

STRATEGIC MARKETING CONTROL:  
WHATEVER HAPPENED TO VARIANCE ANALYSIS?

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ABSTRACT

"We believe that, relatively speaking, what accounting and finance could contribute to marketing has been neglected." (Shapiro & Kirpalini 1984, p. xv)

Virtually all marketing faculty have completed at least a minimum of course work in accounting and finance in pursuit of their terminal degrees. Many have enterprise experience in both operational and strategic processes, including significant involvement in financially based decision and control systems. Yet there is little evidence that few more than a handful have done anything to operationalize the general understanding and acknowledgement of the importance and potential for contribution of lessons from accounting and finance, especially in relatively sophisticated approaches. Unfortunately, there is no generally agreed on structure for the control of strategic marketing, a situation bemoaned by Hulbert and Toy (1977, p. 12). Their antidote was to recommend the use of the accountant's variance analysis to (1) facilitate the comparison of actual marketing performance with marketing plans, and (2) to set up an improved performance evaluation technique that anticipates that different variances, do, in fact, occur. This paper describes variance analysis, discusses some possible explanations for our collective suspected lack of follow through, provides a detailed example of its application that could be used as a classroom example, and encourages us to teach its use in our courses.

Variance analysis basics

Most managers compare their organization's performance with plans, very frequently expressed in a budget. The difference between performance and plan is investigated when significant, so that responsibility can be determined and corrective action taken, or at least understanding gained to minimize the probability of doing the wrong thing more than once. Accountants call deviations from plans variances. Control is facilitated by decomposing variances into several useful parts. Variance can be caused by poor information, so variance analysis is based on ex post information, or what should have happened, rather than on ex ante information, what was known when the plan was made.

Departures from plans can be caused by myriad factors, such as unrealistic management expectations for new products, "sand bagged" sales targets from sales staff, shifts in competitor's strategies, ineffective promotional mixes and messages, and many other external and internal moderating forces, resulting in outcomes which are unforeseen in terms of strength or timing (Bentz and Lusch 1980, p. 18).

It is also possible to achieve targets that in themselves were inappropriately low, and thus it becomes important to determine whether the variances are due to unrealistic plans or poor performance (Guiltinan and Paul 1982, p. 340). In most cases differences are assignable, permitting elimination of the cause. In some cases, variations are random. With random variations, it is advisable to establish limits which would signal the need for process or standard revision (O'Neil et al 1965, p. 281). A major weakness of historical accounting is that the variances produced by the system may be due to difficulties in conceptualization, implementation or both (Wilson 1974 p. 119).

Why it is not commonly used in marketing

Variance analysis is not new, and it is commonly used in the production management field for direct labor and material cost control. So why not in marketing? Obviously, marketing is a substantially more behavioral science than is management science. Yet many marketing practitioners and most marketing faculty are literate in sophisticated methods of analysis in marketing research. So lack of use should not be based on mere fear of numbers.

Marketing practitioners tend to do that which is expected of them in the work place. Oftentimes this takes the form of routine activities, many of which are learned on the job. In most organizations, there is little frank discussion of failures among managers of different departments. After all, its bad enough to face the boss, let alone one's peers. And there is little room for diffusion of innovation from new employees with recent schooling, because new employees are less likely to be involved in review and control activities than more senior colleagues. Perhaps by the time new employees work their way up to positions responsible for strategic control, they have forgotten those lessons that they haven't put to use up to that time. But in most cases, they probably weren't exposed to practical techniques such as variance analysis in their course work.

Where does something like variance analysis fit in the marketing curriculum? In traditional approaches, it simply hasn't. We tend to teach courses required in the major, and perhaps a few in special areas of personal interest. Contributions from accounting and finance simply don't fit in traditional functional areas of the marketing mix such as product development or management, sales promotion, personal selling and sales management, advertising, or even pricing. We teach principles, marketing management and strategic marketing, often employing case methods at higher levels to provide practice in application of concepts to help solve complex problems. And we are myopic in only applying lessons

from marketing in solving marketing problems.

Lee Adler (1967) warned corporate America that a good many marketing men, in the deepest recesses of their minds, are artists, not analysts. For them, he suggests, marketing is an art form, and they really don't want it any other way. It is his explicit opinion that their temperament is antipathetic to system, order and knowledge, and that they enjoy flying by the seat of their pants, though it would be impossible to get most to admit it. He goes on to posit that these marketing men revel in chaos, abhor facts, and fear research, loving to spend, but are loath to assess the results of their spending. Obviously, he's not talking about any of us, is he?

