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Seminar #2

Life Product Hot Topics

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Overview

- Post-AXXX Secondary Guarantee Product Development
  - Pricing Strategies
  - Reinsurance Availability
  - Other Financial Remedies
  - Competitive Environment
- 2001 CSO Life Product Portfolio Redesigns

Overview

- Life Settlements
- Substandard Annuities
- Stochastic Modeling Case Study

Post-AXXX Secondary Guarantee Products

- Actuarial Guideline 38 was designed to impose additional reserves on shadow account and increasing premium designs.

Post-AXXX Secondary Guarantee Products

- There have been certain perceptions about how the new guideline would impact shadow account designs
  - All secondary guarantee designs would hold the same reserve levels for the same premium pattern.
    - I.e. lifetime level premium situations would have whole life reserves as the minimum reserve level.

Post-AXXX Secondary Guarantee Products

- Consistent reserve levels among competitors has not been the result of Actuarial Guideline 38

Post-AXXX Secondary Guarantee Products

- Based on the formulaic approach outlined in the guideline higher reserve levels should be calculated as the company's liability emerges
  - The shadow fund represents the company's liability
- Since shadow account designs differ by company one should expect to see different reserve results by company

Pricing Strategies

- Companies have re-tooled base UL product designs to be more effective competitively and financially for the target market
  - Low CAWL funding levels.
  - Reduced interest rate spreads.
  - Competitive mortality (reinsurance).
  - Maximum SNFL surrender charges.

Pricing Strategies

- Companies have also focused on shadow account designs limiting the AXXX prefunding ratio
  - Two common methods used
    - Design higher early duration charge structures
    - Premium loads on excess premiums
  - Other methods have been employed by companies to get at the same result.

Pricing Strategies

- The premium load has come under scrutiny
  - For many companies this premium load has been important to allow appropriate pricing on single premium (1035 Exchange) business.
  - Some companies have criticized the premium load as solely being a means to depress the prefunding ratio by increasing the value of the denominator.

Pricing Strategies

- 2001 CSO product designs
  - The new table will allow a reduction in the level of reserves generated by XXX & AXXX.
  - This results is somewhat offset by the reduction in surrender charges resulting from the new table.

Reinsurance Availability

- The lack of reinsurance company choice has always been a problem
  - Most companies prefer to spread risk among several reinsurance companies.
- The lack of choice has led to a great deal of business being funneled to one reinsurer.
  - Can one reinsurer continue to support this business going forward?

Reinsurance Availability

- Other alternatives to reinsurance
  - Forming onshore or offshore captive reinsurance companies
    - Set up as traditional reinsurance structure for secondary guarantee UL.
  - Securitization
    - Has been done on a block of business to fund XXX reserves.
    - Is volume a barrier?

Competitive Environment

- Premiums have continued to decline
  - Rate of premium decline has lessened
  - Reduced premium levels generally tied to more complex product designs
- More companies looking to get in than getting out

2001 CSO Life Product Portfolio Redesign

- The 2001 CSO will become the prevailing table for tax purposes on 1/1/2005
- Products covered
  - Term
  - Whole Life
  - Universal Life
  - Variable Universal Life
  - Single Premium Life

Term Insurance

- Areas Affected
  - Statutory Reserves
    - XXX
  - Tax Reserves
  - Cash Values

Term cash values and the triviality test

- If the cash values determined under the standard nonforfeiture method are greater than 2.5% of the face amount then cash values must be provided.
- The new table allows higher issue ages and longer level term periods without cash values

Term Strategy

- New table produces Lower statutory reserves
  - Reduced surplus strain in early years
  - Higher profitability
- Premiums can be lowered
- Opportunity to reduce reinsurance dependence
- Higher issue ages for level term products

Whole Life Insurance

- Areas Directly Affected
  - Statutory Reserves
  - Tax Reserves
  - Cash Values
- Results
  - Increased Profits
  - Lower Premiums

Whole Life Strategy

- Opportunity to increase profits
- Lower premiums to get back to the same level of profitability
- Par Life
  - Dividends decrease due to lower statutory mortality and lower cash values
  - Watch out for possible negative mortality dividends at older attained ages
  - Lower NSP for paid up additions

Flexible premium products

- Areas Affected
  - Maximum COI charges
  - Maximum Surrender Charges
  - Reserves, although the cash surrender value floor often is the reserve
  - Funding Limits
  - Endowment age

Product Structural Changes

- Guarantee COI charges are much lower
  - Generally 30% or more for male nonsmokers
- Maximum surrender charges are reduced
- Some product designs will need to be changed
  - Lower COI rates and surrender charges
  - Product loads will need restructuring to maintain profits

Endowment age 120

- Many UL and VUL products have a maturity extension rider beyond age 100
- The 2001 CSO table extends to age 120
- IRC 7702 deems a maturity date between ages 95 and 100
- The prudent choice might be to wait for guidance before designing a product with a maturity age beyond 100

Mortality Comparison (male nonsmoker ultimate table)

Age	2001 CSO	80 CSO	ratio
Year 25	.98	1.52	64%
Year 45	2.33	3.32	70%
Year 65	14.54	21.13	69%

Accumulation Products

- Lower funding limits affects how much money can be put in
- Higher Death Benefit per $1 of cash value
- COI takes a bigger bite
- Product will be less competitive on a maximum funding basis
- COLI market

Death benefit protection products

- Level premium no-lapse guarantee to age 100
- XXX reserves will be lower
- Improved profits

