Fixed income style factors

BlackRock

Moving from theory to practice

Introduction

As factor investing has grown in popularity in equity markets, investors naturally wonder if a factor-based approach would have applicability in the fixed income markets. BlackRock's research has shown that the core principle of factor investing—systematically identifying and capturing persistent risk premia—also applies to bond markets.

This paper focuses on the fundamental concepts behind style factor investing and explores a strategy which blends two diversifying[1] style factors, Quality and Value, in order to create investable US corporate portfolios that can potentially generate improved absolute and risk-adjusted returns.

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Tom's Take

We believe the combination of low yields and more challenging conditions for active managers may have investors looking for new ideas in fixed income markets. Fixed income factor investing could not arrive at a better time to help investors create new possibilities. While the concept has been debated and discussed in theoretical terms for years, we now have actual live index track records to demonstrate the power that these strategies may bring to a portfolio.

The first step is creating a common language to understand these new types of strategies. We then take the next step of evaluating live index strategies that we have been managing for over three years now to move the discussion from theory into practice.

Whether you are looking to enhance beta returns in a low-yield environment or create more consistent and predictable outperformance in your active book of managers, we believe fixed income factors can help you achieve your fixed income goals.

Thomas Parker

The fundamental investment concepts underlying style investing in equities can also be applied to fixed income markets.

Style factors can help explain the historical differences in risk and return among a universe of US corporate bonds.

Style factors, such as Value and Quality, can be integrated into a US corporate bond portfolio to pursue improved absolute and risk-adjusted returns over a market index.

1 Diversification does not guarantee a profit or eliminate the potential for loss.

The opinions expressed are those of the BlackRock Systematic Fixed Income Group as of October 2020 and subject to change with market conditions.

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Fixed income factors: A quick catchup

Equity and fixed income investors alike have often strived to discern the drivers of investment returns. Over time, clear and persistent drivers of returns—known as "factors"—have been identified. In a previous publication, Fixed Income Factors: Fixed Income's Worst Kept Secret[2], we provide a foundational overview of the intuitive investment concepts behind fixed income factor investing.

Based on our research, we believe factors can be categorized into two general categories—macro and style. Macro factors capture broad, systemic risks such as interest rates and inflation that explain returns across multiple asset classes. Style factors, which will be the focus of this paper, help explain differences in risks and returns within asset classes. Historically, style factors represent characteristics, such as Quality and Value, which may determine, for example, why one group of corporate bonds may have outperformed another.[3]

Style investing in fixed income

While the nomenclature, definition, and measurement can differ across academic research, BlackRock has identified a broad set of fixed income style factors grounded in intuitive, fundamental investment concepts.

Figure 1 provides an overview of the four principal style factors—Quality, Value, Momentum, and Low Volatility—that we believe have the most application for investors.

Implementation: the hard part

In recent years, investors have been inundated with equity-centric factor strategies. However, there have been very few that have been created for fixed income—which begs the question: *Does factor investing work in fixed income?*

We believe the answer is an unequivocal "yes… but." *Yes* in that we believe it will be a mainstay for fixed income investing long term… *But* in that we admit there are additional hurdles that must be overcome. For instance, credit markets may have high transaction costs, less reliable market-wide pricing data, and security availability issues—all of which can accumulate to produce headwinds during portfolio implementation.

Furthermore, the asymmetric return profile of bonds (limited upside versus equities) requires more nuanced approaches to building portfolios to help satisfy investors preferences for return, risk, and yield generation. A Value factor-based portfolio may generate higher yield and total return than a market index, but it may come with securities at a higher risk of default and be susceptible to large drawdowns. Similarly, we have found that credit portfolios that allocate to the Quality or Low Volatility factor may have higher Sharpe ratios given their lower level of risk, but their return will likely be highly cyclical. They may lag the index in terms of yield and return for prolonged periods, and then outperform in more rare downturns.[4]

Due to these limitations, we believe that investors may benefit from blending the characteristics of multiple style factors into a single portfolio. In the following sections, we will explore the existence of factor phenomena in corporate bond markets and discuss how a blended style factor approach may help exploit a common behavioral bias.

Figure 1: Overview of Fixed Income Style Factors

Style Factor	Description	Rationale	Strategy Considerations
Quality	Bonds issued by firms with strong fundamentals may outperform over full business cycles	Firms with healthy capital structure and ability to generate cash flows can better weather risk-off periods	Buy bonds issued by firms with high capacity to service their debt
Value	Bonds priced at a discount relative to their fundamental value may outperform	While markets have been typically efficient, temporary deviations from fundamental values can exist	Buy bonds that are cheap relative to their peers
Momentum	Past winners could be future winners	Investor herding mentality and a tendency to chase winners	Buy bonds based on trending technicals
Low Volatility	Low volatility bonds may have higher risk-adjusted returns	Low-risk, low-volatility bonds may be ignored because they have perceived lower expected returns	Buy low volatility, low risk bonds

Source: BlackRock. Based on the opinions of the Systematic Fixed Income Group as of October 2020. Forecasts are based on estimates and assumptions, there is no guarantee that they will be achieved. The information shown above is for illustrative purposes only and not meant to be a recommendation to buy or sell any security.

