

Relevant to the following management accounting papers in the revised CIMA syllabus:

FMAF, IMPM, IDEC

Sales Variances: Time for the hard sell?

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This article on sales variances explains:

- why sales variances are calculated;
- how to calculate sales variances;
- why it is important to identify relationships between products; and
- discusses other issues that must be considered in relation to sales variances.

A business scenario will be used to demonstrate how to calculate and apply sales variances. Please refer to the detailed workings schedule to gain a full appreciation of how to calculate sales variances since this article focuses on the key steps required for each calculation.

Introduction

While sales variances can be calculated for any organisation which sells goods or services, these variances have not played a prominent role in CIMA's recent examinations. The time has come, however, to re-evaluate the use of these variances in view of the increasing awareness of the applicability of these variances for a wide range of business sectors.

General

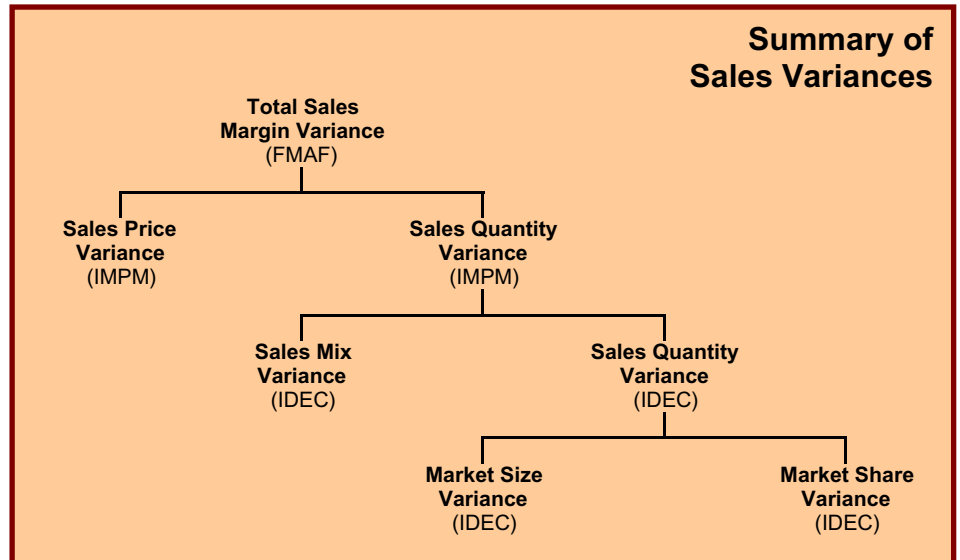
Students must remember that the calculation of variances only represents the first stage of the control cycle, it is necessary to ascertain why variances have occurred then take appropriate action to complete this cycle.

It is also essential to recognise that variances are inter-related, for example price and volume, and it is not possible to understand the significance of particular variances without considering associated variances: quantity and mix, market size and market share.

Bespoke Built Ltd

Bespoke Built Ltd (BBL) makes and distributes a range of golfing products from its factory to golf professionals and retail outlets for resale to the general public:

- Hand-crafted persimmon drivers: Armed & Dangerous (A&D), The Terminator (TT) and Lethal Weapon 1 (LW1).
- BBL headcovers (H) designed to protect the drivers. A recent market survey revealed that 95%+ of the headcovers are sold when the drivers are purchased.



- Shafts (S) and metal heads (MH). These products are used to repair all types of golf clubs.

Budget Data

The following budget data was obtained for BBL's products:

	Qty	Price	Cost
A&D	1,200	£100.00	£63.00
TT	1,800	£110.00	£64.00
LW1	1,400	£120.00	£65.00
H	1,540	£15.00	£9.00
S	1,100	£20.00	£12.00
MH	900	£14.00	£8.00

Actual Data

The following actual data was obtained for BBL's products:

	Qty	Price
A&D	1,285	£99.90
TT	1,777	£110.10
LW1	1,402	£119.80
H	1,664	£15.00
S	1,030	£19.70
MH	942	£14.30

Market Data

Most trade associations collect data from their members and make it available to them on an anonymous basis.

The following data was obtained from the trade association that represents companies which supply golf equipment to retail outlets:

	Budget Qty	Actual Qty
Drivers	80,000	82,500
Headcovers	4,400	4,464
Shafts	22,000	20,000
Metal Heads	18,000	19,000

The budget data is the market data available at the time of setting the budget,

and the actual data is the new data made available at the end of the year.

