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|  | **Flexible Budgets, Overhead Cost****Variances, and Management Control** |
|  |  |

**Transition Notes**

The five-step decision process is incorporated into this chapter as management faces decisions that must be made based upon the overhead variances. The discussion of overhead variances is streamlined making the discussion more readable. The end-of-chapter problem material has undergone significant revisions, with a number of new problems.

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| --- |
| **Problem Material** **Correlation Chart** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **15th** **Edition** | **14th** **Edition** |  | **15th** **Edition** | **14th** **Edition** |
|  | 16 | 16 |  | 30 | 30 Revised |
|  | 17 | 17 |  | 31 | 31 Revised |
|  | 18 | 18 |  | 32 | 32 Revised |
|  | 19 | 19 |  | 33 | 33 Revised |
|  | 20 | 20 Revised |  | 34  | 34 Revised |
|  | 21 | 21  |  | 35  | 35 Revised |
|  | 22 | 22  |  | 36  | 36 Revised |
|  | 23 | 23  |  | 37  | 37 Revised |
|  | 24 | 24 Revised |  | 38  | 38 Revised |
|  | 25 | 25 Revised |  | 39 | 39 Revised |
|  | 26 | 26 Revised |  | 40 | 40 Revised |
|  | 27 | 27 Revised |  | 41  | 41 Revised |
|  | 28  | 28 Revised |  | 42  | 42 Revised |
|  | 29 | 29 Revised |  | 43 New |  |

**I. LEARNING OBJECTIVES**

1. Explain the similarities and differences in planning variable overhead costs and fixed overhead costs.
2. Develop budgeted variable overhead cost rates and budgeted fixed overhead cost rates.
3. Compute the variable overhead flexible-budget variance, the variable overhead efficiency variance, and the variable overhead spending variance.
4. Compute the fixed overhead flexible-budget variance, the fixed overhead spending variance, and the fixed overhead production-volume variance.
5. Show how the 4-variance analysis approach reconciles the actual overhead incurred with the overhead amounts allocated during the period.
6. Explain the relationship between the sales-volume variance and the production-volume variance.
7. Calculate overhead variances in activity-based costing.
8. Examine the use of overhead variances in nonmanufacturing settings.
9. **CHAPTER SYNOPSIS**

The previous chapter focused on analysis of direct manufacturing costs. This chapter moves into planning and variance analysis of variable and fixed manufacturing overhead. Development of budgeted overhead cost rates is covered. Variable overhead spending and efficiency variance are presented, followed by fixed overhead spending and production-volume variances. A 4-way variance analysis is presented, along with the application of variance analysis in nonmanufacturing and service sectors. Finally, application of variance analysis in an ABC system is presented.

**III. Points of Emphasis**

1. Developing budgeted variable overhead cost rates is critical to effectively managing overhead and conducting performance evaluation. Emphasize to the students that a “good” overhead rate using a valid cost driver is the foundation of effective overhead cost allocation.
2. Make sure the students understand the reasons and the potential problems associated with expressing fixed costs on a per-unit basis. Students often fall into the trap of using the same fixed cost per unit when volume changes.
3. Presentation of the 4-way, 3-way, 2-way, and 1-way variance analysis can help the students see how these variances are related to one another. It is also an opportunity to demonstrate that different levels of management need different levels of detail in the reporting system.

**IV. CHAPTER OUTLINE**

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| --- | --- |
| **LEARNING** **OBJECTIVE** | 1 |
| Explain the similarities and differences in planning variable overhead costs and fixed overhead costs… for both, plan only essential activities and be efficient; fixed overhead costs are usually determined well before the budget period begins |
|  |

* 1. Managing overhead costs is challenging. Managers must understand the behavior of overhead costs, plan for them, perform variance analysis, and act upon the results.
	2. In planning **variable overhead costs,** managers must focus attention on activities that create a superior product or service and eliminate activities that do not add value.
	3. Examining how each item of variable overhead relates to delivering a superior product or service is part of this process.
	4. Effective planning for **fixed overhead costs** is similar to planning for variable overhead costs—focusing on eliminating the non-value-added costs.
	5. An additional strategic issue for managers in fixed costs is choosing the appropriate level of capacity that will benefit the company in the long run.
	6. Timing is an important issue in this planning. By the beginning of the budget period most decisions regarding fixed costs will have been made. With variable costs, day-to-day operating decisions affect the level of variable costs incurred in the period.

