

Research Brief

Trend following in a rising-rate environment

Fixed income trend following strategies have benefited over the past 35 years from the combination of a general downwards drift in interest rates and a positive roll yield. Now that rates have started to rise in the US, investors may be concerned that the roll yield could act in the opposite direction to falling spot prices and reduce the returns that trend following on bond futures can earn going forward.

In this research brief, we show that roll yields on US 10-year Treasury note futures have mostly acted in the same direction as spot prices in the past and that there was no significant difference in trend-following performance between the various interest rate and roll-yield “regimes” we identified.

In April 2014, we examined the historical performance of a trend-following strategy on US 10-year Treasury note futures in a research brief titled *Trend Following and Interest Rates*. We found the strategy performed well in both rising and falling interest rate regimes. This result may have surprised those who would expect the roll yield¹ to work against the trend follower in a rising-rate environment.²

Over the past 35 years, the US 10-year Treasury note futures have mostly been in backwardation, which occurs when the government bond yield is greater than the short-term interest rate, resulting in a positive roll yield. In addition, as rates have generally drifted lower over this period, the spot price has trended upwards. Together these produced positive average returns for the cash market and a steep and upwards long-term trend in the back-adjusted futures price³, as seen in figure 1, overleaf.

At the heart of arguments around the prospect of poor trend-following returns is the assumption that bond futures will continue to provide a positive roll yield as we move into a regime of rising interest rates. This would result in the roll yield and changes in spot prices acting in opposite directions and offsetting each other.

¹ The roll yield is the return captured from the convergence of the futures price to the spot price during the life of the futures contract.

² See: Niederhoffer & Weddepohl, *CTAs and rising interest rates: is the party over?*, 2014.

³ The back-adjusted price series reflects the returns of a long position in the front contract of the futures market.

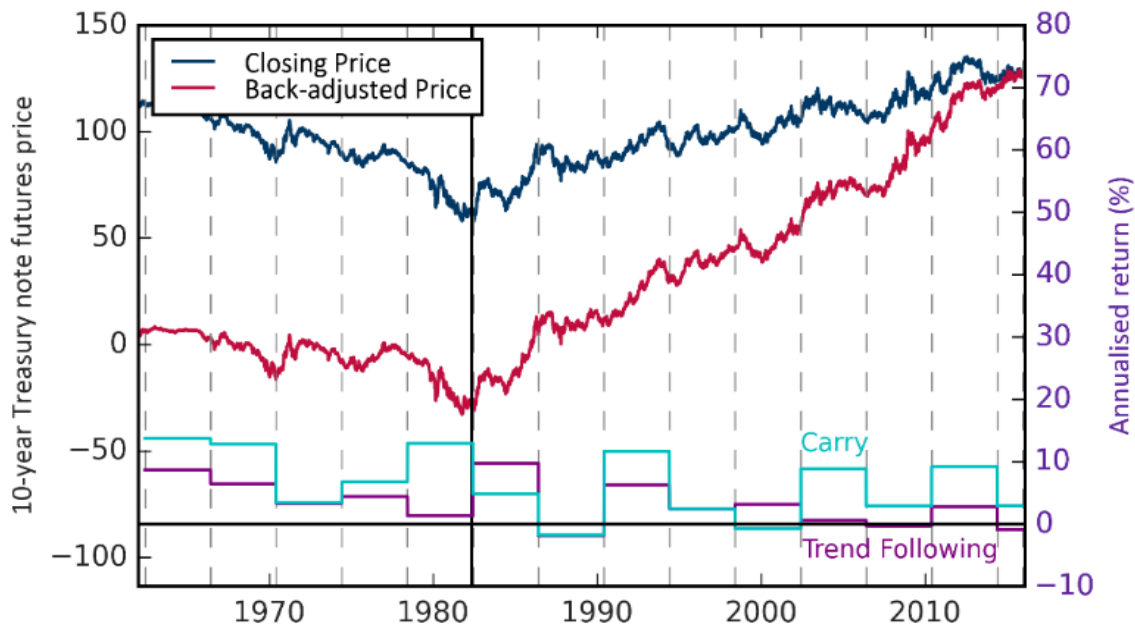


Figure 1. Left-hand axis: Closing (blue) and back-adjusted (red) US 10-year Treasury note futures prices; Right-hand axis: the performance of trend following (purple) and carry (light blue) in four-year, non-overlapping periods from 1962 to 2015; May 1982 (the black line) roughly separates two interest rate regimes.

