

INSIGHTS SERIES

Perspectives and viewpoints
on investing in today's market

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Using momentum investing to enhance fixed income returns

Executive summary

Momentum is a well-established investment style in equities, currencies, and commodities, but should fixed income investors take a closer look at this approach, too? Recent studies provide evidence that the answer is yes. Today's low interest-rate climate and general hunt for yield have many investors naturally looking for ways to enhance their fixed income returns, and there is evidence that buying on upward momentum may offer an effective way to expand the investment potential of this key asset class.

Key takeaways

- Momentum has been well-documented as a successful stock selection strategy, as well as for cross asset allocation in managed futures strategies.
- New research suggests momentum may also be used to strengthen the risk/reward profile of fixed income investments.
- In addition, a momentum fixed income strategy may add a diversified return source to help complement a traditional core bond allocation.

The power of momentum

Momentum-style strategies overweight securities that have recently performed well and underweight securities that have recently performed poorly, essentially following a particular pattern or trend. The premise behind this approach is that asset price trends have historically tended to be longer term, and securities that are rising in value often keep going up. Indeed, a number of studies has documented sizable and economically important return advantages from this momentum effect within individual equities.¹ Not surprisingly, investment strategies that rely (fully or partially) on momentum signals to guide portfolio positioning are now well-established within equity fund management. Kahn and Lemmon (2016) found that for many equity fund strategies, so-called “smart beta” factors, including momentum, explained more than 40% of the active risk taken.²

Until recently, most momentum research has focused on equity investing, and to some extent, on currencies and commodities. However, recent studies have documented positive momentum effects for equity indices, commodity futures, currencies, and government bond futures. Indeed, many managed futures funds rely significantly on trend following in their investment strategies.³ Durham (2015) showed that a strategy using momentum signals to position along the government bond term structure could outperform a passive long-only strategy. This study is particularly interesting because it illustrates that momentum investing can enhance the return even for a long-only investor who is constrained to maintain portfolio duration in line with the benchmark.

In the case of the Durham study, the analyzed segments were referred to as “buckets” of bonds with different duration, and the strategy used the trends of total return indices for these fixed-income buckets to determine momentum and position accordingly, resulting in enhanced returns, without significantly increasing risk. Similar studies have documented significant momentum effects in corporate bond returns, and there is evidence that the potential profits from a momentum strategy have been rising over recent decades.⁴

While the additive benefits seem to be strongest within lower-rated segments of the corporate bond market, the momentum effects seen in corporate bonds do not appear to be derived from momentum in the issuing companies' stocks. By extension, it seems plausible that an approach based on gauging the momentum of different categories of the broader fixed income markets could be used to enhance returns for a long-only bond investor. A particularly interesting question is whether an investor allocating across a diverse range of fixed income categories, including government bonds, mortgage-backed securities (MBS), and corporate bonds, could benefit from a momentum strategy. We believe the answer is yes.

A tale of two investors

To illustrate the benefits of momentum investing across the broader fixed income market, consider a simple hypothetical scenario of two investors:

- One buying on momentum, investing in the two fixed income segments that performed the best during the past twelve months
- One buying for a contrarian play, investing in the two segments that have declined the most in value, expecting a reversal of recent trends

Each investor bought and sold their holdings and then reinvested their balances on a monthly basis, selecting from eight major fixed income segments:

- Three-month U.S. Treasury bills
- One- to three-year U.S. Treasury notes
- Three- to five-year U.S. Treasury notes
- Seven- to 10-year U.S. Treasury notes
- 10-year+ U.S. Treasury bonds
- Mortgage-backed securities
- Investment-grade corporate bonds
- High-yield corporate bonds

1. Jegadeesh and Titman (1993) documented that momentum strategies in individual stocks could generate superior risk-adjusted returns, net of trading costs.

2. Kahn and Lemmon (2016) studied fund manager correlations to six “smart beta” factors for equities (market, size, value, quality, low volatility, and momentum) using Barra's risk model.

3. Menkhoff, Sarno, Schmeling, and Schrimpf (2011) document momentum effects in currencies. More broadly, Asness, Moskowitz, and Pedersen (2013) show momentum effects across asset classes and markets, stocks, equity index futures, government bonds, currencies, and commodity futures.

