There is No Such Thing as Smart Beta

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Director, Senior Portfolio Manager, Head of Best Styles North America

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Investment Beliefs

AllianzGI Best Styles

- Investment styles carry risk premiums which account for roughly 80% of long term excess equity returns

- The core of a portfolio should have persistent and stable exposure to these risk premiums

- Active risk management and diversified exposure is paramount as we strive for consistent outperformance independent from the economic or market environment
The Do’s & Don’t of Style Investing

<table>
<thead>
<tr>
<th>DO</th>
<th>DON’T</th>
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</thead>
<tbody>
<tr>
<td>✓ Diversified and stable exposure over time</td>
<td>× Attempt to style time</td>
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<tr>
<td>✓ Employ active risk management and portfolio construction</td>
<td>× Use a single style premia to adjust for gaps in style</td>
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<tr>
<td>✓ Avoid exposure to non rewarding risks</td>
<td>exposure in the aggregate equity portfolio</td>
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<tr>
<td>✓ Use as a core equity investment</td>
<td>× Believe that having multiple managers guarantees a</td>
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<tr>
<td></td>
<td>diversified style exposure</td>
</tr>
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<td>× Use passive vehicles for style exposure</td>
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Smart Beta is new, but is style investing?
Although the presence and importance of investment styles has been well established for decades, the investment industry is just now being inundated with hundreds of smart beta ETFs that are long on marketing, but short on live track records.
Why factors are risky—and carry a risk premium

- **Value**
  - Higher uncertainty about future cash flows – the value premium is comparable to the credit spread

- **Momentum**
  - Risk of major performance setbacks

- **Earnings Revisions**
  - As with momentum, mean reversion tendencies may lead to setbacks

- **Growth**
  - Visibility of earnings – continuing to meet expected earnings growth rate

- **Quality**
  - Profitability has a mean reversion tendency too – moreover, many high-quality stocks have a low beta, which may trend towards 1, in weak market phases

Investment styles carry higher risks than the broad market and may be subject to sharp pullbacks in performance along with short and medium term periods of high volatility. This necessitates a disciplined, skilled active manager that can harvest the returns, while navigating the risks.

Source: Allianz Global Investors.
Where Do Excess Returns Come From?

Investment style risk premiums are the drivers of active equity returns.

Source: MSCI, Allianz Global Investors.
Many Investment styles are successful in the long run, but timing outperformance is extremely difficult

Relative Performance of MSCI World Risk Premium Indices

Investment style diversification can lead to stable outperformance

Relative Performance of MSCI World Risk Premium Indices

## The Best Styles investment styles

<table>
<thead>
<tr>
<th>Value</th>
<th>Earnings Revisions</th>
<th>Momentum</th>
<th>Growth</th>
<th>Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Earnings Yield</td>
<td>- Revisions over 3/6 months</td>
<td>- Price momentum over</td>
<td>- Track record of delivered growth</td>
<td>- Profitability measures</td>
</tr>
<tr>
<td>- Free Cash Flow Yield</td>
<td>- Surprises over 3/6 months</td>
<td>- 12 months ex 1/3 months</td>
<td>- Trend in EPS estimates over 12 months</td>
<td>- ROE/ROIC</td>
</tr>
<tr>
<td>- Operating Cash Flow Yield</td>
<td>- Upgrades over 3/6 months</td>
<td>- 24 months ex 1/3 months</td>
<td>- Stability in earnings growth</td>
<td>- Indebtedness</td>
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<tr>
<td>- Book Yield</td>
<td></td>
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<td>- Debt to Assets</td>
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<tr>
<td>- Dividend Yield</td>
<td></td>
<td></td>
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<td>- Interest Coverage</td>
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<tr>
<td>- EV/EBITDA</td>
<td></td>
<td></td>
<td></td>
<td>- CDS spreads</td>
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<td></td>
<td></td>
<td></td>
<td>- Earnings Visibility</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>- Volatility</td>
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</tbody>
</table>

- Correlation driven weighting
- Equal weighting
- "worst of" weighting

Source: Allianz Global Investors.
Diversified investment style mix—stable across time

Allocation to investment styles over time
Model Portfolio Target Allocations—Supplemental Information

Key performance drivers for Best Styles:

- Valuation
- Earnings change
- Price momentum

Combination of:

- Contrarian investment style (e.g., valuation)
- Trend-following investment styles (e.g., earnings, momentum)

Seeks to have stable style mix over time
Establishing a diversified investment style mix

