2. Planning and budgetary control systems

2.2 Static budgets and flexible budgets & Variance analysis
Introduction

- Flexible budgets and variances help managers gain insights into why the actual results differ from the planned performance.
- This chapter focuses on the difference of static and flexible budgets and how budgets – specifically flexible budgets – can be used to evaluate feedback on variances and aid managers in their control function.
Learning Objectives

1. Describe the difference between a static budget and a flexible budget
2. Illustrate how a flexible budget can be developed and calculate flexible-budget and sales-volume variances
3. Interpret the price and efficiency variances for direct-cost input categories
Learning Objectives (Continued)

4. Explain why purchasing–performance measures should focus on more factors than just price variances for inputs

5. Describe benchmarking and how it can be used by managers in variance analysis
Learning Objective 1

Describe the difference between a static budget and a flexible budget
A static budget is a budget prepared for only one level of activity. It is based on the level of output planned at the start of the budget period. The master budget is an example of a static budget.
A flexible budget is developed using budgeted revenues or cost amounts based on the level of output actually achieved in the budget period.

A key difference between a *flexible budget* and a *static budget* is the use of the actual output level in the flexible budget.
Assume that LSY manufactures and sells dress suits.

Budgeted variable costs per suit are as follows:

- Direct materials cost: €65
- Direct manufacturing labour: 26
- Variable manufacturing overhead: 24
- Total variable costs: €115
Static Budget (Continued)

- Budgeted selling price is €155 per suit.
- Fixed manufacturing costs are expected to be €286,000 within a relevant range between 9,000 and 13,500 suits.
- Variable and fixed *period costs* are ignored in this example.
- The static budget for the year 2000 is based on selling 13,000 suits.
- What is the static-budget operating profit?
Static Budget (Continued)

- Revenues (13,000 × €155) €2,015,000
  
  Less Expenses:
  
  Variable (13,000 × €115) 1,495,000
  Fixed 286,000
  Budgeted operating profit €234,000

- Assume that LSY produced and sold 10,000 suits at €160 each with actual variable costs of €120 per suit and fixed manufacturing costs of €300,000.
What was the actual operating profit?

Revenues (10,000 \times €160) \quad €1,600,000

Less Expenses:
Variable (10,000 \times €120) \quad 1,200,000
Fixed \quad 300,000

Actual operating profit \quad €100,000
Static-Budget Variance

- A static-budget variance is the difference between an actual result and a budgeted amount in the static budget.
- Level 0 analysis compares actual operating profit with budgeted operating profit.
- Level 1 analysis provides more detailed information on the operating profit static-budget variance.
Static-Budget Variance (Continued)

- What is the static-budget variance of operating profit?
  - Actual operating profit: €100,000
  - Budgeted operating profit: 234,000
  - Static-budget variance of operating profit: €134,000 U

- This is a Level 0 variance analysis.
### Static Budget Based Variance Analysis

(***Level 1 in (000)***)

<table>
<thead>
<tr>
<th></th>
<th>Static Budget</th>
<th>Actual Results</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suits</td>
<td>13</td>
<td>10</td>
<td>3 U</td>
</tr>
<tr>
<td>Revenue</td>
<td>€2,015</td>
<td>€1,600</td>
<td>€415 U</td>
</tr>
<tr>
<td>Variable costs</td>
<td>1,495</td>
<td>1,200</td>
<td>296 F</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>€520</td>
<td>€400</td>
<td>€120 U</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>286</td>
<td>300</td>
<td>14 U</td>
</tr>
<tr>
<td>Operating profit</td>
<td>€234</td>
<td>€100</td>
<td>€134 U</td>
</tr>
</tbody>
</table>

Static-Budget Variance (Continued)

- A favourable variance is a variance that increases operating profit relative to the budgeted amount.
- An unfavourable variance is a variance that decreases operating profit relative to the budgeted amount.
A favourable variance for revenue items means that actual revenues exceeded budgeted revenues.

A favourable variance for cost items means that actual costs were less than budgeted costs.
Learning Objective 2

Illustrate how a flexible budget can be developed and calculate flexible-budget and sales-volume variances
Steps in Developing Flexible Budgets

- **Step 1**: Determine budgeted selling price, budgeted variable cost per unit and budgeted fixed cost.

- The budgeted selling price is €155, the budgeted variable cost is €115 per suit and the budgeted fixed cost is €286,000.
Step 2: Determine the actual quantity of output.

10,000 suits were produced and sold in the year 2000.

Step 3: Determine the flexible budget for revenues based on budgeted selling price and actual quantity of output.

\[ \text{€155} \times 10,000 = \text{€1,550,000} \]
Step 4: Determine the flexible budget for costs based on budgeted variable costs per output unit, actual quantity of output and the budgeted fixed costs.

