

THE RESPONSIVENESS OF AUTOMOBILE

TREND FACTORS

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Mr. Kaliksi's paper is a well-written, easy-to-read paper that points out the danger of following "standard" trend techniques. In a period of changing inflation rates, the actuary who locks himself into a projection based on fitting a curve to the latest twelve points of year ending quarterly data is doomed to miss the mark. As Mr. Kaliski points out, in times of increasing rates of change (for example Mr. Kaliski's progressive annual changes of 4.8%, 6.8%, 9.0% and 13.4%), the average claim cost trend will be understated. Conversely in times of decreasing rates of change (for example progressive annual changes of 13.4%, 9.0%, 6.8% and 4.8%), the trend factors will be overstated. Neither of these conditions is desirable. Under-shooting the trend results in poor underwriting results, while over-shooting results in loss of market share as insureds choose lower priced policies that were based on the correct trend.

Before we dismiss the current trend methodology as a relic of the past, we must recognize its saving virtues, that is, it is reasonably well accepted by the various state insurance departments and it is relatively unbiased in the long run. Its chief defect is its poor performance during times of changing inflation rates. However, during times of stable inflation (low, medium or high) it will produce reasonable answers.

Current Procedures

Before getting into a discussion of Mr. Kaliski's alternatives, some common sense changes can be made by an individual company during

rapidly escalating inflationary times, so that rate indications are less dependent on trend. The changes are:

1) The use of a shorter experience period.

Many companies use two or three years of data in their experience period. In many cases the "allowable" trend in a state will be less than the actual observed trend on a countrywide basis between the years in the experience period. For example, the combined NAI and ISO Fast Track Monitoring System shows that the average pure premium for private passenger comprehensive coverage increased by +15.9% from 1978 to 1979. This happened even though many policyholders were being sold higher deductibles (which theoretically produce lower pure premiums) during this time period. Obviously, if a company is allowed a trend factor of only 10% and applies it to the 1978 and 1979 years, then the company will miss its target underwriting goal.

2) Use of more recent data.

Obviously, the company in Mr. Kaliski's example would be better off using data for accident years ending 6/79 rather than 12/78. For certain lines, another alternative would be to use calendar year data, which would allow data through 9/79 to be used.

Proposed Procedure

Mr. Kaliski suggests a 3 phase trend procedure. Step 1 involves trending from the average accident date of the experience period to the last quarter of the claim cost trend data series. This procedure is useful if more than one year of experience data is used but is questionable if only a one year experience period is used. For example, in Mr. Kaliski's article, accident year 1978 is the latest year used and the trend data, based on year ending points, ends at

12/78, meaning the actual average payment occurred on July 1, 1978. Hence the midpoint of the accident period coincides with the midpoint of the last segment of paid trend data. Further, since the trend data is based on paid losses, the average date of the accidents that are being paid on July 1, 1978 is prior to July 1, 1978. Hence, the use of Step 1 on the latest accident year does not really measure trends applicable to the last year. However, for the 1977 accident year, the change of the paid loss indices from year ending 12/77 to 12/78 may prove to be a good measure of trend needed to move the average accident date of 1977 ahead by 12 months.

One final word of caution must be given on using 2 specific index points on a paid average cost line to measure change. Both points are subject to fluctuation, particularly when using data from a single state. Use of countrywide data could possibly overcome this objection.

Steps 2 and 3 of Mr. Kaliski's procedure involve the use of econometric models. Step 2 uses known changes in various indices, while Step 3 uses estimates of future changes. Step 2 uses a C.P.I. or similar index to adjust the latest observed data point or trend point so that it reflects the current cost level. This C.P.I. or similar index would be modified by the historic relationship between it and the internal trends. This modification implies that the relationship is additive in nature, when actually it is more likely to be multiplicative or exponential.

The third step in the procedure involves the use of estimates of future changes. Mr. Kaliski rightfully concedes that the projection is no more accurate than the projection of the independent variables, but that the actuary can benefit by using the many scenarios that are produced by financial analysts and economists. In

order to appreciate the problem of working with econometric models, an example would be useful. In Massachusetts, hearings are held each year to determine the rate levels for private passenger automobile insurance. Part of the hearings for the 1981 rates involved estimating the effect of the gasoline price increases on consumption. A model was produced that stated:

Change in Gas Consumed = -0.14 change in gas price
(in constant dollar)
+0.36 change in per capita
disposable income
+0.04 change in small cars
+0.15 change in large cars
-0.77 change in miles per gallon
(fleet fuel efficiency)
+0.33 change in population
-0.55 change in households
-0.049 change in population under
18/population
+0.030 change in proportion of
light trucks
+0.049 change in population in
SMSA/population
+0.57 change in maintenance cost

With the number of estimates required and the uncertainty of the estimates, no one answer is possible, only a very broad range. While this example is the worst example I could find, it does point out that econometric modeling is no easy task. The nice, concise, easily defensible (and probably wrong) result of today's

trend procedure will be replaced by a broad range of answers, at least partially based on someone's subjective view of the future.

A possible modification of Step 3 would be the replacement of the subjective estimate of the future change in the C.P.I. (or other indices) by an estimate based on fitting an exponential curve to the last 12 (or any number of) months of the actual C.P.I. (or other indices).

In Summary, changes are needed in the current trend procedures and Mr. Kaliski has outlined a reasonable approach to the problem. However, while the company may make use of the econometric models with subjective estimates of future change in their internal planning procedure, they may find that more structured econometric models are demanded by regulators.