

Current Trends in ALM

Results of the 2002 Tillinghast Cash Flow Testing Survey

2002 SOA Spring Meeting

Colorado Springs, CO

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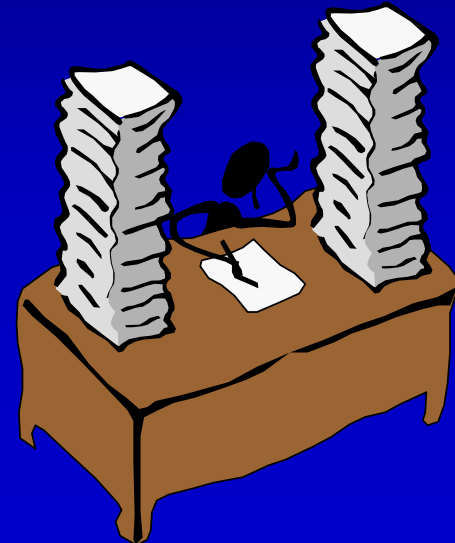
May 31, 2000

Tillinghast - Towers Perrin



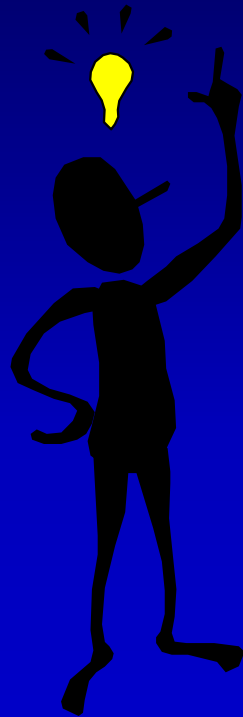
2002 Tillinghast Cash Flow Testing Survey

- Survey sent to 84 companies in December 2001
- 73% response rate
- Purposes:
 - Determine the extent to which companies are utilizing their CFT models
 - Determine number and types of scenarios being used in testing



Benefits to Participants

- Assist in benchmarking current practices
- Offer insights into potential expanded uses of CFT models



Uses of CFT Models

% of Respondents Performing

Asset/Liability Management

- Testing Surplus Adequacy 36%
- Testing Reserve Adequacy 90
- Duration/Convexity Calculations 64
- Testing Alternative Investment Strategies 51

Planning

- Capital/Dividends 34
- GAAP Earnings 39

Embedded Value

30

GAAP (FAS97 source of profit)

41

Risk Management

25

C-3 Scenario Testing

46

Embedded Value

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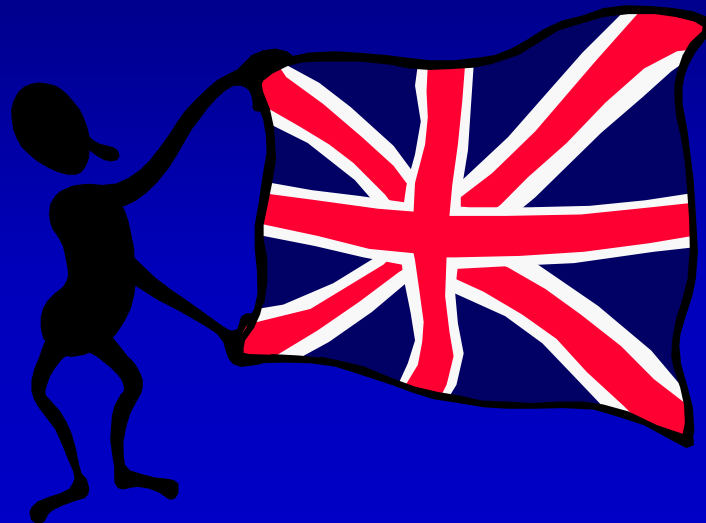
GAAP (FAS97 source of profit) 41

Risk Management 25

C-3 Scenario Testing 46

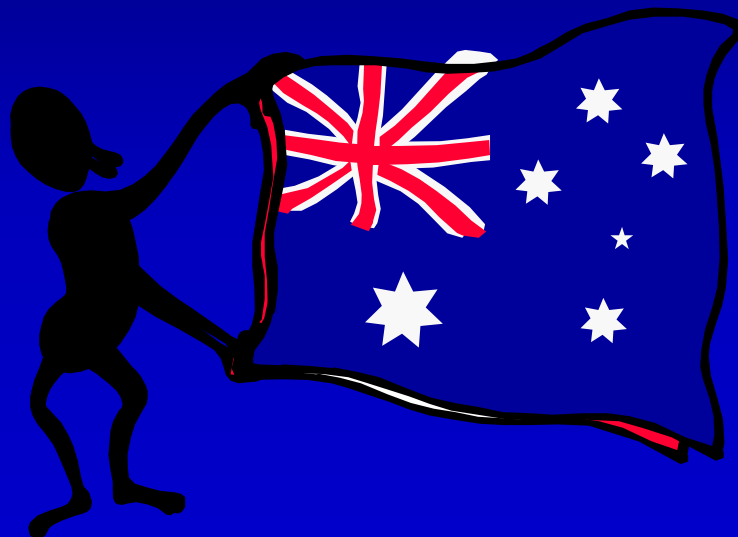
Embedded Value

- Historically utilized in Europe
- U.S. life insurers with European parents were the first U.S. companies to report EVs
- Globalization leading to increased use