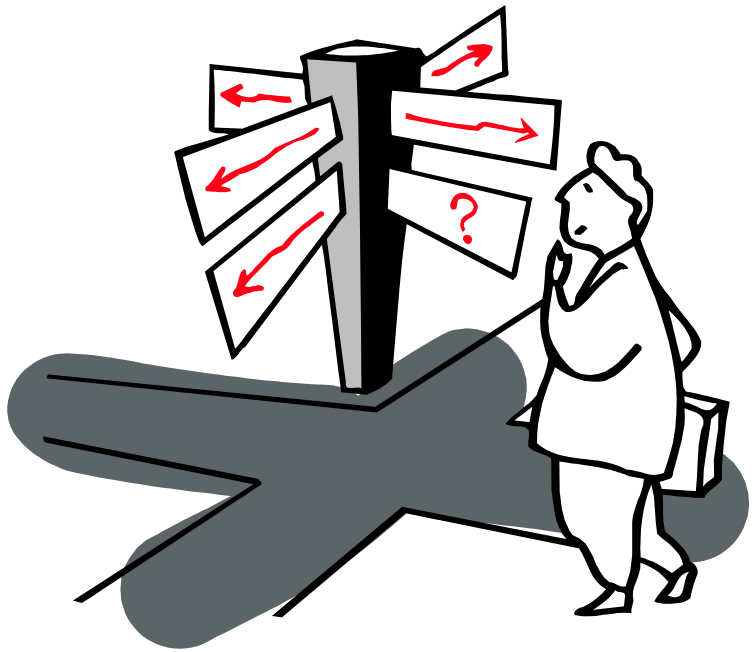
Single Premium Life

- Niche market
- Focus on accumulation
- Generally uses Cash Value Accumulation Test (CVAT) to qualify as life insurance
  - Lower net single premiums
  - Higher net amount at risk
  - Higher COI charges
  - Decrease in pre-death rates of return

What Are Companies Facing?

CURRENT PROBLEMS

- No defined product strategy for 2001 CSO implementation
- Costly and time-consuming product development/ maintenance efforts
- Disappointing product results
- A “broken” development process
- Poor decision-making and control processes
- Lack of devotion to true project and process management



The Product Development Process

All companies will need to roll their current portfolio of products over to the 2001 CSO.

Understanding how the 2001 CSO affects existing products will determine:

- Whether to re-file or re-price existing products.
- The timing of when to convert existing products.
- Resource needs.

Does your company have a strategy?

- Which products do you start with
- Rate refiling or develop new products
- Do you wait for the states to adopt the new table or do you anticipate
- Wait and see what the competition is doing?

Project Scope

- Must be finished by January 1, 2008
- How many different life products are offered by your company?
  - Term (ART, 5, 10, 15 and 20 year level)
  - Whole Life (multiple versions)
  - UL & SUL (multiple versions)
  - VUL & SVUL (multiple versions)
  - SPL

What about other product initiatives?

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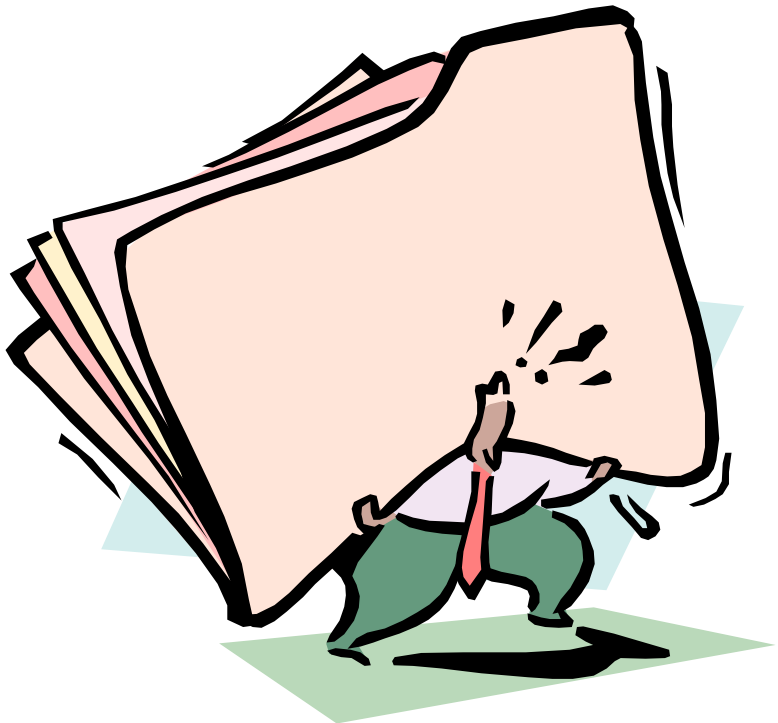
Choices

- Roll over the portfolio with the new table
  - Simple rate refiling
  - Minimal product changes
- Refocus of product portfolio
  - Phase out certain products
  - Pare the number of offered products to a more manageable number
  - Design new products to meet strategic needs

How long does it take to get a new product to market?

- Simple rate refiling
  - Develop rates
  - Implement new rates
  - Illustration compliance
  - State filing
  - Field communication
- New product
  - Product design
  - Pricing
  - Policy forms
  - Systems
  - Marketing materials



What are the obstacles?

- Are there any bottlenecks within your company?
  - Systems
    - Administration
    - Valuation
    - Illustration
  - Policy forms
  - Actuarial (of course not)
- State Insurance Departments
- SEC

Other Considerations

- Additional requirements
  - Submitting mortality experience annually (3 years before you need to start)
  - Asset adequacy analysis required
- Product Area may be ready to go, but other areas of the company may not
  - Need to let them know
  - Maybe wait a year

General Order

- 1. Term & Secondary Guarantee UL
- 2. Whole Life
- 3. Accumulation products

Life Settlements

- An area of concern for secondary guarantee UL products?
  - Funding policies to maturity does not seem to fit in with the life settlement marketplace
  - Typically look to fund policies only slightly beyond life expectancy
- Be wary of producers “banking” business on older insureds for the life settlement marketplace
  - Typically try to sell policies two years and 1 day from issue.

Substandard Annuities

- Used to arbitrage mortality with life insurance sales
  - Typically secondary guarantee products used
- Institutional money managers have discovered for the same risk, different mortality on the annuity and life product.

