REVIEW - THE RELATIONSHIP BETWEEN UNDERWRITING PROFITS AND THE SURPLUS RATIO - A MODEL

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INTRODUCTION

Mr. Niswanders' paper attempts to measure the trade-off between greater underwriting profits (a less competitive position) and surplus growth and thereby address the question as to whether a company's profit goals and competitive goals are consistent.

The question is an important one to understand and, if possible, to answer. Unfortunately, the model as developed does not answer the question due to design flaws.

This review will discuss where the design is flawed, both as to model structure and basic assumptions, as well as discussing the restraints in applying any financial model.

THE MODEL'S STRUCTURE

Our investigation of the model began by running it for varying input assumptions and analyzing the reasonableness of the results. (Most of this stage of the review was performed by Lawrence Williams of the Aetna). The obtained long term results were generally unrealistic and internally inconsistent. This was true even of Mr. Niswander's illustration in Section 4, where in order to increase the long term surplus ratio short term declines in the ratio and successive rate changes of +23.2%, -1.3%, +22.1%, -0.4%, etc. were necessary.

The cause of these inconsistencies was the model's concentration on calendar year results. They would not have appeared if the model built Calendar Year results from the underlying Accident or Policy Year components and concentrated in modeling these components. Two consequences (weaknesses) of the current model structure follow.

A. Earned Premium

The presented model attempts to hold calendar year underwriting gain (as a percentage of earned premium) constant under constant growth and inflation assumptions. As losses and most expenses are assumed to grow by a constant rate and underwriting gain as a percent is constant, earned premium is constrained to grow at a near constant rate.

Unfortunately, the model's starting written premium assumptions are inconsistent with the constant earned premium growth constraint. For example, if 1982 written premium in the author's example grew only by the growth/inflation rate, then the 1983 underwriting gain would be -.8%. To achieve the targeted gain of +4% written premium must be increased by 29.4%, almost twice the growth/inflation rate. Therefore, to achieve a 4% underwriting gain on 1983 Earned Premium, the model requires an excessive rate in 1983 to offset the inadequate rate in 1982.

The opposite situation happens the following year. 1983 Written Premium would produce excessive gains in 1984, so 1984 rates must actually drop to produce the desired underwriting return. This flip-flop of rates is characteristic of the model in almost all cases, because of the inconsistent 1983 starting assumptions. The only place where this wouldn't occur is where the target underwriting profit equals the profit inherent in the starting 1982 written premium. This flip-flop in written premium causes the observed flip-flop in surplus ratios.

Therefore, the model's attempt to target calendar year underwriting profit forces a continual flip-flop in rates. As rate stability is of much greater practical significance to regulators and insureds than constant underwriting profit, restructuring the model to produce stable rate changes and a surplus goal might be an improvement.

B. Incurred Losses

The author assumed that calendar year paid losses and loss reserves would always grow at a constant rate. This implies that the underlying accident year payment pattern will be the same for all years. The model is dependant on this assumption and fails when the payment pattern changes, either for internal (e.g. business mix changes) or external (e.g. switch from contributory to comparative negligence) reasons. Any change in the payment pattern changes the relative level of loss reserves and therefore the amount of investment income each year.

MODEL ASSUMPTIONS

One of the basic assumptions of the model is that calendar year underwriting gain is a measure of competitiveness. This is incorrect. If any underwriting gain can be considered a measure of competitiveness it is the gain inherent in the rates' profit load, not in calendar year results.

Mr. Niswanders' model, as shown above, produces wildly varying rates with wildly varying profit loads to produce a consistent calendar year underwriting gain. The market will not look at the consistent calendar year underwriting gain to see if his rates are competitive, they will look at the rates or at the profit load in the rates. Instead of seeing a stable level of competitiveness, the market will see alternating overly competitive and under competitive rates.

COMMENTS

In addition to the problems inherent in the model logic, some of the implicit assumptions made in the analysis need to be further explored. Specifically, while there is a trade-off to be made between being "competitive" and striving to reach a different surplus position, the trade off is not as apparent as the model implies. In fact, no financial model can

provide answers to the trade off since the model will only project long term financial results. The input assumptions regarding volume and prices incorporate the trade off.

Given that the market for insurance is a competitive market, a supplier of insurance cannot unilaterally decide to become more or less competitive via price without taking account of the market participants' reaction to a change.

By focusing only on the required year to year underwriting margin needed to achieve a different surplus position, the impact of the price changes or volume changes needed to accomplish the goal is minimized. The result is that the model leads to fluctuating prices or volume shifts which are not sustainable in the market place.

In deriving results from any model it is better to select assumptions which are consistent with each other and with the company's marketing and pricing plans. To the extent that current results - e.g. portfolio yield rates - are not at the longer term expected level, then a set of assumptions which allow for year by year variation is appropriate. Results derived from internally inconsistent assumptions are difficult to interpret and largely meaningless.

It should also be recognized that under competitive market conditions the price for the product is given. The issue becomes how much insurance will be offered at the given price. If less insurance is offered due to tightened underwriting criteria, then a higher underwriting profit can be expected. The combination of higher underwriting margins and lower volume will lead to a strengthened surplus position. Whether the trade-off is justified is beyond the ability of the model to predict. However, the model can lead to a better understanding of the long term implications for the company's surplus position.

SUMMARY

Mr. Niswander's question is appropriately addressed via a financial model. The need for reconciling the goal of being competitive with the goal of maintaining or enhancing one's surplus position exists. A financial model can provide valuable insight into the long term implications of given marketing/pricing strategies. Such a financial model, however, needs to be constructed from the ground up - i.e. must take account of the characteristics of each accident (or policy year) in deriving calendar year results. When using any financial model, it is necessary to remember that the models cannot evaluate the trade-off of volume versus profits, only the results of the trade-off on the expected future surplus position.