Embedded Value

- Recent use among Canadian stock companies
- Increasing acceptance of EV reporting in non-U.S. countries, including the U.K., Australia, South Africa and other European countries
- Any move toward the adoption of a worldwide accounting standard for insurance companies would likely include EV



Testing Alternative Investment Strategies

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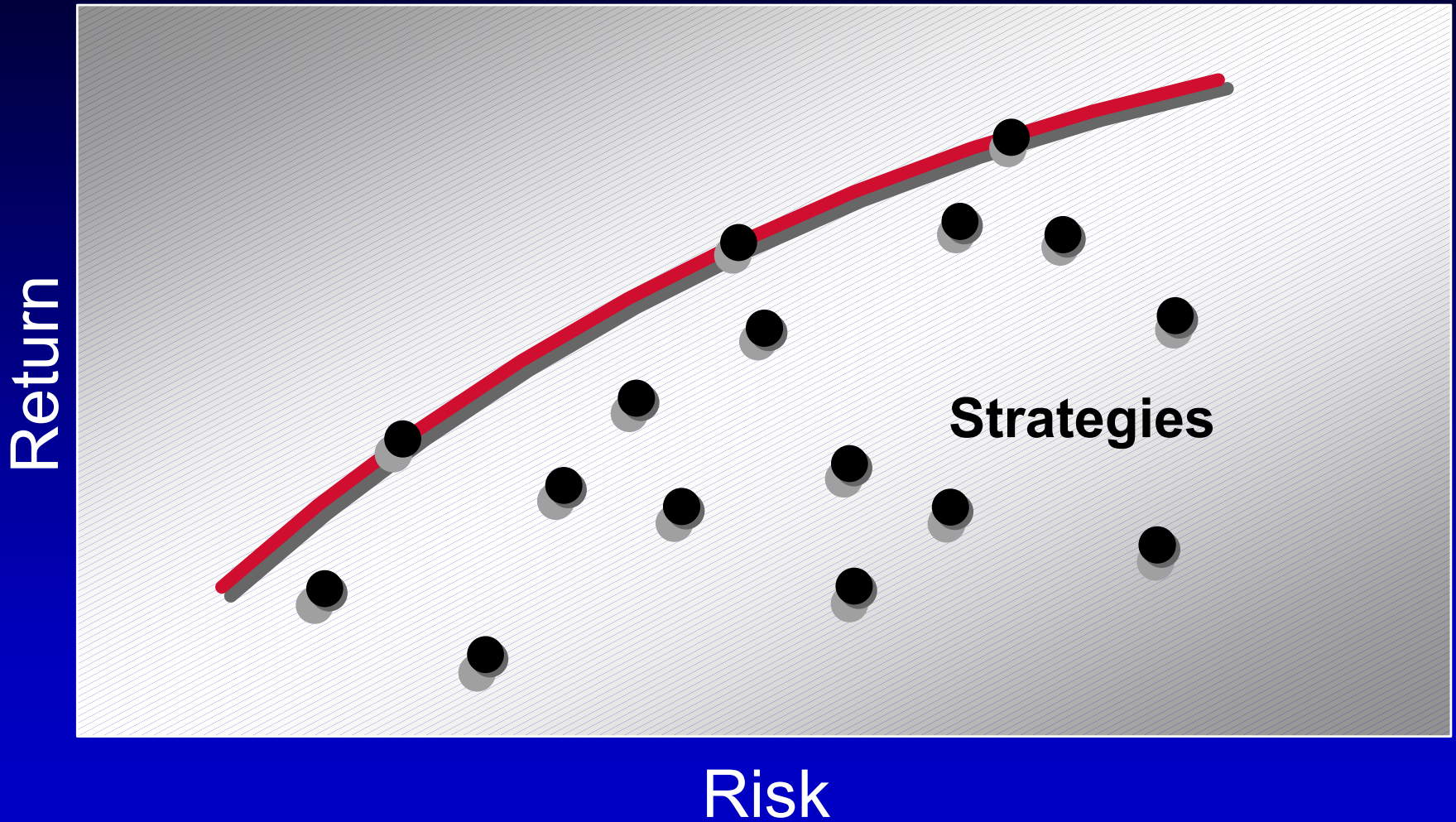
C-3 Scenario Testing

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Testing Alternative Investment Strategies

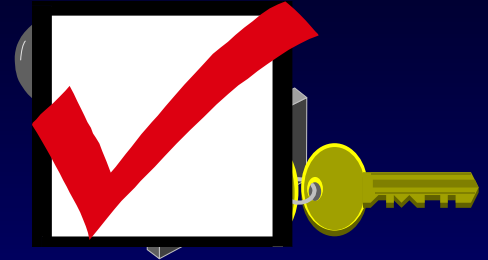
- Trend toward developing and testing alternative investment strategies
- Candidate Analysis vs. True Optimization

