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The New 2001 CSO: Implications for Universal Life Plans

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As the much awaited 2001 CSO Tables appear to be nearing completion, life insurance companies are beginning to explore the impact of these tables on their life insurance product designs. This article will investigate the effect the new mortality tables may have with respect to universal life products.

Background

Significantly lower mortality experience has emerged since the promulgation of the 1980 CSO minimum standard valuation morality tables. Because the lower mortality rates in the proposed 2001 CSO Tables generally result in lower statutory reserves, many companies are anxious to reflect the updated rates as soon as possible. For universal life plans, however, a lower statutory valuation standard can potentially limit the cost of insurance (COI) margin via a reduced cap on the maximum guaranteed COI rate. Additionally, the 2001 CSO Ultimate Tables also function as the maximum mortality standard for tax purposes. For single premium and limited pay UL plans whose focus is on minimizing the dollar of benefit per dollar of premium, the lower maximum mortality rates will increase that ratio.

As of this writing, the 2001 CSO Tables have yet to be adopted. References throughout this article to the 2001 CSO Tables pertain to the proposed valuation mortality rates based on proposed loadings applied to the valuation basic table (VBT). The VBT, the foundation of the 2001 CSO, was adopted by the NAIC in November, 2001.

If the state adopts the regulation (currently in draft form) permitting the use of the new tables, the earliest that companies may value statutory reserves using the 2001 CSO Tables for new life insurance contracts is January 1, 2003. Companies may elect to value statutory reserves on the new table on a plan-by-plan basis. Based on a January 1, 2003, effective date, the minimum statutory valuation standard for all new contracts issued after January 1, 2008, will be the 2001 CSO Tables.

Whereas the 1980 CSO Tables were constructed as attained age tables, the 2001 CSO Tables were constructed as select and ultimate tables with a select period of 25 years. Further, the terminal age of the 2001 CSO Table is 120. The terminal age of the 1980 CSO Table is 100.

The proposed regulation to permit the use of the 2001 CSO Tables allows companies to choose either the select and ultimate or ultimate structure to value statutory reserves. For the analysis in this article, the maximum COIs were assumed to be the rates from the 2001 CSO Ultimate Tables. Regardless of the structure of the mortality discount rates for reserve purposes, it appears that the maximum COIs must be based on the ultimate table because the prevailing tax tables will be the 2001 CSO Ultimate Tables. If the maximum COIs were based on the select and ultimate table, policyholders paying guideline premiums based on the ultimate table could overfund the contract.

The table below compares the 2001 CSO mortality rates to the 1980 CSO mortality rates for males and females, smokers and nonsmokers at selected attained ages.

2001 CSO Smoker-Distinct Mortality (Ultimate) as a Percentage of the 1980 CSO Smoker-Distinct Mortality

Gender	Class	Attained Age							
		25	35	45	55	65	75	85	95
Male	NS	64%	64%	70%	70%	73%	68%	76%	81%
Male	SM	76%	76%	73%	70%	73%	68%	80%	88%
Female	NS	46%	61%	57%	76%	82%	71%	63%	61%
Female	SM	60%	79%	68%	97%	107%	97%	83%	88%

2001 CSO Smoker-Distinct Tables (Select & Ultimate) as a Percentage of the 1980 CSO Smoker-Distinct Tables

Gender	Class	Issue Age	Duration							
			1	5	10	15	20	25	40	50
Male	NS	45	30%	45%	57%	62%	66%	66%	76%	84%
		65	19%	37%	45%	63%	72%	82%	N/A	N/A
Male	SM	45	28%	45%	61%	67%	71%	67%	79%	92%
		65	21%	46%	58%	72%	79%	90%	N/A	N/A
Female	NS	45	28%	45%	61%	77%	83%	79%	64%	61%
		65	25%	37%	53%	64%	59%	57%	N/A	N/A
Female	SM	45	33%	56%	77%	99%	107%	105%	85%	68%
		65	31%	50%	73%	84%	76%	70%	N/A	N/A

continued on page 14

The New 2001 CSO: Implications for Universal Life Plans

continued from page 13

Observations of the mortality ratios include:

- Male smoker and nonsmoker ultimate mortality rates are roughly 25% to 30% lower than the 1980 CSO rates.
- Compared to the males, there is more variation by attained age in the percentage reduction of female nonsmoker ultimate mortality rates. The range of reductions is wider, too, from approximately 15% to 55%.
- Female smoker 2001 CSO ultimate mortality rates at certain attained ages are up to 10% greater than the corresponding 1980 CSO rates. Except at the older ages, the slope of the female smoker 2001 CSO mortality rates is steeper than the 1980 CSO rates. More steeply sloped mortality rates can produce higher reserves.

