

DIVERSIFIED THINKING

The rise of factor-based investing

From securities to asset classes, to factors



Aniket Das is responsible for LGIM's research in the field of factor-based investing. Aniket joined LGIM in 2016 from Redington where he held the title of Senior Vice President.



Andrzej Pioch is a fund manager in the Multi-Asset Funds team with his responsibilities including portfolio management and ongoing development of a multi-factor equity strategy.

INTRODUCTION

There are more than 40,000 publicly traded companies in the world – that's a lot of securities. Investors bundle securities together to form asset classes such as stocks, bonds, commodities and currencies. They do this because they recognise that securities within asset classes tend to perform similarly. However, the 2008 global financial crisis showed that asset classes that may look different can end up behaving in a very similar fashion.

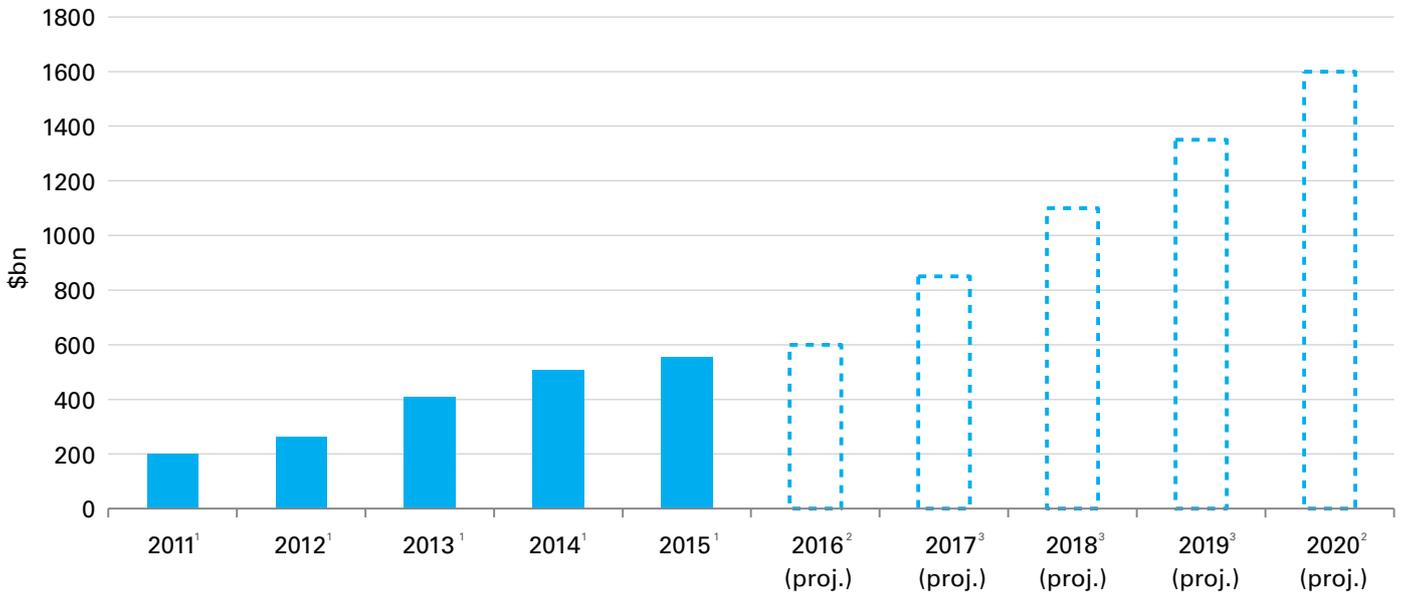
Factor-based investing, which seeks to identify the underlying characteristics that drive performance, has grown rapidly since the crisis. This is because investors are looking to go beyond asset class labels and understand the true drivers of risk and return in their portfolios. Figure 1 shows the historical and projected growth of assets we consider to be invested in factor-based strategies.

Investors use factor-based investing across equity, fixed income and multi-asset strategies to seek

outcomes such as enhanced returns, lower risk, or higher levels of income, in a cost-effective manner. While the bulk of growth in factor-based investing has occurred within equities, many defined benefit (DB) pension scheme clients have started to move away from market-capitalisation index-based fixed income strategies towards a factor-based approach. For defined contribution (DC) schemes, which are governed by a charge cap, factor-based investing can offer some of the benefits of active management but at lower cost.

In this article, we look at the rationale for factor-based investing and explore how it can be integrated into your portfolio.

