegel



“It can be rigorously proved that if stock prices are subject to noise, then capitalization-weighted indexes will offer investors risk-and-return characteristics that are inferior ...”

Jason Hsu



“The sub-optimality arises because cap-weighting tends to overweight stocks whose prices are high relative to their fair value (fundamentals) and underweight stocks whose prices are low relative to their fair value (fundamentals).”

Andre Perold



"The big claim of the theory is that one can outperform cap-weighted indices *without knowing* fair value."

Jack Treynor



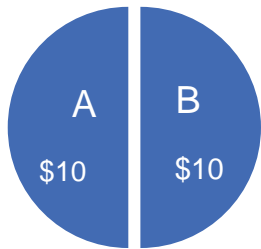
Treynor states that a valuation noise of  $\sigma$  translates into a positive relative performance of  $\sigma^2$  by a market-valuation-indifferent index versus a market value weighted index.

# Why Should Noise Be A Problem For Market Cap Weighted Indexes?

– Hsu's Example

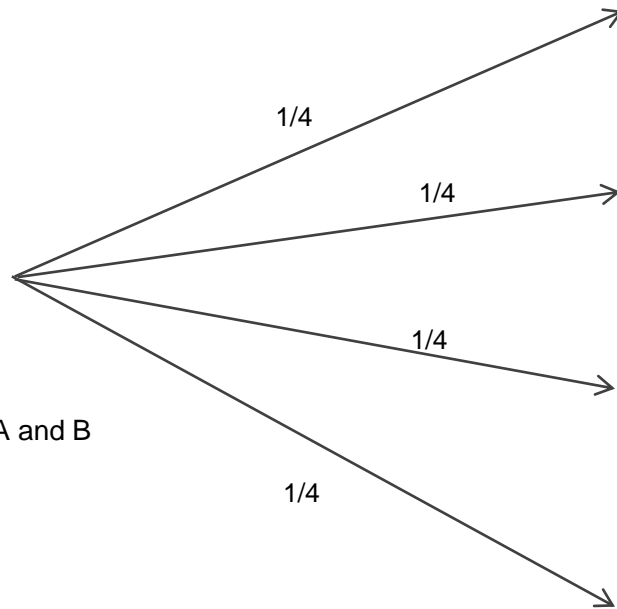
- The noisy market hypothesis starts with the assumption that any given stock is as likely to be overvalued as undervalued.

*true value weighted portfolio*

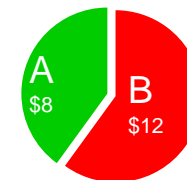
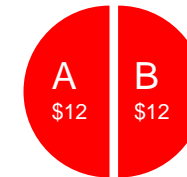
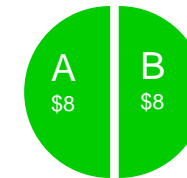
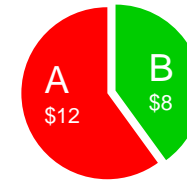


Assume a portfolio of two companies A and B with equal true value

*market value weighted portfolio*



Assume the market misprices shares A and B with true value \$10 in either direction by 20% and with equal probability  $1/4$



## Conclusion

Market value weighted portfolios

are overweight in overvalued stocks (red) and underweight in undervalued stocks (green)

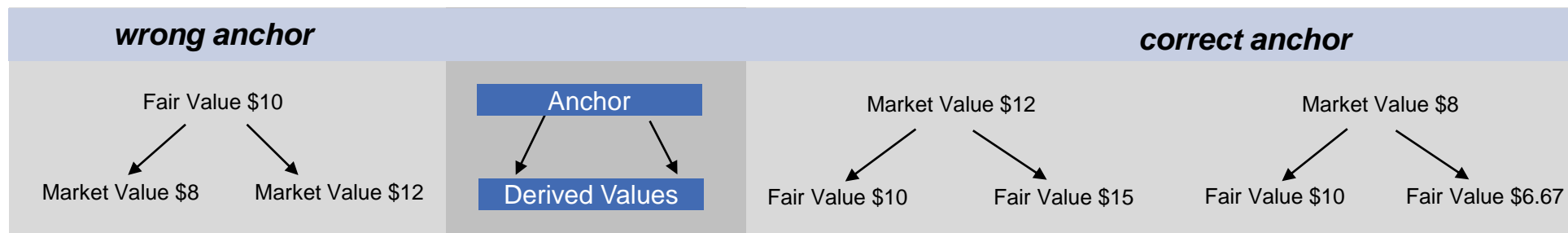


# The Noisy Market Hypothesis Remains Unproven

- In his paper “Fundamentally Flawed Indexing”<sup>1</sup> Andre Perold argues that the proofs of the **Noisy Market Hypothesis are based on flawed thinking.**
- The fundamental flaw is that the **noisy market hypothesis effectively anchors on true values** - holding true value fixed and then deducing the probability distribution of market prices. **The correct analysis has to anchor on observed prices and deduce true values.**



