Chapter 10

Lecture Notes

Chapter theme: This chapter extends our study of **management control** by explaining how **standard costs** are used by managers to control costs. It demonstrates how to compute direct materials, direct labor, and variable overhead variances.

1

1. **Standard costs – setting the stage**
   1. **Basic definitions/concepts**
      * 1. A **standard** is a benchmark for measuring performance. In managerial accounting, **two types of standards** are commonly used by manufacturing, service, food, and not-for-profit organizations:
           1. **Quantity standards** specify how much of an input should be used to make a product or provide a service. For example:

2

1. Auto service centers like **Firestone** and **Sears** set labor time standards for the completion of work tasks.
2. Fast-food outlets such as **McDonald’s** have exacting standards for the quantity of meat going into a sandwich.
   * + - 1. **Price standards** specify how much should be paid for each unit of the input. For example:
3. **Hospitals** have standard costs for food, laundry, and other items.
4. Home **construction companies** have standard labor costs that they apply to sub-contractors such as framers, roofers, and electricians.

2

1. **Manufacturing companies** often have highly developed standard costing systems that establish quantity and price standards for each separate product’s material, labor, and overhead inputs.
2. **Setting standard costs**

#### Setting direct materials standards

1. The **standard price per unit** for direct materials should reflect the final, delivered cost of the materials.

3

1. The **standard quantity per unit** for direct materials should reflect the amount of material required for each unit of finished product, as well as an allowance for unavoidable waste, spoilage, and other normal inefficiencies.

#### Setting direct labor standards

1. The **standard rate per hour** for direct labor includes not only wages earned but also fringe benefits and other labor costs.

4

1. Many companies prepare a **single rate** for all employees within a department that reflects the “mix” of wage rates earned.
2. The **standard hours per unit** reflects the labor hours required to complete one unit of product.

4

1. Standards can be determined by using available **references** that estimate the time needed to perform a given task, or by relying on **time and motion studies**.

#### Setting variable manufacturing overhead standards

1. The **price standard** for variable manufacturing overhead comes from the **variable portion of the predetermined overhead rate**.

5

1. The **quantity standard** for variable manufacturing overhead is expressed in either direct labor hours or machine hours depending on which is used as the **allocation** **base** in the predetermined overhead rate.

#### The standard cost card

1. The standard cost card is a detailed listing of the standard amounts of **direct materials, direct labor, and variable overhead** inputs that should go into a unit of product, multiplied by the standard price or rate that has been set for each input.

6

1. **Using standards in flexible budgets**

#### Activity and spending variances

i. Standard costs per unit for direct materials, direct labor, and variable manufacturing overhead can be used to compute **activity** and **spending** variances as described in the previous chapter.

7

B. **Price** **and quantity** **variances**

ii. Spending variances become more useful by breaking them down into **price** and **quantity** variances. This is our focus in this chapter.

1. **A general model for standard cost variance analysis**

#### Price and quantity variances

#### A price variance is the difference between the actual price of an input and its standard price, multiplied by the actual amount of the input purchased.

8

#### A quantity variance is the difference between how much of an input was actually used and how much should have been used and is stated in dollar terms using the standard price of the input.

#### Price and quantity standards

#### Price and quantity standards are determined separately because price and quantity variances usually have different causes. In addition:

9

1. **Different managers are usually responsible for buying and for using inputs**. For example:
2. The purchasing manager is responsible for raw material purchase prices and the production manager is responsible for the quantity of raw material used.

9

1. **The buying and using activities occur at different points in time**. For example:
2. Raw material purchases may be held in inventory for a period of time before being used in production.

C. The **general model—an overview**

1. Price and quantity variances can be computed for all three variable cost elements – **direct materials, direct labor, and variable manufacturing overhead** – even though the variances have different names as shown.

10

1. Although price and quantity variances are known by different names, they are computed **exactly the same way** (as shown on this slide) for direct materials, direct labor, and variable manufacturing overhead.

11

* + - 1. The **actual** **quantity** represents the actual amount of direct materials, direct labor, and variable manufacturing overhead used.

12

*Helpful Hint: Emphasize that the quantities in this model pertain to inputs not outputs. So, in the case of direct materials, the quantities will be stated in terms such as pounds, ounces, etc., not the number of units of finished goods produced.*

1. The **standard quantity** represents the **standard quantity allowed** for the actual output of the period.

13

*Helpful Hint: Mention that the “SQ” portion of the model is the most common stumbling block for students when it comes to variance analysis. Emphasize that “SQ” refers to the standard quantity of inputs allowed for the* ***actual*** *level of output achieved. For example, if 5,000 drapes were produced and each requires 2 yards of fabric, the standard quantity allowed would be 10,000 yards. Any other amount of fabric used would result in a variance.*

1. The **actual price** represents the actual amount paid for the input used.

14

1. The **standard price** represents the amount that should have been paid for the input used.

15

1. **Using standard costs—direct materials variances**

*Learning Objective 1: Compute the direct materials price and quantity variances and explain their significance.*

16

#### Glacier Peak Outfitters – an example

17

1. The **materials price variance**, defined as the difference between what is paid for a quantity of materials and what should have been paid according to the standard, is **$21 favorable**.

18

* + - 1. The price variance is labeled favorable because the actual price was less than the standard price by **$0.10 per kilogram**.

1. The **materials quantity variance**, defined as the difference between the quantity of materials used in production and the quantity that should have been used according to the standard, is **$50 unfavorable**.

18

* + - 1. The quantity variance is labeled **unfavorable** because the actual quantity exceeds the standard quantity allowed by **10 kilograms**.

