REPRINTED FROM
Risk
December 2016

Ten commandments for alternative premia investing

Luc Dumontier sets out ten commandments for investors looking to construct a robust premia portfolio with stable performance

1 Go beyond the academic

Most factor investing strategies – whether long-only ('smart beta') or long/short ('alternative premia'[1]) – are based on academic factors and seek to capture standard investment styles, including value, carry, momentum, low risk and so on, within traditional asset classes. The rush into factor investing strategies raises legitimate concerns that these common premia may become overvalued, and thereby structurally compressed and overcrowded, magnifying dislocation episodes such as 2007's quant crisis[2].

The best way to mitigate this risk is to broaden the scope of alternative premia.

The academic approach can be extended to other asset classes such as commodities (Dumontier and Garchery, 2015), corporate bonds (Houweling and van Zundert, 2014) and implied assets. The best-known example of the latter is the 'volatility premium', which seeks to monetise the spread between implied and realised volatility of a given asset. Strategies with different investment horizons to those of 'low-frequency' academic premia bring further diversification; for example, a 'pair trading' bet on the convergence between two historically correlated securities, typically over a period not exceeding a week.

Insurance-linked securities also offer interesting potential for alternative premia strategies. Indeed, insurance and reinsurance companies take on the role of the policyholder by assigning (life and non-life) risks to investors and paying them premiums. Finally, certain arbitrage strategies exploit pricing inefficiencies in the cash (or spot) and futures markets for the same asset, often due to the inability of market participants to hold the underlying asset.

2 Do not invent factors

The factor investing buzz has spurred a hunt for new strategies in a quest for diversification. And he who seeks shall find. Harvey, Liu and Zhu (2015) observed a strong increase in factor 'discoveries' since the seminal work of Sharpe on market beta in the 1960s (see figure 1). While the rate of factor discoveries was one per year on average in the 1980s, it increased to five in the 1990s and to almost 20 in the 2000s. To use the expression coined by Cochrane, the factor "zoo" now has several hundred factors.

Expertise in economics and/or statistics is not required to infer that most of these factors represent, at best, another expression of an existing factor (and is therefore likely to deliver correlated returns). At worst, they are unintelligible and probably unrepeatable; that is, unlikely to deliver returns over time. The onward rush of 'discoveries' is especially dangerous as the calibration error of a portfolio's volatility increases with the number of factors it includes, and soars if these factors – which are expected to be uncorrelated – re-correlate strongly[2]. To avoid inventing factors, each must fulfil the strict qualification criteria below.

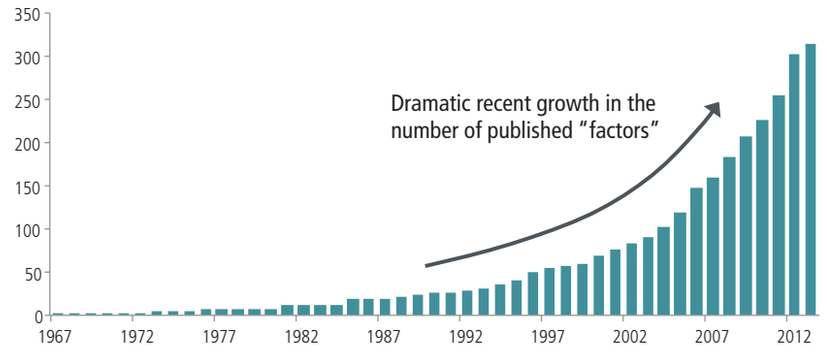
3 Understand the underlying rationale

As per Warren Buffet, we should only invest in what we understand. What is true for stocks is even more so for alternative premia. Understanding the rationale underpinning each factor helps to ensure that: (i) they will persist so that each factor will continue to pay a premium, and (ii) they are different from one another so that factors will deliver uncorrelated premia[2]. Alternative premia should only be retained if they either remunerate exposure to an additional risk factor that cannot be diversified away ('risk premia') or stem from biases linked to market participants' behaviour, investment constraints and structural flows ('style premia').

