CM11574

For professional investors only

Global Equity Market Neutral Strategy

BMO Global Asset Management

February 2017

Agenda

Introduction

Styles

From ‘styles’ to ‘true styles’

Putting it all together

Global Equity Market Neutral Strategy

Summary

Introduction

Key portfolio characteristics

Strategy aims

Global Equity Market Neutral Strategy	
Targeted styles:	• Value • Size • Momentum • Volatility • GARP (growth at a reasonable price)
Targeted volatility:	10%
Targets excess return:	7%*
Portfolio managers:	Erik Rubingh Christopher Childs
Assets under management:	US$594 million

Source: BMO Global Asset Management as at 31.01.2017. *In excess of the risk free rate, gross of fees. The Global Equity Market Neutral Strategy is an absolute return strategy. The Global Equity Market Neutral Strategy aims to deliver a positive return regardless of market conditions over a three year period but such a positive return is not guaranteed over this or any time period. Capital is at risk and an investor may receive back less than the original investment. Capital is not guaranteed and there is no guarantee that a positive return will be achieved over any time period.

BMO Global Asset Management Multi-Strategy team

The BMO Global Asset Management Multi-Strategy Team was seeking an alternative strategy with these characteristics

December 2013	September 2014	July 2015	April 2016
Global Equity Market Neutral strategy launched on a 100x100 basis	Global Equity Market Neutral strategy launched to target specific volatility level (Vol10)	UK registered and domiciled OEIC tracking the Vol10 strategy launched £100m + initial seed from external investor	SICAV launched 8th April 2016 Multiple hedged share classes Targeting 6% vol

Vol = Volatility.

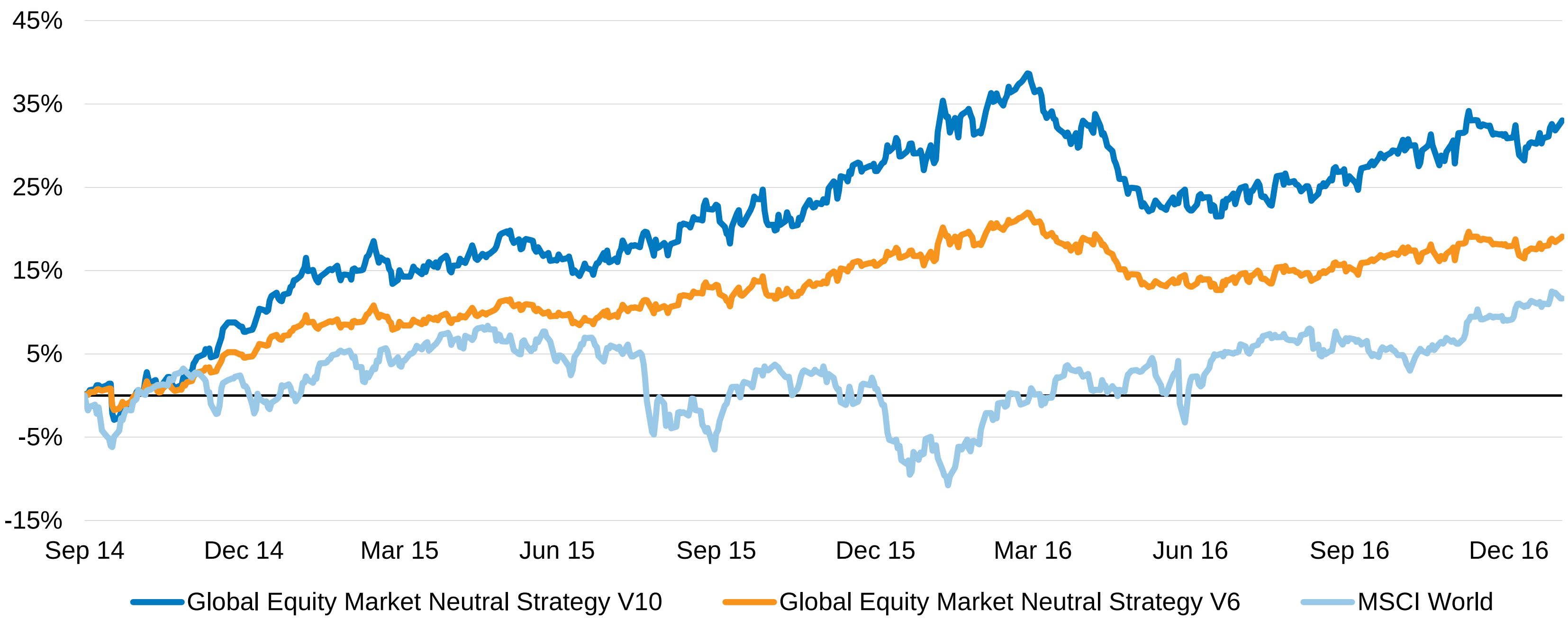
What does it offer the investor?

Global Equity Market Neutral Strategy

- Genuine alternative ✓
- Style driven performance ✓
- Daily liquidity ✓
- Diversifier ✓
- Competitive fee ✓

Global Equity Market Neutral Strategy V10

Cumulative total return



- Strategy has provided differentiated source of return
- Low correlation improves diversification and efficiency of parent portfolio

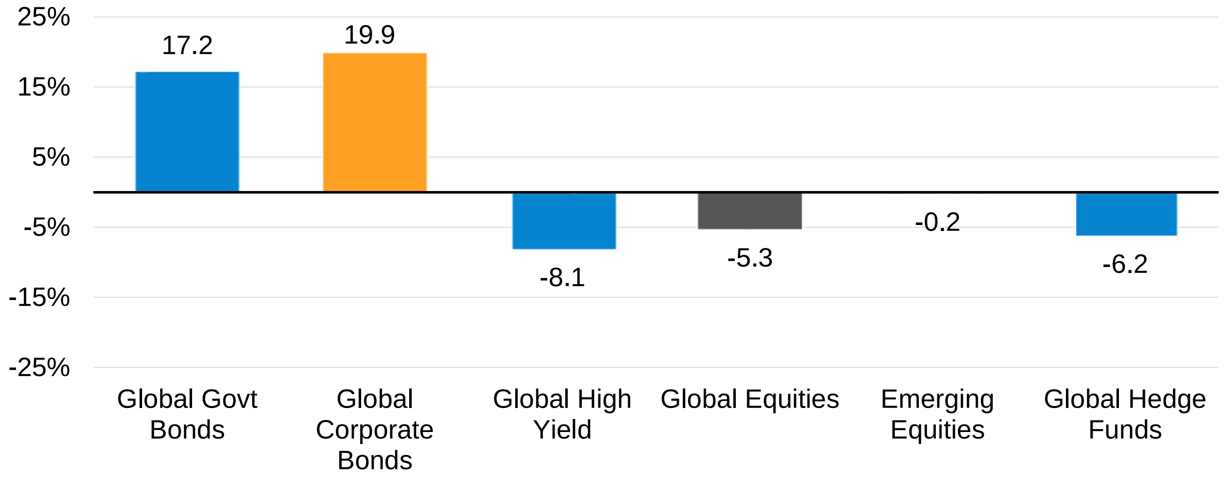
Source: BMO Global Asset Management as at 31.01.2017. Global Equity Market Neutral strategy performance gross of fees, net of implementation costs.

Global Equity Market Neutral Strategy – performance

Strategy performance

	3 months	Year to date	12 Months	Since inception* (annualised)	Volatility since inception (annualised)
Global Equity Market Neutral Strategy	1.80%	1.66%	3.83%	13.02%	10.94%

Asset class correlations



Source: BMO Global Asset Management, Bloomberg as at 31.01.2017. *Strategy inception based on full calendar month performance, 01.10.2014 to 31.01.2017 – daily observations, performance is net of implementation costs. Annualised performance for periods greater than 1 year.

Introduction to style premia

What are style premia?

