Factor investing

A strategy paper in collaboration with Allianz Global Investors & Robeco

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COLOPHON
Strategy paper factor investing

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Executive summary

Factor investing is seen as a third approach to investing, between active and passive.

Factor investing is 'in vogue'. The attribution of (excess) returns to identified factors is becoming more and more mainstream. Even though factor investing is not new, the field is still developing. Institutional investors have adopted factor strategies widely, while private investors are often still considering it.

Extensions of the Capital Asset Pricing Model (CAPM) suggest various explanatory variables for stock (out-) performance. These variables are known as factors and their application in portfolio construction as factor investing. The predominant factors in use today are: value, momentum and low volatility. Quality could be the next accepted factor.

Asset managers Robeco and Allianz Global Investors (AllianzGI) are at the forefront in the field of quantitative investment strategies. They both advocate multi-factor investment solutions. However, their product offering is different. Robeco offers single-factor strategies that can be used as building blocks for multi-factor solutions. AllianzGI favours an integrated multi-factor approach.

'Banks prefer a limited number of robust multi-factor solutions'

Robeco's single factor strategies are designed not to work against each other and factor exposures stay effective when combined in multi-factor solutions. Meanwhile, in solutions of AllianzGI the exposure to so-called superstocks, with high scores on multiple factors, is limited to avoid concentrations.

An enigma

The existence of factor premiums is an enigma in today's financial markets. The leading theories concentrate on two main themes: risk premiums and behavioural biases. The first is based on the intuitive explanation that extra returns are rewards for taking extra risk. The second focuses on behavioural preferences of investors.

The first interpretation does not necessarily refer to bankruptcy risk, but rather to increased business risk for companies that are highly dependent on the economic cycle. Research by the two asset managers shows a generic approach to value investing, for instance, leads to overweighting distressed high-risk stocks. However, this does not lead to higher returns, and thus should be avoided.

The second interpretation should be split between irrational and rational behaviour according to Robeco. If it is irrational, it should be arbitraged away in today's efficient markets. The researchers thus point to persisting rational differences in asset managers' and asset owners' preferences, while their long-term character provides a barrier to arbitrage. It remains a subject for further research.

The gatekeepers of the banks, who have taken part in the discussion, have a preference for a limited number of robust multi-factor solutions and want to avoid chasing every new trend or idea. They welcome factor investing as a third way: between active and passive solutions. On one hand, it generates active returns at a lower cost, while forcing active managers to generate real active returns. On the other hand, it offers an alternative to passive investing, which involves intentionally investing large parts of the portfolio in segments that are known to be associated with disappointing performance characteristics.

Programme

This strategy paper aims to provide insights into factor investing for investment management professionals.

‘Sharing knowledge and providing insights’

On one hand, these are asset managers - as providers of these strategies - and on the other hand, banks and financial planners - as the (wholesale) gatekeepers to the (retail) market of private investors.

The round table and the strategy paper aim to:

- Share knowledge on the subject of factor investing;
- Provide insights into the different factor strategies of AllianzGI and Robeco;
- Discuss issues gatekeepers encounter implementing these strategies.

The round table meeting was held on June 23, 2015, at restaurant Slangevegt in Breukelen. Interviews with the CIO Systematic Equity Benedikt Henne of AllianzGI and the head of quantitative research Joop Huij of Robeco were held in the week before the meeting.

Next to the representatives of the asset managers, gatekeepers Pim Lausberg of ABN Amro Bank, Sven Smeets of Altis[1], Han Dieperink of Rabobank and Arnold Pagen of Trustpartners were invited to join in the round table discussion. The gatekeepers were asked to provide questions and problem statements to be discussed.

After a welcome by moderator Cees van Lotringen, editor in chief of Fondsnieuws, the asset managers Robeco and AllianzGI gave a short presentation on their approaches, followed by an open discussion, in which questions and statements were brought to the table. The event was closed off with a lunch. <<

[1] Mr. Smeets provided input, but was not present at the round table meeting.

Introduction

Academic research has identified various sources of (out-)performance, which are known as factors.

The Capital Asset Pricing Model (CAPM), based on the Modern Portfolio Theory (MPT) formulated by Harry Markowitz in the 1950's, effectively identified one factor: the market.

Capital asset pricing

MPT is based on the assumption of efficient markets. If all information is reflected in prices and investors behave purely rational, the market portfolio should be the optimal portfolio.