Substandard Annuities

- The annuity has worse mortality than the life product
  - One instance on a 78 year old male nonsmoker risk.
  - Annuity mortality had an 8 year life expectancy
  - Life product had a 14 year life expectancy

Substandard Annuities

- UBS Warburg raised over $200 million last summer in a securitization of life insurance
  - Part of the proceeds went to purchase the substandard annuities to finance the life insurance.
  - Life policies are on older aged high net worth individuals

Stochastic Modeling Case Study

- General Stochastic Modeling Considerations
- Model and Assumptions
- Stochastic Case Study Results

General Stochastic Modeling Considerations

- Keys to Success
- Model Construction
- Model Validation

Keys To Successful Stochastic Modeling

- Capturing liability and investment risks
- Quality model data and assumptions
- Model construction
- Interpretation
- Effective resource deployment

Model Construction

- Striking a balance
- Avoid oversimplification

Validation of Models

- Threshold depends upon purpose of model
- Static validation of starting amounts
- Dynamic validation of cash flow and investment income
- Validate non-input items

Validation of Models

- Cash Flows
- Validate against illustration in deterministic static scenario

Sources of Modeling Errors

- Bad data
- Misunderstood liabilities and assets

Stochastic Models as Risk Management Tools

- Ability to demonstrate interaction between assets and liabilities

Analysis and Grouping of Results from Fixed Income ALM Models

- Model validation
- Sensitivity testing
- Capturing and presenting model data

Stochastic Case Study Assumptions

- Treasury Curve from 4/30/2004

Deterministic Scenarios

- Pattern of future yield curves determined ahead of time
- “New York 7” required scenarios
- Other deterministic scenarios

Stochastic Scenarios

- Generated Randomly

Stochastic Interest Rate Models

- Two main types
  - Risk neutral models
  - Realistic models

Risk Neutral Models

- Used for capital markets pricing of assets and/or liabilities
- Give results consistent with the way "Wall Street" would price
- Give pricing consistent with capital markets
- Fit current yield curve

Realistic Models

- Realistic models used to determining the range of results of a portfolio of assets and liabilities using historically based parameters

Realistic Models

- Realistic models used to determining the range of results of a portfolio
- More tractable
- Easier to generalize and make consistent with observed interest rate behavior

Uses of Realistic Models

- Care must be used with realistic models to avoid exploitation of arbitrage opportunities that exist in the model but not in the real world

Other Models

- Numerous more complex models
- Regime switching
- Attempt to match actual distribution

Choosing a Stochastic Generator

- Risk neutral or realistic
- Underlying model and biases
- Cost
- Ease of use

Stochastic vs Deterministic Test Scenario Assumptions

- Realistic generator
- Two factor regime switching lognormal model
- Short and long interest rates
- Correlation between changes in rates
- Mean reversion
- Historical parameters for volatility and average rates

Lognormal Model

- a/k/a Brownian Motion
- $\Delta P = P\,(\mu \Delta t + \sigma\, z\, \Delta t\,)$
- P is stock price
- Change in ln(P) over time period is normally distributed
- Change in stock price ΔP has lognormal distribution

Stochastic Generator

- Regime switching lognormal model
- Lognormal model, or brownian motion can be described by the following equation:

