

Valuation Models - Option Adjusted Spread

By [Greg Crosby](#), ASC Secondary Marketing Product Manager

This article first appeared in the March 2000 Issue of the Holm Mortgage Finance Report newsletter

The selection of a valuation model can have a bearing upon whether your mark to market reports tend to over or under estimate the final results. Also, it can influence the way you hedge.

In the February issue of Holm Mortgage Finance Report we looked at the various approaches one could take in valuing their portfolio. In certain situations models are required. We will look at the strength and weakness of some of the more widely used models and identify some points on when and how to use models.

The Option Adjusted Spread model is often used to determine the price sensitivity on a mortgage or mortgage backed security. The model is based on the theory that the borrower's right to pre-pay their mortgage at any time is similar to an option contract. Option contracts give the holder the right to acquire or sell an asset to the writer of the option at a defined price. The option has an expiration date and typically involves the holder paying the writer a fee for granting the option (right) to exercise.

The OAS (option adjusted spread) model bifurcates the mortgage into components. One component is similar to a classic treasury security with no pre-payment privilege. The other component is that of an option contract. From the investor's standpoint they are the writer of the option. When the option gains value (gets further "In the Money") the potential loss to the writer (mortgage investor) grows. The option tends to get further in the money the lower that rates for new mortgages decline. The embedded option serves as a counter weight to the normal increase in value that securities (like notes and bonds) experience when market yields drop.

Example: A 7% 30 year mortgage was purchased for 100-00 when the current rate for mortgages was 7%. Interest rates decline. The current rate for mortgages becomes 6.5%. If the borrower could not pre-pay (refinance) the mortgage it's value might increase to 105-00. However, the prepayment feature greatly increases the chance that the borrower will take advantage of lower rates and refinance. This sharply reduces the expected remaining life of the mortgage.

The market will therefore only value the 7% mortgage at 102-00. The OAS model would say that the embedded value of the pre-payment option was worth 3-00. $3-00 = (105-00 - 102-00)$. The fact that the value is only 102-00 says that the mortgage required yield spread over the non-prepaying alternative continues to grow as interest rates fall and shrinks as interest rates rise.

This yield spread over the non-prepaying investment alternative is known as the Option Adjusted (yield) Spread. The OAS model attempts to solve for what the OAS must be given the current price of a mortgage investment.

The user of this model will then adjust the yield up and down slightly to see how the value of the mortgage would change given this same yield spread. Risk managers use this value sensitivity to determine the marginal portfolio risk added by this investment. Two of the statistics produced are the "Effective Duration" and the "Effective Convexity". We will delve further into the model and these statistics in our next installment.

[Read Installment #1](#)

[Read Installment #3](#)

[Read Installment #4](#)