Andre Perold



- Kaplan<sup>3</sup> concludes: **Fundamental indexation claims that it *does* outperform without having superior information but the flawed proofs of this statement implicitly include superior knowledge. However, fundamental indexing *can* outperform if fundamental weights are closer to true value weights than market weights.**



Paul Kaplan

1) Andre Perold, “Fundamentally Flawed Indexing”, Financial Analysts Journal, Volume 63, Number 6, November/December 2007.  
 2) Andre Perold, “Fundamentally Flawed Indexing: Author Response”, Financial Analysts Journal, Volume 64, Number 2, March/April 2008.  
 3) Paul D. Kaplan, “Why Fundamental Indexation Might – or Might Not - Work”, Financial Analysts Journal Vol. 64

# Two More Explanations for the Outperformance of Investment Styles

## Outperformance

### Behavioral Finance

#### Explanation

- ▶ Value strategies benefit from cognitive biases of other investors.

#### Typical mistakes

- ▶ Good company = Good stock
- ▶ **Companies' sales and earnings growth are too far extrapolated into the future, and high growth thus overpaid. Hence, growth stock underperform and value stocks outperform,**

### Risk Premium

#### Explanation

- ▶ Value strategies are riskier than average stocks, which is compensated by higher returns.

#### Sources of Risk

- ▶ Value stocks are typically more cyclical, more highly leveraged and less profitable than average stocks.
- Hence, these stocks are at risk in prolonged cyclical downturns.

# Explanations for the Outperformance of Investment Styles

Investment Style	Behavioral Explanation	Risk Premium Explanation
Value	Investors are becoming overly pessimistic on stocks as investors overreact to recent negative events and short term trends. An overly pessimistic view on a stock can push the stock price far below its fair value.	Value stocks are typically more cyclical, more highly leveraged and less profitable than average stocks.
Earnings Revisions	<ul style="list-style-type: none"> <li>- Cockroach theory</li> <li>- Piecemeal Approach</li> </ul>	Earnings Revisions strategies are at mean-reversion risk at market turnarounds
Small Cap	Neglect effect	Small Caps stocks are typically more cyclical, more highly leveraged, less profitable and less liquid than average stocks.
Momentum	Herding	Momentum strategies are at mean-reversion risk at market turnarounds
Low Volatility	Investors' preference for stocks with lottery like payoffs leads to overpricing of high beta stocks	Low beta stocks will fail you when you need them most in turbulent markets as betas converge to one. You are also long equity duration risk.

# Explanations for the Outperformance of Investment Styles

Investment Style	Behavioral Explanation	Risk Premium Explanation
Value	Investors are becoming overly pessimistic on stocks as investors overreact to recent negative events and short term trends. An overly pessimistic view on a stock can push the stock price far below its fair value.	<ul style="list-style-type: none"> <li>■ Outperformance expectations is based on the premise that other investor suffer from behavioral biases, but your portfolio manager is smarter.</li> </ul>
Earnings Revisions	<ul style="list-style-type: none"> <li>- Cockroach theory</li> <li>- Piecemeal Approach</li> </ul>	<ul style="list-style-type: none"> <li>■ This is a demanding assumption that many investors, in particular passive minded investors, would not subscribe to.</li> </ul>
Small Cap	Neglect effect	<ul style="list-style-type: none"> <li>■ What if other investors become smarter?                             <ul style="list-style-type: none"> <li>- Does the effect disappear?</li> </ul> </li> </ul>
Momentum	Herding	<ul style="list-style-type: none"> <li>■ What if the strategy underperforms?                             <ul style="list-style-type: none"> <li>- Does this mean that others have become smarter and the effect has disappeared?</li> </ul> </li> </ul>
Low Volatility	Investors' preference for stocks with lottery like payoffs leads to overpricing of high beta stocks	<ul style="list-style-type: none"> <li>■ Principal task of a portfolio manager is to find new behavioral patterns that can be exploited.</li> </ul> <p>as betas converges to one then.</p>