$$\Delta P = P (\mu \Delta t + \sigma z (\Delta t)^{1/2})$$

Stochastic Generator

- Transition probabilities

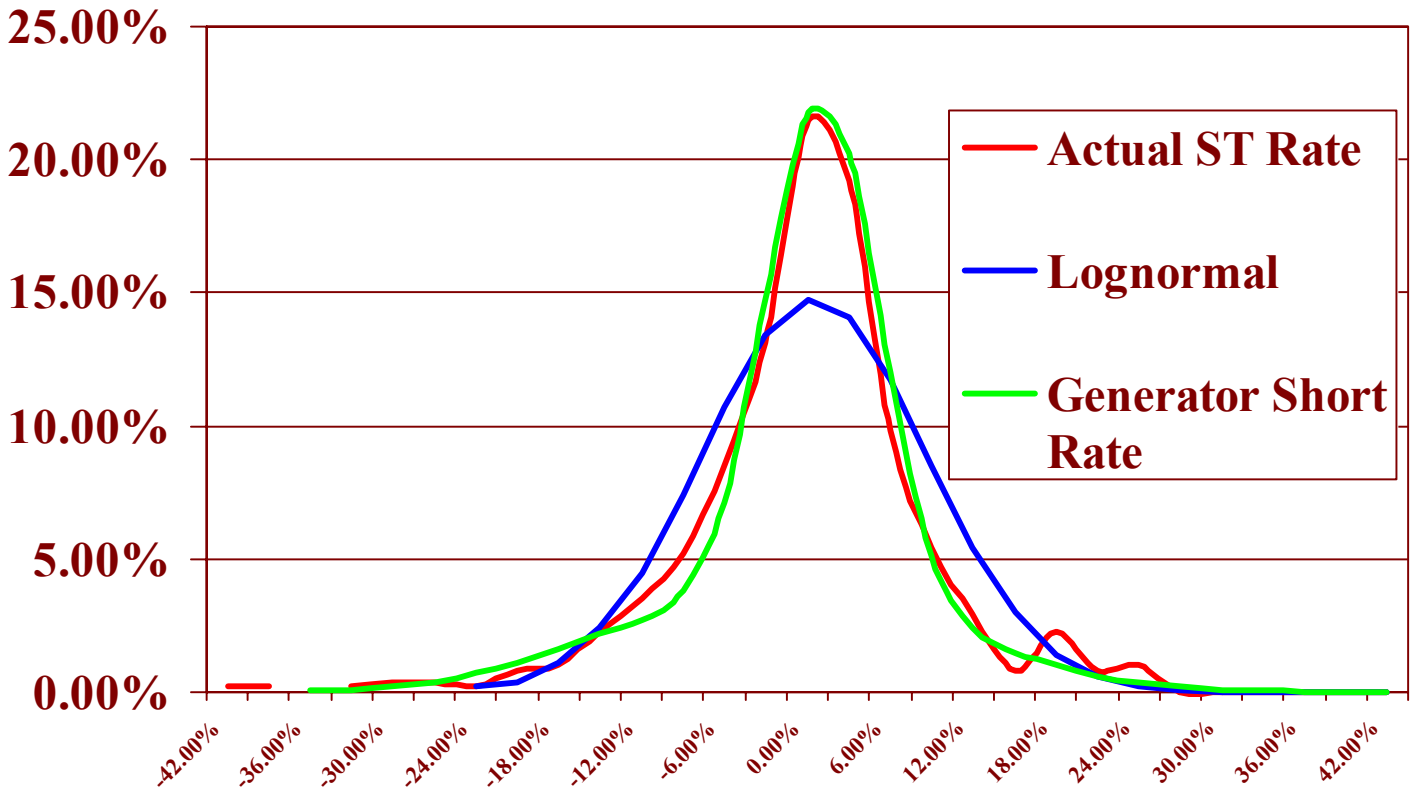
Regime Switching Parameters

μ_1	Mean of first regime
μ_2	Mean of second regime
σ_1	Standard deviation of first regime
σ_2	Standard deviation of second regime
ρ_{12}	Transition probability from regime 1 to regime 2
ρ_{21}	Transition probability from regime 2 to regime 1

Advantages of Regime Switching models

- Serial correlation
- Better representation of actual distribution

Regime Switching Model



Moments of Distribution

Moment	Actual	Single Regime Lognormal Model 100,000 observations	Regime-Switching Lognormal Model 100,000 obs
Mean	.0083	.0083	.0083
Standard Deviation	.0563	.0563	.0561
Skewness	-.4662	.0052	-.5494
Kurtosis	8.0170	.00056	5.6920

Stochastic Generator

- 4 variables
- 2 stock regimes for large cap and small cap stocks
- 2 interest rate regimes for long and short rates
- Stock and rate regimes independent

Stochastic Generator

- Variables correlated
- Intermediate interest rates interpolated

Investment Assumptions

- 4/30/2004 starting scenario
- Invest in 10 year corporates

Stochastic Model Universal Life Assumption Summary

- Universal Life pricing model
- Level premium with persistency
- Profits released
- Criteria is present value of distributable earnings at 12% divided by present value of premium
- Test 1000 stochastic scenarios

Universal Life Product Assumptions

- 5% ultimate lapse rate
- Market sensitive lapses in sensitivity test
- Mortality
- 6 Issue ages; unisex mortality
- Surrender charge per $1000 20 year scale
- Acquisition Expenses
- Maintenance Expenses

Universal Life Product Assumptions

- 500,000 average size
- CRVM base reserves
- Portfolio crediting with 75 basis point spread
- Credited rate reset annually
- 35% tax rate, dac tax

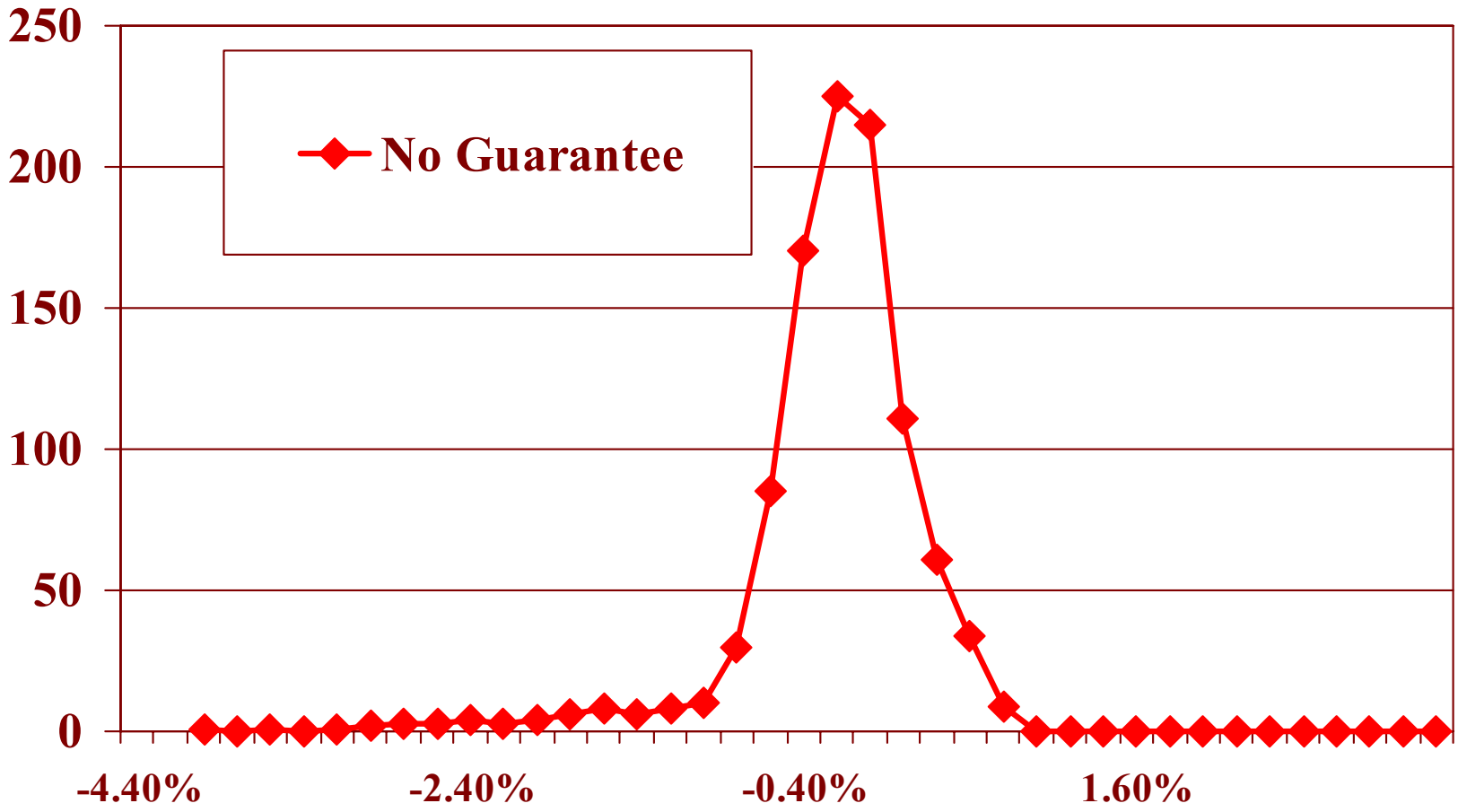
Universal Life Product Assumptions

- If required capital equal to 200% of risk based capital is held, IRR of capital contribution and profit stream is 12% under level scenario
- Within range of various returns companies price for

