On August 9, 2011, SCOR SE, a global reinsurer with offices in more than 31 countries, acquired substantially all of the life reinsurance business, operations and staff of Transamerica Reinsurance, the life reinsurance division of the AEGON companies. The business of Transamerica Reinsurance will now be conducted through the SCOR Global Life companies, and Transamerica Reinsurance is no longer affiliated with the AEGON companies.

While articles, treaties and some historic materials may continue to bear the name Transamerica, AEGON is no longer producing new reinsurance business.

Archive Materials

Insured Mortality Improvement in the 21st Century – Is It Real?

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A recent Society of Actuaries (SOA) life insurance experience study indicated that from 2003 to 2007, overall mortality for fully underwritten policies improved at about three percent per year. During the same time period, US population data from the Centers for Disease Control (CDC) showed improvement of around two percent per year. Is the SOA figure an indication of true short term secular improvement in the insured population or is there a better explanation? In this article, I use our proprietary Transamerica Experience Database (TED) to delve deeper into mortality improvement for the insured population and then compare that experience with general population trends.

Transamerica Reinsurance Experience

TED covers policies exposed to death from January 1, 2004 through June 30, 2009. One of the concerns when analyzing mortality improvement in an insured population is the ability to differentiate true secular trends from those due solely to demographic changes and evolving underwriting practices over the exposure period. To mitigate the underwriting effect, I filtered the database to include only policies issued since 2000 and limited the analysis to companies with three and four nonsmoker class systems. Finally, I excluded small policies with face amounts under $100,000. This provides a reasonably homogeneous cohort from an underwriting perspective. The demographic profile of the group should not change significantly because of the relatively short exposure period (2004-2009). Nevertheless, I reviewed those statistics as part of my analysis.

Improvement Rates

After applying all the data constraints, the TED experience study contains 13,265 claims with an exposure count of nearly 17 million policy years. Figure 1 shows the resulting experience as a percent of the SOA 2001 VBT, along with a linear regression to help smooth year-to-year variations and provide a trendline. Since I have limited the issue years to 2000-2009 the figure illustrates improvement only during the early select period.

Improvement rates can be calculated using the raw and trend line A/E ratios from 2004 and 2009. Assuming that the
2009 ratio approximates that entire year’s experience, then the annualized improvement rate is 2.5 percent (using raw ratios) or 2.6 percent (using trend ratios). In either case, the TED results are certainly in the ballpark of both the SOA and CDC figures. However, does this rate represent true secular improvement, or is it the result of other changes in the underlying policies over time? Demographic data from our TED population can answer this question.

Checking the Demographics

Figure 2 shows changes in various demographic metrics from the population over the exposure period, using expected claims as the basis of measurement. Any distribution changes among preferred underwriting class and among amount bands over the exposure period may be important because A/E ratios based upon a standard table tend to be lower for preferred classes (obviously) and higher for smaller face amounts with less rigorous underwriting.

Demographic data exhibits consistency over the observed period, even though insureds are aging over the period. Only the experience during Policy Years 1-2 shows significant deviation, but when normalized for policy-year skewing, annualized mortality improvement actually increases to about three percent.

Demographics remain very stable from year to year, even though the policyholders are aging through time. The only exception is the percentage of expected claims in policy years 1-2. This metric could be of concern because research has shown that the contestable clause contained in most life insurance policies tends to cause A/E ratios based upon a smoothed industry table such as the 2001 VBT to be lower in policy years 1-2 than in policy years 3 and after. When the data is normalized to compensate for the policy year skewing, the annualized improvement trend actually increases to about three percent per year. This makes intuitive sense since the normalization process lowers the proportion of expected claims in policy years 1-2 for 2004 (increasing the A/E ratio) and raises the proportion in years 1-2 for 2009 (decreasing the A/E ratio).

While changes in demographics are an unlikely cause of the decrease in mortality from 2004 to 2009, it is possible that all other causes have not been factored in. Therefore, it may be prudent to say that the observed improvement rate for this insured population is due to secular and all other unmeasured factors combined.

Improvement by Gender and Attained Age

Figure 3 breaks out five-year annualized improvement trends by gender and attained-age groups. Because of the regression model used to smooth the data, cell values are not necessarily consistent with corresponding totals.

Generally, females are improving at a slightly slower rate than males, and there is not a significant difference between younger and older attained age groups.

Long-term SOA versus Population Experience

Given increased confidence that recent secular mortality improvement in the insured population is not an illusion, how well does this improvement represent long term trends? Historical general population data is readily available and may be used as a
proxy for insured experience. But we need some assurance that this is a reasonable assumption. Relying upon past insured select
experience is difficult due to a lack of homogenous underwriting standards, but using SOA ultimate attained-age experience (i.e.,
mortality after initial underwriting effects have worn off) should mitigate this problem.

Ultimate mortality from the SOA 1957-60 and 1990-95 Basic Tables and corresponding US population mortality from 1958
and 1992 were used to calculate annualized improvement rates over the 34-year period. Figure 4 summarizes male and female
combined results by attained age and shows a noteworthy correlation of improvement rates between the insured and general
populations.

Therefore any analysis performed on US population historical data can be readily translated to the insured population with
some degree of confidence.

**US Population History**

So how reliably can the insured-population five-year improvement rate be used as a predictor of the long term trend? Figure
5 plots the history of moving five-year period improvement rates for the US general population ages 35-54 (approximately the
bulk of ages in the TED study) beginning with the period 1952-1957 through 2002-07.

The chart shows periods of rapid improvement and periods of slow or even negative improvement for both males and
females, but it is clear that the rate for any given five year period is not necessarily a good indicator of the long-term average
(about 1.3 percent for males and 1.4 percent for females at the ages selected).

**Conclusion**

Evidence from the 2004-2009 TED study supports the conclusion that the secular mortality improvement being experienced
by the life insurance industry during the 21st century is a real phenomenon. However, short term rates have varied dramatically
over time so it would not be wise to use current experience as the basis for future mortality projections. The industry should rely
on historical US population data as a reasonable substitute for determining long term trends in the insured population.

**References**