



Active bond returns - powered by factors

By Jay Raol, PhD, and Stephen Quance



In brief

We have often argued that factor investing is by no means confined to equities. The concept is applicable to virtually all asset classes. In this first study in a series of papers designed to help investors better understand the implications of factor investing in fixed income, we apply a factor strategy to bonds and argue that, even when a bond strategy is not explicitly labelled a factor strategy, its factor exposures are what really count and drive the strategy's active performance.

Asset owners and investors are increasingly incorporating factor analysis when analyzing their portfolios. Here, we apply the same kind of analysis to active fixed income strategies - and the results are quite telling.

Morningstar's 2018 midyear report, which tracks active and passive performance across US equity and bond funds, shows that, while only 36% of active equity managers beat their passive benchmarks over the trailing one, three, five and 10-year periods ending in June 2018, more than 70% of bond fund managers beat their passive indices.¹ This data seems to support the view that active investing "works" in fixed income.

But where is this excess return potential coming from? Academic research and investor surveys support the intuition that fixed income managers employ factors - either implicitly or explicitly. Invesco Fixed Income's own research corroborates this view: our analysis shows that most portfolios are exposed to factors even though none follow an explicit factor approach. This factor exposure explains a significant proportion of active returns in bond portfolios. For example, we see evidence that the value factor often helps explain excess returns (value bonds are those that have lower prices compared to similar peers).²

Investors appear to understand this too. In a recent survey by DWS,³ they cited forced sales after ratings downgrades of formerly high-quality bonds (commonly called "fallen angels") by institutions such as central banks, commercial banks and insurance companies as a reason why active management is able to outperform benchmarks. This finding is formalized in academic literature; Wang, Zhang and Zhang (2017)⁴ found that mutual funds provide liquidity to insurance companies during forced bond sales and that this is associated with excess returns. This phenomenon is part of what we capture with our value factor in fixed income.

An initial example: rating downgrades illustrate the value factor at work

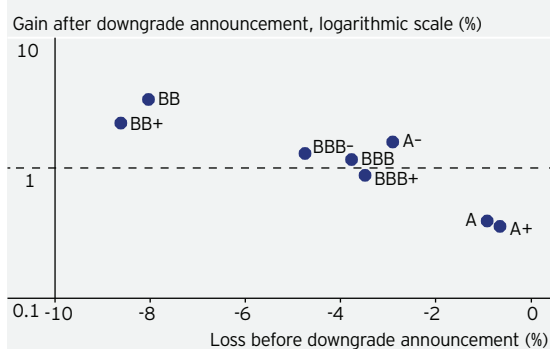
Invesco Fixed Income's research shows that this phenomenon occurs at most credit rating levels. Figure 1 shows bond returns before and after a

In our view, this risk-return tradeoff is the basis of factor investing.

Risk transfer gives rise to factors

The relationship between risk and return is at the heart of factor investing. This risk transfer between market participants with different risk appetites, as predicted in Merton's Intertemporal Capital Asset Pricing Model, naturally gives rise to factors.⁶ In this framework, the liquidity provided by investors in the case of fallen angels is a risk transfer from more risk-averse to more risk-seeking investors. Investors may not realize that they are articulating the benefit of a value factor as a reason for active management to outperform a benchmark - a fact that motivates us to look for other factors that might drive investment performance.

Figure 1
The risk and return surrounding downgrade announcements



The figure shows the return of bonds relative to sector and maturity-matched peers 12 months prior to a downgrade announcement (x-axis) and the return after the downgrade announcement (y-axis).

Source: Bloomberg Barclays US Investment Grade Credit and US High Yield Credit Indices, Invesco calculations, from 1 January 2000 to 30 June 2018. **Past performance is not a guide to future returns.**

downgrade announcement. Bonds tend to lose value before a downgrade announcement and to recover afterwards. While a second downgrade is more likely to occur after the initial downgrade,⁵ it is by no means certain, and it is more likely in recessions. In other words, while some bonds may be subject to further downgrades, bonds on average tend to recover. In our view, this risk-return tradeoff is the basis of factor investing.

The median factor manager relied on liquidity, carry and value to outperform the benchmark

Our analysis covered active manager returns in the core bond fund space to understand whether factors could help explain returns in excess of the benchmark. We sampled 65 investment managers representing the largest managers in the Lipper

Table 1
Active management returns in the Core Plus peer group

	Net information ratio	Gross information ratio	Gross active return (%)	Tracking error (%)
75 th percentile	0.13	0.21	0.97	1.50
Median	0.04	0.13	0.34	1.12
25 th percentile	-0.03	0.08	-0.15	0.85

Source: Bloomberg L.P., Invesco calculations from 1 January 2007 to 30 June 2018. **Past performance is not a guide to future returns.**

Core Plus peer group over the period from 1 January 2007 to 30 June 2018. Table 1 shows summary statistics for the funds considered. "Net IR" refers to the information ratio, or the annualized net-of-fee active return per unit of tracking error; "Gross IR" is the gross-of-fee information ratio. The gross active return is the annualized return of the fund over its benchmark in percent. The tracking error is the annualized standard deviation of the gross active return.

Factors drove most of the outperformance versus benchmarks

Table 1 supports the idea that active managers often beat their benchmark. To understand the drivers of these excess returns, we regressed factor returns against the active returns. For each fund, we aggregated monthly total returns (price returns plus any dividends) and added back stated manager fees to approximate gross monthly returns. Each fund's returns were then subtracted from the benchmark returns to calculate "active" returns.

After calculating each fund's active return, we regressed factor returns against active returns. We utilized a robust form of regression using a bootstrapping method to reduce factor exposures that could be spurious, insignificant or transitory. Several factors were considered, including duration, carry, value, quality and liquidity.

