Cost Accounting 2

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Chapter 2

Analysis of Differences (Variances) of Direct Costs

1

Analysis of the total variance of direct materials

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Analysis of the total variance of direct wages

2/1- Determining the total variance:

❑**The total variance in direct labor** is determined by comparing standard direct labor with actual direct labor for the actual volume of production during the period of the product.

2/1- Determining the total variance:

❑ **Both the standard direct labor and the actual direct labor are determined as follows:**

> **Standard direct labor (wages) (SW) =** number of standard hours per unit of product × standard hourly (wage) rate × actual production volume .

2/1- Determining the total variance:

In the same way, actual direct wages are determined as follows:

Actual direct labor (wages) (AW) = Number of actual hours per unit of product × Actual hourly (wage) rate × actual production volume (quantity)

The previous equations are used to determine both the standard and actual direct wages (labor), whether the product is produced using one or more types of labor, or passes through one or more production departments. Then, we find the total variance using the following equation:

Total Direct Wage (labor) Variance (WV) = Standard Direct Wages (labor) - Actual direct wages (labor)

Example (2)

❑ **Shady Computer Assembly Company assembles computers; each device needs to pass through two departments: the first for the assembly of internal parts and testing them and the second for the external assembly of the device. The following are the standard and actual rates per device for the month of November 2021:**

Example (2)

First: Standard Data:

Desc.	Standard time in hours	Standard hourly rate
Internal part department	1	20
External part department	0.5 (30 min)	10

Example (2)

Second: **Actual Data:**

Desc.	Actual time in hours	Actual hourly rate
Internal part department	1.2	20
External part department	0.4 (24 min)	12

Third: The number of devices assembled during the month is 2000 devices.

Example (2)

Required:

❑ **Determining the total variance in direct wages at the level of:**

✓ **Departments**

✓ **Firm**

Solution

First: Preparation for the solution:

Determine standard direct wages for each department:

> **Standard direct wages (SW)** = the number of standard hours per unit of a product × Standard Hourly Rate × Actual Production Volume

- **SC for the internal parts department** = 1 x 20 x 2000 = 40,000 pounds

- **SC for the external parts section** = 0.5 x 10 x 2000 = 10,000 pounds

Solution

Actual direct wages (AW) = the number of actual hours per unit of the product × Actual Hourly Wage Rate × Actual Production Volume

- AC for the internal parts = 1,2 x 20 x 2,000 = 48,000 pounds

- AC for a section for external parts = 0.4 x 12 x 2000 = 9,600 pounds

Second: Determining the total variance for direct wages (labor):

Using the data previously identified, we can easily determine the total variance in direct wages (labor) as follows:

1. The total variance of direct wages (labor) at the department level:

- **Total Variance of Direct Wages (labor) (WV) = Standard Wages - Actual Wages**

- **WV for the internal parts department = 40000-48000 = (-8000) _Unfavorable._**

- **WV for the external parts department = 10000-9600 = + 400 _Favorable._**

2- The total variance of direct wages (labor) at the enterprise level:

It is calculated based on the total variance at the department level. Then, the total variance of the direct wages (labor) of the firm is calculated as

Total variance of Direct Wages (WV) = Total variance for the Internals department + The total variance for the external parts department

WV= -8000 + 400 = (-7600) Unfavorable.

Moreover, since the total variance appears negative, it is not in favor of the firm. Thus, the firm must examine the causes of this variance by analyzing this variance into its causes.

2/2 - Binary analysis of the total variance of direct wages:

The binary analysis of the total variance of direct wages is made into **a variance (difference) of efficiency, and a variance (difference) of wage rate.**

According to this analysis, the causes of the occurrence of the total variance are:

❑ The presence of an efficiency difference, the same as the (difference) of the quantity of direct materials as a result of the variance in the efficiency of the workers during the implementation, whether by increase or decrease.

❑ The other reason is the variance in the actual wage rate from the standard wage rate, whether by increase or decrease.