#### A gross profit variance illustration

In the fictitious Lay's Silicon Chips Company, the firm produces a model 8088-2 chip with a gross margin budgeted at \$20.00 each, and a newer 80286 with a gross margin budgeted at \$30.00 each. Sales and performance are as follows:

	<u>Actual results</u>	<u>Budget</u>
8088-2	13,200 x \$22.00 = \$290,400.	10,000 x \$20. = \$200,000.
80286	8,000 x 31.50 = <u>277,200.</u>	10,000 x 30. = <u>300,000.</u>
Total	\$567,600.	\$500,000.
Gross profit variance = \$567,600 - 500,000 = \$ 67,600.		

Three factors give rise to the favorable profit variance: changes in gross profit per unit, shifts in projected relative volume, and changes in sales volume. The following illustration isolates these three factors.

	<u>Actual results</u>	<u>Price variance</u>
8088-2	13,200 x \$22.00 = \$290,400.	13,200 x \$20.00 = \$264,000.
80286	8,000 x 31.50 = <u>277,200.</u>	8,000 x 30.00 = <u>264,000.</u>
Total	\$567,600.	\$528,000.

<u>Mix variance</u>	<u>Volume variance</u>
11,000 x \$20.00 = \$200,000.	1,000 x \$20.00 = \$20,000.
11,000 x 30.00 = <u>300,000.</u>	1,000 x 30.00 = <u>30,000.</u>
\$500,000.	\$50,000.

Price variance = \$567,600. - 528,000 = \$39,600.

Mix variance = \$528,000. - 500,000 = <\$ 22,000.>

Volume variance = \$50,000.

In the second column, labeled price variance, volume and sales mix have been held constant with the actual results, but the budgeted gross profit per unit has been used. Had the units been sold at the forecast profit levels, total profit would have been \$39,600 less, that is, the \$39,600 is a price variance attributable to higher than predicted gross margin per unit.

This so called price variance does not address the effect of the shifting sales mix or the volume change. By keeping actual quantity sold at 13,200 + 8,800 = 22,000 but changing the sales mix to

planned equal proportions, the impact on gross profit of the shift in sales mix is isolated. Had actual sales been at budgeted levels, average gross profit per unit would have been \$528,000 / 22,000 = \$24.00.

In the mix variance column, it is assumed that the actual total sales volume of 22,000 units was sold in the projected fifty / fifty mix. Half the units would be 8088s, and the other half would be 80286s. Average gross profit per unit would then be \$550,000/22,000 = \$25.00. Therefore a \$22,000 reduction in profit can be attributed to an unfavorable shift in sales mix: (25-24) x 22000 = \$22,000, or \$550,000 - 528,000 = \$22,000.

The volume variance represents the change in gross profit due to selling more or fewer units than planned. By holding sales mix and gross profits per unit constant and the changing volume from the actual level to the planned level, the change in gross profit due to volume changes can be calculated.

Note that the total gross profit variance equals the sum of the three variances: \$39,600 + 50,000 + <22,000> = \$67,600.

#### Volume variance: a closer look

The \$50,000 favorable volume variance is certainly welcomed by Lay's Silicon Chips management, but must be interpreted with caution. It might not be a good indicator of performance. To determine if the sales force should be commended for doing a terrific job, it is necessary to look a little closer. Assume that the marketing department forecast the total market at 1,000,000 units, and that the firm would capture a 20% share. Now further assume that market growth was actually substantially greater than forecast, say to 1,320,000 units. A revised flexible budget then would reflect the following:

ACTUAL MARKET SIZE X FORECAST MARKET SHARE X				
FORECAST GROSS PROFIT PER UNIT = EXPECTED GROSS MARGIN				
1,320,000	X	20%	X	
		\$25.00	=	\$660,000.

Obviously, the actual gross profit of \$567,600 is a far mark off the expected profit.

The volume variance can be further decomposed into a market share component and a market volume component. This is advised because the sales force has no direct responsibility for increased or decreased sales due to changes in the overall size of the market.