Depending on their risk preference, they should hold a combination of this portfolio and a savings account yielding the 'risk free' rate.

The CAPM:

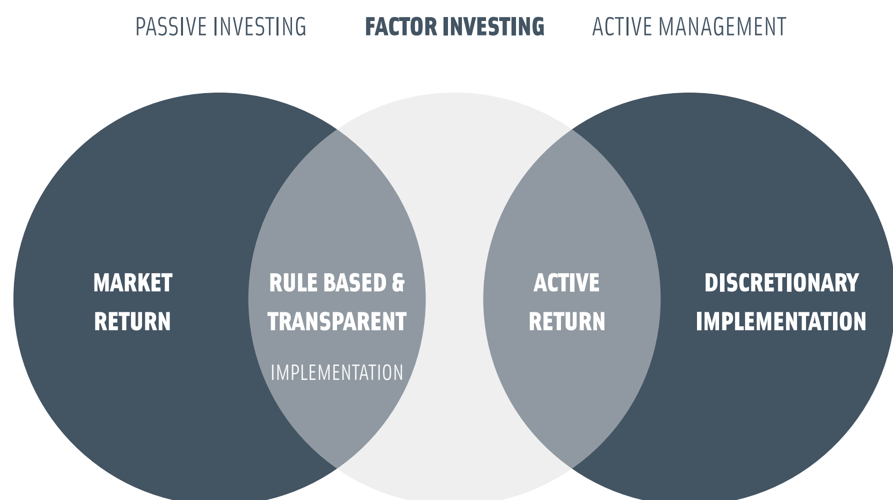
$Rp - Rf = \alpha + \beta m * (MARKET - Rf) + \varepsilon$

Where:
Rp = portfolio return
Rf = risk free rate
ßm = sensitivity to the market

Value and small-cap

However, a number of 'anomalies' with respect to the CAPM has been

INTRODUCTION: FRAMING FACTOR INVESTING AS A THIRD WAY OF INVESTING



- Passive investing features: rule based, evidence based
- Active management features: subjective choices, capacity constrained

Source: "Foundations of Factor Investing", MSCI Research Insight, December 2013

persistent. Eugene Fama and Kenneth French (1993) offered an explanation for the outperformance of small-cap stocks and value stocks that could not be explained by their sensitivity to market risk. They interpreted the extra returns of small-cap stocks and stocks with low price-to-book ratio as risk premiums and introduced two more sensitivities, i.e. two more beta's in the equation.

Their three-factor model expanded CAPM with two factors to reflect the portfolio's exposure to these stock classes. The factor small-minus-large (SML) measures the excess return of small caps over large caps, and the factor high-minus-low P/B (HML) of value stocks over growth stocks.

The Three-Factor Model:

$$Rp - Rf = \alpha + \beta m * (MARKET - Rf) + \beta 1 * SML + \beta 2 * HML + \varepsilon$$

Momentum

Meanwhile, Jagadeesh and Titman (1993) published studies on the factor momentum, described as the tendency for the stock price to continue rising if it is going up and to continue declining if it is going down. They discovered stocks that performed best over de previous 3 – 12 months had the tendency to outperform the following year. Mark Carhart (1997) incorporated this in his extension of the three- to a four-factor model adding the factor momentum.

The Four-Factor Model:

$$Rp - Rf = \alpha + \beta m * (MARKET - Rf) + \beta 1 * SML + \beta 2 * HML + \beta 3 * MOM + \varepsilon$$

Low-vol

The low-volatility anomaly was discovered several years before the value and momentum effects, and just a few years after the CAPM was developed. Instead of the positive relationship between risk and return, assumed in the CAPM, empirical tests showed that the link is less strong than theory would suggest.

Research by Robert Haugen and James Heins (1972) showed that low-volatility stocks realized extra risk-adjusted returns. Later executed studies revealed that the low-volatility anomaly is a global phenomenon.

Quality

Numerous other factors can be derived using regression analysis. Quality is one of the newest effects researched, and is as yet sparsely documented. The idea behind this factor is that high scores on quality variables, e.g. profit stability over time or pay-out to investors, indicate outperformance. High environmental, social and governance (ESG) scores are also thought of as signs of quality.

Size, value, momentum and low volatility, however, remain the predominant factors used today. <<

> ‘Size, value and low volatility are pre-dominant factors’

PHOTO:
Anton Reijinga
(Fondsnieuws)
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Robeco
Factor Investing

Robeco was one of the first European asset managers to put the concept of factor investing into practice.

