White Paper

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Selecting a factor strategy

A bigger challenge than stock picking?

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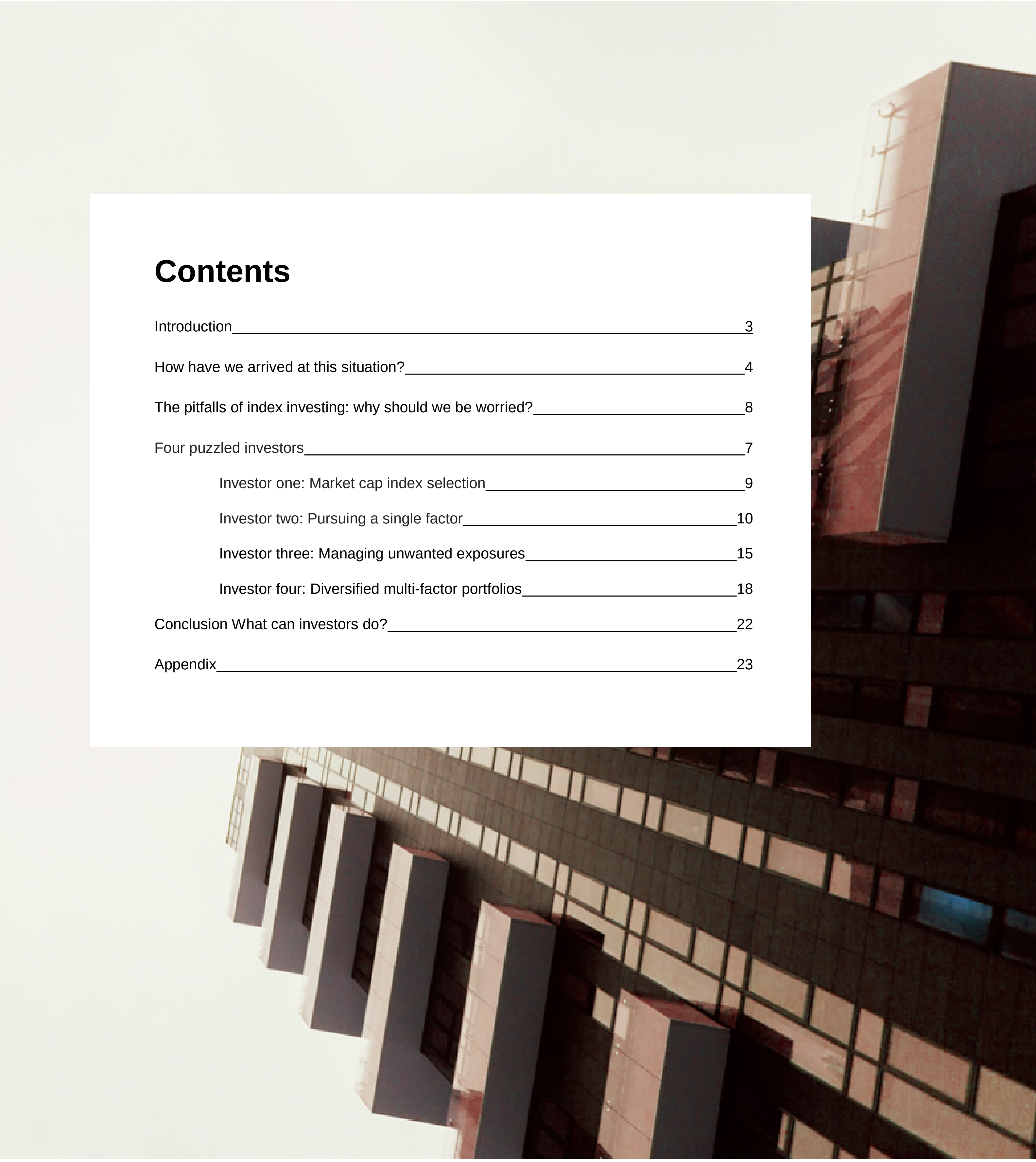
HSBC
Global Asset Management



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> "The arrival of low-cost index strategies for investors is undoubtedly beneficial but, as always cost benefits come with challenges and caveats"

Introduction

In recent years, index-based and "smart beta" investment strategies have proliferated, driven by investors' desire to access equity and bond returns at the lowest possible cost on the one hand, and by relatively widespread dissatisfaction with the lacklustre returns of active management on the other hand. In fact, according to Bloomberg, there are now more indices than stocks on the US market. They reported that between 2010 and 2012 alone, the number of indices available quadrupled to 1,000. While this figure is already impressive, subsequent growth has dwarfed it, with the current number of indices standing in excess of 5,000.

On balance, the arrival of low-cost index strategies for investors is undoubtedly beneficial but, as always, cost benefits come with challenges and caveats. A common misconception in this space is that buying any Value index, for instance, will generate the same returns irrespective of provider (save for a negligible tracking error). In reality, providers use different methodologies for index construction, and these can lead to significantly divergent outcomes for investors. The first question that springs to mind is: "why should two indices make the same style factor look so different and which one is best?" This shows that investors need to understand the methodologies before making a decision. Indeed, because the outcomes derive directly from the rules applied in a systematic strategy, an investor who doesn't understand these rules won't be able to anticipate the kind of returns that can be expected.

But there are more questions to ask when thinking about index-based strategies: Which weighting scheme is most suitable for my objectives? Will it remain suitable over time? How do I know the product is not exposing me to a host of other factors and risks of which I am not aware? The list goes on and on…

The investor's conundrum can be distilled down to the following paradox: if a key argument for switching to index-tracking products is that individuals aren't very good at stock picking, can we expect them to be any better at picking indices? In fact, now that there are more indices than stocks, they could fare even worse.

In this paper, we will explore how we got to this state of affairs, and discuss some of the common risks of index investing. To illustrate some of the challenges in more detail, we will examine four case studies. The first considers a passive investor intent on using a market-cap approach, whilst the next two compare two investors looking to use single factor indices for different applications: one to manage exposures in a pre-existing portfolio, the other as a standalone solution to beat a market-cap-weighted benchmark. Given the material challenges faced by the alpha seeking investor, we use a fourth case study to demonstrate how multi-factor strategies diligently constructed by a reputable asset manager provide a much better core solution to achieve cost-effective, long-term performance.

We aim to show that, while investing in systematic products is a valuable addition to investors' choices of strategies and fulfilment, it is not as easy to implement (properly) as is often characterised. Index investing can assist with many objectives, but it is important to remember what it doesn't do: it doesn't relieve investment boards of the principal-agent dilemma, it doesn't absolve them of the suitability challenge (even when 'buying the market') and it certainly doesn't grant them the luxury of applying less scrutiny when evaluating strategy providers.

How have we arrived at this situation?

Over the past few years, the asset management industry has been through tremendous change, notably with the acceptance that active management does not necessarily deliver the outperformance investors think they are paying for. Investors have expressed their frustration with active managers' high fees and poor returns by moving their money elsewhere. As a consequence, the industry has seen a significant structural shift in asset allocation from active to passive. Exhibit 1 illustrates this shift over the period from 2003 to 2016, and projections to 2021. While global active AUM has continued to grow, its share of total global AUM has shrunk whilst passive, ETFs and LDIs have filled the gap.

Although recent facts support this narrative, the notion that there are 'smarter' ways to invest than active management, or even simple cap-weighted index strategies, is neither new nor profound.

