Lakhbir S. Hayre
(212) 816-8590
lakhbir.s.hayre@ssmb.com

Robert Young
(212) 816-8332
robert.young@ssmb.com

Y.K. Chan
(212) 816-8337
yuenkwok.chan@ssmb.com

The Inverted Yield Curve and Mortgage Valuation

The dramatic rally in the long bond, which has seen its yield drop by 44bp over the past month, while the yield on the two-year Treasury has risen by 18bp, has led to some uneasiness about the use of Treasury rates to calculate mortgage rates and, thus, to calculate prepayments and MBS cash flows. In OAS calculations, the term structure model used to generate yield curve paths is calibrated so as to reprice a set of benchmark securities, typically the on-the-run Treasuries. This leads to a "drift," or trend in the interest rate paths corresponding roughly to the shape of the Treasury forward curve. With an inverted yield curve, this implies that after some point, ten-year Treasury rates, and hence mortgage rates, will have a downward bias. There is a common feeling that this distorts MBS valuations.

One is tempted to respond that we have made our bed, and now we have to lie in it. **The shape of the Treasury curve always influences mortgage rate paths in OAS models**. For example, in a "normal" upward sloping curve, forward rates will be increasing, and there will be an upward trend in mortgage rate paths, which will lead to a slowing trend in prepayment speeds. One could argue that this distorts valuations, especially for IOs and POs. However, the response is that if the MBS is being compared against a portfolio of Treasuries — and it implicitly is in the calculation of OASs to Treasuries — then forward Treasury rates have to be used to correctly rebalance the portfolio. We are not assuming that forward rates are predictors of actual future interest rates. Why then the current uneasiness about the effect of yield curve shape? Among the main reasons (other than a perhaps irrational reaction to an unusual yield curve shape) are:

- The impression that the curve inversion is being driven by technical factors, such as reduced supply of long bonds, rather than traditional causes, such as a recession; and
- The weaker link over the past couple of years between changes in Treasury yields and those of spread product, including MBSs, suggesting a much lower correlation between Treasury yields and mortgage rates in the future.

The first explanation is irrelevant. It does not matter what is causing the curve inversion; if we are hedging the MBS with a basket of Treasuries, then we have to use market prices, regardless of what is driving them.[23] The second point, however,

[23] This could be a factor if the interest rate dynamics assumed by the term structure model no longer hold. For example, if the 30-year Treasury were to delink from the rest of the yield curve, this would suggest modeling it as an additional stochastic variable.

raises a number of questions, a major one being whether we should even compare MBSs to Treasuries — some other benchmark, such as swaps or agency debentures, may be more relevant.[24] However, if we are using Treasuries as the benchmark, and thus discounting based on Treasury rates, but MBS spreads seem more closely tied to swap spreads, should we use swap spreads to calculate mortgage rates along the OAS paths? Although doing so raises questions about the interpretation of OASs[25], it is still instructive to determine how much impact this will have on MBS valuations.

How Much Do OASs Change if Mortgages Track Swap Spreads?

In our standard OAS calculations, mortgage rates are calculated by assuming that MBS spreads to Treasuries remain unchanged. As an alternative, we can assume that MBS spreads track swap spreads going forward. Figure 42 shows an OAS run for conventional TBAs using such an assumption. The flatness of the swap curve from the ten-year to the 30-year points (it declines by 7bp) removes the downward bias in mortgage rates induced by the Treasury curve.

Figure 42. Change in TBA OASs if Mortgage Rates are Calculated from the Swap Curve

Coupon	Price	OAS Change
6.0%	90-12	3 bp
6.5	93-06	4
7.0	95-20	7
7.5	97-27	8
8.0	99-31	10
8.5	101-27	9
9.0	103-14	9

Source: Salomon Smith Barney.

Figure 42 makes clear that there is a marked impact on OASs. Because forward swap spreads are higher than current ones, mortgage spreads to Treasuries also have an upward trend, leading to higher mortgage rates along the OAS paths. This has the most impact on the cuspy premiums.

Conclusions

The shape of the Treasury yield curve always determines the trend or drift in mortgage rates along the interest rate paths generated by OAS models, but the unusual yield curve movements in recent weeks have led investors to focus on this issue. If investors consider Treasuries as their benchmark, then they should accept this artifact of MBS valuations models. If, however, investors believe that the Treasury curve is becoming irrelevant for MBSs, then alternative measures, such as OASs to swaps, should be used.

[24] In fact, there has been a trend away from using Treasuries as a benchmark. In hedging MBSs, the use of swaps and agency debentures, as well as other MBSs, has increased. We have also noticed a rising use of our daily reports (manifolds MB733 and MB734) showing OASs to swaps (a report showing OASs to an agency debenture yield curve will be available shortly).

[25] For example, because we are comparing the MBS to a portfolio of Treasuries and not using swaps in the hedging, we are exposed to swap spread risk.