Teaching point. This is a good time to emphasize that fixed costs provide capacity. As such, the level of fixed costs must be determined well in advance of the budget period and those costs are frequently locked in for an extended time period. Thus this decision-making process can have a long-term effect on company profitability. Check recent business news articles for companies that have downsized, taking large losses while reducing capacity.

**Refer to Quiz Question 1**

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| **LEARNING** **OBJECTIVE** | 2 |
| Develop budgeted variable overhead cost rates… budgeted variable costs divided by quantity of cost-allocation baseand fixed overhead cost rates… budgeted fixed costs divided by quantity of cost-allocation base |
|  |

2.1 **Standard costing** is a costing system that traces direct costs to output by multiplying standard prices or rates of inputs allowed for actual outputs produced and allocates overhead costs based on standard overhead cost rates times the standard quantities of the allocation bases allowed for the actual outputs produced.

2.2 Developing budgeted variable overhead cost-allocation rates is a four-step process. On the basis of standard quantities of inputs for actual outputs provided.

Teaching point. This process will become much clearer to the student if an example is used to work through the process of developing these cost rates. The Webb Company example in the text can be utilized.

**Step 1:** **Choose the Period to Be Used for the Budget.** Normally companies will use a 12-month period for budgeting, but a shorter time frame may be appropriate in given situations.

**Step 2:** **Select the Cost-Allocation Bases to Use in Allocating Variable Overhead Costs to Output Produced.** In selecting the cost-allocation bases, management is seeking a cause-and-effect relationship between the cost and the base, or cost driver.

**Step 3:** **Identify the Variable Overhead Costs Associated with Each Cost-Allocation Base.**

Teaching point. Identifying the cost-allocation bases and the costs associated with those bases are not necessarily sequential steps. The two frequently interact with each other as additional costs or drivers are identified and defined. The number of allocation bases and cost pools will vary depending on the system utilized by the company. With an activity-based system, there will be several drivers and cost pools.

**Step 4:** **Compute the Rate per Unit of Each Cost-Allocation Base Used to Allocate Variable Overhead Costs to Output Produced.**

2.3 Fixed overhead costs are, by definition, a lump sum of costs that remain unchanged in total for a given period despite wide changes in the level of activity.

2.4 These costs are fixed in the sense that they do not automatically increase or decrease with the level of activity within the relevant range.

Teaching point. Discuss unitized fixed costs. Emphasize that fixed costs are expressed on a per-unit basis to facilitate assigning a unit cost to the product or service. Illustrate that a change in the level of activity changes the per-unit cost of the fixed amount, not the total fixed cost.

2.5 As with variable costs, there is a four-step procedure for developing the budget fixed overhead rate.

**Step 1:** **Choose the Period to Use for the Budget.** As with variable costs, this budget period is usually 12 months.

**Step 2:** **Select the Cost-Allocation Bases to Use in Allocating Fixed Overhead Costs to Output Produced.** The cost driver, or allocation base, is also referred to as the **denominator level** as it is the denominator in the fixed overhead rate computation.

Teaching point. Due to the nature of fixed costs it is not always feasible or possible to find a cause-and-effect relationship between the level of activity and the costs incurred. Therefore, even in a well-developed activity-based costing system, a company is likely to have an element of fixed overhead that is allocated under some “generic” allocation base such as machine hours or direct labor hours.

**Step 3:** **Identify the Fixed Overhead Costs Associated with Each Cost-Allocation Base.**

**Step 4:** **Compute the Rate per Unit of Each Cost-Allocation Base Used to Allocate Fixed Overhead Costs to Output Produced.**

**Refer to Quiz Question 2**

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| **LEARNING** **OBJECTIVE** | 3 |
| Compute the variable overhead flexible-budget variance,… difference between actual variable overhead costs and flexible-budget variable overhead amountsthe variable overhead efficiency variance,… difference between actual quantity of cost-allocation base and budgeted quantity of cost-allocation baseand the variable overhead spending variance… difference between actual variable overhead cost rate and budgeted variable overhead cost rate  |
|  |

* 1. The **variable overhead flexible-budget variance** measures the difference between actual variable overhead costs incurred and the flexible-budget overhead amounts.

Variable overhead Actual costs Flexible-budget

flexible-budget variance = incurred – amount

* 1. This variance reveals how much variable overhead costs differed from the flexible budget amount. However, it does little to explain why this difference occurred. To learn why the variance arose, it needs to be divided into two components—variable overhead efficiency variance and the variable overhead spending variance.

Teaching point. Demonstrating the variable overhead variances as you explain each one will help the students grasp the differences and meaning of each. It will also be helpful to explain what each variance represents using nonaccounting language.

