

Variance analysis in WP1

Introduction

The variance is the difference between the expected standard cost and the actual cost incurred. Variance analysis involves breaking down the total variance to explain how much of it is caused by the usage of resources being different from the standard, and how much of it is caused by the price of resources being different from the standard.

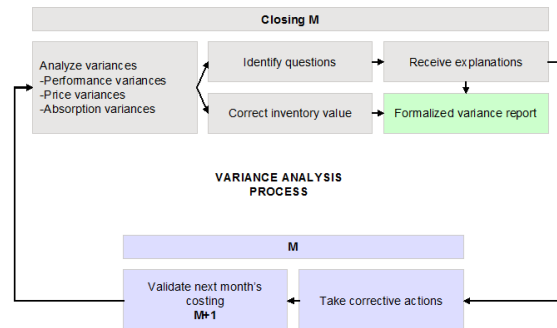
Each site controller has the responsibility to analyze each month the variance and to explain this variance in order to:

- Understand the reasons,
- Initiate corrective actions,
- If needed adjust the inventory value and change the semi-standard way of calculation, depending on the origin of the variance.

This process of analysis, whatever the result be a change of costing or not, must be formalized, and archived as a justification of records based on following templates:

- Variance template
- Cost centers variance
- Performance analysis plant's specification

The analysis is performed in the frame of the internal control : [IAC 01.02. Variance analysis](#)



The significance of variances

The total variance between actual fixed costs and standard has to be analyzed between performance variance and cost centers variance.

Performance variance

Variance for performance is due to the more efficient use of the time available to carry out the actual production. It compares the actual time taken to carry out an activity with the standard time allowed and values the difference at the standard.

$$\text{Performance variance} = (\text{Actual hours} - \text{Standard hours}) \times \text{standard hourly rate}$$

Example: the standard machine time to produce 1 ton of product Alpha is 1,2 h, if the actual time is higher, there is an unfavorable performance variance, on the contrary if the actual time is less than 1,2 h / ton, there is a favorable performance variance.

Itself broken down into:

Price variance

This is the difference between actual fixed costs and budgeted fixed costs "spring".

$$\text{Price variance} = \text{Actual fixed costs} - \text{Budgeted fixed costs "spring"}$$

Example: we budgeted the annual fixed costs "spring" at 1 600 k€. If actual fixed costs are greater than 1 600 k€, there is an unfavorable price variance; if the actual fixed costs are less than 1 600 k€, there is a favorable price variance.

Absorption variance

Standard fixed costs are assigned to each finished product by multiplying the standard hourly rate by the actual hours of production.

The variance for over- or under-activity is the difference between budgeted fixed costs and the amount of fixed costs allocated to production.

$$\text{Absorption variance} = - (\text{Actual hours} - \text{Standard hours "normal capacity"}) \times \text{Standard hourly rate} + (\text{Budgeted fixed costs "spring"} - \text{Standard fixed costs budget})$$

Example: we budgeted a "normal capacity" at 8 140 hours. If actual hours are greater than 8 140 hours, there is a favorable variance called over absorption, but if the actual hours are less than 8 140 hours, there is an unfavorable variance called under absorption.

Note: use the appropriate file to split variance for price and variance for over- or under-activity by production center.

What to do with variance amounts

If the amount is very small, the entire amount is simply put on the profit and loss statement.

- If the variance amount is unfavorable, it increases the costs of good sold-thereby reducing net income.
- If the variance amount is favorable, it decreases the cost of goods sold-thereby increasing net income.

Performance variance

- If variances are due to nonrecurring reasons (temporary events like equipment breakdown) that do not question the accuracy of the standard cost, the variance has to go directly in the profit and loss statement.
- If variances are due to recurring reasons (modifications in the production process not taken in the routings, reorganization of the plant), variances must immediately be incorporated into a new semi-standard.

Price variance

The "variance for price" is never significant in amount compared to the end of period inventory proportionally to the period production. So the entire amount is put in the P&L.