Global Equity Market Neutral Strategy

Source: BMO Global Asset Management. For illustrative purposes only.

Some history

Global Equity Market Neutral Strategy

THE JOURNAL OF FINANCE • VOL. XLVII, NO. 2 • JUNE 1992

The Cross-Section of Expected Stock Returns

EUGENE F. FAMA and KENNETH R. FRENCH*

ABSTRACT

Two easily measured variables, size and book-to-market equity, combine to capture the cross-sectional variation in average stock returns associated with market β, size, leverage, book-to-market equity, and earnings-price ratios. Moreover, when the tests allow for variation in β that is unrelated to size, the relation between market β and average return is flat, even when β is the only explanatory variable.

THE ASSET-PRICING MODEL OF Sharpe (1964), Lintner (1965), and Black (1972) has long shaped the way academics and practitioners think about average returns and risk. The central prediction of the model is that the market portfolio of invested wealth is mean-variance efficient in the sense of Markowitz (1959). The efficiency of the market portfolio implies that (a) expected returns on securities are a positive linear function of their market βs (the slope in the regression of a security's return on the market's return), and (b) market βs suffice to describe the cross-section of expected returns.

There are several empirical contradictions of the Sharpe-Lintner-Black (SLB) model. The most prominent is the size effect of Banz (1981). He finds that market equity, ME (a stock's price times shares outstanding), adds to the explanation of the cross-section of average returns provided by market βs. Average returns on small (low ME) stocks are too high given their β estimates, and average returns on large stocks are too low.

Another contradiction of the SLB model is the positive relation between leverage and average return documented by Bhandari (1988). It is plausible that leverage is associated with risk and expected return, but in the SLB model, leverage risk should be captured by market β. Bhandari finds, however, that leverage helps explain the cross-section of average stock returns in tests that include size (ME) as well as β.

Stattman (1980) and Rosenberg, Reid, and Lanstein (1985) find that average returns on U.S. stocks are positively related to the ratio of a firm's book value of common equity, BE, to its market value, ME. Chan, Hamao, and Lakonishok (1991) find that book-to-market equity, BE/ME, also has a strong role in explaining the cross-section of average returns on Japanese stocks.

* Graduate School of Business, University of Chicago, 1101 East 58th Street, Chicago, IL 60637. We acknowledge the helpful comments of David Booth, Nai-fu Chen, George Constantinides, Wayne Ferson, Edward George, Campbell Harvey, Josef Lakonishok, Rex Sinquefield, René Stulz, Mark Zmijewski, and an anonymous referee. This research is supported by the National Science Foundation (Fama) and the Center for Research in Security Prices (French).

THE JOURNAL OF FINANCE • VOL. XLVIII, NO. 1 • MARCH 1993

Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency

NARASIMHAN JEGADEESH and SHERIDAN TITMAN*

ABSTRACT

This paper documents that strategies which buy stocks that have performed well in the past and sell stocks that have performed poorly in the past generate significant positive returns over 3- to 12-month holding periods. We find that the profitability of these strategies are not due to their systematic risk or to delayed stock price reactions to common factors. However, part of the abnormal returns generated in the first year after portfolio formation dissipates in the following two years. A similar pattern of returns around the earnings announcements of past winners and losers is also documented.

A POPULAR VIEW HELD by many journalists, psychologists, and economists is that individuals tend to overreact to information.[1] A direct extension of this view, suggested by De Bondt and Thaler (1985, 1987), is that stock prices also overreact to information, suggesting that contrarian strategies (buying past losers and selling past winners) achieve abnormal returns. De Bondt and Thaler (1985) show that over 3- to 5-year holding periods stocks that performed poorly over the previous 3 to 5 years achieve higher returns than stocks that performed well over the same period. However, the interpretation of the De Bondt and Thaler results are still being debated. Some have argued that the De Bondt and Thaler results can be explained by the systematic risk of their contrarian portfolios and the size effect.[2] In addition, since the long-term losers outperform the long-term winners only in Januaries, it is unclear whether their results can be attributed to overreaction.

*Jegadeesh is from the Anderson Graduate School of Management, UCLA. Titman is from Hong Kong University of Science and Technology and the Anderson Graduate School of Management, UCLA. We would like to thank Kent Daniel, Ravi Jagannathan, Richard Roll, Hans Stoll, René Stulz, and two referees. We also thank participants of the Johnson Symposium held at the University of Wisconsin at Madison and seminar participants at Harvard, SMU, UBC, UCLA, Penn State, University of Michigan, University of Minnesota, and York University for helpful comments, and Juan Siu and Kwan Ho Kim for excellent research assistance.

[1] See for example, the academic papers by Kahneman and Tversky (1982), De Bondt and Thaler (1985) and Shiller (1981).

[2] See for example, Chan (1988), Ball and Kothari (1989), and Zarowin (1990). For an alternate view, see the recent paper by Chopra, Lakonishok, and Ritter (1992).

Source: The Journal of Finance.

Why do style premia exist?

