



SOCIETY OF ACTUARIES

Article from:

Product Matters!

August 2002 – Issue No. 53

The 2011 CSO Impact on Level Term Insurance

by Douglas C. Doll

The most popular term product, guaranteed level premium term (typically, with level premiums for 10, 20 or 30-years) has basic reserves under 1980 CSO that are significantly larger than needed. The 2011 CSO may provide substantial relief from these excess reserves. This article discusses how much impact on profits this relief may provide.

SAMPLE PRODUCT DEFINITION

We designed a sample product for a 10, 20 and 30-year guaranteed premium term product. The risk classes tested were preferred-plus nonsmoker and preferred smoker. (The impact of reserves on standard risk classes would be the same dollar

amount, but the gross premiums are larger; therefore, the profit margin impact would be similar, but somewhat lower.) The profit impact was calculated over the level term period. The earned interest rate is assumed to be 7 percent. Lapse rates grade quickly to an ultimate rate of 5 percent. We have assumed that basic reserves are calculated using the ultimate form of the valuation mortality table. (For 2011 CSO, using select & ultimate rates generally would increase reserves by a few percent.)

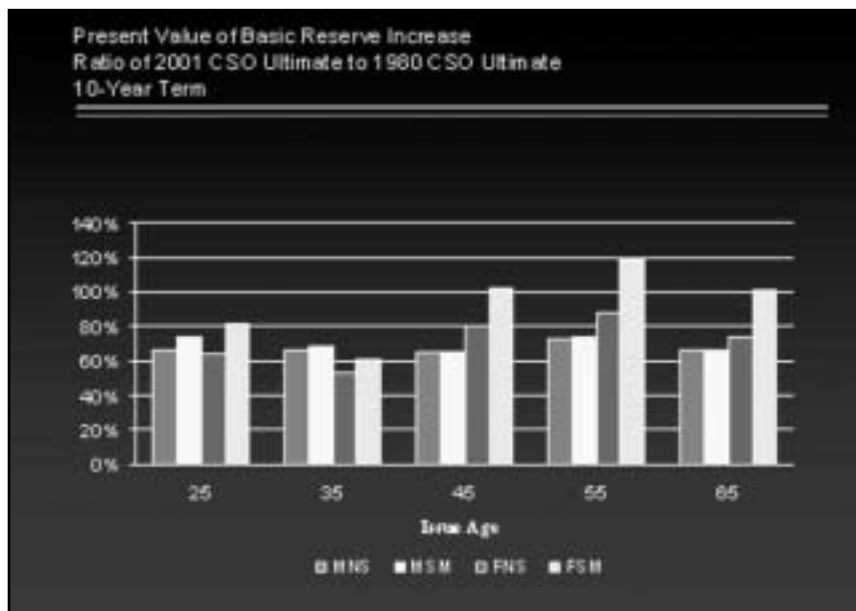
COST OF RESERVES TO PROFITABILITY

If our profit objective is profit margin discounted at the earned interest rate (7 percent), there is no cost to holding a tax-deductible reserve, because the interest earned on assets backing the reserve offsets the discounting effect of deferred profits. If reserves are not tax deductible, there is an annual cost of holding reserves equal to the tax on interest, or 2.45 percent.

If we are measuring profits based on a higher return on capital measure, the cost of holding reserves is larger. For example, using a 12 percent desired rate of return, the cost of a reserve is 5.00 percent if tax deductible, and 7.45 percent if not tax deductible.

The preceding two paragraphs are applicable for reserves that insurers hold on their statements. However, a substantial amount of term insurance (typically 80-90 percent) is reinsured, with a large part of the reserves ceded offshore to take advantage of lower