Figure 1. Assets invested in factor-based strategies



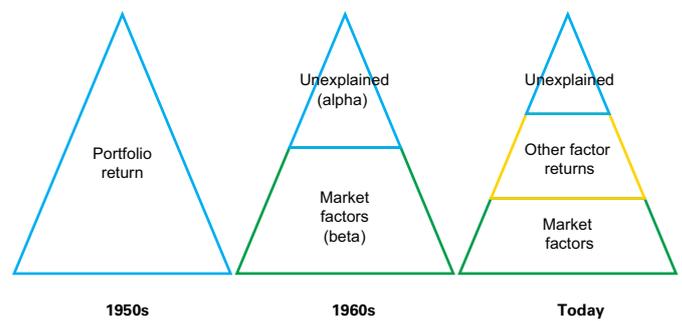
Source: Morningstar, Citi, LGIM. (1) Morningstar projections. (2) Citi projections. (3) LGIM projections – filling in linearly for 2017,2018,2019 (based on Citi projections for 2016 and 2020)

WHAT ARE FACTORS?

Firstly, there are ‘market factors’ which will commonly affect the value of many asset classes. These market factors include growth, inflation and interest rate sensitivity. For example, the value of corporate bonds is typically affected by changes in all three of these market factors: shocks to growth can hurt company profits and the safety of a bond, while changes in interest rates and inflation can affect the discount rate that investors use to price the bond.

While broad asset class returns can be explained by market factors, to explain the performance of a portfolio which holds active positions (i.e. does not only hold market-cap indices) we have to look at individual securities. When we do so, we see that certain characteristics drive the performance of one security relative to another and these characteristics are distinct from market factors. In the case of equities, such characteristics are labelled under groups such as value, size, momentum, low risk and quality. These groups of characteristics, alongside market factors, better help to explain portfolio performance.

Figure 2. Explaining portfolio performance through factors



The introduction of the Capital Asset Pricing Model in the 1960s allowed portfolio returns to be decomposed into market returns (often termed ‘beta’) and those returns not able to be explained by market movements (often termed ‘alpha’ and attributed to manager skill). With factor-based analysis, we can decompose more of the portfolio return into identifiable sources with less of the return unexplained/attributed to skill.

While factors may drive risk and return, this does not necessarily mean that they produce a positive return over the long term. Hence investors must be careful to understand which factors they believe are rewarded when choosing where to invest. We would suggest investors consider the following:

- Is there an economic reason, a behavioural trait or a structural anomaly as to why the factor should be rewarded?
- Is there a body of academic research which supports the existence of a positive return premium in the factor?

- Is there evidence of the factor working in multiple regions, time periods and possibly asset classes?

We view answering these questions as fundamental before plotting a course towards factor-based investing. The growing universe of products and solutions in this area requires scrutiny, particularly to understand whether investors will gain the type of outcome they desire (for example higher returns or lower risk than a market-cap weighted index, lower correlation to market risk, or a specific level of income).

