

How to build a customized portfolio using factors

By Bill DeRoche and Grant Wang

Factor-driven quantitative investing is gaining popularity for its potential to outperform broad-based equity markets in a cost effective manner relative to traditional active management. But the benefit of a systematic rules-based approach also lies in its ability to tailor factors and create customized solutions that satisfy unique investment objectives and risk tolerances.

This is particularly true for small to medium-sized institutions who seek very specific market exposures and risk constraints and yet continue to own off-the-shelf investments because they lack the necessary scale and in-house expertise required to design and manage a made-to-order strategy on their own.

Step 1: Identify the Need

The starting point for any type of customization is to identify the problem that needs to be solved. For some, the goal might be to find a better way to seek income with reduced correlations to both equity and fixed income markets. For others, it could be protecting against future inflation or providing a smoother ride during market downturns.

Step 2: Define the Universe

Once an overarching objective has been set, the next step is to define the desired market universe and corresponding index needed for benchmarking purposes. The Russell 1000, for instance, may be a good choice for gaining broad exposure to the largest companies in the U.S. equity market, while the MSCI All-Country World Equity Index could be used for global mandates that want to invest in both developed and developing markets.

These aren't the only options, of course. An experienced "quant" can work with a wide array of universes and potential benchmarks to develop solutions that reflect particular investment requirements such as eliminating securities based on ethical concerns.

Step 3: Factor Selection

From here, decisions need to be made about what factors are going to be used and the financial data that will define them. Typically, this involves choosing a combination of valuation, momentum, capitalization, quality and low volatility factors, but may include additional factors such as dividend growth, equity buybacks, and environmental, social and governance (ESG). In many instances, these factors will be created from a blend of sub factors, of

which, definitions need to be determined. For example, will quality be measured by return on equity, gross profit margin or both? Will value be measured by price-to-equity, price-to-book, EV/ EBITDA or all of these sub-factors?

Once this determination is made, all of the raw data needs to be compared on an apples-to-apples basis in order for it to be meaningful from a portfolio construction standpoint. This is commonly done by calculating standardized z-scores that convert all indicators to a common scale.

Step 4: Set up additional parameters

One of the potential advantages of a tailored solution over an off-the-shelf product is the allowance for certain controls and constraints in the portfolio construction phase of the process. Often, this involves the inclusion

of a desired tracking error relative to the assigned benchmark. Additionally, it's important to identify the sources of tracking error in a portfolio. This can maximize the amount of tracking error coming from those factors being targeted, while minimizing the tracking error that results from unintended exposures.

Sector, country and/or individual security constraints are also common and help limit unintended exposures as well as protect the portfolio from large drawdowns when model forecasts do not materialize.

In addition to constraints, there are a number of structural tools that can be used to tailor portfolio outcomes. These include long/short, market neutral and/or options overlays that have the potential to impact individual factor returns (see chart below) and provide important risk mitigation.

Ranking of historical returns for factors in a long only portfolio

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Volatility	Valuation	Size	Volatility	Momentum	Valuation	Volatility	Momentum	Valuation	Momentum
Size	Size	Momentum	Market Cap	Valuation	Size	Valuation	Market Cap	Size	Market Cap
Valuation	Market Cap	Valuation	Size	Size	Momentum	Market Cap	Volatility	Volatility	Volatility
Market Cap	Volatility	Volatility	Valuation	Market Cap	Market Cap	Size	Valuation	Market Cap	Valuation
Momentum	Momentum	Market Cap	Momentum	Volatility	Volatility	Momentum	Size	Momentum	Size

Ranking of historical returns for factors in a long/short portfolio

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Volatility	Valuation	Size	Volatility	Momentum	Valuation	Volatility	Momentum	Valuation	Momentum
Valuation	Size	Momentum	Momentum	Size	Momentum	Valuation	Volatility	Size	Volatility
Size	Volatility	Valuation	Size	Valuation	Size	Momentum	Valuation	Volatility	Valuation
Momentum	Momentum	Volatility	Valuation	Volatility	Volatility	Size	Size	Momentum	Size

The chart represents the MSCI factor indexes calendar year performance for quality, momentum, value, size and volatility expressed in U.S. dollar terms. Source: Morningstar as of December 31, 2017.