# Explanations for the Outperformance of Investment Styles

Investment Style	Behaviorial Explanation	Risk Premium Explanation
Value	<ul style="list-style-type: none"> <li>■ Outperformance expectations is based on the existence of risk premiums.</li> </ul>	<p>Value stocks are typically more cyclical, more highly leveraged and less profitable than average stocks.</p>
Earnings Revisions	<ul style="list-style-type: none"> <li>■ This is not a demanding assumption, and many passive investors believe in the existence of risk premiums. Hence, positioning a product as a risk-based smart beta product is appealing to passive investors.</li> </ul>	<p>Earnings Revisions strategies are at mean-reversion risk at market turnarounds</p>
Small Cap	<ul style="list-style-type: none"> <li>■ Does the effect disappear? Not as long as these stocks remain riskier.</li> </ul>	<p>Small Caps stocks are typically more cyclical, more highly leveraged, less profitable and less liquid than average stocks.</p>
Momentum	<ul style="list-style-type: none"> <li>■ What if the strategy underperforms?               <ul style="list-style-type: none"> <li>- If risk premiums materialized all the time they wouldn't be risk premiums.</li> </ul> </li> </ul>	<p>Momentum strategies are at mean-reversion risk at market turnarounds</p>
Low Volatility	<ul style="list-style-type: none"> <li>■ Principal task of a portfolio manager is to diligently manage the risks associated with the targeted risk premiums.</li> </ul> <p>for stocks with lottery like payoffs leads to overpricing of high beta stocks</p>	<p>Low beta stocks will fail you when you need them most in turbulent markets as betas converge to one. You are also long equity duration risk.</p>



## How Smart is Smart Beta?

- Investors can do Better when it Comes to Harvesting *Single* Risk Premiums than Buying a *Single* Smart Beta Index

**Smart Beta indices are not designed to harvest the equity risk premiums in the most efficient way, but are designed for simplicity and appeal.**

- **RAFI Fundamental Indices**

These indices can be biased towards financially distressed companies.

**The value premium can be earned more efficiently by striking a balance between highly volatile value names and lowly volatile value stocks.**

- **MSCI Minimum Volatility Indices**

These indices – while targeting the low volatility premium –

**leave the exposure to other risk premiums like value or momentum unmanaged.**

The index was a small cap value index in 2000, now it is a large cap growth index.

- **MSCI Momentum Indices**

Naïve momentum strategies like the MSCI Momentum strategy are very much **at risk at major market reversals.**

There are more aspects to momentum, i.e. the **idiosyncratic part of momentum or the interaction of earnings and price momentum.**