The terminal age of the valuation mortality table was extended from 100 to 120. With respect to the definition of life insurance (Internal Revenue Code Section 7702), the assumed maturity age for calculational purposes must fall between attained ages 95 and 100, inclusive. Some in the life insurance industry believe that it is unlikely that this rule will be changed in the near future due to other higher priorities within the IRS. For the analysis in this article, it was assumed that the maturity age of the sample contracts was 100 and that the DEFRA corridor factors were still applicable. If the maximum assumed maturity age increases, the IRS will likely revisit these factors.

Universal Life

Many flexible premium universal life policy designs can be categorized according to planned premium patterns (annual pay versus limited pay). The analysis of the 2001 CSO Tables on annual pay plans is primarily of interest insofar as the maximum cost of insurance charges and statutory reserves are affected. The impact of the 2001 CSO Tables on reserves of limited pay plans is negligible; reductions in life insurance tax law limits as a result of the 2001 CSO Tables are of relatively more interest to limited pay plans.

Planned Premium Pattern: Annual

To explore the potential impact of the 2001 CSO Tables on annual pay UL designs, a generic UL policy was constructed with product features and pricing assumptions consistent with industry norms. The COIs were structured to be somewhat "reverse select and ultimate." Many companies find it preferable to define larger COI margins in the early policy years in order to achieve profit targets and often achieve it through the COI charge.

It was assumed that the sample contracts satisfied the definition of life insurance via the Guideline Premium Test. Annual gross premiums were consistent with competitive target premiums available in the market today and well below the Section 7702 guideline premium limits.

Implications of the 2001 CSO Tables on the profitability resulting from changes to the valuation-based components of annual pay universal life plans include:

1. Statutory Reserves

- Many UL contracts are written such that the maximum COI rates are the 1980 CSO rates. Replacing these rates with the 2001 CSO Ultimate, depending on the structure of the COI rates actually charged, may limit the scale of COI rates charged on a current basis. If no new loads are introduced in this case, the account value potentially will increase. For adequately funded contracts, the cash surrender value often begins to exceed the formula reserves after the first several policy years and thus become the reserve. Although the reserve pattern is highly dependent on the actual funding level, the CSO 2001 Tables may accelerate the point in time when the cash surrender value becomes the reserve.
- The almost universally lower maximum COI rates under the proposed 2001 CSO Tables relative to the 1980 CSO Tables can reduce the Guaranteed Maturity Premium (GMP) and, thus, the Guaranteed Maturity Fund (GMF). Therefore, the "r" factor, the ratio (not to exceed one) of the actual account value to the GMF, may increase. Coupling a potentially higher account value with a potentially lower GMF further increases the "r" factor. Everything else equal, higher "r" factors increase reserves.
- Irrespective of the "r" factor, the CRVM expense allowance decreases for most cases under the 2001 CSO Tables relative to the 1980 CSO. The increase in reserves as a result of lower expense allowances may be somewhat mitigated by a slightly faster amortization rate.
- The valuation mortality on the 2001 CSO basis is lower than the 1980 CSO basis for most cases. Without regard to the expense allowance or the increase in the "r' factor, these lower mortality rates may decrease reserves relative to the 1980 CSO basis roughly between 0% and 10%, varying by gender, issue age, risk class, and duration. The slightly higher "r" factor and lower expense allowances can offset the reserve decrease, particularly in the first few policy years.

A summary of the 2001 CSO terminal reserves for the sample plan as a percentage of the 1980 CSO terminal reserves is contained in the table below. Reserves are higher on a 2001 CSO select and ultimate basis as a percent of the 1980 CSO relative to the ultimate basis due to the difference in the mortality discount rates. For the sample contracts, the cash surrender values were identical across valuation tables because the actual COI rates were not limited by the lower maximum guaranteed rates.