Asset file assumptions

- Crediting strategies
- Policyholder behavior
- Investment strategies
- Investment expenses
- Other assumptions

Stochastic Model Results



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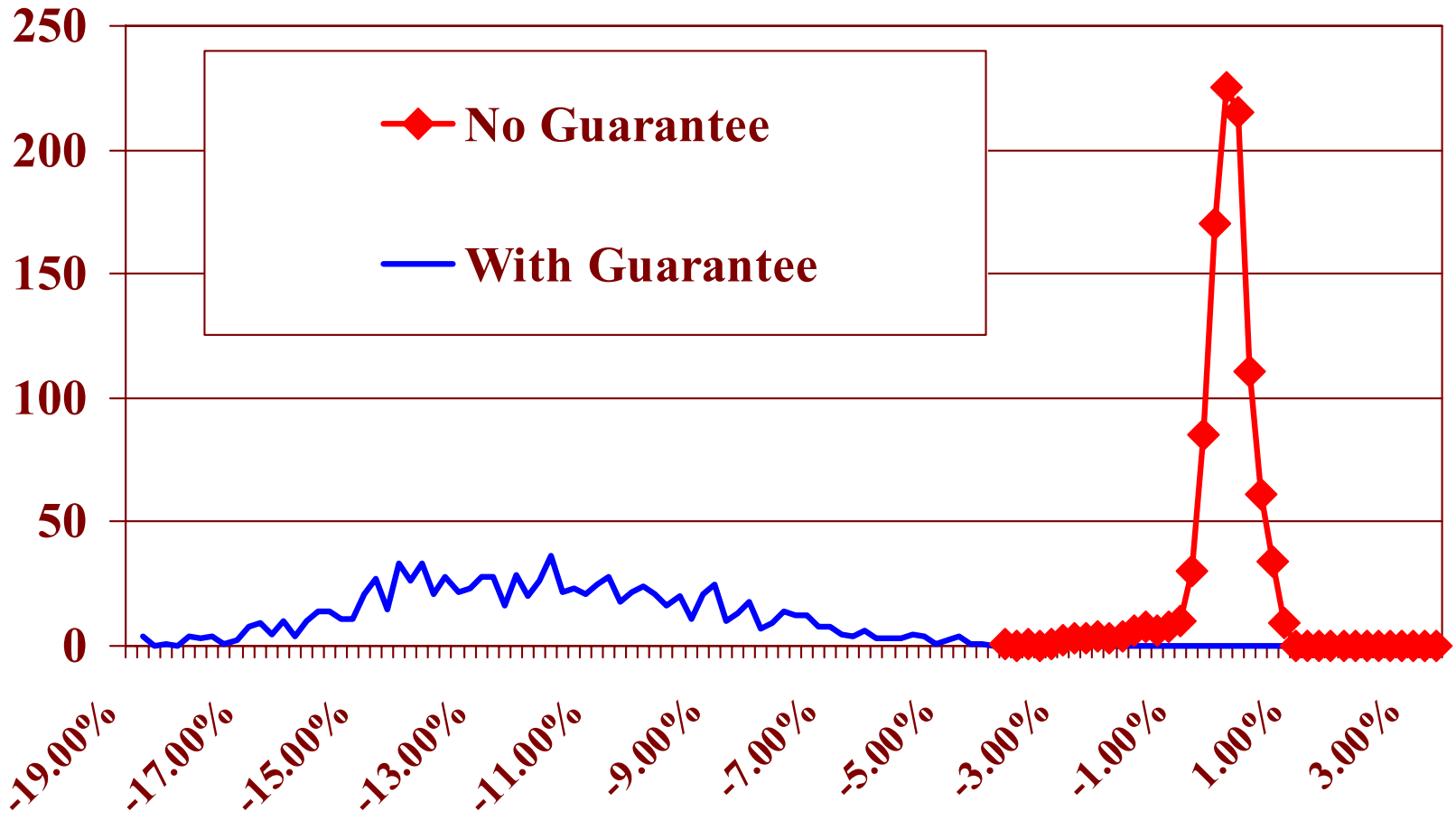