1,320,000 x 16.67% x \$25.00 = \$550,000

1,000,000 x 16.67% x \$25.00 = \$416,667

1,000,000 x 20% x \$25.00 = \$500,000

Size variance equals \$550,000 - 416,667 = \$133,333

Share variance equals \$416,667 - 500,000 = <\$ 83,333 >

Total variance equals \$133,000. + <\$83,333> = \$50,000

As before, the left side shows budgeted gross profit at the actual volume and actual market share (22,000 units sold divided by market volume of 1,320,000 = 16.67%). To determine the effects on gross profit attributable to market growth, market share and budgeted gross profit per unit are held constant. These factors are multiplied by the planned market size and actual market size:

(1) PLANNED MARKET SIZE	X	ACTUAL MARKET SHARE	X	PLANNED GROSS PROFIT PER UNIT	=	GROSS PROFIT
1,000,000	X	16.67%	X	\$25.00	=	\$416,667.
(2) ACTUAL MARKET SIZE	X	ACTUAL MARKET SHARE	X	PLANNED GROSS PROFIT PER UNIT	=	GROSS PROFIT
1,320,000	X	16.67%	X	\$25.00	=	\$550,000.

The difference between (1) and (2) above represents the gross profit caused by market growth. If the market grew by 320,000 units above forecast, then gross profit should have been \$550,000, not the actual of \$567,600., given an actual market share of 16.67%.

A portion of the volume variance is the result of the actual market share of 16.67% falling short of the planned 20% penetration. The drop in market share cost the company \$83,333. (shown before) which is the difference as illustrated next.

(3) FORECAST MARKET SIZE	X	ACTUAL MARKET SHARE	X	PLANNED GROSS PROFIT PER UNIT	=	GROSS PROFIT
1,000,000	X	16.67%	X	\$25.00	=	\$416,667.
(4) FORECAST MARKET SIZE	X	PLANNED MARKET SHARE	X	PLANNED GROSS PROFIT PER UNIT	=	GROSS PROFIT
1,000,000	X	20.00%	X	\$25.00	=	\$500,000.

The overall volume variance did not seem significant until it was decomposed. In this example, market growth hid a reduced market share. The share variance points out the need for further investigation. Was the variance the result of a complacent sales force easily making its quota in a rapidly expanding market? Were increased prices a factor? Share variance cannot provide definitive answers, but it does provide a useful mechanism to ask such questions.

#### Ex post analysis

Variances merely indicate deviations from plans, but plans by their very nature are often obsolete. The prolific management writer Peter Drucker (personal class notes, 1979) claims that it is impossible to forecast, and precisely because we can't forecast, it is necessary to plan. Some portion of variances may be due to excellent or poor performance. An ex post plan represents what the original plan would have been, if it included unforeseen events that altered the ultimate outcome. This type of revision permits management to separate each variance into two parts, a part attributable to performance and a part attributable to defective planning.

Returning to the example of the silicon chip industry, assume that one firm has a dominant fifty percent market share. Lay's Silicon Chips has specialized in the low end of the market by focusing on lower prices, generally discounting prices ten percent below the industry leader. Lay's had planned on actual revenue and manufacturing expenses as follows for its 8088 chip:

	PLANNED	ACTUAL	VARIANCE
SELLING PRICE	\$50.00	\$56.00	\$ 6.00
MANUFACTURING EXPENSES	30.00	34.00	4.00
GROSS PROFIT	\$20.00	\$22.00	\$ 2.00

In this example the planned selling price was based on the assumption that the major competitor would hold the price at \$55.00 per unit. To bolster domestic production of silicon chips, further assume that the government has placed a very high tariff on imported chips. The dominant competitor raised their selling price to \$57.00 per unit for their nearly identical 8088 chip in response to the new tariff. Had Lay's marketing department been able to anticipate the new tariff and the resulting strong prices, the adjusted planned selling price for the 8088 would have been \$57.00 - 10% = \$51.30 per unit.

Overtime was required to meet the increased domestic demand, resulting in a unit production costs increase of \$.60. Had these events been incorporated in the original budget, the gross profit would have been: selling price \$51.30 - manufacturing expenses of 30.60 = per unit gross profit of \$20.70. The favorable price variance of \$26,400 may be decomposed into the following components:

132,000 X \$22.00	=	\$290,400.	13,200 X \$20.70	=	\$272,240
132,000 X \$20.00	=	\$264,000.			
			Price Performance Variance	=	\$290,400 - 272,240 = \$18,160
			Price Forecasting Variance	=	\$273,240 - 264,000 = \$9,240

Lay's Silicon Chips performance variance indicates the difference between real gross profit resulting from actual prices and ex post gross profit that would have been planned had the marketing department been prescient with respect to the tariff and its competitive reaction. Price increases have caused the ex post level by \$17,160.

