



Standard Costs – Overview

1. What are standard Costs.
2. Why do we set standard costs?
3. How do we set the standards?
4. Calculating Variances: DM and DL
 - Disaggregating variances into price and volume.
 - Difference between labor and direct materials.
 - How do we use variances in evaluating performance?
5. Calculating Overhead variances.
6. The incentives created when Standard cost systems are implemented



Standard Costs

What are standard Costs?

Standard costs are the expected costs of manufacturing the product.

Standard Direct Labor Costs = Expected wage rate X Expected number of hours

Standard Direct Materials cost = Expected cost of raw materials X Expected number of units of raw material.

Standard overhead costs = Expected fixed OH + Expected Variable Overhead X Expected number of units to be produced.



Standard Costs

What is a standard Cost system?

A standard cost system is a method of setting cost targets and evaluating performance.

Targets or expected costs are set based on a variety of criteria, and actual performance relative to expected targets is measured.

Significant differences between expectations and actual results are investigated.

Consistent with the themes developed throughout this class, standard cost systems are a means of helping managers with decision making and control.



Standard Costs

Target Costing

1. The market place determines the selling price of the future product
2. The company determines the profit margin they desire to achieve on this product.
3. The difference between the selling price and the profit margin is the target cost



Standard Costs

Why use a standard cost system?

1. Standards are important for decision making
 - How we produce our product.
 - How we price our product.
 - Contract billing
2. Monitor manufacturing
 - Large variances may indicative of problems in production.
3. Performance measurement
 - Deviations between actual and standards are often used as measures of a manager's performance
 - Who sets the standard?



Standard Costs

How do we set the standards?

Theoretically the standard should be the expected cost of producing the product.

General practices:

1. Prior years performance
2. Expected future performance under normal operating conditions.
3. Optimistic (Motivator)



Standard Costs

Important considerations in setting standards:

1. Why are senior managers using standards?
 - Pricing
 - Performance measurement
 - Production decisions
2. What happens if managers fail to meet the standards?
3. Standards are supposed to represent the opportunity cost of production.



Standard Costs

Consider the following information on Beer manufacturing:

Expected DM and DL for producing 1000 gallons of beer			
	Standard Quantity	Standard Price	Total
Raw Materials:			
Wheat	100 lbs	\$50.00 per pound	5000
Hops	200 lbs	\$50.00 per pound	10000
Barley	200 lbs	\$50.00 per pound	10000
Direct Labor	500 hours	\$20.00 per hour	10000
Total			35,000



Standard Costs

Actual results associated with the purchase of 1000 gallons of beer				
	Quantity Purchased	Quantity used in Production	Materials and labor price	Total
Raw Materials:				
Wheat	100 lbs	100 lbs	\$55.00 per pound	5500
Hops	300 lbs	150 lbs	\$50.00 per pound	7500
Barley	500 lbs	250 lbs	\$40.00 per pound	10000
Direct Labor		550 hours	\$22.00 per hour	12100
Total				35100



Standard Costs

Raw Material Price Variance:

Raw Materials	Actual price	Standard Price	Variance	Quantity Purchased	Total Variance
Wheat	?	?	?	? lbs	?
Hops	?	?	?	? lbs	?
Barley	?	?	?	? lbs	?



Standard Costs

Raw Material Quantity Variance:

Raw Materials	Quantity Used	Standard Quantity	Variance	Standard Price	Total Variance
Wheat	? lbs	? lbs	?	?	?
Hops	? lbs	? lbs	?	?	?
Barley	? lbs	? lbs	?	?	?



Standard Costs

What do we do with the raw materials price variance?

Who do we hold responsible?

What do we do with the raw materials quantity variance?

Who do we hold responsible?



Standard Costs

Direct Labor Wage Variance:

	Actual price	Standard Price	Variance	Actual Hours	Total Variance
Direct Labor	22.00	20.00	2.00	550	\$1100.00

There is a \$1100 unfavorable wage variance



Standard Costs

Direct Labor Efficiency Variance:

	Actual Hours	Standard Hours	Variance	Standard rate	Total Variance
Direct Labor	550	500	50	20	\$1000.00

There is a \$1000 unfavorable Efficiency variance



Arrow Industries (problem 12-3)

See the exercise “Arrow Industries”: Problem 12-3 in
Zimmerman, Jerold L. *Accounting for Decision Making and
Control (4th Edition)*. McGraw-Hill/Irwin, 2002, pp 624-5.



