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Why discounting cashflows is so much better than making funding level projections

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About a year ago we put out a **thought piece** explaining how to assess whether a portfolio of assets can be expected to generate enough cashflow to meet a set of liability obligations, even if future loss given default experience is materially worse than expected, and without relying on future reinvestment conditions.

In this short follow-up note, we will show why the approach previously described is so much better than the traditional approach of developing return distributions and projecting funding levels.

We previously showed that if the present value of asset cashflows is greater than or equal to the present value of liability cashflows using a consistent (and close to risk-free) discount rate, then the asset cashflows should be sufficient to meet the liability cashflow obligations. The main attractions of this approach are:

1. It is well suited to hold to maturity bond (and bond-like) asset portfolios which generate defined cashflows though time;
2. It can consider downside risk by varying loss-given default assumptions rather than by generating return distributions;
3. It reflects the 'pull-to-par' nature of bond and bond-like assets, unlike traditional models which project return distributions;
4. No re-investment assumptions are required; and
5. It takes into account the excess returns that will be generated on high quality assets that will be held beyond typical projection periods.

In this short note we illustrate why point number 4 is so important, and show how traditional funding level projections can over-state (or under-state) whether a portfolio of assets is likely to meet liability obligations. We will consider points 2 and 3 above in our next thought piece which will show why traditional approaches almost always over-state the risks associated with hold to maturity bond and bond-like portfolios.

Asset portfolio sufficiency

The discounting approach can show whether a portfolio of assets is sufficient to meet the liability cashflow obligations under either central loss-given default assumptions, or under stressed assumptions. We will consider the latter in our next thought piece.

Traditional approaches to assessing asset sufficiency rely on funding level projections which are based on asset return assumptions.

We will use the following simple example to illustrate why such an approach is less reliable than a discounted cashflow approach.

Example:

Single liability cashflow of £1,000 in 10 years' time.
Asset value of £590.

Using risk free discount rates at 30 June (10 year zero coupon yield of 4.4%), the present value of the liability cashflow is c£650 (i.e. 91% funded).

If the asset portfolio generates an excess return of 1% per annum (pa) it will be worth £1,000 in 10 years' time and will be sufficient to meet the liability cashflow obligation. Thus a traditional funding level projection would consider an asset portfolio with an expected excess return of 1% to be sufficient to cover the liability.

If an asset can be found which can be expected to generate an excess return of 1%pa over the full 10 year period (e.g. a portfolio of 10 year zero coupon corporate bonds offering a 1% spread, net of expected loss given default), then the traditional approach works. However, in the real world, the individual assets in most portfolios have a range of different terms to maturity, and so whilst the expected return of each individual asset can be forecast reasonably accurately over its own maturity, the overall portfolio return is much harder to forecast with confidence over any single time horizon. This can be illustrated by comparing the following portfolios (where 'spread' should be read to mean full contracted spread less expected loss-given default):

1. **The simple portfolio of 10 year zero coupon bonds with a spread of 1%.** This portfolio has an expected excess return of 1%pa. Under the discounted cashflow approach, using consistent risk free discount rates for the asset and liability cashflows, the present value of the contracted cashflows is £650 (i.e. the same as the liability, and hence enough). A traditional projection starting with an asset value of £590 would correctly reach the same conclusion for this portfolio, as it generates an excess return of 1%pa over the full 10 year period, and will therefore generate the £1,000 required.

2. **A mix containing 50% in 5 year zero coupon bonds with a spread of 1% and 50% in 10 year zero coupon bonds with a spread 1%**. This portfolio also has an expected excess return of 1%pa, but under the discounted cashflow approach, the present value of the contracted cashflows is only £630 (i.e. not enough – more value will still need to be generated by reinvesting the cashflow that will be received in 5 years' time to generate more excess return). A traditional projection would not identify this vulnerability because it would typically make the implicit assumption (not unreasonably) that reinvestment terms in future are similar to investment conditions at the date of the projection. If in practice an excess return of 1%pa or better is still available in the market when the 5 year bonds mature, then the portfolio will generate the sum required, but if reinvestment conditions are less favourable it may not. This introduces uncertainty into the central assessment of sufficiency.

3. **A mix containing 50% in 5 year zero coupon bonds with a spread of 1% and 50% in 10 year zero coupon bonds with a spread 1.5%**. This portfolio has an expected excess return of 1.25%pa, and a present value of £650 (i.e. sufficient) under the discounted cashflow approach. This tells us that when the 5 year bonds mature, even if the redemption amounts are reinvested in risk-free assets, the portfolio will still generate the £1,000 required. Arguably misleadingly, the traditional approach would project the assets at the full expected excess return of 1.25%pa for the full 10 years, and could conclude that the portfolio is generating more return than it needs to resulting in an expected surplus or an expectation that full funding would be achieved in less than ten years. In actual fact, it is generating exactly the right amount of return, but the incidence of the excess returns are 1.25 pa for the first 5 years and a contracted return of 0.75%pa for the final 5 years, rather than 1%pa throughout. If maturity proceeds after 5 years are reinvested, the portfolio will then generate more return than it needs to, and thereby take more risk than it needs to (as all excess return comes with some risk).

4. **A mix containing 50% in 5 year zero coupon bonds with a spread of 1.5% and 50% in 10 year zero coupon bonds with a spread 1%**. This portfolio also has an expected excess return of 1.25%pa, but a present value of £640 (not enough, despite having a higher expected return than portfolio 1). As for portfolio 2, reinvestment conditions will be important for this portfolio, albeit the hurdle for success will be lower (at only 0.5%pa) as more return is being generated in the first 5 years.

These simple example portfolios illustrate the importance of the reinvestment assumption which is required for projections using expected returns. The reinvestment assumptions made in our modelling are reasonable assumptions (in our view), but like any assumption they could turn out to be wrong, and this introduces uncertainty into the central assessment of asset sufficiency. Furthermore, it would be completely impractical to attempt to assess whether actual portfolios of fixed income assets generating a 1.25%pa excess return (for example) are more like portfolio 3 (which does not require any reinvestment in return-seeking assets) or portfolio 4 (which will generate cashflows that will need to be reinvested after 5 years to generate more excess return over years 6 to 10).

A reinvestment assumption is not required in the discounted cashflow approach, and this makes it a more robust approach in our opinion. To the extent that this approach shows a shortfall – this approach can also be used to demonstrate what level of excess return would need to be achieved on re-investment and consideration can then be given to how reasonable that requirement is. It also lends itself much better to stress testing the remaining key assumption (the loss given default assumption) which we will illustrate in our next thought piece on this topic.

The punchline

Traditional funding level projections rely on reinvestment assumptions that may turn out to be too high or too low. The discounted cashflow approach is more robust because the only assumption it requires is a loss-given default assumption. All other parameters in the assessment can be observed. Furthermore, the approach can much more effectively assess the impact of varying the loss-given default assumption than a traditional approach, and we consider this further in our next thought piece.

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