2. Maximum COI Rates

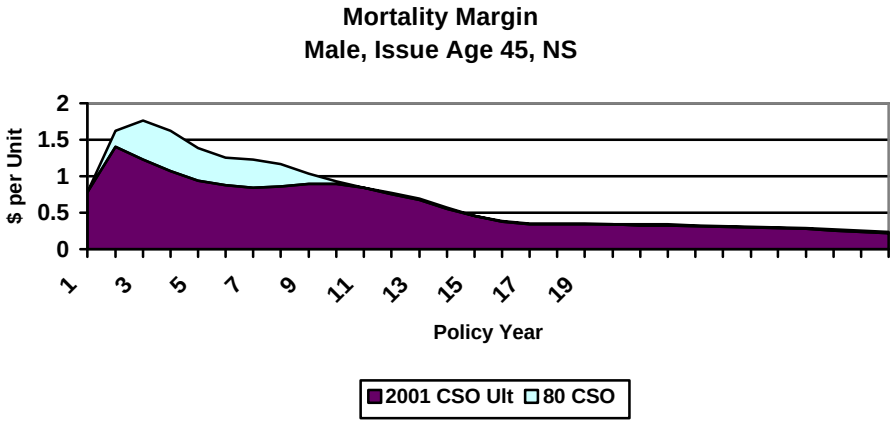
The reduction in the maximum mortality charges resulting from the introduction of the 2001 CSO Tables, particularly on reverse select and ultimate policy designs, can reduce mortality margins.

2001 CSO (Ultimate) UL Statutory Terminal Reserves (Per Unit In Force) as a Percentage of the 1980 CSO UL Statutory Terminal Reserves (Per Unit In Force)								
Gender, Issue Age, Class	Ratio	End of Policy Year						
		1	3	5	7	10	15	20
Male, 45, NS	2001 Ult/1980	113%	101%	99%	98%	99%	100%	100%
	2001 S&U/1980	110%	103%	101%	100%	100%	100%	100%
Male, 65, NS	2001 Ult/1980	107%	101%	100%	100%	100%	100%	100%
	2001 S&U/1980	115%	111%	109%	108%	105%	102%	101%
Female, 45, NS	2001 Ult/1980	106%	101%	99%	99%	100%	100%	100%
	2001 S&U/1980	104%	102%	101%	101%	100%	100%	100%
Female, 65, NS	2001 Ult/1980	105%	101%	100%	100%	100%	100%	100%
	2001 S&U/1980	113%	114%	114%	113%	109%	103%	101%
Male, 45, SM	2001 Ult/1980	110%	101%	99%	99%	100%	100%	100%
	2001 S&U/1980	106%	105%	105%	104%	100%	100%	100%
Male, 65, SM	2001 Ult/1980	105%	100%	99%	99%	100%	100%	100%
	2001 S&U/1980	100%	113%	113%	112%	109%	102%	101%
Female, 45, SM	2001 Ult/1980	94%	99%	100%	100%	100%	100%	100%
	2001 S&U/1980	92%	101%	102%	103%	100%	100%	100%
Female, 65, SM	2001 Ult/1980	105%	101%	100%	100%	100%	100%	100%
	2001 S&U/1980	113%	114%	114%	113%	109%	103%	101%

The graph at right illustrates a sample of the dollars of profit generated from the COI margin under two valuation bases for a male, issue age 45, nonsmoker within a highly reverse select and ultimate COI pattern.

For this model test cell, an update of the 1980 CSO Table to the 2001 CSO Ultimate Table results in a decrease (the profit margin under 1980 CSO minus the profit margin under 2001 CSO) in the after-tax profit margin of 2%.

The following independent changes to the policy load structure are examples of what would be required to produce the same after-tax profit margin (present value of after-tax profits divided by the present value of premiums) as under the 1980 CSO valuation table.