Thus selected, premia strategies are likely to persist. Rational investors will always require a return to take on additional risk. In the equity value strategy, for example, investors hold stocks with attractive valuations but which are, correspondingly, vulnerable to the 'value trap' phenomenon. Investors are paid a premium to assume this risk which could materialise if reasons for these low valuation multiples intensify. Similarly, behavioural biases are so strongly ingrained that it will always prove difficult for rational investors to arbitrage them completely. For example, investors tend to overreact in the short term to new information (eg, earnings publication). Mean-reverting strategies capitalise on this by buying past losers and selling past winners (using a lookback period of few days) to bet on the convergence in their short-term returns. Finally, regulation such as the Basel Accord for banks and Solvency Directive for insurance companies should generate more opportunities for non-constrained investors; for example, cash-and-carry arbitrage strategies.

Image: Shutterstock

1. The factor zoo



Source: Harvey, Liu and Zhu (see references)

4 Avoid data mining or over-fitting

While it is said that 'promises only bind those who believe in them', investors are often willing to trust simulations of factor-based strategies, assuming they are built using simple criteria supported by academic research. Nevertheless, Suhonen, Lennkh and Perez (2016) show alternative beta strategies are far from immune to simulation biases. This comprehensive study analysed a wide range of rules-based strategies offered by investment banks, and found a median 73% deterioration in Sharpe ratios between back-tested and live performance periods (see figure 2). Interestingly, the fall-off in risk-adjusted performance was even greater for complex strategies with numerous rules and filters.

Recent research papers identify other common biases and help to separate the robust factors from the lucky factors. Harvey and Liu (2014) propose methods to account for multiple testing. Bailey and de Prado (2012) define the minimum track record needed for statistical significance. Amenc et al (2015) discuss the relative robustness or ability of a strategy to offer similar performance in similar market conditions. Investors should stick to strategies that resist parameter changes well, including the number of assets selected or the frequency of rebalancing (see figure 3).

5 Control exposure to underlying asset classes

It seems universally acknowledged that long/short portfolios that capture standard equity premia must be market (beta) neutral to preserve their diversification power, but little emphasis is placed on the importance of market neutrality for other asset classes.

For example, a carry premia strategy on foreign exchange is often implemented through a portfolio that is long the three highest-yielding currencies and short the three lowest yielding. The result is returns that are highly correlated with risky assets[2]. Similarly, a government bond portfolio that is long US and short Japanese bonds with the same duration displays positive overall market exposure, as US beta is far higher than that of Japan. Finally, a gold versus oil position is probably not 'commodity neutral'[3].

Investors should use principal component analysis (PCA) to control the biases to the underlying asset classes[3]. For example, developed market currencies (versus the US dollar) have common exposure to two factors that are robust over time (see figure 4). The 'US dollar factor' (x-axis) represents the co-movement of all currencies versus the US dollar. The 'bloc factor' (y-axis) represents the fact that dollar bloc commodity currencies on the one hand and European currencies on the other tend to display even stronger co-movements. According to this analysis, alternative premia should comprise positions such as 'AUD vs NZD' or 'SEK vs NOK' to be 'market neutral'. While the expected Sharpe ratios of these pairs is lower than the traditional forex '3 vs 3' carry trade, this is compensated for by low and stable correlation[2].

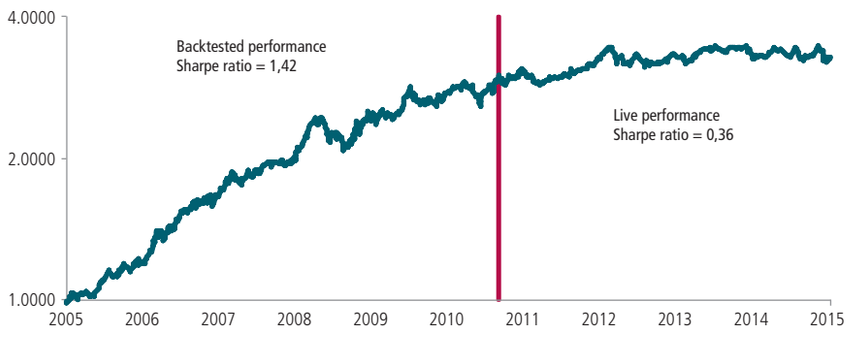
6 Control exposure to other alternative premia in the portfolio