Total Sales Margin Variance (FMAF)

Total sales margin variance calculates the effect of external market factors, using standard cost, on profitability ie price and sales volume.

$$\begin{aligned} & (\text{Budget sales price} - \text{budget cost}) \\ & \quad \times \text{budget quantity} \\ & \quad \quad \quad \text{Less} \\ & (\text{Actual sales price} - \text{budget cost}) \\ & \quad \times \text{actual quantity} \end{aligned}$$

NB Calculated for each product.

While this variance doesn't provide any insight into product s' performance, particularly for a multiple product company, it must be calculated to provide a complete reconciliation between budget and actual profit.

Sales Price Variance (IMPM)

Sales price variance (SPV) calculates the effect on profitability of the actual selling price being different from budget selling price.

$$\begin{aligned} & (\text{Actual selling price} - \text{budget selling price}) \\ & \quad \times \text{actual quantity} \end{aligned}$$

NB Calculated for each product.

This variance should be considered in relation to sales volume variance since, for example, a below budget selling price may have increased sales.

Sales Volume Variance (IMPM)

Sales volume variance calculates the effect of actual sales volume being different from budget, sales volume using standard profit, on profitability.

Please note that sales price variance takes account of the difference between actual and budget selling prices.

(Budget sales price - budget cost)
x budget quantity
Less
(Budget sales price - budget cost)
x actual quantity

NB Calculated for each product.

While this variance has isolated the effect of volume changes on profit, it still doesn't provide much information about products' performance in the marketplace. Further analysis is consequently required.

Related Products

Prior to considering the other sales variances it is essential to appreciate that these variances must be calculated in relation to products which are sold into the same market to produce a valid analysis. It is consequently important to identify competing and complementary products:

- Competing products are products that are sold by a company to the same market which compete against each other and competitors' products eg A&D, TT and LW1.
- Complementary products are products which are sold as a result of the sales of another product eg BBL headcovers.

Valid information will be obtained for these product relationships since a company will have an expectation of the level of demand for each of its competing products and its "secondary" products.

No valid information would be obtained if these variances are calculated in relation to products sold to different markets since the factors which influence demand and preferences in these markets would be different. For example, no meaningful information would result if these variances were calculated by SAAB for total car and jet fighter sales since cars are sold to the general public and warplanes are sold to governments. Separate sales variances calculations must consequently be made for each of BBL's markets ie drivers, headcovers, shafts and metal heads.

Sales Quantity Variance (IDEC)

The sales quantity variance calculates how much more / less profit would have been made if sales were above / below budget for a competing range of products since it calculates what should have been sold of each product if total actual sales were in line with the budget sales mix %.

The first step is to identify the competing products – A&D, TT and LW1 - and calculate the budget sales mix. for them.

	Qty	Mix
A&D	1,200	27.3%
TT	1,800	40.9%
LW1	1,400	31.8%
Total	4,400	100.0%

The second step is to determine how much of the competing products would have been sold if total actual sales were in line with the budget sales mix

A&D	4464 x 27.3% = 1,217
TT	4464 x 40.9% = 1,826
LW1	4464 x 31.8% = 1,420

The third step is to multiply the differences between expected and budget sales by the budget gross profit margin to determine the sales quantity variance.

A&D	17.5 x £37 = £646
TT	26.2 x £46 = £1,204
LW1	20.4 x £55 = £1,120

The above calculations indicate that an additional £3,406 would have been made if the total sales of the competing products were in line with the budget sales mix.

Separate calculations are made for each of the other products since each is sold to a separate market.

Sales Mix Variance (IDEC)

The method of calculating the sales quantity variance allows the calculation of a sales mix variance ie the effect on profitability of the actual sales mix being different from the budget sales mix . This calculation determines whether or not more / less contribution / gross profit was made by the range of competing products as a consequence of selling relatively more/less of each product.

The first step is to compare actual sales with expected sales ie the figures calculated for the sales quantity variance. Please note that the differences must add up to zero since total sales are the same.

	Actual	Exptd	Diff
A&D	1,285	1,217	+67.5
TT	1,777	1,826	-49.2
LW1	1,402	1,420	-18.4
Total	4,464	4,464	0

The next step is to multiply the differences between actual and expected sales by the budget gross profit margin to determine the sales mix variance.

A&D	+67.5 x £37 = +£2,499
TT	-49.2 x £46 = -£2,262
LW1	-18.4 x £55 = -£1,010

The calculations indicate that a loss of £773 was made as a result of customers purchasing relatively more of the products which have a lower gross profit margin.

Mix variances are not calculated for the other products since they don't have any competing products.