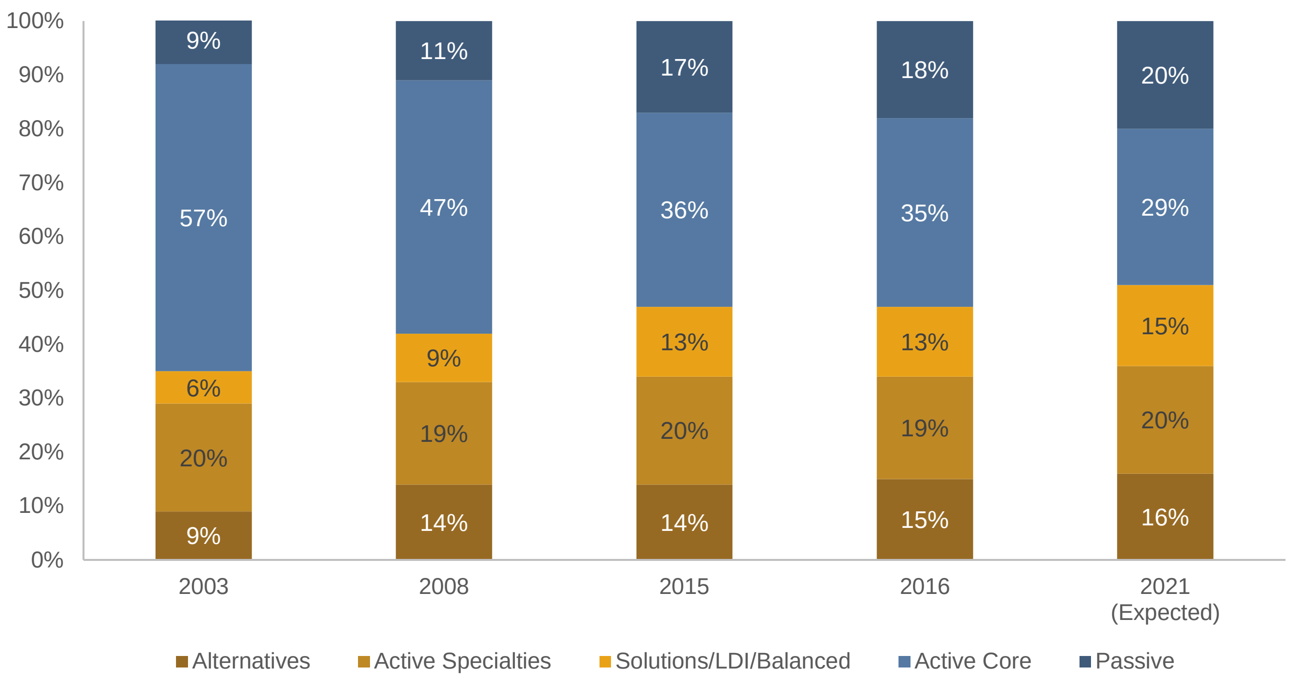
Greenwich Associates founder Charley Ellis pointed out the shortcomings of active investment management over 30 years ago, and a wealth of academia evidences the risks and pitfalls of cap-weighted strategies. This begs the question: if active management is not a panacea, then what is?

The trend started with simple products that tracked the world's largest indices. However, more recently, investors have come to realise that simply tracking a cap-weighted index may not be the most efficient use of one's funds – cue the rise to prominence of 'smart beta' and factor-based investing.

Practitioners and academics agree that, over the long term, factor exposures, portfolio diversification and rebalancing are important contributors to the performance of a strategy.

Smart beta makes these performance ingredients available to investors at lower costs than traditional active management through a transparent, rules-based framework that can be expressed in the form of an index.

Exhibit 1: Global AUM split by product (%)



Source: BCG Perspectives – Global Asset Management 2017: The Innovator's Advantage

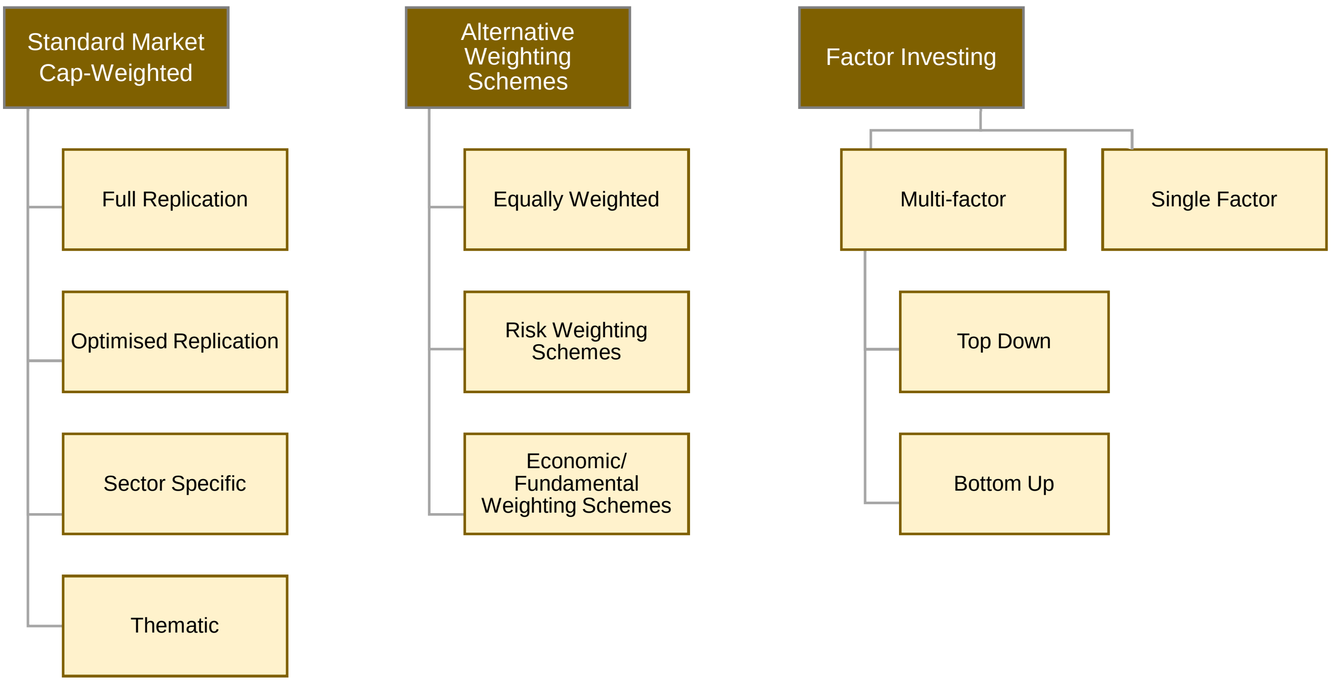
Followers of Shiller understand that rebalancing a stock portfolio to a slowly varying set of weights will capture the returns from excess volatility. Simple alternative weighting schemes, such as equal-weighting, risk-weighting or weighting according to economic attributes like GDP, all harvest this rebalancing premium and benefit from implicit exposures to systematic drivers of alpha.

Sophisticated institutional investors are increasingly starting to review systematic strategies that explicitly target factor returns. For example, the parliament of Norway, a trustee of the Norwegian Oil Fund, commissioned a report on the fund's investment returns after the fund's performance fell short of popular equity market benchmarks. The report showed that the returns relative to a cap-weighted benchmark of the fund's actively managed portfolio could be explained by exposure to a set of well-documented alternative risk factors. The authors argued that such exposures could be obtained through purely systematic factor strategies such as Value, Size and Momentum. Index providers have been quick to capitalise on this opportunity by commoditising exposure to factors through simple, rules-based methodologies that can provide cheap effective beta capture with highly diversified portfolios (thereby reducing stock-specific risk).

Yet the choice in indexation strategies is vast, as illustrated in Exhibit 2, and even for investors convinced of the virtues of systematic investing, deciding on an appropriate weighting scheme poses a serious challenge.

With the universe of alternative indexation seemingly only set to expand, it will become ever more important for investors to be aware of the pitfalls associated with index provision. Having traced the broad trend, it is clear that systematic strategies have a significant role to play in an investor's portfolio. However, it is equally important to acknowledge that not all systematic strategies and fulfilment vehicles are created equal. We explore some of the pitfalls of index investing in the following section.

Exhibit 2: The index universe



Source: HSBC Global Asset Management 2017

The pitfalls of index investing: why should we be worried?

Before diving into the intricacies of index construction methodologies, let us take a moment to appreciate the bigger picture and the challenges systematic strategies pose at this high level.