The difference between the ex post planned profit and the ex ante planned gross profit is a forecasting variance. The \$9,240. variance shows the impact on gross profit from the higher prices resulting from the tariff.

The market size and share variances just shown can be subdivided into performance and forecasting variances with the aid of an ex post plan. In continuing this illustration, suppose that the tariff caused the domestic demand to grow by fifteen percent, and that Lay's captured ten percent of that growth. Separation of performance and forecasting variances follow.

	SIZE	X	SHARE	X	G.P./UNIT	=	G.P.
(A)	1,320,000	X	16.67%	X	\$25.00	=	\$550,000.
(B)	1,150,000	X	16.67%	X	25.00	=	479,167.
(C)	1,000,000	X	16.67%	X	25.00	=	416,667.
(D)	1,000,000	X	17.52%	X	25.00	=	438,000.
(E)	1,000,000	X	20.00%	X	25.00	=	500,000.

MARKET SIZE PERFORMANCE VARIANCE	MARKET SIZE FORECASTING VARIANCE	MARKET SHARE FORECASTING VARIANCE	MARKET SHARE PERFORMANCE VARIANCE
\$550,000(A)	\$479,167(B)	\$416,667(C)	\$438,000(D)
-479,167(B)	-416,667(C)	-438,000(D)	-500,000(E)
\$ 70,833	\$ 62,500	\$27,333	\$62,000

Total market size

variance = \$133,333

Total market share

variance = \$483,333

Total volume variance = \$ 50,000

Lay's forecasters had predicted a market size of 1,000,000. The tariff caused a fifteen percent increase (150,000). Had the tariff not been adopted, total market size would have been 1,320,000 - 150,000 = 1,170,000. An investigation should be conducted to determine the cause of the seventeen percent unexplained market growth or variance due to a poor forecast. While it is unrealistic to expect pinpoint accuracy, a more accurate forecast is very desirable to support planning, budgeting, production, inventory and control. Favorable size variances are not necessarily good, nor necessarily bad. Large major market size variances can be damaging whether they are favorable or unfavorable. Significantly favorable differences may result in stock outs, rush orders, overtime, lower product quality, etc., and significantly unfavorable size variances may result in excessive production, inventories, returns, layoffs, and so forth.

The market size forecasting variance of \$62,500 (B - C) is a direct result of the tariff and subsequent price leader reaction. Forecasters should not be held accountable for this portion of the size variance. The market size forecasting variance represents the difference between the ex post planned gross profit of \$479,167 and the planned ex ante gross profit at the actual market share of \$416,667.

In a similar manner, Lay's market share can be revised to see what would have happened without the tariff. The following calculation demonstrates removing this effect:

	Sales volume	Growth due to tariff	Volume without tariff
Total market	1,320,000	150,000	1,170,000
Lay's S.C.	220,000	15,000	204,000

The unfavorable market share variance was displayed earlier, and is decomposed into two parts. The unfavorable \$21,333 market share forecasting variance has resulted from capturing only ten percent of the market growth due to the tariff, rather than Lay's regular target of twenty percent. Without the growth, Lay's market share would have been 205,000 / 1,170,000 = 17.52%.

The market share performance variance has cost Lay's \$62,000. in lost profit. Even without the unforeseen tariff imposition, market share would have dropped substantially. Management should attempt to find out why. Now that the effects are known from variance decomposition analysis, management can seek the causes to result in improved future performance.

#### A call to action

Variance analysis is not very complex. It is well within the competence of most marketing faculty. It has demonstrated value for improving strategic marketing control. It does fit in the traditional marketing curriculum, but like other new material, variance analysis requires some explanation, modeling or demonstration, and practice. It is our experience that it is useful in marketing management

and strategic marketing classes, and agreeable to students. Consulting clients have found its application to be beneficial in fixing responsibility and improving performance. Variance analysis then is not as complex as it sounds, is effective, fits in the curriculum, and is accepted by students and practitioners alike.

"Marketing program performance variances are the key to isolating deviations between expected and actual performance. In strategic control, a new focus is the assignment of variances to the functional marketing program and to planning. Strategic marketing control integrates marketing information concepts, the marketing audit and variance analysis to provide information to all management levels." (Neidell 1983, p. 510)

Variance analysis should be in every marketing manager's tool box. Let us insure they know how to use it.

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