2 Hyperlink: https://www.blackrock.com/institutions/en-us/insights/portfolio-design/fixed-income-factors. Published 12 June 2019. 3 "Foundations of Factor Investing"; Jennifer Bender, Remy Briand, Dimitris Melas, and Raman Aylur Subramanian. 30 December 2013. MSCI. 4 "Reach for Safety"; Johnny Kang, Tom Parker, Scott Radell, and Ralph Smith. 30 September 2018. The Journal of Fixed Income.

Style factor application: Reach for safety *not* yield

The capital asset pricing model (CAPM) suggests that securities markets are efficient at valuing risk on the premise that (1) all investors choose to invest in the portfolio with the highest expected excess return per unit of risk, and (2) investors can employ leverage to target a desired absolute level of risk and return. In theory, a security cannot be undervalued relative to its risk for extended periods because demand for that security would increase until the expected excess return per unit of risk reverts to market levels.[5]

In practice, however, many bond investors are constrained in their ability to employ leverage, and therefore must instead overweight riskier bonds to attain desired income or risk targets—commonly known as "reaching for yield." Reach for yield behavior may not be the best long-term solution for credit investors, because while it may be beneficial during prolonged periods of upward trending markets, it can be severely penalized in down markets when securities reprice, are downgraded or eventually default.

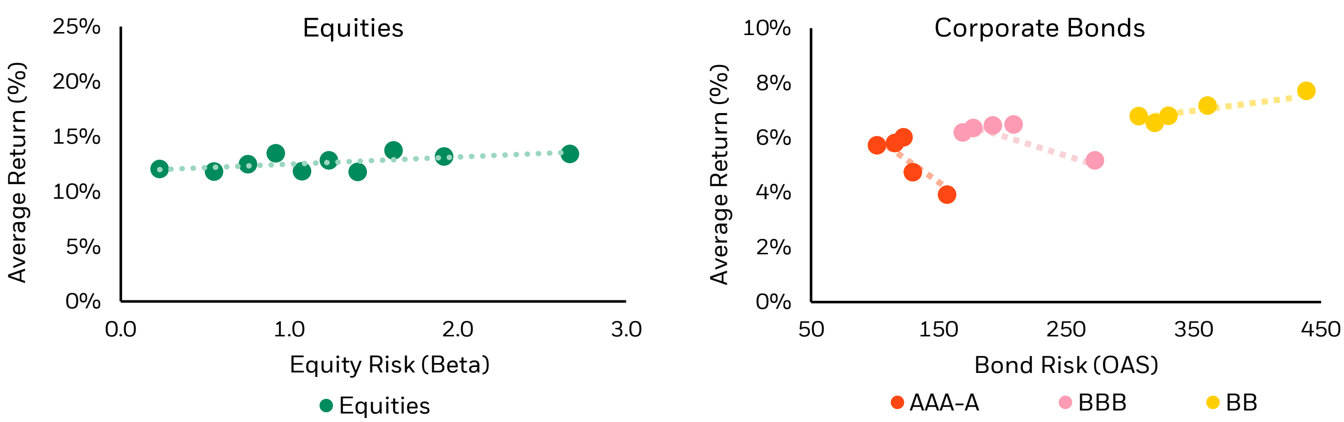
This behavioral bias of favoring higher beta, often riskier securities, as a substitute for levering risk-efficient securities leads to what is known as the "low volatility anomaly," and historical evidence suggests that it has existed in bond markets for decades.[6] It implies that the CAPM theory fails because higher risk securities may become overpriced relative to their expected return per unit of risk as investors bid them up. In the long-run, lower volatility securities may actually produce similar absolute, and hence a higher return per unit of risk, as they are overlooked by market participants that are chasing yields.

To illustrate, in Figure 2, we replicate the findings of Fama and French, who show that historically, the security market line (SML) in US equities is flatter than what models like CAPM would suggest—an upward sloping line where additional risk equates to additional reward.[7] In the charts below, we see a similar phenomenon in US corporate bonds. The sets of markers correspond to historical value-weighted quintile portfolios constructed within ratings groups using a measure of default risk.

Across ratings groups (from AAA to BB), there exists a generally positive relationship between risk and return that is consistent with theory. Within ratings groups, however, the portfolios with the lowest default risk have tended to actually outperform portfolios with the highest default risk. In effect, the flat to negative relationship between risk and return within corporate bond ratings groups may parallel the phenomenon observed in equities.[8] We argue that investor propensity to reach for yield drives this anomaly in the corporate bond market and creates an opportunity for investors to seek to "reach for safety."