4. Jostova, Nikolova, Philipov, and Stahel (2013) documented momentum effects in the corporate bond market.

In order to provide a long-term historical perspective of the momentum effects in these key fixed income categories, our analysis compiled more than 50 years (1963–2015) of monthly returns. Not all of the segments were available for the entire period. Mortgage-backed securities were added in 1976, and investment-grade and high-yield corporate bonds were included, starting in 1980. This enables a study of the momentum effects in the full range of fixed income categories over a 35-year+ period (see appendix for details on the data set). The results can be found in **Figure 3**.

The goal of this example is not to construct a complete, tradable strategy with parameters optimized to maximize returns and mitigate trading costs.⁵ Rather, the focus is to use the results from a simple, rules-based illustration to highlight historical performance characteristics and gain insights from the return patterns shown over time. Past performance is no guarantee of future results.

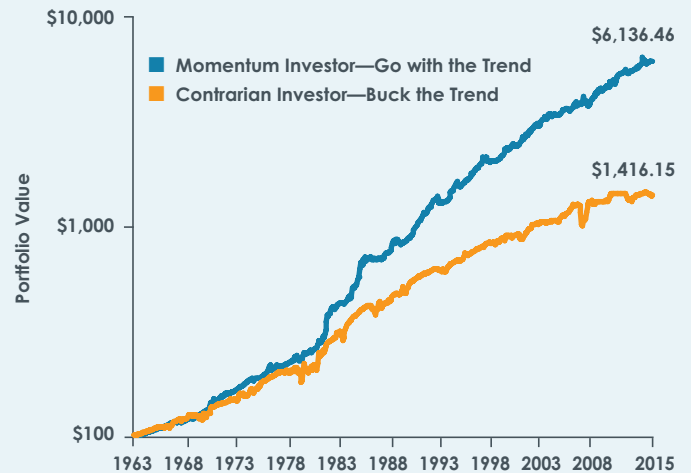
Consistent return advantage with momentum

As **Figure 1** shows, the difference in performance is significant. Based on an initial \$100 investment, the momentum investor's portfolio grew to \$6,136.46 — more than four times than the contrarian investor's \$1,416.15.⁶

Delving deeper into this performance offers additional insights into the potential benefits of a fixed income momentum investing approach. **Figure 2** shows the excess returns of the momentum investor compared to the contrarian investor on an annual basis, including rising (1970s and 1980s) and declining (1990s to now) bond yield periods. The momentum investor outperformed the contrarian investor in 62% of the periods (33 out of 53 years). The strategy was subject to higher volatility around the 2008–09 financial crisis and early recovery, but overall shows a fairly consistent batting average in terms of producing stronger returns across different decades. It is also worth noting that after declines, historically, the momentum strategy often recovered within a fairly short time frame.

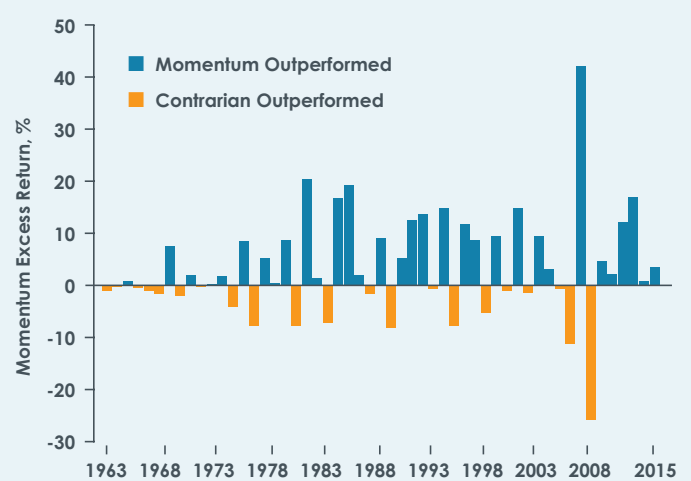
Figure 1: Historically, the Trend Was Your Friend in Fixed Income Investing —1963–2015

Based on Hypothetical \$100 Investment in Top Two vs. Bottom Two Performing Fixed Income Segments of the Prior Year



Past performance is no guarantee of future results, which will vary. An investment cannot be made directly into an index.

