

The 2001 CSO Table

2002 Valuation Actuary Symposium - Session 10PD

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September 19, 2002

Tillinghast - Towers Perrin

Agenda

- Update on Model Regulation
- Impact of 2001 CSO Table on product
 - reserves
 - non-forfeiture values
 - COI rates
 - s. 7702 compliance

Development of the Model Regulation

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Update on the development of the model regulation

- Status of proposed model regulation
- Provisions of the model regulation
- Open issues

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Status of proposed model regulation

- The model regulation was agreed to be put forward to the "A" committee at the September LHATF meeting

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Provisions of the model regulation

- Title is "Recognition of the 2001 CSO Mortality Table for Use in Determining Minimum Reserve Liabilities and Nonforfeiture Benefits Model Regulation"
- When can you use the 2001 CSO table?
 - A company may elect to utilize the 2001 CSO table as the minimum standard for *specified plans* of insurance issued on or after January 1st of the calendar year next following or coincident with the effective date of the regulation
 - The 2001 CSO table will be used for minimum standards for *all* policies issued on or after January 1, 2009

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Provisions of the model regulation

- The name "2001 CSO Mortality Table" encompasses:
 - Sex-distinct rates
 - Distinct smoker and nonsmoker rates
 - Composite rates that do not distinguish between smokers and nonsmokers
 - Ultimate rates, select and ultimate rates
 - This is slightly different than the definition of the 80 CSO table in the XXX regulation which did not include the select form of the table.

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Provisions of the model regulation

- ETI tables are not provided
 - ETI data provided to the SOA was minimal and ETI is not as prevalent a nonforfeiture option as in the past
 - The ETI data suggested the mortality was not too dissimilar to the ordinary ultimate mortality of the same company
 - The minimum basis of ETI purchase rates, reserves and cash values will be based on the CSO version

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Provisions of the model regulation

- Rules for using smoking-distinct rates are specified
 - If premiums or rates are smoking-distinct, then
 - minimum reserves and minimum nonforfeiture values may be based on either smoking distinct or composite mortality rates,
 - valuation net premiums and additional minimum reserves, if any, required by SVL when $GP < VNP$ may be based on smoking distinct rates even if composite rates are used for minimum reserves and minimum nonforfeiture values.
 - If premiums or rates are not smoking-distinct, then minimum reserve and nonforfeiture values must be based on composite rates.

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Two requirements must be met to elect the 2001 CSO table for reserving

- When a company elects to use the 2001 CSO Mortality Table as a reserve basis in an annual statement filed with the Commissioner, an actuarial opinion based on an asset adequacy must accompany the annual statement as specified in the Valuation of Life Insurance Model Regulation. Begin to save and retain by electronic means its inforce and death data for individual life policies

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Provisions of the model regulation

- Utilization of mortality in Guideline XXX is specified

1980 CSO Mortality Table Usage in XXX Regulation	2001 CSO Mortality Table Usage in XXX Regulation
Section 3a(2)(b) – Calculating Net Level Premiums for UL Exception From XXX	
80 CSO ultimate, sex distinct, smoking distinct	Same, but using 2001 CSO versions
Section 4B – Mortality Allowed in Determining Length of Segments	
80 CSO with select factors, unmodified by "X" factors, allowed	Same, but using 2001 CSO versions
Section 5A – Basic Reserve Minimum Mortality	
80 CSO with select factors allowed	Same, but using 2001 CSO versions

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Provisions of the model regulation

- Utilization of mortality in Guideline XXX is specified

Section 5B – Sufficiency Reserve Minimum Mortality	
80 CSO with select factors allowed, "X" factor allowed in first segment on XXX appendix sourced select rates	2001 CSO with select factors allowed, "X" factor allowed on basic table select rates
Section 6C – Minimum Value Reserves (Tabular Cost)	
80 CSO with 10-year select factors allowed	2001 CSO ultimate rates only
Section 6E(4) – Optional Exemption for YRT Reinsurance – Determination of Valuation Net Premium	
80 CSO with 10-year select factors allowed	2001 CSO ultimate rates only
Section 6F(4) – Optional Exemption – Attained Age YRT policies – Determination of Valuation Net Premium	
80 CSO with 10-year select factors allowed	2001 CSO ultimate rates only
Section 6G(2) – Exemption from Unitary Reserves for Certain n-Year Renewable Term Net Premium Test	
80 CSO with 10-year select factors allowed	2001 CSO ultimate rates only
Section 7A(1)(6) – UL Policies – Comparison of Minimum Premium to One Year Valuation Premium	
80 CSO with 10-year select factors allowed	2001 CSO ultimate rates only

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Provisions of the model regulation

- Other applications of the table are specified
 - Gender blended tables
 - Current language allows usage of blends for nonforfeiture at company election
 - Proposed language would limit use of blends to plans where premiums are not sex-distinct or where distinction based on gender is not allowed by state law
 - Blended tables created by applying specified methodology (also under discussion)
 - Age last birthday modification
 - Methodology specified on how to create the ALB tables

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Provisions of the model regulation

- The same form of the table **does not** need to be used for both basic reserves and alternate minimum reserves
 - There was a significant amount of discussion over the proposed section where if one uses select and ultimate on the basic reserves, then one must use the select and ultimate on the alternate minimum
 - The intent may be to force the use of the same q_x 's in both reserve calculations
 - Departure from current practice
 - In the end, the model regulation was put forth by LHATF without this section

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Impact on Cash Values and Reserves

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The 2001 CSO table will have a profound impact on life insurance sold in the U.S.