Global Equity Market Neutral Strategy

Compensation for taking risk

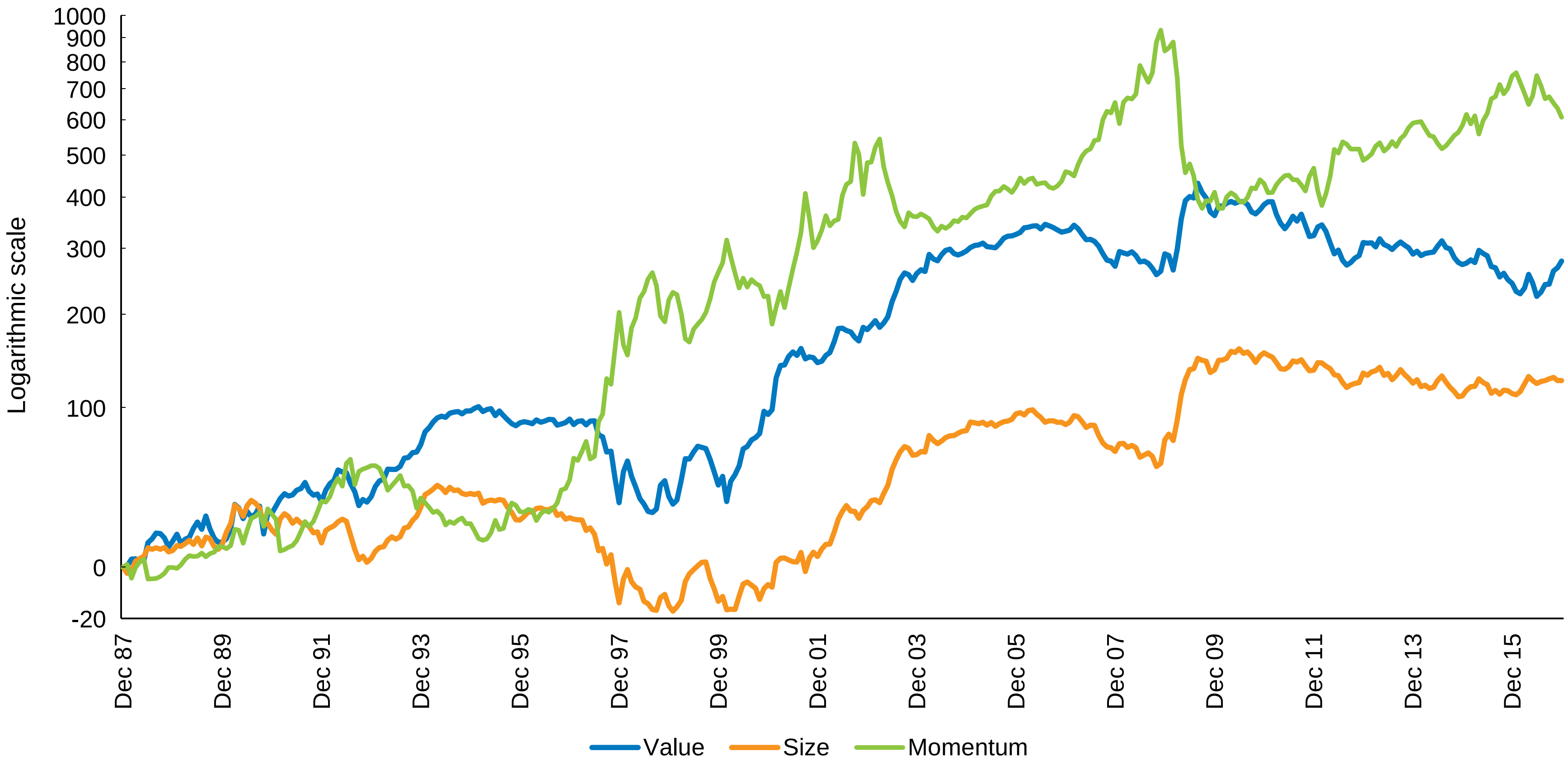
Efficient market

Result of hardwired human nature

Behavioural

Observed returns to styles

Global Equity Market Neutral Strategy



Source: BMO Global Asset Management, Factset from 31.12.1987 to 31.12.2016. Universe: MSCI World. The returns represent observed outcomes of zero investment portfolios that go long the top 20% of stocks with each particular attribute and go short the bottom 20%, rebalanced monthly, and do not include any transaction costs. This information is not a representative investment strategy but an indication of the efficacy of each style. Logarithmic scale = It shows two equal percent changes plotted as the same vertical distance on the scale.

From ‘styles’ to ‘true styles’

Global Equity Market Neutral Strategy

Style premia are attractive, but:

A potential problem is the fact that various styles are not necessarily independent:

For example value stocks may very well be stocks with poor momentum

This can lead to:

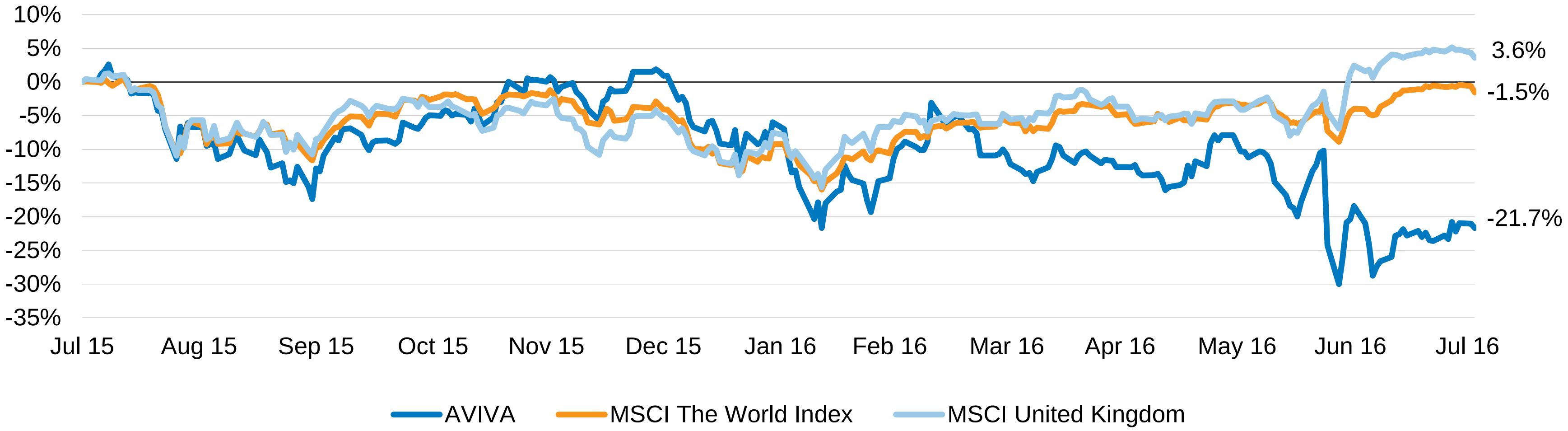
- ✗ Worse risk/return characteristics than hoped for
- ✗ Lower diversification benefits than anticipated

Our unique ‘true styles’ approach:

- ✓ Isolates the desired style to capture the returns independent of the influence of other styles and market factors
- ✓ Greatly improved predictive power of the style
- ✓ Can improve long-term return
- ✓ Lowers correlation between styles, improving the diversification benefit

When does a stock represent good value?

Cumulative total return



- Aviva has struggled in recent market environment
- As a result the Aviva stock has underperformed both MSCI World and MSCI UK by a wide margin
- Does this underperformance represent a good value investing opportunity?

Source: BMO Global Asset Management as at 02.08.2016.

Value – what is important?

- Aviva trades at a book-to-price ratio of 1.00
- Book-to-price ratio of MSCI World is 0.59

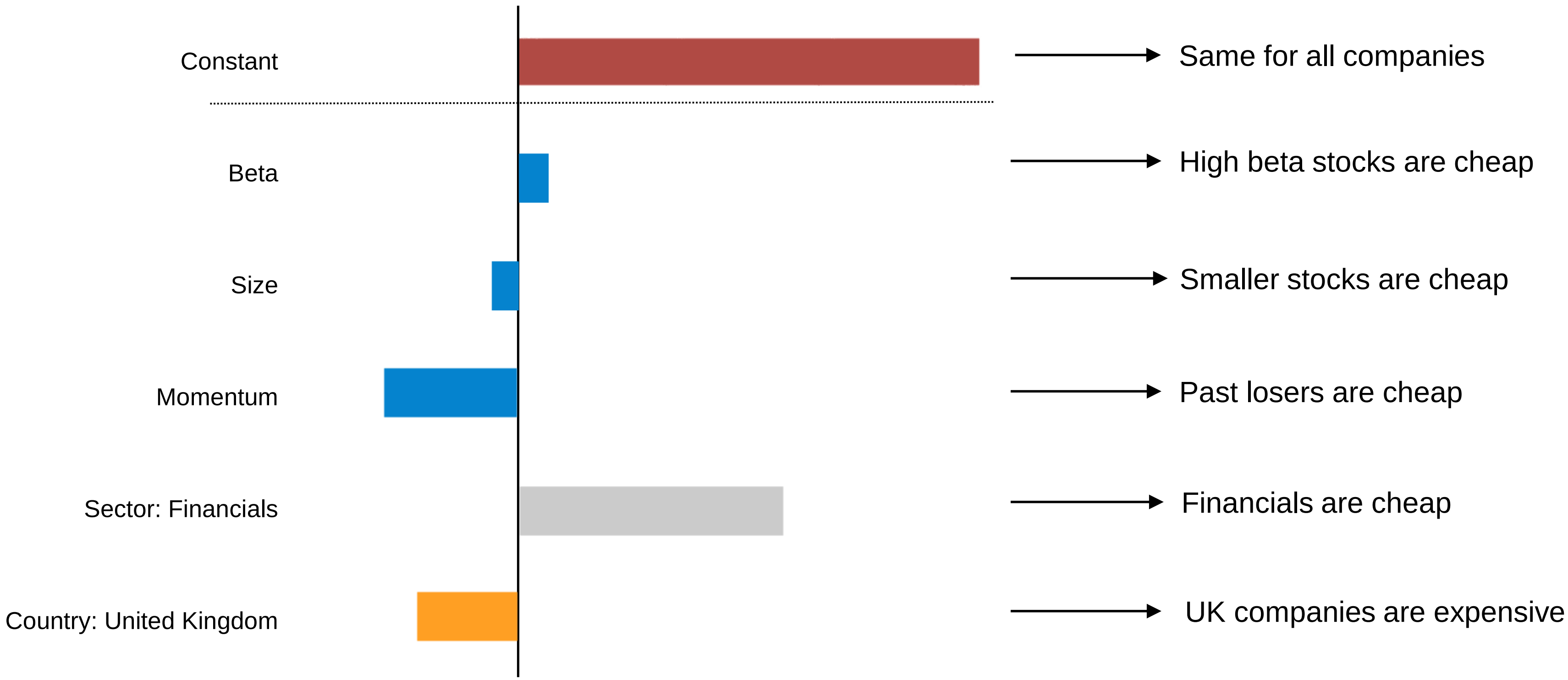
Aviva appears to be cheap

Aviva plc	
Book-to-price	**1.00**
Beta	1.16
Size (US$ bn)	$21
Momentum	-24.2%
Sector	Financials
Country	United Kingdom

- The other characteristics, however, contain valuable information of what Aviva's b/p ratio should be!

