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ACTUARIAL NOTE: FIXED AND VARIABLE EXPENSES

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A variety of meanings appear to have been attached to the expression "fixed expenses," with the result that we sometimes find ourselves talking at cross-purposes. The intent of this note is to see if any clarification is possible.

A cost which does not depend upon a particular variable is by definition constant, or fixed, with respect to that variable. For example, administrative costs do not depend upon premium rates although both may depend upon the value of money. A rate increase or a rate decrease does not affect the cost of underwriting, bookkeeping, etc. Administrative costs can therefore be logically regarded as fixed with respect to premium rates. Such costs, however, are obviously not fixed with respect to time since they depend upon the value of money and other factors, such as technology, which change with time.

It might be observed that administrative costs, although fixed with respect to premium rates, are not fixed with respect to premiums since policies with larger premiums often involve more underwriting expense than policies with smaller premiums.

The dependence, however, is indirect. Where the larger premium is a consequence only of higher rates there is no necessary dependence. The controlling factor is the amount of work entailed which, although correlated to some degree with premiums, actually depends on such factors as the complexity of the risk, the need for inspection, expected costs of loss adjustment, etc. The degree of correlation between administrative costs and size of premium will therefore be negligible when variations in premium size are due only to variations in rate for a given kind of business. Where, however, variations in premium are associated with variations in exposure there will often be corresponding, but smaller, variations in administrative costs. Hence administrative costs are in some cases unrelated to premium and in other cases weakly related. Care is necessary to avoid error.

Another sense in which costs can properly be regarded as fixed is as a minimum. If, for example, it is known that a cost of at least $4 is incurred for every policy of a certain kind put on the books, then the fixed cost of this policy is $4 in the sense that $4 is the constant term in a mathematical equation. As such it will contain some elements of administrative cost but not necessarily all. Inspection, for example, could hardly be included.

A third sense in which costs can properly be regarded as fixed is reflected in the "out-of-pocket" cost principle, to which reference is frequently made in ratemaking for public utilities. Here, if a given increment to a carrier's total business will produce more revenue than the resulting increment to expenses, the new business is said to cover out-of-pocket costs. Any excess is a contribution toward overhead and profit. Fixed expenses here are all those which are not increased. The problem of defining fixed expenses in such cases is complicated by the fact that, whereas an increment of one size may not affect certain costs, a larger increment will do so. Each case must be analyzed from its own facts. It is apropos to remark here that where competition leads to widespread use of rates sufficient only to cover out-of-pocket costs, financial failures can be expected.

Contrasting with fixed costs, certain costs such as commissions, premium taxes, and assessments are clearly variable with respect to premiums. The correlation here is complete within a kind of business subject to the same tax rates. Another kind of variable cost is allocated overhead. This paradoxical definition arises from the fact that important "fixed" expenses must be covered one way or another. One way is to allocate them arbitrarily as a function of premium, say as a constant percentage. If the allocation at every instant is in proportion to "standardized premium in force,"* then the fixed expenses so allocated are made a function of earned premium by fiat.

It is no wonder, considering the foregoing, that different meanings have been attached to the expression "fixed expenses." Different things are meant in different contexts. The Author suggests that when we refer to "fixed" expenses we take pains to be sure that the sense in which the word is used is clear. The use of such expressions as "costs independent of premium," "minimum costs per policy," "costs independent of exposure," etc., would make for better understanding in many cases.

DISCUSSION BY PAUL S. LISCORD

As one who is constantly being tripped up by terminology I find Mr. Roberts' paper on Fixed and Variable Expenses extremely helpful. It should be required reading for those of us who are faced with the forthcoming study of expenses by size of risk for Workmen's Compensation on Liability lines.

Such a study after all concerns itself with an analysis of "fixed expenses" which include those defined by Mr. Roberts as " '. . . costs independent of premium,' 'minimum costs per policy', 'costs independent of exposure,' etc." The fact that these expenses are subsequently related to premiums (by size) only makes it of increasing importance to recognize differences not only in terminology, but also in measurability and controllability.

We are indebted to Mr. Roberts for what I hope is an introduction to many more contributions to our *Proceedings* on this subject.

* An expression coined by the author to denote the value obtained by dividing each premium in force by the term which it covers and adding the quotients. Integration of this sum with respect to time yields earned premium.