Factor-based investing

One philosophy, several ways to implement

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For Institutional Investor and Financial Advisor Use Only

HSBC Global Asset Management

Introduction

Investors continually struggle with the challenge of how to best add performance to their portfolios and for many years the response has been diversification. At first, the move was to diversify a portfolio across multiple asset classes seeking to increase returns from exposure in equity, fixed income, currency and commodities; as well as potentially more illiquid asset classes, such as infrastructure and real estate. In a second phase, investors took additional steps to diversify across an array of strategies within each of these asset classes, with recent examples being Emerging Market Debt in local currency and Frontier Equity exposure.

However, closer examination of these portfolios, especially during stress periods over the last 20 years, has revealed that this diversification has been as effective as anticipated. Research has discovered that the diverse components of these portfolios actually have greater correlations than expected, despite exposure to a broader number of asset classes and investment strategies.

The cause of the correlation is that many of the strategies inherently sought to take advantage of the same biases or common underlying risk factors. This realisation has led investors to question the building blocks that drive risk and return within an asset class and how these may overlap. This work has led to a far greater focus on the role of factors and factor premia in driving risk and return, as well as closer scrutiny of how such factors can be better employed to add diversification to a portfolio.

What is factor investing?

> ***"Factors are the basic building blocks of asset classes and source of common risk exposures across asset classes. Factors are the systematic (or non-idiosyncratic) units that influence investment return and risk characteristics……In a chemistry analogy: if asset classes are molecules, then factors are atoms." Podkaminer 2013[1]***

Factor investing is an investment technique where investors opt for factor-exposure when building their investment portfolio. Investors need to first identify the factors they want to be exposed to and then second, determine how much they want to allocate to each factor. A factor-based investing approach will look to identify and allocate to factors that are expected to earn a positive return premium over time.

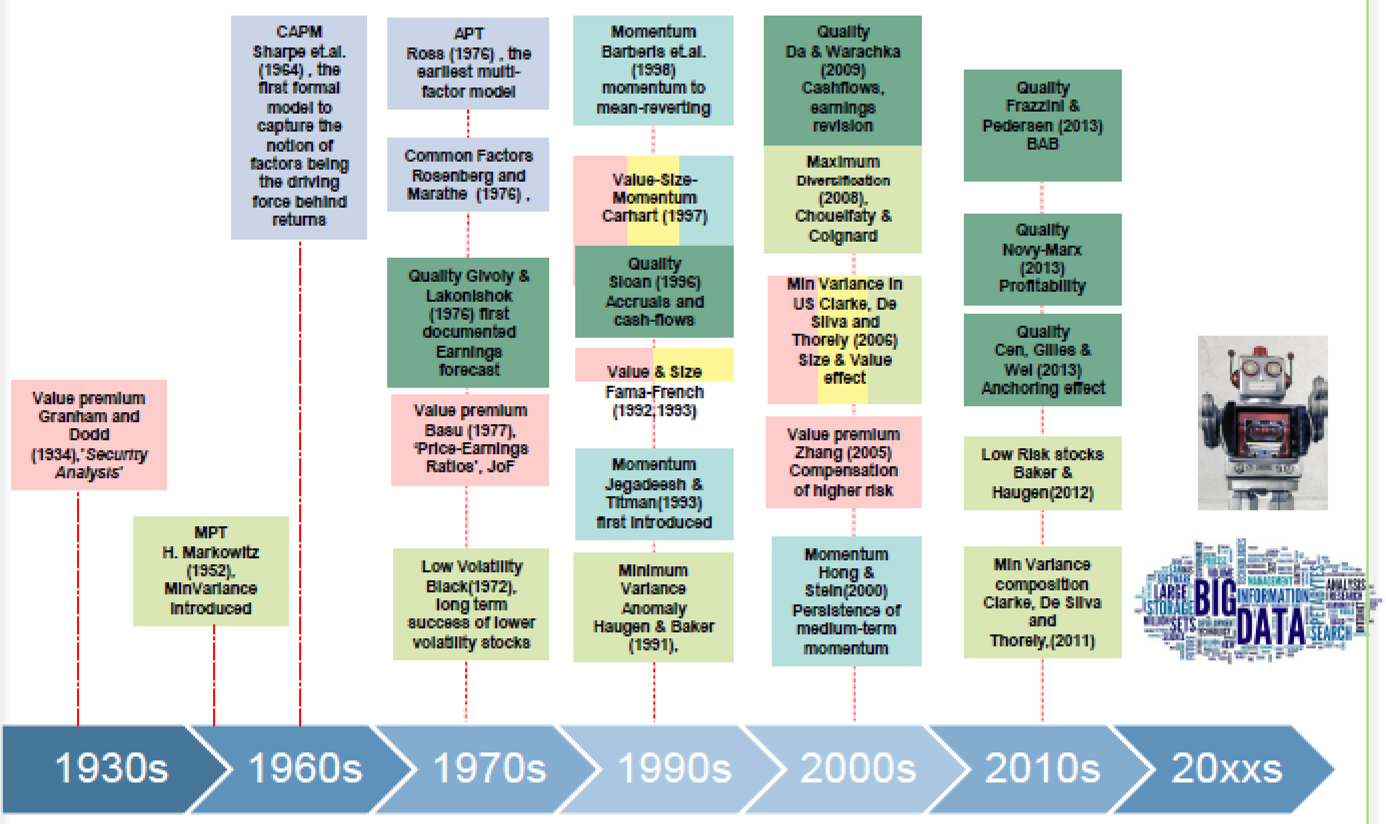
[1]Risk Factors as Building Blocks for Portfolio Diversification: The Chemistry of Asset Allocation" Eugene L Podkaminer, CFA. CFA Institute 2013