Figure 2: The Momentum Investor Outperformed the Contrarian Investor 62% of the Time—1963–2015



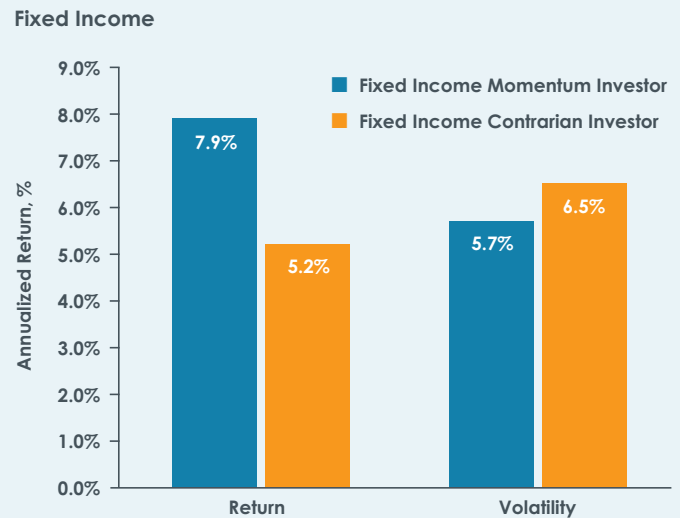
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5. For simplicity, the simulation is using bond indices as proxies for returns in different sectors of the fixed income market, but in practice, an investor would experience tracking error and trading costs, related to ongoing rebalancing of the underlying indices.
 6. Caveats apply to these statistics as trading costs and tracking error, relative to the underlying indices, could affect the results materially in practice. The results do, however, show evidence of the potential for enhanced returns from utilizing a momentum approach in fixed income, if portfolio turnover is managed well.

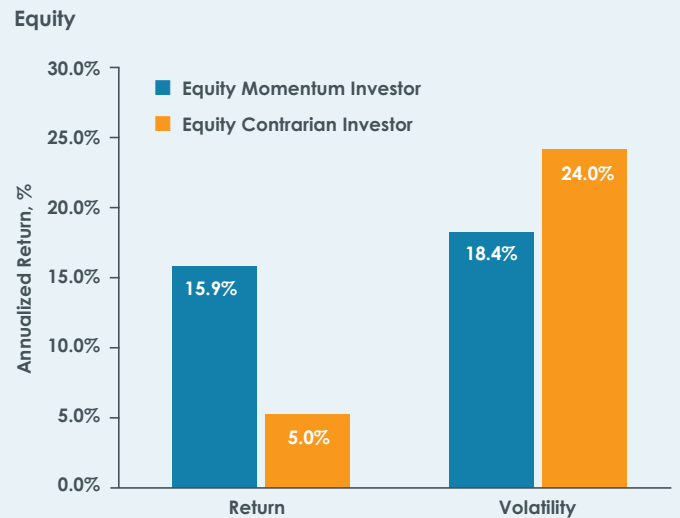
The momentum investor also achieved a substantially higher 7.9% average annual return than the contrarian investor's 5.2%, as shown in **Figure 3**. Moreover, despite this sizable return difference, volatility was roughly the same for both investors.⁷ In fact, the momentum investor experienced a slightly lower standard deviation of 5.7% versus 6.5%, which suggests that this outperformance is not driven by the momentum strategy simply selecting riskier fixed income categories. It also indicates, since both strategies can take positions in a broad range of fixed income sectors, including high yield corporate bonds, that investors may be able to enhance returns by utilizing momentum-style investing without necessarily adding significant risk by expanding the opportunity set to also include high yield bonds.

This higher average return bias was consistent with the trend shown in a similar U.S. equity-focused analysis,⁸ albeit less pronounced. Again, one scenario assumes investment in the top two deciles of U.S. stocks when sorted by performance over the past 12 months, thus following the recent trend.⁹ The second assumes investment in the bottom two deciles. Interestingly, the contrarian strategy in this example tended to show significantly higher volatility than the momentum approach, likely driven by the fact that stocks experiencing sustained downturns are more volatile on average, while underperforming fixed income categories are not necessarily more volatile.