- Basic reserves and deficiency reserves on new issues
- Tax reserves on new issues
- Non-forfeiture requirements
- In addition, the table impacts the following
 - Maximum cost of insurance charges
 - Section 7702 - guideline premiums
- The impact of each of these may vary by product

For certain product lines it will be advantageous to utilize the 2001 CSO table, for others, it will not.

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In some states, the table will be effective as early as
January 1, 2003

- The timetable should then be as follows:
 - December 2004 - at least 26 states approve the table, it then becomes prevailing for 2004
 - January 2007 - three years after the table becomes the prevailing table, it must be used for tax reserve purposes
 - January 2009 - the table must be used for valuation of new issues

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Basic reserves are driven by the shape of the table

- It is generally thought that the adoption of a new CSO table will lower reserves
- The relationship between future net premiums and the mortality rates determines the amount of pre-funding required and thus the level of reserves

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The AAA compared whole life reserves under 1980 CSO and 2001 CSO in its report for whole life

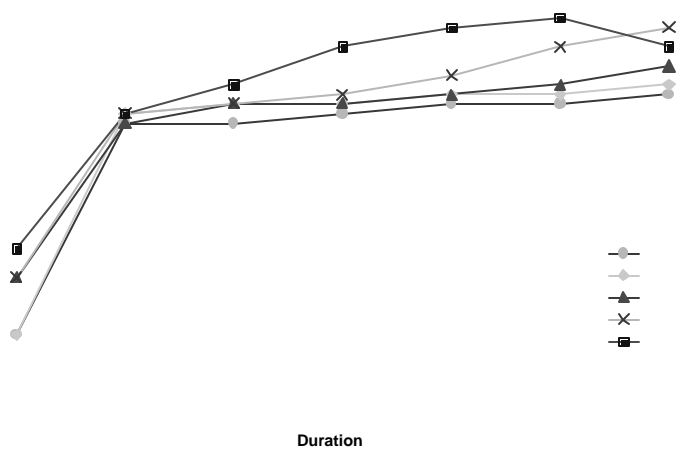
- Reviewed for male nonsmokers, male smokers, female nonsmokers and female smokers
 - Issue ages: 25, 35, 45, 55 and 65
 - Durations: 1, 5, 10, 15, 20, 25 and 30
- Based on ultimate mortality for both 1980 CSO and 2001 CSO