The asset manager incorporates three factors in its strategies: value, momentum, and low volatility. Robeco's assets under management in these strategies recently surpassed 25 billion euro.

How does factor investing fit into the landscape of investment management? Passive investing is inefficient, according to Joop Huij, head of Factor Investing Research at Robeco, because it invests in all types of stocks, also the unattractive ones. He sees factor investing as 'a third way': between active and passive management. It has the rule and evidence-based approach in common with passive investing. However, subjective choices are made, like in active management. For instance, for large investors like sovereign wealth funds, capacity can be a constraint, to which the implementation should be tailored.

The third way

Huij looked at the value premium and its explanations to find out whether the premium is a reward for risk. Generic value strategies were indeed tilted towards stocks with high distress risk. Moreover, the widely used RAFI fundamental indices of Research Affilates currently have high weightings in Greece and Russia, which look cheap from a valuation point of view, but are also risky. Huij, however, does not subscribe the view that a good return must be a reflection of high risk. On the contrary, he concluded that investment strategies could be improved by avoiding these unrewarding risks.

Other Robeco studies also looked at long-only versus long-short approaches. While in theory long-short portfolios were superior, this result was not clear in a 'fair comparison' including the effect of for instance transaction costs and the costs associated with stock lending.

According to Robeco there is not one solution that fits all investors. The optimal weight on each of the factors is dependant on individual investors' preferences as well as their existing portfolios. If, for instance, investors already have a large exposure to value stocks, it would be unwise for them to allocate more to this particular factor. If they have a negative exposure to momentum and low volatility, they should add these factors. The Robeco Factor Exposure Monitor can provide such insights by measuring the factor exposures of the existing portfolio. The monitor calculates the relative over- and underweights per factor.

Huij noted that generic factor indices often go against other premiums. For example, by having unattractive valuation or momentum characteristics. The positive effects of harvesting one factor premium could therefore be cancelled out by the negative exposure to otherfactors. The Robeco enhanced approach avoids negative exposures to other factors by taking them into account in its stock selection models. <<

> 'Robeco Factor Exposure Monitor'

Robeco discussion

What considerations should investors make when implementing factor investing?

An investor has to decide first which factors should be included. Robeco is convinced of the evidence that support the three factors mentioned – Huij adds maybe 'four or four-and-a-half' factors in total could be relevant, while other fund managers think there are 80 or even over 100 relevant factors. Many of these factors suggested are interdependent or overlap with the 'proven' factors.

Huij does not agree that certain factors should be played at different times or that some might disappear over time. Critics say that strategies that work tend to get arbitraged away. Robeco found this is not the case, at least for its three factors. Huij is hesitant towards including small-cap as an independent factor, like in the Fama and French three-factor model. It has not shown to be robust over time. In strategies that focus on the other factors, often small-caps are overweighted relative to a market-cap weighted reference index. Small-caps are used as a catalyser for obtaining exposure to the other factors. In a multi-factor strategy, therefore, the gain of adding small-cap as a separate factor would add little value, he argues.

Joop Huij

> 'How many factors are relevant: 4 or 80?'

Investor preference

The existence of factor premiums is broadly accepted. However, there is no consensus on the rationale behind their existence. The main theories on this subject are split between risk-based and behavioural interpretations. In the risk-based approach they are a reward for risk, i.e. taking on more risk should lead to a higher return. The behavioural explanation of the premiums focuses on different preferences among market participants.

Robeco has not found supportive evidence for the risk-based interpretation of factor premiums. E.g. generic value strategies select stocks of companies in distressed situations. This is also seen in the recent overweighting of stocks from Greece and Russia in the RAFI indices. In general, these stocks are indeed more risky (volatile), but do not offer extra returns to compensate for this.

Robeco favours the behavioural interpretation. However, it is not merely irrational mispricing, which could be arbitraged away. Rather, the explanation could lie in rational preferences for certain sorts of stocks by market participants. E.g. growth stocks (as opposed to value stocks) make it more likely for an asset manager to

outperform in the short-term. There is career risk for portfolio managers in not owning these stocks. This leads to a misalignment of interests between asset managers and asset owners. Furthermore, there must be barriers to the exploitation of this mispricing, or it could be eliminated over time. Further research into these barriers is needed.