Consider an approach which blends these two separate and diversifying factors. First, a Quality factor screen can be used to remove riskier securities that have a higher probability of default. Intuitively, we believe removing such securities may help provide downside mitigation and avoid the behavioral bias of chasing yield in riskier securities. Second, a Value factor tilt can be used to favor bonds that appear to be underpriced relative to fundamentals. Value is a historically rewarded risk factor which seeks to identify bonds that are inexpensive relative to their financial strength.[9] Such approach allows for the screening of riskier, overvalued exposures while simultaneously seeking to preserve market context yields and improve total return potential with less cyclicality.

Figure 2: Historical Security Market Lines in US Equity and US Corporate Bond Markets



Source: BlackRock, using ICE BofAML US Corporate Index for ratings group AAA-A and BBB, and ICE BofAML US High Yield index for ratings group BB, from 1998-2020; Ken French library. These plots illustrate the historical relationship between risk and return in US equities and US corporate bonds. For equities, the dots correspond to monthly value-weighted decile portfolios formed on equity beta between January 1964 and June 2020 using data from Ken French's website. For corporate bonds, the sets of markers correspond to monthly value-weighted quintile portfolios formed on distance-to-default within different ratings groups using data from January 1998 to June 2020 of ICE BofAML Indices.

5 "The Capital Asset Pricing Model: Theory and Evidence"; Fama, E., and K. French. 2004. Journal of Economic Perspectives. **6** "Low-risk Anomalies In Global Fixed Income: Evidence From Major Broad Markets"; Carvalho, R., P. Dugnolle, L. Xiao and P. Moulin. 2014. The Journal of Fixed Income. **7** "The Capital Asset Pricing Model: Theory and Evidence"; Fama, E., and K. French. 2004. Journal of Economic Perspectives. **8** "Reach for Safety"; Johnny Kang, Tom Parker, Scott Radell, and Ralph Smith. 30 September 2018. The Journal of Fixed Income. **9** "Value Investing in Credit Markets"; Correia, M., S. Richardson and I. Tuna. 31 March 2011. Review of Accounting Studies Vol 17.

Case Study: Building a *Reach for Safety* portfolio

In this section, we will review a factor-based approach to credit that seeks to minimize reach for yield behavior, but still offer the risk, return and yield potential that investor need to meet their performance objectives.

I. Background

Today's low yield environment has made it challenging to generate income and total returns while managing corporate bond risk. Investors seek total return and income from fixed income, but some may be leverage-limited. Investors are often forced to reach for yield and take on more risk to meet return and income targets. While corporate bonds provide incremental yield over government securities, avoiding defaults when the credit cycle turns downward is extremely important to maximize total return in the long run. Due to the limited upside in bonds versus equity securities, we believe it can be more important to avoid losers than to pick winners.

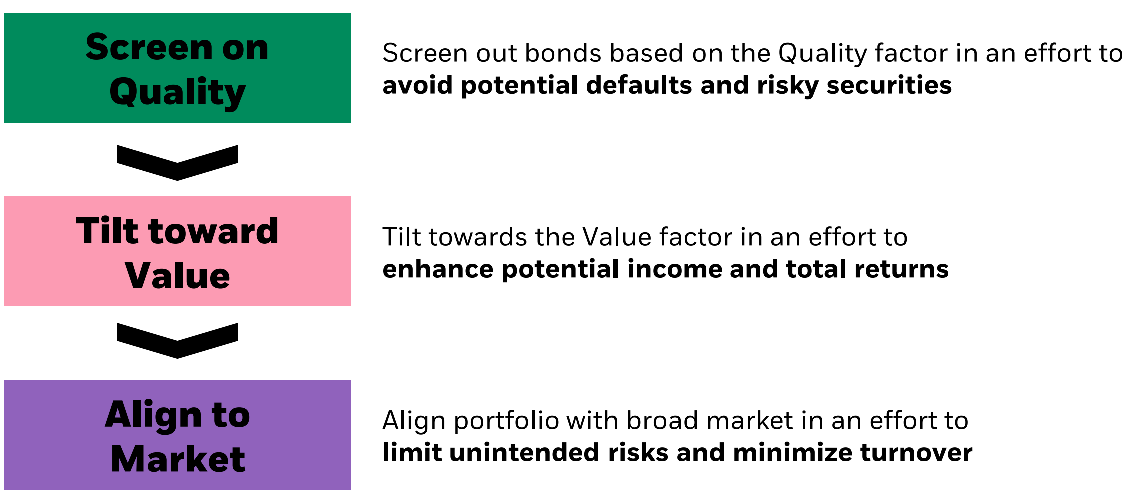
In this case study, we will go over the fundamental investment approach and realized returns of two factor-based US corporate bond indices that we developed in 2017, the BlackRock Investment Grade Enhanced Bond Index[10] and the BlackRock High Yield Defensive Bond Index.[11] For a deeper look at the methodologies for the BlackRock indices, see Addendum A on page 9.

These indices combine two diversifying factors, Quality and Value, to create portfolios that are grounded in the "reach for safety" insight we highlighted in the previous section. We believe a "reach for safety" approach can help seek superior absolute and/or risk-adjusted returns relative to traditional market capitalization-weighted benchmarks.