Graph 1A



Graph 1B

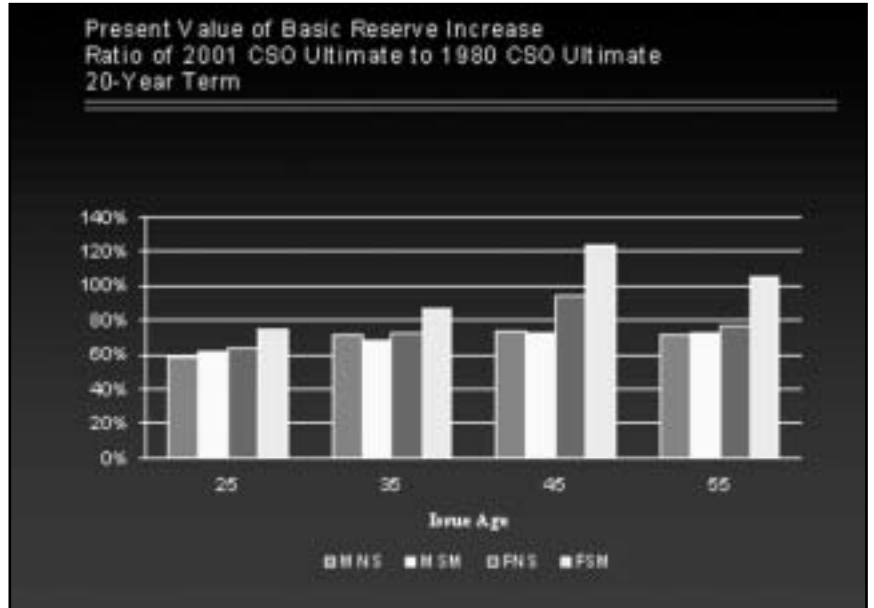
reserve requirements. The excess reserves are backed by a letter of credit or by assets in trust. For purposes of this article, we have assumed that all of the reserve reduction provided by 2001 CSO represents excess reserves that otherwise could have been backed by a letter of credit at an annual cost of 1.00 percent (.65 percent after-tax).

IMPACT OF BASIC RESERVES

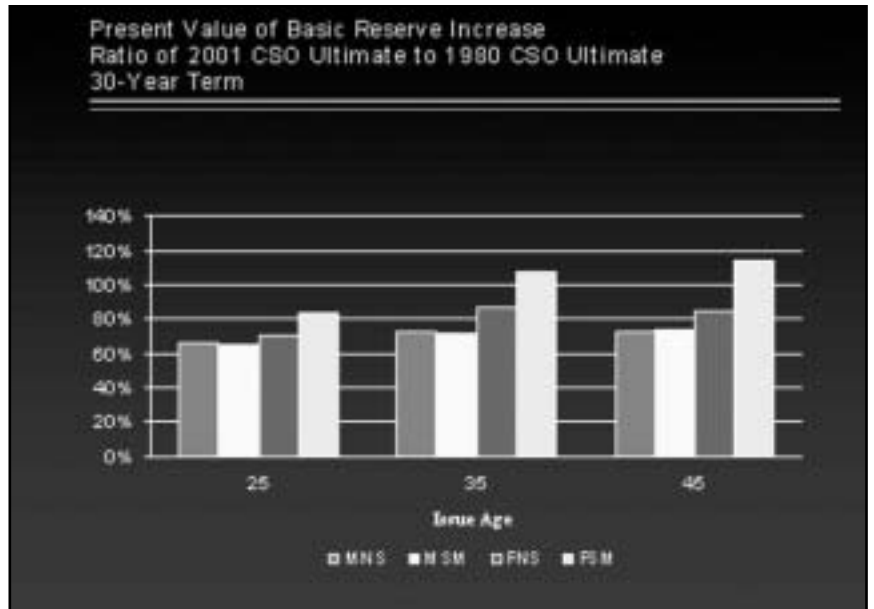
Graphs 1A, 1B and 1C compare the profit test present value of reserve increases for the 2001 CSO table as a percentage of the corresponding present value for the 1980 CSO table. These are mean reserves, assuming annual premium mode and discounted at 7 percent. Male reserves are significantly lower using 2001 CSO. Female nonsmoker reserves are lower, but not as much lower as males. Female smoker reserves are actually larger for some issue ages.