Active or passive

Investors who are seeking to harvest these premiums have to determine how to implement their strategy. They can choose generic or sophisticated products. In other words, they have to choose between passive or active approaches.

As opposed to managers like Robeco, there are index followers. MSCI, RAFI and FTSE are providers of relativetransparent indices on which many products are based. However, as discussed, this generic approach can easily lead to the selection of risky stocks or value traps. Furthermore, combining different factor ETFs could lead to an overlap in certain segments of the market, which increases the risk of concentration in the portfolio, or it could lead to the cancelling out of factor exposures, i.e. when stocks selected on the basis of one factor score negative on others.

> ‘There is career risk for not owning these stocks’

Robeco does not announce which positions it is going to trade. For index-based products, this situation may be different. Around reweighting of the indices turnover soars. Many investors suspect arbitrageurs or flash traders to anticipate the rebalancing and make a profit at the expense of ETF investors. For that reason Huij is working with a PhD student to quantify the arbitrage effects. They investigate if the price movements of stocks during rebalancing of ETFs are temporarily or persistent. They try to split the effects into arbitrage and overcrowding, where overcrowding is deemed structural.

Quality as a screening

Even if quality is not treated as a separate factor, it could be used as a screening tool in order to enhance performance of different other factor strategies. Although Huij says he is open towards the idea, he is still looking at which definition for quality works best. It could have predictive value above or beyond the three other factors, he thinks. Adding a quality variable could for instance helps to avoid value traps. Research is needed to understand whether and why this factor exists. <<

AllianzGI
Best Styles

Based on five year rolling time windows, the AllianzGI Best Styles portfolios have outperformed the market at all times during the last 16 years.

The persistence of style premiums supported the view of Benedikt Henne, CIO Systematic Equity at AllianzGI, that they should be seen as rewards for particular risks rather than results of behavioural biases and inefficiencies. Value, for instance, has long been identified, is still around and has never been arbitraged away. Even though many studies link behavioural biases to momentum, it is still there. Henne concludes there must be persistent obstacles to arbitraging these extra returns away.

This holds even in the most efficient market: the American stock market. On the one hand, in this market information advantages or behavioural biases should be arbitraged away. What remains are risk premiums. On the other hand, the amount of replication ETFs (index trackers) is growing, which raises the concern that only a few investors remain to find out the true stock values. This doesn't worry Henne. Even if the adoption of ETFs rises much further, it is not a problem, a small part of the market that trades actively is sufficient for price formation and price discovery, he believes.

Benedikt Henne

> ‘AllianzGI ends up over-weighting small caps’

With respect to using small-caps as a separate factor, Henne is sceptical. AllianzGI's Best Styles strategies end up overweighting small caps as a consequence of seeking exposures in other investment styles like value and growth. Buying stocks just because they are small does not work reliably.

Minimum-volatility strategies are a mixed bag. For instance, they end up with highly varying exposures to value stocks and other investment styles. Another performance driver for those strategies is the long equity duration, or interest rate sensitivity of these stocks. Rising rates could make low volatility strategies suddenly less profitable. Therefore minimum volatility strategies should be carefully risk managed, Henne added.

According to him diversification is the first success factor of his strategy. Standard quant scoring or a mix of ‘smart beta’ ETFs may lead to a strong overlap of investment styles. If the same stocks are selected for each factor this leads to concentration and higher risks when markets turn. It is better then to manage the overlap, i.e. put a limit on the concentration of the portfolio in so-called ‘super stocks’. Henne blames this concentration in super stocks for the ‘quant meltdown’ in 2007.

The key performance drivers Henne identified are valuation, earnings change, and price momentum - next to growth and quality. He sees no need to separately target small caps. The low volatility anomaly, though, should be targeted through a separate product, he thinks.

The second success factor of his strategy, Henne said, is establishing diversity within investment styles across macro risk dimensions. What he means is that it is best to keep the portfolio as ‘pure risk premium product’ as possible, focussed on the targeted factor exposures. Tilts to macro factors, regions and sectors, high or low volatility, interest rate sensitivity, economic cycle (GDP), over or under bought, etcetera, should be avoided. Trying to time factors only makes the strategy less pure and reliable on the timing skills of the portfolio manager.