Each of them is measured as follows:

1. **Efficiency variance (EV) = (Standard hours - Actual hours) × Standard wage rate**

2. **Wage rate variance (WV) = (standard wage rate - actual wage rate) × actual hours**

In the previous example (Example 2), the total variance of direct wages can be analyzed as follows:

1- Efficiency variance (difference):

- **Efficiency variance (EV)**= (Standard hours - Actual hours) × Standard wage rate

- **EV for the internal department** = [(1 x 2000) - (1.2 x 2000)] ×20 = (2000-2400) × 20

  = -400 × 20 = (-8000) **Unfavorable.**

- **EV for the external department**=[(0.5 × 2000) - (0.4 × 2000)] ×10=(1000-800)×10

  = 200 x 10 = +2000 **Favorable.**

2- Variance (difference) of the wage rate:

- **Wage rate variance (WV) = (standard wage rate - actual wage rate) × actual hours**

- **WV for the internal department = (20 - 20) × (1.2 x 2000) = Zero x 2400 = zero**

- **WV for the external department = (10-12) × (0,4 x 2000) = -2 x 800**

$$= (-1600) \text{ Unfavorable.}$$

The efficiency variance can be calculated at the firm level as follows:

A-The Firm's Efficiency variance = the total of the firm's efficiency variance:

$$= -8000 + 2000 = (-6000) \text{ Unfavorable.}$$

It is noticed here that despite the high efficiency of the external parts department, this is unable to absorb the lack of Efficiency of the internal parts department, which resulted in the firm bearing an <u>unfavorable variance of 6000 pounds</u>.

The wage rate variance can also be calculated at the enterprise level as follows:

B- The firm's wage rate variance = the total of the firm's wage rate variance

= Zero + (-1600) = (-1600) Unfavorable.

It is an Unfavorable variance arising entirely from the external parts department, as the variance in the wage rate of the internal parts department is equal to zero because the actual rate does not change from the standard wage rate.

The firm's total variance can also be calculated as follows:

C- Total variance for direct wages =Efficiency variance for the firm +wages rate variance of the firm

$$= (-6000) + (- 1600) = (- 7600) \text{ Unfavorable}$$

It is the total variance previously calculated and this variance is not in favor of the firm. It is due to the decrease in efficiency and the increase in wage rates during implementation.

2/3- Triple analysis of the total variance of direct wages:

Further analysis of the total variance can be accurately done to determine the responsibility for this variance. We use the so-called triple analysis.

2/3- Triple analysis of the total variance of direct wages:

According to this analysis, the efficiency variance remains the same as in the binary analysis, while the wage rate variance is analyzed into:

1. **Net wage rate variance (NWV)** = (standard wage rate - actual wage rate) ×

   (Standard Hours × Actual Production Volume)

1. **Mixed rate wage variance (MWV)** = (Standard hours - Actual hours) ×

   (Actual wage rate - standard wage rate)

Solution

In the previous example (Example 2), the total variance in direct wages can be analyzed according to the triple analysis as follows:

1- Efficiency variance (difference):

The same was done in the binary analysis

2- The variance in the net wage rate:

Net wage rate variance (NWV) = (standard wage rate - actual wage rate)

× (Standard Hours × Actual Production Volume)

- (NWV) for the internal department = (20-20) × (1 x 2000) = Zero x 2000 = zero

- (NWV) for the external department = (10-12) × (0.5 x 2000) = -2 ×1000 = (- 2000) *Favorable*

- Firm net wage rate variance = zero + (- 2000) = (- 2000) *Unfavorable*

3- Mixed wage rate variance:

Mixed wage rate variance (MWV) = (Standard hours - Actual hours) × (actual wage rate - standard wage rate)

- **MWV for the internal department** = ((1 × 2000) - (1.2 × 2000)) × (20-20)

    = (2000-2400) x zero = zero

- **MWV for the external department** = ((0.5 × 2000) - (0.4 × 2000)) × (12-10)

    = (1000-800) × 2 = + 200 × 2 = + 400 *favorable*

- **The variance in the mixed wage rate of the firm** = 0 + 400 = + 400 *favorable*

❑ **In the analysis of the wage rate, it becomes clear that the unfavorable variance in the net wage rate of the external department of the firm is greater than the variance in the total wage rate before its analysis.**

❑ **The reason is that there is a mixed variance in favor of the firm as a result of the effect of high efficiency in this section, where 6 minutes were saved for each device assembled.**

The total variance in the wage rate can be measured as follows:

Total wage rate variance = net wage rate variance + mixed wage rate variance

$$= \text{-2000} + 400 = (\text{- 1600}) \; \textit{\underline{Unfavorable}}$$

2/4- Preparing a report on the variances (differences) of direct wages:

Report summary on measuring direct wage variances

Period: November 2021

Desc.	Efficiency variance	Wage rate variance	Total variance	Net wage rate variance	Mixed wage rate variance	Total variance of wages
Internal parts department	-8000	0	-8000	0	0	0
External wages department	+2000	-1600	+400	-2000	+400	-1600
total	-6000	-1600	-7600	-2000	+400	-1600

The End
Thank You