With regard to the effects of these reserve differentials on profits, consider the situations for “cost of reserves to profitability” discussed above:

- Reserves held in statement—impact at 7 percent discount. The only impact is due to tax/statutory reserve differentials which are small to begin with. Since the 2001 CSO reserves are smaller for most pricing cells, the tax/statutory differentials are also smaller, which increases the profit margin. However, the magnitude of the impact is negligible for 10-year term, and only .10-.20 percent for the typical 20-year term cell. For

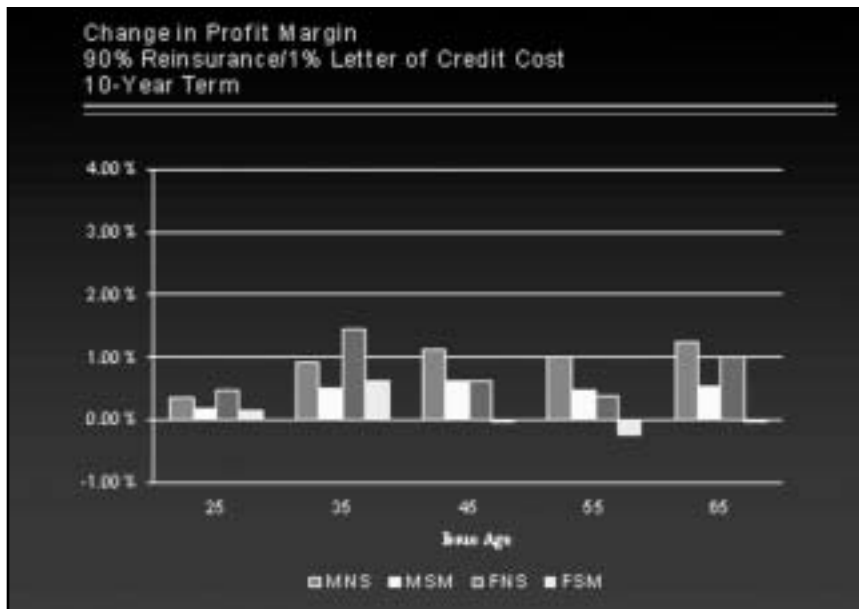


Graph 1C



continued on page 12

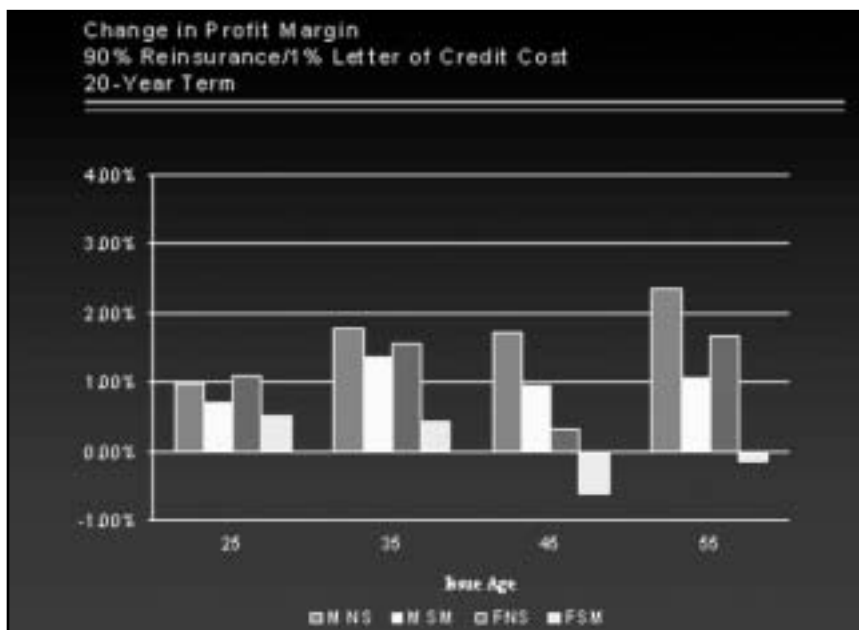
Graph 2A



30-year term, male profit margins increase .30-.92 percent, and female margins increase less. (Female smokers ages 35 and 45 margins decrease slightly.)

- Reserves held in statement—impact at 12 percent discount. These impacts are fairly large, especially for the longer-term products where reserves are relatively larger. Male nonsmokers have profit margin increases of 2-6 percent for 10-year term, 4-10 percent for 20-year term and 6-14 percent for 30-year term. Results vary by issue age and risk class consistent with the reserve ratios shown in Graphs 1A, 1B and 1C. Female smokers show little or negative improvement.