The impact on basic cash values will be similar to the impact on reserves

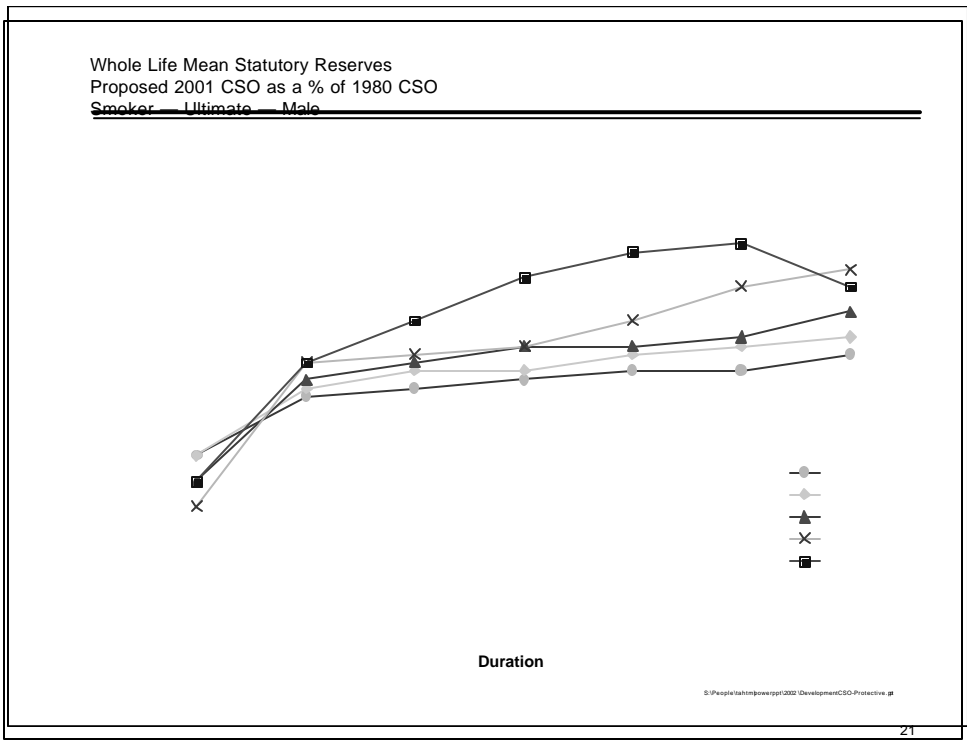
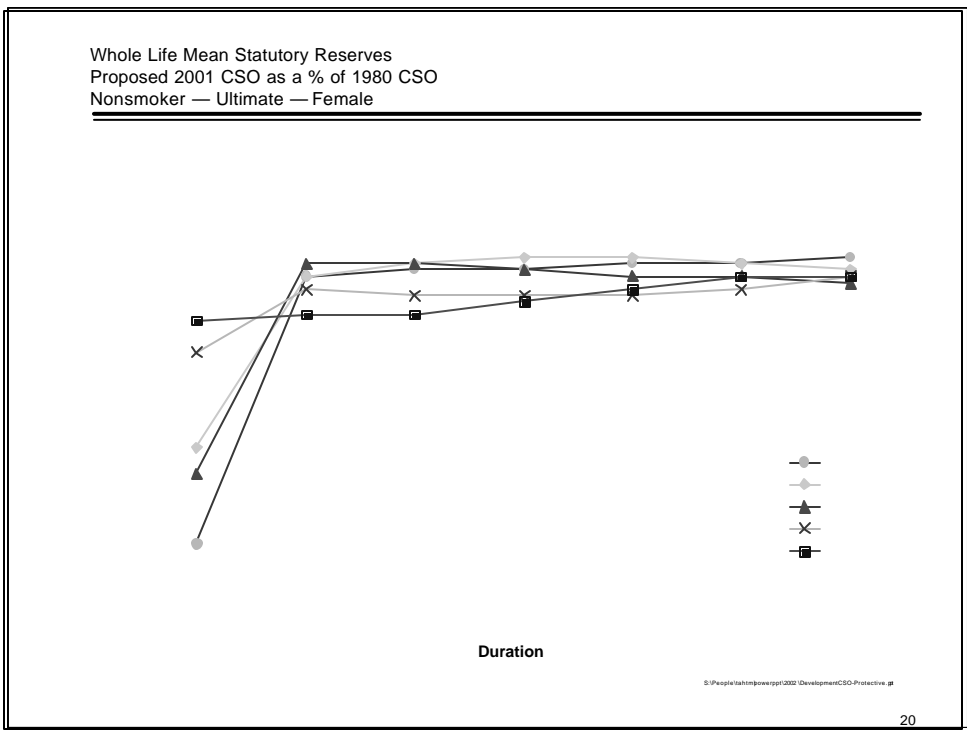
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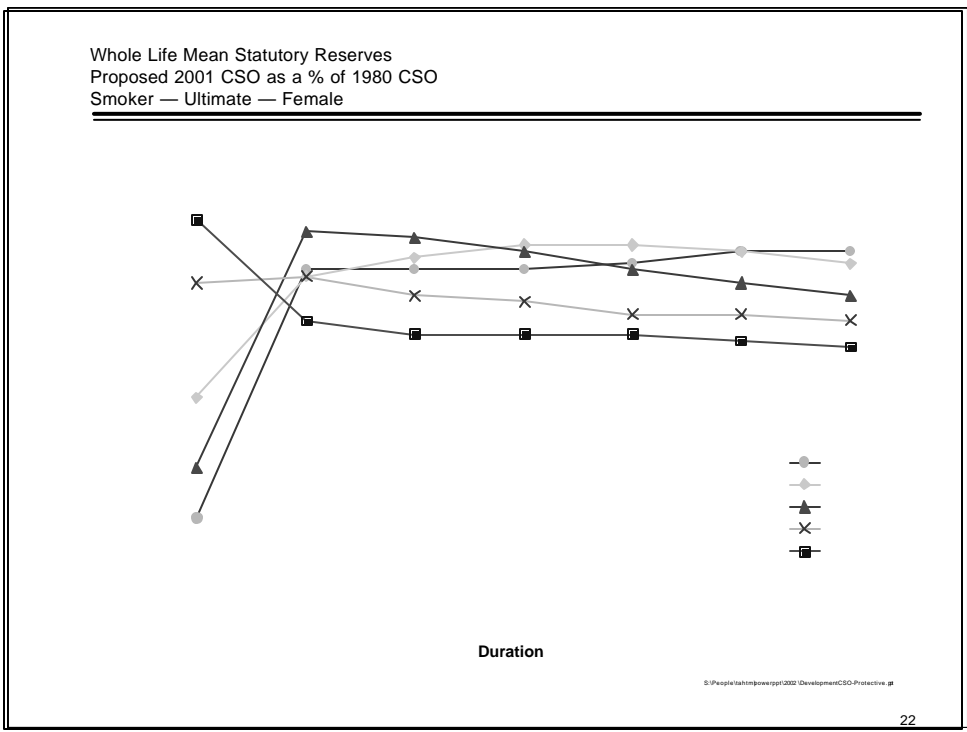
Whole Life Mean Statutory Reserves
Proposed 2001 CSO as a % of 1980 CSO

Nonsmoker — Ultimate — Male



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The AAA report also presented results of a model office

Whole Life Model Office Reserves — 2001 CSO Reserves as a Percentage of 1980 CSO Reserves (After 10 years)

	Age 25	Age 35	Age 45	Age 55	Age 65	All Ages
Male	80.0%	82.0%	83.5%	86.3%	89.7%	84.1%
Female	86.1%	86.9%	90.2%	85.1%	80.0%	85.8%
Combined	82.6%	83.6%	85.8%	85.8%	84.9%	84.8%

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2001 CSO impact on term insurance

- Not impacted by 7702 or maximum charge limitations
- Miscellaneous impacts
 - Cash value limitations
- Impact on statutory reserves
 - Basic reserves are lower
 - Mixed impact on deficiency reserves
 - Mixed differential between ultimate and S&U

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Most popular term plan today is level term