- Small overlap with high diversification potential

A diversified investment style mix manages the risks of investment styles

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

During any given stage of the investment process the selection criteria may vary from those shown above. The diagrams and statements above reflect the typical investment process applied to this strategy. At any given time other criteria may affect the investment process and the characteristics shown above. See additional disclosure at the end of this presentation.
Establishing a truly diversified investment style mix

Management of investment style overlap and the 2007 “Quant Meltdown”

Hypothetical portfolios

- The performance of the Best Styles Global Developed Equity composite was more stable than the performance of a mix of Value and Sentiment. The investment style Sentiment comprises the investment styles Momentum and Earnings Change (Revisions)
- An important factor is the smaller weight of “investment style super stocks” (stocks that are attractive for more than one investment style) in comparison with classical quant models

Relative Performance of a typical mix of Value and Sentiment, including and excluding “investment style super stocks”

The chart above uses hypothetical portfolios from May 1, 2007 through September 30, 2007 (where historical data is available) representing different investment styles. The chart above represents the returns of hypothetical portfolios representing different investment styles as defined on the Best Styles investment styles on slide 11 that include or exclude companies that may overlap styles. Sentiment is a hypothetical portfolio comprised of 50% Momentum and 50% Earnings Change. Historical simulation: performance before transaction costs. Assumptions of the historical simulation: performance results for hypothetical portfolios have certain inherent limitations. The results do not reflect the results of trading in actual accounts or the material economic and market factors that could impact an investment manager’s decision-making process. Any performance figures are before taxes and before transactions costs, dividends are reinvested. All weights in the portfolios are initially of equal size. The resulting portfolio is re-weighted to ensure sector and region neutrality. The portfolios were rebalanced monthly. Investment styles are built by choosing the top 20% of stocks in an investment style within the MSCI World Index. Simulated or hypothetical trading programs in general are also subject to the fact that they are designed with the benefit of hindsight. No representation is being made that any account will or is likely to achieve profits or losses similar to these being shown. The chart above does not show the actual weights or sensitivities of an actual Best Styles portfolio and is not indicative of future results. The information above is supplemental to and complements the Best Styles Global Developed Equity GIPS compliant composite presentation in the Appendix. See additional disclosure at the end of this presentation.
Management of style overlap to improve performance stability

Hypothetical portfolios

- Long term, hypothetical performance including “super stocks” has not been meaningfully different from the performance excluding these stocks.
- However, the relative performance of a diversified investment style mix excluding “super stocks” appears more stable.

Avoiding “super stocks” increased performance stability without impacting long-term return

Source: FTSE, AllianzGI. The charts above uses hypothetical portfolios from January 1, 1987 through April 30, 2016 (where historical data is available) representing different investment styles. The chart above represents the returns of hypothetical portfolios representing different investment styles as defined on the Investment Styles on slide 11 that include or exclude companies that may overlap styles (super stocks). Sentiment is a hypothetical portfolio comprised of 50% Momentum and 50% Earnings Change. Historical simulation: Performance after estimated transaction costs. Assumptions of the historical simulation: Performance results for hypothetical portfolios have certain inherent limitations. The hypothetical analysis above has been provided for illustrative purposes only and do not reflect the results of trading in actual accounts or the material economic and market factors that could impact an investment manager’s decision-making process. Any performance figures are before taxes and before transactions costs, dividends are reinvested. All weights in the portfolios are initially of equal active size. The resulting portfolio is re-weighted to ensure sector and region neutrality. Portfolios are rebalanced quarterly. Investment styles are built by choosing the top 500 of stocks in an investment style within the FTSE Global Equity Index. Simulated or hypothetical trading programs in general are also subject to the fact that they are designed with the benefit of hindsight. No representation is being made that any account will or is likely to achieve profits or losses similar to those being shown. The chart above does not show the results of an actual Best Styles portfolio and is not indicative of future results. See additional disclosure at the end of this presentation.
There are two kinds of risk

- **Risk premia (Investment Styles)** are typically rewarded in the long-term, generating an excess return
  - Value
  - Small Caps
  - Emerging Markets

- **Risk premia are used in a portfolio**
  - **as return driver** harnessing risk premia without timing exposure
  - **for risk-management** by diversifying across several risk premia

- **Risk factors** are typically not rewarded in the long-term, but may provide **short term, tactical return opportunities**
  - Interest rate-sensitive stocks
  - Currency risk
  - GDP-sensitive stocks

- **Risk factors may be used in a portfolio**
  - **for risk-management**, by immunizing the portfolio against uncompensated risk
  - **as return opportunity**, through tactical timing of entry and exit

The information and charts above are provided for illustrative purposes only, illustrating examples of two types of risk, and not an accurate representation of the characteristics of an actual Best Styles portfolio. The charts do not reflect actual data or show actual performance and is not indicative of future performance.
Diversity within investment styles across risk dimensions