The temptation to shun responsibility

Any investor who manages money on behalf of others (pension scheme participants, insurance policy participants, or even shareholders) acts as an agent and therefore has a certain responsibility to make the appropriate investment choices for the ultimate beneficiaries. As such, any investment choices delegated to an investment manager with discretion present a risk of creating divergent incentives between delegator and delegate. Investing in an index as a proxy for the wider market can be seen as a way to bypass this principal-agent problem. Indeed, if an insurance or pension fund investor is ‘buying the market’ through a rules-based product, the asset manager acting as agent will simply not have enough autonomy to generate incentives that could conflict with the investor’s objectives.

In fact, while the idea of ‘buying the market’ is attractive, it does not eliminate the problem, but simply shifts it in that, rather than picking the right stock (or the right manager), the insurance or pension fund investor now needs to choose the correct index and methodology to represent the market. Of course, they could simply choose to ignore the issue and select an index without conducting proper due diligence, but they would be somewhat violating their fiduciary duty to the ultimate beneficiaries.

Using an index also adds another layer of opacity to a traditional investment management relationship. Index providers can have voluminous rulebooks for how they construct their indices. Execution of the rules is passive, but their definition entails a surprisingly active decision-making process, and one that is not necessarily standardised across providers. An agent is an agent, whether a stock picker or an index methodology researcher, and principals must recognise that rules-based investing does not ‘index away’ the principal-agent problem, nor their fiduciary responsibility.

Assessing suitability

Our second concern relates to suitability. One of the reasons for the current abundance of indices is that they incorporate a variety of methodologies designed to cater for different client requirements. Investors need to carefully consider their risk appetite, their investment beliefs and the purpose of their allocation (core allocation, satellite investment, risk management, etc.), as some systematic strategies are wholly inappropriate for particular uses. For example, some providers strongly recommend against investing in their momentum factor indices as a single factor strategy, because of their high turnover and trading costs - despite including the same indices in their multi-factor portfolios.

Another facet of the suitability argument is that it is not static: a given factor will not necessarily be suitable in all market environments. When managing a portfolio either partially or wholly fulfilled by systematic strategies, investors should remember to review their factor strategies frequently, to ensure that they remain relevant and continue to fulfil their intended purpose. Passive fulfilment should not foster complacency in an investment approach.

Choosing the right provider

Our final concern relates to the calibre of indexation strategies. In the case of smart beta strategies delivered by bulge-bracket index providers, considerations of the more commercial aspects, such as capacity and factor exposure, often overshadow efforts to ensure the signal is truly robust, efficient and well-crafted. Delivering an appropriate solution is not trivial: it requires a thorough understanding of, and confidence in, the signal prior to implementation.

Diligent managers differentiate themselves through systematic strategies that go the extra mile for investors:

- *A disciplined investment process*: the approach needs to be rule-based, whilst providing sufficient room for evolution. In many cases, providers have rushed to release simplistic rules-based strategies and have subsequently issued new, enhanced factor ranges without always improving the product held by their original investors.
- *Exercising judgement*: a strong methodology is built on the foundations of conscientious research and development. Sufficient attention should be paid to the assurance of unbiased factor combination and robust portfolio construction.
- *Intelligent implementation*: an excellent systematic strategy on paper will serve no purpose if it is not implemented in a cost-effective way in practice. This demands clever algorithmic trading translating into low impact costs.

Four puzzled investors

Having looked at some of the larger issues with systematic investing, we will now explore the case of four investors, each with different objectives, and some of the challenges they might face in choosing a suitable index-based strategy for them.

The first investor wants exposure to international markets. They believe markets are relatively efficient and, as such, seek simple fulfilment for their passive exposure. For this investor, the relevant form of implementation will of course be market-cap-weighted indices.

The second investor is tempted to bet on single factors to try and achieve superior returns to a simple benchmark. In this example, we will be focusing on the difficulties in identifying and timing robust factors, arguing how factor diversification can prove a much more attractive option.

The third investor already holds a core portfolio, but wishes to use a single-factor strategy to correct under or over-exposure to a given factor exhibited by that portfolio. We will illustrate how single-factor strategies can be useful in terms of risk management so long as the construction methodology focuses on delivering pure factor exposure.

Investor four wants to fulfil a core portfolio with factor-based strategies. The investor has the following constraints: they want returns to be as stable as possible, and they cannot afford any short-term drawdowns. The fulfilment option considered in this case is a diversified multi-factor product.

As we go through these examples, we will highlight the challenges index products pose, as well as the sort of questions a prudent investor should be asking.

Investor one: Market cap index selection

Despite market-cap indices looking all very much the same at first glance, behind every provider's passive index range is in fact a thick rulebook encapsulating a number of voluntary investment and construction decisions. The hitch is that, whilst many of these rules are well-established, they can vary across providers and can ultimately affect index performance. There is little evidence to question the motivation behind these decisions. The objective stated by most market-cap index providers is to provide maximal coverage of the relevant investment market. But making this objective a reality is fraught with complications, and most construction decisions are made for practical rather than performance reasons. Additionally, investors are often unaware that the rulebooks are not always static documents, and that certain changes can impact the product and its return profile. Rules can be added or amended for a variety of reasons; ultimately investors need to recognise that these are at the discretion of the index provider, not the end investor.

Rules relating to corporate governance provide a particularly interesting example of the level of discretion that can come with index construction. Recently, S&P Dow Jones indices announced that the S&P Composite 1500 and its constituent indices would not add any more companies with multiple share-class structures. Prominent names with multiple share-class structures currently in the index include Alphabet and Facebook, which illustrates the potential impact of such a decision. In a similar case, FTSE Russell announced that they are planning to exclude Snap Inc. from their indices because of the company's share-class structure and the implications for voting rights. In both instances, the decisions were made in pursuit of improved transparency and governance. Yet, whilst they are almost unequivocally beneficial from a corporate governance perspective, the crux of the matter is that investors are abdicating what used to be their active decision. These examples were highly publicised because of their positive reception from investors, but they also reveal how major index providers can have tremendous influence on corporate governance activism throughout the passive and benchmark-constrained asset management industry.

Corporate governance can extend beyond stock-level eligibility: it can affect the coverage of entire markets. For example, MSCI Has announced they will include 222 China A-share large-cap stocks in their MSCI Emerging Markets index, representing 0.73% of the index on a pro-forma basis. The A-share market is highly inefficient, with limited foreign access and a high risk of trading suspensions and frozen IPOs. Index providers face the decision of where to draw the line between meeting their coverage objective and protecting tracker or benchmark-constrained investors from risky, immature markets. These 222 names certainly do not constitute an exhaustive list of Chinese large-caps, and their selection would have required careful analysis. As such, an investor thinking they have bought passive exposure to emerging markets will in fact be taking a very active bet on a select group of Chinese companies as they are added to the index.

Moreover, if rules are implemented in a flexible way, i.e. using buffer zones or not enforcing new eligibility criteria on existing constituents, some companies listed in an index will not meet that index's liquidity, transparency, size or governance qualification criteria. S&P Dow Jones will continue to hold Alphabet and Facebook in spite of their multiple share-class structure because their membership preceded the new eligibility criteria. As a result, it is all the more important for investors to know what they are or are not actually buying. This is a particularly salient point in the case of China, whose influence in indices is only expected to grow.

Decisions such as these can have a profound impact on investment performance and, whilst the ultimate implementation may be passive, index selection certainly should not be.

[1] https://www.spice-indices.com/idpfiles/spice-assets/resources/public/documents/561162_spdjimulti-classsharesandvotingrulesannouncement7.31.17.pdf?force_download=true ; current members with multiple share-class structures have been grandfathered in and will not be impacted.
[2] https://uk.reuters.com/article/us-snap-russell-idUKKBN1AB2TW ; http://www.ftse.com/products/downloads/FTSE_Russell_Voting_Rights_Consultation_Next_Steps.pdf

Investor two: Pursuing a single factor

Our second and third investors express an interest in smart beta strategies, with two different objectives in mind. The second investor wants to outperform a market-cap benchmark, and is set on using single factors to express his investment conviction. The third investor already has a core portfolio, and is only interested in single-factor indices as a satellite investment to help diversify existing exposures. There are two key questions these investors need to ask themselves:

- Which is the right factor to meet my needs/beliefs?
- What are the key things I should be looking for in the factor construction and implementation methodology?

