



# **Cost accounting 2**

## **Section NO. (10)**

**Analysis of differences (variances) of direct cost**

**Prepared by :**

**Shehata Shaheen**

— جامعة مدينة السادات —

## Analysis the total variance of direct materials

### Frist: Determination of the total variance:

$$\text{Total variance} = \text{Standard Cost} - \text{Actual Cost}$$

**Standard Cost** = Standard Quantity per Unit of Product × Standard Price per Unit of Raw Material × Actual of Production Volume

$$SC - DM = SQ \times SP$$

**Actual Cost** = Actual Quantity per Unit of Product × Actual Price per Unit of Raw Material × Actual of Production Volume

$$AC - DM = AQ \times AP$$

## Example (1)

•The following data were extracted from an industrial company:

| Direct Materials | Standard Data  |                        | Actual Data              |                     |
|------------------|--|------------------------|--------------------------|---------------------|
|                  | Standard Quantity per unit   | Standard Price per kg. | Actual Quantity per unit | Actual Price per kg |
|                  | 4 kg.  | 3 EGP.                 | 5 kg.                    | 2 EGP.              |
|                  | <input type="checkbox"/> Actual Volume of production 3,000 unit.<br><input type="checkbox"/> Actual Volume of production 5,000 unit. |                        |                          |                     |

**Required :**

**Determine and analyze the variances between the standard cost and the actual cost of Direct materials.**

## Solution

### Frist: Determination of the total variance of Direct Materials:

$$\text{Total variance} = \text{Standard Cost} - \text{Actual Cost}$$

$$\text{Standard Cost} = \text{SQ} \times \text{SP}$$

$$\text{SC} = \text{SQ} \times \text{SP}$$

$$\text{SC} = 12,000 \times 3$$

$$\text{SC} = \mathbf{36,000 \text{ EGP.}}$$

$$\text{Actual Cost} = \text{AQ} \times \text{AP}$$

$$\text{AC} = \text{AQ} \times \text{AP}$$

$$\text{AC} = 15,000 \times 2$$

$$\text{AC} = \mathbf{30,000 \text{ EGP.}}$$

| Direct<br>Materials | Standard Data  |                | Actual Data        |              |
|---------------------|--|----------------|--------------------|--------------|
|                     | Standard<br>Quantity   | Standard Price | Actual<br>Quantity | Actual Price |
|                     | 4 kg.  | 3 EGP.         | 5 kg.              | 2 EGP.       |
|                     | <input type="checkbox"/> Actual Volume of production 3,000 unit<br><input type="checkbox"/> Actual Volume of production 5,000 unit |                |                    |              |

$$\text{SQ} = 4\text{kg} \times 3,000 \text{ unit} = 12,000 \text{ kg.}$$

$$\text{AQ} = 5\text{kg} \times 3,000 \text{ unit} = 15,000 \text{ kg.}$$

$$\text{Total DM - variance} = \text{Standard Cost} - \text{Actual Cost}$$

$$= 36,000 - 30,000$$

$$= \mathbf{+ 6,000 \text{ EGP Favorable.}}$$

## Second: Binary analysis of the total variance of direct raw materials:

**Quantity Variance** = (Standard Quantity of actual production - Actual Quantity of actual production) × Standard Price

$$QV = (SQ - AQ) \times SP$$

**Price Variance** = (Standard Price – Actual Price) × Actual Quantity of actual production

$$PV = (SP - AP) \times AQ$$

## Second: Binary analysis of the total variance of direct materials:

**Quantity Variance** =  $(SQ - AQ) \times SP$

$$QV = (12,000 - 15,000) \times 3$$

$$QV = - 3,000 \times 3$$

$$QV = - \mathbf{9,000 \text{ EGP Unfavorable.}}$$

**Price Variance** =  $(SP - AP) \times AQ$

$$PV = (3 - 2) \times 15,000$$

$$PV = 1 \times 15,000$$

$$PV = + \mathbf{15,000 \text{ EGP Favorable.}}$$

| Direct<br>Materials | Standard Data  |                | Actual Data        |              |
|---------------------|--|----------------|--------------------|--------------|
|                     | Standard<br>Quantity   | Standard Price | Actual<br>Quantity | Actual Price |
|                     | 4 kg.  | 3 EGP.         | 5 kg.              | 2 EGP.       |
|                     | <input type="checkbox"/> Actual Volume of production 3,000 unit<br><input type="checkbox"/> Actual Volume of production 5,000 unit |                |                    |              |

**Total variance** = **Quantity Variance** + **Price Variance**

$$= (- 9,000) + 15,000$$

$$= + \mathbf{6,000 \text{ EGP Favorable.}}$$

### Third: Tribble analysis of the total variance of direct raw materials:

$$\text{Quantity Variance} = (SQ - AQ) \times SP$$

$$\text{Net Price Variance} = (\text{Standard Price} - \text{Actual Price}) \times \text{Standard Quantity of Actual production}$$

$$\text{NPV} = (SP - AP) \times SQ$$

$$\text{Mixed Price Variance} = (\text{Standard Quantity} - \text{Actual Quantity}) \times (\text{Actual Price} - \text{Standard Price})$$

$$\text{MPV} = (SQ - AQ) \times (AP - SP)$$

### Third: Trible analysis of the total variance of direct raw materials:

**Quantity Variance = - 9,000 EGP Unfavorable.**

**Net Price Variance = (SP – AP) × SQ**

$$\text{NPV} = (3 - 2) \times 12,000$$

$$\text{NPV} = 1 \times 12,000$$

$$\text{NPV} = + 12,000 \text{ EGP Favorable.}$$

| Direct<br>Materials   | Standard Data        |                | Actual Data        |              |
|---|----------------------|----------------|--------------------|--------------|
|   | Standard<br>Quantity | Standard Price | Actual<br>Quantity | Actual Price |
|   | 4 kg.                | 3 EGP.         | 5 kg.              | 2 EGP.       |
| <input type="checkbox"/> Actual Volume of production 3,000 unit |                      |                |                    |              |
| <input type="checkbox"/> Actual Volume of production 5,000 unit |                      |                |                    |              |

**Mixed Price Variance = (SQ - AQ) × (AP - SP)**

$$\text{MPV} = (12,000 - 15,000) \times (2 - 3)$$

$$\text{MPV} = (12,000 - 15,000) \times (- 1)$$

$$\text{MPV} = (- 3,000) \times (- 1)$$

$$\text{MPV} = + 3,000 \text{ EGP Favorable.}$$

**Total variance = Quantity Variance + Net Price Variance + Mixed Price variance**

$$= (- 9,000) + 12,000 + 3,000$$

$$= + 6,000 \text{ EGP Favorable.}$$



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*Thanks*

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