

A (not so) new approach to investing in bonds

By Mark Stacey, Grant Wang and Bill DeRoche

Factor-based approaches to fixed income investing have existed on the fringes for years, but improvements in data mining are now helping bring it to the fore.

Quantitative, factor-based approaches to equity investing have been well documented in academia for decades and products based on these approaches have dominated the headlines for many years due to their attraction of significant asset flows. Only recently, however, have a select few fixed income products employing similar approaches begun to enter the marketplace.

This surprising lag in product development would lead one to believe that a quantitative approach to fixed income, including those that incorporate style factor models, is a new practice. This assumption is not entirely correct. Investment decisions rooted in mathematical logic, such as those that underlie many fixed income approaches, are the basis of quantitative analysis. Quantitative approaches exclusive to fixed income investing have existed in the realm of hedge funds for decades. This precedence and the rapid increase in fixed income data quality/accessibility combined with the massive computing power of modern quants is proving to be a natural marriage ripe with opportunity.

A quantitative approach to fixed income

When compared to equity investments where idiosyncratic or non-systematic risk is a significant component of stock performance, fixed income performance is largely defined by risk factors, lending itself very well to a quantitative approach. When analyzing fixed income securities, bond managers have a clear understanding of the variables that can create volatility in bond prices. Specifically, the cash flow a bond provides is explicitly known, as is the premium/discount to par value. Additionally, features such as the maturity date and any optionality/call-ability are clearly understood. This means that in fixed income markets, investors tend to be more fairly compensated for any incremental risks taken and the outcome of an investment can be predictably modelled.

However, the sheer number of fixed income securities in existence is astounding, with a global bond market that is estimated to now exceed US\$100 trillion¹, dwarfing the global equity market value of approximately US\$79 trillion². The Bloomberg Barclays Global Aggregate Index alone consists of approximately 22,400 fixed income securities. To analyze the individual characteristics of each bond within the universe would be impossible for any fundamental management team.

¹ Bank for International Settlements, "BIS statistics on international debt issuance", December 31, 2017.

² The World Bank, World Federation of Exchanges database, December 31, 2017.

Higher rates are factor friendly

Historically, investors have been rewarded for simply taking on excessive exposure to interest rate risk in their bond portfolios, but with interest rates near lower bounds across the developed world, this strategy is unlikely to yield strong results over the coming years. Entering 2018, the bond market had experienced a bull run lasting more than three decades, though more recent normalization of monetary policy has increased volatility and muted returns in 2018.

Given the current environment in fixed income and longer-term projections for interest rates, many investors have begun to diversify existing bond portfolios into strategies that offer access to diverse areas of the market and employ unique approaches to the asset class.

How does a factor-based approach perform in a rising rate environment? A factor-based fixed income approach can help navigate increased uncertainty in the macroeconomic landscape by seeking to provide improved risk-adjusted returns by deliberately capturing and diversifying the sources of risk and return in the fixed income portfolio.

10-year U.S. Treasury Yield



Source: Bloomberg L.P. as of September 30, 2018.

The AGFiQ team of quantitative managers, when analyzing the 26,000 fixed income securities that exist within the Bloomberg Barclays Multiverse Bond Index, looks at 328 columns of data for each security in the universe. This results in 8.5 million pieces of data analyzed by the AGFiQ programs every month, leading to a broader understanding of the overall characteristics of securities within that universe.

Further, given a quantitative approach to fixed income requires the existence of sufficient data and history for modelling purposes, the massive universe of fixed income securities is distilled down to a sub-set of investment opportunities that are more liquid, are easily sourced and are transparently priced, leading to an efficient implementation and potentially lower security-specific risk profile.

Fixed income factors

While not as extensively studied as equity style factors, academic research on fixed income factors dates back to the early nineties when Nobel Laureate Eugene Fama and Kenneth French published research proving duration and credit to be major performance drivers in bond returns³.

The duration factor indicates that long duration bonds have higher risk than short-duration bonds. Further, the credit factor has proven that low-quality bonds are riskier than high-quality bonds. In fact, within fixed income, research has demonstrated that interest rate risk and credit risk together account for nearly 90% of cross-sectional differences in bond returns⁴.