## How Smart is Smart Beta?

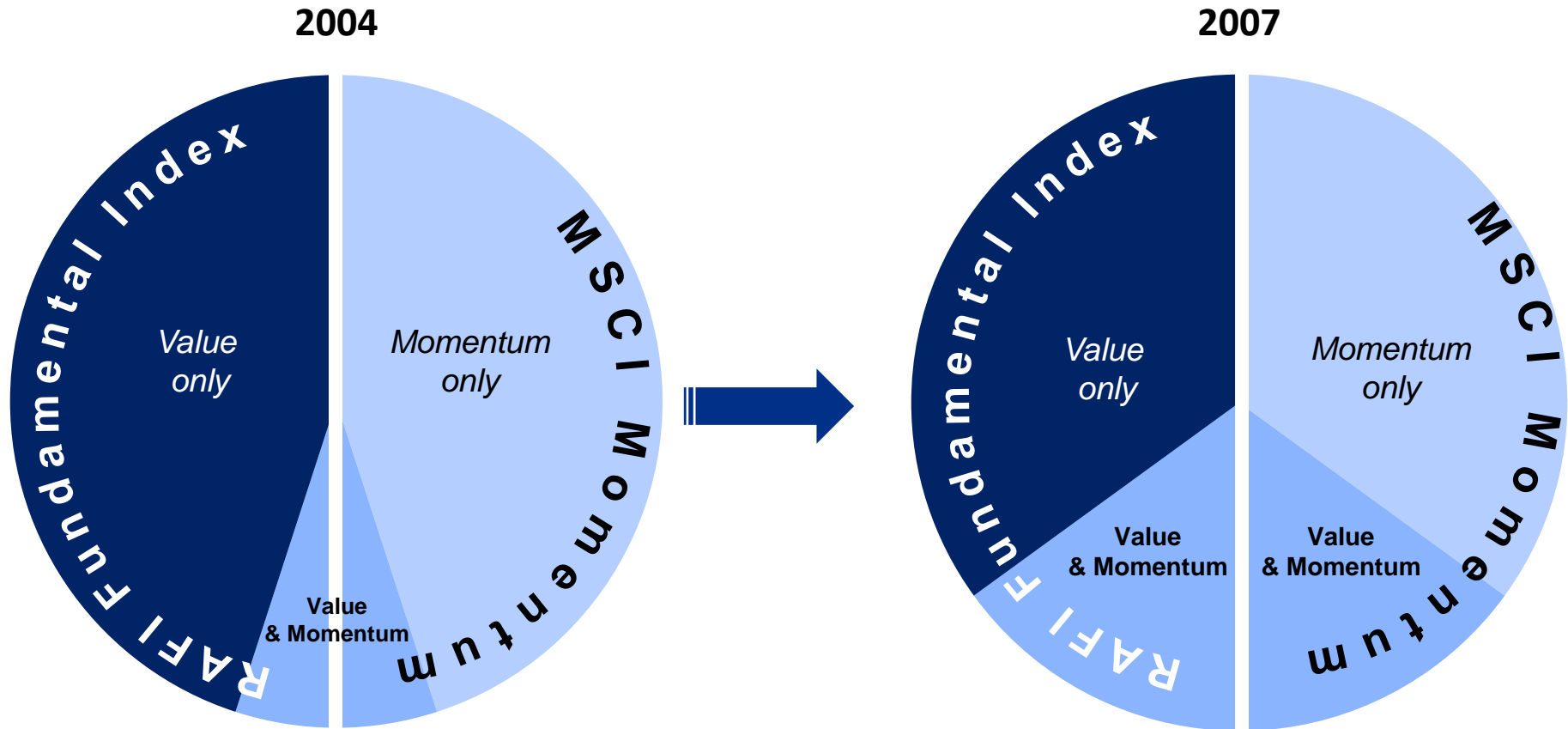
– Investors can do Better when it Comes to Harvesting *Multiple* Risk Premiums than Buying *Multiple* Smart Beta Indices

- Simply blending Smart Beta indices results in many unmanaged risk factors and leads to incomplete diversification.

Risk Dimension	Blend of Smart Beta Indices	Integrated Fund Approach
How many dimensions of diversification are available?	Diversification across chosen indices	Diversification at stock level
Capitalizing on single stock correlations	No	Yes
Diversification across <i>targeted</i> risk factors like value or momentum	Very limited - only by weighting Smart Beta indices - impaired by instable exposures of Smart Beta indices to the risk factors	Yes, by buying and controlling the desired exposures
Diversification across <i>unintended</i> risk factors like macro risks	Very limited, take as is.	Yes, by imposing constraints
Management of single stock risk	No	Yes

