

have been challenged where reserves of an individual line of business have developed redundancies in excess of 15% and deficiencies assessed. Those responsible for establishing reserves by line of business would do well to keep them within this tolerance.

DISCUSSION BY J. A. SCHEIBL

Much has been written in recent years on scientific approaches to management decision-making. Primary factors that have contributed to this surge of literature have been the increasing complexity of the type of decisions necessary in today's increasingly complex world and the development of the electronic computer providing the wherewithal for operations research. A key technique in the new methodology has been the simulation of decision problems through mathematical models.

The ultimate in modeling is the simulation of all operations of a business enterprise and the external forces that affect that enterprise. Through the examination of all likely results from a range of all possible decisions, and, through the repetition of this process as these indicated results lead to more decisions, management teams have at their disposal the means to operate at a high level of efficiency.

Of course, the efficiency attainable by these means depends a great deal on the quality of the corporate model. The model must reflect the action, reaction and interaction of all pertinent factual and assumptive variables. This suggests that an early stage in the construction of a corporate model is to weed out relatively extraneous variables and to trace the actions of only those that are considered pertinent. Mr. Beckman has done a commendable job in demonstrating how this may be done preliminary to constructing the potentially complex income tax phase of a corporate model. He has conveniently and properly ignored many of the minute details of income tax calculations that would detract from his broad illustrations of the actions of the four variables he has chosen to examine. In so doing, he has undoubtedly perpetuated the usefulness of his paper. While, as the saying goes, "there is nothing as certain as death and taxes," we might add by the way of paraphrase, "there is nothing as uncertain as the manner of death or the manner of the tax structure."

The paper does not go into the reaction and interaction of dependent variables and, therefore, stops short of illustrating actual real-life applica-

tions which are the next stages in the formation of a corporate model. Obviously, an insurance company does not change its investment portfolio, nor does it experience radical changes in underwriting results without some reaction from other variables affecting profitability. For instance, sales and purchases of bonds usually involve capital gains or losses, as well as changes in the relationship of tax-exempt and taxable income. Also, interest rates on bonds purchased with new money affect net income differently than interest rates on bonds that are approaching maturity. Factors such as these must be taken into consideration when constructing a corporate model simulating real-life conditions.

It should be noted that Mr. Beckman's paper reflects changes in the tax laws made by the 1969 Tax Reform Act and that his calculations are based on the tax rates effective on 1971 business. Anyone reading this paper in the future should be cautioned to determine the tax provisions in effect at the time of the reading to update the illustrations.

Since the scope of Mr. Beckman's paper does not include mutual companies or reciprocal underwriters and inter-insurers, it may be in order here to offer a postscript for the benefit of those who want to apply the concepts of his paper to such companies.

Mutual companies are subject to Sections 821-825 of the Federal Tax Code. Section 826 applies to reciprocals which are taxed as mutuals with minor exceptions. For the most part, mutuals have been taxed exactly the same as stock companies since January 1, 1963. Two notable exceptions are:

1. Mutual companies with gross premium and investment income of \$150,000 or less are not subject to income tax. Companies with gross premium and investment income over \$150,000, but under \$500,000, may be taxed on investment income only, unless they elect to be taxed on total income. A special deduction is allowed companies with gross premium and investment income between \$500,000 and \$1,100,000 which has the effect of smoothing the transition from an investment income to a total income tax base.
2. Section 824 of the Tax Code requires each mutual company to establish and maintain a Protection Against Loss (PAL) account to be used as a reserve against extraordinary losses, since a mutual company must look to its retained income to meet such emergencies.

Additions to the PAL account are treated as a deduction from underwriting gain for tax purposes.

The code provides specific formulas for establishing and maintaining this special reserve.

It should also be pointed out that, although tax code provisions are similar for mutual and stock companies, the inherent differences in operations and financial structure of the two types of companies may affect the relevancy of some factors in determining maximization of net income after tax.

For one thing, policyholder dividends are more likely to play a significant role in determining the taxable income for mutual companies than for most stock companies. As Mr. Beckman points out, declared policyholders' dividends are a direct deduction from underwriting income. This suggests that company management may look to income from high-yield taxable securities to balance declared dividends in its plan to optimize net income after taxes.

When considering the tax impact of policyholder dividends in corporate planning, it is important to note that only dividends on expired or expiring policies are used to determine underwriting income, although these dividends are a deduction from gross underwriting income earned from all policies in force during and, to some extent, prior to the tax year. This lag may be pertinent in the development of a corporate model concerned with maximizing income after taxes over a span of years.

Another inherent difference between the two types of companies affecting the relevancy of factors in the planning process is in the makeup of investment portfolios — especially with regard to the balance between equity and fixed income securities. As a rule, mutual company investment portfolios lean more heavily toward fixed income securities than do stock company portfolios. Thus, we would expect mutual companies to place less emphasis than stock companies on dividend credits and capital gains or losses from common stocks when planning for maximum after-tax income.

It seems logical to assume that the insurance industry, which is essentially a "numbers" industry, should be an ideal subject for the application of decision theory. Yet, while literature abounds on decision-making and modeling, there is very little published on its application to insurance. Not

too many years ago the scope of our Associateship examinations was broadened to include decision theory. More recently, the Insurance Institute of America has prepared a study course in its application. Now, Mr. Beckman has opened the door a bit further by demonstrating how a preliminary stage in the development of a corporate model may be accomplished. More of this needs to be done in other phases of corporate modeling. Then, hopefully, someone, some day, will put all the pieces together.