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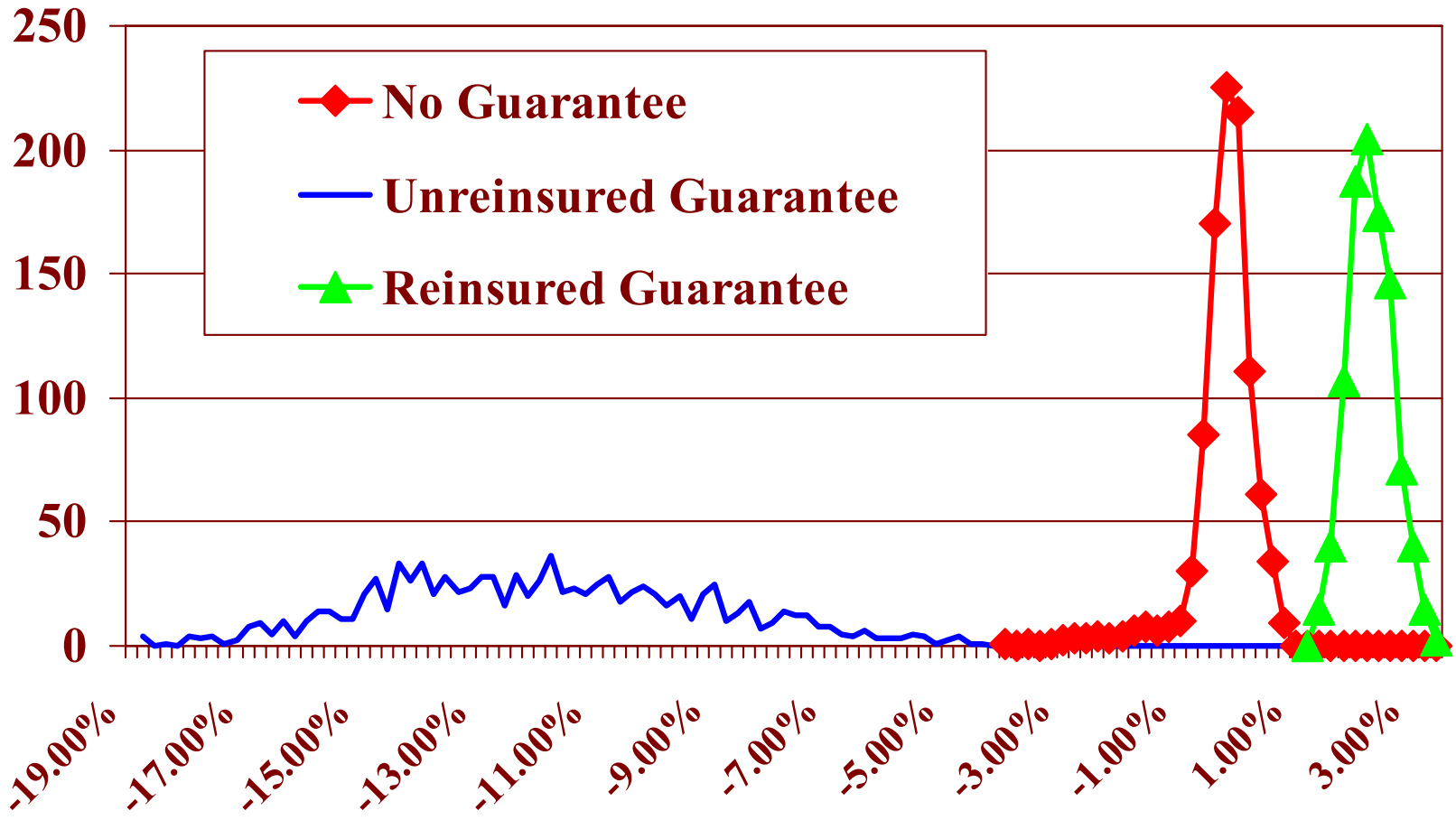
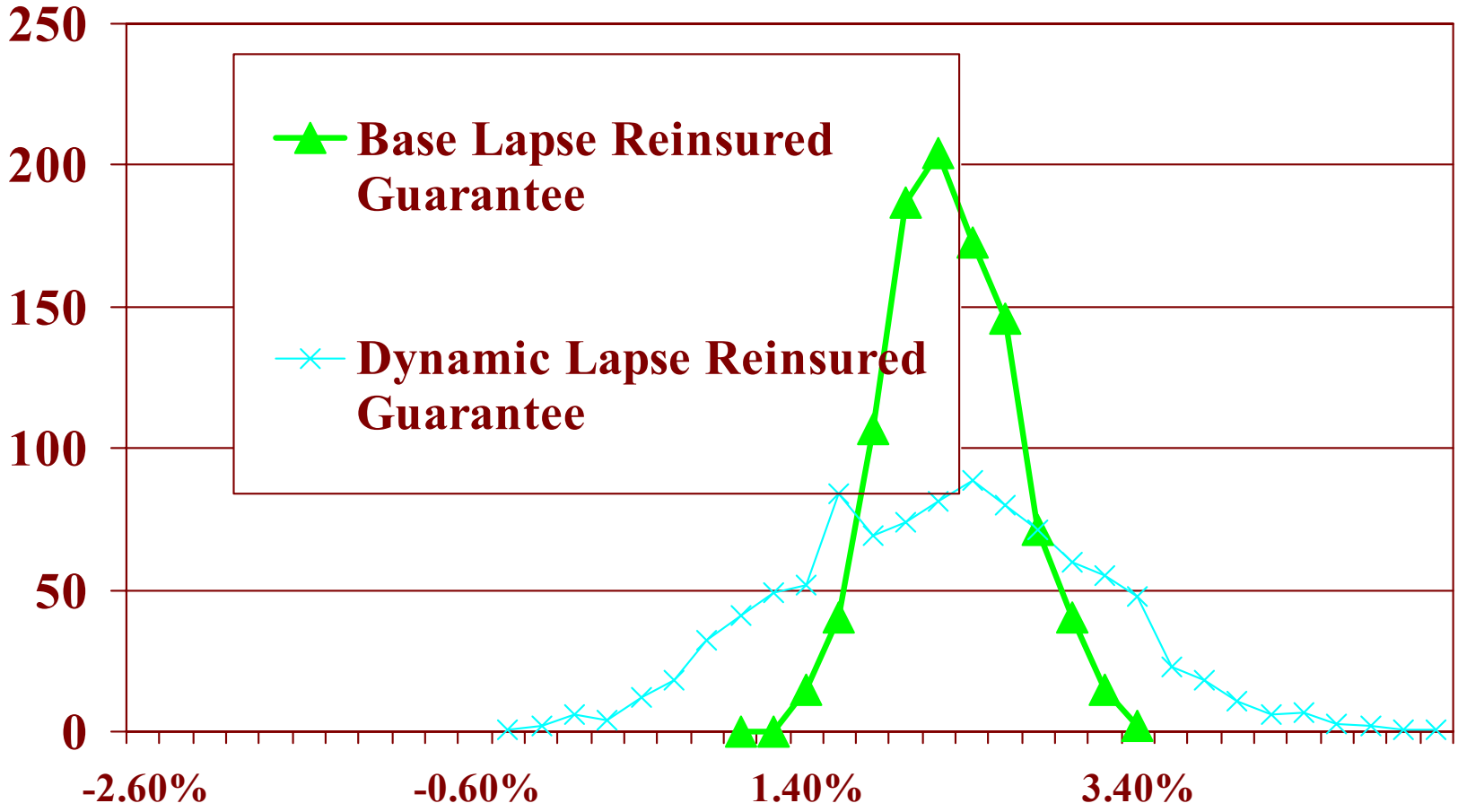


