

ACCT 102 - Professor Johnson
Lecture Notes – Chapter 17: ACTIVITY-BASED COSTING AND ANALYSIS

ASSIGNING OVERHEAD COSTS

Background

In Chapter 14, we learned that product costs consist of direct materials, direct labor, and factory overhead. We also understood that direct materials are assigned to product costs via the materials requisition form, and direct labor is allocated to product costs using time tickets. Direct material and direct labor costs are easily traceable to these source documents, so accuracy in assigning these costs is not difficult to achieve.

However, factory overhead cannot be allocated to products using source documents. We must use an allocation system to assign overhead costs, such as factory maintenance and factory supervisors' salaries, to products.

As factories become more and more mechanized, factory overhead becomes a larger portion of product costs. As a result, assigning factory overhead to individual products manufactured becomes more important. This chapter introduces three methods of allocating overhead:

1. The single plantwide overhead rate method
2. The departmental overhead rate method
3. The activity-based costing (“ABC”) method.

Why is this important?

Most companies produce more than one product. An important managerial accounting function is to accurately allocate direct materials, direct labor, and factory overhead costs to each product so that the cost of each product is available. Management can then determine the gross profit per product, and use this cost data to set appropriate selling prices for each product. If the product costs are not allocated accurately, the gross profit for each product will be incorrect, and management may set inappropriate selling prices.

Plantwide Overhead Rate Method

The plantwide overhead rate method is practical when (1) overhead costs are closely related to production volume, or (2) a company produces only one product. The plantwide method is applied as follows:

1. Total budgeted overhead costs are combined into one overhead cost pool.
2. Next, the cost pool is divided by the chosen allocation base, such as total direct labor hours, to arrive at a single plant wide allocation rate.
3. Finally, this rate is applied to assign costs to all products.

The advantages of using the plantwide overhead rate method are:

- The information necessary is readily available
- Its implementation is simple
- It is sufficient to meet financial accounting requirements.

Here is a guided example illustrating use of the plantwide overhead rate method:

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However, for a company that makes more than one product, or whose factory overhead costs are not related to production volume, the plantwide overhead rate method is the least accurate and may result in over or under-assignment of factory overhead costs to individual products. This is known as *product cost distortion*. Product cost distortion can lead to inappropriate selling prices and decreased company profitability.

Departmental Overhead Rate Method

The departmental overhead rate method results in a better allocation of factory overhead costs to departments when overhead resources are consumed in substantially different ways.

Its calculations involve two stages:

1. First stage—overhead costs are determined separately for each production department.
2. Second stage—each department determines an allocation base, such as machine hours or direct labor hours. An overhead rate is then computed for each production department. This overhead rate is used to allocate factory overhead costs to products passing through that department.

While the departmental overhead rate method is more accurate than the plant wide overhead rate method, it has limitations that may result in product cost distortions. Different products within the department may differ in batch size and complexity. Additionally, significant overhead costs such as machine setup costs and engineering modifications may not be affected by factors such as machine hours.

What follows is a guided example comparing use of the single plantwide overhead rate method and the departmental overhead rate method:

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Activity-Based Costing Rates and Methods

ABC attempts to more accurately assign overhead costs by focusing on *activities* that cause factory overhead costs to increase. Examples of such activities are machine setup costs, cutting parts, receiving shipment, and sampling products for quality control purposes. These activities are then matched with the activity that causes the cost to increase (the activity driver). The costs of these activities are often driven by activities other than direct labor hours or machine hours.

For example, quality control costs are driven by the number of product lots produced. So, a product with more lots produced should bear more of the quality control costs.

Engineering design modifications are costly, as engineers tend to be higher paid than most factory employees. The cost of engineering design modifications are driven by the number change requests. A standardized product will require few change requests, where a product that is customized may require several change requests. So, a product with more change requests should be allocated more of the engineering design modification costs.

ABC accumulates overhead costs into activity pools and then allocates those costs to products using activity rates in four steps.

- A. Step one: Identify activities and cost pools. Activities causing overhead cost are typically separated into four levels reflecting control: (1) unit level activities are performed on each product unit, (2) batch level activities are performed only on each batch or group of units, (3) product level activities are performed on each product line independent of the number of units or batches, and (4) facility level activities are performed to sustain facility capacity as a whole.
- B. Step 2: Trace overhead costs to cost pools. Look for costs that are caused by the same activities within each activity level. Pool costs that are related to the same driver.
- C. Step 3: Determine activity rate. Proper determination of activity rates depends on proper identification of the cost driver within each pool and proper measures of activities. To compute the activity rate, total cost in an activity pool is divided by the measure of the activity.
- D. Step 4: Assign overhead costs to cost objects. Overhead costs in each activity cost pool are allocated to product lines and then divided by the number of units of that product line to arrive at overhead cost per product unit.

Here is a guided example which illustrates using ABC to allocate overhead costs:

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What follows is a guided example using ABC to compute activity rates and overhead cost allocations for two different products. Then, the total cost per product, including direct material and direct labor costs, is calculated. Finally, the profit per product is calculated.

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Assessing Activity-Based Costing

A. Advantages of Activity-Based Costing

1. More accurate overhead cost allocation because there are more cost pools, the costs in each pool are more similar, and allocation is based on activities that cause overhead costs.
2. More effective overhead cost control by focusing on processes or activities.
3. Focus on relevant factors by assigning costs to any cost object that is of interest to management.
4. Better management of activities by helping managers identify the causes of costs and the activities driving them.

B. Disadvantages of Activity-Based Costing

1. ABC is not easy to implement and maintain. ABC requires management commitment and financial resources.
2. Uncertainty with decisions may remain and management must interpret ABC data with caution in making managerial decisions.