

IMPLICATIONS OF SALES AS AN EXPOSURE BASE FOR PRODUCTS LIABILITY

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Mr. Philbrick's paper on sales as an exposure base for products liability represents a significant contribution to the *Proceedings* as a quantification of what heretofore had been held as a relatively subjective underwriting criterion. I found his presentation particularly interesting in the manner in which he demonstrated the problem with an illustrative example. While some readers may have felt the initial assumptions were oversimplified, I would disagree. Before a problem can be solved, it must be identified. All too often authors proceed immediately into a case study involving a number of complexities which tend to obscure the characteristics of the variable under investigation. The initial portion of this paper could be used by any number of underwriters, risk managers or interested insureds as a primer on the analysis of the amount of products that are currently in the stream of commerce. The remaining portion of the paper is well suited to the actuary or student who wishes to go beyond the initial assumptions and test the sensitivity of the various factors in the author's model. From a pedagogical point of view, I think the gradual introduction of complicating variables allows the reader to appreciate the role each concept plays in the total picture.

While I feel Mr. Philbrick did a fine job in analyzing the effect of "inventoried" sales on the "true" exposure, I must admit I was surprised that there was no mention of what may be an equally serious implication of sales as an exposure base. The author quotes Dorweiler where he states that a "good" exposure medium should satisfy at least two criteria:

1. The magnitude of the medium should vary with the hazard.
2. The medium should be practical and preferably already in use.

While the second criterion is certainly satisfied by sales, I question whether increased sales are, ipso facto, indicative of increased hazard. Many manufacturers of high-technology products spend a significant amount of funds on research and development. In addition, it is not uncommon for producers of manually operated equipment (e.g., snowblowers, drill presses, etc.) to design safety mechanisms which exceed governmental requirements or industry norms.

These additional costs are generally passed on to the purchaser in the form of higher prices. This may lead to an inequity in rating if one relies solely on sales as a measure of exposure. As an illustration, consider two manufacturers who produce items (*A* and *B*) in the same products rating classification. Item *A* is produced as cheaply as possible while item *B* has undergone rigorous testing and is equipped with a number of supplemental safety features. It is entirely possible that item *B* may have a sales price twice that of item *A* while it may represent only one-half the frequency and/or severity hazard. Using standard manual rating techniques, the premium arising from item *B* would be twice that of *A* while the pure premium ratio of *B* to *A* should actually be 1:2. In my admittedly extreme example not only does the medium (sales) fail to increase with the hazard but, in fact, they are inversely related. While experience rating should eventually reflect these differences, the inequities in the early years are never acknowledged.

The use of sales as a common exposure base within a classification is equivalent to assuming an average fixed price for each similar product. For example, \$2,000 of lawnmower sales are assumed to represent the same exposure, regardless of manufacturer (e.g., ten mowers at an average price of \$200). In reality, \$2,000 in sales may represent anywhere from five very safe mowers to twenty hazardous pieces of equipment. The danger implicit in the assumption of an average price is discussed in another context when Mr. Philbrick discusses the growth patterns g in his computation of v : "... whenever growth patterns of a firm differ from those of the total industry, sales may *not* be a good measure of exposure." I believe the same conclusion is valid when the price per item for a firm differs from the industry average.

A common approach used today to price certain "a" rated risks is to measure the *number of units* manufactured and in the stream of commerce. While this concept helps reduce some of the inequity of a sales exposure base, it does not completely eliminate all bias. From a practical point of view, I would not advise a complete conversion to "number of units" as a new exposure base since the marginal improvement in accuracy may not compensate for the loss of sales as an inflation-sensitive exposure base.

The growing importance of the large commercial accounts and the concern for the financial stability of recently formed captives make it imperative that individual modifications from industry averages result in adequate yet competitive rates. Formal recognition of such pertinent characteristics as the concentration of products in the stream of commerce, which Mr. Philbrick discusses, or any number of other underwriting criteria will improve the art of rating and benefit both the insurer and the insured.