THC Financial Engineering
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Risk Modeling Bulletin Issue 5

Mortgage Servicing

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In this issue, we focus on the mortgage servicing risk. Since the fee income of a fixed rate mortgage is in essence an IO, we first describe the risk of a 30 year fixed rate Interest-Only (IO) by present the key rate durations of a 30year IO. This risk measure has been discussed in Bulletin 2#. We then discuss the implied volatilities as measured in the market. These volatilities are used to price the IOs.

Feature Article: Mortgage Servicing - the IO Risk

A mortgage servicer receives a portion of the monthly interests stripped from a mortgage loan. How can we measure the risks of such servicing fee? Can we hedge the risks?

The following simulation from Decisions shows the risk of a 30yr IO for both 03/06 and 06/06 cycle. TABLE 1 describes an IO. Figure 1 shows the key rate durations of the IO on 03/06 and 06/06 cycles. It is clear that the IO price falls significantly when the 10 or 7year rate falls. This is because the prepayments are significantly affected by these rates; higher the prepayment, lower is the IO value. The performance profile in Figure 2 depicts the dramatic impact on the IO value. Therefore, mortgage servicers may consider holding a long position in 7 and 10 year bucket to manage the risks on the servicing fee.

TABLE 1

WAC of Mortgage(%)	Pass-through Rate(%)	Start Date	Maturity
6.00	5.50	2006-03-01	2035-11-01

FIGURE 1

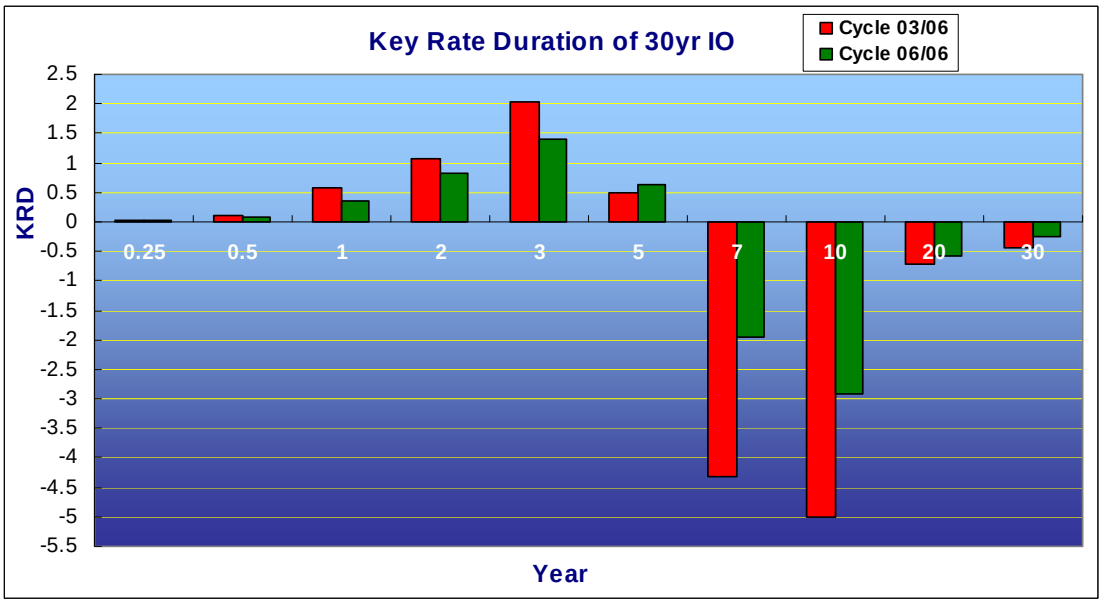
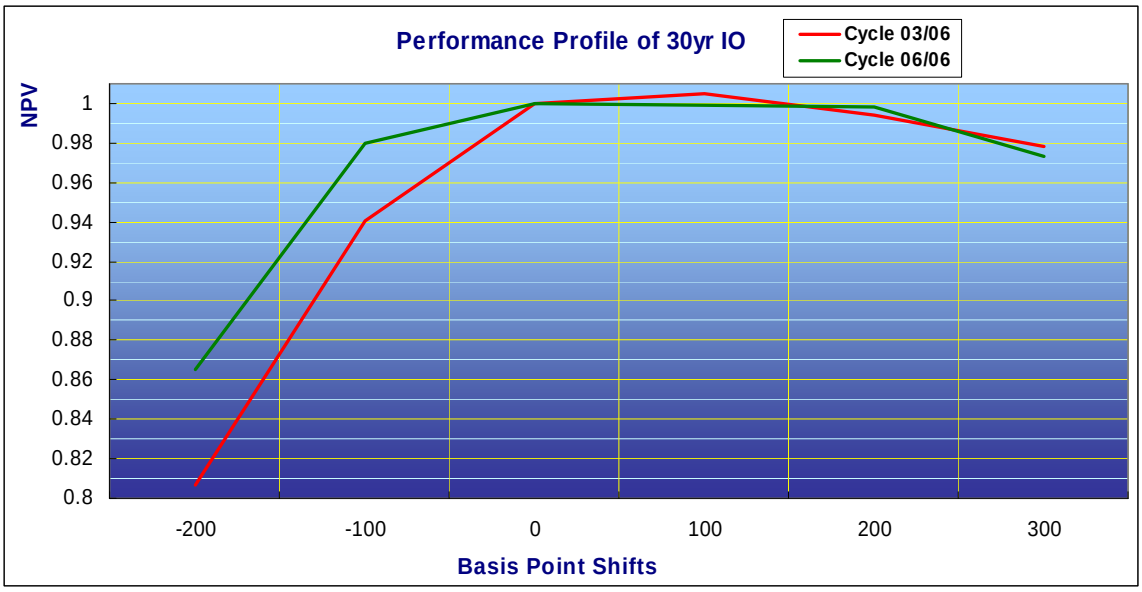