II. Portfolio Construction

To build our factor-based credit portfolios, we will follow a three step-approach. First, we will screen out bonds that appear low quality, then tilt the portfolio towards bonds that appear undervalued. Finally, we align the portfolio to have similar characteristics to the broader market to limit any unintended active risks and minimize turnover (Figure 3).

Figure 3: Blended Style Factor Portfolio Construction Process



Source: BlackRock. Investment process is shown for illustrative purposes only and is subject to change.

10 Hyperlink: https://www.blackrock.com/us/individual/products/287311/blackrock-investment-grade-enhanced-bond-index-fund
11 Hyperlink: https://www.blackrock.com/us/individual/products/287310/blackrock-high-yield-defensive-bond-index-fund

Screen on Quality

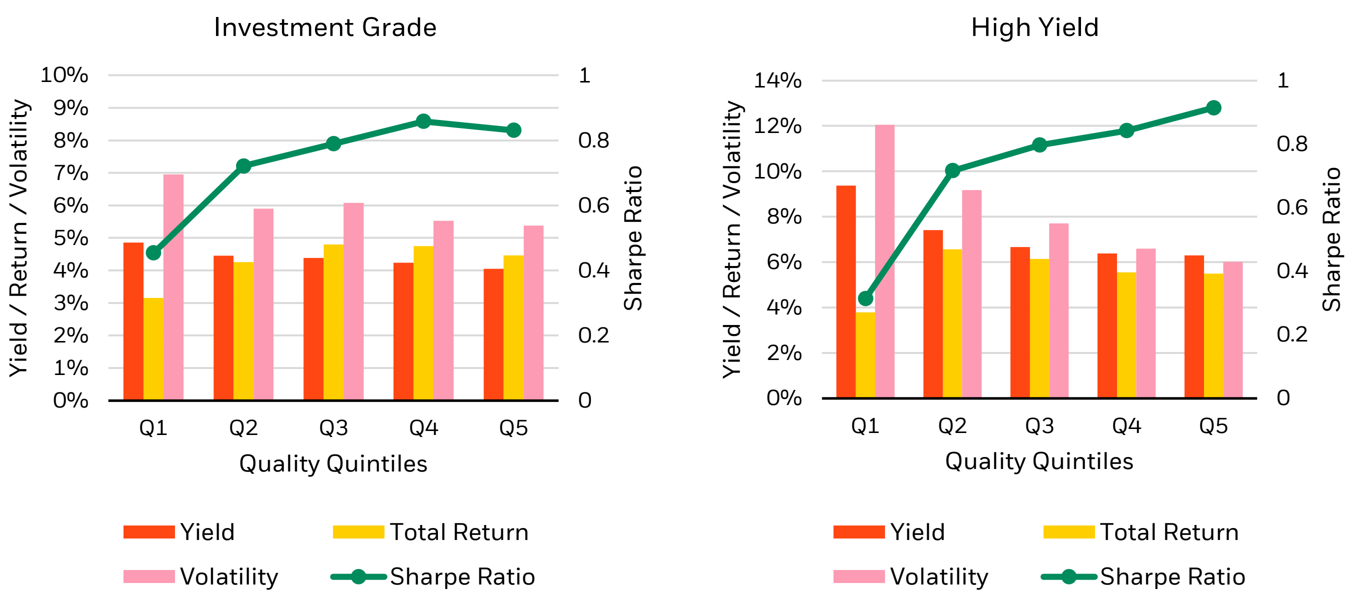
The first step in the process is to screen on Quality. Starting with a broad investable universe, as defined by the ICE BofA US Corporate Index and the ICE BofA US High Yield Index, lower quality bonds are screened from the portfolio. The relative quality of corporate bond issuers is measured via a proprietary, probability of default estimate.

BlackRock's probability of default models is grounded in the basic assumption that default occurs mainly if a firm's assets fall short its liabilities. The probability of default model uses accounting, market data of equity and bond instruments, bond ratings, and other economic variables to estimate the probability of default for the issuer over the next twelve-month period. Thus, a full balance sheet approach is taken in assessing credit quality, similar to fundamental credit analysis.

Figure 4 shows the yield, risk, and Sharpe ratios (a measure of risk-adjusted return) of the corporate bond market across quintiles of Quality. In these illustrative examples, we stratify the ICE BofA US Corporate Index and the ICE BofA US High Yield Index into five quintiles based on exposure to the Quality style factor, with the fifth quintile (Q5) representing the highest exposure to the given factor, and the first quintile (Q1) representing the lowest exposure.

Looking at Figure 4, our analysis reveals that bonds with a lower probability of default—higher quality—are less volatile, illustrated by the descending pink bars. However, they also carry a lower yield, as illustrated by the downward trending orange bars. Sharpe ratios are shown in green. A flat green line would suggest that as investors take on more risk, they are fairly compensated by higher returns. The line is fairly flat in quintiles 3, 4, and 5, illustrating a stable trade-off between risk and returns. However, this line slopes downward sharply for the lower quality quintiles 1 and 2 suggesting that taking on more risk to chase higher yields no longer compensated by a commensurate level of return. Using a Quality screen would effectively remove the bonds from the lower quintiles.

