

AGF INSIGHTS

When Algorithms Lose Their Rhythm

**How quantitative approaches to multi-factor investing can
benefit from adjustments driven by the human element.**

Mark Stacey, MBA, CFA

SVP, Co-Chief Investment Officer, Highstreet,*
and Head of AGFiQ Portfolio Management

Quantitative investors put a great deal of emphasis on the mathematical models they use to construct factor-based portfolios. And why not? Multi-factor approaches to investing have proven their worth over many years and can often lead to greater diversification and better risk-adjusted returns when done well.

But sometimes the math doesn't add up to these desired outcomes and even the most robust models can be wrong—or only partly right—leading to periods of underperformance.

When that happens, as it has for much of this year, some of the most important decisions that a quant can make are those intended to improve the efficacy of the model going forward as well as those that fall outside the predetermined rules and constraints that govern it.

This isn't about undertaking a complete reboot or going "off-model." Rather, it's making sure there is enough flexibility in the approach to adapt to shifts in market conditions that may arise over time.

In the case of a multi-factor model, this includes the continuous process of monitoring and testing all existing and potential sub-factors that can systematically determine a security's exposure to one or more factors. For value, as an example, the applicable sub-factors might range from price to sales to price-to-book or dozens of valuation metrics depending on the sophistication of the model.

Whatever the chosen mix, it's important that these sub-factors remain relevant and continue to interact and are correlated to the rest of the sub-factors in a way that is additive. If not, and their efficacy wanes, it may be necessary to de-emphasize their importance in the model.

At the same time, it may be the case that a metric or ratio not part of the existing mix of sub-factor becomes more relevant and after extensive evaluation is added to the model.

Beyond efforts like this to fine-tune a particular model, it's equally important to understand its inherent limitations and mitigate any potential risks through further adjustments that fall to human judgement as much as computer algorithms.

Over the past year, for instance, it has become evident that factor performance can vary greatly from the historical averages that help inform optimal portfolio exposures in a multi-factor model. These deviations can be tracked by a number of tools and signals including valuation spreads that show how expensive stocks are within and across factors as well as the return spread between the winners and losers within a certain factor.

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While it's understood that factors eventually revert to their mean, it is almost impossible to pinpoint exact inflection points and determine when an outperforming (or underperforming) factor will normalize. Is it going to be after a two standard deviation move? Or after a three or four standard deviation move? There is no real way of knowing.

As such, pure quants who solely rely on their models, may be more susceptible than those less reliant to being overly exposed to underperforming factors that do not revert as expected and continue to underperform and, vice versa, trimming too much exposure to outperforming stocks that continue to outperform instead of reverting to the mean.

That's not to say those who complement their models with a level of human decision-making are any better at factor timing. The idea that one factor can be turned off completely in favour of another can seriously hinder diversification and increase risk in a multi-factor approach.

What it does do, however, is allow for a more nuanced tilting of factor exposures that might otherwise be difficult to achieve. Such tilts can be tactical in nature, while still being a part of the portfolio rebalancing that

is generally designed to bring exposure back in line with pre-determined allocations. More specifically, the main purpose of factor tilting a portfolio is to take some advantage of the dislocations in the market, but not be overly aggressive as to add significant risk to the portfolio.

Ultimately, quantitative approaches to investing may benefit from diligent upkeep of the models being utilized as well as adjustments driven by human decision-making. As much as being a quant is about the science behind it, there is an art to it as well.

Mark Stacey is Senior Vice-President, Co-CIO, Highstreet Asset Management Inc. and AGFiQ's Head of Portfolio Management. He is a regular contributor to AGF Insights.



Mark Stacey, MBA, CFA
SVP, Co-Chief Investment Officer, Highstreet,*
and Head of AGFiQ Portfolio Management

Mark joined Highstreet Asset Management Inc. (Highstreet) in 2011 and today leads the firm's investment management functions. He is also responsible for portfolio management of the Highstreet Canadian small cap and Canadian equity mandates. Mark has 14 years of investment experience applying quantitative and qualitative management techniques to the portfolio management process.

Prior to joining Highstreet, Mark was Vice-President, Equities at London Capital Management for six years where he managed a variety of core, value and growth-oriented Canadian and U.S. portfolios.

Mark has a Masters of Industrial Relations from the University of Toronto and an MBA from the Richard Ivey School of Business, University of Western Ontario. He is a CFA® charterholder.

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