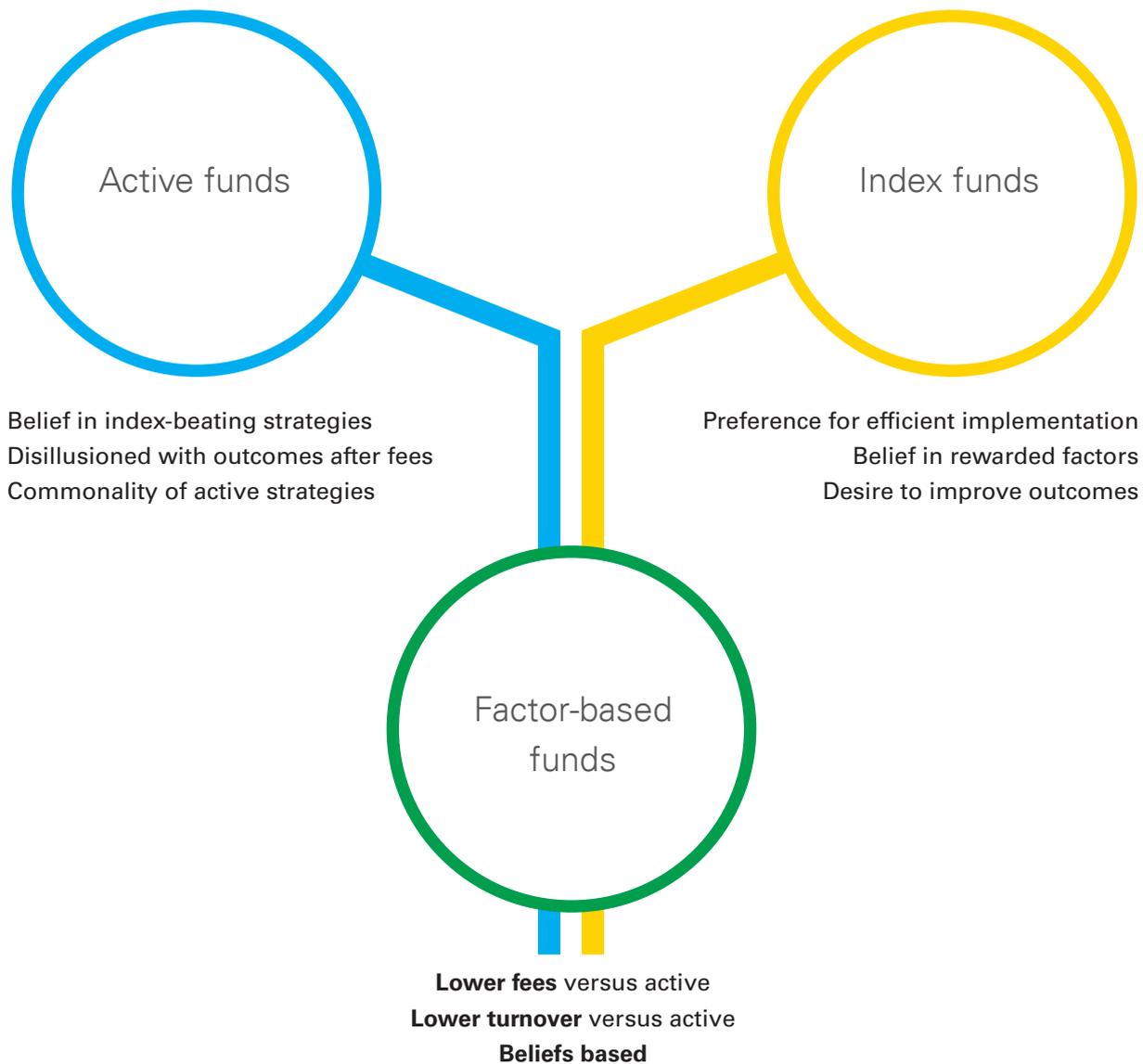
Equity Factor	Description	Rationale for positive factor return	Academic research supporting factor premium
Value	The value factor considers how 'cheap' a stock is relative to others based on comparing a stock's price to company financial data such as earnings, cashflows, sales or book value	Markets often overreact to bad news from a company and extrapolation of the recent past leads to underpricing. Value stocks often have higher sensitivity to economic shocks which requires higher returns as compensation	Basu (1977), Fama & French (1992)
Low risk	The low risk factor in academic literature is defined variously as low stock price volatility, low market beta or low idiosyncratic volatility, though all the definitions rest on a similar behavioural concept of low risk investing	Investor aversion to leverage means that high return portfolios are dominated by high risk stocks, leading to overpricing relative to low risk stocks. Further, tracking error constraints mean that low risk stocks can remain mispriced	Black, Jensen, Scholes (1972), Haugen & Heins (1975), Ang, Hodrick, Xing, Zhang (2006)
Quality	Quality companies are those that produce strong, sustainable returns for shareholders; this factor is usually defined by a combination of measures including high profitability, low investment and/or low leverage	Investors systematically underprice quality stocks due to their often stable, unexciting business strategy (for example lack of mergers and acquisitions activity)	Sloan (1996), Piotroski (2000), Cooper, Gulen & Schill (2008), Novy-Marx (2013)
(Small) size	The size factor refers to the market capitalisation of a company, with mid- and small-cap having more exposure to this factor than large-cap companies	Lower liquidity and higher levels of business risk are compensated with higher returns. Smaller companies may also structurally receive less investor attention	Banz (1981), Fama & French (1992)
Momentum	Momentum is typically characterised by a stock's return over the past 12 months, with strong momentum indicative of high historical returns	Investor overconfidence leads to persistence in stock price performance. High momentum companies also typically have higher business cycle risk and higher tail risk which requires higher return to compensate	Jegadeesh and Titman (1993), Carhart (1997)

HOW CAN FACTOR-BASED INVESTING HELP YOU?