Figure 4: Quality Factor Quintile Portfolio Analysis



The figures shown relate to past performance. Past performance is not a reliable indicator of current or future results.
Source: BlackRock, ICE BofA Indices, Bloomberg. Based on the ICE BofA US Corporate Index and the ICE BofA US High Yield Index from 1 January 2004 to 30 June 2020. The plots show the historical performance of market value-weighted quintile portfolios (Q1 to Q5) that measures the Quality (distance to default) for investment grade and high yield bonds. Sharpe ratios are reported for the quintile portfolios. Index returns are shown for illustrative purposes only. It is not possible to invest directly in an index.

Accordingly, this Quality screen serves a very important purpose. It removes those credits with the highest expected probability of default and those that have had poor risk-adjusted returns relative to peers. We believe this can act as a defensive property for both high yield and investment grade portfolio construction.

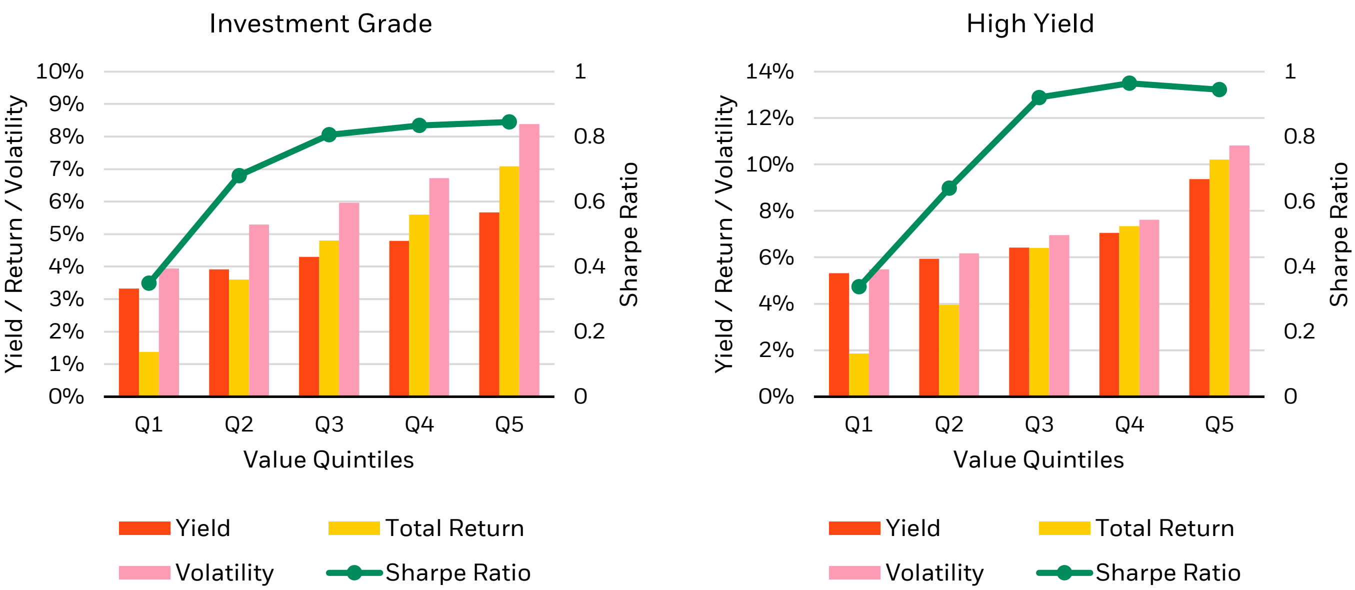
Tilt toward Value

Portfolios based solely off the remaining high-quality bonds would likely be very defensive but also quite cyclical. Thus, we introduce a potentially diversifying[12] factor, Value, which favors bonds that are inexpensive relative to their current fundamentals and future prospects. In this case we measure Value based on an option-adjusted spread metric that is modified to take into account BlackRock's estimated default probability of the issuer, what we call default-adjusted spread.

Accordingly, Figure 5 shows the yield, return, volatility and Sharpe ratios of bonds based on Value quintiles. We believe that seeking a Value tilt will potentially boost the portfolios' yield and absolute total return—as illustrated by the upward trending orange and yellow bars in Figure 5.

Importantly, our research has found that the Value factor has historically performed well during periods in which the Quality factor (which is effectively captured through the screening process) has lagged.[13] Combining these two historically rewarded factors is designed to help improve the cyclicality of returns relative to a strategy of screening out securities based only on one factor such as Quality.