Source: Allianz Global Investors

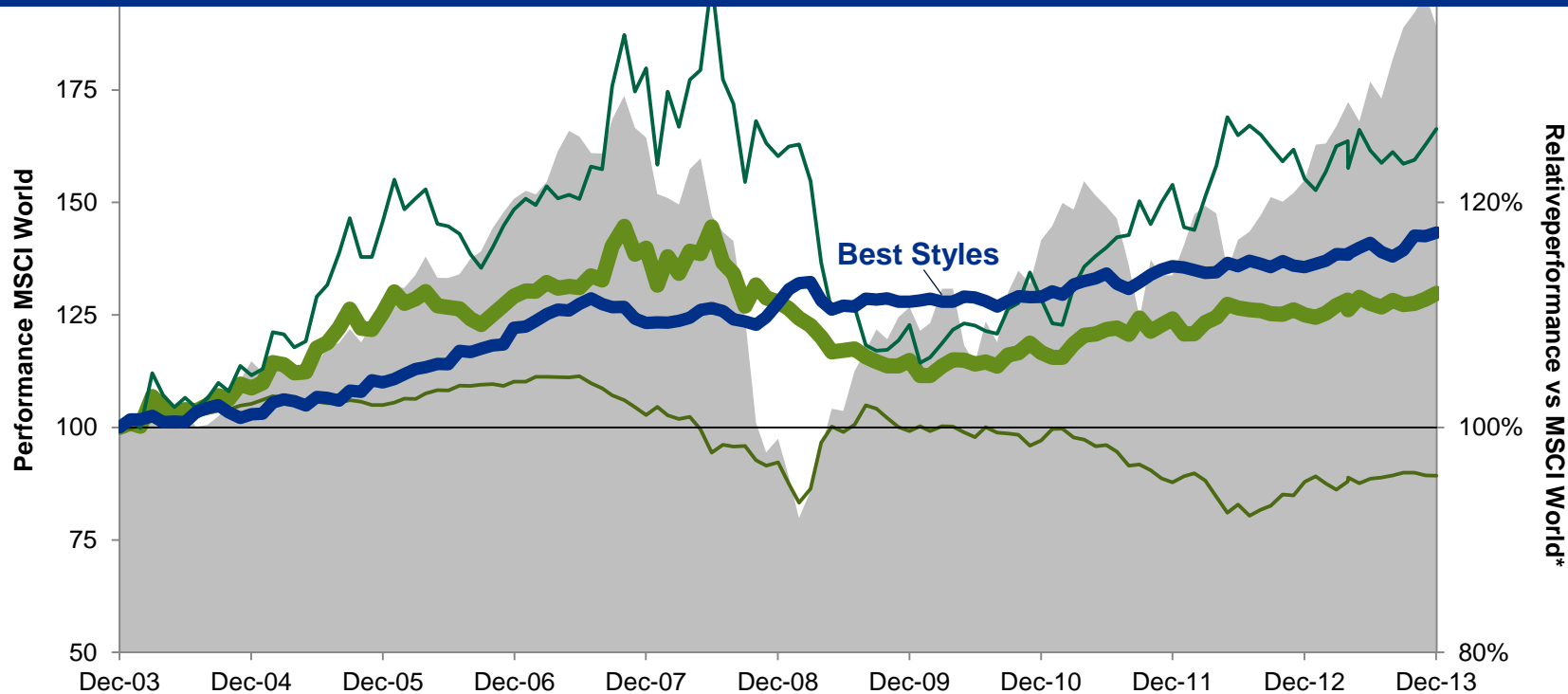
# The Investment Style Overlap Cannot be Managed When Buying a Blend of Smart Beta Indices



# Combination of Smart Beta indices or Integrated Solution?

- The **Smart Beta debate** has finally established the concept of harvesting equity risk premiums as a promising way of equity investing.
- **Best Styles** has successfully been harvesting investment style risk premiums for **15 years** now in an integrated way, long before the term “**Smart Beta**” was coined.
- The performance of **Best Styles** is more stable than a combination of the MSCI Smart Beta indices.

Relative Performance of Best Styles Global vs. MSCI Risk Premium Indices



MSCI WORLD
  Mix of VALUE & MOMENTUM
  WORLD VALUE WEIGHTED
  WORLD MOMENTUM

\* Source: AllianzGI, MSCI.  
The performance of Best Styles Global is represented by the composite SYSTEMATIC EQUITY GLOBAL BEST STYLES DEVELOPED - COMP0189.  
The other indices are MSCI World Risk Premium Indices, except the Momentum index where a MSCI World version is not available and the relative performance of the MSCI AC Momentum index vs MSCI AC World is shown instead.  
We applied transactions costs to the indices to proxy the performance of ETFs mimicking these indices.