The theory and history behind Factor based investing

A wide range of factors have been analysed over the years with academic work surrounding factors now traced back as far as 70-80 years. Graham and Dodd's work on 'Value investing' in the 1930s provides a clear example of a factor that has been followed by investors for decades.

If we think of a "factor" offering exposure to systematic sources of risk and earning a return or premium for bearing this, it is not surprising that a variety of "factor premias" have developed over time that academia has sought to identify, define and quantify.

In the table below we can see the evolution of thoughts around the concepts we can clearly define as risk premia – value, size, momentum as examples. However what also becomes evident is that investment and portfolio construction techniques have also become more widely associated with the factor story. For example, portfolio construction techniques, such as maximum diversification and minimum variance, enable an investor to target an advantageous point on an efficient frontier and potentially outperform the market cap index, but this does not mean they have a risk premia associated to them. However, over time, they have become part of the 'factor investing lexicon'.



Source: Evolution of factor theory – HSBC Global Asset Management 2016

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The rise of ‘smart beta’ solutions

At the heart of a strategic asset allocation (SAA) lies the objective to access a series of traditional beta’s – fixed income and equity being the most common. Many of these assets have become clearly defined around benchmarks and are readily adopted either as an index allocation or as a benchmark allocation (ie JP Morgan World Government bond index, S&P 500, the S&P Goldman Sachs Commodity Index).

With the initial rise of ‘smart beta’ solutions, investors gained access to alternative indices, most often designed to structurally capture exposure to a specific style that could potentially add performance over time. For equity, this was in the form of small cap and value stocks, whereas fixed income took a different route and diversified into Emerging Bonds (local and hard currency), as well as other extended credit markets.

What makes a factor?

A key starting point in addressing factor investing is to understand what determines a factor. According to research by Ang et al (2009)[1] and Ang (2013)[1], a factor is determined by having 4 attributes:

1) Strong academic and practitioner research
2) Exhibits significant premiums, which are persistent
3) Availability of historical returns, especially during periods of negative or volatile returns
4) Can be implemented with liquid, tradable instruments

These attributes described above can be used as a framework for investors considering single or multi-asset investment solutions. It is, however, evident that not all allocations fit into a convenient definition of a ‘risk premia’, however each will have attributes that will likely reward the investor for the exposure in the portfolio. **Illiquidity** for example may not be termed a risk premium but returns from investments in infrastructure, private equity and commercial property have all become mainstays of many allocations. As such, the label of alternative risk premia suggest investors can benefit from an ‘illiquidity premium or factor’.