Discussion: Mix and Quantity

Sales quantity and mix variances provide useful information since they give an insight into market movements. For example, if total sales were above budget the sales quantity variance would indicate how much more profit should have been made as a result of increased demand. The sales mix variance would then be calculated to determine which products customers bought relatively more / less of at the

increased level of demand. If customers purchased more of the products that generate lower profit - traded down - an adverse variance would be reported. If customers purchased more of the products which generate higher profits - traded-up - a favourable variance would be reported. The reasons for the variance would then be ascertained and the appropriate action taken:

- amend advertising strategy.
- review pricing policy.
- recognise changing preferences.
- improve / replace / withdraw product.

Market Growth Variance (IDEC)

It is possible to further subdivide sales quantity variance to gain more insight about products' performance if it is possible to obtain reliable market data.

Market growth variance calculates how much more/less profit would have been made if budget market share was maintained.

The first step is to calculate the expected % market share from the budget market data. NB The figure for Drivers is the total budget sales of BBL's drivers; and the potential market for headcovers is the total budget sales of BBL's drivers.

Drivers	4,400 / 80,000 = 5.5%
Headcovers	1,540 / 4,400 = 35.0%
Shafts	1,100 / 22,000 = 5.0%
Metal	900 / 18,000 = 5.0%
Heads	

The next step is to calculate the expected market share in units from the actual market data.

Drivers	82,500 x 5.5% = 4,538
Headcovers	4,464 x 35.0% = 1,562
Shafts	20,000 x 5.0% = 1,000
Metal	19,000 x 5.0% = 950
Heads	

The next step is to multiply the differences between actual and expected sales by the budget gross profit margin to determine the market size variance. NB The profit margin for drivers is a weighted average ie total budget profit for drivers / total budget sales for drivers.

Drivers	+137.5 x £46.41 = -£6,381
Headcovers	+22.4 x £6.00 = £134
Shafts	-100.0 x £8.00 = -£800
Metal	+50.0 x £6.00 = £300
Heads	

The calculations indicate that an additional £6,016 would have been made if budget market share was achieved.

Market Share Variance (IDEC)

The method of calculating the market share variance allows the calculation of a market share variance ie the effect on profitability of actual market share being different from budget market share.

The first step is to compare actual sales with expected sales ie the figures calculated for the market size variance.

	Actual	Exptd	Diff
Drivers	4,464	4,538	-73.5
Headcovers	1,664	1,562	+101.6
Shafts	1,030	1,000	+30.0
Metal Heads	942	950	-8.0

The next step is to multiply the differences between actual and expected sales by the budget gross profit margin to determine the market share variance.

Drivers	-73.5 x £46.41 = -£3,411
Headcovers	+101.6 x £6.00 = £610
Shafts	+30.0 x £8.00 = £240
Metal Heads	-8.0 x £6.00 = -£48

The calculations indicate that a loss of £2,609 was made as a result of not maintaining its market share for all its products ie the adverse variances outweigh the favourable variances.

Sales Variances Bases

Sales variances can be calculated on a number of bases:

- Profit margin.
- Contribution.
- Sales price.

Hongren et al demonstrate sales variances using selling price while Drury uses contribution. So which approach is correct?

While the use of sales price can be justified if the analysis is concerned with evaluating sales performance, companies, at the end of the day, are concerned with profitability. It is consequently better to value these variances using contribution or profit margin to give an indication as to how market movements have affected profitability. So which basis is better: contribution or gross profit? The answer depends on a company's cost structure. If a company has a high level of variable costs and the remainder of its costs are largely fixed over its expected range of activity, then contribution will probably give a satisfactory analysis. On the other hand, if a company has a relatively low level of variable costs and a significant level of semi-fixed costs, gross profit should be used. This is particularly true for a company which sells competing products which absorb different amounts of overheads.

Please note that it is possible using different valuation bases for the same figures to obtain contradictory results eg sales price may produce a favourable mix variance, and profit margin may produce an adverse variance! The appropriate basis must consequently be used to obtain reliable information.

Bespoke Built Ltd

It is often difficult to reach definite conclusions and recommendations from a sales variance analysis since the variances largely reflect the impact of external factors.

That does not mean, however, that such an analysis should not be undertaken. For example, while BBL's total sales margin variance was £2,281 favourable, the detailed analysis produced a different picture.

Budget Profit	£227,640
Sales Price Variance	-£80
Sales Mix Variance	-£773
Market Size Variance	£6,016
Market Share Variance	-£2,609,
Actual Profit	£230,193

The sales variance analysis for BBL revealed the following issues that would be discussed and investigated by the management team:

- Why are customers purchasing relatively more of the drivers that have a lower profit margin?
- Why has BBL sold a higher proportion than expected of headcovers?
- Why has the BBL lost market share in the drivers market?
- Why has the overall market for shafts declined?
- Why has BBL increased its market share in the shafts market which may be a declining market?
- Why has BBL been able to increase the price of metal heads without losing market share?
- Should BBL reconsider its pricing policy in relation to its drivers?