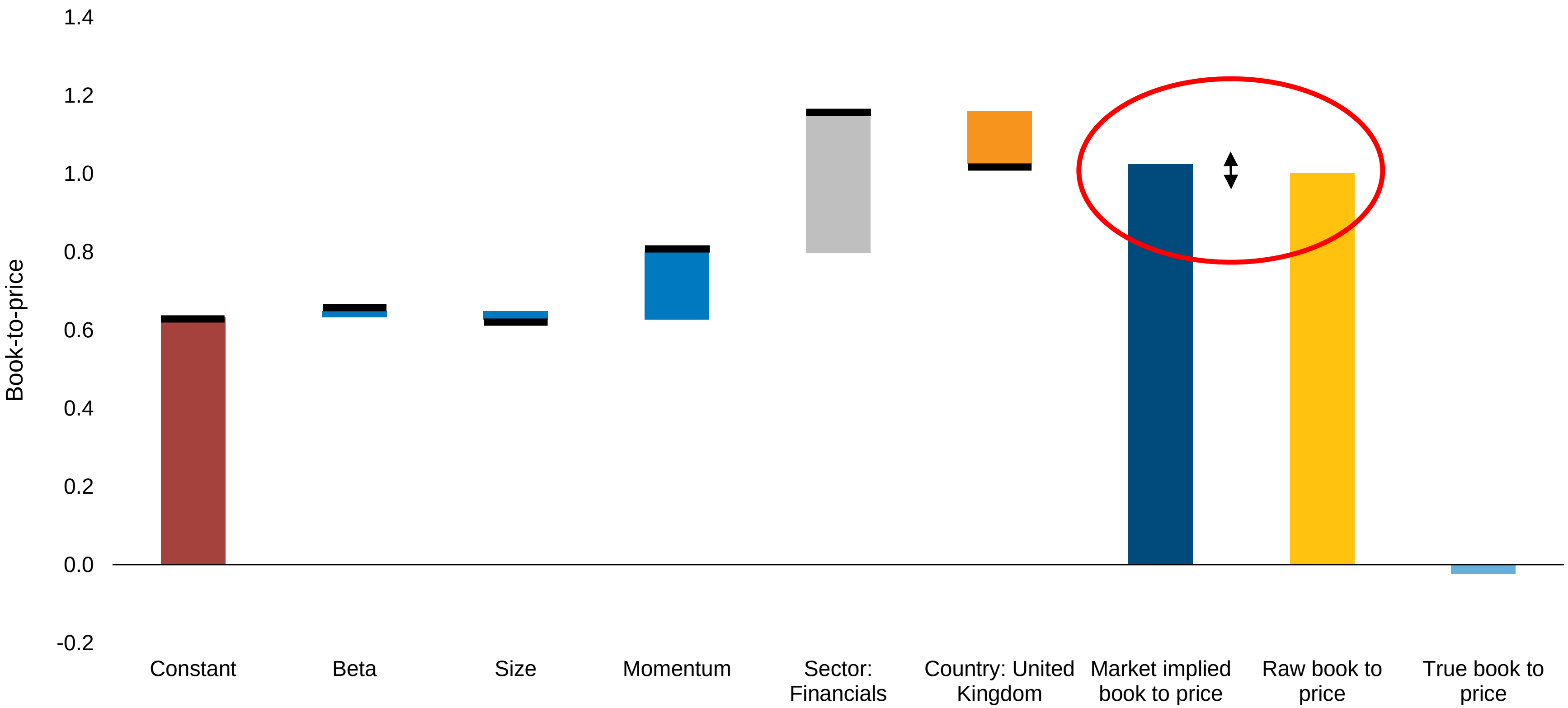
Source: BMO Global Asset Management as at 02.08.2016. B/P = Book-to-Price.

Value – what is the market telling us?



Source: BMO Global Asset Management as at 02.08.2016.

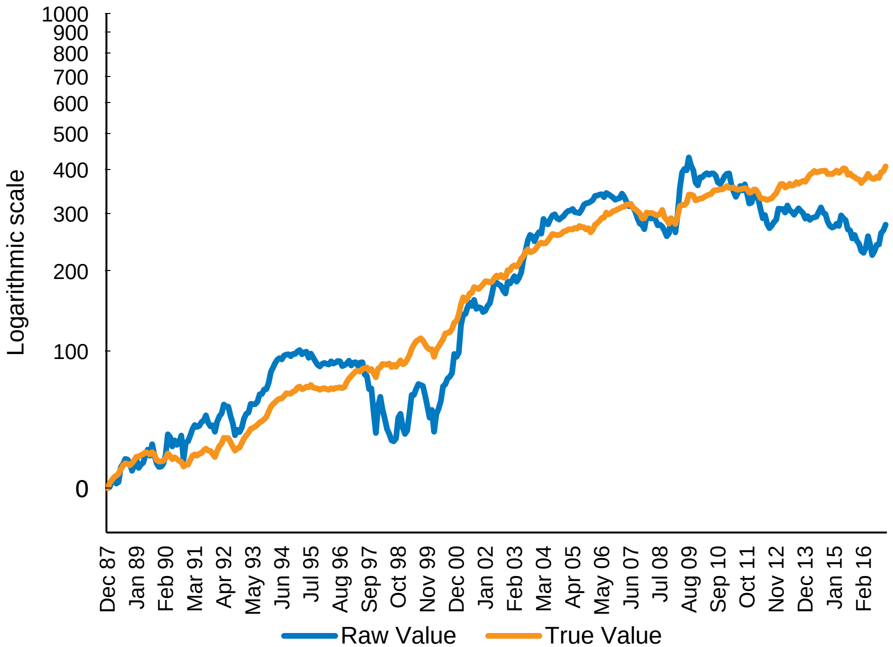
So what about Aviva?



Source: BMO Global Asset Management as at 02.08.2016.

Observed returns to raw and true style

Global Equity Market Neutral Strategy



	Return (pa)	Volatility (annualised)	Sharpe ratio
Raw Style*	4.7%	12.5%	0.38
True Style**	5.8%	4.9%	1.19

