Standard Costing

1. Standard Overhead Cost Accounting

1.1 Variable Overhead

(1) Choose an activity measure which is most highly correlated with the variable overhead cost.

(2) Estimate a standard (budgeted) rate ($SR_v$) of application for variable overhead per unit of activity (chosen in step 1 above).

(3) Estimate the activity level required to produce one unit of output.

(4) Apply variable overhead to work-in-progress at the $SR_v$ times the standard activity allowed for actual output achieved.

1.2 Fixed Overhead

(1) Choose an activity level.

(2) Estimate the factory activity level for the period. This activity level is called the denominator level.\(^1\)

(3) Estimate the total amount of fixed overhead for the period, i.e., budgeted fixed overhead.

(4) The standard rate ($SR_f$) for fixed overhead is then the budgeted fixed overhead divided by the denominator level.

(5) Apply fixed overhead to work in progress at the ($SR_f$) times the standard activity allowed for the actual output achieved.

During the period, applied overhead is recorded in the Applied Overhead account, while actual overhead costs are recorded in the Overhead Control

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\(^1\) Note: (i) the activity level used here is generally not estimated on a period-by-period basis—it is usually the long-run average production level which is called the normal capacity; (ii) the denominator level need not be the activity measure chosen for the application of the variable overhead.
account. At the end of the period, the difference between the balances of these two accounts is under/over-applied overhead for the period. This amount is either closed to the Cost of Goods Sold or pro-rated to the different inventory accounts.

2. Overhead Variances

While the above steps are all that is required in order to keep books under a standard costing system, firms frequently break the under/over applied overhead into component variances in order to pinpoint avoidable costs or to refine the underlying assumptions linking activities undertaken and costs incurred.

2.1 Variable Overhead Variances

There are two potential sources of under/over applied variable overhead:
(1) Dollars spent for overhead items differed from the standard;
(2) Actual activity level of drivers differed from standard activity allowed for actual output produced.

2.1.1 Variable Overhead Spending Variance

\[ V_{vs} = (\text{Actual Variable } OH) - (SR_v)(AQ) \]

where \( AQ \) is the actual activity level, not actual quantity of overhead items.

This variance seems similar to the price variances defined for materials and labor. However, while a price variance could result from errors in estimating input prices only, a variable spending variance may be the result of a wrong estimate of overhead input usage, in addition to an erroneous prediction of their prices. Thus, the variable spending variance is really a combination of price and quantity variances.

2.2 Example

Assume that the variable overhead is the cost of grease for the factory machines. The standards are $2.00 per pound of grease and an average usage of .05 pounds of grease per \( DLH \). The \( SR_v \) then is $.10 per \( DL \) hour. Actual \( DLH \) was 100,000 hrs, and actual variable overhead was $12,000. What is the \( V_{vs} \)? [Answer: $12,000 - $.10/\( DL \) hour \times 100,000 \( DL \) hours = $2,000(\( U \)).]
The above variable spending variance could be due to a grease price different than $2.00 per pound, and/or grease consumption different than 0.05 pound per \textit{DLH}.

\subsection*{2.2.1 Variable Overhead Efficiency Variance}

\[ V_e = (SR_v)(AQ) - (SR_v)(SQ) \]

where \( SQ \) is the standard activity level allowed for actual output achieved.

This variance looks like the efficiency variances for direct materials and labor, but it is somewhat different. Indeed, the variable overhead efficiency variance represents an over/under usage of overhead. However, it is not due to an inefficient usage of the overhead items per se, but rather due to additional/less variable overhead required because the actual activity level in the factory was less/more efficient than the standard level. For example, if our activity measure is direct labor hours, an unfavorable overhead efficiency variance may reflect inefficiencies in the use of hired labor.

\subsection*{2.3 Fixed Overhead Variances}

\subsubsection*{2.3.1 Fixed Overhead Spending Variance}

\[ V_{fs} = (\text{Actual Fixed Overhead}) - (\text{Budgeted Fixed Overhead}) \]

This is the only cost control variance associated with fixed overhead. It is also called the fixed-overhead flexible-budget variance.