In the same way, it can be argued that **currency** is not an asset class, as it has no attributable risk premium. However, the structural inefficiency of the currency market enables approaches around valuation, momentum and carry to successfully add returns over time – though these can be highly volatile.

Within **a multi-asset context** it’s clear that an investor may benefit from blending exposure to risk premia such as value or momentum alongside risk factors such as minimum variance portfolio construction. As such, targeting an asset class allocation does not necessarily mean settling for traditional performance over time.

Factor exposure via indices?

Over the past 10 years, several thousand indices have been created that aim to deliver ‘factor exposure’ suggesting that there are many influences that are being called ‘factors’.

When applying the framework previously, we highlight that:

1) Many of the “new factors” available to investors lack the history or justification to be considered a new premia; as such, they may be little more than ‘product ideas or index strategies’
2) A large number of factors proposed may, in fact, simply be sub-definitions of an existing factor (ie value, quality or momentum)

If factors form the DNA of a portfolio, why did we take so long (2010) to start using them?

The answer is not clear-cut.

1) Investors have in fact taken on factor exposure throughout the years but the exposure has been implemented using the risk budget of an active strategy.
   - Example: an investor blends active “global small cap value” with “large cap global growth” and achieves factor exposure (ie size, value) as part of their active manager risk budget.
2) In the 1990s and 2000s, “style analysis” became popular and was used to identify and measure factor exposure in a portfolio. However, factors and styles became bundled into the overall ‘alpha’ delivered by the active manager.
   - The crucial adjustment (in the 2000s) has been a move to more granular understanding of portfolio risk and return, and the necessity to unbundle stock selection skill from factor exposure. Factor exposure can then be harnessed more directly within a portfolio.

[1]Evaluation of Active Management of the Norwegian Government Pension Fund – Global, December 14, 2009. https://www0.gsb.columbia.edu/faculty/aang/papers/report%20Norway.pdf
[2]Fracotr Investing, June 10, 2013
https://poseidon01.ssrn.com/delivery.php?ID=926110097116068010114101115093024092029042041058054022096075004072105099108071091081035042057063112008038072089029121028097111031044060037085078094127122001097037044085099068027095028079125000127023066067064099100067091090064125123082073020081069&EXT=pdf

The risk factor dimension

At a **single asset class** level, investors may well look at the wider array of factors available to best exploit and benefit from all available premia. Within a **fixed income** portfolio, portfolios are managed with focus on duration, curve, credit and instrument type, all of which could be considered “factors” that will contribute to performance.

When investors allocate to **equities**, they are typically looking to capture the risk premium associated with making a move away from cash and bonds. In academia, this is also referred to as the ‘market’ factor and will often lead to a “benchmarking” of a factor portfolio to an equity index (ie MSCI world for global developed market equities). When an equity factor strategy is implemented to add excess returns via exposure to factor premia (value, size, momentum, low beta/volatility or quality) it creates, in effect, “tilts” around the core ‘market’ exposure.

The same premise may equally be used for constructing an **absolute return** strategy, which is in effect optimising across the factors and removing the restrictions inherent in an equity or fixed income benchmark. This could be helpful to an investor who has a specific alternative allocation “bucket” in their portfolio, which is not guided by a single asset class benchmark. It would also work highly effectively where the investor has constructed an overall strategic asset return benchmark and thinks in terms of risk allocation, as well as those who are looking for a new return pattern such as an inflation benchmark (ie CPI @ +4%).

We highlight that research produced by Bender et al (2010)[1] addresses factor premia and demonstrates that, historically, factor-based investing has improved risk-adjusted returns when combined with a range of diverse portfolios.

[1]Bender et al (2010) Portfolio of Risk Premia: A new approach to diversification. The Journal of Portfolio Management.

Factors used for single asset classes and multi-asset portfolios may differ

The inherent flexibility of factors implies that they can be used in both single asset class or multiple asset class portfolios. It should be noted that factors used for a single asset class may differ than that of a multi-asset portfolio. The best example is “size” that clearly works for equity but is not suitable for bonds or currency.

Risk factor mapping: economic growth, inflation, liquidity and tail risk

The table below illustrates how factors has been categorized and adopted by many asset owners. The table has been simplified as a two-dimensional analysis as it only considers asset classes and "risk factor strategies" (what has been selected to be used as the alternative risk premium).

