

# CPA BEC - STUDY UNIT 20

## Standard Costs and Variance Analysis: Core Concepts

### A. Static and Flexible Budgeting

1. **Variance analysis** is the foundation of any performance evaluation system based on a budget. Variances are the calculated differences between the amounts budgeted and the amounts actually incurred (or, in the case of revenues, earned). When analyzing **costs**, always subtract actual amounts from budgeted amounts. This results in favorable variances being positive, and unfavorable variances being negative.
2. The starting point for variance analysis is the **static, or master, budget**. The static budget is management's best estimate about sales, production levels, and costs for the upcoming period. The static budget for a production input is the standard quantity times the standard price. The **static budget variance** is the total variance to be explained. It equals the static budget minus the actual results for the period.
3. Variance analysis becomes much more meaningful when the static budget variance is separated into its **two component variances**. In order to do this, the flexible budget must be prepared.
  - a. The **flexible budget** consists of the costs that **should have been** incurred given the actual level of production achieved. The flexible budget equals the actual number of outputs produced, times the standard inputs per unit of output, times the standard price per unit of input. The product of the first two elements of this equation, that is the actual number of outputs produced and the standard inputs per unit of output, yields the **"expected" quantity of inputs**.
4. The two component variances of the static budget variance can now be derived. The **sales volume variance** reveals how the number of inputs codified in the master budget before the period began compares to the inputs that should have been used given the achieved level of output (holding price constant). A more accurate name for this variance, therefore, would be production volume variance. The **flexible budget variance** reveals how both the price paid for inputs and the quantity of them consumed compares to the price and quantity that should have been paid and consumed, given the actual level of output. What was codified in the master budget is not relevant to this side of the calculation. By definition, the sales volume and flexible budget variances net to the static budget variance.

### B. Direct Materials Variances

1. The **flexible budget variance** portion of the total variance for any of the three variable production inputs (direct materials, direct labor, and variable overhead) can be **subdivided** into two component variances. In the case of direct materials, the two components are the price variance and the quantity variance (also called the efficiency or usage variance).
2. The **materials price variance** is a pure measure of how much the actual price paid for inputs deviated from the standard (holding quantity constant). It equals the actual quantity times the difference between the standard and actual prices. The **materials quantity variance**, on the other hand, measures how efficiently direct materials were used given the actual level of production (holding price constant). It equals the difference between the expected and actual quantities times the standard price.
3. Variances **cannot be interpreted in isolation**. No variance by itself is either "good" or "bad" news.

### C. Direct Labor Variances

1. As with direct materials, the **flexible budget variance** portion of the total variance for direct labor can be **subdivided** into two component variances: the rate variance and the efficiency variance.
2. The **labor rate variance** equals the actual number of hours worked times the difference between the standard and actual wage rates. The **labor efficiency variance** equals the difference between the expected and actual number of hours worked times the standard wage rate.

### D. Overhead Variances

1. As with direct materials and direct labor, the **static budget variance** for variable overhead can be **subdivided** into two component variances.
2. The variable overhead **flexible budget variance** reports how much actual variable overhead costs deviated from what was expected given the actual level of production. In other words, the variable overhead flexible budget variance is the amount of over- or underapplied variable overhead. The variable overhead **sales volume variance** reports how much variable overhead costs applied deviated (given the actual level of production) from what was planned when the master budget was prepared.
3. Likewise, the **flexible budget variance** for variable overhead can be **subdivided** into two component variances. The **variable overhead spending variance** measures how much the “actual” overhead rate deviated from the standard (holding the driver level constant). It equals the actual driver level times the standard rate for the driver, minus the actual costs incurred. The **variable overhead efficiency variance** measures the “efficiency” with which the allocation base was used (holding the application rate constant). It equals the difference between the expected and actual driver levels, times the standard rate for the driver.
4. The **fixed portion** of the total overhead variance also has two components, but they are **not combined**. Just as with variable overhead, the **fixed overhead spending variance** is derived by comparing the actual costs incurred with the flexible budget. Note that **fixed overhead** has **no efficiency variance**, due to the fact that the flexible and static budget amounts for fixed overhead are the same. Instead, a production-volume variance, also known as a denominator-level variance, is calculated. The production volume variance equals the fixed overhead allocation minus the flexible/static budget.
5. **Integrated overhead variance analysis** combines the variable and fixed portions of the overhead variance to allow simplified scrutiny.
  - a. **Four-way:** VOH spending, FOH spending, VOH efficiency, FOH production-volume
  - b. **Three-way:** Spending, VOH efficiency, FOH production-volume
  - c. **Two-way:** Flexible budget, FOH production-volume
  - d. **One-way:** Overhead

### E. Review of Variance Analysis

1. **First level:**  
$$\text{Static budget variance} = (\text{SQ} \times \text{SP}) - (\text{AQ} \times \text{AP})$$
2. **Second level:**  
$$\text{Sales volume variance} = (\text{SQ} - \text{EQ}) \times \text{SP}$$
$$\text{Flexible budget variance} = (\text{EQ} \times \text{SP}) - (\text{AQ} \times \text{AP})$$
3. **Third level:**  
$$\text{Materials price / labor rate / VOH spending variance} = \text{AQ} \times (\text{SP} - \text{AP})$$
$$\text{Materials quantity / labor efficiency / VOH efficiency variance} = (\text{EQ} - \text{AQ}) \times \text{SP}$$