Additional Loads Required To Achieve Base Case After-Tax Profit Margin (M, 45, NS)	
Policy Load Component	2001 CSO Ultimate
Percent of Premium, *or*	2%
Per Policy (per month), *or*	$8
Annual Per Unit	$0.40

3. Surrender Charges

The promulgation of the 2001 CSO Tables will reduce the maximum per unit first year surrender charge allowed by the UL Model Regulation for most gender, issue age, and class combinations. Notable exceptions are at the older issue ages where the expense allowance is capped by formula.

continued on page 16

The New 2001 CSO: Implications for Universal Life Plans

continued from page 15

Maximum First Year Surrender Charge Per Unit					
Gender, Issue Age, Class	1980 CSO	2001 CSO Ultimate	Gender, Issue Age, Class	1980 CSO	2001 CSO Ultimate
M, 45, NS	27.98	24.68	F, 45, NS	24.78	22.13
M, 65, NS	60.00	58.06	F, 65, NS	56.15	46.96
M, 45, SM	35.07	30.11	F, 45, SM	28.06	27.35
M, 65, SM	60.00	60.00	F, 65, SM	60.00	60.00

The table on on this page compares the maximum surrender charge per unit for the sample plan under both bases.

In addition to the reduction of the first year surrender charge, the new valuation rates define the minimum amortization rate at which the maximum surrender charge must decrease by policy year. A comparison of these minimum amortization rates across valuation mortality tables for a male, issue age 45, nonsmoker indicates that no appreciable difference emerges during the first fifteen policy years. Further, differences emerging in the later policy years are probably unimportant because most surrender charges for UL plans marketed today grade to zero over the first fifteen to 20 years.

The reduction in the maximum surrender charges was not reflected in the reserve analysis above. Lower surrender charges would serve to further accelerate the point at which the cash surrender value overtakes the formula reserve.

4. Tax Reserves

The UL Model Regulation defines the method for tax reserves as well as statutory reserves. However, whereas the company may choose which structure of the valuation table to use to calculate statutory reserves, the minimum valuation standard for tax purposes is declared by the IRS. Even though the 2001 CSO tables have not yet been promulgated, the 2001 CSO Ultimate Table is expected to be the prevailing tax table because it produces lower reserves when applied to a model of the life insurance industry.

Using the same adequately funded model plan as in the statutory reserve analysis, the tax reserves on the 2001 CSO basis can be higher than the 1980 CSO basis in the early durations and lower for a few years after that before the cash surrender value governs the reserve. Since lower tax reserves increase taxable income, one strategy companies might choose to follow is to wait until the end of the tax table phase-in period before implementing the new tables for tax purposes.

Planned Premium Pattern: Limited Pay

Limited pay universal life plans share the same issues as annual pay plans with respect to maximum COI charges and surrender charges. A new minimum valuation standard would not be expected to significantly impact reserves of limited pay plans because the cash surrender value would generally exceed the calculated statutory reserve in the early policy durations. Whereas the definition of life insurance premium limits are not typically factors for annual pay designs, they play a significant role in limited pay designs.

An analysis of the 2001 CSO impact on the profitability of a sample plan from the valuation morality-based components is described below.

1. Guideline Premiums

As with tax reserves, the maximum mortality rates for definition of life insurance purposes is expected to be the 2001 CSO Ultimate Table. Guideline Level Premiums (GLP) and Guideline Single Premiums (GSP) for a generic UL design can range from 10% to 30% lower than under the 1980 CSO Tables, depending on the policy load structure. Reductions are smaller for female smokers.

The table below summarizes the ratio of 2001 CSO GLPs and GSPs to the 1980 CSO GLPs and GSPs for a generic UL design ($6/month per policy and 5% of premium load). A comparison of Section 7702(A) 7-Pay premiums is also included.

The net amount at risk increases for many cases under the 2001 CSO for a single premium design. If no changes are made to the policy design, the increase in profits from the COI charges collected on the higher net amount at risk is somewhat mitigated by any potential reduction in the cap on maximum mortality charges imposed by the 2001 CSO relative to the 1980 CSO.

2. Maximum COI Rates

The net effect on profitability of the lower gross premiums and lower COI rates on a model test plan where the gross premium is the GSP is summarized in the table above for selected test cells.