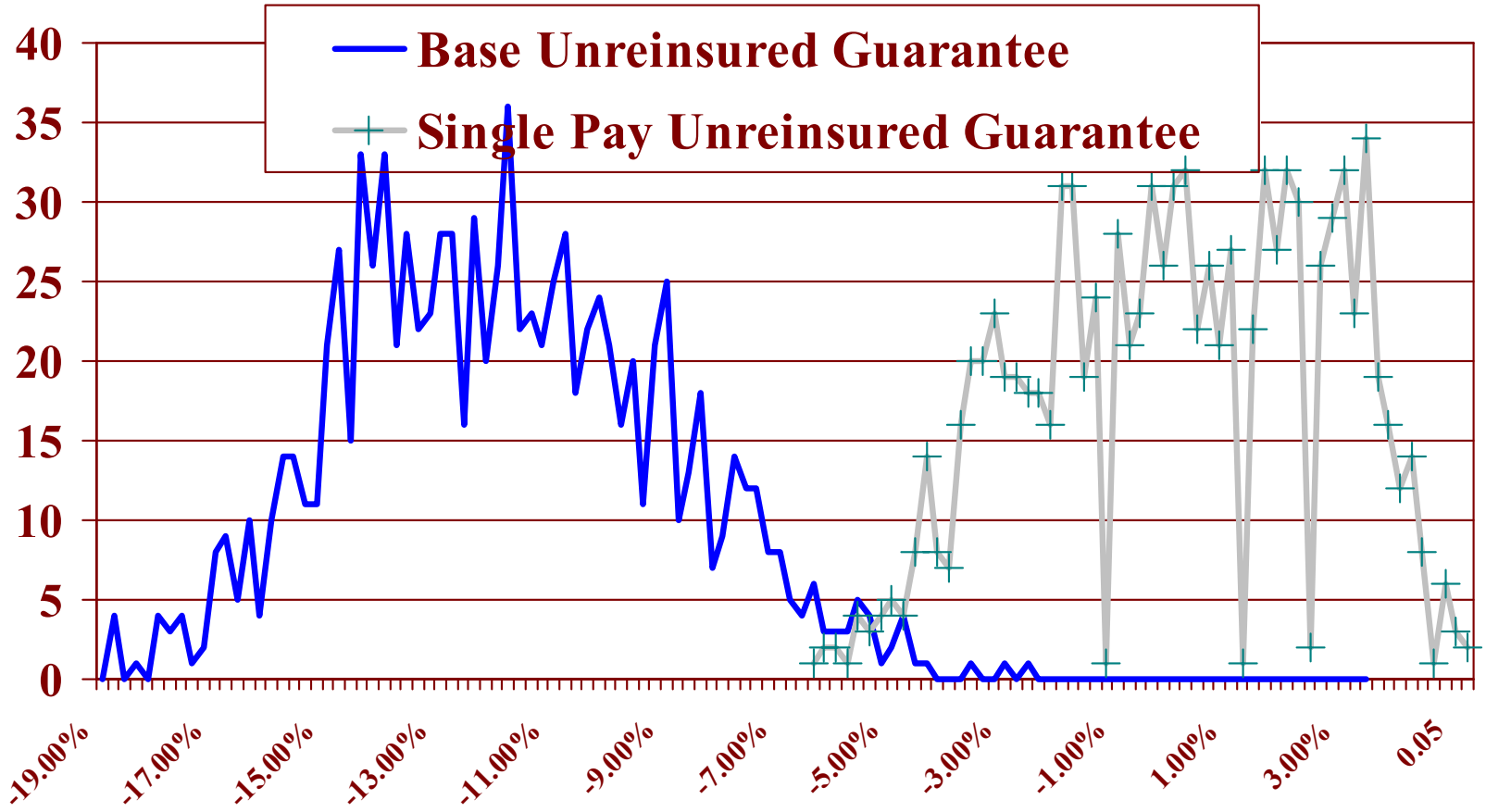
Stochastic Model Results

Lapse Sensitivity



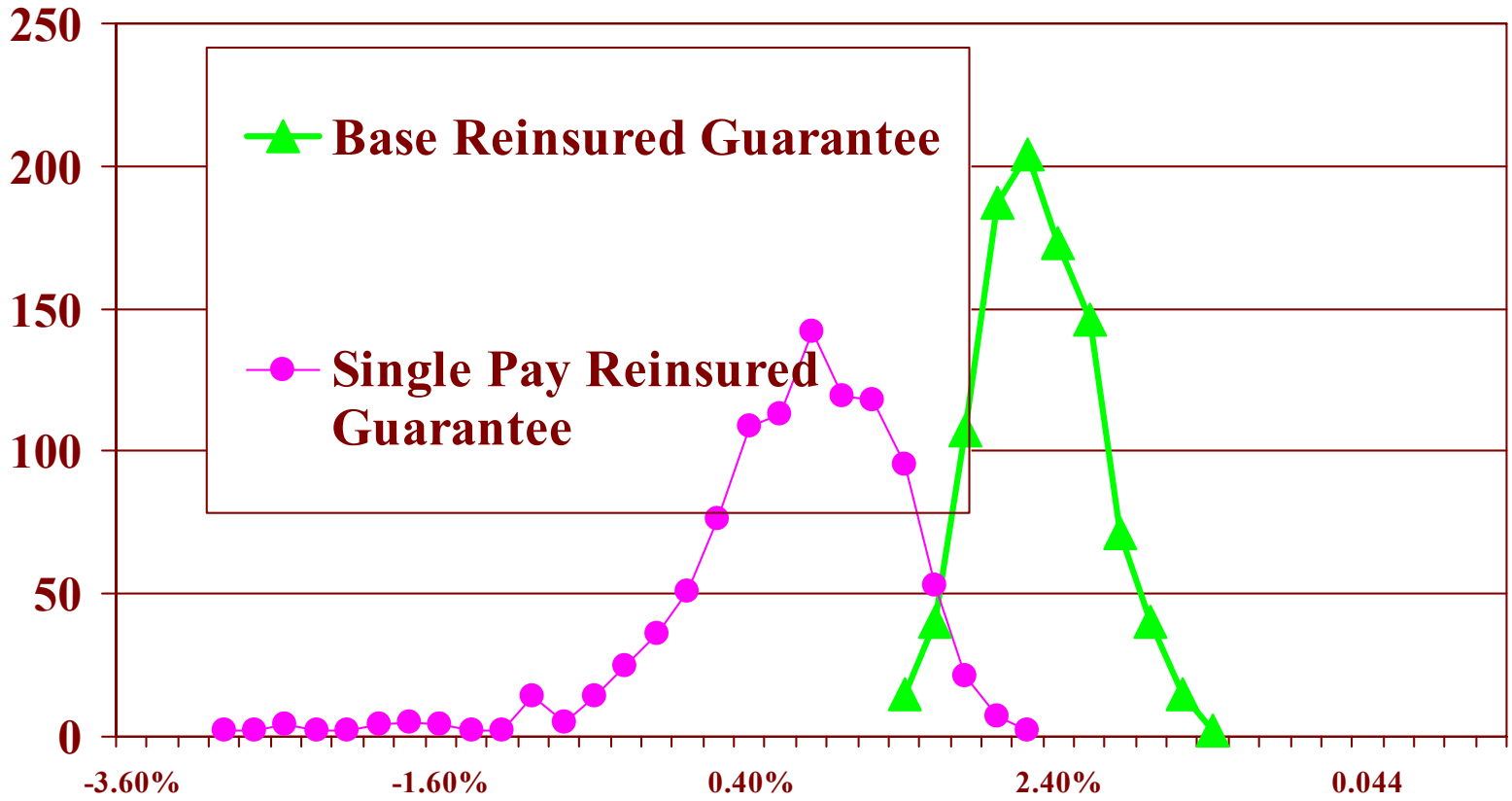
Stochastic Model Results

Funding Level