Fundamental fixed income managers, in recognition of this relationship, have historically based their investment approaches on the premise of over/under-weighting duration or credit quality relative to benchmarks, while simply not utilizing the lexicon of a "factor-based" approach.

Within the decade, additional research has identified the relationship between well-known equity style factors and the performance of fixed income securities that exhibit these characteristics. Momentum, value, quality and, specific to fixed income, carry factors have all been proven to have a predictive relationship to performance in corporate bonds, though the underlying definitions of these factors may differ between equity and fixed income approaches.

Factor	Equity Definition	Fixed Income Definition
 Quality/ Risk High-quality bonds tend to outperform low-quality over the long run as lower-risk assets tend to deliver better risk-adjusted returns.	<ul style="list-style-type: none"> • EBIT Margin • Asset Turnover • LT Debt/Equity • ROE • ROIC • Dividend Yield 	<ul style="list-style-type: none"> • Low leverage (net debt to total asset) • High gross profit over assets (gross profit over asset) • High interest coverage (EBIT over interest expense)
 Momentum Bonds that have performed well recently will continue to perform well. Stock returns tend to lead corporate bond returns.	<ul style="list-style-type: none"> • Price Change 12 Month • Price Change 3 Month • Price Change 1 Month 	<ul style="list-style-type: none"> • Bond momentum: Cumulative excess return compared with duration-matched treasury • Issuer equity momentum: Cumulative return from equity issuer
 Value Undervalued bonds will outperform over the long term.	<ul style="list-style-type: none"> • Price/Sales • Price/Cash Flows • Fwd Price/Earnings • Trailing Price/ Earnings • Price/Book • EV/EBITDA 	<ul style="list-style-type: none"> • The difference between observed Option Adjusted Spread (OAS) – model implied OAS. Higher difference means more undervalued
 Carry Higher-yielding bonds tend to indicate higher expected returns.		<ul style="list-style-type: none"> • OAS

³ https://rady.ucsd.edu/faculty/directory/valkanov/pub/classes/mfe/docs/fama_french_jfe_1993.pdf

⁴ <https://us.spindices.com/documents/research/research-factor-based-fixed-income.pdf>

Not all bonds are alike

Fixed income securities, across different sub-sectors, are perhaps as fragmented as their equity counterparts when it comes to understanding which individual factors relate to performance. As such, it has proven that the factor definitions applied should be adjusted for each sub-sector of the bond market (including government bonds, corporate bonds) and account for different regional differences and credit qualities.

For example, the AGFiQ model evaluating and ranking corporate bonds and sovereign bonds both consider Value, Momentum, Carry and Quality factors, but the underlying definitions of each of these factors differs for the two bond types.

Although factor-based approaches to fixed income investing may appear to be a new development, the arrival of products that explicitly focus on risk management while pursuing opportunities for total return and income are well-timed for the increasingly challenging environment ahead.

Factor	Corporate Bonds (IG & HY)	Sovereign Bonds
Quality	Low Leverage (net debt to total assets) High Gross Profit/Assets (Gross Profit to Total Assets) High Interest Coverage Ratio (EBIT to Interest Expense)	Low Duration – Shorter-duration bonds are preferred over longer-duration bonds due to the lower risk profile
Momentum	Bond Momentum: Cumulative excess return compared with duration-matched treasury Issuer Equity Momentum: Cumulative Return from Equity Issuer	12-month bond returns
Value	Difference between observed OAS and model-implied OAS. Higher difference means bond is undervalued and receives a higher weight	Real Yield: Each bond’s nominal yield – duration matched inflation expectation. The higher the real yield of the bond, the better its rank in the model
Carry	Option Adjusted Spread: The spread between the yield of a bond (adjusted for embedded options that impact projected cash flows) and a reference rate (Treasury Yield)	Nominal yield of the bond minus the term spread

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.



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For more information on the full lineup of AGFiQ ETFs, visit AGFiQ.com.

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