Profit streams in the present value measures were discounted by the after-tax net investment earnings rate. Reasons for the change in the profitability from the 1980 CSO basis to the 2001 CSO basis include:

2001 CSO Ultimate Guideline Premium Limits as a Percentage of the 1980 CSO Guideline Premium Limits							
Gender, Issue Age, Class	GSP	GLP	MEC	Gender, Issue Age, Class	GSP	GLP	MEC
M, 45, NS	85%	85%	89%	F, 45, NS	86%	86%	89%
M, 65, NS	89%	83%	90%	F, 65, NS	88%	83%	90%
M, 45, SM	85%	83%	88%	F, 45, SM	97%	97%	98%
M, 65, SM	89%	81%	89%	F, 65, SM	99%	97%	99%

continued on page 8

Statutory Valuation Basis	Male, 45, NS		Male, 65, NS	
	PV Profit (Per Unit)	Profit Margin	PV Profit (Per Unit)	Profit Margin
1980 CSO	$9.60	4.5%	$21.08	9.9%
2001 CSO S&U	$8.69	4.8%	$24.78	13.7%
2001 CSO Ultimate	$8.69	4.8%	$24.70	13.7%

- Reductions in the dollars of profit from the interest margin resulting from the new cap on the reverse select and ultimate COI rates offset slightly by increases in the dollars of profit from the mortality margin due to increases in the net amount at risk. Larger offsets occur at older issue ages for this sample case because of the larger percentage increase in the net amount at risk;
- A decrease in the dollars of premium tax resulting from the lower gross premium; and
- Lower percent of premium surrender charge income resulting from the lower gross premium.

It is worth noting that the profit margin may increase (as a result of lower gross premiums) while the actual dollars of profit may decrease.

Independent changes in the policy load structure were determined such that the 1980 CSO present value of profits was maintained.

In summary

- The 2001 CSO Tables may reduce projected account values of reverse select and ultimate plan designs through lower caps on the maximum COI rates.
- Plans funded at (lower) tax law limits may develop lower account values unless loads, COIs, or credited interest rates are reconfigured;
- Higher reserves on annual pay plans may not by themselves require a change in the plan design. While 2001 CSO reserves may be higher on a percentage basis than 1980 CSO reserves during the early durations, the increase in dollars of reserves is somewhat limited due to the fact that reserves for moderately funded annual pay plans are typically lower in the early policy years anyway.
- Surrender income may be reduced slightly if existing surrender charges are above the new maximum limits.
- To offset potential lost income on COI charges of UL plans with highly reverse select and ultimate COI patterns, companies may consider implementing a per unit charge that varies by gender, issue age, risk class and policy duration.
- Companies may elect to postpone implementing the CSO 2001 Tables on a tax basis until the latest phase-in date for tax purposes.
- Many UL plans are constructed to satisfy the definition of life insurance via the Guideline Premium Test. However, the increase in the net amount at risk as a result of the 2001 CSO Tables for plans that satisfy the definition of life insurance via the Cash Value Accumulation Test (CVAT) may to be less at some attained ages than the increase in the net amount at risk for Guideline Premium Test plans. As a result, companies may begin to consider the CVAT design more often.

Additional Loads Required To Achieve 1980 CSO Present Value of Profits (M, 45, NS)	
Policy Load Component	2001 CSO Ultimate
Percent of Premium, *or*	1%
Per Policy (per month), *or*	$2
Annual Per Unit	$0.20

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Structured Creativity

continued from page 3

defining the customer's critical requirements. It is used to select new markets, define new products, track post-launch market behavior, and leverage market intelligence efforts. In other words, it is the front end of a multi-disciplinary, structured product development process.

It is no secret that some new products fail to meet sales expectations, and others never make it to market. In some cases, a pet idea is advanced, even in the face of negative market research. In other cases of failure, market size is overestimated, a product is incorrectly positioned, or unexpected competition emerges. If a product never makes it to market, it may be because there was insufficient information to warrant the product development investment, or because of unexpected showstoppers. Finally, many companies are so busy with "me-too" responses and product fixes that they miss new or established market opportunities. It all boils down to a lack of information—information that would have been gathered if the DFSS/i framework was used.

continued on page 18