THC Financial Engineering
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Risk Modeling Bulletin Issue 1

Interest Rate Risk

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The movement of interest rate is a key source of risk in the market. By using portfolio revision analysis, the risk of funding fixed rate mortgages with deposits can be determined.

Feature Article: Risk of Funding Fixed Rate Mortgage with Deposits - Portfolio Revision Analysis

As the yield curve flattens, the balance sheet tends to take on more 30-year fixed rate mortgages funded by deposit accounts. There are risks in funding fixed rate mortgages with deposits. The balance sheet duration lengthens and exposure to larger losses increases with a rise of the yield curve.

Consider the following THC simulation. Figure 1 and Table 1 show a thrift with a base case NPV of $610.366 million, with an addition of $1 million face value of 30-year fixed rate mortgage loans, and the same amount added to the passbook savings in the CMR report.

The results are:

1. The portfolio loses (gains) value when the yield curve rises (falls)
2. The portfolio loses more than it gains for the same amount of the yield curve shift, due to the prepayments of mortgages. This is termed the negative convexity effect of the mortgages.
3. A $1 million face value increase in the portfolio would lead to a $11,000 increase in market value, which is considered the “intangible value.”

FIGURE 1

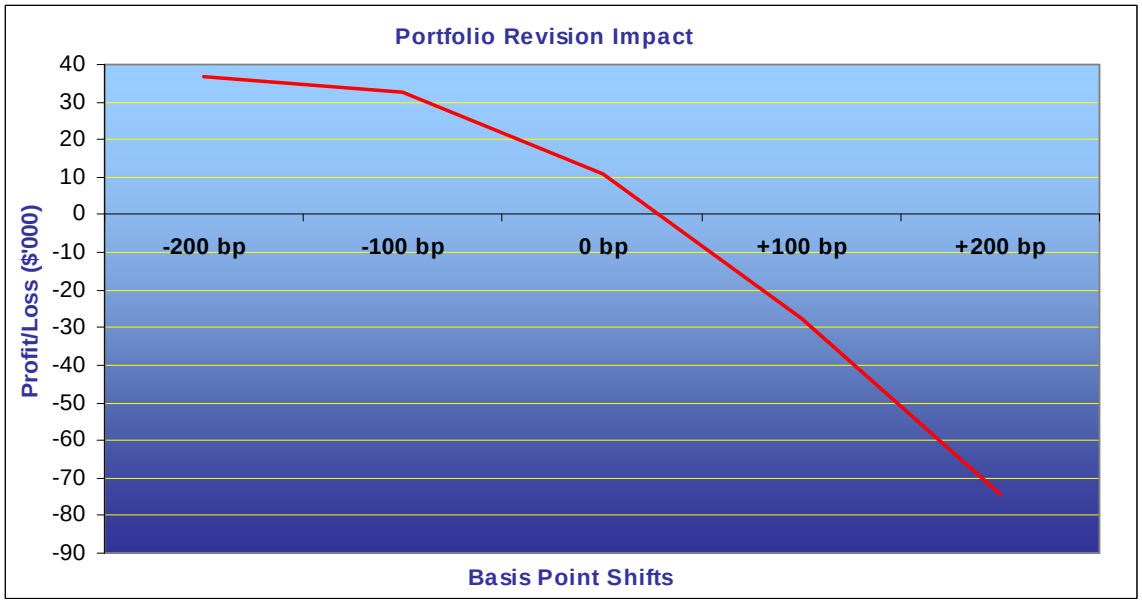


TABLE 1: Impact of the Portfolio Revision

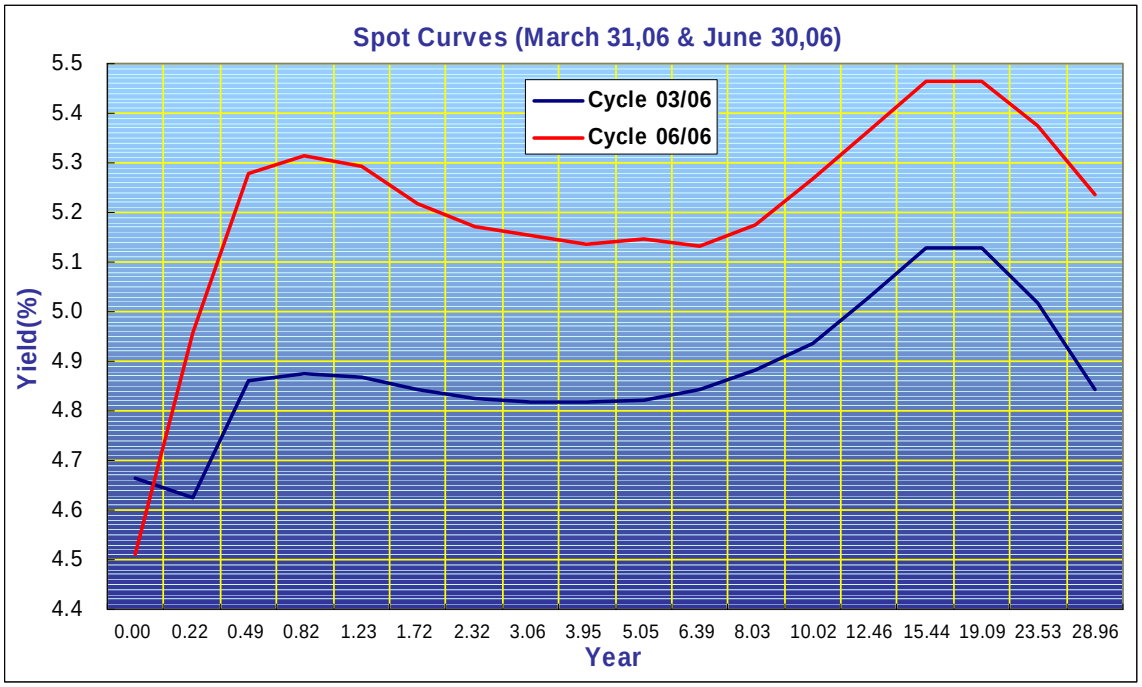
	-200 BP	-100 BP	0 BP	+100 BP	+200 BP
NPV(before)	612253.30	611471.10	610366.00	608944.74	607313.55
NPV(after)	612289.83	611503.63	610377.08	608917.01	607239.25
Net	36.53	32.53	11.08	-27.73	-74.30

(Unit: $ '000)

Market Perspective：Yield Curve Movements

NPV valuation depends on the spot yield curve and it makes changes to the yield curve movements. The spot yield curve provides the yield of a bullet payment for a given maturity, and it forms the basis in valuing all the cashflows on the balance sheet. Figure 2 shows the yield curve movements from cycle 03/06 to cycle 06/06. The spot curve rises approximately 30 basis points across the yield curve. Therefore, a thrift with an NPV 4-year duration would observe the NPV falling 1.2% (4 x 0.3 %). At NPV $611.471 million, a shift of the yield curve leads to an unrealized loss of $7.34 (=611.47*1.2%) million in capital. The question is: what can we do for the next quarter?

FIGURE 2



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