Asset/Liability Efficient Frontier

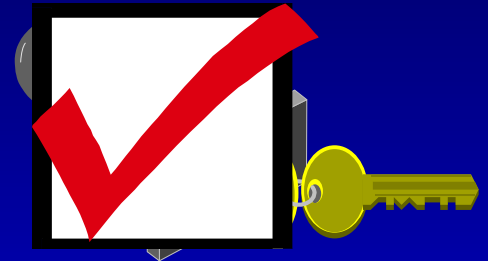


Asset/Liability Levers

Product Design



Interest Crediting Strategy



Investment Strategy



Risk and Return Measures

	% of Respondents
<i>Earnings</i>	79%
ROI	32
ROE	28
Probability of Negative Earnings	17
Present Value of Distributable Earnings	15
Present Value of Future Statutory Earnings	9
Present Value of Book Profits	6
Earnings at Risk	4
<i>Surplus</i>	32%
Probability of Negative Surplus	13
Present Value of Future Surplus	9
Market Value of Surplus	6
Other Surplus-related Measures	4
<i>Other</i>	9%

Types of Scenarios Used

	Stochastic	Deterministic
Asset/Liability Management		
– Testing Surplus Adequacy	36%	77%
– Testing Reserve Adequacy	47	89
– Duration/Convexity Calculations	60	40
– Testing Alternative Investment Strategies	80	24
Planning		
– Capital/Dividends	5	95
– GAAP Earnings	6	94
Embedded Value	8	92
GAAP (FAS97 source of profit)	0	100
Risk Management	82	18
C-3 Scenario Testing	78	22

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Number of Scenarios

	Stochastic	Deterministic
Asset/Liability Management		
– Testing Surplus Adequacy	100	8
– Duration/Convexity Calculations	100	3
– Testing Alternative Investment Strategies	100	9
Planning		
– Capital/Dividends	100	1
– GAAP Earnings	50	1
Embedded Value	300	1
GAAP (FAS97 source of profit)	N/A	1
Risk Management	400	7
C-3 Scenario Testing	50	12

Number of Scenarios

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Asset/Liability Management		
– Testing Surplus Adequacy	100	8
– Duration/Convexity Calculations	100	3
– Testing Alternative Investment Strategies	100	9
Planning		
– Capital/Dividends	100	1
– GAAP Earnings	50	1
Embedded Value	300	1
GAAP (FAS97 source of profit)	N/A	1
Risk Management	400	7
C-3 Scenario Testing	50	12

Model Run-Time

Satisfaction with Model Speed

Reported Level	% of Respondents
Very Satisfied (5)	12%
Somewhat Satisfied (4)	12
Satisfied (3)	41
Somewhat Dissatisfied (2)	27
Very Dissatisfied (1)	8

Mean level of satisfaction = 2.92

Model Run-Time

Summary of Model Run Time (computer hours)

	New York 7	All Scenarios
Mean	27 hours	83 hours
Median	10 hours	27 hours

Model Size

Summary of Model Sizes (model cells)

	Liabilities	Assets
Mean	9,092	2,485
Median	5,000	1,250

Model Consolidation

- Definition: mapping of similar liabilities and/or similar assets in an attempt to reduce the total number of model cells
- About 40% of respondents have attempted to consolidate their models
 - Those who have consolidated have seen a 40% mean reduction in run-time

Model Accuracy

Satisfaction with Model Accuracy

Reported Level	% of Respondents
Very Satisfied (5)	7%
Somewhat Satisfied (4)	44
Satisfied (3)	42
Somewhat Dissatisfied (2)	5
Very Dissatisfied (1)	2

Mean level of satisfaction = 3.49

Model Accuracy

- Gauged by performing validations
- Static validations measure accuracy of producing balance sheet items at the model start date
 - 95% report performing static validations
- Dynamic validations measure accuracy of projecting income statement items by comparison to recent periods
 - 44% report performing dynamic validations

RBC C-3 Requirements

RBC C-3 Scenario Requirement for “Fixed Interest Risk”

	Yes	No
Did your company take an exemption for the 2000 filing?	71%	29%

C-3 Phase II

- Proposal addresses interest rate and equity risk associated with variable products with guarantees other than index guarantees
 - e.g., GMDB, GMIB, GMAB

C-3 Phase II

1. Run stochastic scenarios for variable product cash flows.
2. For each scenario, calculate the present value of the accumulated statutory surplus as of each calendar year-end.
3. Tabulate the lowest of these present values, and sort the scenarios on this measure.
4. Calculate the Modified Conditional Tail Expectation at the 90% level (“CTE 90”) defined as the arithmetic average of the worst 10 percent of all scenarios with no scenario being calculated as a positive value of accumulated surplus. This CTE 90 estimated surplus requirement less the reserves set up for these benefits would establish the RBC amount required.

C-3 Phase II

- We advise that companies offering variable products with guarantees keep abreast of these discussions