Howard Binding (Problem 12-16)

See the exercise “Howard Binding”: Problem 12-16 in
Zimmerman, Jerold L. *Accounting for Decision Making and
Control (4th Edition)*. McGraw-Hill/Irwin, 2002, pp 630.



Standard Costs

There are three types of overhead variances that are commonly computed in standard cost systems. Before we describe each of these variances we need to do a brief review on overhead.

1. Overhead consists of both fixed costs and variable costs.
2. Overhead is allocated to the product using an activity base.

Thus overhead variances can occur for three reasons

1. the activity base estimate is different than the actual activity base.
2. The amount spent for fixed overhead differs from the standard.
3. The amount spent on variable overhead (the rate per unit) differs from the standard.



Standard Costs

Overhead spending variance

This variance is designed to measure how much overhead was actually incurred compared to the overhead that should have been incurred at the actual volume for the activity base.

Spending variance = Actual overhead – budgeted fixed costs – budgeted variable overhead allocation rate * actual activity base.



Standard Costs

Overhead efficiency variance

This variance is a measure of the effect of the difference in the amount of an activity base incurred compared to the expected amount of the activity base.

Using additional machine hours or direct labor hours causes additional variable overhead

Efficiency variance = Variable overhead allocation rate * (actual activity base – budgeted activity base)



Western Sugar (Problem 13-9)

See the exercise “Western Sugar”: Problem 13-9 in Zimmerman, Jerold L. *Accounting for Decision Making and Control* (4th Edition). McGraw-Hill/Irwin, 2002, pp 660-1.



Standard Costs

Overhead volume variance

The overhead volume variance measures the cost or benefits of using less or more than expected capacity.

$$\text{Volume Variance} = \text{Fixed Overhead} \frac{*(\text{Budgeted volume} - \text{actual volume})}{\text{budgeted volume}}$$

If budgeted volume = actual volume, then you have derived no extra benefits or costs associated with capacity.

When budgeted volume is less than expected volume, then the fixed costs associated with providing capacity are greater than expectations



Standard Costs

When standards are used to measure performance, then the manager has an incentive to insure production costs come in below standards. Consider the following good and bad incentives:

1. Direct Material Price standards create the incentive to purchase materials in large volume to get price discounts.
2. Direct Material Price standards create the incentive to reduce the quality of the material purchased.
3. Standards create the incentive for cross monitoring. When managers are held responsible for costs that are outside of their control, they will monitor other managers to ensure they meet standards.
4. Managers also have the incentive to control costs so long as they do not exceed the standard. No incentive to reduce costs below standard.



Standard Costs

What controls can you implement to discourage the harmful incentives and encourage the productive incentives?

Just-in-time inventory

System of Quality Control

Engineering specifications

Controllability of Costs

Non-linear reward system for cost reduction.



Activity Based Costing

How do we use Activity Based Costing?

1. Costs are accumulated in activity centers (a.k.a. Cost Centers such as order processing or special components)
2. Managers select an activity base for the center to apply the cost to the product.
 - Multiple cost drivers in the firm
 - Use non-financial measures to reduce the tax on production activities.
 - Four Basic types of Cost Drivers:
 1. Unit level
 2. Batch Level
 3. Product Level
 4. Production Sustaining Costs
3. Costs are allocated to the product as the product passes through the activity center.



Activity Based Costing

What are the benefits of using Activity Based Costing Systems?

1. More costs are traced to the product.
2. Activity Based Costing Requires managers to obtain a better understanding of:
 - How costs are consumed by individual products.
 - The different activities that produce products.
 - The indirect costs associated with these activities.
 - How indirect costs relate to cost drivers.
3. Product costs are more accurate.

Proponents argue that having more accurate costs will help in decision making



Activity Based Costing

Key Points regarding Activity Based Costing:

1. Useful for developing a more accurate measure of the cost of multiple products with different levels of manufacturing sophistication and different volumes of production.
2. Managers must recognize that overhead varies by factors other than volume of production for the product.
3. The managers ability to successfully identify these cost drivers will ultimately determine the usefulness of an ABC costing system.



Activity Based Costing

What are the costs of implementing an Activity Based Cost system?

1. Updating the accounting system and maintaining an ABC system requires additional time and money.
2. Managers select cost drivers in their activity centers. There is a tradeoff between decision making and control.
3. While ABC systems may more accurately measure costs, they ignore the benefits of a multi-product production strategy.
4. Generally ABC system demonstrate that low volume products are more costly to produce than high volume products. This is a very costly method to derive this result.