Figure 3: Fixed Income Momentum Risk/Reward Benefits Consistent with Those in Equities—1963–2015



Sources: Bloomberg, Federal Reserve Economic Data (FRED). For details on how the indices were compiled, see appendix.



Source: Data library on Professor Kenneth R. French's web site, Dartmouth University, http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

Past performance is no guarantee of future results, which will vary. An investment cannot be made directly into an index.

7. The 0.23% average monthly difference in return has an estimated standard error of 0.09%, and the t-stat for testing whether this return differential is larger than zero is 2.65, implying that if there was, in fact, no difference between the top 2 and bottom 2 categories, the probability of observing a return differential this large would be as small as 0.04%.

8. The 0.91% average difference in monthly return has an estimated standard error of 0.22%, and the t-stat for testing whether this return differential is larger than zero is 4.08, implying that if there was, in fact, no difference between the top 2 deciles and bottom 2 deciles of stocks, the probability of observing a return differential this large would be as small as 0.003%.

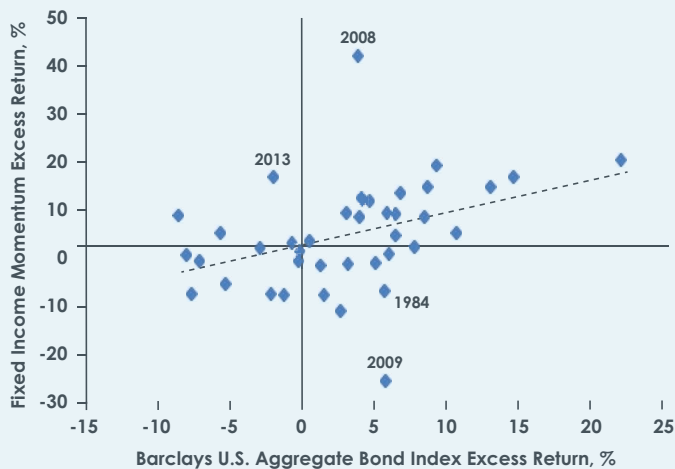
9. The momentum-sorted portfolios of Professor K.R. French use the past 12-month cumulative total return of each stock, but skip the most recent month's return. This is common in the literature on equity momentum as it captures the short-term reversal pattern often seen in individual stocks.

A potential, diversifying, excess return source

Fixed income momentum investing may also provide attractive diversification benefits. Again, applying the simplified example of our momentum and contrarian investors, **Figure 4** plots the annual excess returns of the momentum strategy over the contrarian approach against the annual excess returns of the Barclays U.S. Aggregate Bond Index over three-month U.S. Treasury bills for the period 1976 to 2015 (when the index's data began being tracked). It is worth noting that the performance of the momentum strategy exhibits only a moderate correlation with the performance of the index, generally considered a bellwether representation of the overall core bond market.¹⁰ Years with the most extreme outlier performance are also highlighted.

This indicates that the improvement in return from overweighting strong momentum categories and underweighting weak momentum categories is not generally dependent on the strength of the overall core bond market. Importantly, it also points to the fact that the momentum effects in our analysis are not simply driven by the trend decline in bond yields over recent decades. In fact, the momentum investor in our example shows positive excess performance in the majority of years — largely independent of whether the core bond market was up or down. For the 40-year period, this translates into positive excess returns 54% of the time for the 13 years the index produced negative excess returns and 74% of the time for the 27 years when the index achieved positive excess returns.¹¹ Overall, this results in the momentum excess returns outperforming 68% of the time, or roughly every two out of three years. It is interesting to note that this outperformance average is higher in years of overall positive core bond returns, but this may be due to the fact that trends have become more persistent in the latter part of the period, perhaps because of structural changes in investor behavior.