We will consider these questions from the third investor's perspective in good time. But first, let us look at the second investor and the challenges he faces in realising his factor-investment ambitions.

Choosing the right factor – looking for long-term return potential

Factor investing must take its share of the blame for the proliferation in indices because it offers so many dimensions of choice. Its increased prominence has certainly boosted the accessibility of these systematic drivers of return but, at the same time, it has potentially developed new conflicts of interest.

With so many providers competing, there is a high incentive to find unique alpha factors that will capture the imagination of investors and build market share. By questioning the robustness of many of these factors, Harvey, Liu & Zhu's paper "….*and the Cross-Section of Expected Returns"* [3] helped foster a degree of healthy scepticism in the industry. This is not to say that investors should shy away from new ideas; but rather that innovation should be welcome as long as it is not purely for innovation's sake. We recommend investors considering any new factors should look out for possible factor-fishing and model-mining.

In particular, investors need to be confident that their chosen factor is robust and demonstrates long-term return potential, but this is easier said than done. For example, consider Growth and Value investing, two investment styles which have been around for a long time, and yet are natural counterparts. The former focuses on producing excess returns by finding the next big thing, which is probably valued at a premium, whilst the latter looks for the unloved stocks that will recover their fair value over time. We illustrate some of the complexities around identifying robust factors by considering an investor trying to decide between these two styles.

A robust factor should boast an intuitive economic rationale and strong empirical support. However, it is not hard to produce an attractive back-test for a proposed strategy, and back-testers can be very creative when it comes to developing theories to explain their results. Growth investing focuses on companies that exhibit signs of high growth potential in order to deliver capital appreciation. The strategy seems to make economic sense. However, thanks to the improvement in computing power and the availability of data, Eugene Fama and Kenneth French were able to demonstrate that Growth investors who targeted companies with low book–to-market ratios seemed to deliver substandard long-term returns relative to their counterparts who invested in cheap, high book-to-market stocks. The evidence suggested that investors overestimated the growth potential of these companies and ultimately paid too much for them.

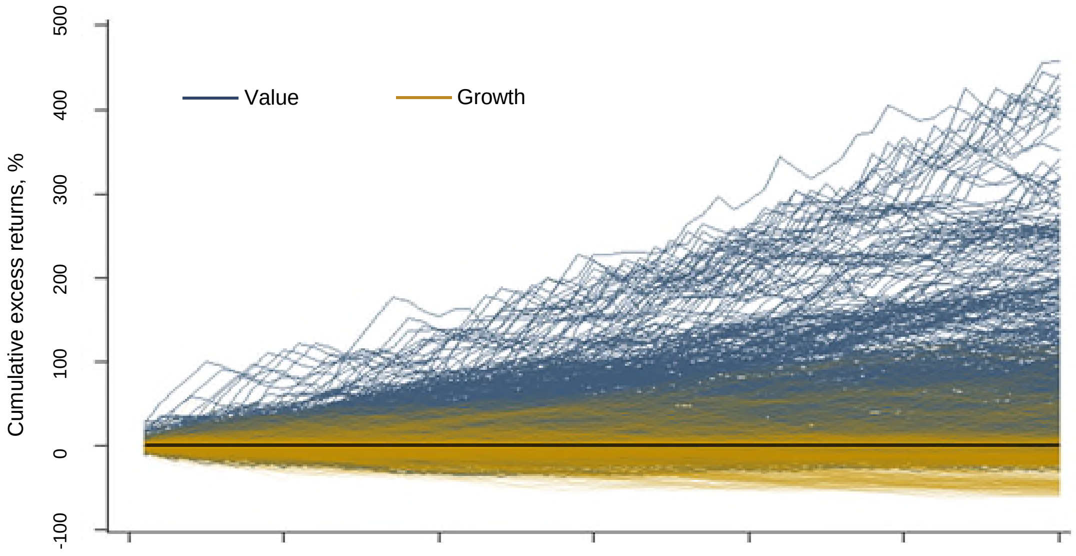
[3] Harvey, Campbell R. and Liu, Yan and Zhu, Heqing, "…and the Cross-Section of Expected Returns" (2015) The Review of Financial Studies, Volume 29, Issue 1

Even validated risk premia proven to perform well in the long term suffer short-term volatility. This makes it notoriously difficult to identify robust factors on the basis of short-term performance alone, and it is all too easy for investors to fall into the trap of making a damaging investment decision by acting too swiftly. Kenneth French provides monthly returns for portfolios sorted by his book-to-market factor going back to 1926. In Exhibit 3, we consider the cumulative excess returns of the lowest (Growth) and highest (Value) book-to-market portfolios during every continuous 5-year horizon in this database. The long Value portfolio (in blue) delivers some impressive excess returns over many of the periods covered, whilst the non-robust Growth portfolio (in gold) delivers very few returns of significant note. This is what we would expect given the widely-acknowledged return potential of the Value strategy.

What is much more surprising, however, is over how many 5-year horizons the robust Value strategy underperformed the benchmark. In fact, Value's worst performance competes with Growth's worst performance for the first 30 months of the investment horizon, demonstrating that even well-accepted factors can generate disappointing returns if the investor is unlucky in her timing.

Yet, given the short-term volatility exhibited by robust factors, negative performance early on in the investment period is in fact perfectly likely, and it takes time for the positive compounding effect to reverse these early setbacks. Therefore, on average, the distribution of cumulative returns follows an upward trend with some disappointing returns possible in the early years. There is no such average trend for the non-robust Growth portfolios.

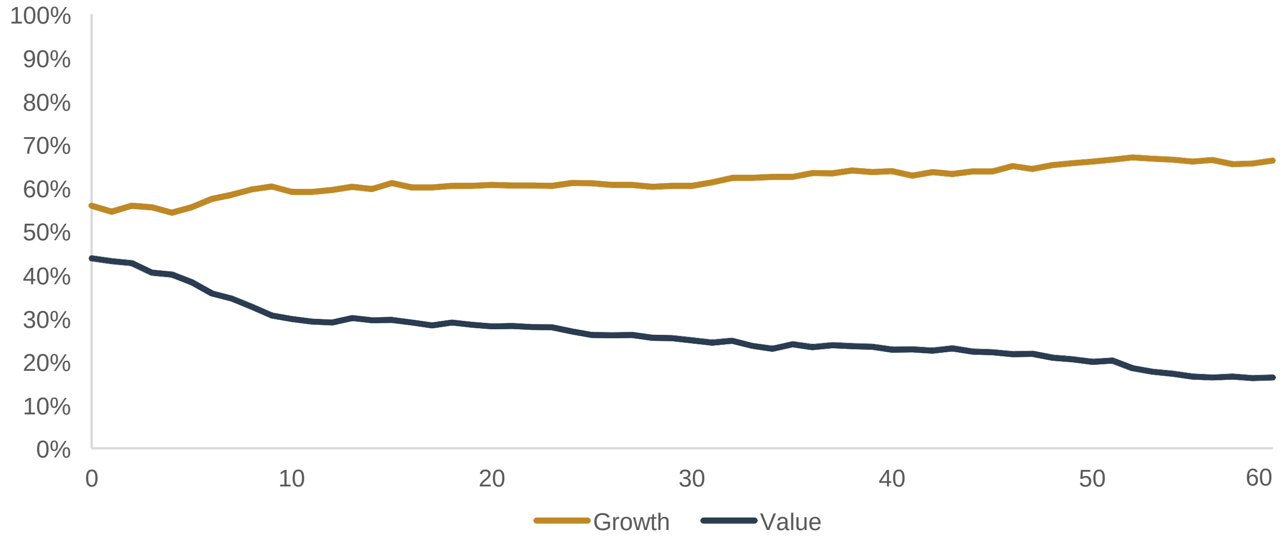
Exhibit 3: Cumulative excess returns of the lowest book-to-market quintile portfolio and highest book-to-market quintile portfolio portfolios during every continuous 5-year horizon from January 1940 to July 2017



Source: HSBC Global Asset Management July 2017, raw data from Kenneth French's data library.