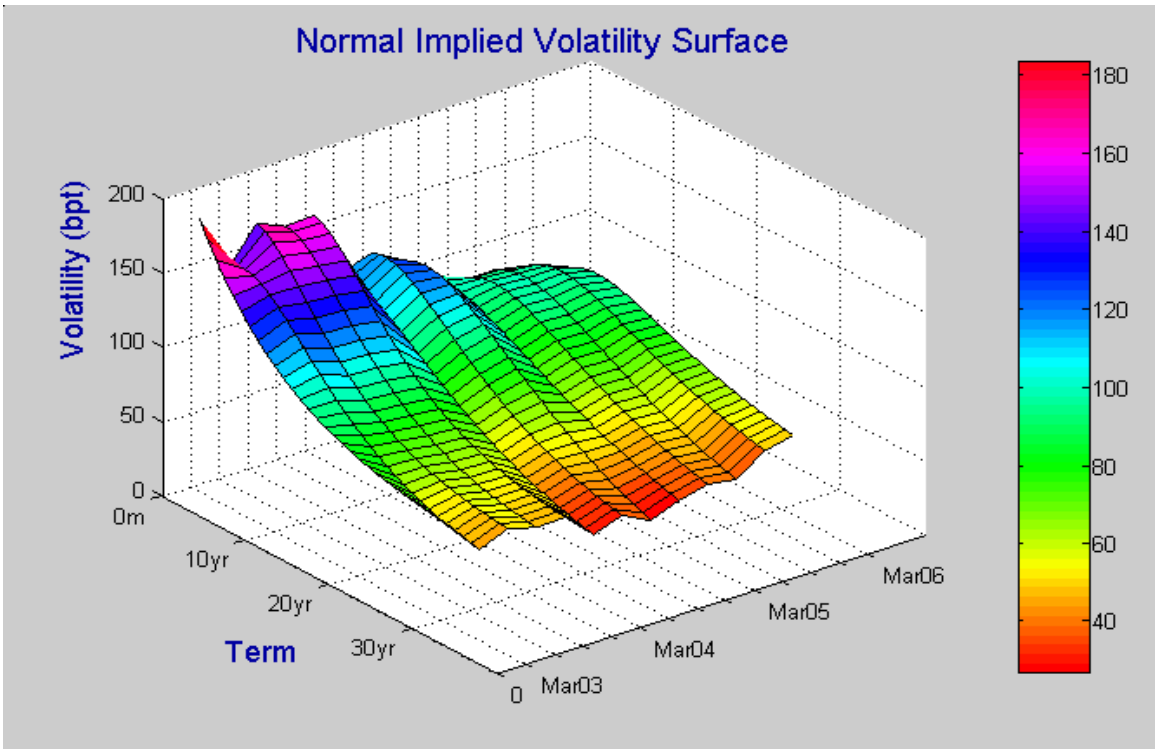
FIGURE 2



Market Perspective: Implied Volatilities

In the calibration of an interest rate model, we use the implied volatilities as observed in the swaption market. THC research shows that the surface of Black volatilities can be represented by an "implied volatility function." Figure 3 shows the evolution of the implied volatility function from 03/03 to 03/06. Volatilities are measured in basis points in this presentation. The volatility is defined as the one standard deviation of the short term rate (one month rate) over one year. Note that the market perception of risk has fallen in recent months. However, the fear of inflation has led to an increase in the long term volatility, although the short term volatility continues to fall.

FIGURE 3



Reference: Ho and Lee Oxford Guide to Financial Modeling 2002 Oxford University Press pp 186-188

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