Investors use factor-based investing for a number of different reasons. Two of the most common are: 1) investors currently invested in market-cap weighted indices believe in the existence of rewarded factors and are looking to generate better outcomes; and 2) clients wish to access some of the benefits of active management but at a much lower cost.

Improved portfolio diversification is one of the other key reasons for adopting factor-based investing. A large number of investors are in rules-based non-market-cap weighted strategies, often termed ‘smart beta’. These strategies typically offer access to a single factor such as value or low risk. However, some of these investors are looking to diversify their exposures by moving towards a multi-factor approach. As individual factors have their own cycles of performance, diversifying across a number of factors can help to smooth returns over time, leading to higher risk-adjusted returns.

Figure 3. Two pathways, same destination



EXPOSURE TO EQUITY FACTORS

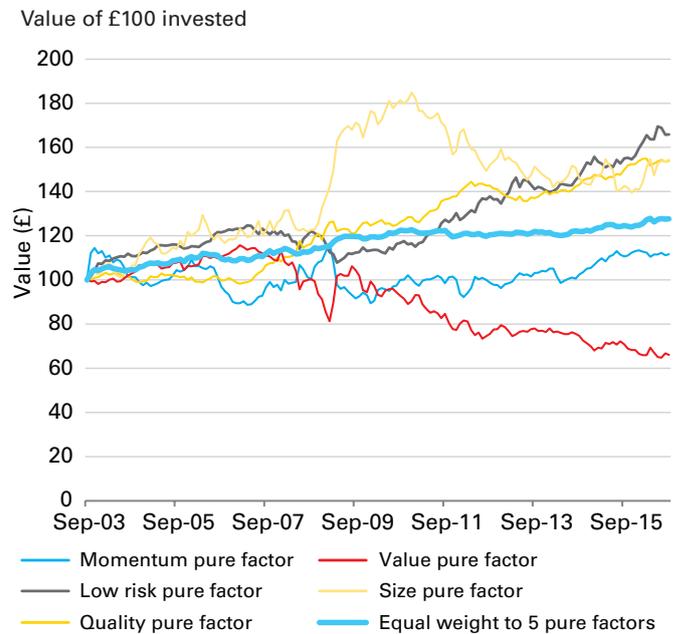
The chart below illustrates how equities exposed to different factors have performed since September 2003. It should be noted that while size produces higher performance than the market-cap index, it does so with greater volatility and a relatively high tracking error. Additionally, in the case of value which has underperformed the market-cap weighted index, we would highlight that this window is still a relatively short time period for judging whether a certain factor is rewarded or not. Academic studies typically use much longer spans of data. Combining the five factors in equal weight¹ produces higher performance than the market-cap weighted index, but with lower volatility than many of the individual factors. However, it is important to recognise that market factors will still be the dominant source of risk and return for a standard multi-factor strategy and, as such, correlations to market returns will still generally remain high.

Figure 4. Performance of global equity factors



Source: LGIM, Style Research.

Figure 5. Equity pure factor performance

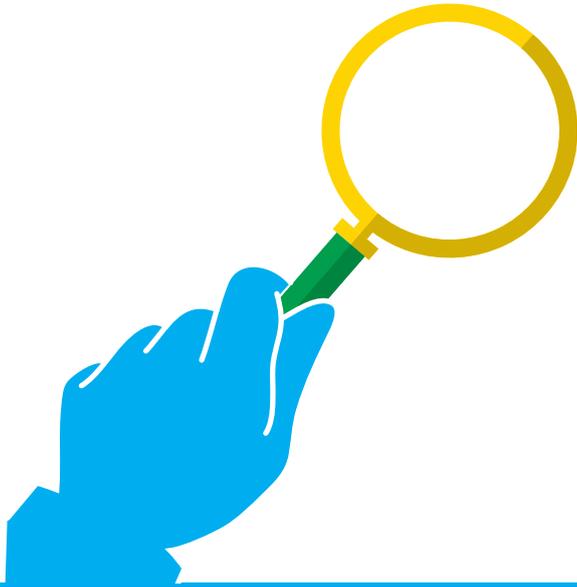


Source: LGIM, Style Research.