Even if biases versus main asset classes are controlled upstream (fifth commandment), premia may still be correlated – positively or negatively, structurally or cyclically. One topical bias is how expensive the low-risk equity premium is now, in terms of valuation multiples (eg, price-earnings and price-to-book ratios). This is often attributed to the popularity of this strategy and translates into cyclical negative exposure to the 'value vs growth' premium. The low-risk premium is also structurally negatively correlated to the 'small minus big' premium. Specifically, stocks of big companies – on average well diversified, both geographically and in terms of business mix – tend to be less volatile than the stocks of small companies.

The allocation process between premia (ninth commandment) can address this re-correlation risk. However, for the sake of parsimony and readability, we encourage a 'double-sorting' approach to build the purest possible premia strategy. As an illustration (see figure 5), the main biases of the low-risk premium can be minimised by: (i) removing from the investment universe the most expensive and cheapest stocks, and (ii) building several low-risk portfolios within each of the major capitalisation tranches (eg, big, medium and small).

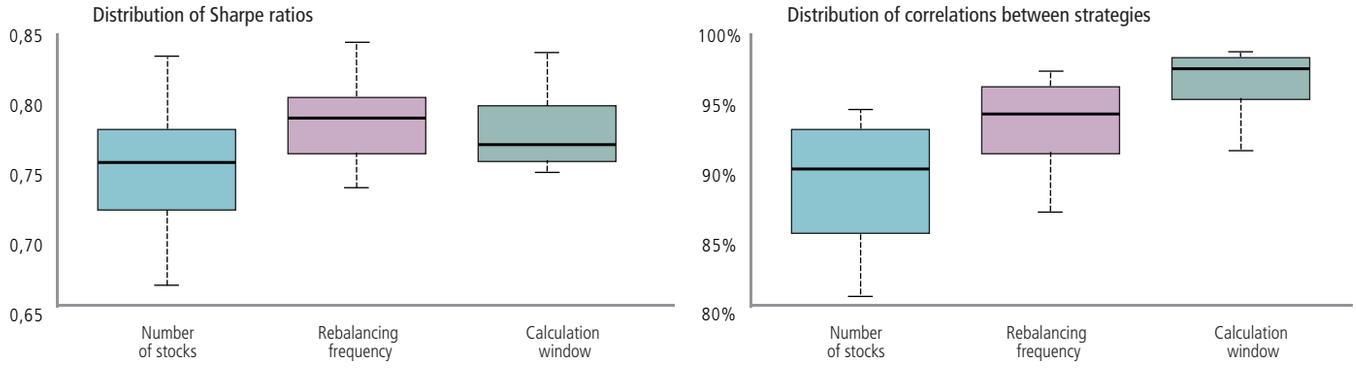
2. Illustration of strategy performance

Backtest versus live sample (log scale)



Source: Suhonen, Lennkh and Perez (see references)

3. Ensuring the robustness of the equity low risk premia strategy



Source: La Française Investment Solutions

7 Minimise idiosyncratic risks

A major event in premia investing was the strong appreciation of the Swiss franc after the Swiss National Bank's decision to de-peg it from the euro in early 2015, and the subsequent simultaneous plunge of common forex academic premia[2]. Few realise events of this magnitude occur on a daily basis in equity markets; for example, following the news of a takeover bid or a profit warning. The equity universe being much larger than that of factors, equity portfolios are usually well diversified and less sensitive to strong idiosyncratic movements. The Swiss franc example serves as a useful reminder that a portfolio of alternative premia is, above all, a collection of individual positions and must be managed accordingly.