*Helpful Hint: Remind students that a favorable price variance might not always be a good thing. If it arose from receiving inferior or obsolete goods at a reduced price, the total costs of making the company’s products might be higher.*

1. **Supporting/additional computations**
2. The standard quantity of **200 kilograms** was computed as shown.

19

1. The actual price of **$4.90 per kilogram** was computed as shown.

20

1. The equations that we have been using thus far can be **factored** as shown and used to compute price and quantity variances.

21

#### Direct materials variances—points of clarification:

22

1. The **purchasing manager** and **production manager** are usually held responsible for the materials price variance, and materials quantity variance, respectively.

22

The **standard price** is used to compute the quantity variance so that the production manager is not held responsible for the performance of the purchasing manager.

1. The materials variances are not always entirely **controllable** by one person or department. For example:
   * + 1. The production manager may schedule production in such a way that it requires **express delivery** of raw materials resulting in an unfavorable materials price variance.

23

The purchasing manager may purchase **lower quality raw materials** resulting in an unfavorable materials quantity variance for the production manager.

*Quick Check – direct materials variance calculations*

24-32

1. **Using standard costs—direct labor variances**

*Learning Objective 2: Compute the direct labor rate and efficiency variances and explain their significance.*

33

#### Glacier Peak Outfitters – continued (assume the information as shown)

34

#### The labor rate variance, defined as the difference between the actual average hourly wage paid and the standard hourly wage, is $1,250 unfavorable.

35

1. The rate variance is labeled **unfavorable** because the actual average wage rate was more than the standard wage rate by **$0.50 per hour**.
2. The **labor efficiency variance**, defined as the difference between the actual quantity of labor hours and the quantity allowed according to the standard, is **$1,000 unfavorable**.

35

* + - 1. The efficiency variance is labeled **unfavorable** because the actual quantity of hours exceeds the standard quantity allowed by **100 hours**.

1. **Supporting/additional computations**
2. The standard quantity of **2,400 hours** was computed as shown.

36

1. The actual price (or rate) of **$10.50 per hour** was computed as shown.

37

1. **Factored equations** can also be used to compute the efficiency and rate variances.

38

#### Direct labor variances—points of clarification:

* 1. Labor variances are **partially controllable** by employees within the Production Department. For example, production managers/supervisors can influence:

39

1. The deployment of highly skilled workers and less skilled workers on tasks consistent with their skill levels.
2. The level of employee motivation within the department.

39

1. The quality of production supervision.
2. The quality of the training provided to the employees.
3. However, labor variances are not entirely **controllable** by one person or department. For example:
4. The Maintenance Department may do a **poor job of maintaining production equipment**. This may increase the processing time required per unit, thereby causing an unfavorable labor efficiency variance.

40

1. The purchasing manager may purchase **lower quality raw materials** resulting in an unfavorable labor efficiency variance for the production manager.

41-46

*Quick Check – direct labor variance calculations*

1. **Using standard costs—variable manufacturing overhead variances**

*Learning Objective 3: Compute the variable manufacturing overhead rate and efficiency variances and explain their significance.*

47

#### Glacier Peak Outfitters – continued

48

1. The **variable overhead rate variance**, defined as the difference between the actual variable overhead costs incurred during the period and the standard cost that should have been incurred based on the actual activity of the period, is **$500 unfavorable**.

49

1. The rate variance is labeled **unfavorable** because the actual variable overhead rate was more than the standard variable overhead rate by **$0.20 per hour**.
2. The **variable overhead efficiency variance**, defined as the difference between the actual activity of a period and the standard activity allowed, multiplied by the variable part of the predetermined overhead rate, is **$400 unfavorable**.

49

* + 1. The efficiency variance is labeled **unfavorable** because the actual quantity of the activity (hours) exceeds the standard quantity of the activity allowed by **100 hours**.

1. **Supporting/additional computations**
2. The standard quantity of **2,400 hours** was computed as shown.

50

1. The actual price of **$4.20 per hour** was computed as shown.

51

1. **Factored equations** can be used to compute the efficiency and rate variances.

52

53-58

*Quick Check – variable overhead variance calculations*

1. **Materials variances—an important subtlety**

#### When the quantity of materials purchased differs from the quantity used in production, the price variance is based on the quantity purchased and the quantity variance is based on the quantity used in production.

59

60

B. **Glacier Peak Outfitters—revisited**

i. The **materials price variance** is computed using the actual quantity purchased (**210 kgs**.); therefore, the materials price variance is **$21 favorable**.

61

ii. The **materials quantity variance** is computed using the actual quantity used in production (**200** **kgs**.); therefore, the materials quantity variance is **$0**.

IX. Standard costs—**managerial implications**

#### Advantages of standard costs:

#### Standard costs are a key element of the management by exception approach.

1. Standards can provide **benchmarks** that promote economy and efficiency.

62

1. Standards can greatly **simplify bookkeeping**.
2. Standards can support **responsibility accounting systems**.

#### Potential problems with standard costs:

#### Standard cost variance reports are usually prepared on a monthly basis; hence, they may contain information that is outdated.

1. If variances are **misused** as a club to negatively reinforce employees, **morale may suffer** and employees may make **dysfunctional decisions**.

63

1. Labor variances make **two important assumptions**. First, they assume that production is labor-paced; if labor works faster, output will go up. Second, they assume that labor is a variable cost. These assumptions are often invalid in today’s automated manufacturing environment where employees are essentially a fixed cost.
2. In some cases, **a “favorable” variance can be as bad** **as or worse than an “unfavorable” variance**.
3. **Excessive emphasis** **on meeting the standards** may overshadow other important objectives such as maintaining and improving quality, on-time delivery, and customer satisfaction.

64

1. Just meeting standards may not be sufficient; **continuous process improvement** may be necessary to survive in a competitive environment.