Conclusion

Sales variances can provide a valuable insight into products' performance if they are correctly applied to a company's product range. Product relationships - competing and complimentary products - must be identified to produce a reliable analysis. Failure to identify these relationships will result in misleading information.

While it possible to value sales variances using a number of bases, accountants should always remember that profitability is the key issue for private sector companies. Profit margin or contribution should normally be used to value these variances.

References and Further Reading

Drury, C (2000) *Management and Cost Accounting*, 734 - 738, Thomson Learning 2000
 Horngren et al, *Management and Cost Accounting*, 606 - 613, Prentice Hall Europe

Detailed Workings

Budget	Quantity	Selling Price	Cost	Profit Margin
A & D	1200	£100.00	£63.00	£37.00
T	1800	£110.00	£64.00	£46.00
LW1	1400	£120.00	£65.00	£55.00
Headcover	1540	£15.00	£9.00	£6.00
Shaft	1100	£20.00	£12.00	£8.00
Head	900	£14.00	£8.00	£6.00
	<u>7940</u>			

Actual	Quantity	Selling Price
A & D	1285	£99.90
T	1777	£110.20
LW1	1402	£119.80
Headcover	1664	£15.00
Shaft	1030	£19.70
Head	942	£14.30
	<u>8100</u>	

Market Data	Budget Qty	Actual Qty
Drivers	80000	82500
Headcover	4400	4464
Shafts	22000	20000
Heads	18000	19000

Total Sales Margin Variance	Budget	Actual	Variance
A & D	£44,400	£47,417	£3,017
T	£82,800	£82,097	-£703
LW1	£77,000	£76,830	-£170
Headcover	£9,240	£9,984	£744
Shaft	£8,800	£7,931	-£869
Head	£5,400	£5,935	£535
	<u>£227,640</u>	<u>£230,193</u>	<u>£2,553</u>

Sales Price Variance	Actual Price	Budget Price	Difference	Actual Qty	Variance
A & D	£99.90	£100.00	-£0.10	1285	-£128
T	£110.20	£110.00	£0.20	1777	£355
LW1	£119.80	£120.00	-£0.20	1402	-£280
Headcover	£15.00	£15.00	£0.00	1664	£0
Shaft	£19.70	£20.00	-£0.30	1030	-£309
Head	£14.30	£14.00	£0.30	942	£283
					<u>-£80</u>

Detailed Workings

Sales Volume Variance	Budget	Actual	Variance
A & D	£44,400	£47,545	£3,145
T	£82,800	£81,742	-£1,058
LW1	£77,000	£77,110	£110
Headcover	£9,240	£9,984	£744
Shaft	£8,800	£8,240	-£560
Head	£5,400	£5,652	£252
	<u>£227,640</u>	<u>£230,273</u>	<u>£2,633</u>

Sales Quantity Variance	Budget Sales Mix	Expected Sales (Qty)	Budget Sales (Qty)	Difference (Qty)	Profit Margin	Variance
A & D	27.3%	1217	1200	17.5	£37.00	£646
T	40.9%	1826	1800	26.2	£46.00	£1,204
LW1	31.8%	1420	1400	20.4	£55.00	£1,120
		<u>4464</u>	<u>4400</u>	<u>64.0</u>		<u>£2,970</u>
Headcover						£744
Shaft						-£560
Head						£252
						<u>£3,406</u>

Sales Mix Variance	Actual Sales (Qty)	Expected Sales (Qty)	Difference (Qty)	Profit Margin	Variance
A & D	1285	1217	67.5	£37.00	£2,499
T	1777	1826	-49.2	£46.00	-£2,262
LW1	1402	1420	-18.4	£55.00	-£1,010
	<u>4464</u>	<u>4464</u>	<u>0.0</u>		<u>-£773</u>

Market Size Variance	Actual Qty	Budget Sales Mix	Expected Qty	Budget Qty	Difference Qty	Profit Margin	Variance
Drivers	82500	5.50%	4538	4400	137.5	£46.41	£6,381
Headcover	4464	35.00%	1562	1540	22.4	£6.00	£134
Shafts	20000	5.00%	1000	1100	-100.0	£8.00	-£800
Heads	19000	5.00%	950	900	50.0	£6.00	£300
							<u>£6,016</u>

Market Share Variance	Actual Qty	Expected Qty	Difference Qty	Profit Margin	Variance
Drivers	4464	4538	-73.5	£46.41	-£3,411
Headcover	1664	1562	101.6	£6.00	£610
Shafts	1030	1000	30.0	£8.00	£240
Heads	942	950	-8.0	£6.00	-£48
					<u>-£2,609</u>