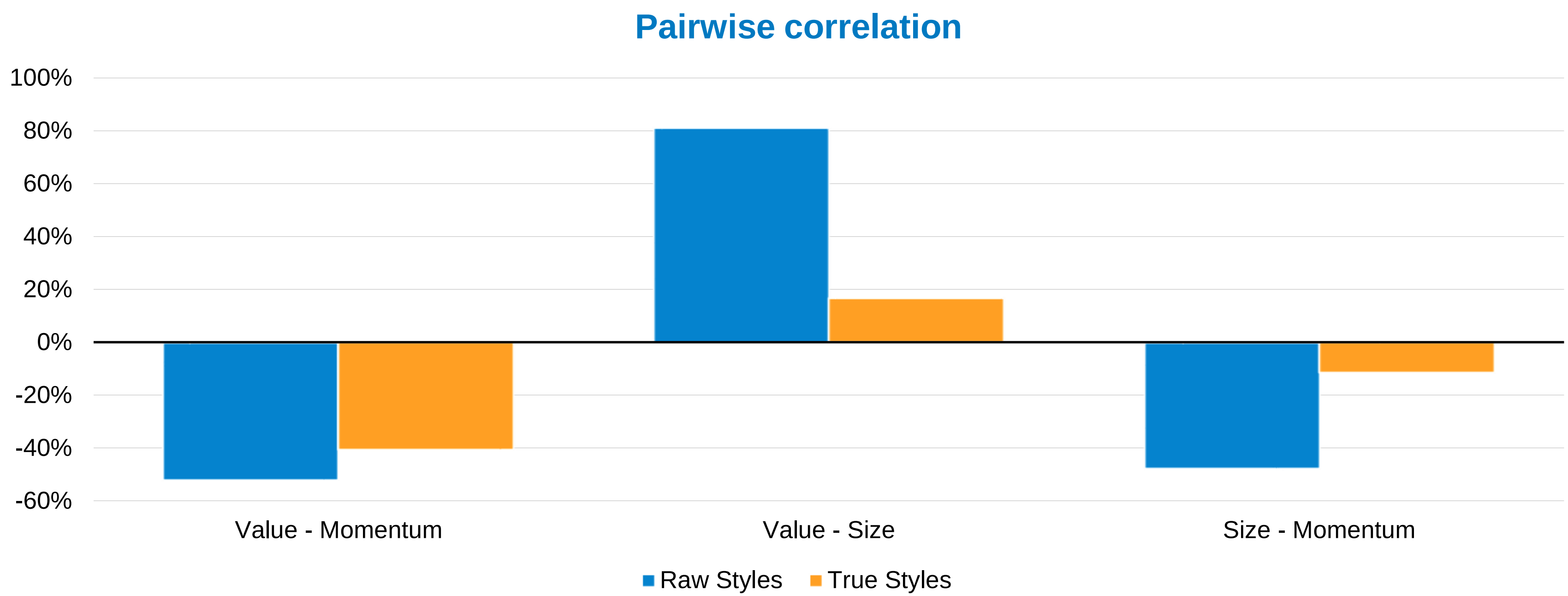
*In this example, the 'Raw Style' is companies with a high book-to-price ratio

**Once our systematic approach has reduced the impact of overlapping styles the 'True Style' of companies with a high book-to-price ratio is revealed

Source: BMO Global Asset Management, Factset from 31.12.1987 to 31.12.2016. Universe: MSCI World. The returns represent observed outcomes of zero investment portfolios that go long the top 20% of stocks with each particular attribute and go short the bottom 20%, rebalanced monthly, and do not include any transaction costs. This information is not a representative investment strategy but an indication of the efficacy of each style. Logarithmic scale = It shows two equal percent changes plotted as the same vertical distance on the scale; PA = Per Annum.

True styles not just about returns…

Global Equity Market Neutral Strategy



- Low correlations between the style portfolios
- This is no coincidence
- Significant diversification benefits when constructing portfolio

Source: BMO Global Asset Management correlations of observed style returns. Data as at 31.12.2016.

Putting it all together

Selected styles

Global Equity Market Neutral Strategy

True value	Excessive pessimism with respect to the prospects for ‘cheap’ companies leads to higher returns	**Fama & French 1992**
True size*	Higher (diversifiable) risk of smaller companies leads to better returns of smaller companies as a group	**Fama & French 1992**
True momentum	Under reaction to news and extrapolation of past trends leads to past winners continuing to win and past losers continuing to lose	**Jegadeesh & Titman 1993** **Carhart 1997**
Low volatility	Aversion to leverage and the ‘lottery effect’ lead to low risk stocks outperforming high risk stocks	**Clark & DeSilva 2004**
True growth at a reasonable price	Stocks with good growth, moderate valuations and good quality financial statements represent ‘the best of all worlds’	**BMO Systematic Equities Live Model (since 2007)**

*True size is implemented on a seasonal basis.

Portfolio construction – putting it all together

Global Equity Market Neutral Strategy

Construct individual market neutral True Style portfolios

Combine True Style portfolios through equal risk contribution

Calibrate to desired risk level

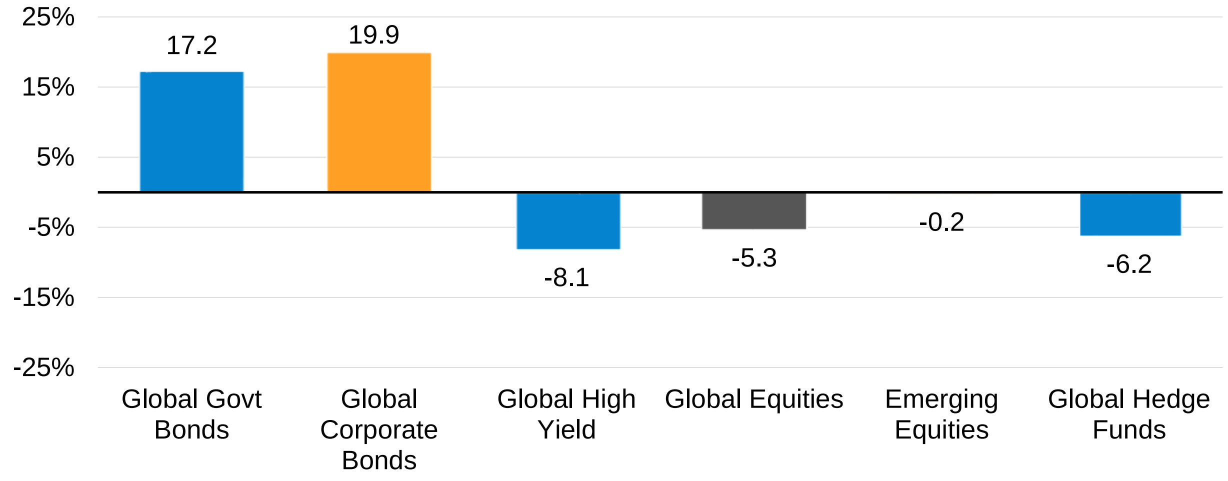
Implement through synthetic prime brokerage

Global Equity Market Neutral Strategy – performance

Strategy performance

	3 months	Year to date	12 Months	Since inception* (annualised)	Volatility since inception (annualised)
Global Equity Market Neutral Strategy	1.80%	1.66%	3.83%	13.02%	10.94%

