

Modelling NII (Low IR Environment)



- Agenda
 - » Introduction
 - » Recent Experience
 - » Practical Examples
 - » Upcoming Issues
 - » Recent Events
 - » Questions / Discussion

Modelling NII (Low IR Environment)

- Model interest rate risk using scenario modelling techniques
 - » Management Information
 - » Basel 2 Internal Capital Adequacy Assessment (ICAAP)
 - » Basel 2 General Interest rate risk sensitivity modelling
 - » EU Law Economic Value Sensitivity
 - » Products with complex risk, e.g. fixed rate mortgage convexity risk.
 - » Ad hoc scenario modelling
- The scenario modelling process involves
 - » Extraction of data from core data warehouses
 - » Data cleansing, augmentation and preparation
 - » Business assumption collection and input
 - » Behavioural cash flow modelling
 - » Interest Rate Scenario testing
 - » Monte Carlo simulation

Recent Meeting (Modelling in a low rate environment 1)

- Does it make sense to model the effects of a 100bps shock in this environment
 - » Interest rate floors (rates can't go below zero)
 - » Convexity as deposits start to reach implied floors
- Range of shocks will be used in year end accounts
 - » 100 bps, 50bps, 25 bps
 - » 100 bps leads us to almost zero rates
 - » Intra month volatility suggests 100bps is required to give credibility
 - » But in many cases its does not make sense (negative rates in the US)
- What we should do is model sensible
 - » Review assumptions
 - » Existing assumptions may no longer be valid
 - » Beware over reliance on historical data
 - » Document / agree revised assumptions
 - » Ensure Senior management signoff

Recent Meeting (Modelling in a low rate environment 2)

- Disconnect in the Curves
 - » Cash & Swap Curves are now disconnected
 - Illogical, Implied forward curves make no sense
 - Perhaps we have to use other inputs (SONIAs & swaps)
 - Economist curve useful for stress testing but not for R&A
 - » Libor and Base rate no longer similar
 - Basis risk now very material
 - More important than ever to separate Libor and Base products
- Report & Accounts
 - » Variety of shocks used
 - » Choose a shock that give a reasonable view of the risk
 - » Should mitigating factors be included / or show the raw results
 - » Considerable judgement involved

Recent Meeting (Modelling in a low rate environment 3)

- Other Issues
 - » Critical to review assumptions
 - » Re-pricing algorithms will have changed
 - » Floors need to be revised
 - » Duration assumptions will change
 - » Basis risk is a really important risk to model