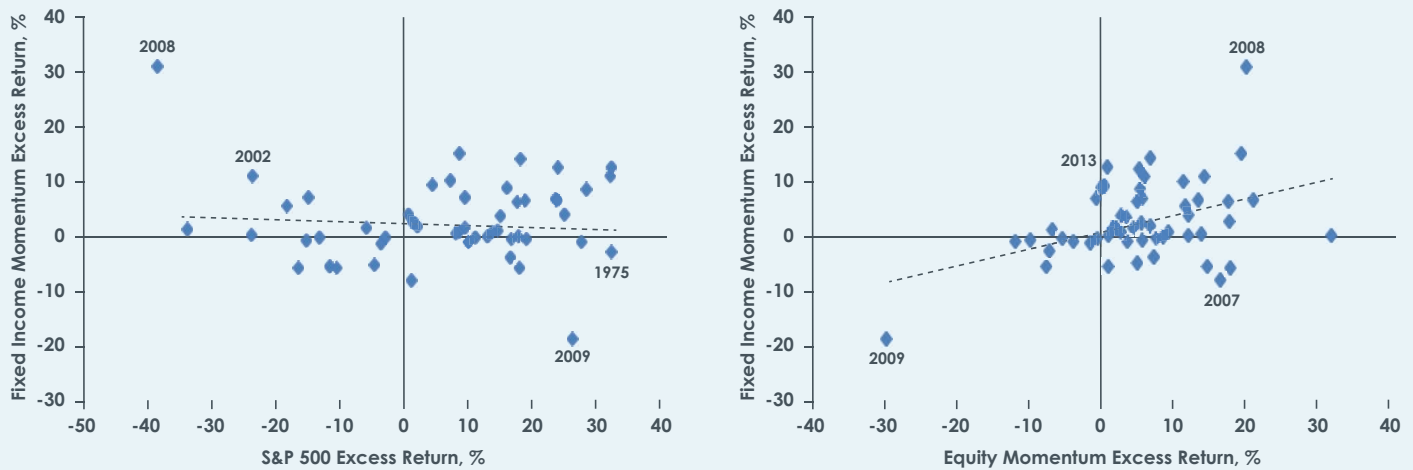
Figure 4: Low Correlation between Momentum Investor Excess Return and Broader Bond Market Excess Return—1976–2015



Past performance is no guarantee of future results, which will vary. An investment cannot be made directly into an index.

10. The correlation between annual returns for fixed income momentum and the Barclays U.S. Aggregate Bond Index is 0.39 with a t-stat of 2.57, which means the correlation is not significant at the 1% level.
 11. To be precise, this measures the Barclays U.S. Aggregate Bond Index returns in excess of three-month U.S. Treasury bill returns, and a negative excess return refers to when the bond market underperformed the risk-free rate.

Figure 5: Low to Negative Correlations between Fixed Income Momentum Investor Excess Return and Equity and Stock Momentum Investor Excess Return—1963–2015



Past performance is no guarantee of future results, which will vary. An investment cannot be made directly into an index.

Figure 5 plots annual excess returns for the fixed income momentum investor against annual excess returns for the S&P 500 over three-month U.S. Treasury bills. The correlation with equity market returns is slightly negative, but not significant.¹² This indicates that the strength of momentum effects in fixed income markets has not generally been dependent on the direction of the equity market, and thus, may offer a diversifying return source that has the potential to improve the overall return of a balanced portfolio, without adding significantly to the portfolio's volatility.

In addition, the same exhibit includes the correlations between both our fixed income and equity momentum investors' excess returns (the annual return differences between the momentum and contrarian examples). Interestingly, there is some correlation between these, but at 0.41, the correlation is moderate.¹³ In addition, if