## Examples from Investment Style Research Findings

- Correlations between the MSCI risk premium indices for value and momentum shift over time.
- Most of the time, like today, the correlation of relative returns is negative, hence there is a substantial diversification advantage from blending value with momentum.
- However, in prolonged cyclical value rallies like the one from 2003 to 2007, value and momentum typically go hand in hand, and hence there is no diversification advantage left from blending value with momentum.
- Diversification was badly needed at the end of the value rally in 2008 as both value and momentum stocks tanked as the global economy grinded to a halt after the Lehman collapse.
- However, for investors in these two MSCI risk premium indices there was nothing that could be done to restore diversification, investors just had to accept the loss of diversification.
- Smart beta indices like the MSCI risk premium indices are not designed with a view towards a diversified combination with other smart beta indices, but are designed as stand-alone products.
- A portfolio manager in an integrated portfolio solution can provide the proper diversification across *multiple* risk premiums by structuring the *individual* risk premium portfolios already with a view towards the subsequent diversification across *multiple* risk premiums.
- Example: If correlations between value and momentum are becoming too high, the portfolio manager will put more weight on those value stocks that are not at the same time momentum stocks, and put more weight on those valuation criteria that will have a lower correlation with momentum factors to effectively restore diversification between value and momentum.



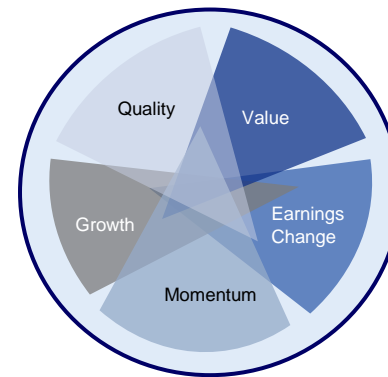
# 1<sup>st</sup> Success Factor of Integrated Risk Premiums Approach: Establishing a Diversified Investment Style Mix

## Diversified investment style mix



- Small overlap with high diversification potential

## Standard quant scoring, or mix of risk premium ETFs



- Strong overlap of investment styles implies a focus on over-loved, over-owned stocks which are highly at risk at market turnarounds

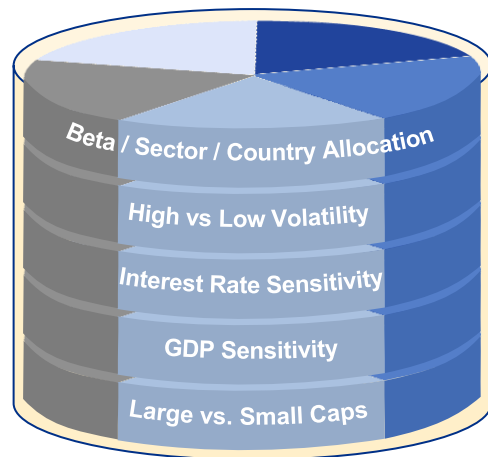


A diversified investment style mix manages the risks of investment styles

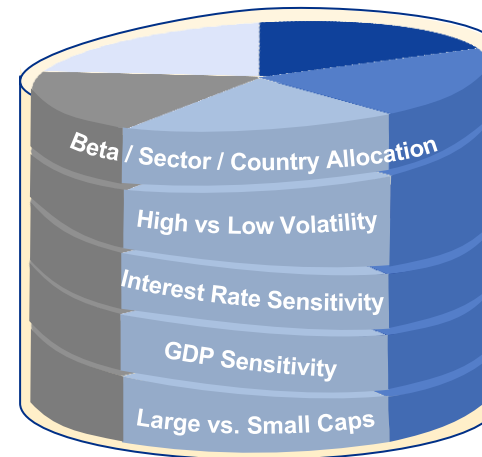
## 2<sup>nd</sup> Success Factor of Integrated Risk Premiums Approach: Establishing Diversity Within Investment Styles Across Risk Dimensions

- Efficient risk premium harvesting portfolios represent each investment style in its full diversity and do not focus on one risk dimension within an investment style only.

Portfolio with diversified exposures to investment styles and full diversity within investment styles