Figure 5: Value Factor Quintile Portfolio Analysis



The figures shown relate to past performance. Past performance is not a reliable indicator of current or future results.
Source: BlackRock, ICE BofA Indices, Bloomberg. Based on the ICE BofA US Corporate Index and the ICE BofA US High Yield Index from 1 January 2004 to 30 June 2020. The plots show the historical performance of market value-weighted quintile portfolio (Q1 to Q5) on measures of Value (default-adjusted spreads) for investment grade and high yield bonds. Sharpe ratios are reported for the quintile portfolios. Index returns are shown for illustrative purposes only. It is not possible to invest directly in an index.

Align to market

Finally, we constrain portfolio level risks and turnover relative to the starting investable universes, the ICE BofA US Corporate Index and the ICE BofA US High Yield Index. The duration risk, credit risk, and liquidity profile of the strategy are constrained to stay within specific ranges of the benchmarks. Industry and issuer level exposure are governed through a rules-based process as well. In order to build the most robust portfolio solution, the correlation of all of the portfolio level risk factors—not just the bond-level risk factors, are taken into account through a risk model. Finally, transaction costs, which detract from total return, are contained by mitigating overall portfolio turnover.

While the three-step process for the investment grade and high yield factor-based portfolios is the same, the goal for each is slightly different. Specifically, a more defensive profile is targeted in the high yield strategy while greater absolute return is targeted in investment grade strategy. Consequently, the Quality screen is emphasized more in the high yield strategy, while the Value tilt is emphasized more in the investment grade strategy.

12 Diversification does not guarantee a profit or eliminate the potential for loss. 13 "Reach for Safety"; Johnny Kang, Tom Parker, Scott Radell, and Ralph Smith. 30 September 2018. The Journal of Fixed Income.

III. Measuring Results

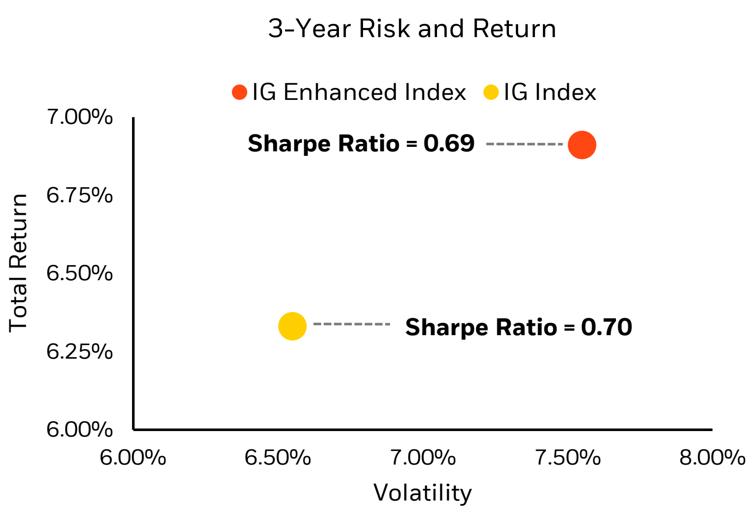
After screening for Quality, tilting towards Value, and aligning the portfolio characteristics, we arrive at our multi-factor portfolios for investment grade and high yield. This style factor portfolio construction can be applied through a rules-based portfolio construction process which BlackRock codified in the development of the BlackRock Investment Grade Enhanced Bond Index (**IG Enhanced Index**) and BlackRock High Yield Defensive Bond Index (**HY Defensive Index**).

These BlackRock indices were launched on May 31, 2017 and now have three years of live index returns in which to evaluate. Figures 6 and 7 compare the three-year realized risk, return, and current characteristics of the two factor-based indices to two common market capitalization-weighted counterparts, the Bloomberg Barclays US Corporate Bond Index (**IG Index**) and the Bloomberg Barclays US High Yield Bond Index (**HY Index**).

Looking at the scatter plot in Figure 6, over the three-year annualized period, the IG Enhanced Index has returned 6.91% versus 6.33% compared to the IG Index, clearing its objective of enhanced absolute returns. From a risk perspective, the IG Enhanced Index has produced higher 3-year annualized volatility of 7.55% versus 6.55% for the IG Index—resulting in a Sharpe Ratio that is largely in line with the IG Index. We believe credit investors who are leverage constrained, but need higher returns in today's muted return environment, may want to consider a factor-based index investment to help them achieve their return objectives without resorting to reach for yield behavior.

From a portfolio composition perspective, the IG Enhanced Index has exhibited a diversified[14], but more concentrated portfolio than the IG Index due to its factor-based security selection process. However, key characteristics such as yield, option-adjusted spread, and credit quality are relatively in line with the IG Index. As part of a larger asset allocation, the IG Enhanced Index may provide superior absolute returns without taking on significantly greater active risk over the benchmark.

