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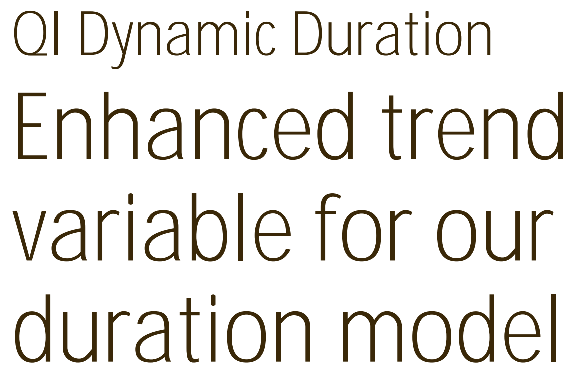

QI Dynamic Duration

Enhanced trend variable for our duration model

- Duration model determines positioning Dynamic Duration funds
- Ongoing enhancement effort led us to adjust its trend variable
- This will lead to lower turnover

We have enhanced the trend variable of the duration model in two ways: we extend the lookback period somewhat and we adjust the implementation to avoid short-term reversals. These adjustments will only have a minor impact on the information ratio of the trend variable, but they will lower turnover.

Based on thorough backtests, we found that using a somewhat "longer-term" trend variable can substantially reduce turnover without harming the information ratio. Furthermore, we can refine the trend variable to avoid short-term reversals, in line with momentum variables applied for equities. Therefore, we decided to implement the enhanced trend variable from March 2019 onwards.

Article
For professional investors
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Asset classes are often considered from a standalone perspective. But financial markets don't work in isolation. They interact across geographies and asset classes and give rise to similar market anomalies. For investors, this means valuable information can be gleaned from analyzing data on one asset class, to invest in another.

With this in mind, Robeco's quantitative research team recently investigated whether the trend variable used in our long-standing duration model could benefit from insights gained in other asset classes. Because the trend variable used in this model is "shorter-term" than those we apply to other asset classes, we analyzed whether it would make sense to implement a more "long-term" one in this model as well.

Proven model

Robeco's quantitative duration model was developed in the 1990s and has been the sole instrument to systematically determine the duration positioning of our Dynamic Duration strategies since 1998. Thanks to its pronounced active duration positions and lack of inherent bullish or bearish bias, the model has proved able to deliver both attractive absolute returns, in times of falling yields, and downside protection against rising yields, therefore providing strong diversification benefits.

The model forecasts changes in interest rates for the main developed government bond markets: the US, Germany and Japan. This is done using financial market data to extrapolate expectations concerning the fundamental drivers of bond markets – inflation, economic growth and monetary policy – as well as variables based on the proven value and trend factors.

The basic principles behind the model have not changed over the past two decades. We still derive growth expectations from equity markets and use commodity prices as inflation variable, although we have switched to a broader commodity index and refined the way we compute the momentum of this index. We still use the slope of the yield curve as valuation variable and the model still contains a trend variable.

Refining the trend variable

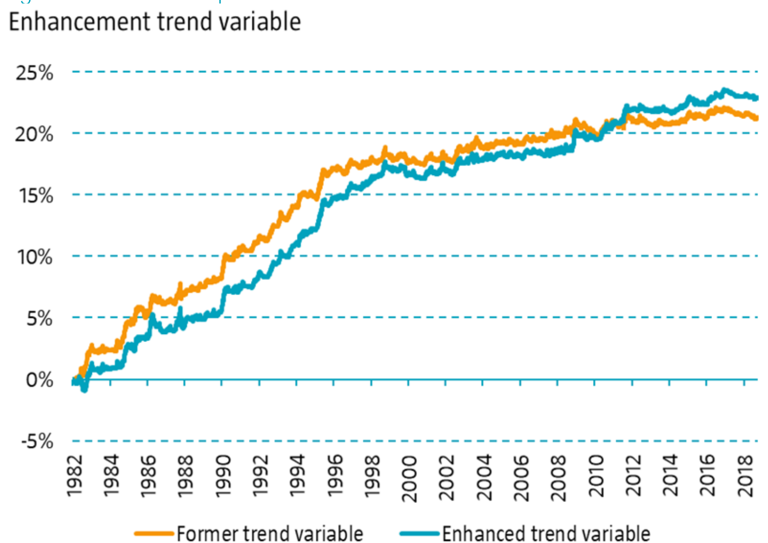
As part of our continuous effort to improve the duration model, our researchers recently analyzed whether its trend variable could be improved using a more "long-term" variable. Combined with a seasonal variable, the trend variable is used as a timing variable in the model. These variables complement the information given by financial market data to capture expectations on the key drivers of bond markets, as well as the valuation variables used to assess how much these expectations are already discounted in bond prices.

Concretely, our researchers analyzed the consequences of replacing the existing trend variable with a somewhat "longer-term" one. They also looked at ways to avoid short-term mean-reversion effects.

The idea behind these adjustments was twofold. First, the trend variable used until now in the duration model was much "shorter-term" than those applied in Robeco models for other asset classes. Second, bond markets necessarily experienced changes in the way they operate over the past quarter-century, for example due to the rapid rise of passive fixed income strategies. As a result, it made sense to analyze whether a better trend variable could be set.

The main finding of simulations over the 1982-2018 period is that this new trend variable would have led to a meaningful reduction in the turnover of the strategy – more than 10% – without weighting on returns, over the whole sample period. Figure 1 illustrates this. It shows the backtested cumulative performance that would have been generated by the two versions of the trend variable.

Figure 1. Cumulative performance for the old and the new trend variables



Source: Robeco.

The new trend variable would have generated a slightly better outcome over the whole sample period, due a better performance during the last two decades. Meanwhile, the turnover of the strategy would have been consistently lower during the sample period, thanks to this slower trend variable, in particular during the 2008-2018 decade.

Changing global bond markets

Bond markets – like equity markets – have changed over the past decades, due to the emergence of index-based products such as futures, ETFs and index mutual funds. For equity markets, a forthcoming paper by Robeco's Guido Baltussen, and fellow researchers Sjoerd van

Bekkum and Zhi Da,[1] shows that while serial dependence in daily to weekly equity index returns around the world had been traditionally positive, it has turned significantly negative since the emergence of index-based products.

We find that the emergence of index-based products has affected bond markets in a similar way. This explains why the performance impact of the adjustment to avoid short-term reversals, which would have been negative over the first decade of the backtest period, has become increasingly positive from the mid-1990's onwards.

Conclusion

While the basic principles behind our duration model have not changed over the past two decades, our researchers constantly seek for further refinements, in order to maximize the after-cost performance of our Dynamic Duration strategies for our clients. The recent enhancement of the trend variable of the model is part of this ongoing effort.

[1] Baltussen G., Van Bekkum S. and Da Z., 'Indexing and Stock Market Serial Dependence Around the World', Journal of Financial Economics, forthcoming.

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