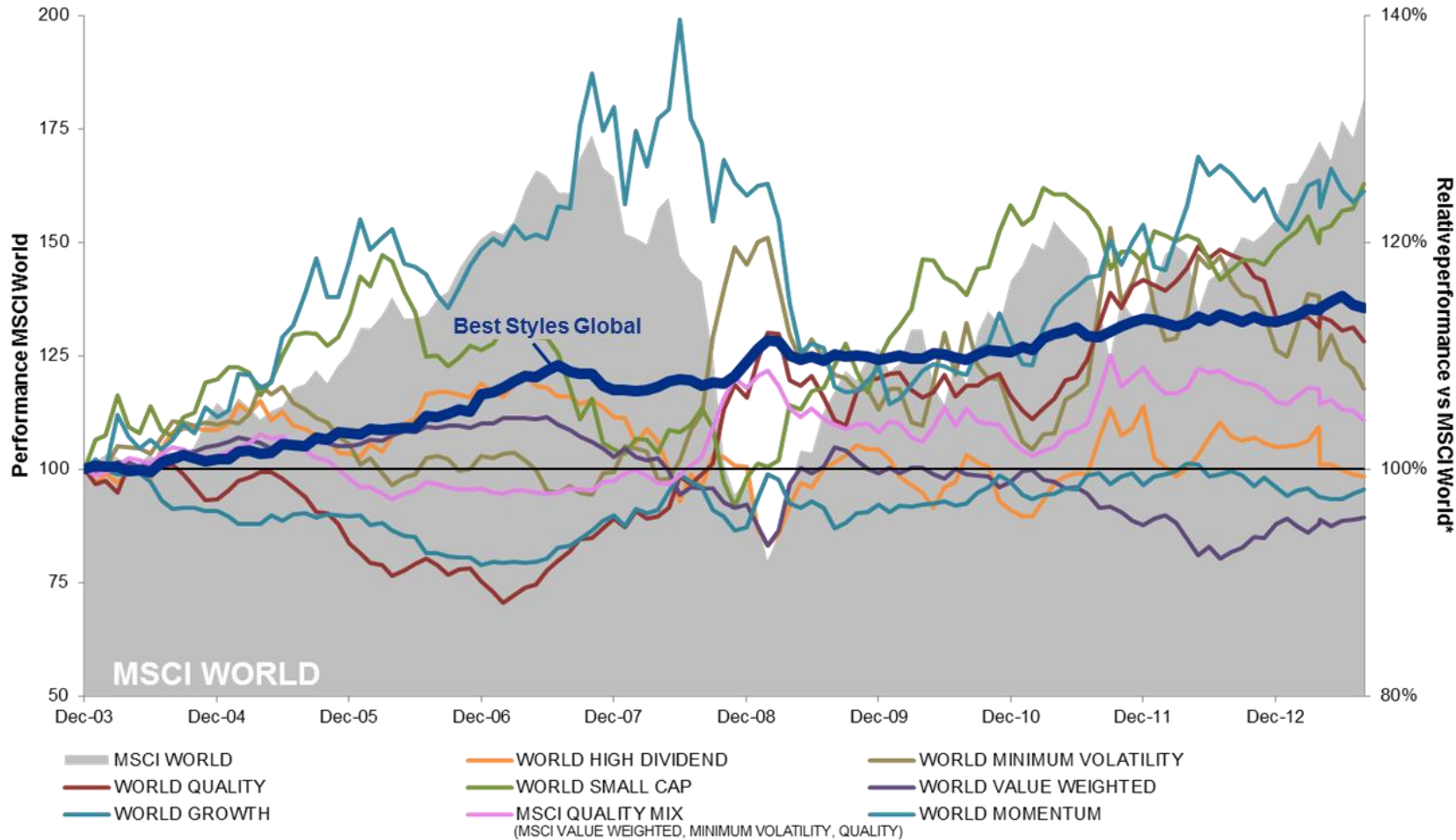
Portfolio with diversified exposures to investment styles, but with a lack of diversity within investment styles.



**More stable performance through balancing investment styles across several dimensions including sector, size, volatility or inflation exposures**

# Best Styles Harnessing Investment Style Risk Premiums In An Integrated Way

**Relative Performance of Best Styles Global vs. MSCI Risk Premium Indices ETFs\***



\* Source: AllianzGI, MSCI.  
The performance of Best Styles Global is represented by the composite SYSTEMATIC EQUITY GLOBAL BEST STYLES DEVELOPED - COMP0169.  
The other indices are MSCI World Risk Premium Indices, except the Momentum index where a MSCI World version is not available and the relative performance of the MSCI AC Momentum index vs MSCI AC World is shown instead.  
We applied transactions costs to the indices to proxy the performance of ETFs mimicking these indices.

# Harvesting Risk Premiums - Integrated Approach

## Summary

- Stable outperformance and a high Information Ratio in all major regions of the world can be delivered through harvesting risk premiums
- High active money is spread over different market drivers creating moderate tracking error only
- High capacity approach suitable for large institutional investors
- Success factors of an integrated risk premium approach:
  - Diversified investment style mix
  - Diversity within investment styles