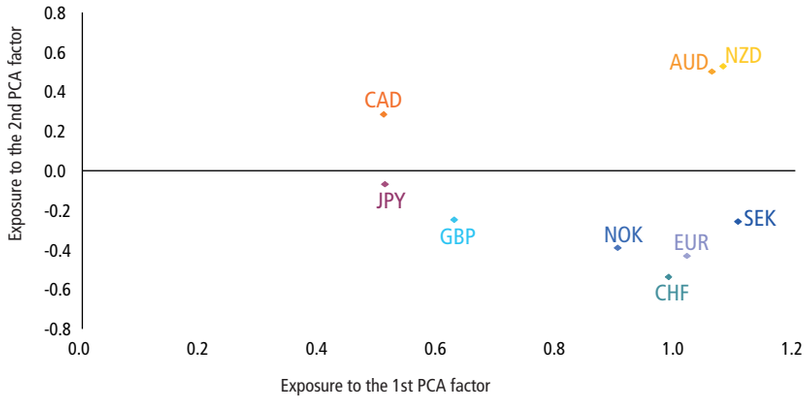
One approach is to underweight alternative premia based on asset classes where the investment universe is smaller. A better option would be to set ad hoc constraints in nominal terms to force the containment of idiosyncratic risks and expand the investment universe to the highest possible number of assets. As an example, many investment solutions implement premia in the government bonds space using only the four to five liquid 10-year futures. By using swaps, it is possible to more than double the number of underlying countries to which the strategy has exposure.

8 Monitor correlations in specific situations

Controlling historical correlation between premia (fifth and sixth commandments) and aggregate exposure to single assets (seventh commandment) does not mitigate concentration risk in full. For example, a portfolio with juxtaposed standard academic premia would have progressively carried significant 'commodity risk' in 2015: short commodity-related stocks (low risk and momentum premia), short high-yielding commodity currencies (momentum premium) and short energy commodities[3] (carry and momentum premia). If this risk is not addressed, the performance of the overall portfolio depends only on developments around this specific thematic – a significant departure from the diversification promised by 'factor investing'.

To gauge instantaneous correlation between premia, we suggest retropolating returns with current positions; that is, without any historical rebalancing. Simultaneous movements of these series, as well as the performance of the overall portfolio, particularly in response to: (i) periods of financial crisis (eg, Lehman bankruptcy), (ii) specific macroeconomic developments, (iii) strong movements in asset classes, and even (iv) customised scenarios are very useful for assessing concentration risk. The final step is to implement stop-loss policies. For example, if the current portfolio were likely to lose more than 5% in any considered scenario, a portion of the actual positions could be cut.

4. Principal component analysis (PCA) among G10 currencies

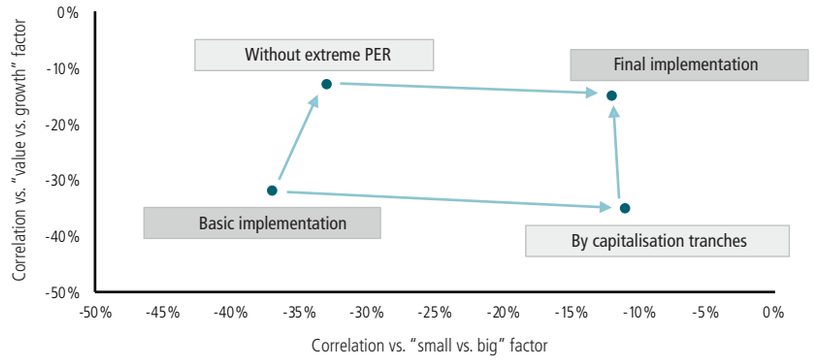


Source: La Française Investment Solutions

9 Beware of the temptation to time factors

According to Rob Arnott, founder and chairman of Research Affiliates, a Pimco subadvisor, many versions of smart beta equity products (eg, low volatility) became victims of their own popularity and grew increasingly expensive in terms of valuation multiples. This raised the question of whether factor timing can add value. In the other camp, Cliff Asness, co-founder of AQR Capital Management,

5. Orthogonalisation of the equity low risk premia strategy



Source: La Française Investment Solutions

found that timing strategies using the simple 'value' of the factors themselves did not deliver convincing results. The author's research supports the AQR view. This is unsurprising if we take a step back. If it is complicated to predict how equity markets will evolve, why should it be easier for alternative factors?