PURE FACTOR PORTFOLIOS

For further diversification, a powerful application is to use factors while limiting the exposure to market risk, e.g. through an appropriate short position in equity futures. This leads to the creation of pure factor portfolios which have a generally low, sometimes negative, correlation to market returns (see chart above). As an example, a momentum pure factor portfolio would hold a momentum factor index, along with a short position in equity futures which seeks to hedge the market risk of the index. This may be suitable for those investors looking for strategies that have low correlation to equity and credit markets, allowing them to significantly diversify their growth portfolios. However, on an unleveraged basis this type of strategy typically runs at a low level of risk and may earn a return below investors' requirements. Hence this may necessitate the use of leverage within a risk-managed framework to generate a return more in line with needs.

1. Note that ongoing changes in how factors interact may lead to solutions which deviate from the equal weighting scheme shown in this illustrative example



CASE STUDY: FACTOR-BASED INVESTING IN EQUITIES

HSBC's UK DC pension scheme was looking to redesign its market-cap equity-based default fund (over £1.5 billion). The scheme was looking to earn better risk-adjusted returns while also protecting from the long-term financial risk of climate change. By working closely with HSBC, LGIM and a leading index provider were able to design a bespoke index which met the scheme's needs. This index comprises a multi-factor equity strategy exposed to four factors on a balanced basis, in addition to a climate overlay which aims to manage the risk of transition to a low-carbon economy.

CONCLUSION

The use of factor-based investing is growing. Our clients are increasingly using the approach to try to gain a better understanding of risk and return, increase diversification, enhance return, reduce risk or generate income – all in a cost-effective manner. Our experience with clients shows that innovative approaches to factor-based investing can help them achieve their desired outcomes. However, there are a number of choices investors face when implementing a factor-based strategy. In our next piece, we will look at some of the issues investors confront when choosing to pursue factor-based investing.



References

- Ang A., R.J. Hodrick, Y. Xing and X. Zhang (2006), The Cross-Section of Volatility and Expected Returns, *Journal of Finance*, 61, pp. 259-299
- Banz R.W. (1981), The Relationship between Return and Market Value of Common Stocks, *Journal of Financial Economics*, 9(1), pp. 3-18
- Basu S. (1977), Investment Performance of Common Stocks in Relation to Their Price-Earnings Ratios: A Test of the Efficient Market Hypothesis, *Journal of Finance*, 32(3), pp. 663-682
- Black F., M.C. Jensen and M.S. Scholes (1972), The Capital Asset Pricing Model: Some Empirical Tests, in M.C. Jensen (Ed.), *Studies in the Theory of Capital Markets*, Praeger Publishers Inc., pp. 79-121
- Carhart M.M. (1997), On Persistence in Mutual Fund Performance, *Journal of Finance*, 52(1), pp. 57-82
- Cooper M.J., H. Gulen and M.J. Schill (2008), Asset Growth and the Cross-Section of Stock Returns. *Journal of Finance*, 63(4), pp. 1609-1651
- Fama E.F. and K.R. French (1992), The Cross-Section of Expected Stock Returns, *Journal of Finance*, 47(2), pp. 427-46
- Haugen R.A and A.J. Heins (1975), Risk and the Rate of Return on Financial Assets: Some Old Wine in New Bottles, *Journal of Financial and Quantitative Analysis*, 10(5), pp. 775-784
- Jegadeesh N. and S. Titman (1993), Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency, *Journal of Finance*, 48(1), pp. 65-91
- Novy-Marx R. (2013), The Other Side of Value: The Gross Profitability Premium, *Journal of Financial Economics*, 108(1), pp. 1-28
- Piotroski J.D. (2000), Value Investing: The Use of Historical Financial Statement Information to Separate Winners from Losers, *Journal of Accounting Research*, 38, pp. 1-41
- Sloan R.G. (1996), Do Stock Prices Fully Reflect Information in Accruals and Cash Flows about Future Earnings?, *Accounting Review*, 71(3), pp. 289-315

Important Notice

This document is designed for the use of professional investors and their advisers. No responsibility can be accepted by Legal & General Investment Management Limited or contributors as a result of information contained in this publication. Specific advice should be taken when dealing with specific situations. The views expressed here are not necessarily those of Legal & General Investment Management Limited and Legal & General Investment Management Limited may or may not have acted upon them. Past performance is not a guide to future performance. This document may not be used for the purposes of an offer or solicitation to anyone in any jurisdiction in which such offer or solicitation is not authorised or to any person to whom it is unlawful to make such offer or solicitation.

© 2016 Legal & General Investment Management Limited. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, including photocopying and recording, without the written permission of the publishers.

Legal & General Investment Management Ltd, One Coleman Street, London, EC2R 5AA

Authorised and regulated by the Financial Conduct Authority.

M1155