In Exhibit 4, we use the cross-section of returns plotted in exhibit 3 to calculate the probability of cumulatively underperforming the market for each month of a randomly-selected 60-month investment horizon, for a Value portfolio and a Growth portfolio respectively. Despite the alpha potential of the Value strategy, the probability of underperforming the benchmark starts off not much lower than that of Growth. It then decreases over time, whilst the Growth strategy shows a consistent probability of underperforming of at least 55%. Institutional investors typically reassess their investments every three years. If their decision is based purely on whether their portfolio has outperformed the benchmark, this investigation demonstrates that the investor has a one in four chance of erroneously exiting the robust Value strategy, and a 45% chance of remaining invested in a lacklustre Growth strategy. In this light, investors looking for the right single factor should be aware of the need to take a long-term view, where it becomes clear that Value is more likely to produce outperformance than Growth. As such, investors need absolute clarity about what they are trying to achieve. There is much empirical evidence around how factors behave but, as this example demonstrates, this evidence often takes more than a superficial analysis to be correctly understood and interpreted.

Exhibit 4: Probability of underperforming the benchmark - percentage of 5-year portfolios in Exhibit 3 that underperformed the benchmark



Source: HSBC Global Asset Management July 2017, raw data from Kenneth French's data library.
For illustrative purposes only.

Choosing well-defined factors

When evaluating factor strategies, investors should consider whether the factor actually delivers a unique source of alpha or whether it simply captures a well-established factor from a different perspective. A number of the 316 factors tested by Harvey, Liu and Zhu were in fact various metrics capturing different characteristics of the Value factor. Whilst it may be tempting to discuss the merits of each metric, there is no reason why any single measure should perfectly capture a systematic driver of return. In fact, it is our belief that factor investing is best executed through composites of multiple, correlated metrics that harvest the various characteristics of each factor.

Of course, choosing which group of metrics to combine introduces yet another dimension of variation in factor indices, and yet another decision to make.

Defining Quality

No factor exemplifies the dispersion in the definition of a single strategy better than Quality. Quality remained a relatively unexplored factor until its attractiveness as a countercyclical premium caught investors' attention in the aftermath of the Global Financial Crisis. Yet industry practitioners had great difficulty pinning down a definition. Quality seemed to encompass everything from profitability to accounting quality, earnings variability or the effectiveness of management. Asness et al's influential paper (Asness, Clifford S. and Frazzini, Andrea and Pedersen, Lasse Heje, *Quality Minus Junk*, 2013) set a precedent for composite factors that attempted to harvest different flavours of Quality (Profitability, Payout, Growth and Safety). However, quality composites vary from provider to provider, as shown in the table below:

Quality Minus Junk (QMJ)	HSBC Quality Factor	MSCI Quality	FTSE Quality
Profitability composite	Profitability composite	ROE	ROA
Payout composite	Earnings quality composite	Earnings variability	Change in asset turnover
Growth composite (change in profitability metrics)	Low leverage composite	Debt to equity	Accruals
Safety composite (including various forms of low risk)			Operating cash flow to Total debt

[5] Harvey, Campbell R. R., Yan Liu, and Heqing Zhu (2013): ... and the Cross-Section of Expected Returns, unpublished working paper, Duke University

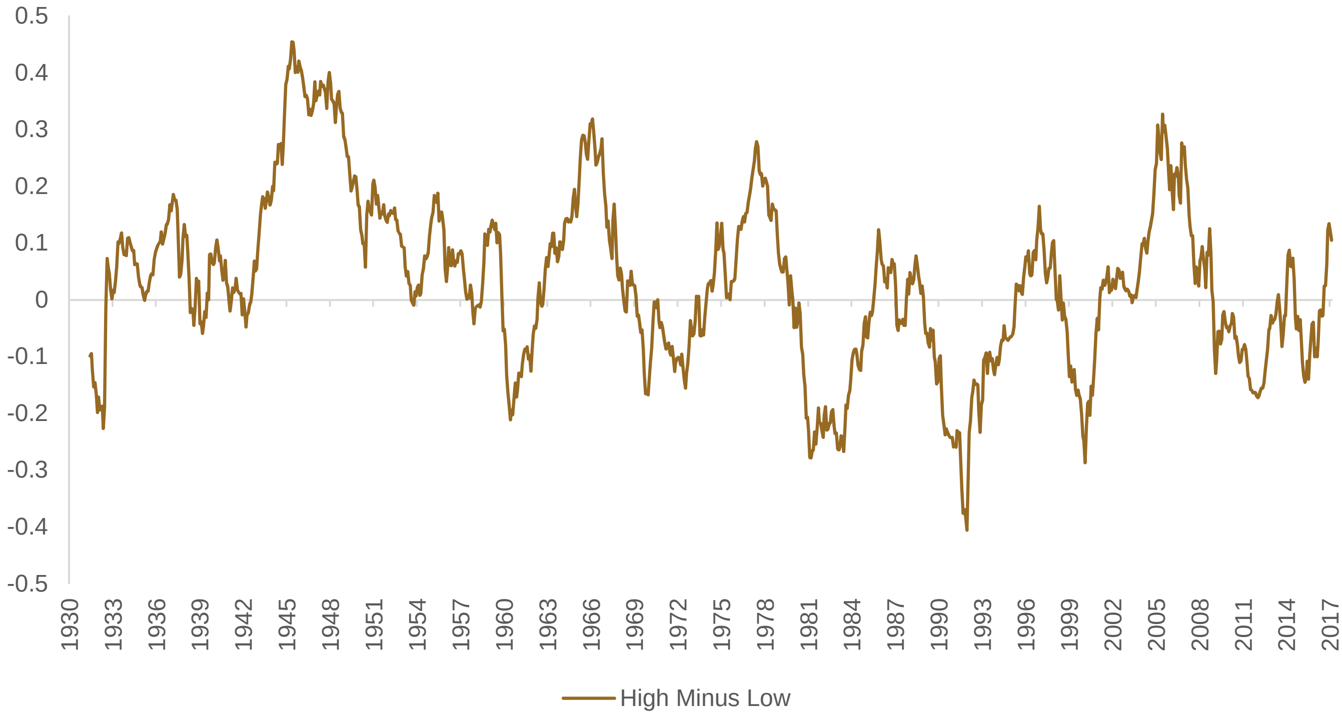
Timing Factor Investments

Even if our second investor demonstrates the patience and statistical know-how to identify robust factors, his ambition to pick the “right” index is somewhat naïve. A contributing element to factors’ short-term volatility is the fact that they are inherently cyclical. Exhibit 5 shows the rolling 60-month Sharpe ratio of Fama & French’s famous Value Minus Growth, or High Minus Low book-to-market strategy since 1931. This long-short Value strategy sought to profit from the diverging performance of Value and Growth investing. The chart demonstrates that this measure of the Value factor has undergone cycles of significant amplitude over the course of market history, typically with a time period of approximately 10 years. For an investor with a high sensitivity to short-term performance, capturing the wrong end of a factor cycle can truly harm results, with drawdowns potentially setting back long-term performance for years.

The temptation may be to ride factor cyclicality by “timing” entry and exit points into single-factor investments. Different factors exhibit different cycles, so jumping from one strategy to another at the appropriate moment may sound like a lucrative strategy in theory. In practice, this is near-impossible to achieve without taking a painful hit to performance at some point. We would counsel caution to this ambitious investor and advise that a more diversified investment, such as a multi-factor strategy or an alternative weighting scheme may prove less hazardous in the long term.

In short, choosing a single-factor strategy is not trivial and there is a lot for the investor to think about if she really does expect to choose a factor successfully. Investors need to be familiar with the statistical techniques required to evaluate the robustness of a signal rigorously, in order to make informed decisions. Moreover, timing is crucial, as even robust factors can exhibit cyclical performance over fairly lengthy time periods. For this reason, we think that investors looking to fulfil a core strategy should instead investigate more diversified factor investment strategies.

Exhibit 5: 60-month rolling Sharpe ratios for the High Minus Low book-to-market long-short factor



Source: Kenneth French’s data library, as of February 28, 2017. Past performance is no indication of future returns.