Figure 6: IG Enhanced Index Portfolio Analysis



Key Characteristics

	IG Enhanced Index	IG Index
# of Positions	417	6513
Yield-to-maturity	2.27%	2.15%
OAS (bps)	167	148
Duration (yrs)	7.62	8.37
Avg Credit Quality	BBB+	A-

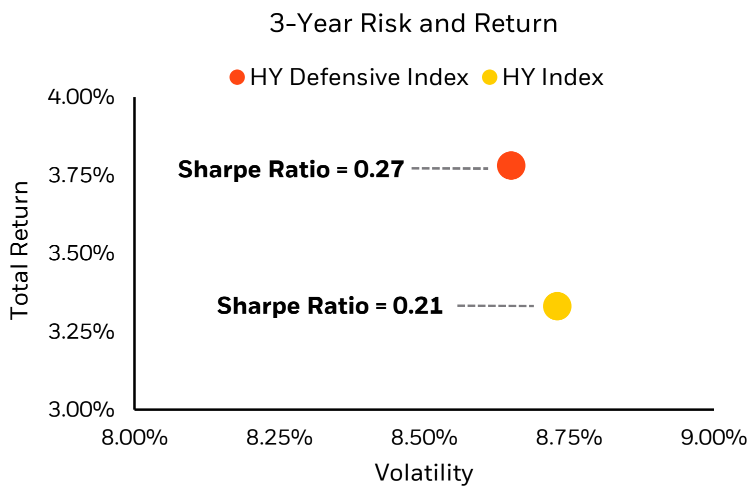
Source: Bloomberg and BlackRock. Returns from 30 June 2017 to 30 June 2020. Volatility calculated as standard deviation of monthly returns. Index risk characteristics as of 30 June 2020. The "IG Enhanced Index" represented by the BlackRock Enhanced Corporate Bond Index, which incepted on 31 May 2017. The BlackRock Investment Grade Enhanced Bond Index seeks to provide enhanced risk-adjusted returns relative to comparable capitalization-weighted indices for the U.S. investment grade corporate bond market. The "IG Index" represented by the Bloomberg Barclays US Corporate Bond Index. The Bloomberg Barclays US Corporate Bond Index measures the investment grade, fixed-rate, taxable corporate bond market, which includes USD denominated securities publicly issued by US and non-US industrial, utility and financial issuers. Past performance is not a guarantee of future results. Index returns are shown for illustrative purposes only. It is not possible to invest directly in an index. The credit quality of a particular security or group of securities may be determined either by BlackRock or a nationally recognized statistical rating organization and does not ensure the stability or safety of an overall portfolio. In the event a security in unrated by a ratings organization, BlackRock may assign an internal rating for purposes of determining credit quality.

14 Diversification does not guarantee a profit or eliminate the potential for loss.

Turning to Figure 7, over the three-year annualized period, the HY Defensive Index has returned 3.78% annually, outperforming the HY Index by 0.45%. At the same time, the defensive nature of the factor-based index's construction has resulted in slightly lower risk of 8.65% versus 8.73% for the HY Index. As a result, the HY Defensive Index has exhibited a higher Sharpe Ratio of 0.27 versus 0.21 for the HY Index. Finally, the HY Defensive Index is largely in line with HY Index but it does so through a more concentrated portfolio. However, the HY Defensive Index's portfolio exhibits higher levels of yield and lower duration risk without sacrificing credit quality.

For high yield investors who are concerned about taking on greater default risk to enhance returns, a factor-based approach may help them seek their yield and income targets while limiting the volatility that can come with moving into riskier assets.

Figure 7: HY Defensive Index Portfolio Analysis



Key Characteristics

	HY Defensive Index	HY Index
# of Positions	236	2083
Yield-to-maturity	7.20%	6.72%
OAS (bps)	668	618
Duration (yrs)	3.82	4.25
Avg Credit Quality	BB-	BB-

Source: Bloomberg and BlackRock. Returns from 30 June 2017 to 30 June 2020. Volatility calculated as standard deviation of monthly returns. Index risk characteristics as of 30 June 2020. The "HY Defensive Index" represented by the BlackRock High Yield Defensive Bond Index, which incepted on 31 May 2017. The BlackRock High Yield Defensive Bond Index seeks to provide enhanced risk-adjusted returns relative to comparable capitalization-weighted indices for the U.S. high yield corporate bond market. The "HY Index" represented by the Bloomberg Barclays US High Yield Bond Index. The Bloomberg Barclays US Corporate High Yield Bond Index measures the USD-denominated, high yield, fixed-rate corporate bond market. Securities are classified as high yield if the middle rating of Moody's, Fitch and S&P is Ba1/BB+/BB+ or below. Past performance is not a guarantee of future results. Index returns are shown for illustrative purposes only. It is not possible to invest directly in an index. The credit quality of a particular security or group of securities may be determined either by BlackRock or a nationally recognized statistical rating organization and does not ensure the stability or safety of an overall portfolio. In the event a security in unrated by a ratings organization, BlackRock may assign an internal rating for purposes of determining credit quality.

IV. Summary

As the zero-interest rate policy and low rate environment will likely continue to stretch on, we believe credit investors may reach further and further for yield. In this case study, we showed how a "reach for safety" approach that blends style factors—Quality and Value—can potentially generate improved absolute and risk-adjusted returns in a US investment grade and US high yield credit portfolio context.