Furthermore, it is important to keep in mind that if a specific factor is excluded while maintaining the same target return for the portfolio, the remaining factors have to deliver individually higher Sharpe ratios to compensate for the resulting diversification shortfall. Removing one factor from an equally risk-weighted portfolio of five independent factors[4] would require the four remaining factors to each deliver a 20% higher Sharpe ratio to generate the same overall return – that seems unlikely. A more credible way of enhancing returns is to add new factors (first commandment), provided they comply with the selection criteria outlined above.

10 Invest in people and infrastructure

Compliance with the first nine commandments requires an investment team able to deploy experience and techniques from across the finance industry, including quantitative asset management and investment banking. A robust investment infrastructure is also necessary.

The investment team must be capable of identifying opportunities, as well as designing, implementing and managing a wide range of alternative premia, from academic to investment-banking strategies (first commandment). While different in nature, each strategy must respect the same set of selection criteria (second, third and fourth commandments) to maintain the coherence of the whole. They must also be built and combined to maximise diversification (fifth and sixth commandments), whatever the market context (eight commandment), while minimising specific risks (seventh commandment).

Efficient implementation is also important. Academic premia are mostly implemented using plain vanilla instruments. Here, every basis point counts and the ability to pre-negotiate the lowest possible transaction costs can have a significant impact. For premia implemented using derivatives instruments, dealing arrangements with the maximum number of counterparties is a determinant of success. Indeed, most of these investment strategies are only visible to investors whose scope of counterparty relationships allows them to see opportunities, such as a bank needing to recycle a given risk.

When solicited on the subject of smart beta and, by extension, alternative premia strategies, Markowitz is said to have compared this investment framework to so-called all-natural food at a grocery store. Many products may bear the 'smart beta' label; however, not all are necessarily all natural or even good for you. Each alternative premia strategy must be evaluated individually on its merits. ■

Luc Dumontier is head of factor investing and senior portfolio manager at La Française Investment Solutions in Paris.

1. Alternatively, 'risk premia', 'style premia', 'style factors', 'risk factors', 'factor premiums', etc.
2. See 'Why re-correlation matters in alternative premia investing' by Dumontier, published on Risk.net, October 2016 www.risk.net/2473808.
3. See 'Commodity premia – It's all about risk control' by Dumontier and Garchery, published on Risk.net, December 2015 www.risk.net/ 2437558
4. About the number of independent factors that can be captured from the set of traditional academic premia.

REFERENCES

Amenc N, F Golts, S Sivasubramanian and A Lodh, 2015
Robustness of Smart Beta Strategies
Journal of Index Investing, Vol. 6, No.1, Summer 2015, pp. 17–38

Arnott R, V Kalesnik, J West and N Beck, 2016
How can "Smart Beta" Go Horribly Wrong?
Research Affiliates

Asness C, 2016
The Siren Song of Factor Timing
Journal of Portfolio Management, Vol. Special Issue, No.1, 2016

Bailey D and M L de Prado, 2012
The Sharpe Ratio Efficient Frontier
Journal of Risk, Vol. 15, No. 2, Winter 2012/13

Bailey D, J Borwein, M L de Prado and Q J Zhu, 2014
Pseudo-Mathematics and Financial Charlatanism: The Effects of Backtest Overfitting on Out-of-Sample Performance
Notices of the American Mathematical Society, 61(5), May 2014, pp. 458–471

Cochrane J, 2011
Presidential Address: Discount Rates
The Journal of Finance, Vol. LXVI, No.4, August 2011

Dumontier L, 2016
Why Re-Correlation Matters in Alternative Premia Investing
Published on Risk.net, October 2016

Dumontier L and G Garchery, 2015
Commodity Premia: It's All About Risk Control
Published on Risk.net, December 2015

Harvey C, Y Liu and H Zhu, 2013
… and the Cross-Section of Expected Returns
Review of Financial Studies, January 2016, pp. 5–68

Harvey C and Y Liu, 2014
Lucky Factors
Working Paper, Available at SSRN

Houweling P and J van Zundert, 2014
Factor Investing in the Corporate Bond Market
Forthcoming: Financial Analysts Journal, Available at SSRN

Suhonen A, M Lennkh and F Perez, 2016
Quantifying Backtest Overfitting in Alternative Beta Strategies
Working paper, Available at SSRN