* 1. The **variable overhead efficiency variance** measures the difference between actual quantities of the cost-allocation base used and budgeted quantities of the cost-allocation base that should have been used to produce actual output.

Variable overhead efficiency variance =

(Actual Qty of Allocation Base – Standard Qty of Allocation Base allowed for actual output) × Standard Price

Teaching point. The variable overhead efficiency variance measures the efficiency with which the cost-allocation base is used. For example, if the allocation base is direct labor hours and there is an unfavorable direct labor efficiency variance, the variable overhead efficiency variance will also be unfavorable.

* 1. The **variable overhead spending variance** is the difference between actual variable overhead costs per unit of the cost-allocation base and budgeted variable overhead cost per unit of the cost-allocation base. This variance arises simply because the items that make up variable overhead cost more or less than was budgeted.

Variable overhead spending variance =

(Actual Price of Allocation Base – Standard Price of Allocation Base) × Actual Qty

(Exhibit 8-4 displays variable overhead efficiency and spending variance calculations.)

* 1. In recording the journal entries for variable overhead, the variances are included, so that the costs of the products or services are recorded at standard. Note that an unfavorable variance will be recorded as a debit and a favorable variance as a credit.

Teaching point. In illustrating the computation of these variances it will reinforce the concept for the students if you conclude by illustrating the journal entries.

**Refer to Quiz Questions 3, 4, and 5 Exercises 8-16 and 8-18**

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| **LEARNING** **OBJECTIVE** | 4 |
| Compute the fixed overhead flexible-budget variance,… difference between actual fixed overhead costs and flexible-budget fixed overhead amountsthe fixed overhead spending variance, and the fixed overhead production-volume variance… difference between budgeted fixed overhead and fixed overhead allocated on the basis of actual output produced |
|  |

4.1 The flexible-budget amount for fixed costs is also the amount included in the static budget prepared at the beginning of the period because fixed costs are not affected by changes in output.

Teaching point. As with the variable overhead variances, demonstrating the fixed overhead variances as you explain each one will help the students grasp the differences and meaning of each. It will also be helpful to explain what each variance represents using nonaccounting language.

4.2 The **fixed overhead flexible-budget variance** is the difference between actual fixed overhead costs and fixed overhead costs in the flexible budget.

Fixed overhead Actual costs Flexible-budget

flexible-budget variance = incurred – amount

4.3 Note that there is no fixed overhead efficiency variance because the amount of fixed overhead is unaffected by how efficiently the allocation basis is used to produce output.

4.4 Because there is no fixed overhead efficiency variance, the **fixed overhead spending variance** and the fixed overhead flexible-budget variance are the same.

Fixed overhead Actual costs Flexible-budget

spending variance = incurred – amount

4.5 This variance arises because the items making up fixed overhead cost (such as insurance) were more or less than was budgeted.

4.6 The **production-volume variance** (also known as the **denominator-level variance**) arises only for fixed costs. This variance is the difference between budgeted fixed overhead and fixed overhead allocated based on the number of units actually produced.

Production Budgeted Fixed overhead allocated

volume variance = fixed overhead – for actual output units produced

4.7 The production-volume variance is an indicator of the use of capacity. If the company exceeded planned capacity, the variance is favorable, as fixed overhead is divided among a greater number of units. If the company fell short of planned capacity, the variance is unfavorable, as there was unused capacity. It should be noted that this variance is directly influenced by the **production-denominator level,** or definition of capacity for determining the application rate.

4.8 Another way to view the production-volume variance is that a favorable variance indicates that overhead was overallocated; if unfavorable, overhead is underallocated.

(Exhibit 8-3 is a graphic presentation of the production-volume variance.)

4.9 As with variable overhead, the journal entries for fixed overhead incorporate the variances into the accounts.

Teaching point. As with variable overhead variances, the concept will be reinforced if you conclude by illustrating the journal entries.

4.10 At the end of the accounting period, any balance in the variable or fixed overhead variance accounts must be dealt with. If the amount is deemed to be immaterial, these balances may be written off directly to Cost of Goods Sold. If they are material, the balances should be allocated among Work-in-Process, Finished Goods, and Cost of Goods Sold.

**Refer to Quiz Questions 6, 7, and 8 Exercises 8-17 and 8-19**

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| **LEARNING** **OBJECTIVE** | 5 |
| Show how the 4-variance analysis approach reconciles the actual overhead incurred with the overhead amounts allocated during the period … the 4-variance analysis approach identifies spending and efficiency variances for variable overhead costs and spending and production-volume variation for fixed overhead costs |
|  |

5.1 As we have seen, the calculation of variances for variable overhead and fixed overhead differ.

* Variable manufacturing overhead has no production-volume variance.
* Fixed manufacturing overhead has no efficiency variance.