Flexible budget:
- Variable costs \((10,000 \times €115)\) €1,150,000
- Fixed costs 286,000
- Total costs €1,436,000
Variances

- Level 2 analysis provides information on the two components of the static-budget variance.
  1. Flexible-budget variance
  2. Sales-volume variance
## Flexible-Budget Variance

### Flexible-Budget Variance

**(Level 2) in (000)**

<table>
<thead>
<tr>
<th></th>
<th>Flexible Budget</th>
<th>Actual Results</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suits</td>
<td>10</td>
<td>10</td>
<td>0 U</td>
</tr>
<tr>
<td>Revenue</td>
<td>€1,550</td>
<td>€1,600</td>
<td>€50 F</td>
</tr>
<tr>
<td>Variable costs</td>
<td>1,150</td>
<td>1,200</td>
<td>50 U</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>€400</td>
<td>€400</td>
<td>€0 U</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>286</td>
<td>300</td>
<td>14 U</td>
</tr>
<tr>
<td>Operating profit</td>
<td>€114</td>
<td>€100</td>
<td>€14 U</td>
</tr>
</tbody>
</table>

Flexible-Budget Variance (Continued)

- Actual quantity sold: 10,000 suits

<table>
<thead>
<tr>
<th>Flexible-budget variance</th>
<th>Actual results operating profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>€14,000 U</td>
<td>€100,000</td>
</tr>
</tbody>
</table>

Flexible-budget operating profit
€114,000
The flexible-budget variance arises because the actual selling price, variable costs per unit, quantities and fixed costs differ from the budgeted amount.

- **Selling Price**
  - Actual: €160
  - Budgeted: €155

- **Variable cost**
  - Actual: €120
  - Budgeted: €115

Flexible-Budget Variance
(Continued)

- The flexible-budget variance pertaining to revenues is often called a **selling-price variance** because it arises solely from differences between the actual selling price and the budgeted selling price.

- Selling-price variance = \((€160 - €155) \times 10,000 = €50,000\) F.

- Actual selling price exceeds the budgeted amount by €5.
Flexible-Budget Variance
(Continued)

- Why is the flexible-budget variance €14,000 unfavourable?
- Selling-price variance €50,000 F
  Actual variable costs exceeded flexible budget variable costs 50,000 U
  Actual fixed costs exceeded flexible budget fixed costs 14,000 U
- Total flexible-budget variance €14,000 U
Sales-Volume Variance

- The sales-volume variance is the difference between the static budget for the number of units expected to be sold and the flexible budget for the number of units that were actually sold.

- The only difference between the static budget and the flexible budget is the output level upon which the budget is based.
Sales-Volume Variance (Continued)

<table>
<thead>
<tr>
<th>Sales-Volume Variance (Level 2) in (000)</th>
<th>Flexible Budget</th>
<th>Static Budget</th>
<th>Sales-Volume Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suits</td>
<td>10</td>
<td>13</td>
<td>3 U</td>
</tr>
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<td>€1,550</td>
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<td>€465 U</td>
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<td>1,150</td>
<td>1,495</td>
<td>295 F</td>
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<tr>
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<td>€400</td>
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<td>€120 U</td>
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<tr>
<td>Fixed costs</td>
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<tr>
<td>Operating profit</td>
<td>€114</td>
<td>€234</td>
<td>€120 U</td>
</tr>
</tbody>
</table>

Sales-Volume Variance (Continued)

- Actual quantity sold: 10,000 suits

<table>
<thead>
<tr>
<th>Sales-volume variance</th>
<th>Flexible-budget operating profit</th>
<th>Static-budget operating profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>€120,000 U</td>
<td>€114,000</td>
<td>€234,000</td>
</tr>
</tbody>
</table>
Sales-Volume Variance (Continued)

- Why is the sales-budget variance €120,000 unfavourable?
- Static budget units 13,000
  Actual units sold 10,000
  Variance 3,000 U

- Budgeted contribution margin per unit:
  $(€155 - €115) = €40$

- $3,000 \times €40 = €120,000$ unfavourable variance
Budget Variances

Level 1

Static-budget variance
€134,000 U

Level 2

Flexible-budget variance
€14,000 U

Sales-volume variance
€120,000 U
Learning Objective 3

Interpret the price and efficiency variances for direct-cost input categories
Level 3 analysis separates the flexible-budget variance into price and efficiency variances.