A quality screen was used to filter out securities that may be at a higher risk of rating downgrades or defaults, which we believe can potentially minimize drawdown in market downturns and help protect income and capital during recessions. Next, a tilt towards value was applied to potentially enhance income and total returns of the portfolio after the lower quality securities were removed. Finally, each portfolio was optimized to align risk characteristics with the broad market while seeking to limit turnover and potential transaction costs. This style factor framework has been developed into a rules-based index through the BlackRock Investment Grade Enhanced Bond Index and BlackRock High Yield Defensive Bond Index.

These indices may provide opportunities to meet a mix of client objectives such as higher total returns, lower volatility and/or superior risk-adjusted returns versus market capitalization-weighted allocations. Although the current live track record for these indices is only three years long, we believe the results are promising for style factor-based fixed income strategies.

Conclusion

As with equities, factors can play a pivotal role in the risk and return outcomes within fixed income markets. Fixed income style factors—such as Value, Quality, Momentum, and Low Volatility—can help explain the differences in returns within asset classes like corporate bonds.

From a practitioner's perspective, a style factor lens can be used to seek improved security selection within a universe of corporate bonds that doesn't rely on chasing yields.

Three years in, the BlackRock Investment Grade Enhanced Bond Index and BlackRock High Yield Defensive Bond Index have demonstrated that blending the Quality and Value style factors can potentially generate improved absolute and risk-adjusted returns.

We believe style factor investing in fixed income has arrived and represents the next evolution in portfolio construction that will ultimately help investors build better portfolios.

Addendum A: BlackRock Factor-Based Index Rule Summaries

	Investment Grade Enhanced Index	High Yield Defensive Index
Key Objectives	• Maximize value metric (see below) while mitigating portfolio risk and T-costs relative to Investible Universe. • Limit deviations from Investible Universe on: Issuer weights, Duration Times Spread of the index, Duration of the index.	
Included Securities	USD-denominated, corporate bonds rated investment grade (Baa3/BBB- or higher) for the Investment Grade Enhanced Index and high yield (Ba1/BB+ or lower) for the High Yield Defensive Index; callable/puttable, 144a with registration (for investment grade) and without registration (for high yield), fixed rate, zero coupon, and bonds with predetermined step up schedule.	
Excluded Securities	Called bonds, bonds from countries with tax haven issues, fix-to-float bonds, D-rated bonds, defaulted bonds, convertible bonds, floaters, bonds with warrants, inflation-linked bonds, Eurodollar bonds, Reg S bonds, contingent capital bonds, Structured notes, non-callable perpetual bonds, PIK bonds, toggle notes, municipal bonds, preferred equities, non-corporate credit.	
Duration	Min: 90%, Max: 110% of investment universe	Min: 90%, Max: 110% of investment universe
Duration-Times-Spread	Min: 95%, Max: 105% of investment universe	Min: 95%, Max: 105% of investment universe
Issuer Weights	Max underweight: 100 bps, Max overweight: 50 bps relative to investment universe	Max underweight: 150 bps, Max overweight: 75 bps relative to investment universe
Maturity	> 12 months to final maturity	
Minimum Issue Size	$500 mm Amt Outstanding	$350 mm Amt Outstanding
Included Countries	Australia, Belgium, Canada, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, Spain, Sweden, United Kingdom, United States	Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, Spain, Sweden, United Kingdom, United States
Quality Screen Metric	Utilizes a Probability of Default estimate to screen out up to 20% (for investment grade) or 30% (for high yield) of eligible issuers within credit rating buckets; screen more heavily on lower credit rating buckets, agnostic to industry. Probability of Default model inputs are accounting, market data of equity and bond instruments, bond ratings, and other economic variables. The output of the model is an estimate of the probability of default for the issuer over the next twelve-month period.	
Value Tilt Metric	Utilizes Default-Adjusted Spread: OAS – Probability of Default x (1 – Recovery Rate Assumption*)	
Rebalance Frequency	Monthly	
Turnover Constraint	Target <6% one way turnover on a monthly basis.**	

Source: BlackRock as of 30 June 2020. Subject to change.
For full index rules, please see: https://www.blackrock.com/us/individual/literature/index-methodology/blk-smart-beta-corp-bond-index-methodology.pdf

Risk: Investing in the bond market is subject to certain risks including market, interest-rate, issuer, credit, and inflation risk. High-yield, lower-rated, securities involve greater risk than higher-rated securities; portfolios that invest in them may be subject to greater levels of credit and liquidity risk than portfolios that do not. There can be no assurance that performance will be enhanced or risk will be reduced for strategies that seek to provide exposure to certain quantitative investment characteristics ("factors"). Exposure to such investment factors may detract from performance in some market environments, perhaps for extended periods. In such circumstances, a strategy may seek to maintain exposure to the targeted investment factors and not adjust to target different factors, which could result in losses. Diversification may not protect against market risk or loss of principal.

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