Graph 2B



- 90 percent of reserves ceded offshore—impact at 7 percent discount. Since most companies cede a significant portion of their term business, this result is probably more applicable than the first two. The results are shown in Graphs 2A, 2B and 2C. Male nonsmokers have profit margin increases of approximately 1 percent for 10-year term, 1.5-2.0 percent for 20-year term, and 1.5-3.5 percent for 30-year term.

- 90 percent of reserves ceded offshore—impact at 12 percent discount. At a 12 percent discount rate, the present value of the cost of the letter of credit is smaller, but the cost of the 10 percent retained portion of reserves is larger. The net effect is that the changes in profit margin are similar to, but slightly larger than, the changes using a 7 percent discount rate.

Graph 2C

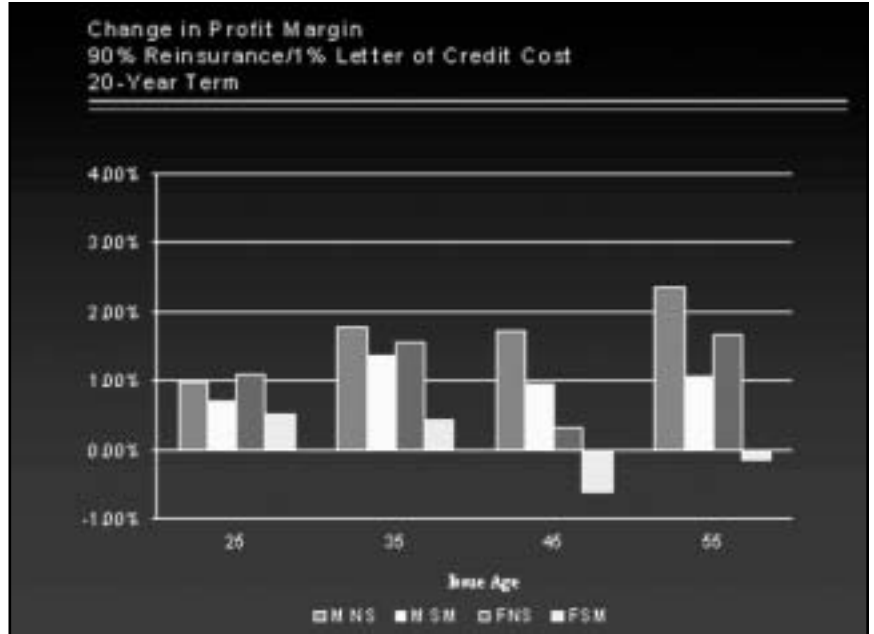
What impact do these profit changes imply for gross premiums? Assuming that insurers desire to maintain the same profit margins, the percentage impact on gross premiums could be approximately twice that for profit margins (because the profit margins are after-tax, and because there is some leverage from percentage of premium expenses).

OTHER IMPACTS OF 2001 CSO TABLE

The 2001 CSO table will affect cash values, but initial calculations indicate that there will not be a large change in the maximum issue age at which level term can be issued without cash values.

The 2001 CSO table will have a significant impact on deficiency reserves for certain issue ages and risk classes. Individual company results will vary based on their slope of pricing mortality and level of gross premiums, but in general, the 2001 CSO deficiency reserves, if any, have the following characteristics, compared with those for the 1980 CSO.

- Nonsmoker deficiencies are lower, particularly where the discontinuity in XXX select factors (attained age 70) is a factor.
- Smoker deficiencies are larger because the 2001 CSO has a steeper slope.
- Deficiencies, if they exist, may last for



more years because there is less redundancy in basic reserves.

Obviously, having larger or smaller deficiency reserves will also impact profitability, but it is beyond the scope of this article to show sample calculations to illustrate this.

CONCLUSION

There probably will not be much impact on product design due to the 2001 CSO table, but there will be changes in gross premiums. In comparing the impact, male nonsmokers are obvious winners, while female smokers are not. The improvements in profitability are sufficiently large that we expect term writers to switch to the new table as soon as practical. □



Douglas C. Doll, FSA, MAAA, is a consulting actuary at Tillinghast-Towers Perrin in Atlanta, GA. He can be reached at dold@towers.com.