(Exhibit 8-4 illustrates an integrated summary of the variable and fixed overhead variances.)

5.2 When all of the overhead variances are presented together, it is referred to as a**4-variance analysis.** Although this presents the same information that calculation of the individual variances gives, this does so in a unified presentation that also indicates that the fixed overhead efficiency and variable overhead production-volume variance never exist.

5.3 Not all managers need the detail found in the 4-variance model. Managers of smaller businesses may understand their operations better from personal observation and nonfinancial measures. They may find that a **3-variance analysis** provides an acceptable level of detail. This is obtained by combining the spending variances for variable and fixed overhead into a *single overhead spending variance*and presenting the variable overhead efficiency and fixed overhead production-volume variances.

5.4 In other situations, it may be desirable to present even less detail. This can be accomplished through a **2-variance analysis.** This analysis combines the overhead spending variance and the variable overhead efficiency variance into a single *flexible-budget variance* along with the fixed overhead production-volume variance.

5.5 Finally, the flexible-budget variance and the fixed overhead production-volume variance can be combined into a **1-variance analysis**reflecting a *total overhead variance.* This is the total underapplied or overapplied overhead costs.

Teaching point. Having the students work through the process of calculating variances and then presenting them in a 4-, 3-, 2-, and 1-variance analysis will reinforce the concepts covered in this chapter and help them to relate overhead variance analysis to the bigger picture.

5.6 All the variances discussed in this chapter are examples of financial performance measures. Managers will also find nonfinancial performance measures to be helpful.

5.7 Nonmanufacturing and service sector companies can benefit from the use of variance analysis. Many of these companies have a high level of fixed costs and the key to their profitability is the effective use of capacity.

**Refer to Quiz Questions 9 and 10 Exercises 8-21, 8-22, and Problem 8-40**

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| **LEARNING** **OBJECTIVE** | 6 |
| Explain the relationship between the sales-volume variance and the production-volume variance… production-volume variance and operating income volume variances together comprise the sales-volume variance. |
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6.1 The sales-volume variance helps managers understand the lost contribution margin from selling fewer units than planned according to the static budget.

6.2 The sales-volume variance has two components:

* The operating income volume variance is measured as operating income (based on actual units sold) minus operating income per the static budget. If actual units sold are greater than static budget units sold, this variance will be favorable.
* The production-volume variance is the difference between budgeted fixed overhead costs and allocated fixed overhead costs.

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| **LEARNING** **OBJECTIVE** | 7 |
| Calculate overhead variances in activity-based costing… compare budgeted and actual overhead costs of activities |
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7.1 As has already been mentioned, ABC systems classify costs of various activities into a cost hierarchy of output unit-level, batch-level, product-sustaining level, and facility-sustaining level costs.

7.2 The basic principles and concepts of variable and fixed overhead analysis can be applied to the cost hierarchy in an ABC system.

**Refer to Quiz Question 11 Problem 8-35 and 8-37**

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| **LEARNING** **OBJECTIVE** | 8 |
| Examine the use of overhead variances in nonmanufacturing settings… analyze nonmanufacturing variable overhead costs for decision making and cost management; fixed overhead variances are especially important in service settings. |
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8.1 Managers consider variance analysis of all variable costs including distribution and other nonmanufacturing costs.

8.2 Costs incurred by service companies are not easily traced to outputs. Because the majority of costs are fixed overhead, effective utilization of capacity is a key element of profitability. Attention to fixed overhead variances can help managers utilize capacity effectively.

8.3 Nonfinancial measures such as variances between budgeted and actual amounts of materials used or machine hours worked may be reported earlier than financial variances. Both financial and nonfinancial performance measures are used to evaluate managers.

**Refer to Quiz Question 12 Problem 8-41**

**V. OTHER RESOURCES**

To download these and other resources, visit the Instructor’s Resource Center [*www.pearsonhighered.com*](http://www.pearsonhighered.com/).

The following exhibits were mentioned in this chapter of the Instructor’s Manual, and have been included in the **PowerPoint Lecture presentation** created specifically for this chapter. You may use the PowerPoint Lecture presentations “as is”, or modify them to suit your individual needs.

Exhibit 8-3 is a graphic presentation of the production-volume variance.