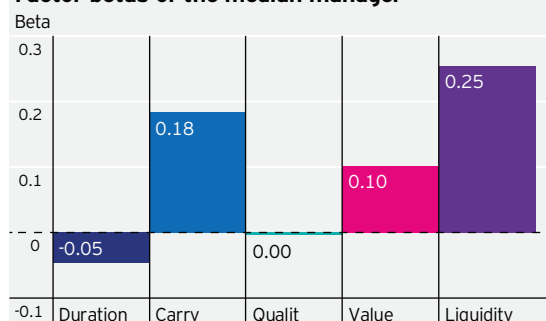
We used the Bloomberg Barclays US Treasury Index total return to represent duration return and the duration-hedged return of the Bloomberg Barclays US Credit Index to evaluate carry. The duration-hedged returns to liquidity, quality and value are discussed in more detail in Raol and Pope (2018)⁷ and are described in the box below.

Factor exposures explained 66% of excess return variations

Figure 2 shows the regression results for the median manager. It shows the average beta, or correlation coefficient, between the factor and the manager's active return. The median manager had positive exposure to carry, liquidity and value. There was no

Figure 2

Factor betas of the median manager



Source: Bloomberg L.P., Invesco calculations from 1 January 2007 to 30 June 2018.

significant quality exposure and negative exposure to duration. This means the majority of managers were able to beat their benchmarks by holding older, smaller issue size bonds with lower ratings and longer maturities than the benchmark average (large exposures to the liquidity and carry factors). To a lesser extent, managers held securities that were cheap relative to their sector and rating peers (value exposure). Managers appeared to allocate very little to US Treasury bonds and high-quality credit. On average, across the entire peer group, factor exposures explained 66% of the benchmark excess return variations - a substantial portion.

Factor exposures explained 66% of the benchmark excess return.

Invesco Fixed Income credit factor definitions

We found four factors that help explain credit returns across bonds and investment environments:

Carry	Quality	Value	Liquidity
The carry factor captures the excess return resulting from higher yielding bonds regardless of credit rating. In this context, it is synonymous with the concept of a credit premium, but a carry factor can be more general in other contexts.	The quality factor explains the higher risk-adjusted returns associated with holding low-volatility bonds and is widely observed in the academic literature. ⁸ These bonds typically have short maturities and low default risk as measured by their ratings. The quality factor is a characteristic of securities that tend to be good stores of value during times of market stress since they have low volatilities.	The value factor explains the excess return obtained by holding assets that are priced at a discount relative to similar securities. Since a bond's price is a function of its default risk, a natural definition is to identify bonds priced at a discount relative to their implied default rates. These factor returns include transaction costs of 10-40 basis points, depending on the maturity and rating of the bond.	The liquidity factor explains the excess risk and return associated with holding illiquid bonds and has been well researched in the literature. ⁹ The liquidity factor is defined by older vintage bonds that are small in issue size relative to large, newly issued bonds.

These results have several interesting implications. First, they show that investors likely already have exposure to factors in their portfolios - either implicitly or explicitly. Once we acknowledge the role factors play, we can take control by exploring the ramifications:

- To which factors should investors have exposure?
- How much factor exposure should they have?
- How much should they pay for factor exposure?

Figure 3 plots each fund's R-squared against its management fee. We see that no clear relationship emerges. In an ideal world, higher fees should be associated with funds that demonstrate consistently high alpha beyond factor exposure. Funds with consistent factor exposure but little alpha should likely cost less than high-alpha funds but still be more valuable than strategies that do little more than replicate the market. Yet the reality is different.

Conclusion

With a clear understanding of a strategy's factor exposures, alpha generating ability and costs, investors have more information to help determine the likelihood of achieving their desired result. Fixed income factor strategies can be utilized to complement other strategies through explicit factor exposures, replace inefficient or cost-ineffective strategies or diversify the overall portfolio. We will explore these issues further in upcoming articles on factor investing in fixed income.

Figure 3

Fees and factors - no clear relationship



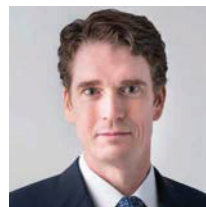
Source: Bloomberg L.P., Invesco calculations from 1 January 2007 to 30 June 2018.

About the authors



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Notes

- 1 <https://www.morningstar.com/blog/2018/08/23/actively-managed.html>.
- 2 For a more detailed explanation of Invesco Fixed Income factor definitions, see Raol, J. and Pope, S. (2018), "Why should investors consider credit factors in fixed income?" Invesco Working Paper 2018.
- 3 <https://etf.dws.com/LUX/ENG/Download/Brochure/79382ba7-e035-4e69-b085-dff2232528c7/Passive-Investing-Research-2018-2336.pdf>.
- 4 Wang, Zhang and Zhang (2017), "Fire Sales and Liquidity Provision in the Corporate Bond Market", Working Paper.
- 5 D. Lando and T. Skodeberg (2002), "Analyzing rating transitions and rating drift with continuous observations", *Banking and Finance*, Vol 26, pp. 423-444.
- 6 Merton (1973), "An Intertemporal Capital Asset Pricing Model", *Econometrica*, Vol. 41, No.5, pp. 867-887.
- 7 Raol, J. and Pope, S. (2018), "Why should investors consider credit factors in fixed income?" Invesco Working Paper 2018.
- 8 For example: Frazzini, Andrea and Pedersen (2014), "Betting Against Beta", *Journal of Financial Economics*, 111, 1-25. Low-volatility bonds are typically characterized as bonds with short maturities and low default risk.
- 9 Bao, Pan and Wang (2011), "Liquidity in Corporate Bonds", *Journal of Finance*, 66, 911-946.

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