



# Risk Modeling Bulletin Issue 24

## Net Interest Income

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This issue focuses on Net Interest Income (NII). Feature Article explains the NII projection; Market Perspective describes the generation of NII distribution.

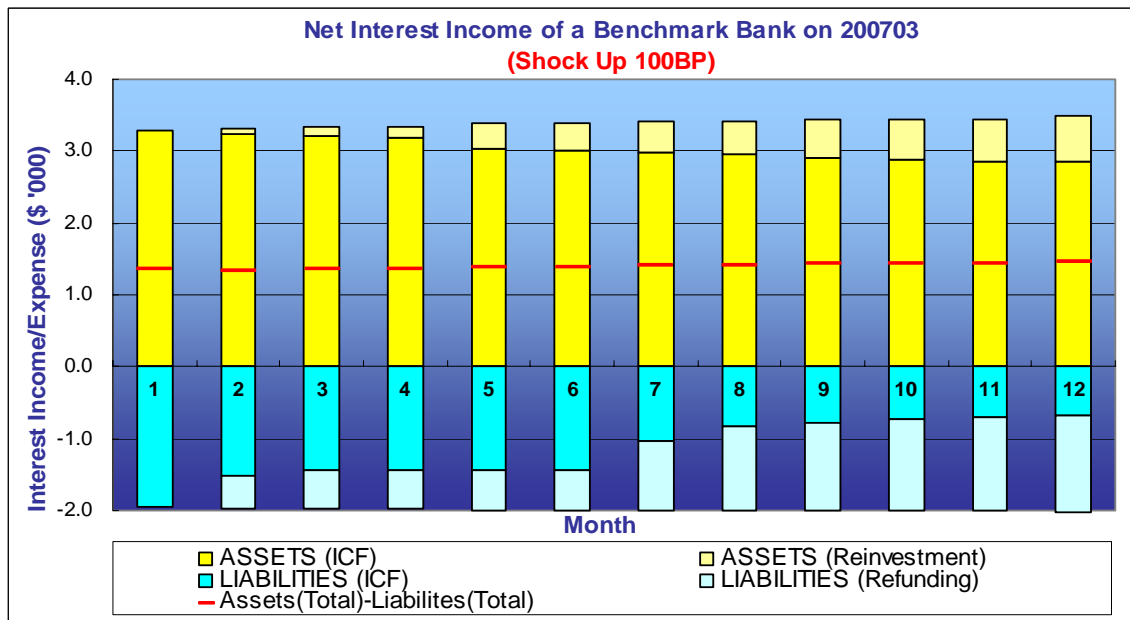
### Net Interest Income Projection

THC Decisions projects the Net Interest Income (NII) by generating the interest income of assets and interest costs of the liabilities separately. The principal amount takes amortization, prepayments/withdrawals and defaults into account. The interest income/expense is then determined from the prevailing principal amount. The Net Interest Income is determined for the swaps analogously.

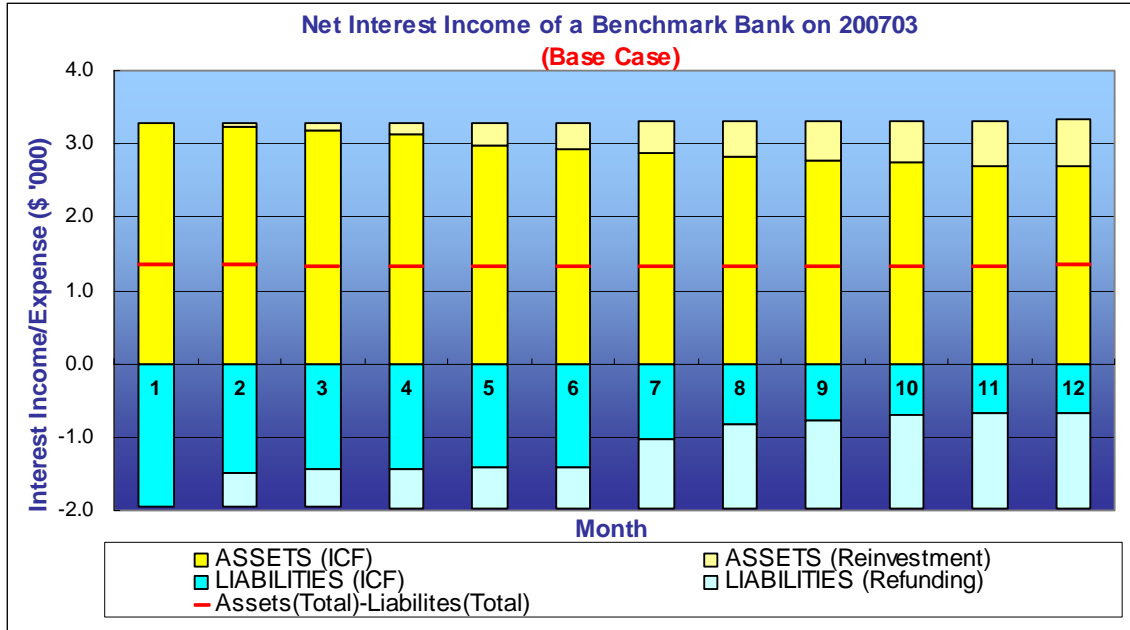
Reinvestment and refinancing rules assume no growth. For assets, the principal inflow from assets is reinvested at the T-year Treasury rate plus the appropriate OAS on the prevailing yield curve, where T is the duration/maturity. Likewise, the core deposit rates are determined by the prevailing funding rates.