60-month rolling Sharpe ratios, 1921-2017, raw data from Kenneth French’s Data Library, http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

Investor three: Managing unwanted exposures

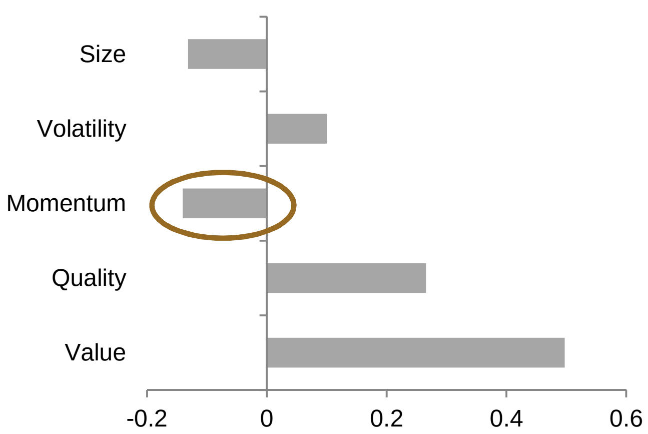
Single-factor indices may not be core portfolio material, but they can play an important role in other applications, such as risk management. Building portfolios with a bottom-up approach can sometimes result in holding a collection of securities that exhibit unwanted aggregate factor exposures. It is important to manage these biases in order to improve a portfolio's risk profile. Exhibit 6 shows an example whereby our third investor holds a core portfolio that targets good quality companies at attractive prices. Such a portfolio will exhibit a natural bias to the Value and Quality factors (Portfolio 1). However, by breaking down the portfolio's factor exposures, our third investor also identifies a significant unintended negative exposure to momentum (see Portfolio 1). Such exposures can be hedged through the use of indices or strategies that target a similarly defined factor.

The investor uses a satellite investment in a momentum strategy/index to reduce the negative exposure in his portfolio to levels that are more palatable (Portfolio 2).

Exhibit 7 demonstrates how the portfolio's momentum bias had put an unnecessary drag on performance, and how effective risk management with a single factor strategy provides a slight uplift to cumulative returns.

Exhibit 6: Using a Momentum strategy to correct negative momentum exposure in an existing core portfolio. Active factor exposures versus MSCI World Index

Portfolio 1: with unwanted momentum exposure



Portfolio 2: with tilt correction – adding 10% momentum tilt

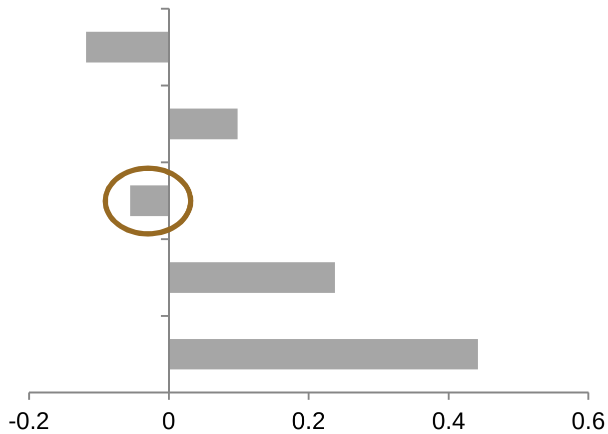
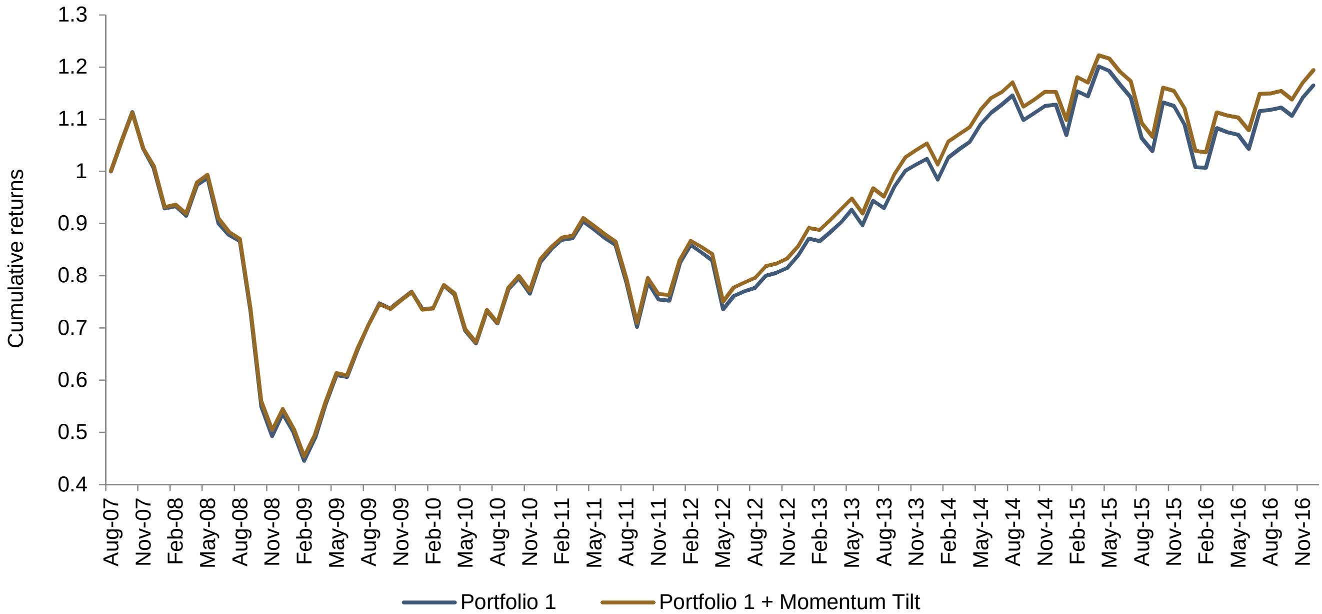


Exhibit 7: Cumulative excess returns of the lowest book-to-market quintile portfolio and highest book-to-market quintile portfolio portfolios during every continuous 5-year horizon from January 1940 to July 2017



Source: HSBC Global Asset Management, July 2017. Raw data from Thomson Reuters, MSCI, Worldscope and IBES. For illustrative purposes only.