- 10/20/30-year level premiums (also 5, 15, 25)
- Preferred and "super-preferred" risk classes assume very low mortality
- Premiums after level term larger than 1980 CSO to reduce unitary reserves
- Regulation XXX requires reserves based on level period
 - New select factors attempted to "update" 1980 CSO
 - Slope issues
 - No basic reserve relief
- Offshore solutions reduce cost of redundant reserves

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Among the top 15 term writers
in the Tillinghast Mortality Table Survey:

- All but two reinsure 80 – 90% of face amount
- Median face amount is \$400,000
- Median number of risk classes is ten (five per gender)
- As a percent of 75 – 80, typical best nonsmoker is 20 – 30%, worst smoker is 100 – 120+%

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Cash value impact is fairly small

- Key issue is whether cash values can be eliminated (using unitary calculations)
 - Depends on steepness of premium rates
- Either ultimate or S&U rates may be used
- Some states limit the ultimate guaranteed maximum premiums
- Impact is not expected to be large for most term plans

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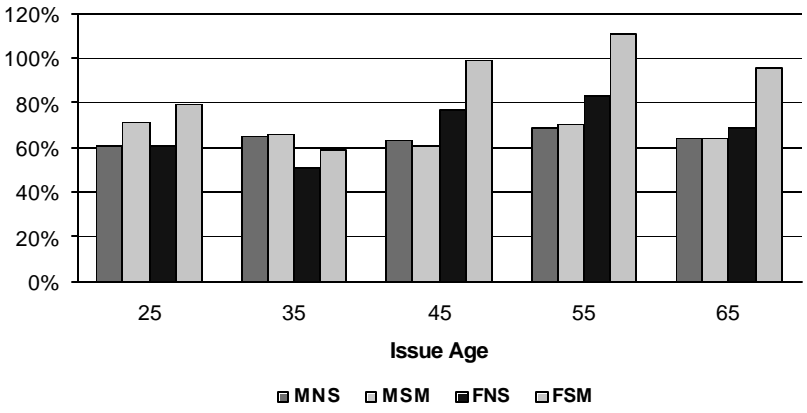
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Basic reserves are lower because mortality rates are lower

- Impact varies by issue age, risk class and term period
- Controversy about using select for deficiency reserves and ultimate for basic reserves is winding down
- Reserves are still significantly larger than gross premium reserves for preferred risk
- The following three slides compare present value of reserve increases for a variety of term plan cells

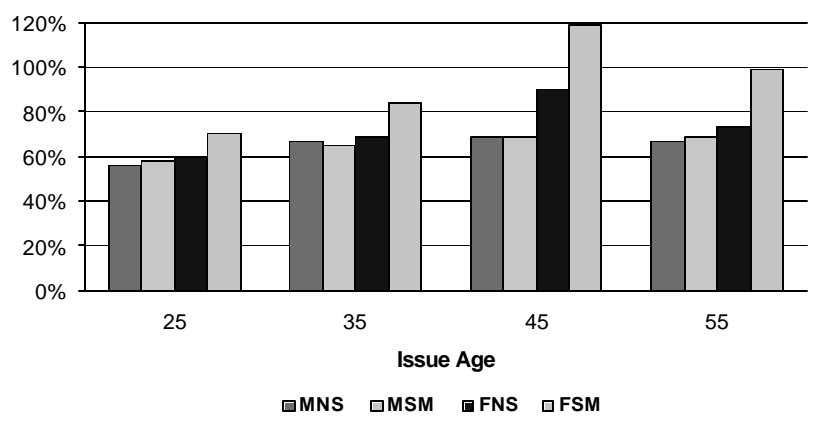
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Present Value of Basic Reserve Increase Discounted
at 7% Ratio of 2001 CSO Ultimate to 1980 CSO Ultimate
10-Year Term



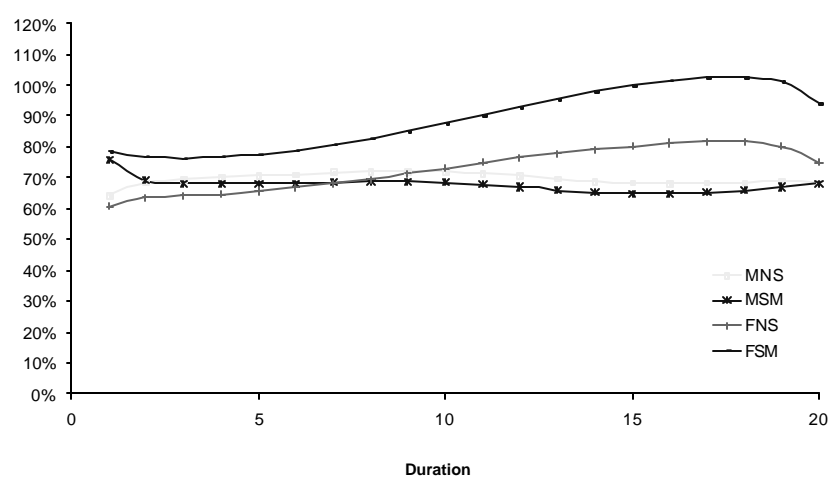
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Present Value of Basic Reserve Increase Discounted
at 7% Ratio of 2001 CSO Ultimate to 1980 CSO Ultimate
20-Year Term

