Lecture 3: Exercises

17.13   Variance analysis of revenues, multiple products

The Antwerp Lions play in the Flemish Football League. The Lions play in the Antwerp Stadium (owned and managed by the City of Antwerp), which has a capacity of 30 000 seats (10 000 lower-tier seats and 20 000 upper-tier seats). The Antwerp Stadium charges the Lions a per-ticket charge for use of their facility. All tickets are sold by the Reservation Network, which charges the Lions a reservation fee per ticket. The Lions budgeted net revenue for each type of ticket in 2004 is calculated as follows:

	Lower-tier tickets	Upper-tier tickets
Selling price	€35	€14
Antwerp Stadium fee	10	6
Reservation Network fee	5	3
Net revenue per ticket	20	5

The budgeted and actual average attendance figures per game in the 2004 season are:

	Budgeted seats sold	Actual seats sold
Lower tier	8 000	6 600
Upper tier	12 000	15 400
Total	20 000	22 000

There was no difference between the budgeted and actual net revenue for lower-tier or upper-tier seats.

The manager of the Lions was delighted that actual attendance was 10% above budgeted attendance per game, especially given the depressed state of the local economy in the past six months.

Required:

1.   Calculate the sales-volume variance for individual 'product' net revenues and total net revenues for the Antwerp Lions in 2004.
2.   Calculate the sales-quantity and sales-mix variances for individual 'product' net revenues and total net revenues in 2004.
3.   Present a summary of the variances in requirements 1 and 2. Comment on the results.

Suggested Solution

1

$$\begin{array}{l} \text{Sales – volume} \\ \text{variance} \\ \text{of revenue} \end{array} = \left(\frac{\text{Actual sales}}{\text{Quantity in units}} - \frac{\text{Budgeted sales}}{\text{Quantity in units}} \right) \times \begin{array}{l} \text{Budget net} \\ \text{revenue per ticket} \end{array}$$

Lower tier tickets	=	(6,600 − 8,000) × €20 =	€28,000U
Upper tier tickets	=	(15,400 − 12,000) × €5 =	€17,000F
All tickets			€11,000U

2

$$\text{Budgeted average net revenue per ticket} = \frac{(8,000 \times €20) + (12,000 \times €5)}{20,000}$$

$$= \frac{€160,000 + €60,000}{20,000} = \frac{€220,000}{20,000}$$

$$\mathbf{=} \quad \mathbf{€}11 \text{ per unit (seat sold)}$$

Sales-mix percentages:

	Budgeted	Actual
Lower tier	$\dfrac{8,000}{20,000} = 0.40$	$\dfrac{6,600}{22,000} = 0.30$
Upper tier	$\dfrac{12,000}{20,000} = 0.40$	$\dfrac{15,400}{22,000} = 0.70$

Solution Exhibit 17.13 presents the sales-volume, sales-quantity and sales-mix variances for lower tier tickets, upper tier tickets and in total for Antwerp Lions in 2011.

The sales-quantity variances can also be calculated as:

$$\begin{array}{c}\text{Sales-quantity}\\ \text{variance}\\ \text{of revenues}\end{array} = \left| \begin{array}{c}\text{Actual units of}\\ \text{all tickets sold}\end{array} - \begin{array}{c}\text{Budgeted units of}\\ \text{all tickets sold}\end{array} \right| \times \begin{array}{c}\text{Budgeted}\\ \text{sales-mix}\\ \text{percentage}\end{array}$$

$$\times \begin{array}{c}\text{Budgeted}\\ \text{net revenue}\\ \text{per ticket}\end{array}$$

The sales-mix variance can also be calculated as:

Lower tier tickets	=	(22,000 − 20,000) × 0.40 × €20	=	€16,000F
Upper tier tickets	=	(22,000 − 20,000) × 0.60 × €5	=	€6,000F
All tickets				€22,000U

The sales-mix variance can further be calculated as:

$$\begin{array}{c}\text{Sales-quantity}\\ \text{variance}\\ \text{of revenues}\end{array} = \left| \begin{array}{c}\text{Actual units of}\\ \text{all tickets sold}\end{array} - \begin{array}{c}\text{Actual sales-mix}\\ \text{percentage}\end{array} \right| \times \begin{array}{c}\text{Budgeted}\\ \text{sales-mix}\\ \text{percentage}\end{array}$$

$$\times \begin{array}{c}\text{Budgeted}\\ \text{net revenue}\\ \text{per ticket}\end{array}$$

The sales-mix variance can also be calculated as:

Lower tier tickets	=	22,000 × (0.30 − 0.40)	=	€44,000U

Upper tier tickets = 22,000 × (0.70 – 0.60) = €11,000F
All tickets €33,000U

3 The Antwerp Lions increased average attendance by 10% per game. However, there was a sizeable shift from lower tier seats (budgeted net revenue of €20 per seat) to upper tier seats (budgeted net revenue of €5 per seat). The net result: the actual revenue was €11,000 below the budgeted net revenue.

Solution Exhibit 17.13

Columnar presentation of sales-volume, sales-quantity and sales-mix variances for Antwerp lions

	Flexible budget (Actual units of all tickets sold x Actual sales mix) x Budgeted Unit net revenue (1)	(Actual units of all tickets sold x Budgeted sales mix) x Budgeted unit net revenue (2)	Static budget (Budgeted units of all tickets sold x Budgeted sales mix) x Budgeted unit net revenue (3)
Panel A: Lower tier	(22,000 x 0.30^a) x €20 = 6,600 x €20 = €132,000	(22,000 x 0.40^b) x €20 = 8,800 x €20 = €176,000	(20,000 x 0.40^b) x €20 = 8,000 x €20 = €160,000

$\cdot$ _____ €44,000 U _____ $\cdot$ _____ €16,000 F _____ $\cdot$
Sales-mix variance   Sales quantity variance
$\cdot$ _____ €28,000 U _____ $\cdot$
Sales-volume variance

Panel B: Upper tier	(22,000 x 0.70^c) x €20 = 15,400 x €5 = €77,000	(22,000 x 0.60^d) x €20 = 13,200 x €5 = €66,000	(20,000 x 0.60^d) x €5 = 12,000 x €20 = €60,000 €132,000

$\cdot$ _____ €11,000 F _____ $\cdot$ _____ €6,000 F _____ $\cdot$
Sales-mix variance   Sales-quantity variance
$\cdot$ _____ €17,000 F _____ $\cdot$
Sales-volume variance

Panel C: All tickets	€209,000^e	€242,000^f	€220,000^g

$\cdot$ _____ €33,000 U _____ $\cdot$ _____ €22,000 F $\cdot$
Sales-mix variance   Sales-quantity variance
$\cdot$ _____ €11,000 U _____ $\cdot$
Sales-volume variance

Note that F = favourable effect on operating profit; U = unfavourable effect on operating profit.

Actual sales mix: Budgeted sales mix:
^{a}Lower tier = 6,600 ÷ 22,000 = 30% ^{b}Lower tier = 8,000 ÷ 20,000 = 40%
^{c}Upper tier = 15,400 ÷ 22,000 = 70% ^{d}Upper tier = 12,000 ÷ 20,000 = 60%
^{e}€132,000 + €77,000 = €209,000 ^{f}€176,000 + €66,000 = €242,000
^{g}€160,000 + €60,000 = €220,000