Robust construction

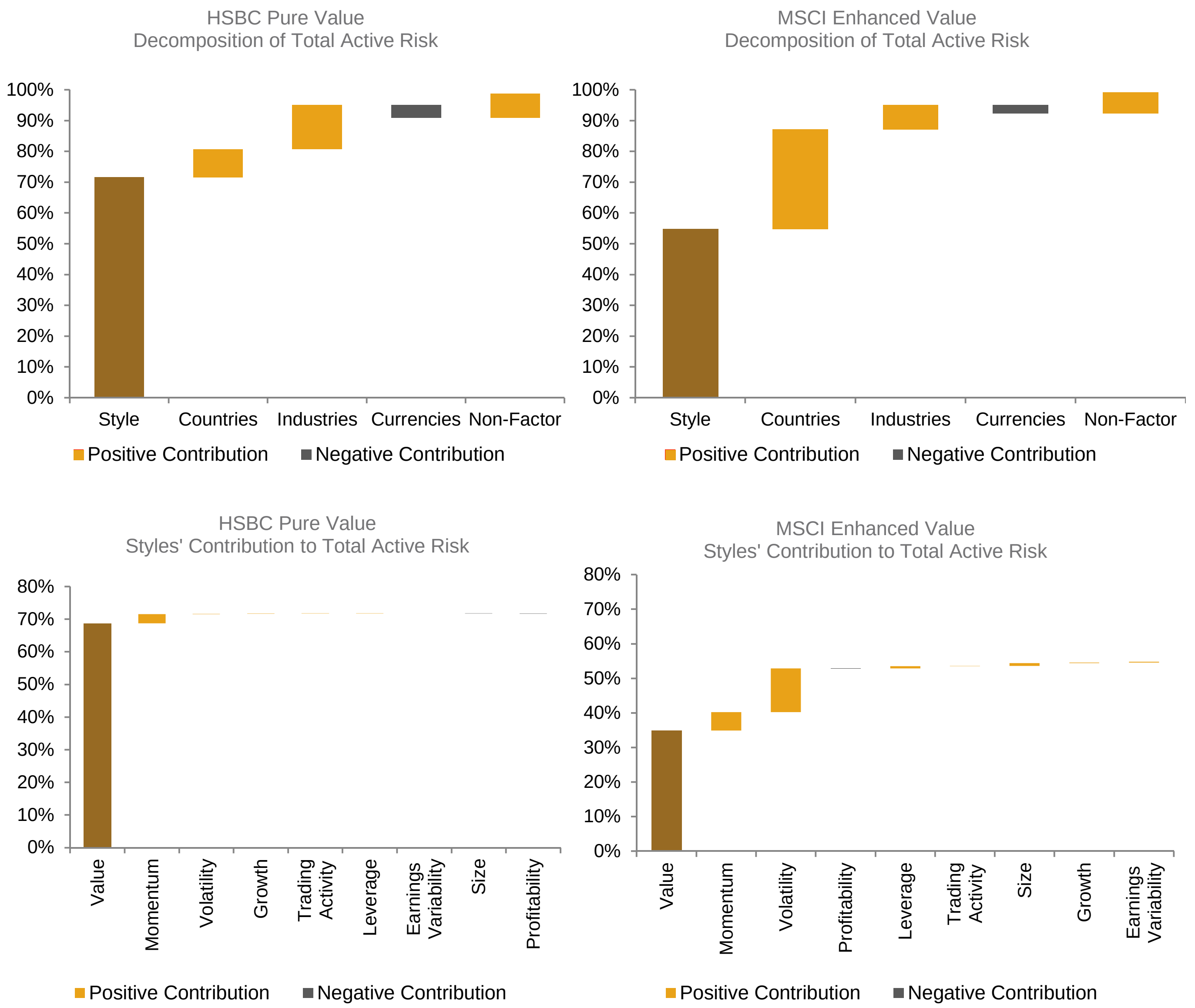
In these kinds of risk management applications, the quality of the factor-construction methodology is of the utmost importance. In theory, an investor may know they want to invest in, say, a systematic Value strategy but, with so many competing providers, it is extremely difficult to know which product to choose. Many providers focus on delivering a suite of products that cater for various trade-offs between strong factor exposure and high capacity, according to investor appetite and suitability.

Yet, whilst target factor exposure seems the most obvious qualifier, it doesn’t tell the whole story.

Systematic strategies with simplistic methodologies tend to suffer from unintended exposures that contaminate both performance and risk. This is disastrous in a risk management scenario, where attempting to hedge exposure to one factor could end up enhancing exposures to others. Ideally, our investor should refine their search to identify only strategies offering pure exposure to the target factor.

Our research suggests that factor indices from bulge-bracket index providers fail to pay sufficient attention to these secondary exposures. Metrics that look at the proportion of the active risk budget allocated to the desired factor provide an indication of how well a factor product delivers on its investment objective. Exhibit 8 illustrates how a construction methodology that addresses purity ensures that more of the risk budget is allocated to styles, and more specifically to the target style factor (in this case Value), than for a typical index provider strategy. Products that are ‘contaminated’ with other exposures may not be as efficient at correcting the bias and may actually concentrate yet more unwanted exposures in the portfolio.

Exhibit 8: Example decompositions of total active risk (December 2016)



Source: HSBC Global Asset Management, December 2016. Raw data from Thomson Reuters, MSCI, Worldscope and IBES

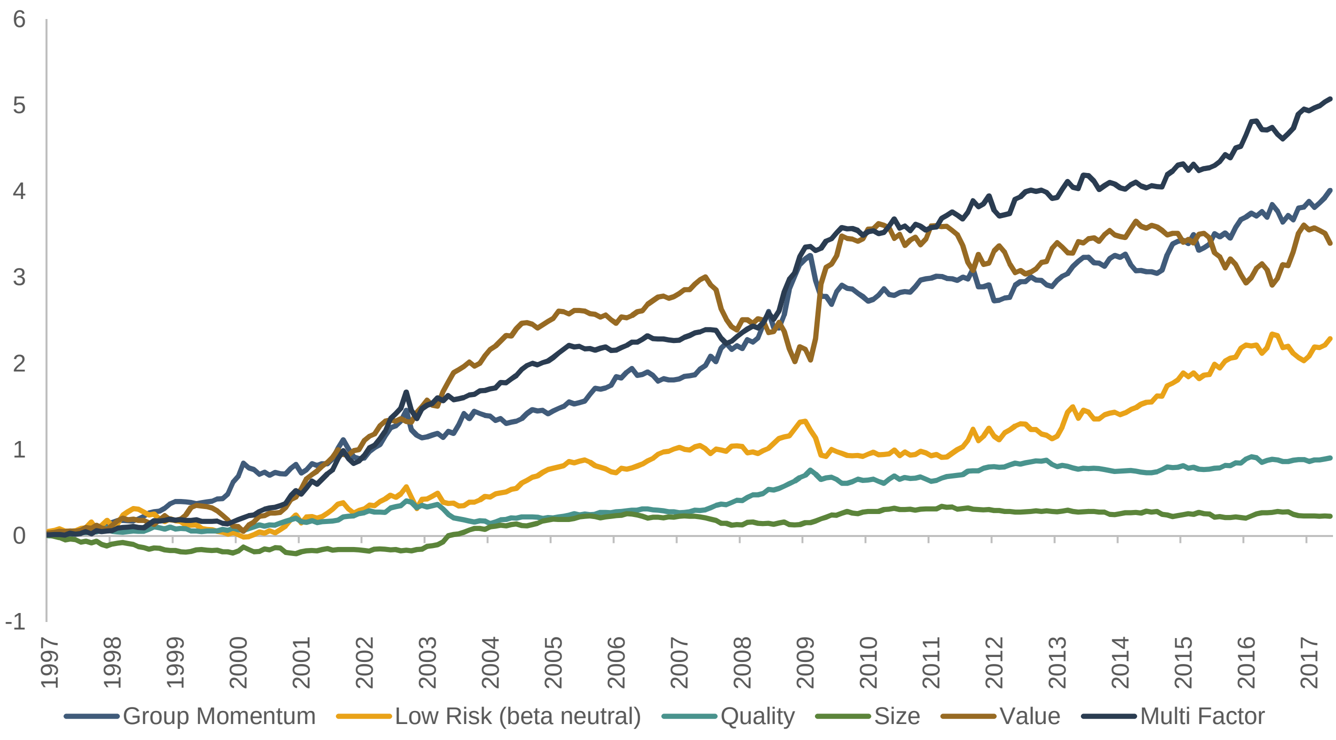
Investor four: Diversified multi-factor portfolios

Our fourth investor wants to fulfil a core portfolio with a cost-effective, diversified strategy that delivers long-term returns. However, he is also concerned about short-term performance, and is unwilling to accept drawdowns in the near term even if these come with the benefit of higher long-term performance. Alternative weighting schemes such as equal risk or economic weighting strategies can provide long term-cumulative performance through implicit exposure to factors and periodic rebalancing; but for an investor who is sensitive about short-term performance, a multi-factor strategy that focuses on factor diversification explicitly will provide a much smoother ride.

As illustrated in the previous Value versus Growth example, investing in single factors can be a challenge, as these can be cyclical in the same way stocks are. The extension of this consideration is that multiple factors should be used simultaneously to mitigate some of this cyclicality. Of course, the key question becomes how best to achieve this.

Fortunately, not only do robust pure factors exhibit relatively low correlations with one another, but their dependency on the economic cycle also varies, all of which support the idea that investors should take advantage of the diversification "free lunch" in factor investing. Multi-factor strategies benefit by ironing out their underlying components' cyclicality and avoiding the worst of their performance set-backs. Therefore, whilst single-factor strategies may exhibit short-lived periods of outperformance, diversification affords multi-factor strategies the stamina to win the performance race in the long term, as illustrated in Exhibit 9.

Exhibit 9: The benefits of diversification: Long-short returns, single factors versus multi-factor



Source: HSBC Global Asset Management as of May 31, 2017. Raw data from Thomson Reuters, MSCI, Worldscope and IBES

How to combine factors?

