

THE RELATIONSHIP OF UNDERWRITING, INVESTMENT,
LEVERAGE, AND EXPOSURE TO TOTAL
RETURN ON OWNERS' EQUITY

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DISCUSSION BY R. J. BALCAREK

It is only very recently that the insurance industry began to acquaint itself with the concept of the return on owners' equity and its implications. Professor Ferrari's important and interesting paper presents a solid foundation for further exploration and analysis.

The reviewer found the formulas illuminating and beautiful in their simplicity. However, simplicity is not always an unqualified blessing. It may be useful to warn that the utilization of Ferrari's formulas requires a great deal of caution. As a case in point, one could easily argue on the basis of formula (3) that, provided the underwriting results do not fall below a certain standard, the premium volume should be expanded as much as possible. No doubt, such expansion would increase the total return on owners' equity but the equity would be exposed to a considerably higher risk. Therefore, it would seem that the maximization of the return should be subject to the condition that there is no appreciable increase in the degree of risk to which the owners' equity is exposed.

Secondly, the formulas lend themselves best to describe a static state. They could be used to illustrate the current or past relationships of a single insurer, a group of insurers, or the industry as a whole. Once we adopt a dynamic approach we would find that most of these relationships start interacting with each other. We cannot say: "Let us increase the premium writings in relation to surplus, assume all other relationships constant, and thus determine the effect of the increase in premium volume on the rate of return." The problem is that the other relationships will not stay constant and they will change directly as a result of the change in premium volume. Professor Ferrari anticipated this to some degree when he mentioned the

possibility of the additional business being of a poorer quality, i.e., using his symbols, if P/S increases then U/P may decrease. Obviously this is a possibility, but it would appear that the majority of the companies could avoid it provided they imposed adequate controls over the process of expansion. However, there will be other, perhaps more powerful, relationships, assuming the need to keep the risk to owners' equity unchanged:

(1) When the premium to surplus ratio P/S increases, then the investment gain on assets I/A will tend to decrease because (a) the proportion of uninvested assets originating from the insurance operations, such as cash and agents' balances, will tend to rise, and (b) with a higher P/S the element of risk to owners' equity becomes greater and this would have to be compensated for by a more conservative investment policy.

(2) An insurer can safely write a larger premium volume with the same surplus if his underwriting results are more favorable. In other words, the ratio of premium volumes to surplus P/S will move in the same direction as rate of underwriting profit U/P .

(3) An examination of the relationship between the rate of underwriting profit U/P and the investment return on assets I/A leads to the conclusion that they would tend to move in the same direction. This means that if underwriting results are good the insurer could indulge in a more aggressive investment policy.

No doubt, there are more such inter-relationships and no formula or mathematical model could possibly take them all into account. However, the reviewer feels that Ferrari's formula would benefit greatly if two or three such relationships were incorporated into it. It has to be realized that a study of each of these relationships would be fairly involved, providing ample material for a separate paper. The reviewer is convinced that it is possible to determine, at least partially, the parameters involved in these relationships. Once this is done (easier said than done), then, using linear programming or a similar technique, Ferrari's formula could be used⁷ to determine an optimal solution from the stockholders' viewpoint.

The reviewer's recent paper entitled "The Capital Investment Market and the Insurance Industry"* presents a special case of the relationship

* *PCAS*, Vol. LV, p. 186 (1968).

between U/P and P/S . It describes the case when the rate of underwriting return U/P is so low that the desirable written premium to surplus ratio P/S is equal to zero.

DISCUSSION BY ROBERT A. BAILEY

Mr. Ferrari has illuminated the relationships among return on equity, return on assets, and return on sales with simple formulas. These simple relationships provide valuable insight and should be helpful to anyone who must make meaningful decisions as to the future course of an insurer, in underwriting commitments, investments, and prices.

Mr. Ferrari's formulas illustrate the effect of leverage — the relationship of premiums and liabilities to shareholders' equity — and have thereby enabled him to pose the important problem of the optimum capital structure for an insurer.

His formulas lead to two significant conclusions:

(1) Capacity depends on profits. If the net result from underwriting plus the investment gain from the investable portion of the insurance reserves is a profit, capacity will increase. If it is a loss, capacity will decrease. (Of course, profits may also be dependent on capacity — too much capacity leading to reduced profits in a competitive market.) The correct measurement of investment returns from funds attributable to the underwriting operation is therefore of critical importance to the management of an insurer.

(2) The optimum capital structure, assuming a profitable result from underwriting and the underwriting portion of investment income, is a minimum of capital and a maximum of leverage. In fact, if it is possible, the optimum capital is less than zero. Mr. Ferrari suggests that variability of earnings introduces an opposing tendency to maximize capital in order to stabilize earnings, because stable earnings are capitalized at a higher rate than variable earnings. According to this theory the optimum capital structure is attained at some mid-point between the opposing tendencies to maximize leverage and to maximize stability of earnings. However, this restraint on attaining maximum leverage applies only if the insurer is an independent entity. This restraint is largely eliminated if the insurer is owned by a holding company that holds other enterprises in addition to insurance.

A holding company can treat its insurance operation like a separate