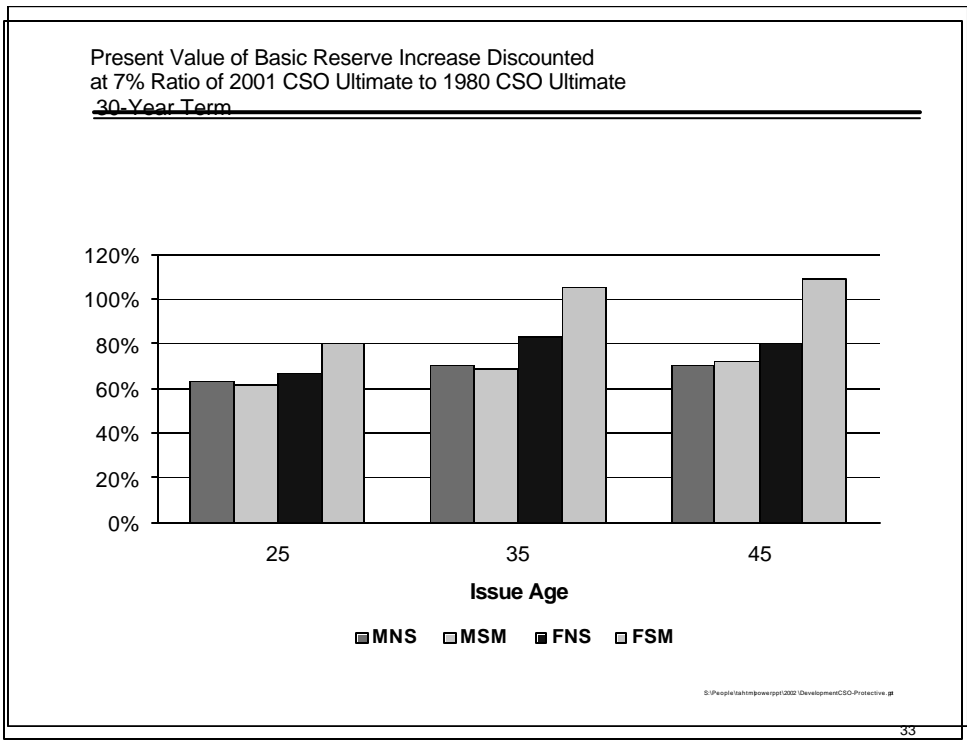
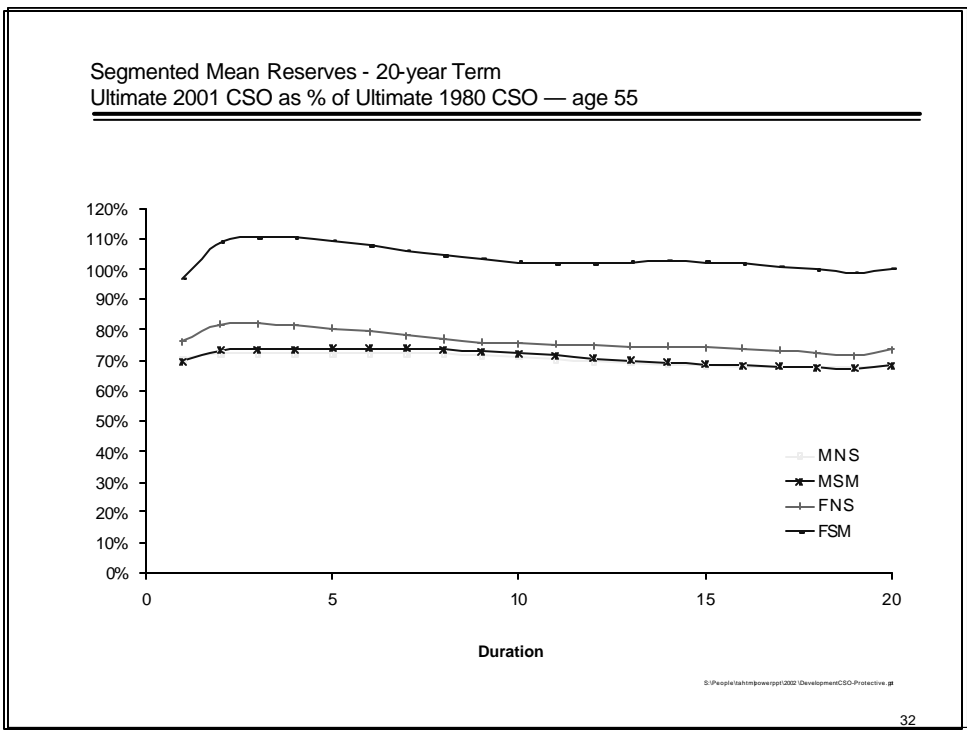


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Segmented Mean Reserves - 20-year Term
Ultimate 2001 CSO as % of Ultimate 1980 CSO — age 35



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Deficiency reserve results are mixed

- Several factors determine whether a deficiency reserve will exist in a level term plan
- Gross premiums include provision for expenses and profits, which is a factor to *avoid* deficiency reserves
- Gross premiums discount future mortality at a higher rate of interest and with provision for lapse, which is a factor that potentially can *cause* deficiency reserves

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Deficiency reserve results are mixed

- The "X" factor causes valuation mortality to equal pricing mortality in year 1 (if justified by experience), but the valuation mortality may have a steeper slope, which is a factor that potentially can *cause* deficiency reserves
- Redundancy in basic reserves will offset some or all of deficiency reserves in later durations