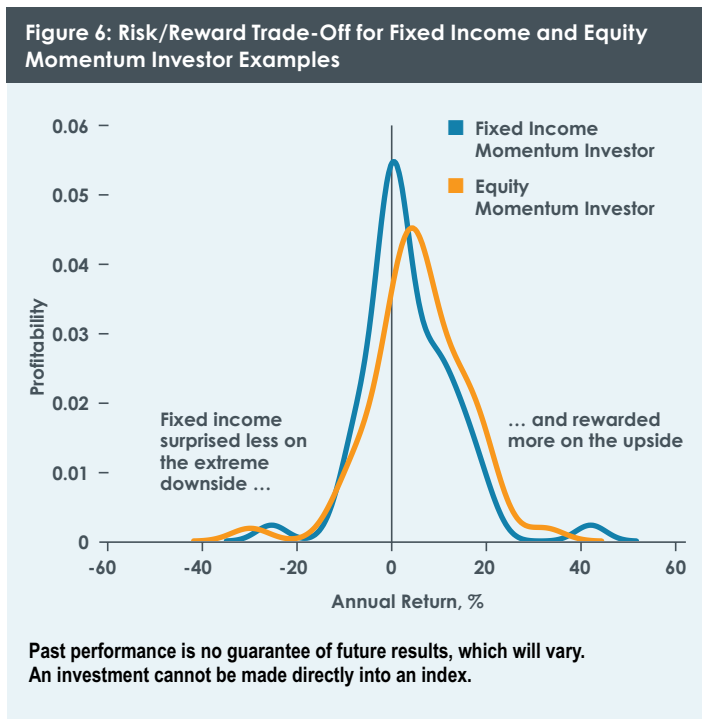
the extreme moves of 2008–09 are removed from the calculation, the correlation declines to 0.16, indicating that mainly two outliers are driving a substantial part of the initial result. While it appears that fixed income momentum and equity momentum are not completely unrelated, numbers still point to the factors behind momentum effects in equities not generally coinciding with the factors driving momentum effects across fixed income categories. Hence, it does not appear that investors with a momentum tilt in their equity positions would necessarily amplify their momentum exposure in any significant way if they add a momentum tilt to their fixed income positions as well.

12. The correlation between annual returns for fixed income momentum and the S&P 500 from 1988-2015 is -0.07 with a t-stat at -0.54, which is not significant at the 10% volatility level.
 13. The correlation between annual returns from 1963-2015 is 0.41 with a t-stat at 3.21, which is significant at the 1% level. Still, from a portfolio diversification perspective, 0.41 is a moderate correlation, and it is consistent with the findings of Asness, Moskowitz, and Pedersen (2013). Moreover, when eliminating just two outliers, 2008 and 2009, the correlation declines to 0.16 with a t-stat at 1.15, which is insignificant at the 10% level.

Evaluating momentum tail risk

Figure 6 shows the distribution of annual returns between 1963 and 2015 for the fixed income momentum and equity momentum investors. Both use the excess return differences between the returns of the momentum-driven investor and the contrarian investor as an indicator of the potential to enhance returns via momentum investing. Note, that to make the results comparable, returns have been scaled, so that both strategies match a volatility of 10%.¹⁴

There is evidence of slightly asymmetric distributions and somewhat fat tails for both equity momentum and fixed income momentum, but it is interesting to note that while the equity momentum example appears somewhat skewed to the downside, indicating that large losses are more frequent than large gains, the fixed income momentum example shows another tendency.¹⁵ Here, the returns appear to be skewed to the upside, with large gains more frequent than large losses. From a fixed income investor's perspective, this is an intriguing difference.



What explains these momentum effects?

Given the significance of momentum effects in both equities and fixed income, it seems natural to ask whether these effects will eventually decay, as more investors attempt to take advantage of them. However, researchers have pointed to a number of reasons why momentum effects may, in fact, be very persistent, as they relate to behavioral biases among investors and structural issues in financial markets. Here are several of the most important reasons:

- Studies have documented the so-called disposition effect in equity markets.¹⁶ Investors tend to sell winners too quickly and hold on to losers for too long, and such behavioral patterns among many investors leads to a delayed reaction to fundamental news, which in turn, implies that security returns will show momentum effects as prices adjust.
- Investors are sometimes subject to herding behavior, jumping the bandwagon trade that is trending right now.¹⁷ Eventually, this may lead to an over-reaction in market prices. Private investors may be influenced by peers to follow recent trends, and with low-cost trading vehicles increasingly available across asset classes, electronic trading, and a 24-hour financial news cycle, there are reasons to believe that this type of behavior may, in fact, play an increasing role across several asset classes.
- Fund flows increasingly react to changes in relative rankings among fund managers. Funds holding momentum securities will see fund inflows, while funds holding out-of-favor securities are more likely to see outflows. This may affect the price trends of these securities, especially in parts of the market that are not highly liquid.