First and foremost, trend-following performance depends on the interaction between changes in the spot price and the roll yield over the timescales a system is designed to be profitable on; not long-term directional trends in contract prices alone. That said, our analysis suggests that markets have tended to provide a negative roll yield when rates rise.

To reach this conclusion we ran historical simulations of trend-following and carry systems on US 10-year Treasury note futures.⁴ Carry strategies attempt to directly predict and profit from the roll yield. On the right-hand axis of figure 1 we show the annualised return, gross of transaction costs, of carry (light blue) and a medium-speed trend-following system (purple) during four-year, non-overlapping periods. Both systems had an approximately constant annualised volatility of 10%.

We then separated the price history into two distinct periods: January 1962 to April 1982, when interest rates generally rose (and prices fell), and April 1982 to December 2015, when interest rates broadly fell (and prices rose). Comparing these two periods, there was no significant change in the performance of the two systems.⁵

We also used our backtest to simulate the performance of trend following when the market was in backwardation or contango — that is, a positive or negative roll yield, respectively — and in rising and falling interest rate environments. We use the sign of the carry signal to identify whether the market is in contango or backwardation.⁶ Table 1, overleaf, shows the annualised return (and the corresponding standard error) of trend following in each of these four “regimes”. In brackets, we have provided the total numbers of years spent in each regime.

⁴ We focus on a single market for simplicity and select US 10-year Treasury note futures as it is the largest bond futures market by volume. A similar analysis could be applied to other bond markets if historical government bond yields and short-term interest rate data is available. The futures prices have been synthesised from April 1982 back to January 1962 by using historical bond yields and short-term interest rates, assuming spot-future parity. Our trend-following system starts from May 1962, while our carry strategy starts from July 1963.

⁵ We need to be careful when analysing the profitability of a trading system that uses synthetic data. Synthesised futures prices are an estimate of what a futures contract would have traded for at the time and tend to be smoother than real prices.

⁶ In this case, defined as the government bond yield minus the short-term interest rate.

| Annualised return (number of years in regime) | | |
|---|-------------------|-------------------|
| | 1963-1982 | 1982-2015 |
| Backwardation | 3.2 ±4.1% (6.1Y) | 2.3 ±1.6% (27.3Y) |
| Contango | 7.3 ±3.9% (12.3Y) | 5.3 ±3.3% (6.0Y) |

Table 1. The historical performance of a simulated trend-following system on US 10-year Treasury note futures in four “regimes”. The total period in years spent within each regime is in brackets. The errors on the annualised returns are standard errors.

For the most part, we found that US 10-year Treasury note futures were in backwardation during the falling-rate period but in contango during the rising-rate period. This means that roll yields and changes in spot prices tended to be in the same direction, potentially amplifying futures price trends.

We also saw that the trend-following strategy had performed well in all four combinations of the interest rate and roll yield “regimes”; delivering positive performance when roll yields and spot price changes were acting in the opposite direction. Interestingly, during the falling-rate period, the system performed better when the market was in contango rather than in backwardation, on average. However, the differences in returns between the four “regimes” were not statistically significant.

While we have only assessed a single trading system on a single market, and past performance is no guarantee of future results, this brief shows the dangers of making performance assumptions that are not backed up by the analysis of data.

LEGAL DISCLAIMER

This document is communicated by Winton Capital Management Limited (“WCM” together with its affiliated companies, “Winton”), which is authorised and regulated by the UK Financial Conduct Authority, is registered as an investment adviser with the US Securities and Exchange Commission (“SEC”), is registered with the US Commodity Futures Trading Commission and is a member of the US National Futures Association.

The information herein does not constitute an offer to sell or the solicitation of any offer to buy any securities in a fund established, advised or managed by Winton.

No guarantee or representation is made that an Investment Program will achieve its investment objective and the value of investments made in accordance with an Investment Program may go down as well as up. Past performance is not indicative of future results. This document may contain simulated or hypothetical performance results that have certain inherent limitations. Unlike the results shown in an actual performance record, these results do not represent actual trading.

The information herein may be approximate, is subject to updating and further verification and may be amended at any time and WCM is under no obligation to provide you with an updated version. The information contained in this document is believed to be materially correct but WCM makes no representation or warranty as to its accuracy or completeness and accepts no liability for any inaccuracy or omission. Information obtained from third parties is believed to be reliable but has not been independently verified by WCM.