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CAPITAL ATTRIBUTION

FLAMETREE TECHNOLOGIES PTY LTD

Introduction

Historically, there are two ways to measure the effects of changes in the shape of the yield curve on your portfolio.

The first is to decompose changes in the yield curve into parallel shift, twist, etc.

The second is to go back to basics and use the well-known Brinson approach - but the sectors to be used are duration or maturity buckets, rather than industry sectors or credit buckets.

Is it possible to run fixed income attribution without a yield curve?

Ordinarily, the answer is always 'no'. By its nature, fixed income attribution measures the effects of changes in the shape of the curve.

However, it is sometimes possible to find a way around this restriction. If you have security-level yields, you can go a long way towards a full attribution analysis without using any curve data.

Let's consider the various effects and attribution analysis measures.

Carry return is generated by the passage of time, and is closely approximated by

$$r_{carry} = y \times \delta t \tag{1}$$

where y is yield to maturity.

Curve return is given by

$$r_{curve} = -MD \times \delta y \tag{2}$$

where δy is the change in the security's yield.

Without curve data, we cannot say anything about the return generated by changes in spreads, or parallel vs. non-parallel movements in the sovererign curve. But we can still aggregate return from all yield movements into a single number, which we call capital return, since it is effectively measured from changes in the capital price of the underlying bond.

We can also calculate convexity return, but not rolldown,

since this is driven directly from the shape of the curve.

As a fixed income analyst, I spend plenty of time talking about yield curves. But it's important to remember that not everyone needs this level of detail.

Implementation

FIA implements this attribution model using the *Capital* switch. If turned on, no sovereign curve or spread effects are calculated, and a single return for curve effects is displayed on all reports. There is no need to supply any yield curve data as long as individual security yields are supplied along with weights and returns.

For instance, consider a duration allocation analysis, where the returns of the portfolio are broken down into

- carry
- market direction return
- duration allocation returns
- security-specific returns

For this type of investment strategy, there is no need to measure the effects of detailed curve movements, because the portfolio is not managed in these terms.

Capital attribution is *not* suitable if you need to measure

- curve decomposition effects (parallel/non-parallel movements, shift/twist/curvature, etc)
- credit effects
- rolldown return

as all curve, credit and security-specific effects are combined into a single measure: the change in security yield. However, this disadvantage may be outweighed by the lower data requirements of capital attribution.

Biography

ANDREW COLIN is founder and CEO of Flametree Technologies, a company that provides innovative performance and attribution software to fund managers of all sizes. He was previously Head of Fixed Income Research at StatPro Ltd, and has held positions in finance, academia and defence in the UK and Australia.

Andrew holds a PhD in applied mathematics from the University of St Andrews. He is a Fellow of the Institute of Mathematics and its Applications, and holds Chartered Mathematician (C.Math) accreditation.

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