14. To make returns comparable in terms of risk, equity position sizes were adjusted down and fixed income position sizes were adjusted upwards, so that both would have the same 10% volatility.

15. Technically, the skewness coefficient (the third standardized moment) is +0.74 for annual fixed income momentum returns, while equity momentum returns show a skewness coefficient of -0.50 for the period 1963–2015. This is evidence that both distributions show some asymmetry, but with fixed income momentum showing favorable upside asymmetry.

16. Grinblatt and Han (2005) provide evidence that the 'Disposition Effect' is linked to momentum in stock returns. Other studies have documented links to momentum in real estate and mutual fund investments.

17. Daniel, Hirshleifer, and Subrahmanyam (1998) discuss a theory of how investor under-reaction to fundamental news as well as, eventually, over-reaction are, in fact, not contradictory explanations.

- Herding or bandwagon behavior is not limited to private investors. Studies have shown that institutional investors may also act in ways that magnify recent market moves.¹⁸ Motivated by peer rankings, fund managers may trade in ways that amplify recent market moves. If managers overweighting a troubled segment of the market are drifting lower in peer rankings, other managers may rush into reducing their holdings of such assets, assuming that other peers might do the same. A similar mechanism works in reverse.
- With tighter regulation of banks in recent years, Wall Street broker/dealer inventories of bonds have declined significantly, which means less capacity for market makers to step in and take a contrarian position after a major market move.¹⁹ This may affect price dynamics, especially in the less liquid parts of the bond markets.
- Low interest rates, tighter regulation of the financial industry in general, and the rising use of liability-driven investing within pension funds in recent years have sometimes forced institutional investors to follow the recent trend in bond markets, simply because asset-liability management forces them to do so, though this is a more recent phenomenon.

It is also important to keep in mind that momentum investing is not risk-free, as momentum investors will tend to overweight securities that are 'in favor' and underweight the securities that are 'out of favor'. When there are sudden shifts in sentiment or market liquidity, momentum portfolios may underperform. In other words, returns generated by momentum-style investing are not a "free lunch." Momentum is a risk factor, and the return premium it delivers over the longer run is compensation for this risk.

Structural changes affecting fixed income investor behavior

The key to success in a momentum strategy is to position for market moves driven by behavioral patterns among investors. Momentum effects are driven by investors 'jumping on the bandwagon,' buying recent winners, and selling recent losers. While there can be many reasons why investors may choose to buy recent winners, there may be structural reasons why they are sometimes forced to do so, and a number of structural trends suggests this may, in fact, be increasing.

With the decline of bond yields in recent years, rising longevity, and the trend towards tighter regulation, many institutional investors, from banks to pension funds and insurers, find themselves increasingly constrained in managing their fixed income portfolios. In some cases, institutional investors may, in fact, be forced to be reactive and follow the trend — as opposed to being proactive by acting on their fundamental views — after a market move in either direction. For example, a decline in bond yields will put upward pressure on pension funds' or insurers' long-term liabilities, and it may affect the funding status of a pension plan or the capital coverage of a bank or insurer's balance sheet. With stress testing a more common and important part of decision making, institutional investors may be forced to reallocate their bond market exposure across both the duration and credit spectrum in order to comply with regulations and risk limits. This makes it harder for them to maintain a fundamental view of the markets and potentially take contrarian positions aimed at buying low and selling high.

The factors driving these changes in institutional investor behavior are likely to be very persistent. Changes in the regulatory environment, the backdrop of an aging population and rising longevity, as well as interest rates that remain low by historical standards, are all phenomena that tend to change at an almost glacial pace. Consequently, these structural issues lend further support to the view that momentum effects within fixed income are here to stay.

18. Feroli, Kashyap, Schoenholtz, and Shin (2014) document significant momentum effects in fund flows that are correlated with changes in peer rankings. They show evidence that this is driven by a feedback loop between fund flows and prices.

19. According to the New York Federal Reserve Bank, primary dealers held roughly \$5 billion of corporate bonds as of 4/13/2016. On 1/31/2007, before the financial crisis, the number was \$218 billion.