The following relates to LSY:

Direct materials purchased and used: 42,500 square metres

Actual price paid per metres: €15.95
Price and Efficiency Variances (Continued)

- Actual direct manufacturing labour-hours: 21,500
- Actual price paid per hour: €12.90
- What is the actual cost of direct materials?
  - $42,500 \times €15.95 = €677,875$
- What is the actual cost of direct manufacturing labour?
  - $21,500 \times €12.90 = €277,350$
Price Variances

- A price variance is the difference between the actual price and the budgeted price of inputs multiplied by the actual quantity of inputs.
  - Input-price variance
  - Rate variance
- Price variance = (Actual price of inputs – Budgeted price of inputs) × Actual quantity of inputs.
Price Variances (Continued)

- What is the price variance for direct materials?
  - $(€15.95 - €16.25) \times 42,500 = €12,750 \text{ F}$

- What is the price variance for direct manufacturing labour?
  - $(€12.90 - €13.00) \times 21,500 = €2,150 \text{ F}$
Price Variances (Continued)

Actual Quantity of Inputs at Actual Price
42,500 \times €15.95 = €677,875

Actual Quantity of Inputs at Budgeted Price
42,500 \times €16.25 = €690,625

\[ \text{€12,750 F} \]

Materials price variance
Price Variances (Continued)

Actual Quantity of Inputs at Actual Price
21,500 × €12.90
= €277,350

Actual Quantity of Inputs at Budgeted Price
21,500 × €13.00
= €279,500

€2,150 F
Labour price variance
Price Variances (Continued)

- What is the journal entry when the materials price variance is isolated at the time of purchase?
  
  - Materials Control 690,625
    - Direct Materials Price Variance 12,750
    - Accounts Payable Control 677,875

  To record direct materials purchased.
Price Variances (Continued)

- What may be some of the possible causes for LSY’s favourable price variances?
  - LSY’s purchasing manager negotiated more skilfully than was planned.
  - Labour prices were set without careful analysis of the market.
Efficiency Variances

- The efficiency variance is the difference between the actual and budgeted quantity of inputs used multiplied by the budgeted price of input.

- Efficiency variance = (Actual quantity of inputs used – Budgeted quantity of inputs allowed for actual output) × Budgeted price of inputs.
Efficiency Variances (Continued)

- What is the efficiency variance for direct materials?
  
  \[(42,500 - 40,000) \times \€16.25 = \€40,625 \text{ U}\]

- What is the efficiency variance for direct manufacturing labour?
  
  \[(21,500 - 20,000) \times \€13.00 = \€19,500 \text{ U}\]
Efficiency Variances (Continued)

Actual Quantity of Inputs at Budgeted Price

\[ 42,500 \times €16.25 = €690,625 \]

Budgeted Quantity Allowed for Actual Outputs at Budgeted Price

\[ 40,000 \times €16.25 = €650,000 \]

\[ €40,625 \text{ U} \]

Materials efficiency variance
Efficiency Variances (Continued)

Actual Quantity
of Inputs at
Budgeted Price
21,500 \times \€13.00 = \€279,500

Budgeted Quantity
Allowed for Actual
Outputs at Budgeted Price
20,000 \times \€13.00 = \€260,000

\€19,500 \text{ U}
Labour efficiency variance
Efficiency Variances (Continued)

What is the journal entry to record materials used?

Work-in-Progress Control  650,000
Direct Materials Efficiency Variance  40,625
Materials Control  690,625

To record direct materials used.
Efficiency Variances (Continued)

- What may be some of the causes for LSY’s unfavourable efficiency variances?
  - LSY’s purchasing manager received lower quality of materials.
  - The personnel manager hired under-skilled workers.
  - The maintenance department did not properly maintain machines.
Price and Efficiency Variances

- What is the journal entry for direct manufacturing labour?

- Work-in-Progress Control 260,000
  Direct Manufacturing Labour
  Efficiency Variance 19,500
  Direct Manufacturing Labour Price Variance 2,150
  Wages Payable 277,350

To record liability for direct manufacturing labour.
Price and Efficiency Variances (Continued)

- What is the flexible-budget variance for direct materials?
  - Materials-price variance €12,750 F + Materials-efficiency variance €40,625 U = €27,875 U

- What is the flexible-budget variance for direct manufacturing labour?
  - Labour-price variance €2,150 F + Labour-efficiency variance €19,500 U = €17,350 U
### Variance Analysis for Direct Materials Costs

<table>
<thead>
<tr>
<th></th>
<th>Direct Materials Actual Costs</th>
<th>Direct Materials Static Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>42,500 × €15.95</strong></td>
<td><strong>€677,875</strong></td>
<td><strong>13,000 × 4 × €16.25</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>€845,000</strong></td>
</tr>
</tbody>
</table>

\[ \text{Static-budget variance for direct materials} = \text{€167,125 F} \]

(costs less)
Variance Analysis for Direct Materials Costs (Continued)

Direct Materials
Actual Costs
42,500 × €15.95
€677,875

Flexible Budget
40,000 × €16.25
€650,000

€27,875 U
Flexible-budget variance for direct materials (costs more)
Variance Analysis for Direct Labour Costs

- What is the static-budget variance for direct labour?