\subsubsection*{2.3.2 Production-volume Variance}

\[ V_{pv} = (\text{Budgeted Fixed Overhead}) - (SR_f)(SQ) \]

where (once again) \( SQ \) = the standard activity level allowed for actual output.

This variance arises solely as a result of the difference between the standard activity level allowed for output achieved and the denominator level. Note that it does not involve actual expenses; all of the amounts are estimates. Thus, an unfavorable production volume variance does not indicate that fixed overhead costs are excessive.
2.4 Further Terminology and Notation

Spending variance = $V_s = V_{fs} + V_{vs}$

Flexible-Budget variance = $V_B = V_s + V_e$

Total overhead variance:

\[
(\text{Actual } FOH - (SR_f) \cdot (SQ)) + (\text{Actual } VOH - (SR_v) \cdot (SQ))
\]

\[
= (V_{fs} + V_p) + (V_{us} + V_e)
\]

\[
= \text{Under/over applied OH}
\]

2.5 Example

Standard variable overhead rate $= 4.00$ per $DLH$

Standard $DL = 0.5$ $DLH$ per unit

Budgeted fixed overhead $= 40,000$

Denominator level $= 8,000$ $DLH$

Actual output $= 12,000$ units

Actual variable overhead $= 25,000$

Actual fixed overhead $= 50,000$

Actual $DLH = 7,500$

REQUIRED: Compute the different overhead variances.

**Answer:** Variable overhead Spending Variance

\[
V_{vs} = \text{Actual } VOH - (SR_v)(AQ)
\]

\[
= 25,000 - 4.00/\text{hour} \times 7,500 \text{ hours}
\]

\[
= 5,000(F)
\]

Variable overhead Efficiency Variance

\[
V_e = (SR_v)(AQ) - (SR_v)(SQ)
\]

\[
= 4.00/\text{hour} \times 7,500 \text{ hours} - 4.00/\text{hour} \times 6,000 \text{ hours}
\]

\[
= 6,000(U)
\]
Fixed overhead Spending Variance

\[ V_{fs} = \text{Actual FOH} - \text{Budget FOH} \]
\[ = \$50,000 - \$40,000 \]
\[ = \$10,000(U) \]

Production Volume Variance

\[ V_{pv} = \text{Budget FOH} - (SR_f)(SQ) \]
\[ = \$40,000 - \$5.00/\text{hour} \times 6,000 \text{ hours} \]
\[ = \$10,000 \]

Under/over Applied overhead

\[ = \text{Actual OH} - (SR_{v+f})(SQ) \]
\[ = \$25,000 + \$50,000 - (\$4.00 + \$5.00)/\text{hour} \times 6,000 \text{ hours} \]
\[ = \$21,000 \]

3. Journal Entries for Overhead Cost

3.1 Variable Overhead

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<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Applied overhead</td>
<td>24,000</td>
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<tr>
<td>VOH eff. variance</td>
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<td>overhead control</td>
<td>25,000</td>
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<tr>
<td>VOH spend. variance</td>
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3.2 Fixed Overhead

<table>
<thead>
<tr>
<th>Description</th>
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<tbody>
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<td>Applied overhead</td>
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<tr>
<td>FOH spend. variance</td>
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<tr>
<td>Prod. Volume variance</td>
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<tr>
<td>overhead control</td>
<td>50,000</td>
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</table>

At the end of the period the overhead variances are closed to cost of goods or prorated to inventories.
When the variances resulting from the standard costing accounting system are relatively small, they can be closed to cost of goods sold at the end of the accounting period. In some cases these variances are significant and closing them to cost of goods sold could materially misrepresent income. External reporting requirements (i.e., the need to prepare financial statements in accordance with generally accepted accounting principles for external users) may dictate that the variances be prorated to all affected inventory accounts in addition to cost of goods sold.