



Advanced Sales and Marketing Variances

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The syllabus for Professional Level Performance Management indicates that “Advanced Variance Analysis” is an examinable topic for this paper. The learning guide which accompanies the syllabus gives details of what is required in this area, including (inter alia) “sales mix and quantity variances” [as well as] “sales market size and sales market share variances”.

It is important that candidates should be thoroughly familiar with the learning guide and should prepare themselves for the exam accordingly. Unfortunately, this does not always happen; at a number of recent sittings many candidates appear to have presented for this paper with only a “basic” knowledge of variance analysis (rather than the “advanced” knowledge indicated in the syllabus and learning guide) and have consequently been unable to seriously attempt the variances question.

The purpose of this article is to present a worked example which includes sales mix/quantity and market size/share variances, in the hope that this will help candidates to master the topic and to appreciate the level of knowledge which is expected in answering a question on this topic in the Professional Level Performance Management paper.

Example: Timekeeper Ltd.

Timekeeper Ltd. manufactures three types of specialist watch which it sells to retail customers. All watches are sold in the month when they are produced. The following budget data is available for last month:

	Budgeted selling price per unit	Budgeted variable cost per unit	Budgeted sales quantity
Product A	€100	€60	800 units
Product B	€75	€45	1,200 units
Product C	€50	€30	2,000 units
			Total budgeted sales quantity = 4,000 units

The actual variable cost per unit for each product was the same as budgeted. However, the actual sales prices and quantities last month were somewhat different from the budget, as the following actual sales data shows:

	Actual selling price per unit	Actual sales quantity
Product A	€99	750 units
Product B	€76	1,250 units
Product C	€49	2,500 units
		Total actual sales quantity = 4,500 units

The purpose of variance analysis is to identify the financial effect of differences between budgeted and actual outcomes, with a view to identifying underlying causes and taking action to increase the likelihood of better performance in future. An “advanced” (rather than a “basic”) variance analysis is worthwhile when the advanced variance analysis provides more thorough insights in this regard. Let’s see now what insights we can obtain by conducting a variance analysis of the sales data for Timekeeper Ltd.

Basic variance analysis

A “basic” variance analysis of the sales data involves determining a sales price variance and a sales volume variance as follows:

- Sales price variance (SPV):

Product	Actual selling price (AP)	Budget selling price (BP)	Actual quantity (AQ)	SPV = (AP – BP) * AQ
A	€99	€100	750	(€99 - €100) * 750 = €750 U
B	€76	€75	1,250	(€76 - €75) * 1,250 = €1,250 F
C	€49	€50	2,500	(€49 - €50) * 2,500 = €2,500 U
				Total SPV = €2,000 U

- Sales volume variance (SVV):

Product	Actual quantity (AQ)	Budget quantity (BQ)	Budget contribution per unit (BC)	SVV = (AQ – BQ) * BC
A	750	800	€100 - €60 = €40	(750 - 800) * €40 = €2,000 U
B	1,250	1,200	€75 - €45 = €30	(1,250 – 1,200) * €30 = €1,500 F
C	2,500	2,000	€50 - €30 = €20	(2,500 – 2,000) * €20 = €10,000 F
				Total SVV = €9,500 F

Broadly, we can say that selling prices were reduced (costing Timekeeper Ltd. €2,000) but that this financial effect was more than offset by the extra contribution from achieving increased sales volumes (€9,500). However, a key limitation of this basic variance analysis is that it gives us little basis for identifying underlying causes and taking action to achieve better performance in future. For example, a SVV potentially arises from a combination of two different effects (a “sales mix” effect and a “sales quantity” effect). Let’s quantify each of these effects separately and then identify what additional insights they provide us with.

Sales mix and quantity variances

Sales mix:

The budget data made the following assumption in relation to the sales mix:

Product A:	800 / 4,000 → 20% of all units sold
Product B:	1,200 / 4,000 → 30% of all units sold
Product C:	2,000 / 4,000 → 50% of all units sold

A sales mix variance (SMV) arises if the actual mix of units sold did not correspond exactly to these budgeted percentages. For example, remember that Timekeeper Ltd. earns more contribution when it sells a unit of Product A (€40) than when it sells a unit of Product C (€20). This is why a change in the sales mix is likely to have a significant financial effect. The sales mix variance is calculated as follows:

Product	Actual quantity in actual mix	Actual quantity [4,500] in BUDGET mix	Budget contribution per unit (BC)	Variance
A	750	20% * 4,500 = 900	€40	(750 - 900) * €40 = €6,000 U
B	1,250	30% * 4,500 = 1,350	€30	(1,250 - 1,350) * €30 = €3,000 U
C	2,500	50% * 4,500 = 2,250	€20	(2,500 - 2,250) * €20 = €5,000 F
	Total = 4,500 units	Total = 4,500 units		SMV = €4,000 U

The unfavourable sales mix effect arises because there has been movement “away from” the higher contribution products (A €40 and B €30) and “towards” the lowest contribution Product C (€20).