At this point, a dilemma arises. Should investors blend styles in-house by investing in external single-factor indices according to their preferred ratio, or should they outsource the process by investing directly into a multi-factor product?

Combining factors is not a trivial exercise and will test the sophistication of an investor's internal asset allocation team. Moreover, in-house factor combining commits the fund to a "top-down" approach, i.e. investing in multiple separate single-factor index vehicles. This method provides diversification which can be attractive in its simplicity and may give a false sense of clear performance attribution across the factors, but it is terribly inefficient and has been shown to provide inferior risk-adjusted returns both in theory and in practice. Doubling up holdings of the same stock in the different indices can result in high turnover and in concentrated stock-specific positions. Moreover, inconsistent index construction methods and a lack of focus on factor purity mean that a performance attribution by each individual factor index may not give a representative indication of actual factor returns. If the constituent indices are not pure, each index will contain additional factor exposures which will distort the performance of the other indices.

In recent years, a large number of white papers have been published by various asset management houses demonstrating the virtues of using a "bottom-up" approach. This all-in-one strategy selects stocks according to how well they cater for all targeted factors simultaneously, improving trading efficiency and ensuring sufficient multi-factor exposure through a minimum number of holdings. Ultimately, this implies that the investor must entrust the factor combination and tactical allocations to the fund manager. Whilst this hopefully means that investors are putting these important decisions in capable hands, once again we are reminded of the importance of fiduciary duty and the concerns raised by the principal-agent problem.

> "Combining factors is not a trivial exercise and will test the sophistication of an investor's internal asset allocation team"

[5] Clarke, de Silva, Thorley (2015), "Factor Portfolio and Efficient Factor Investing"

Conclusion: What can investors do?

As we have seen in this paper, index investing is an old idea which has gained newfound popularity as investors have become somewhat disillusioned with active management. The demand for passive investment strategies has been growing, concurrently with a rise in interest in factor investing. The market has responded with a bewildering array of ever more complex index- and factor-based products. Of course, investing using such index-based strategies was never going to allow investors to sidestep their fiduciary responsibilities, and the proliferation of indices has made that point all the more obvious, as selecting the appropriate solution has become ever more difficult.

In the equities arena, investors have three fundamental types of passive/algorithmic investing to choose from, each with a myriad of variations: standard market-cap, alternative weighting schemes, and factor investing. Yet whatever the category, not all products are created equal, and investors must be aware of some key considerations:

- Choosing the right strategy requires due diligence, in particular to ensure the methodology is right for the investor;
- Suitability must be assessed against the investment objectives, risk appetite and investment beliefs.

When it comes to factor investing, the difficulties of selecting are compounded as investors need to choose the appropriate factor or set of factors, the appropriate implementation of each factor and the appropriate methodology for combining factors. We believe this should be an integrated process and investors will generally be best served by selecting one consistent multi-factor strategy instead of mixing a set of single-factor indices.

Finally, it is crucial to select the right provider: one which has established solid, not simplistic, rules and has left room within the strategy for evolution; one which has conducted robust research and development, in particular to limit biases and unwanted exposures; and one that can offer a cost-efficient implementation so as not to lose the benefits of the strategy.

The four examples we have explored in this paper illustrate the opportunities and challenges offered by different systematic products, and highlight the type of questions a prudent investor should ask. Having demonstrated how complex such a selection can be, what do we believe investors can do to navigate this complex environment?

What can investors do?

Highlighting the pitfalls of index investing underlines the original challenge faced, which is that, if on average managers cannot identify stocks that are going to outperform, how might they be able to pick the correct investment strategy? To answer this conundrum, investors can use one of three main approaches.

First, they could simply ignore the problem and select fulfilment based on a single metric of efficiency (e.g. solely tracking error, price, or track record). This is not an approach we would recommend, but it is one we believe is quite prevalent in the market. Whilst we recognise that efficiency is indeed paramount, it should be a subsequent step, only to be taken after confirming the robustness of an investment strategy.

Second, investors could use the services and advice of a consultant to help them determine the optimal strategy to use. Seeking outside advice is a valuable approach although, as everything else, it has certain limitations investors should bear in mind. Research has found, for example, that recommendations are sometimes driven more by non-performance-related elements and that, where performance is assessed, there tends to be a bias towards recommending larger funds (some of which have benefited from the first-mover advantage rather than from any intrinsic qualities).

Consultants' focus on non-performance elements – i.e. process and methodology – is actually of benefit in the factor-based investing space, where the two categories of performance and non-performance are inextricably linked. Indeed, performance will be informed by process and philosophy; there can be space for idiosyncratic factors in a more active fund, but a systematic strategy – if implemented correctly – will be transparent and replicable. As such, performance-related variables can be of value but more scrutiny needs to be added to the non-performance factors. In no space more so than in systematic investing will performance be a derivative of the methodology employed.

However, as discussed in this paper, the principal-agent problem is a reminder for investors to ensure that their advisors truly understand the implications of the methodology behind the index construction, so they do not end up adopting a "set, forget, regret" approach to their factor-based investing.

A further option is to employ an asset manager that is also a systematic strategy provider, and to use them in an advisory capacity. With all the infrastructure required to research and construct indices, attempting to replicate this for due diligence can be a costly and time-consuming exercise. Investors can benefit from leveraging the experience of established managers, by using their insight into the most efficient ways to execute these strategies. Indeed, the asset manager will have had to ask themselves the same key questions when constructing their product; there is little sense in replicating a process that has already been completed.

Finally, investors can choose to use a partner for both advisory and fulfilment. The efficiency derived from this approach can be particularly important, since one of the essential drivers for choosing index-based and/or algorithmic investment strategies is to reduce costs. A manager that manufactures such strategies themselves can indeed be more competitive, as they would be able to avoid unnecessary costs by using in-house strategies more cheaply where appropriate, and third-party strategies where more suitable.

Using a manager for an integrated approach can be especially advantageous in multi-factor equity investing, where the construction of single-factor indices and the way they are combined could mean the difference between consistent outperformance and significant underperformance.

The benefits of such a choice are not confined to internal consistency: the asset manager can be relied on to continuously develop its factor strategies and integration approach, using internal research and advances in the academic world. In contrast, the rules of an index are most often set in stone and can only reflect the state of affairs prevalent on the day they were created. It may once have been the epitome of luxury to travel from London to New York in a propeller plane via Iceland and Newfoundland, but that does not mean it is how people should make that journey today.

7 Jenkinson, Tim and Jones, Howard and Martinez, Jose Vicente, Picking Winners? Investment Consultants' Recommendations of Fund Managers (September 26, 2014). Journal of Finance, Forthcoming.

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Appendix: Factor investing checklist

Are you asking the right questions?

Market cap	Alternative weighting	Single factor indices	Multi factor
Suitability			
Do I believe markets are efficient?	Am I looking for long-term excess returns?	Do I have a core portfolio with a factor exposure I want to correct?	Am I looking for long-term excess returns?
Do I need quick, cheap access to certain markets?	Am I happy to put up with volatility in the short term?		Am I worried by short-term volatility?
Choosing the product			
Are the stock inclusion rules reasonable?	Does the weighting scheme generate statistically significant outperformance?	Does the strategy allocate a sufficient share of its risk budget to the target factor? Or is it contaminated by other sources of risk?	Are the targeted factors robust?
Do all the constituents obey these rules? Or do some pre-date the rules?	How stable are the factor exposures of this weighting scheme?	Is the definition of the factor similar to the definition used to asses my core portfolio exposures? If not my hedge could suffer from basis risk.	Am I satisfied with the definitions of the factors? Or could other definitions prove more successful at harvesting the factor returns?
Do I agree with the index provider's trade-off between maximising coverage and avoiding excessive risk?	How volatile is this weighting scheme?		Are the factors combined in an even or a biased way?
Do I want an index tracker that fully replicates the index, or do I want an optimised replication strategy?	If the constituents are based on a named market cap index, am I happy with the stock inclusion rules for this index?		Does the methodology meet my capacity requirements?
Is the tracking error of the index tracker competitive?			Is there excessive stock-specific concentration?

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