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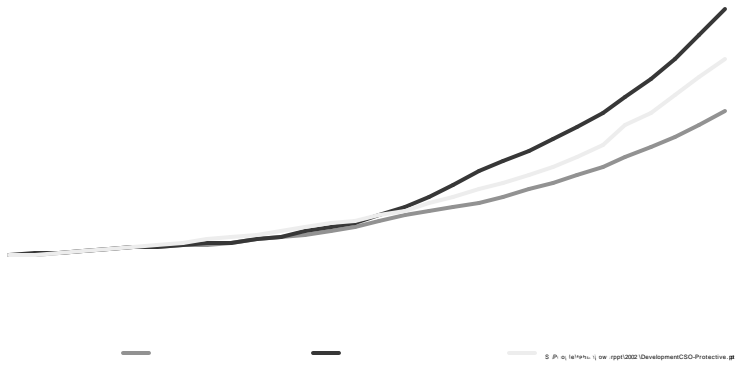
Observations on deficiency reserves — 2001 vs. 1980 CSO

- Nonsmoker deficiencies are lower, particularly where the discontinuity in XXX factors (age 70) is a factor
- Smoker deficiencies are larger — the 2001 CSO has a steeper slope
- Deficiencies last longer because of less redundancy in basic reserves — two pricing cells had deficiencies for five years (one had eight) vs. three years as the longest for 1980 CSO

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Impact of Deficiency Reserve Mortality
Male, Age 45, Preferred NS

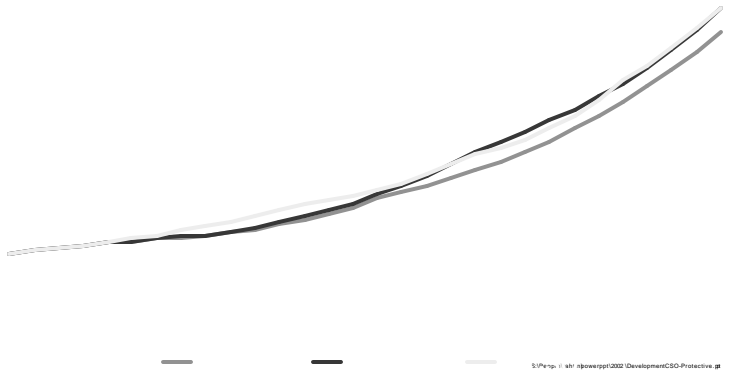
	10	20	30
Net Premium — 1980 CSO	.77	1.67	3.54
Net Premium — 2001 CSO	.85	1.69	3.11
Net Premium — Pricing @ 4.5%	.75	1.44	2.52
Net Premium — Pricing @ 12.5%	.64	1.00	1.34



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Impact of Deficiency Reserve Mortality
Male, Age 45, Smoker

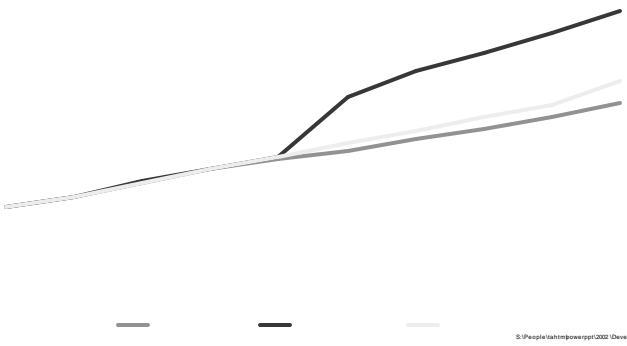
	10	20	30
Net Premium — 1980 CSO	2.45	5.00	8.97
Net Premium — 2001 CSO	2.84	5.60	9.37
Net Premium — Pricing @ 4.5%	2.39	4.60	8.07
Net Premium — Pricing @ 12.5%	2.04	3.20	4.28