Factor	Equity	Rates	Credit	Currencies	Commodities
Market	✓	✓	✓	✓	✓
Carry	✓	✓	✓	✓	✓
Liquidity	✓	✓	✓	✓	✓
Momentum	✓	✓	✓	✓	✓
Reversal	✓	✓		✓	✓
Value	✓	✓	✓	✓	✓
Volatility	✓	✓	✓	✓	✓
Event	✓				
Growth	✓				
Low Volatility	✓				
Quality	✓				
Size	✓				

Source: HSBC Global Asset Management and the paper "A Primer on Alternative Risk Premia" by R. Hamdan, F. Pavlowsky and T. Roncalli, April 2016. http://www.thierry-roncalli.com/download/Alternative_Risk_Premia.pdf?bcsi_scan_3e0b3f92fa3efdb7=cO+/Hy1NdzNBRY6EXWtKtJYDtxcCAAAAZPyrAg==&bcsi_scan_filename=Alternative_Risk_Premia.pdf

Five equity factors in more detail:

Key factors	Risk rationale	Behavioural rationale	Assessment criteria examples
Momentum	Changing expectations	Under-reaction to new information	12-month share price change
Value	Uncertainty over future business prospects	Fear, loss aversion	Book-to-price Earnings-to-price
Low Volatility	Leverage constraints favour high-beta stocks	Investors prefer big winners or "lottery" stocks	Return volatility (standard deviation) Beta
Quality	Potential for competitive advantage to be eroded	Loss aversion	Return on Equity Return on Capital Employed
Small Size	Illiquidity	Inefficient information	Market capitalization

Portfolio construction techniques

When building factor portfolios, solutions will be implemented differently and can depend on:

(1) Whether it is a single asset class or multi-asset portfolio

(2) Investor objectives

To optimise an investment in a single factor or a multi factor portfolio, and avoid exposure to the systemic risk of the underlying asset class(es), a **long short approach** is the preferred option. That said, many investors choose, for certain asset classes, to use factor exposure as an 'alpha source' and thus constrain the asset manager to providing an index plus return objective. In this scenario, the investor will gain the benefit of the market premium over time but, at the same time, the factor exposure becomes the highest driver of risk for the portfolio.

Instrument use:

For **single asset classes**, market practice is to hold stock or bonds directly (screened to meet the chosen factors). The number of factors will determine the number of screens. The outcome is a basket of stocks or bonds which demonstrate all the identified characteristics.

It should be noted that a single security may have exposure to multiple factors at any given time. This means that care needs to be taken when multiple factors are combined into one portfolio. At present, with the rapid growth in the number of indices/strategies in the market, one of the key investor concerns is that some of these products may exhibit 'unintended biases'.

Multi-asset portfolios tend to use derivatives, especially if the managers are looking to implement the factors across all the asset classes. Portfolio may also be implemented with a combination of direct securities and derivatives.

Weighting of holdings:

Managers use a variety of weighting techniques, ranging from traditional tracking error to risk parity. The technique selected will depend on the context of the overall investment solution. For investors looking to add factor investing to a long only portfolio, tracking error against a benchmark is often used. Others looking to allocate risk in a band, approaches such as equal weighting, portfolio tilting and risk parity are all well developed approaches.

Long only or long/short:

If a principle consideration of the portfolio is low correlation to an index, then implementation via long/short is the most effective method to achieve this aim. Long/short positioning can be implemented in both single asset classes as well as multi-asset class portfolios. It should be noted that if the factor portfolio is designed to sit alongside other long only portfolios, a long/short approach may not be appropriate.

HSBC Global Asset Management provides factor-based investment solutions

Single Asset class beta

Clients come to us for **equity** investment solutions that aim to fulfil their equity beta allocation whilst harnessing factor premiums to improve performance.

We have been managing **equity factor products** since the early 2000's and since this time, we have remained committed to designing and up scaling our solutions for clients. Our proprietary research has led us to concentrate our efforts on five factors* (size, value, momentum, quality and low risk/volatility). Here, we propose to clients single customized factors and multi-factor portfolios. Clients can also 'tilt' their selected factor approach in tandem with an ESG (Environmental Social and Governance) approach which can allow the portfolio to reduce its carbon footprint. Our equity factor approach is built within a robust investment process and is supported by our well-resourced and highly experienced research and investment team.

