

Group	$\frac{\Sigma 1/\sqrt{S}}{\bar{S}}$	Correlation Coefficient	
		Actual	Expected
1	7.40098	.194	.199
2	2.38759	.489	.252
3	8.44241	.108	.096
4	13.98084	.104	.107
12	9.78857	.211	.218
123	18.23098	.042	.180
1234	32.21182	.052	.154

The actual correlation coefficient for any group would vary either up or down from the theoretical expected value because of the limited number of companies in each group and the resulting lack of steadiness. Furthermore, as more and more groups are combined into one big group, the assumption that the constant A in the formula is constant becomes less valid and the actual correlation would tend to be smaller than the expected value. This is what Mr. Simon meant when he said, "There are times when a true correlation will be masked if two dissimilar groups are thrown together." The effects of this can be seen by comparing the actual and expected values for Group 123 and for Group 1234.

There are undoubtedly other formulas which would produce expected values just as close to the actual values. The formula proposed in this review is only one of many possible ones and was selected on the basis that it was simple, reasonable and consistent with the data available. A larger volume of data would be required to test how accurately the proposed formula describes the relationship between size and profit.

It is hoped, however, that the proposed formula will provide a framework within which we can further Mr. Simon's important contribution toward evaluating objectively the relationship between size, strength and profit.

DISCUSSION BY CLYDE H. GRAVES

In summarizing his study "Size, Strength and Profit" Mr. Simon stated, "Within the limits of the study, we find that no meaningful relationship exists between the premium size of a company and its profitability or between the premium size of a company and its strength as measured by the ratio of surplus to net premiums written."

I believe this statement will come as a surprise to many as I confess it did to me. I think of the Allstate, State Farm, Nationwide, Travelers, Aetna, Hartford, Liberty Mutual and Insurance Company of North America as large companies, making large profits and being towers of strength, and it comes as a shock to learn that there is no meaningful relationship between premium size and profitability, nor between premium size and strength. The shock was so great that I even calculated some coefficients of correlation myself to check on Mr. Simon's statement.

One item in the expense provisions which I felt would have a definite relationship to size was "general expense." The larger the company the smaller would be the ratio of general expense to premiums. I used the 1961 Loss and Expense Ratios published by the New York Insurance Department and calculated the correlation between "X" and "Y". With "X" representing net

premiums written (countrywide) and "Y", general expense ratio, the following coefficients of correlation were determined:

r_{ij} —where "i" represents type of company and "j", line of insurance:

<u>Type of Company</u>	<u>Line of Insurance</u>
1—Stock	1—Fire
2—Mutual	2—Extended Coverage
	3—Homeowners
	4—Workmen's Compensation
	5—General Liability
	6—Automobile BI Liability

The 12 coefficients of correlation calculated are:

r_{11}	\equiv	-.116
r_{21}	\equiv	-.217
r_{12}	\equiv	-.071
r_{22}	\equiv	-.133
r_{13}	\equiv	-.178
r_{23}	\equiv	-.271
r_{14}	\equiv	-.074
r_{24}	\equiv	-.198
r_{15}	\equiv	-.025
r_{25}	\equiv	-.050
r_{16}	\equiv	-.531
r_{26}	\equiv	-.639

It is to be noted that all the coefficients of correlation are negative, indicating that for all lines of insurance and types of company, the larger the company the smaller the ratio of general expense to premiums. However, only for Automobile BI are the coefficients of any size.

Other items of expense, such as taxes, commissions, are directly related to premiums and, therefore, it would not be expected that the ratio of these expenses to premiums would vary by size of company. Loss adjustment expense ratios, which are directly related to losses, and loss ratios themselves, would not necessarily vary by size of company. Therefore, on reflection, perhaps it is not too surprising after all that Mr. Simon arrived at his conclusion.

DISCUSSION BY CHARLES C. HEWITT, JR.

Mr. Simon has been a leading contributor to our Proceedings both in quantity and quality. It is, therefore, with some regret that I report that, in this reviewer's opinion, his recent work entitled "Size, Strength and Profit" falls considerably short of his other current and earlier efforts. I hasten to assure Mr. Simon's reading public that a conclusion to the effect that the author is slipping is unwarranted. In this paper Mr. Simon has tackled the unhappy job of "unscrewing the inscrutable." "Roy" comes out second best only because of his selection of topic and not for lack of ability or effort.

In this instance the "inscrutable" consists of two major questions. One, can we define what is meant by the terms "size," "strength" and "profit" as they