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

Seek more stable alpha through balancing investment styles across several dimensions including sector, size, volatility or inflation exposures

During any given stage of the investment process the selection criteria may vary from those shown above. The diagrams and statements above reflect the typical investment process applied to this strategy. At any given time other criteria may affect the investment process and the characteristics shown above. See additional disclosure at the end of this presentation.
Portfolio integration is key to successful outcomes

Diversification of complementary styles
- Manage style constituents to ensure consistent correlations
- Mix of contrarian and trend-following style exposures

Stock overlap between investment styles
- “Super stocks” exhibit multiple style characteristics and behave differently than stocks of only one style exposure
- Excessive stock overlap between style portfolios can impair performance stability

Uncompensated risk-factor biases
- Style portfolios should manage exposure to risk factors that add volatility without expected return
There is strong academic research and our own 20 year experience demonstrating that style premiums are the true drivers of active returns.

Frequently, plan sponsors and investors are unaware of their own exposure, do not have a stable allocation, and have not assessed how best to harvest the excess returns while diversifying the risk.

We have done frequent analysis for plan sponsors on their aggregate equity portfolios, and on individual managers.

The majority of the results point to volatile allocations to the key style premiums or worse, systematic overweights to non or low rewarding risk factors and systematic underweights to premiums such as Value or Momentum.
Case Study: Government Pension Fund of Norway

- Largest investment fund in the world, with approximately $800 billion in assets
- Extensive study done by Ang, Goetzmann and Schaefer (2009), all well known finance professors, on the structure of the active portfolio and the nature of the excess returns
- Conclusion: many of the active bets by managers cancelled each other out and about two thirds of the aggregate portfolio level return came from exposure to certain factors such as Value, Size, and Momentum.

Targeted, stable allocation to desired style premiums

- Stable and positive relative exposure to five key investment styles
- Size of relative position aligned with each investment style’s historical excess return, correlation with other styles, and risk diversification

Investment Style Decomposition

Source: Allianz Global Investors as of June 30, 2015. Data versus the MSCI World benchmark. The chart above represents the active money allocation relative to the MSCI World for the Strategy's representative account. Representative account characteristics are supplemental information and supplement the Best Styles Global Developed Equity GIPS compliant composite presentation in the Appendix. The account presented was selected by the firm as a representative account that is deemed to best represent this management style. See additional disclosure at the end of this presentation.
In Conclusion, Remember To…

**DO**

- ✓ Diversified and stable exposure over time
- ✓ Employ active risk management and portfolio construction
- ✓ Avoid exposure to non rewarding risks
- ✓ Use as a core equity investment

Do you know what your exposure is within your own portfolio?
Experience and stability are important for long-term sustainable success

As of December 31, 2015.
Total US AUM: $82 billion as of December 31, 2015

AUM by Asset Class: US

- Alternatives: $4bn (5%)
- Multi Asset: $20bn (24%)
- Fixed Income and Money Market: $13bn (16%)
- Equity: $46bn (55%)

AUM by Client Segment: US

- Institutional: $32bn (39%)
- Retail: $50bn (61%)

1. Includes Institutional share classes of mutual funds.
Global research headcount

- An average of 15 years of industry experience
- Innovative and proprietary investment tools
- Analysts manage sector and thematic mandates
- Each analyst conducts an average of 100 meetings per year with corporate management
- Research identifies the key drivers of each stock, which frames and focuses the analytical process
- Dedicated sustainability research analysts
- Complemented by GrassrootsSM Research

<table>
<thead>
<tr>
<th>Region</th>
<th>Consumer</th>
<th>Financial</th>
<th>Health Care</th>
<th>Industrial &amp; Resources</th>
<th>Tech &amp; Telecom &amp; Media</th>
<th>ESG &amp; Engagement</th>
<th>GrassrootsSM Research</th>
<th>Credit</th>
<th>Total</th>
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<td>6</td>
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<td>2</td>
<td>0</td>
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<td>14</td>
<td>9</td>
<td>5</td>
<td>12</td>
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</tr>
</tbody>
</table>

Data as of March 31, 2016. GrassrootsSM Research is a division of Allianz Global Investors that commissions investigative research for asset-management professionals. Research data used to generate GrassrootsSM Research reports are received from reporters and Field Force investigators who work as independent, third-party research providers, supplying research that is paid for by commissions generated by trades executed on behalf of clients.
Dr. Michael Heldmann, CFA
Portfolio Manager Best Styles US Equity/Best Styles International Equity/Best Styles Emerging Markets Equity

Dr. Heldmann is a portfolio manager and a director with Allianz Global Investors, which he joined in 2007. He is a member of the Systematic Equity team and manages Best Styles Europe Equity and Best Styles Emerging Markets Equity mandates. Dr. Heldmann has nine years of investment-industry experience. Previously, he worked at CERN in Geneva, Switzerland, as a researcher in particle physics. Dr. Heldmann has a master's degree in physics from the University of Mainz, Germany, and a Ph.D. from the University of Freiburg, Germany. He is a CFA charterholder.