Practical Example

Mortgages

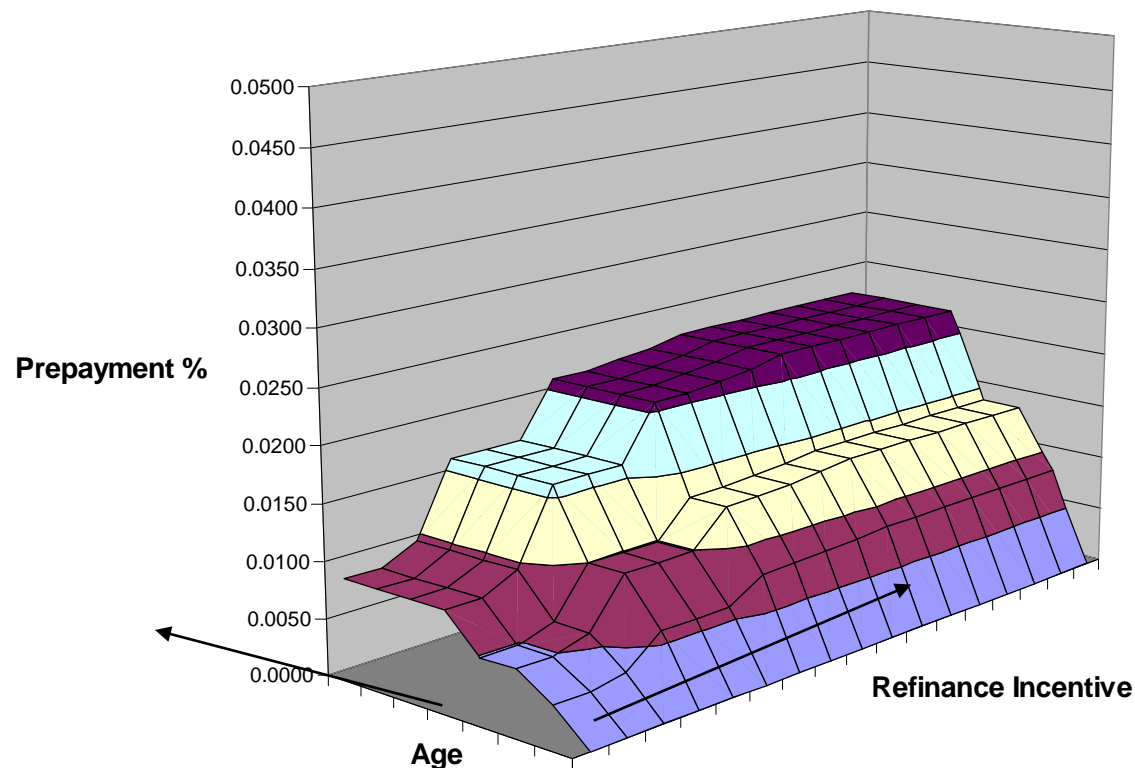


- Sub Prime Crisis Effects
 - » Credit & LTV issues
 - » Changing products (base rate linked mortgages less popular)
 - » Fixes roll to SVR (and remaining there)
 - » Changing Margins
 - » Political Effects
 - » Is this the new paradigm / or will we revert to pre crisis
 - » Prepayment Falls with lower rates !
 - This has never happened before.
 - Unexpected benefit

Fixed Rate Mortgage Option Risk

- Extension Risk (Prepayment falls as market rates rise resulting in portfolio extension)
- Contraction Risk (Prepayment rises as market rates fall resulting in portfolio contraction)
- The age variable describes how prepayment changes with age
- The refinance incentive variable describes how prepayment changes with refinance incentive
- The tables have been empirically calibrated by looking at actual mortgage behaviour

Bi Variate Pre Pay Table (3 Yr Fixed Rate Mortgage)



Practical Example

Re-pricing Review



- Existing Algorithms are no longer valid
 - » Relationships to base rate disrupted
 - » Change in product nature
- Basis Risk
 - » More important than ever to distinguish basis risk
 - » Little data to base this on. Historical Analysis no longer so valid
 - » Disconnect in the Curve (Cash & Swap Curve now totally disconnected)
 - » LIBOR vs base rate, cannot have a disjointed curve
 - » Illogica. And give rise to unrealistic implied forwards
 - » Perhaps use SONIAs and swaps rather than Libor and swaps
 - » Economist curves for interest and stress testing but not for R&A.

Practical Example Floors & Margins



- Floors have been revamped
 - » New rate environment allows lower floors
 - » Sticky retail deposits more
- Margins have expanded
 - » Mortgages SVR margins up considerably
 - » New business margins different to existing margins

Practical Example Ctd



- Around the Globe
 - » 200 bps shocks are no longer possible in some currencies
 - » In the USD they represent the Japan sever recession scenario
 - » Shock creep has move the standard shock test to extremes in the US
 - » Only serves to highlight the disconnect between countries
 - » In the countries most affected by the recession the shocks are the most severs
- Value Metrics
 - » EVE measure rising in significance
 - » FSA 017 report does value shift
 - » EVE Law
 - » Longevity assumptions key to value sensitivities
 - » More uncertainty now than ever in relation to roll down profiles
 - » Historical analysis provides valuable information but be very careful about applying this in the new paradigm

Stress Testing

- Its okay this is the stress test
 - » Not so. Sub Prime is just one case
 - » Stress testing need to consider different scenarios
 - » Learn from the past to expect the unexpected
 - » If all we learn from the past is how to deal with the sub prime crisis we will get caught again (Paul Sharma)
 - » Stress testing need to be viewed as value added
 - Should be part of new product approval
 - Finance should use in stressing budgets
 - Increase Senior management presence
- Software and Systems
 - » Technologies to manage data
 - » Simulation systems to model market risk
 - » Joined up simulation (Liquidity, IRR, Capital Planning) Its all the same data
 - » Time to deliver information much tighter
 - » Need to increase capacity / quality / value added