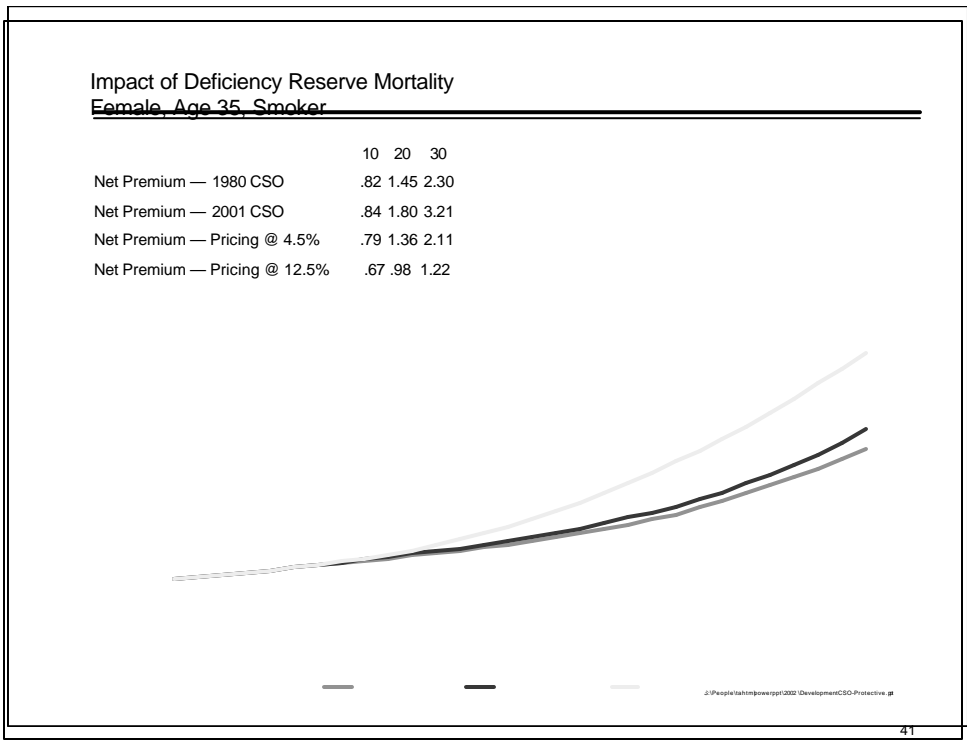
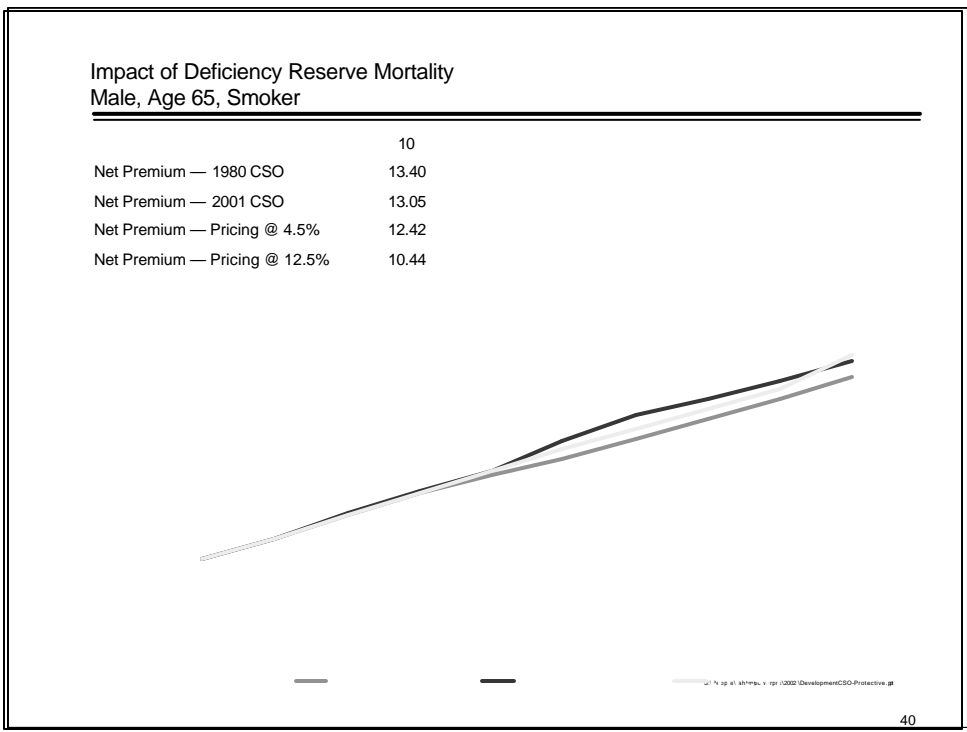
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Impact of Deficiency Reserve Mortality
Male, Age 65, Preferred NS

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Net Premium — 1980 CSO	5.72
Net Premium — 2001 CSO	4.19
Net Premium — Pricing @ 4.5%	3.88
Net Premium — Pricing @ 12.5%	3.26



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Comparison of initial deficiency reserves— nonsmoker

Plan	1980 CSO	2001 CSO
10-Year Plan		
■ M45	.65	1.36
■ M55	—	.49
■ M65	9.90	—
■ F65	7.64	—
20-Year Plan		
■ M35	.11	—
■ M45	2.65	2.93
■ M55	12.44	4.31
■ F55	2.72	—
30-Year Plan		
■ M35	2.11	—
■ M45	16.76	9.85
■ F35	1.01	1.25
■ F45	9.54	2.53

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Comparison of initial deficiency reserves— smoker

Plan	1980 CSO	2001 CSO
10-Year Plan		
■ M45	—	2.56
20-Year Plan		
■ M35	1.62	2.33
■ M45	3.33	11.56
■ M55	9.76	11.46
■ F35	—	3.21
■ F45	—	1.82
30-Year Plan		
■ M35	1.57	2.16
■ M45	1.18	7.91
■ F35	—	12.46

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UL product development parameters

- Marketing concept
 - Minimum premium/maximum coverage
 - Lifetime no-lapse guarantee
 - Face amount \$500,000
- Competitive restraints
 - Generally top quartile as determined by no-lapse premium
 - Use "shadow fund" design to solve for no-lapse premium
 - Maintain baseline competitive posture throughout the testing
- Profit goal varies by no-lapse guarantee design
 - Baseline 80 CSO Shadow fund design targeted 15% IRR
 - Lower IRR for Shadow Fund with AXXX reserves and Level Specified Premium design with XXX reserves

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Product specification basics

- Current loads
 - 10% of premium policy years 1 – 10, 5% thereafter
 - Level per unit load policy years 1 – 10, varies by issue age
 - \$60 per policy all years
- Current COI structure is a declining multiple of experience mortality
 - Initial multiple varies by issue age
 - Grades to 105% in policy year 16
- Preferred and standard NS underwriting classes, male and female
- Maximum surrender charges policy years 1 – 5, grading linearly to zero at end of policy year 15