- Static-budget labour cost: 13,000 suits × 2 hours/suit × €13.00/hour = €338,000

- Actual labour cost:
  21,500 hours × €12.90/hour = €277,350

- Variance = €338,000 − €277,350 = €60,650 F
Variance Analysis for Direct Labour Costs (Continued)

Direct Labour
Actual Costs
21,500 × €12.90
€277,350

Direct Labour
Static Budget
13,000 × 2 × €13.00
€338,000

€60,650 F
Static-budget variance for direct labour (costs less)
What is the sales-volume variance for direct labour?

- Static-budget labour cost: 13,000 suits × 2 hours/suit × €13.00/hour = €338,000

- Flexible-budget cost for direct labour: 10,000 suits × 2 hours/suit × €13.00/hour = €260,000

- Variance = €338,000 − €260,000 = €78,000 F
Variance Analysis for Direct Labour Costs (Continued)

<table>
<thead>
<tr>
<th></th>
<th>Flexible Budget</th>
<th>Static Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Labour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales-volume variance for direct labour (costs less)</td>
<td>€78,000 F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10,000 × 2 × €13.00</td>
<td>13,000 × 2 × €13.00</td>
</tr>
<tr>
<td></td>
<td>€260,000</td>
<td>€338,000</td>
</tr>
</tbody>
</table>

What is the flexible-budget variance for direct manufacturing labour?

- Actual labour cost €277,350 – Flexible-budget cost €260,000 = €17,350 U
## Variance Analysis for Direct Labour Costs (Continued)

<table>
<thead>
<tr>
<th>Direct Labour</th>
<th>Direct Labour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Costs</td>
<td>Flexible Budget</td>
</tr>
<tr>
<td>21,500 × €12.90</td>
<td>10,000 × 2 × €13.00</td>
</tr>
<tr>
<td>€277,350</td>
<td>€260,000</td>
</tr>
</tbody>
</table>

**Flexible-budget variance for direct labour (costs more)**

€17,350 U
## Variance Analysis

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Static-budget variance</th>
<th>Flexible-budget variance</th>
<th>Sales-volume variance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Materials</strong></td>
<td>€167,125 F</td>
<td>€27,875 U</td>
<td>€195,000 F</td>
</tr>
<tr>
<td><strong>Labour</strong></td>
<td>60,650 F</td>
<td>17,350 U</td>
<td>78,000 F</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>€227,775 F</td>
<td>€45,225 U</td>
<td>€273,000 F</td>
</tr>
</tbody>
</table>

### Variance Analysis (Continued)

<table>
<thead>
<tr>
<th>Level 2</th>
<th>Flexible-budget variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td>€27,875 U</td>
</tr>
<tr>
<td>Labour</td>
<td>17,350 U</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>€45,225 U</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 3</th>
<th>Price variance</th>
<th>Efficiency variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td>€12,750 F</td>
<td>€40,625 U</td>
</tr>
<tr>
<td>Labour</td>
<td>2,150 F</td>
<td>19,500 U</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>€14,900 F</strong></td>
<td><strong>€60,125 U</strong></td>
</tr>
</tbody>
</table>
Learning Objective 4

Explain why purchasing-performance measures should focus on more factors than just price variances for inputs.
Performance Measurement
Using Variances

- A key use of variance analysis is in performance evaluation.
- Two attributes of performance are commonly measured:
  1. Effectiveness
  2. Efficiency.
Effectiveness is the degree to which a predetermined objective or target is met.

Efficiency is the relative amount of inputs used to achieve a given level of output.

Variances should not solely be used to evaluate performance.
If any single performance measure, such as a labour efficiency variance, receives excessive emphasis, managers tend to make decisions that maximise their own reported performance in terms of that single performance measure.
Multiple Causes of Variances

- Often the causes of variances are interrelated.
- A favourable price variance might be due to lower quality materials.
- It is best to always consider possible interdependencies among variances and to not interpret variances in isolation of each other.
When to Investigate Variances

- When should variances be investigated?

- Frequently, managers base their answer on subjective judgements.

- For critical items, a small variable may prompt follow-up.

- For other items, a minimum monetary variance or a certain percentage of variance from budget may prompt an investigation.
Learning Objective 5

Describe benchmarking and how it can be used by managers in variance analysis
Benchmarking refers to the continuous process of measuring products, services and activities against the best levels of performance.

- The best levels of performance are often found in competing organisations or in other organisations having similar processes.
- Companies should ensure that the benchmark numbers are comparable.
Benchmarking (Continued)

Benchmarking facilitates companies using the best levels of performance within their organisation, in competitor organisations or at other non-competitor organisations to gauge the performance of their own managers.
End of Chapter 2.2