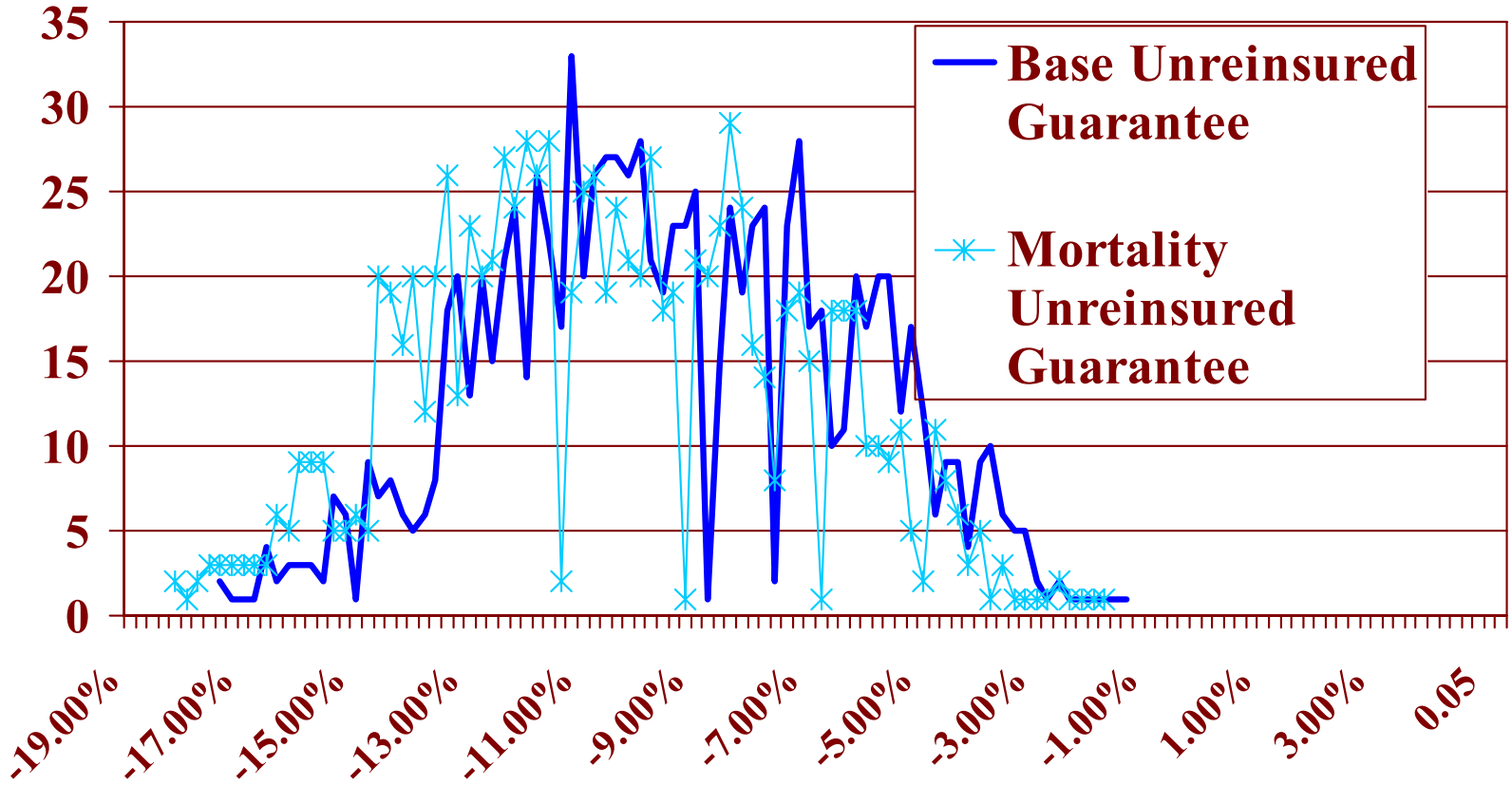
Stochastic Model Results

Funding Level



Stochastic Model Results

Mortality



Stochastic Model Results

Mortality