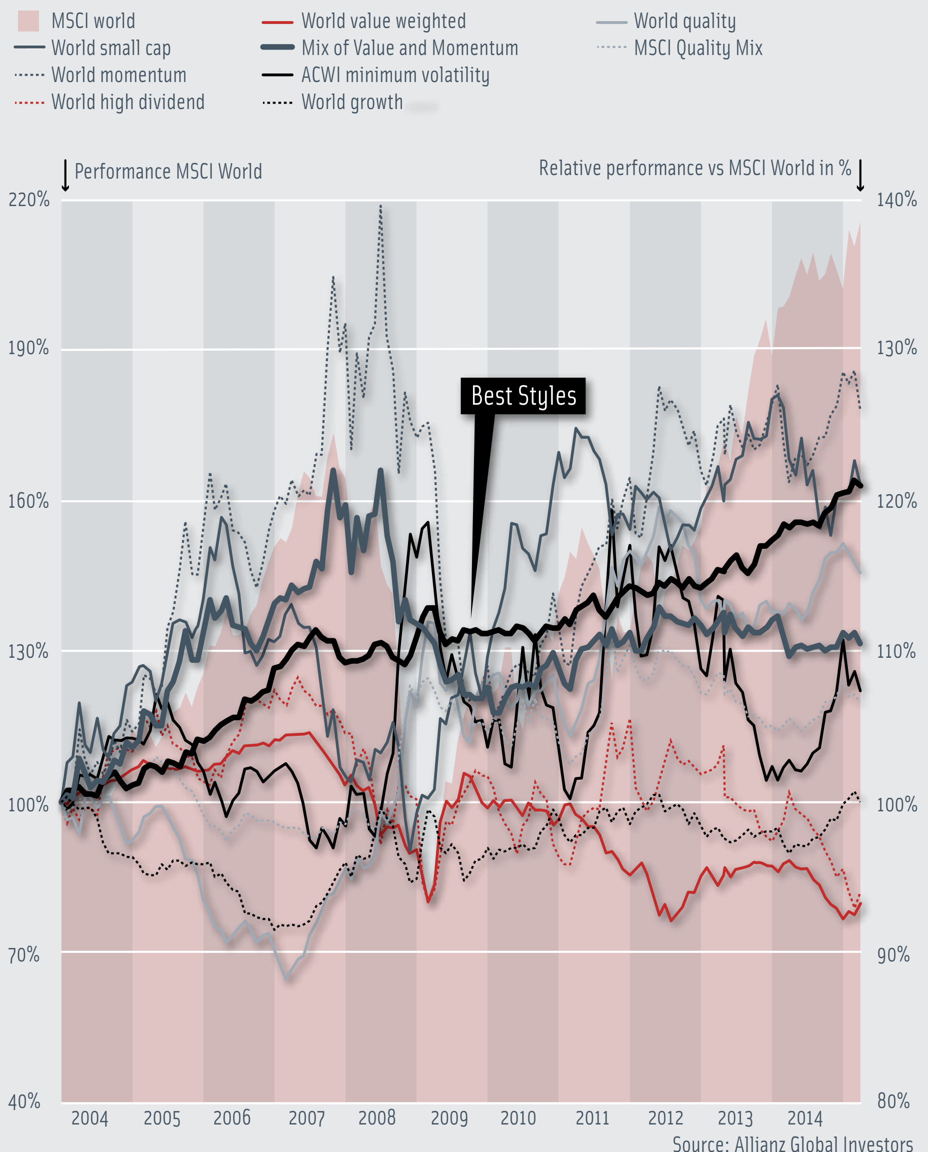
Henne divides risks in two kinds: ‘smart risk’, which are

the factor risk premiums, and 'non-rewarding risks' - those with zero average return that should be avoided if you do not want to time them. The first are the risks worth taking, the latter are more on the macro side and should be kept low. The key is not to have better factors per se, but have better risk management.

Another example of this is the realisation that the premium of the value factor is not concentrated in bankruptcy risk. Arguable value stocks sometimes trade at depressed prices because the chance of failure is higher. However, research has shown there is not much reward in taking this risk. The factor premium is rather a reward to different cyclical or business risks. Henne noted others in recent years did extensive sector timing by shying away from the financial sector, telecoms and utilities sectors. He kept the weights close to market and outperformed by stock selection within those sectors.

AllianzGI has 30 billion euros under management in the Best Styles strategies. The asset manager sees this way of implementing factor investing in multi-asset and multi-fund solutions 'ideal'. <<

Best Styles vs MSCI Risk Premium Indices



Source: Allianz Global Investors

AllianzGI

discussion

AllianzGI chooses an integrated approach or multi-factor solutions, but the same framework can be set to work in different markets or geographical areas.