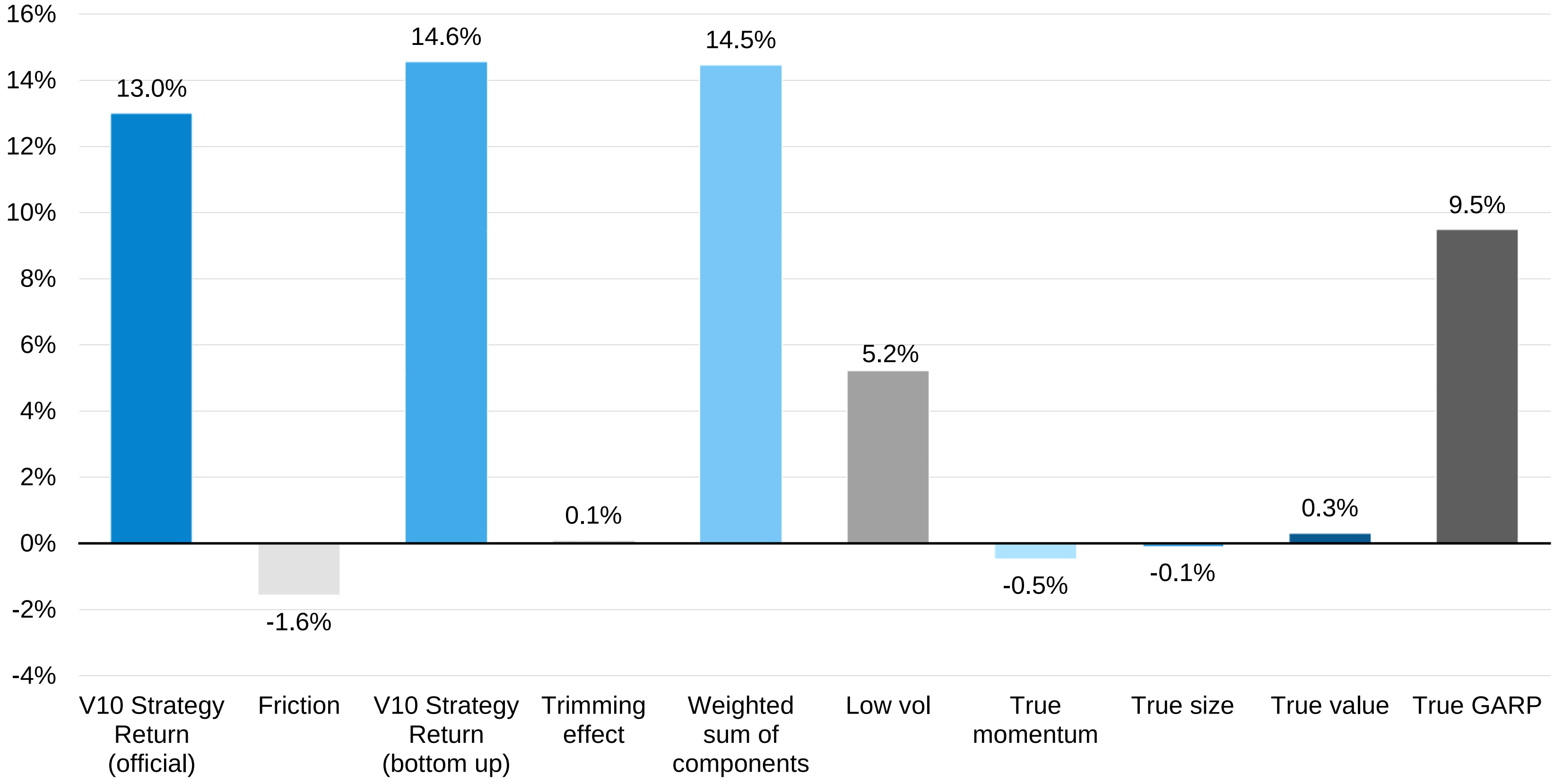
Asset class correlations



Source: BMO Global Asset Management, Bloomberg as at 31.01.2017. *Strategy inception based on full calendar month performance, 01.10.2014 to 31.01.2017 – daily observations, performance is net of implementation costs. Annualised performance for periods greater than 1 year.

Global Equity Market Neutral Strategy – contributions

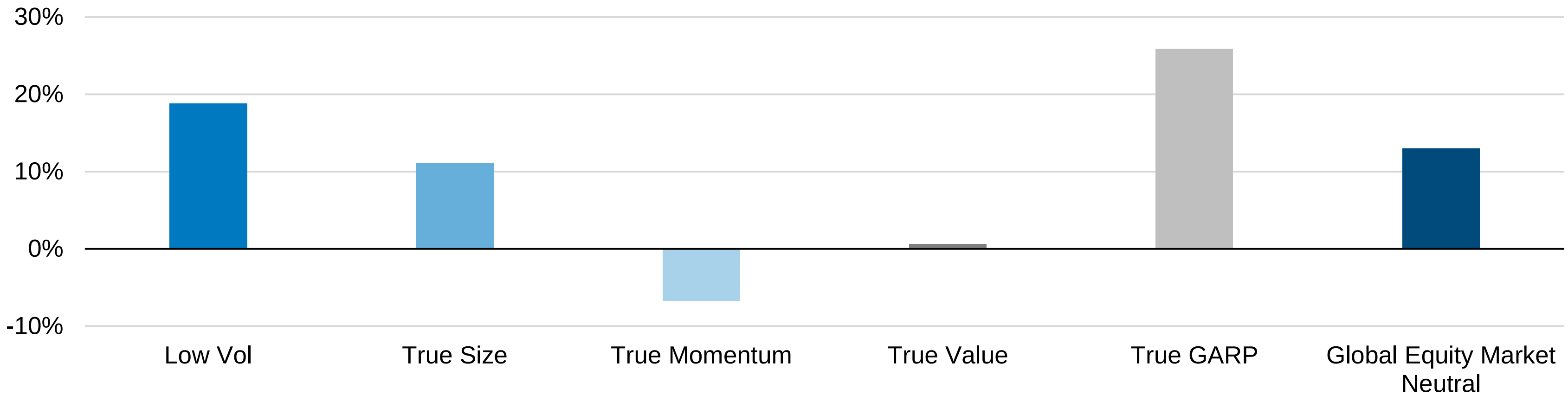
Global Equity Market Neutral Strategy (V10) returns and contributions p.a.



Source: BMO Global Asset Management, Bloomberg as at 31.01.2017. Performance shown gross of fees, net of implementation costs.

Component performance V10

- 3 out of 5 components have contributed positively
- Very low correlations between the components: excellent diversification!



	Low vol.	True size	True momentum	True value	True GARP	Global Equity Market Neutral
Returns (pa)	18.8%	11.1%	-6.7%	0.6%	25.9%	13.0%
Ann vol	15.5%	20.9%	33.9%	18.0%	19.1%	10.9%

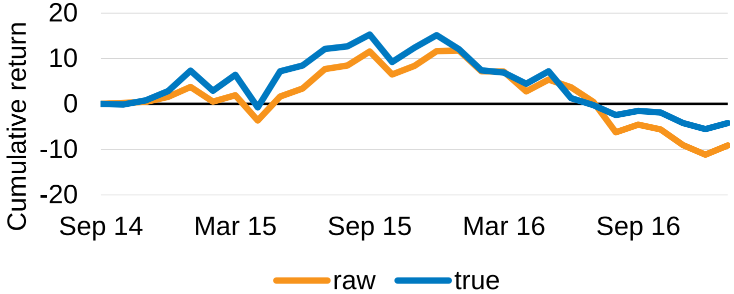
	Low vol.	True size	True momentum	True value
True size	-16.3%			
True momentum	23.4%	-5.3%		
True value	-14.1%	-4.0%	-22.2%	
True GARP	-3.9%	-13.9%	-7.4%	27.4%

Source: BMO Global Asset Management, Bloomberg. Since inception full calendar month performance, 01.10.2014 to 31.12.2016 – daily observations. Performance shown gross of fees in excess of 3 months LIBOR (London Interbank Offered Rate) of the strategy, performance is net of implementation costs.

