

Activity-Based Costing

Cost Pools

As we mentioned in Chapter 3, in a manufacturing situation, there are three components to cost:

- Direct Labor,
- Direct Materials, and
- Manufacturing Overhead.

As noted previously, it is relatively easy to allocate Direct Labor and Direct Materials to the products produced, but it is difficult to allocate Manufacturing Overhead costs. Because of this, we have Normal Costing and the allocation of Manufacturing Overhead using Predetermined Overhead Rates.

In Chapter 3, we used a single, Predetermined Overhead Rate to allocate the Manufacturing Overhead costs to the products being produced. If all of the products are similar, this approach may produce a fairly accurate allocation of Manufacturing Overhead.

On the other hand, if you have widely diversified product lines and production operations, then a Plant-Wide Application Rate may not be very accurate. You may find that some products are being under-costed and others are being over-costed. In this case, you might obtain more accuracy in the allocation of Manufacturing Overhead to the units that generated it by using more than one overhead cost pools. The number of cost pools to use always involves a cost-benefit analysis, because of the additional record keeping involved.

Why should you care whether your products being over-costed or under-costed? Having more accurate cost information can lead to an improvement in your bidding process. If you base your customer bid prices on your costs, you could charge the wrong amounts. If you charge more than your competitors, then you will lose business. If you charge less than your competitors, you will get more business, but your profits will be less than you expected because you are not charging your customers enough.

Having more accurate cost information could improve a firm's product mix. Even if your prices are not based on your costs (e.g., set by the free market), you still may have problems. For example, you may not actively go after certain business because you don't think it is very profitable when that business actually is profitable. Similarly, you may go after other business that you believe is very profitable, when it is not profitable or less profitable than you believe.

Another way that over-costing or under-costing can affect a business is in the decision whether to offer a product or discontinue a product. Having misinformation on the

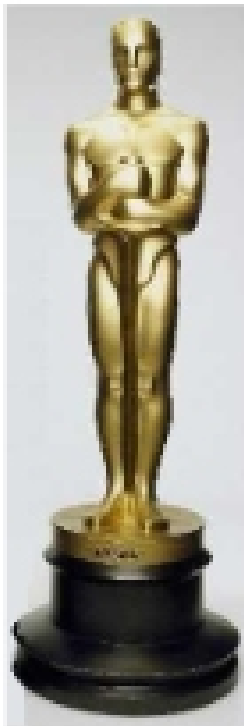
profitability of a product may cause a product to be improperly discontinued (or retained when it should be discontinued). For example, a firm may incorrectly outsource the manufacture of a part or product because it wrongly believes that it is cheaper to purchase the part or product rather than manufacture it.

Department Allocations of Overhead

A simple way to have multiple cost pools is to pool Manufacturing Overhead costs separately by production department. This is especially true if the departments are very different (e.g., one is labor intensive, and the other is automated).

You calculate a separate Predetermined Overhead Rate for each department's Manufacturing Overhead. When using Departmental Application Rates, it is possible to use different Cost Drivers for different departments.

Departmental Application Rate Example



Ajax Inc. produces standard model trophies, as well as, custom designed trophies. Ajax's plant has two production departments: (i) the Design Department and (ii) the Manufacturing Department. The standard model trophies are made in the Manufacturing Department without any Design Department services. Custom designed trophies are designed in the Design Department and then manufactured in the Manufacturing Department.

The Design Department uses 10,000 Direct Labor Hours, and the Manufacturing Department uses 90,000 Direct Labor Hours. Ajax currently allocates its Manufacturing Overhead using one Plant-Wide Application Rate using Direct Labor Hours as the Cost Driver.

The Manufacturing Overhead for the plant is as follows:

<u>Indirect Costs</u>	<u>Design</u>	<u>Manufacturing</u>	<u>Total</u>
Rent	\$20,000	\$ 80,000	\$100,000
Depreciation	---	200,000	200,000
Supervisors	50,000	50,000	100,000
Maintenance	<u>20,000</u>	<u>80,000</u>	<u>100,000</u>
Total	<u>\$90,000</u>	<u>\$410,000</u>	<u>\$500,000</u>

Recently, Ajax bid on two different jobs. Job 1 involves a unique product design, and it requires 20 Direct Labor Hours of Design services and 20 Direct Labor Hours of Manufacturing services. Job 2 involves a standard model, and it involves no Design services. Job 2 only requires 20 Direct Labor Hours of Manufacturing services. Both jobs require \$200 of Direct Materials, and the Direct Labor Cost is \$5 per Direct Labor Hour. Ajax prices its products using a cost plus 20% profit margin method.

Even though Ajax's costs are no different than its competitors, the customer, who received the Job 2 bid, asked Ajax to lower its bid stating that Ajax's competitors charged lower prices for similar work. On the other hand, the customer, who received the Job 1 bid, did not hesitate to accept that bid.

Plant-Wide Application Rate

Ajax's current Plant-Wide Application Rate is calculated as follows:

$$\$500,000 / 100,000 = \$5 \text{ per Direct Labor Hour}$$

Using this application rate resulted in the following Manufacturing Overhead cost calculation for Jobs 1 and 2:

$$\begin{aligned} \text{Job 1: } & 40 \text{ hours} \times \$5 \text{ per DLH} = \$200. \\ \text{Job 2: } & 20 \text{ hours} \times \$5 \text{ per DLH} = \$100. \end{aligned}$$

Using these costs, Ajax bid the two jobs as follows:

	<u>Job 1</u>	<u>Job 2</u>
Direct Materials	\$200	\$200
Direct Labor	\$200	\$100
Manufacturing Overhead	<u>\$200</u>	<u>\$100</u>
Total Cost	\$600	\$400
Profit	<u>\$120</u>	<u>\$80</u>
Price Bid	<u>\$720</u>	<u>\$480</u>

Departmental Application Rates

If Ajax were to use separate Departmental Application Rates, the following rates would be used:

$$\begin{aligned} \text{Design Department:} & \quad \$90,000/10,000 = \$9.00 \text{ per DLH} \\ \text{Manufacturing Department:} & \quad \$410,000/90,000 = \$4.55 \text{ per DLH} \end{aligned}$$

If Ajax had used Departmental Application Rates to calculate the Manufacturing Overhead costs of Jobs 1 and 2 the following costs would have resulted:

	<u>Job 1</u>	<u>Job 2</u>
Design Department	20 hours x \$9 = \$180	
Manufacturing Department	20 hours x \$4.55 = <u>\$91</u>	20 hours x \$4.55 = <u>\$91</u>
Total Overhead	\$271	\$91