Absorption variance

"Variance for over- or under-activity" can never be added to any inventory account. The variance goes directly to the profit and loss statement. It increases the net income if the variance is favorable or decrease the net income if the variance is unfavorable.

Illustrative example

Let's assume that in 2010, the plant manufactures 1 500 tons of product Alpha and 1 500 tons of Beta.

Let's also assume that the actual fixed costs for the year are 1 500 k€. As we calculated earlier, the standard hourly rate is 245 € / h.

We begin by determining actual hours used to produce 3 000 tons of finished products

$$\begin{aligned}
 &= \text{Quantity produced} \quad \times \text{ actual throughput} + \text{Quantity produced} \quad \times \text{ actual throughput} \\
 &= 1\,500 \text{ To} \quad \times 1,3 \text{ h/To} \quad + \quad 1\,500 \text{ To} \quad \times 1,0 \text{ h/To} \\
 &= \mathbf{3\,450 \text{ hours}}
 \end{aligned}$$

There is an unfavorable variance for performance because 3 450 hours were used to produce 3 000 tons of finished products. This is 150 hours more than the standard quantity.

The "variance for price" is never significant in amount compared to the end of period inventory proportionally to the period production. So the entire amount is put in the P&L.

The additional 150 hours is multiplied by the standard rate of 245 € to give an unfavorable performance variance of $150 \times 245 \text{ €} = \mathbf{36\,750 \text{ €}}$

We begin by determining fixed costs absorbed by the production in 2010 knowing that the average production time per ton of product Alpha is 1,3 h / ton and 1,0 h / ton.

The amount of fixed costs absorbed into each product is calculated by multiplying the standard hourly rate by the actual number of hours. The amounts absorbed are thus:

$$\begin{aligned}
 \text{Alpha} &= \text{Quantity produced} \quad \times \quad \text{actual throughput} \quad \times \quad \text{standard hourly rate A} \\
 &= 1\,500 \text{ To} \quad \times \quad 1,3 \text{ h / To} \quad \times \quad 245 \text{ € / h} \\
 &= \mathbf{477\,750 \text{ €}}
 \end{aligned}$$

$$\begin{aligned}
 \text{Beta} &= \text{Quantity produced} \quad \times \quad \text{actual throughput} \quad \times \quad \text{standard hourly rate A} \\
 &= 1\,500 \text{ To} \quad \times \quad 1,0 \text{ h / To} \quad \times \quad 245 \text{ € / h}
 \end{aligned}$$

= 367 500 €

Total fixed costs absorbed = 477 750 + 367 500 = 845 250 €

The analysis shows that the actual fixed costs are 1 500 k€ and the fixed costs absorbed by the production are 845 k€. This unfavorable difference of 655 k€ is the sum of the two variances:

Variance for price	1 600 k€ - 1 500 k€	=	100 k€	Favorable
Variance for over- or under-activity			<u>755 k€</u>	Unfavorable
Total variance cost centers variance			655 k€	Unfavorable

Variance analysis synthesis

Variance	Definition	What it tells ?	Where does it end up ?
Any variance that is insignificant in amount		Don't be concerned with insignificant, immaterial amounts	Put the insignificant variance amounts on the P&L without allocating any amount to inventories.
The following variances are assumed to be significant in amount...			
Performance variance	Due to more or less time efficiency available to carry out the actual production.	Favorable	Actual machine hours were less than standard machine hours for the good output.
		Unfavorable	Actual machine hours were more than standard machine hours for the good output.
Absorption variance	Difference between actual fixed costs and the amount of fixed costs allocated to production.	Favorable	Actual hours are greater than expected.
		Unfavorable	Actual hours are less than expected.
Price variance	Difference between actual fixed costs and budgeted fixed costs spring	Favorable	Actual fixed costs are greater than expected.
		Unfavorable	Actual fixed costs are less than expected.