Sales quantity:

We also calculate a **sales quantity variance (SQV)**. The purpose of this is to capture the financial effect of the fact that the actual total units sold (4,500) was greater than the budgeted sales units (4,000). This variance is a favourable one in this case since (in principle) more units sold should result in higher total contribution. In performing this calculation, we hold the sales mix constant at its original budget level¹.

Determination of the sales quantity variance (SQV):

- Actual sales quantity (AQ) = 4,500 units.
- Budgeted sales quantity (BQ) = 4,000 units.
- Weighted average contribution (WAC) per unit of product.
= (20% * €40) + (30% * €30) + (50% * €20) = €27.
- Hence: $SQV = (4,500 - 4,000) * €27 = €13,500 \text{ F}$.

Insights and interpretation:

Timekeeper Ltd. needs to ask itself some hard questions about the causes of the €4,000 unfavourable sales mix variance and what steps it can take to prevent its recurrence. For example, price-sensitive customers may have switched from buying Product A to buying Product C instead especially if Timekeeper's marketing efforts did not sufficiently prioritise promotion of Product A (which they should do, since it offers Timekeeper the highest contribution per unit).

It is tempting for marketing staff at Timekeeper Ltd. to claim credit for the €13,500 favourable sales quantity variance, and to argue that this benefit from selling a bigger overall quantity more than outweighs the combined adverse effects of the sales price variance (€2,000 unfavourable) and the sales mix variance (€4,000 unfavourable). But, to determine if this claim stands up to scrutiny, we should carry out one further level of analysis. This consists of analysing the sales quantity variance into two parts: a market share variance (MSHV) and a market size variance (MSZV). This analysis is conducted in the next section.

¹ Of course, the actual sales mix is not the same as the budgeted sales mix, but we have captured the financial effect of this change in mix separately by determining the sales mix variance (SMV).

Market share and market size variances

We have seen in the previous section that there is a favourable sales quantity variance (SQV) of €13,500 which arose because the actual sales quantity (4,500 units) was greater than the budgeted sales quantity variance (4,000 units). However, we should now distinguish between the various possible causes of the SQV. Specifically, a favourable SQV can arise because of (i) successful marketing efforts, resulting in Timekeeper gaining market share from its competitors and/or (ii) an increase in the size of the total market².

To determine market share and market size variances, we need information about the budget and actual market size. Let's assume that we are now told the following:

- When Timekeeper Ltd. was preparing its budget for last month, the company assumed that the total market size would be 20,000 units. Therefore, Timekeeper's budgeted sales (total 4,000 units) amounted to a budgeted market share of $(4,000 / 20,000 = 20\%)$.
- However, the actual size of the market last month was 30,000 units.

Determination of the market share variance (MSHV):

- Actual sales quantity (AQ) = 4,500.
- Standard share of actual market = $20\% * 30,000 = 6,000$.
- Weighted average contribution (WAC) per unit of product [calculated in the previous section] = €27.
- Hence: $MSHV = (4,500 - 6,000) * €27 = €40,500 \text{ U}$

² "Market size" refers to the combined total of all units sold by firms in the industry (i.e., Timekeeper Ltd. and its competitors). If the market size increases then this is typically due to macroeconomic factors (e.g., economic growth) rather than the specific actions of a particular firm.

Determination of the market size variance (MSZV):

- Change in market size = 20,000 VS 30,000 → 10,000 units increase.
- If Timekeeper Ltd. had achieved the 20% market share as budgeted, then this increase in the market size would have resulted in (10,000 * 20% = 2,000) extra sales units for Timekeeper
- Weighted average contribution (WAC) per unit of product [as before] = €27.
- Hence: MSZV = 2,000 * €27 = €54,000 F

Arithmetic check:

Market share variance (€40,500 U)	+	Market size variance (€54,000 F)	=	Sales quantity variance (€13,500 F)
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Conclusion

Timekeeper Ltd. experienced very disappointing outcomes last month. The company (and in particular its marketing staff) must take responsibility for last month's disappointing outcomes and for achieving better outcomes in future.

Specifically, Timekeeper lost market share to competitors (which resulted in a €40,500 decrease in contribution); experienced a reduction in selling prices (giving rise to a €2,000 reduction in contribution); and experienced a shift in demand away from its more profitable Products A and B and towards its least profitable Product C (this mix effect reduced contribution by €4,000). It is true that Timekeeper benefitted greatly from the increase in market size (€10,000 favourable variance) but a market size variance is typically due to factors beyond the individual firm's control – it is a matter of “good luck” and not “good management”.

Timekeeper should take steps to identify the underlying causes of the controllable variances and take corrective action so that more favourable outcomes are achieved in future. For example, it may be that the reduction in market share occurred because Timekeeper's competitors reduced their selling prices to a greater extent than Timekeeper did. If that is the case then Timekeeper should carry out cost-benefit analysis to determine if deeper price cuts are justified in order to regain market share.