COMPARING VARIANCES USING A SINGLE LEVEL OF VARIANCE

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A credible cross-section of marketing professionals, academics and practitioners, has underscored the need for more *fact-based knowledge*. These professionals, acting as Marketing Science Institute (MSI) trustees, have declared that "assessing marketing productivity (return on marketing) and marketing metrics" a priority for 2002-2004 (Lehman 2002). Traditional accounting tools are often eschewed because of a cost control perspective rather than a market control perspective. Variance analysis is an excellent example of a cost control tool that can be made more relevant to the control of marketing. However, few of our marketing students have a solid understanding of accounting principles, and substantial minority have the quantitative skills necessary for effective marketing control.

Hulbert and Toy (1977) demonstrated that quantity variances could be analyzed in terms of changes in market size and market share. Extensions to Hulbert and Toy's work on exogenous and uncontrollable pricing variables such as reference point market prices and proportion of reference prices maintained leave the marketing managers with a series of variances to compare and analyze. The decomposition of such complex variables has been traditionally handled with a multi-level pair-wise analysis approach (Mitchell and Olsen 2003; Weber 2000). The major disadvantage is that variances at the end of different decomposition branches cannot be directly compared to each other.

However, the proposed single tier method allows for comparing the relative sizes of all variances and requires that total potential extension of the analysis be represented in the initial decomposition. That is to say, the total revenue variance is recognized as being comprised of four variables – Reference Price Variance, Relative Price Variance, Market Share Variance, and Market Size Variance – at the first tier of the analysis.

The Single Level Approach

To rectify the lack of comparison inherent in the multi-level approach, the variance in total sales revenue, Ta –Tb, can be re-written. The resulting identity is described as sales revenue being equal to the product of the four variables that were originally identified in the multi-level approach.

$$T_a - T_b = \%_a R_a S_a M_a - \%_b R_b S_b M_b \qquad (4)$$

where T = total sales revenue	subscripts a = actual, b = budgeted
Relative Price Variance = $(R_a S_a M_a)(\%_a - \%_b)$	Reference Price Variance = $(\%_a S_a M_a)(R_a - R_b)$
Market Share Variance = $\%_a R_a M_a (S_a - S_b)$	Market Size Variance = $\%_a R_a S_a (M_a - M_b)$
Plus the complement of each Variance	

In a single level approach, each of the four variables is decomposed separately into a primary variance and its complement. The primary variance of each variable, $(X_a - X_b)$, is weighted by the product of the actual levels of the other three variables. The complementary variance represents the combined impact of the other three variables. The sum of the primary variance and its complement, by definition, equal the difference in total sales revenue. Each of the four primary variances can be directly compared and ranked in terms of their relative impact on revenues. Managerial control is now augmented allowing limited resources to be focused on a strategy that should produce the most impact.

DISCUSSION

Variance analysis is the investigation of a difference between a planned and an actual performance. The most important role for variance analysis is to provide symptoms of a firm's operations being out-of-control. In marketing this takes on a special

significance because only portions of a variance analysis are directly or indirectly impacted by the firm's marketing strategy. The traditional multi-level approach to variance analysis may not allow managers to directly compare variances that are under their control. This paper illustrates that a single level of analysis allows all four of the primary variances to be directly compared and ranked in terms of relative importance. Using a single level of analysis allows the impact of changing the firm's relative price and the firm's market share to be directly compared.

Based upon a cursory review of current marketing textbooks and experience in the classroom, our students are failing to receive sufficient training in analysis and control techniques. It also appears that classic tools such as variance analysis need to be reviewed and revamped for the modern era of databases and Internet. The new generation of managers must be in a position to respond to MSI's call for enhanced assessment of marketing productivity (Lehman 2002).

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