Henne presents the success factors of the Best Styles: diversified investment style mix, diversity within investment styles, and stock selection based on research.

Rewarding or not

AllianzGI strives to be neutral to the macro-economic cycle. Dynamic weighting is avoided.

Henne is aware that factors have sensitivity to the economic cycle. However, trying to play certain themes or ride the cycle using factor funds can look nice for a while, but sooner or later mean reversion is likely to destroy the investor's track record. It is better to focus on the rewarding risks, i.e. pure factor exposures.

Robeco leaves more room to clients to implement their own weights for the combination of style strategies. AllianzGI does not allow this, as it wants to keep its risk management intact. AllianzGI also notes that if an unbalanced combination of styles does not do well for some time, clients will find it difficult to distinguish between their own responsibility and the manager's responsibility for the negative result.

> ‘It offers an active stance against lower costs’

Superstocks and quant

One lesson to be learned from the quant crisis of 2007, that eventually led to the demise of Goldman's Global Alpha fund, of which Mark Carhart was one of the managers, is to actively limit the overlap between factors. Many investors were holding the same super stocks, scoring well on multiple factors, but when the market turned they all tried to exit these positions at the same time. The more overcrowded stocks were, the harder they fell.

If an investor believes factor premiums are due to inefficiencies, there should be no problem with super stocks. This is why so many investors did not see the risk of a lack of diversification. However, the overcrowding effect made these stocks extra vulnerable. AllianzGI rather buys a limited exposure of these stocks, and then buys other stocks from the value and momentum lists that are on one list only in order to achieve a better diversification across risk premiums.

Unlike in fixed income, where the relation between risk and return is quite straight forward, the debate is undecided on the risk-based interpretation in equities. <<

From concept to implementation

Gatekeepers are increasingly convinced of the merits of factor investing. They prefer a robust multi-factor approach.

Before the meeting, participants were asked to share some topics and problems they would like to discuss. Some were discussed in the presentations. Other subjects and thoughts were discussed at the round table Q&A-session.

Single vs multi-factor

Pim Lausberg, portfolio manager equities at ABN Amro Bank, says it is still a struggle, advising clients on factor investing. He has a preference for a multi-factor product. In his view, the first 'win' is that it offers an active stance against lower cost than outright active management.

Arnold Pagen, partner at IFA Trustpartners, agrees and is content with the offering of more investable products in the last couple of years. However, he also notes trends in the offering of asset managers and if the industry keeps reinventing, it might be difficult for investors to keep up with. Henne notes that only large institutional investors, with long time horizons of e.g. 15 years, can build multi-factor portfolio's themselves. Everyone else needs products incorporating thorough risk management.

Han Dieperink, CIO of Rabobank, says the unpredictability of factor returns is an argument for investors to stay invested in different factors. Investors are too much focussed on the short term and the story of factor investing is already compelling, although it takes time to harvest the premiums.

Moreover, he sees factor investing as what investing is really about, and the concept is good to explain. In his view, it is an alternative to passive investing. Finally, it is also an alternative to active investors that do little more than taking bets on the market as a whole or on individual factors.

Allocation of capital

On one side, the rise of factor investing forces active managers to be more humble and to truly do something different. The first 'quick win' is lower fees active managers can justifiably charge. On the other side, Dieperink sees it as a strong alternative to what he calls 'the passive world'.

Passive investing in ever-growing large-cap stocks does little or nothing for the real economy, he notes. It even causes productivity in the developed world to drop,

Han Dieperink

Arnold Pagen

Pim Lausberg

as it diminishes the market's function to allocate capital efficiently. He sees factor investing as giving companies an incentive to deliver on for instance shareholder value and positive earnings momentum.

However, the question remains what explains, for instance, the value premium. This factor is seen as the one with the most predictive power. Robeco's Huij says he is ambiguous on what value is. He describes it as a dispersion of premiums to earn a better return. 'It's like brewing beer. People could make it for centuries, without really knowing what was going on. Only with the development of chemistry, we came to understand it better. Since then, we were able to improve the brewing process.'

Professional investors are increasingly looking at factor investing and what factor investing can do for them, concludes Huij. 'Moreover, we see an increasing number of investors actually implementing factor investing in one way or another. Given the vast amount of evidence in favour of it and the fact that it is getting more and more embraced by the industry, we strongly believe factor investing is here to stay.' <<