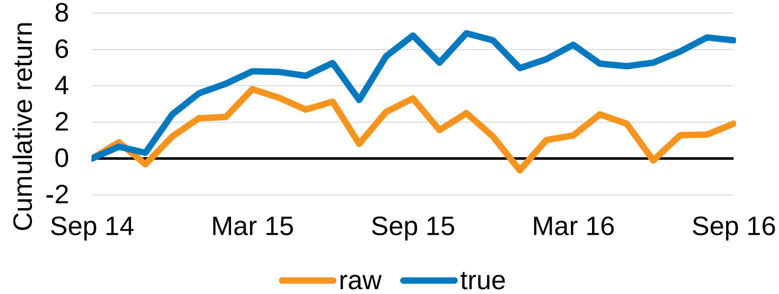
True versus Raw Styles

True Styles benefits – like for like component comparison

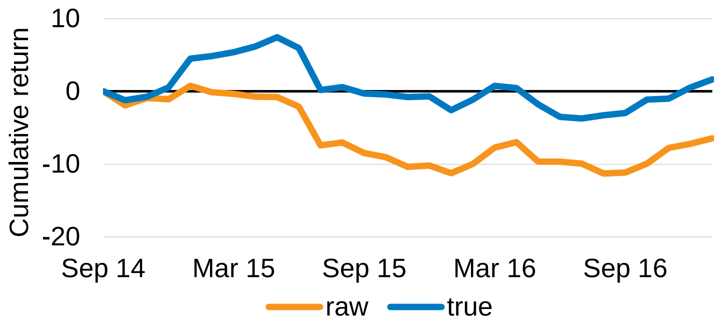
Momentum



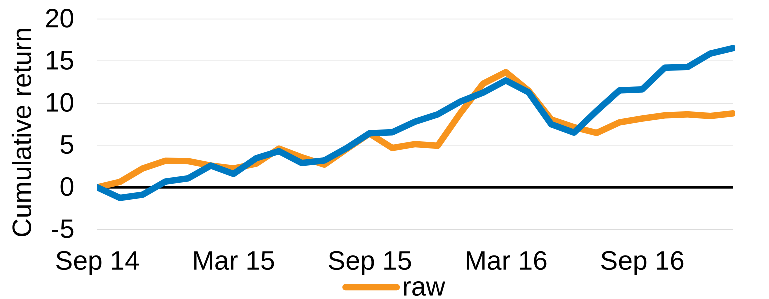
Small size



Value



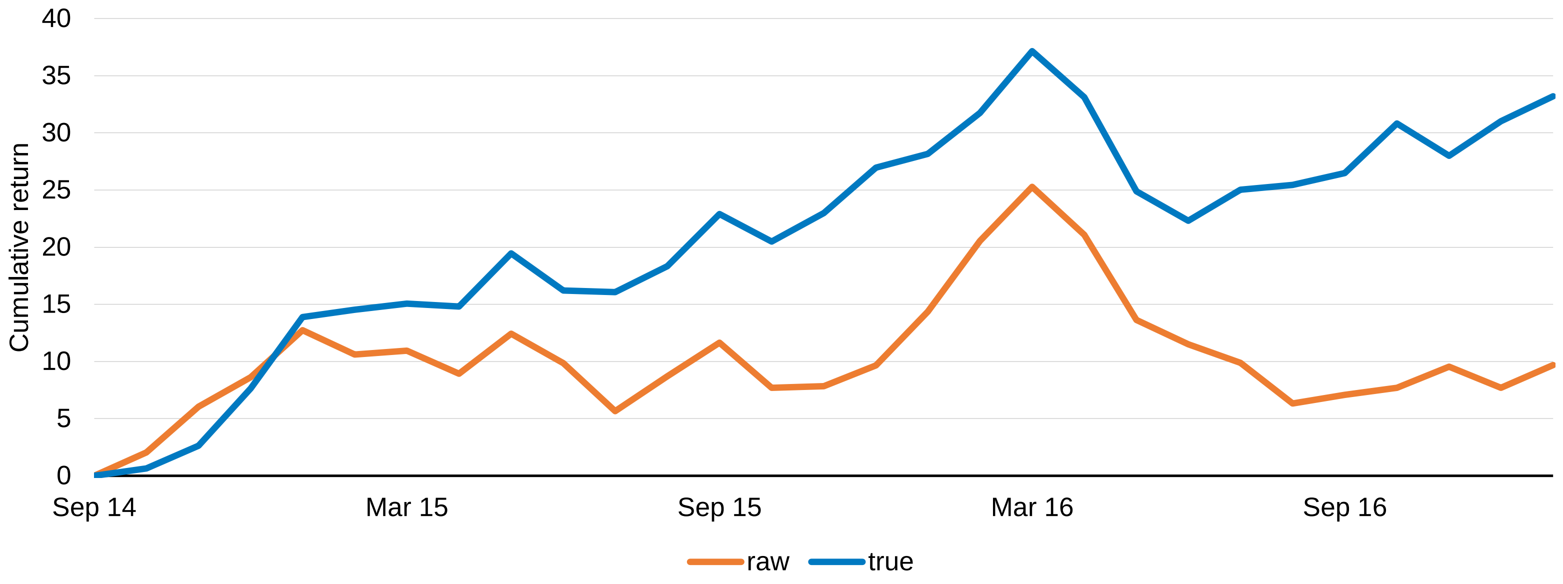
GARP



	Low Vol	Momentum		Small Size		Value		GARP	
	Raw/True	Raw	True	Raw	True	Raw	True	Raw	True
Return (ann)	5.74	-4.03	-1.81	0.42	3.01	-2.82	0.71	3.66	6.77
Volatility (ann)	5.84	10.78	11.69	4.37	3.53	5.76	5.93	5.04	4.67
Sharpe	0.98	-0.37	-0.16	0.10	0.85	-0.49	0.12	0.73	1.45

Source: BMO Global Asset Management, Bloomberg as at 31.01.2017. Strategy inception based on full calendar month performance, 01.10.2014 to 31.01.2017 –performance is net of implementation costs. 'Raw style' returns are simulated using the exact same underlying data that was used to manage the real-life product. For illustrative purposes only.

True Styles benefits – like for like comparison



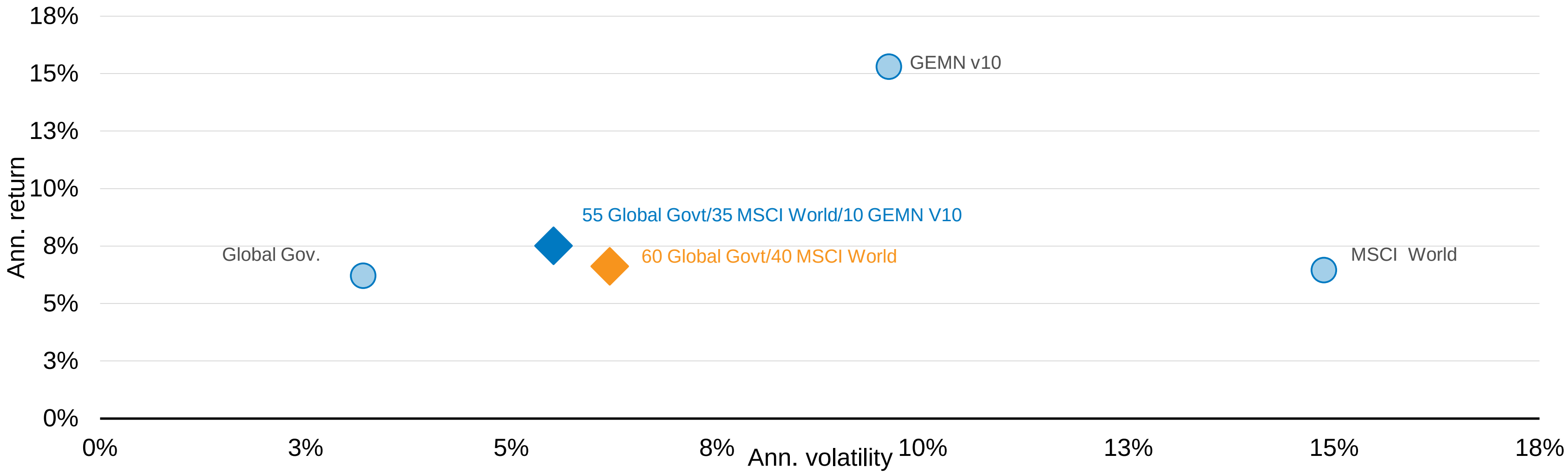
	Low Vol	Momentum		Small Size		Value		GARP		GEMN V10	
	Raw/True	Raw	True	Raw	True	Raw	True	Raw	True	Raw	True
Return (ann)	5.74	-4.03	-1.81	0.42	3.01	-2.82	0.71	3.66	6.77	4.05	13.07
Volatility (ann)	5.84	10.78	11.69	4.37	3.53	5.76	5.93	5.04	4.67	10.37	9.40
Sharpe	0.98	-0.37	-0.16	0.10	0.85	-0.49	0.12	0.73	1.45	0.39	1.39

Source: BMO Global Asset Management, Bloomberg as at 31.01.2017. Strategy inception based on full calendar month performance, 01.10.2014 to 31.01.2017 – performance is net of implementation costs. 'Raw style' returns are simulated using the exact same underlying data that was used to manage the real-life product. For illustrative purposes only.