Dr. Benedikt Henne, CFA
Co-CIO Systematic Equity

Dr. Henne is Co-CIO Systematic Equity with Allianz Global Investors, which he joined in 1998. As the co-chief investment officer of the Systematic Equity team, he oversees more than $34 billion in assets under management. Dr. Henne previously managed equity enhanced products for the firm. He has 18 years of investment-industry experience. Dr. Henne has a master's degree in mathematics from the University Pierre et Marie Curie in Paris, and a doctorate from the University of Bonn, Germany. He is a CFA charterholder.

Dr. Magnus Weis
Portfolio Manager Best Styles Global Equity

Dr. Weis is a portfolio manager with Allianz Global Investors, which he joined in 2004. He is a member of the Systematic Equity team and manages Best Styles Global Equity mandates. Dr. Weis has 15 years of investment-industry experience. He previously worked at an IT consultancy on several projects for Allianz Global Investors involving quality management, development, support and design of applications. Dr. Weis has a master's degree in physics and a doctorate in theoretical glaciology and numerical modeling from the University of Technology in Darmstadt, Germany.

Dr. Klaus Teloeken
Co-CIO Systematic Equity

Dr. Teloeken is Co-CIO Systematic Equity with Allianz Global Investors, which he joined in 1996. As the co-chief investment officer of the Systematic Equity team, he oversees more than $34 billion in assets under management. Dr. Teloeken is responsible for the team's development and the management of active investment strategies. He was previously a quantitative analyst for the firm. Dr. Teloeken has 18 years of investment-industry experience. He is the author of several publications on probability theory and statistics as well as performance measurement and investing. Dr. Teloeken studied mathematics and computer science, and has a master's degree and a doctorate from the University of Dortmund, Germany.

Dr. Rainer Tafelmayer, FRM
Portfolio Manager Best Styles Global Equity

Dr. Tafelmayer is a portfolio manager with Allianz Global Investors, which he joined in 2002. He is a member of the Systematic Equity team and has 21 years of investment-industry experience. Before joining the firm, he worked as a business consultant in finance and risk management, and was a researcher in operations research at the Technical University of Chemnitz, Germany. Dr. Tafelmayer has a master's degree and a doctorate in physics from the University of Heidelberg, Germany.

Karsten Niemann, CFA
Portfolio Manager Best Styles US Equity/Best Styles International Equity

Mr. Niemann is a portfolio manager with Allianz Global Investors, which he joined in 1998. He is a member of the Systematic Equity team and manages Best Styles US Equity mandates. Mr. Niemann is also responsible for the team's European high-dividend products. He previously managed Best Styles Global Equity and Best Styles Euroland Equity mandates for the firm; before that, he was a quantitative analyst. Mr. Niemann has 18 years of investment-industry experience. He has a master's degree in economics from the University of Bonn, Germany, and is a CFA charterholder.
AllianzGI Best Styles Global Equity team

Rohit Ramesh  
*Portfolio Manager Best Styles Emerging Markets Equity*

Mr. Ramesh is a portfolio manager with Allianz Global Investors, which he joined in 2007. He is a member of the Systematic Equity team and manages Best Styles Emerging Markets Equity mandates. Mr. Ramesh was previously a member of the firm’s Asia Pacific team, focusing on emerging-market companies. He has nine years of investment-industry experience. Before joining the firm, he worked at DaimlerChrysler Asia Pacific in Singapore as an emerging-markets analyst. Mr. Ramesh has a bachelor’s degree in finance and accounting from the University of Bombay, India; a master’s degree in economics and management from the National University of Singapore; and a master’s degree in economics and public policy from the University of Pune, India.

Dr. Andreas Domke, CFA  
*Portfolio Manager Best Styles Euroland Equity*

Dr. Domke is a portfolio manager with Allianz Global Investors, which he joined in 2007. He is a member of the Systematic Equity team and focuses on the Best Styles Euroland Equity strategy, managing a retail fund and numerous institutional mandates. Before joining the firm, Dr. Domke worked at Citigroup; prior to that, he was a consultant. He obtained a Ph.D. in physics from the University of Liverpool, UK, and is a CFA charterholder.