Conclusion

- Momentum has been used successfully as a stock selection strategy, as well as for cross asset allocation in managed futures products, and there is increasing evidence that it can be used within fixed income as well.
- The historical simulation experiment comparing a momentum-driven investor to a contrarian investor shows that simple, rules-based strategies, systematically rebalancing the portfolio to overweight recent winners and underweight recent losers, have the potential to enhance returns.
- In practice, active trading and rebalancing in the context of a more refined strategy are necessary, in order to capture the gains from these momentum effects. However, even with the caveats that apply to these simulation experiments, the results indicate a promising potential for momentum to enhance returns in an important asset class where yield is scarce.
- Importantly, the strength of fixed income momentum does not appear to be dependent on the overall direction of either bond or equity markets, and it is also not strongly correlated with the performance of equity momentum strategies. These results indicate that fixed income momentum has the potential to enhance returns over time, without necessarily exposing a portfolio to increased volatility.
- **Systematic, momentum-style investing is not just for use within equities, currencies, and commodities. It is time for fixed income investors to consider utilizing this style as well.**

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DATA SET UTILIZED IN OUR RESEARCH

Total return indices are calculated assuming coupons are reinvested in the index. In order to get return series with a sufficiently long history, we combined returns from several sources. Our sources for return data series:

Momentum Portfolios for U.S. Equities: Monthly equity returns sorted into deciles by recent momentum from the data library on Professor Kenneth R. French's web site at Dartmouth University.

3M Treasury Bills: Federal Reserve Economic Data (FRED) online data library. Monthly returns are calculated as 3M T-Bill Rate at beginning of month/12.

1–3Y Treasury Index: From Dec 1962–Jul 1976, not included. From Jul 1976–Dec 1979, we use a proxy 2Y Treasury Note Total Return Index created via a regression of total returns on levels and changes in the 2Y Treasury yield from Thomson Reuters. From Dec 1979–Dec 1991, we use Thomson Reuters Datastream's 2Y Treasury Note Total Return Index. From Dec 1991–Dec 2016, we use the Bloomberg/EFFAS 1–3Y U.S. Treasury Total Return Index.

3–5Y Treasury Index: From Dec 1962–Dec 1979, we use a proxy 5Y Treasury Note Total Return Index created via a regression of total returns on levels and changes in the 5Y Treasury yield from Thomson Reuters. From Dec 1979–Dec 1991, we use Thomson Reuters Datastream's 5Y Treasury Note Total Return Index. From Dec 1991–Dec 2016, we use the Bloomberg/EFFAS 3–5Y U.S. Govt Total Return Index.

7–10Y Treasury Index: From Dec 1962–Dec 1979, we use a proxy 10Y Treasury Note Total Return Index created via a regression of total returns on levels and changes in the 10Y Treasury yield from Thomson Reuters. From Dec 1979–Dec 1991, we use Thomson Reuters Datastream's 10Y Treasury Note Total Return Index. From Dec 1991–Dec 2016, we use the Bloomberg/EFFAS 7–10Y U.S. Govt Total Return Index.

10+Y Treasury Index: From Dec 1962–Mar 1977, not included. From Mar 1977–Dec 1979, we use a proxy 30Y Treasury Bond Total Return Index created via a regression of total returns on levels and changes in the 30Y Treasury yield from Thomson Reuters. From Dec 1979–Dec 1991, we use Thomson Reuters Datastream's 30Y Treasury Bond Total Return Index. From Dec 1991–Dec 2016, we use the Bloomberg/EFFAS 10+Y U.S. Govt Total Return Index.

MBS Index: From Dec 1962–Dec 1976, MBS are not included. From Jan 1976–Dec 2016, we use the Barclays U.S. Mortgage Backed Securities Index.

Investment-Grade Corporate Bond Index: From Dec 1962–Dec 1979, not included. From Dec 1979–Dec 1989, we use the Citi USBIG Corporate Index. From Jan 1990–Dec 2016, we use the BAML U.S. Corporate Master Index.

High Yield Corporate Bond Index: From Dec 1962–Dec 1979, not included. From Dec 1979–Aug 1986, we use the BAML U.S. High Yield 100 Index. From Sep 1986–Dec 2015, we use the BAML U.S. High Yield Master II Index.

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