Step 5: Ensure long-term efficacy

Defining the desired market exposure and risk parameters is crucial, but it is just one facet in the design and management of a factor-based custom solution. The efficacy of any tailor-made proposal also needs to be validated through simulations and back-testing to confirm the expected theoretical outcome is consistent with history. The process, after being codified, must then be monitored over time to ensure actual results match expectations and that frictions associated with implementation are not undermining performance.

Factor decay, for instance, can take place over time whereby the highest and lowest ranked securities eventually migrate towards the middle. Furthermore, some factors such as momentum will decay more rapidly than others such as valuation.

Without proper care, a rebalancing frequency that is more rapid than the decay rate of the factor will result in turnover that has little ability to increase exposure to the desired factors. Conversely, a rebalancing frequency that is slower than the decay rate of the factor could result in a negative exposure to desired factors.

Ultimately, factor-driven quantitative investing gives a growing number of institutional investors the opportunity to build customized solutions like never before. This requires a great deal of collaboration, flexibility and know how about the efficacy of factors in different market scenarios, but for those who get it right, success in meeting objectives can be achieved.

Case Study: Outperform the U.S. large cap universe

AGFiQ recently worked with an outsourced chief investment officer (OCIO) on a custom solution designed to outperform the Russell 1000 in a cost effective manner relative to traditional active management.

The OCIO wanted exposure to value, momentum, and quality factors, but also desired an ESG overlay be added to one of its client pools. In addition, the OCIO set a tracking error target of 200 basis points/year and a maximum annual turnover to 100% of the portfolio.

The end result was two separate accounts (one with ESG overlay) that could be mirrored for additional clients in future.

The AGFiQ Difference

AGFiQ's quantitative investment philosophy is based on the belief that outcomes can be improved by assessing and targeting the factors that drive market returns. Given this philosophy, the team's objective is to provide better risk-adjusted returns through our construction of innovative investment portfolios that we believe successfully balance risk management with opportunities for capital appreciation.

Our deep expertise lends itself to the creation of solutions in a variety of vehicles including mutual funds, exchange-traded funds and separately managed accounts designed to help investors achieve a spectrum of goals from risk management to capital appreciation. The AGFiQ investment team works with clients to design vehicle-agnostic, tailored strategies to achieve client-driven objectives, along with extensive experience designing and managing ETF strategist portfolios across asset classes for institutional investors.

About the Authors



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Grant joined Highstreet Asset Management Inc. (Highstreet) in 2012 and leads the research team to develop and enhance Highstreet's quantitative investment strategies. He plays a key role in facilitating the sharing of ideas between Highstreet's portfolio managers and quantitative specialists with respect to research proposals and findings.

Prior to joining Highstreet, Grant spent seven years as a lead quantitative researcher for one of Canada's largest pension funds. He has 15 years of experience developing predictive statistical models.

Grant has a B.A. and M.A. in Economics from Nankai University, and a Ph.D. in Economics from University of Western Ontario.



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Bill is Chief Investment Officer and Portfolio Manager at FFCM, LLC (FFCM).

Bill is one of the co-founders of FFCM. Founded in 2009, FFCM is a Boston-based investor advisory firm founded with a vision to provide investors efficient and inexpensive exposure to investment factors through a family of ETFs and investment strategies otherwise limited to institutional investors.

Before founding FFCM, Bill was a Vice President at State Street Global Advisors and was the head of the U.S. Enhanced Equities team. His focus was on managing long only and 130/30 US strategies, as well as providing research on SSgA's stock-ranking models and portfolio construction techniques. Prior to joining SSgA in 2003, Bill was a quantitative analyst and portfolio manager at Putnam Investments. Bill has been working in the investment management field since 1995.

Bill has a Bachelor's degree in Electrical Engineering from the United States Naval Academy and an MBA from the Amos Tuck School of Business Administration at Dartmouth College. He is a CFA charterholder and holds FINRA licenses 7, 63 and 24.

For more information, please visit: AGFiQ.com

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AGFiQ Asset Management (AGFiQ) is a collaboration of investment professionals from Highstreet Asset Management Inc. (HSAM), a Canadian registered portfolio manager, and of FFCM, LLC (FFCM), a U.S. registered adviser. This collaboration makes up the quantitative investment team.

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