Yogesh Padmanabhan  
*Portfolio Manager Best Styles Emerging Markets Equity*

Mr. Padmanabhan is a portfolio manager of Best Styles products, and manages the Best Styles Emerging Markets portfolios. He joined the Systematic Equity team in July 2014. Before joining the systematic team, Mr. Padmanabhan was a research analyst in the portfolio management team at RCM Asia Pacific in Hong Kong, focusing on industrial stocks in India, Thailand and Indonesia. He is a RCM Global Graduate. He holds a Bachelor of Engineering degree in Electronics and Instrumentation Engineering from BITS-Pilani university, India, and has completed his MBA from the Indian Institute of Management (IIM), Ahmedabad, focusing on finance and strategy. Mr. Padmanabhan is a CFA charterholder.

Dr. Kai Hirschen, CFA, CAIA, FRM  
*Portfolio Manager High Dividend Global*

Dr. Hirschen is a portfolio manager with Allianz Global Investors, which he joined in 2009. He is a member of the Systematic Equity team and manages High Dividend Global mandates, including enhanced dividend strategies with an option overlay. Dr. Hirschen previously worked for a leading international consultancy in risk management and risk modeling. He has a master’s degree in mathematics from the University of Hannover, Germany, a doctorate from the University of Darmstadt, Germany, and a master’s degree in finance and accounting from the University of Frankfurt, Germany. He is a CFA charterholder and a CAIA charterholder, and holds the financial risk manager designation.

Erik Mulder, CFA  
*Portfolio Manager Best Styles Global Equity/Stable Growth Europe*

Mr. Mulder is a portfolio manager with Allianz Global Investors, which he joined in 2008. He is a member of the Systematic Equity team and manages Best Styles Global Equity mandates. Mr. Mulder is also responsible for the team’s Stable Growth Europe strategy. He previously worked for IDS, an Allianz affiliate, specializing in equity-portfolio performance and risk analytics. Mr. Mulder has 17 years of investment-industry experience. He has a master’s degree in business administration from Erasmus University Rotterdam in the Netherlands and is a CFA charterholder.

Dr. Paul Reska  
*Portfolio Manager Systematic Equity*

Dr. Paul Reska is a portfolio manager in the Systematic Equity Team. He joined Allianz Global Investors in March 2015. Previously, he worked as a quantitative analyst at the credit insurser Atradius in Amsterdam, the Netherlands. He obtained his degree in theoretical physics from Utrecht University, where he carried out research in the field of gravitation and cosmology. He initially studied at the RWTH Aachen and obtained his master’s degree from Imperial College London.
Christian McCormick, CFA  
Senior Inter-Regional European Product Specialist

Mr. McCormick is senior inter-regional European product specialist with Allianz Global Investors, which he joined in 2015. As a member of the Systematic Equity team, his primary role is as a senior product specialist for the firm’s Best Styles strategies in the US and Canada. Mr. McCormick also has product-specialist responsibilities in the US for the firm’s Europe-based equity strategies. He has 17 years of investment-industry experience. Mr. McCormick was previously a managing director at INTECH, where he had client-service and product-specialist responsibilities. Before that, he was an investment consultant for Meketa Investment Group. Mr. McCormick has a B.A. in business administration and Russian studies from Principia College. He is a CFA charterholder, and holds the FINRA series 7 and 63 licenses.

Tanya Vasileva  
Product Specialist Associate Systematic Equity

Ms. Vasileva is the product specialist associate for Allianz Global Investors’s Systematic Equity products. She joined the Systematic Equity team in May 2015. Previously, Ms. Vasileva worked as a Portfolio Analyst, directly supporting the collaboration between Retail Product Reporting Team / Allianz Global Investors and Retail Fund Reporting Services / IDS GmbH. Prior to joining the Allianz Group, she worked on the Securities Holdings Statistics project with the European Central Bank as well as in Investment Controlling with Wimdu GmbH, a subsidiary of Rocket Internet GmbH. She holds a bachelor’s degree in business management from the University of Magdeburg, Germany. Ms. Vasileva is a CFA charterholder and a CAIA charterholder.

Georg Elsaesser  
Product Specialist Systematic Equity

Mr. Elsaesser is a product specialist with Allianz Global Investors, which he joined in 2012. He is a member of the Systematic Equity team. Mr. Elsaesser has 14 years of investment-industry experience. He previously worked at HSBC Trinkaus & Burkhardt as an equity strategist and a quantitative analyst; at GenRe Capital as an investment analyst for equities and asset allocation; and at WestLB AG as an equity and multi-asset strategist. Mr. Elsaesser has a master’s degree in business mathematics from the University of Dortmund, Germany.
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