Multi-Asset Factor long/short

Our experience in managing multi-asset long/short strategies also dates back to the early 2000's. Our flagship strategy is well suited for clients with an objective to achieve absolute return objectives. This strategy is exposed to 3 style factors: carry, momentum and value; each style factor is invested across equity, bond and currency markets and are also invested by taking long and short positions, hence the strategy has no structural exposure to any asset class. The strategy is implemented using highly liquid derivatives only, thus the portfolio offers a matching daily liquidity. It also has the benefit of an easy look through in a Solvency II context.

Conclusion

Factor investing is an investment approach which can be used for single asset class or multiple asset portfolios. The variety of portfolio construction techniques allows investors to choose different outcomes, which will lead directly to different portfolio characteristics.

At HSBC Global Asset Management we propose factor investing along side our other strategies available in each asset class or in multi-asset.

Different factor based approaches are complementary to each other and investors can combine strategies to accommodate different needs.

* Different definitions exist for factors. For example, HSBC Global Asset Management's definition of "value" may differ from the definition of another provider.

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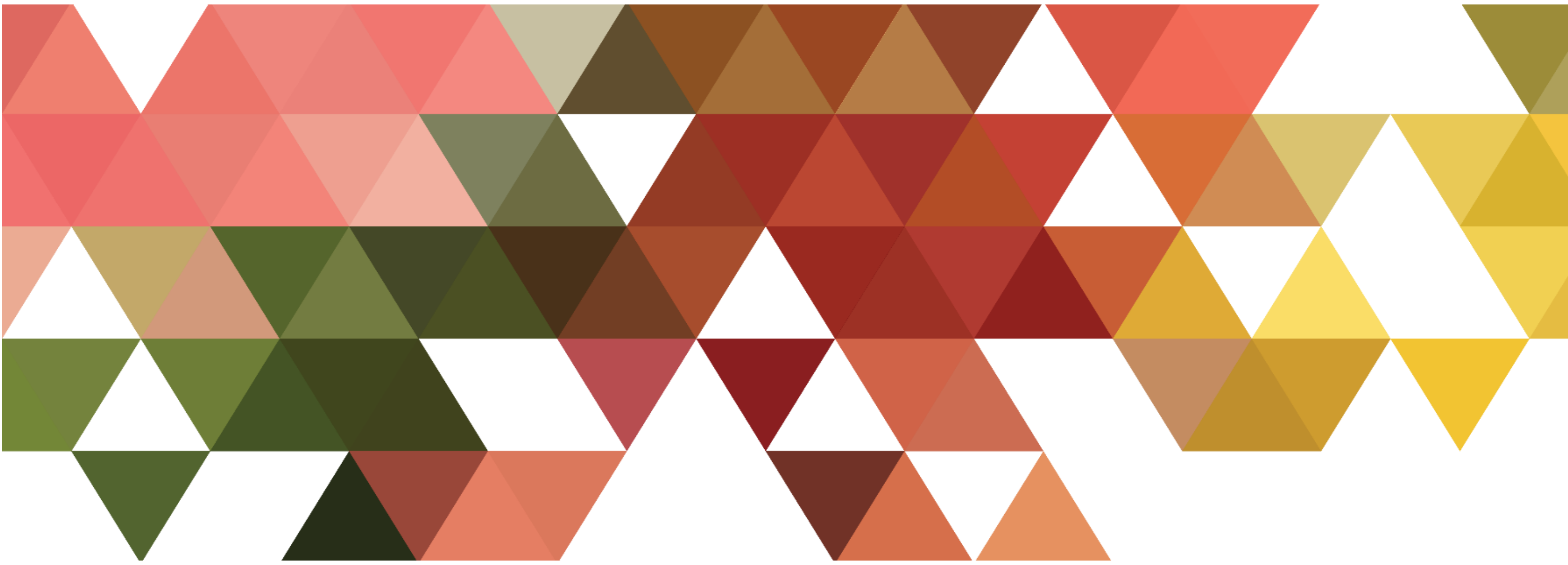

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