Exhibit 8-4 illustrates an integrated summary of the variable and fixed overhead variances.

Exhibit 8-5 displays variable overhead efficiency and spending variance calculations.

**CHAPTER 8 QUIZ**

1. Which of the following pertains primarily to the planning of fixed overhead costs?
2. A standard rate per output unit is developed.
3. Only essential activities are to be undertaken.
4. Activities are to be undertaken in the most efficient method.
5. Key decisions are made at the start of the budget period determining the level of costs.
6. In selecting a cost-allocation base for variable overhead, what criteria for the base is preferred?
7. Ease of acquiring reliable information for accurate allocations
8. A cause-and-effect relationship between the cost and the activity level
9. A single base that will simplify the allocation process
10. One that has been used in the past

**The following data apply to questions 3 through 10.**

Sebastian Company, which manufactures electrical switches, uses a standard cost system and carries all inventories at standard. The standard manufacturing overhead costs per switch are based on direct labor hours and are shown below:

Variable overhead (5 hours @ $12 per direct manufacturing labor hour) $ 60

Fixed overhead (5 hours @ $15\* per direct manufacturing labor hour) 75

Total overhead per switch $135

\*Based on capacity of 200,000 direct manufacturing labor hours per month.

The following information is available for the month of December:

* 46,000 switches were produced although 40,000 switches were scheduled to be produced.
* 225,000 direct manufacturing labor hours were worked at a total cost of $5,625,000.
* Variable manufacturing overhead costs were $2,750,000.
* Fixed manufacturing overhead costs were $3,050,000.
1. [CMA Adapted] The variable overhead spending variance for December was

a. $50,000 U.

b. $350,000 U.

c. $10,000 F.

d. $60,000 F.

1. [CMA Adapted] The variable manufacturing overhead efficiency variance for December was

a. $50,000 U.

b. $350,000 U.

c. $10,000 F.

d. $60,000 F.

1. The total variable manufacturing overhead variance was
2. $10,000 F.
3. $10,000 U.
4. $110,000 U.
5. $110,000 F.
6. [CMA Adapted] The fixed manufacturing overhead spending variance for December was

a. $450,000 F.

b. $400,000 F.

c. $50,000 U.

d. $775,000 F.

1. The fixed overhead production-volume variance for December was

a. $450,000 F.

b. $400,000 F.

c. $50,000 U.

d. $775,000 F.

1. What amount should be credited to the Allocated Manufacturing Overhead Control account for the month of December?

a. $6,210,000

b. $5,800,000

c. $5,760,000

d. $5,700,000

1. Under the 2-variance method, the flexible-budget variance for December was

a. $10,000 F.

b. $40,000 U.

c. $50,000 U.

d. $100,000 U.

1. Under the 3-variance method, the spending variance for December was

a. $10,000 F.

b. $40,000 U.

c. $50,000 U.

d. $100,000 U.

1. Which of the following statements is *true* about overhead cost variance analysis using activity-based costing?
2. Overhead cost variances are calculated only for output-unit level costs.
3. Overhead cost variances are calculated only for variable manufacturing overhead costs.
4. A 4-variance analysis can be conducted.
5. Activity-based costing uses input measures for all activities, resulting in the inability to do flexible budgets needed for variance analysis.

12.Which of the following is an example of a nonmanufacturing cost that may be analyzed using variances?

a. Factory rent

b. Product distribution costs

c. Indirect labor

d. Factory supplies

**CHAPTER 8 QUIZ SOLUTIONS**

# 1. d

# 2. b

# 3. a

# 4. d

# 5. a

# 6. c

# 7. a

# 8. a

# 9. b

# 10. d

# 11. c

**Quiz Question Calculations**

3. Standard 225,000 DLH × $12 = $2,700,000

Actual 2,750,000

VOH Spending variance $ 50,000 U

4. Standard 46,000 switches × 5 DLH/switch = 230,000

Actual DLH 225,000

VOH Efficiency variance 5,000 × $12 = $60,000 F

5. Total variable overhead variance = $50,000 U + $60,000 F = $10,000 F

6. Budgeted fixed OH 200,000 DLH × $15/DLH = $3,000,000

Actual fixed OH 3,050,000

FOH Spending variance 50,000 U

7. Budgeted DLH 200,000

Allocated 46,000 × 5 230,000

30,000 × 15 = 450,000 F

8. 230,000 × (15 + 12) = $6,210,000

1. 50,000 U – 60,000 F + 50,000 U = 40,000 U
2. 50,000 U + 50,000 U = 100,000 U