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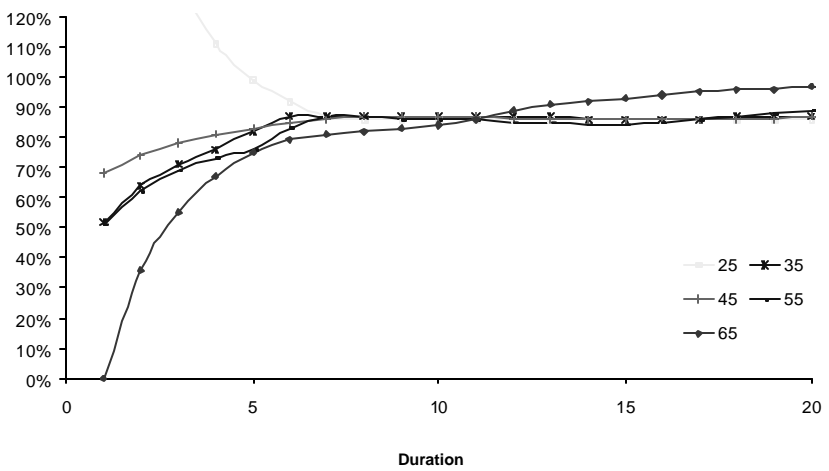
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Required product changes for 2001 CSO

- Product specifications
 - Guarantee cost of insurance charges
 - Current cost of insurance charges
 - Surrender charges
 - Shadow fund charges
- Reserves
 - 2001 CSO ultimate mortality for ULCRVM and tax reserves
 - 2001 CSO select and ultimate for basic secondary guarantee reserves
 - 2001 CSO select and ultimate with X factors for minimum secondary reserves

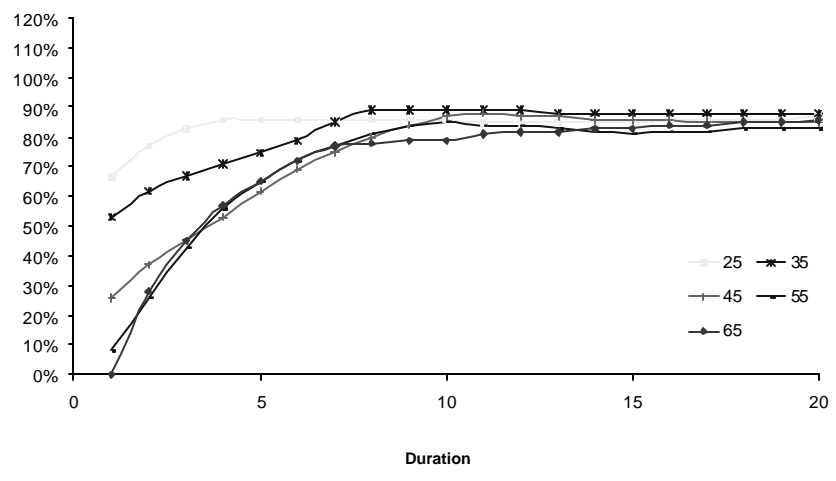
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Segmented Terminal Reserves - Universal Life w. Level Target Premium Secondary Guarantee
2001 CSO as % of 1980 CSO — Male Preferred



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Segmented Terminal Reserves - Universal Life w. Level Target Premium Secondary Guarantee
 2001 CSO as % of 1980 CSO — Female Preferred



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Cost of insurance rate guarantees may be altered

- The 1980 CSO table has traditionally defined the level of guaranteed COI rates in UL and VUL contracts
 - we are not aware of any state that has incorporated this into law, however, it has been the common practice
- A new CSO table could result in lower guaranteed COI rates for UL and VUL products
 - the lower guaranteed COI rates could be lower than current residual standard COI rates
 - companies may need to restructure their loads if current COIs are greater than 2001 CSO table

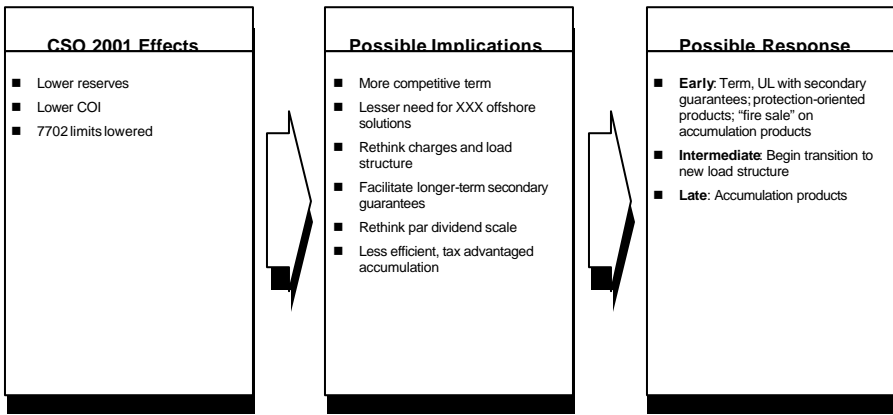
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A new valuation mortality table could have an impact on s.7702

- A new CSO table would result in lower guideline premiums
 - this will limit the amount of cash build-up in life insurance contracts
 - there may be a restructuring of guaranteed loads within products to increase guideline premiums
- It should be noted that the CVAT requires that the mortality table used has an omega of 100
 - therefore omega of 121 in 2001 CSO table will not apply when used with CVAT

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Timing may be everything — so plan your effort and pick your spots



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