Figure 1, 2 and 3 depict the interest income from the assets, interest expense from liabilities, and Net Interest Income over the next 12 months for a benchmark bank on 2007Q3, with the yield curve Shock Up 100BP, On Base Case and Shock Down 100BP, respectively.

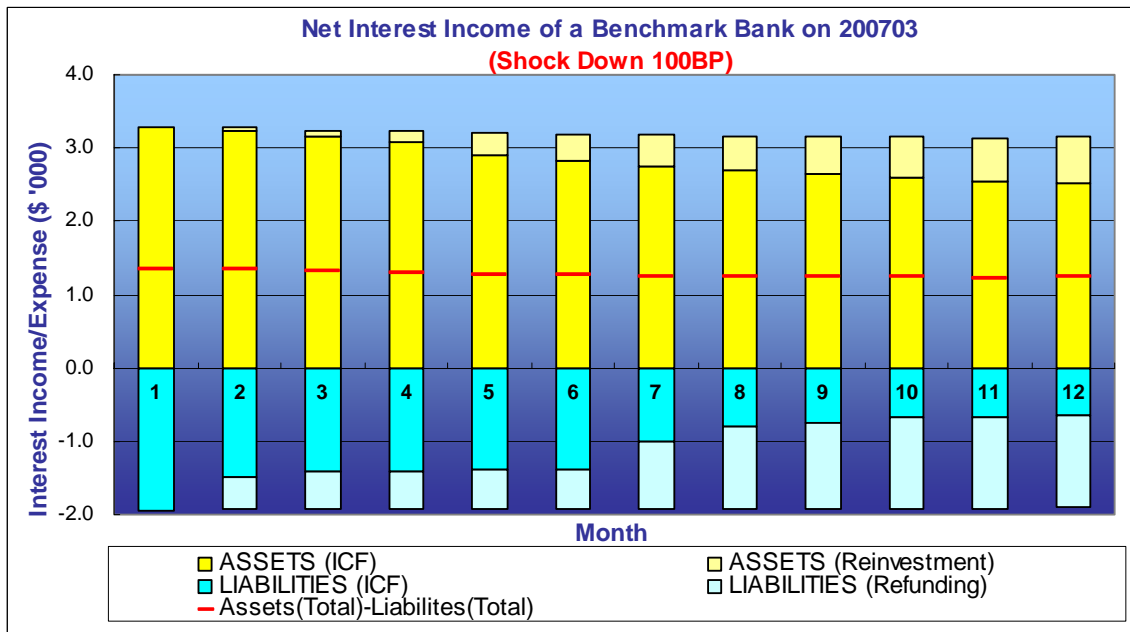
**FIGURE 1**



**FIGURE 2**



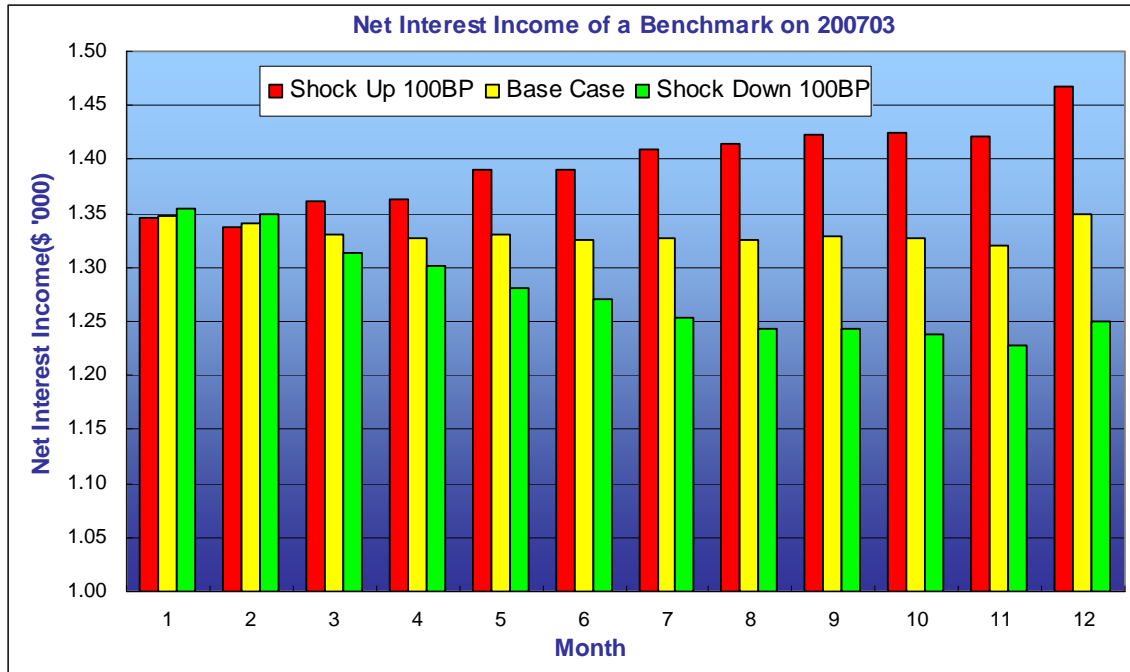
**FIGURE 3**



The results show that both interest income and expense decline with the interest rates down, and rise with the interest rates up. The interest income changes at a higher speed compared to the interest expense, leading to an incremental NII when interest rates rise, and vice versa.

Figure 4 below depicts the NII with the 3 interest rate scenarios above and clearly demonstrates the trend.

**FIGURE 4**

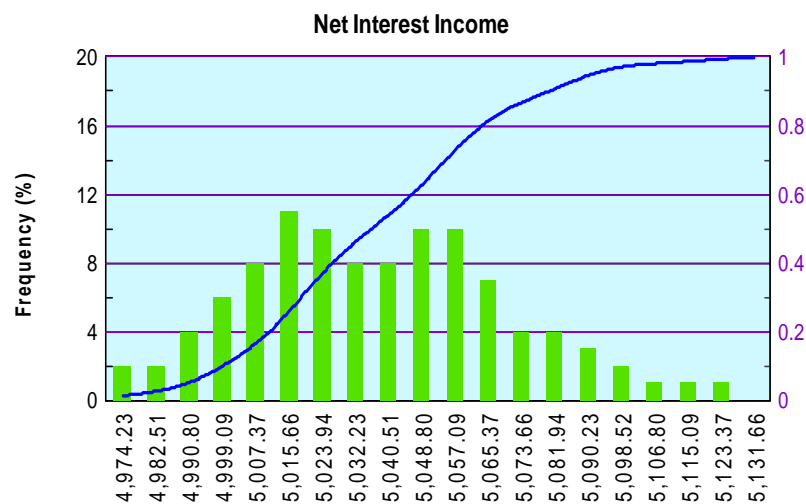


### Net Interest Income Distribution

THC Decisions can generate a Net Interest Income (NII) Distribution. The quarterly cumulative net interest income is simulated over a three-month horizon based on a Monte-Carlo random generating process. Figure 5 depicts the NII distribution of a benchmark bank generated and the result shows that the NII can have a wide variation ranging from \$4.98 million to \$5.12 million. This result can be used to identify the net interest income risk based on the investment and funding mix.

**FIGURE 5**

Description	Expected Interest Income/Expense	Standard Deviation	VaR (95%)	EaR (90%)
ASSETS	9,902.50	22.40	35.17	27.57
LIABILITIES	5,855.45	15.02	24.06	18.76
OFF-BALANCE-SHEET POSITIONS	995.45	21.28	33.64	26.21
NET PORTFOLIO VALUE	5,042.49	31.43	48.43	39.21



The result show that over a three month time horizon, the NII has a potential loss of \$76,320 or 2.618% (= 76.32/2,915) at a 90% confidence level. However, the distribution of the NII is not symmetric, with a positive skew toward higher income.

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