As a component of a multi-asset portfolio?

How it can help your portfolio – longer term perspective

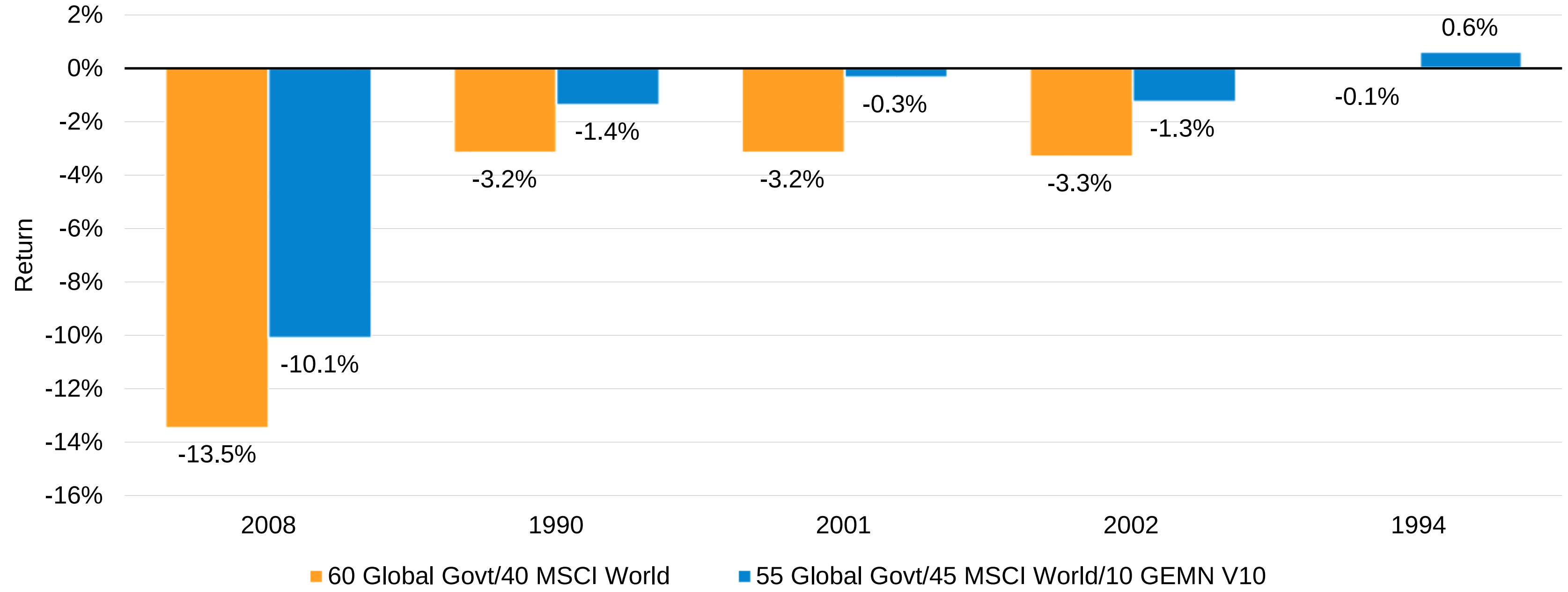
Risk-return: Dec 89 – January 2017



	Return (ann)	Vol (ann)	Sharpe
60 Global Govt/40 MSCI World	**6.61%**	**6.20%**	**0.50**
55 Global Govt/35 MSCI World/10 GEMN V10	**7.51%**	**5.51%**	**0.73**

Source: BMO Global Asset Management, Bloomberg, Factset as at 31.01.2017. Strategy inception based on full calendar month performance, 01.10.2014 to 31.01.2017 – performance is net of implementation costs. GEMN V10 Returns prior to 1.10.2014 are simulations. For illustrative purposes only.

…and helps when it matters most!



Source: BMO Global Asset Management, Bloomberg, Factset as at 31.01.2017. Strategy inception based on full calendar month performance, 01.10.2014 to 31.01.2017 – performance is net of implementation costs. GEMN V10 Returns prior to 1.10.2014 are simulations. For illustrative purposes only.

Key messages

Global Equity Market Neutral Strategy

Genuine alternative	✓	Market neutral by design
Style driven returns	✓	Strategy returns are based on equity investment styles – no portfolio manager discretion
Daily liquidity	✓	Investment universe of MSCI World offers excellent liquidity – daily dealing
Diversifier	✓	Strategy exhibits low correlation to principle risk in a multi-asset portfolio
Cost effective	✓	Competitive fee structure

Appendix

Systematic strategies team

We have managed style based strategies since 2003

2003	2007	2008	2010	2013	2015
True GARP multi-style strategy first developed by Erik Rubingh at ABP Investments	Erik Rubingh joined as Head of Systematic Equity. The core portfolio management team has been working together since 2007	Launched long-only version of the strategy utilising the True GARP multi-style approach	Launch of the global strategy utilising the same multi-style approach	Development of proprietary True Styles in value and momentum. Launch of equity market neutral long/short strategy.	True value, True momentum and low volatility added to the True GARP long-only strategy

Team AUM c.£2 billion

Erik Rubingh
Head of Systematic Strategies

Graziano Mirata
Portfolio Manager

Mark Sawyer
Analyst

Chris Childs
Director, Multi Strategy Investments

Chris Langford
Assistant Fund Manager

Source: BMO Global Asset Management as at 31.01.2017. AUM = Assets Under Management.

Systematic equity track record

Product category	Strategy	Inception date	Annualised active return				TE/Vol	IR/ Sharpe	AuM US$ mn
			1-yr	3-yr	5-yr	Since inception			
Style Premia Market Neutral L/S	F&C Market Neutral Equity Style Premia (unlevered)	Jan-14	0.83	2.70	-	2.70	2.97	0.9	54
	F&C Market Neutral Equity Style Premia Vol.10	Oct-14	3.19	-	-	12.76	9.58	1.3	610
Style Premia long-only	Global Equity Style Premia	Jul-10	-1.43	1.11	1.05	0.49	2.14	0.2	200
GARP long-only	North America Core	Feb-08	0.37	0.84	1.03	0.86	2.18	0.4	256
	AC World High Alpha	Nov-14	0.19	-	-	1.23	2.59	0.5	157
	All-World x UK High Income	Feb-13	5.03	0.86	-	-0.28	2.96	-	459
	Japan Core-Satellite*	Oct-14	3.41	-	-	3.67	2.75	1.3	358
	Europe Index Plus Composite	Feb-09	0.54	0.89	0.75	0.71	0.71	1.0	248
	Systematic Equities**	Feb-08	1.71	1.29	1.05	1.17	1.58	0.7	1,320
Passive	FTSE All-Share Tracker	Oct-07	-0.26	-0.16	-0.14	-0.01	0.19	-	446
	MSCI World Tracker Hedged €	May-13	-0.26	-0.31	-	-0.31	0.31	-	1,455

Source: BMO Global Asset Management as at 31.12.2016, numbers gross of fees. Active return numbers are geometric. TE = Tracking Error; IR = Information Ratio; L/S = Long/Short. *The strategy is managed by the Systematic Strategies Team (core portfolio) and by the Global Equities Team (satellite portfolio). **Systematic is the NAV weighted average of the Long-Only Active funds.

Disclaimer

Past performance should not be seen as an indication of future performance. The value of investments and income derived from them can go down as well as up as a result of market or currency movements and investors may not get back the original amount invested.

Equity Market Neutral: An investment strategy that seeks to exploit differences in stock prices by being long and short in stocks within markets, sectors, industries or countries. This strategy is intended to create returns that, over an extended period of time, are uncorrelated with general equity market performance, however this cannot be guaranteed and over discrete periods there may be a high degree of positive or negative correlation.

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- Comprehensive range of products and solutions
- Defined expertise – including a suite of specialist investment boutiques

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