THE NEW RISK-BASED CAPITAL MODEL FOR FARMER MAC

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The New Risk-Based Capital Model for Farmer Mac

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A Little History!

- **Food, Agriculture, Conservation, and Trade Act of 1991**
  - Section 8.32 Required FCA to Establish a Risk-Based Capital Stress Test for Farmer Mac
- **Farm Credit System Reform Act of 1996**
  - Prohibited FCA from Establishin a Stress Test Before February 1999.
- **Proposed Rule November 1999**
  - Comment Period Through June 2000
- **Final Rule April 2001**
  - Effective Date May 23, 2001
  - 12 Month Phase In
    - Required to Report, but Not Comply
    - Address Implementation Issues With Farmer Mac

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Objectives

- Comply with Statutory Requirements.
  - Prescribed Stressful Credit Risk Risk
  - Prescribed Stressful Interest Rate Risk
  - Maintain Solvency for 10-year Period
- Require Regulatory Capital that Appropriately Reflects Prescribed Stressful Conditions
- Ensure the Stress Test is Internally Consistent
- Avoid Creating Inappropriate Economic Incentives
- Keep it as Simple and Flexible as Possible.
- Reflect Farmer Mac's Current Operating Policies and Procedures
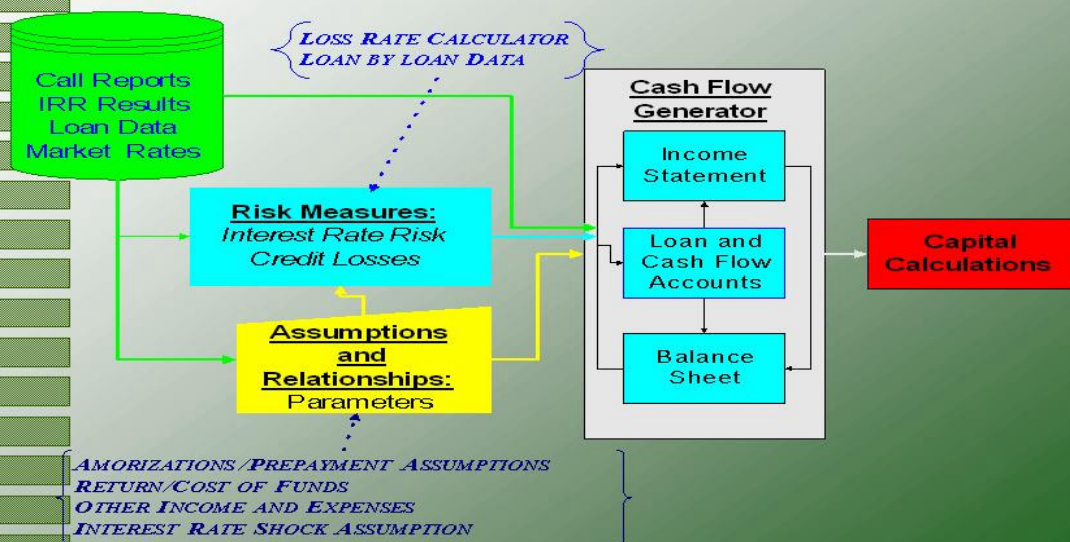- Maintain Reasonable Development Cost.

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Final Rule

- Establishes the Risk-Based Capital Stress Test
- Establishes Capital Calculation, Reporting, and Compliance Requirements
- Provides Farmer Mac Flexibility to Calculate the Stress Test
- Outlines Monitoring, Examination, Supervisory, and Enforcement Activities.
- Prescribes Certain Business and Capital Planning Requirements.

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Stress Test Components

LOSS RATE CALCULATOR
LOAN BY LOAN DATA

Call Reports
IRR Results
Loan Data
Market Rates

Risk Measures:
Interest Rate Risk
Credit Losses

Assumptions and Relationships:
Parameters

Cash Flow Generator
- Income Statement
- Loan and Cash Flow Accounts
- Balance Sheet

Capital Calculations

AMORIZATIONS/PREPAYMENT ASSUMPTIONS
RETURN/COST OF FUNDS
OTHER INCOME AND EXPENSES
INTEREST RATE SHOCK ASSUMPTION

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Statutory Requirements

- **Credit Risk Component**
  - Reasonably Relate Loan Default Probability and Severity of Losses to those:
    - Experienced in contiguous areas of the US containing at least 5% of the total US population that experienced the highest rates of default and severity of agricultural mortgage losses during a historical period of at least 2 consecutive years.
      - Referred to Often as the Benchmark Loss Rate
- **Interest Rate Risk Component**
  - Shock Rates
    - 50% of the average interest rate on Treasury obligations the previous 12 months OR
    - 600 basis points, whichever is less
  - Hold Shocked Rates Constant throughout the 10-year Period.

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Credit Risk Component

Loss Rates Calculator

- Apply Loss Frequency Equation to Loan Level Data
  - Equation Estimated from Historical Data
  - Based on Farmer Mac Loan Origination Data
  - Probability that a Loan Defaults **and** has Positive Losses
- Multiply Loss Severity with the Default Probability Estimate
  - 20.9% Weighted Average
- Adjust for Loan Seasoning
  - Represented by a Beta Distribution
- Use Results to Compute State Level Loss Rates
- Apply State Level Loss Rates in the Stress Test
  - Need to Allocate Lifetime Age-Adjusted Losses to Each Period of the 10-Year Stress Test

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Loss Frequency Equation

Explanatory Variables

- Reflecting Farmer Mac Loan Characteristics
  - LTV Ratio at Loan Origination;
  - DSCR at Loan Origination;
  - Original Loan Balance in 1997 Dollars; and
  - D/A Ratio at Loan Origination.
- Reflecting Credit Stress
  - Maximum Annual Percentage Decline in Farmland Prices
    - Negative 23.52%
    - Based on Benchmark Loss Study
- Nonlinear Transformations Applied to LTV, Loan Size, and Maximum Land Price Decline
- Explanatory Variables Produced the Best Statistical Fit.

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Interest Rate Risk Component

- **Interest Rates are Shocked Up and Shocked down**
  - Most stressful Rate Movement is Used
  - Consistent with Statutory Requirements
- **Stress Test the 10 year CMT**
  - Simple to Apply and Readily Available
  - Allow Farmer Mac to Use Additional Rate Indices
- **Interest Rate Risk Measurement**
  - Measure through Market Value Changes Based on Farmer Mac's Reported Exposures
    - Calculate Effective Duration of Equity in 50 BP Increments
    - Use Effective Duration to Determine Dollar Impact of Interest Rate Risk for the Rate Shock Prescribed by the Statute
  - Applied to Equity Within the 1st Year of Stress Test

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Other Issues

- **Stress Test Run Under a Steady State**
  - Assets essentially held constant
  - Financial Performance Reflected in Equity
    - Credit Risk Effects -- Net Income or loss
    - Interest Rate Risk Effects
  - Liabilities Used to Maintain Accounting Identity
    - Assets = Liabilities - Equity
- **Income and Expense Generation**
  - Earnings Rates on Assets
  - Cost Rates on Debt
  - Guarantee Fees and Other Income
  - Operating Expenses
- **Regulatory Capital Calculation**
  - Increase/Decreases Starting Equity Until Insolvency Constraint is Satisfied

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