Introduction To Cost Accounting

- 15.501/516 Accounting
- Spring 2004

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- Sloan School of Management
- Massachusetts Institute of Technology
- April 28, 2004

Outline

- Overview of managerial accounting issues
  - Brief discussion of performance evaluation
- Cost accounting terminology
- Cost behavior
- Product costing: traditional method
- Product costing: activity based costing (ABC)

Managerial Accounting

- What are the Goals?
- Performance Evaluation (Control)
- Costing
- Decision Making
- Financial Reporting
- Pricing
- Production
- Make or Buy
- Product Mix
- Change Methods
- Discontinue

Page 1
A few words about Performance Evaluation

- “You get what you pay for”
- Strongly recommended reading: “On the folly of rewarding A, while hoping for B”
  - Doctors and litigation – penalty for type II errors.
  - Where else is this evident? Auditors
  - Litigation risk induced conservatism
  - Insurance company – reward for attendance but hoping for performance.
  - Financial markets – focus on quarterly earnings while hoping for long-term growth in profitability

Basic Cost Terms: Cost Objects and Drivers

**Cost**
- A sacrifice of resources. Distinguish from “expense.”

**Cost Object**
- Any activity or item for which a separate measurement of costs is desired.

**Cost Driver**
- Any factor whose change “causes” a change in the total cost of a related cost object. Note: Cost drivers can be factors other than volume.

Basic Cost Terms: Direct and Indirect Costs

**Direct Costs**
- Costs that can be traced to a given cost object (product, department, etc.) in an economically feasible way.

**Indirect Costs**
- Costs that cannot be traced to a given cost object in an economically feasible way. These costs are also known as “overhead”.

**Cost Assignment**
- Direct costs are traced to a cost object.
- Indirect costs are allocated or assigned to a cost object.
Basic Cost Terms:
Product and Period Costs

Product Costs
- Costs that “attach” to the units that are produced (i.e., manufacturing costs) and are not reported as expenses until the goods are sold.

Period Costs
- Costs that must be charged against income in the period incurred and cannot be inventoried (e.g., selling and administrative expenses).

Unit Costs
- Total cost of units divided by units produced.

Cost Behavior

Variable Costs
- Costs that change directly in proportion to changes in the related cost driver.

Fixed Costs
- Costs that remain unchanged for a given time period regardless of changes in the related cost driver.

Other Common Functions for Cost Behavior
- Semi-variable costs (part variable and part fixed)
- Step costs (aka semi-fixed costs)

Main Assumptions Needed to Define Fixed and Variable Costs
- Cost object, Time span, Linear functional form
- Relevant range: the band of cost driver activity in which a specific relationship between a cost and a driver holds.

Basic Cost Terms

- Product costs can be Direct or Indirect (Overhead)
- Not all Direct costs are variable
  - The depreciation of a special piece of equipment bought to manufacture a single product line.
- Not all Overheads are fixed
  - Processing of raw material purchase orders
  - Electricity used in operating production equipment.
The “Ins” of Inventory Accounting

➤ What costs are assigned to inventory as products are manufactured?
➤ GAAP requires Full Absorption Costing: the products fully absorb all manufacturing costs, including:
  • Variable manufacturing costs: e.g., direct material
  • Fixed manufacturing costs: e.g., building depreciation
➤ Results in unitizing fixed costs: convert total fixed costs (TFC) to a unit cost by allocating TFC to the units produced.

The “Ins” and “Outs” of Inventory Accounting

- Raw Materials Inventory
- Work-in-process Inventory
- Finished Goods Inventory
- Non-manufacturing (period) costs
- Direct Labor
- Transportation, Set-up, etc
- Indirect labor, Indirect materials, Depreciation
- Cost of Goods Sold
- US, Retained Earnings

Examples of Product Costing

➤ Electron, Inc. produces 10,000 calculators in one month.
➤ Variable manufacturing costs are:
  • $6/unit for material,
  • $1/unit for direct labor, and
  • $1/unit for variable overhead.
➤ Fixed manufacturing overhead is $50,000/month.
➤ Unit costs are $8 (variable) + $50,000/10,000 (fixed) or $13/unit.
➤ How do these costs flow through Inventory Accounts?
Product Costing Events

11/1: Purchase and receive $60,000 of material (Nov. supply)
11/2: Requisition ½ of materials to the factory floor ($30,000)
11/5: Apply labor to the materials ($5,000)
11/7: Recognize depreciation expense for the month ($50,000)
11/8: Apply variable OH to the materials ($5,000)
11/9: Transfer 5,000 completed calculators from WIP to FG Inventory
11/10: Ship 2,000 completed calculators to customer

How do Costs Flow through Inventory Accounts?

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Cost Flow Through Inventories

- In particular, note the following
- On direct labor, the accounting entry is
  - Dr WIP 5
  - Cr Wages Payable 5
- Not
  - Dr Salaries Expense 5
  - Cr Wages Payable 5
- Similarly, on depreciation for manufacturing facility
  - Dr WIP 50
  - Cr Accumulated Depreciation 50
- Not
  - Dr Depreciation Expense 50
  - Cr Accumulated Depreciation 50

Traditional Costing System

<table>
<thead>
<tr>
<th>Direct Costs</th>
<th>Overhead Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Labor</td>
<td>Indirect Labor</td>
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<tr>
<td>Direct Materials</td>
<td>Indirect Materials</td>
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<td></td>
<td>Depreciation</td>
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</table>

Product Costs

- Traced directly
- Traced using allocation base eg direct labor hrs, machine hrs

Examples of Overhead Activities

- Purchase order processing
- Receiving/Inventorizing materials
- Inspecting materials
- Processing accounts payable
- Facility maintenance
- Scheduling production
- Customer complaints
- Quality inspection/testing
**Activity-Based Costing System**

- **Direct Costs**
  - Direct Labor
  - Direct Materials

- **Overhead Costs**
  - Indirect Labor
  - Indirect Materials
  - Depreciation

**Activities that drive overhead**

- Product Costs

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**Typical Activity Cost Drivers**

- Number of alteration notices per product
- Units produced
- Number of receipts for materials/parts
- Stockroom transfers
- Direct labor hours
- Set-up hours
- Inspection hours
- Facility hours
- Number of customer complaints

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**Cost Allocation Example**

Dialglow Corporation manufactures travel clocks and watches. Overhead costs are currently allocated using direct labor hours, but the controller has recommended an activity-based costing system using the following data:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cost Driver</th>
<th>Cost Driver Details</th>
<th>Clocks</th>
<th>Watches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Setup</td>
<td>$120,000</td>
<td>No. of setups</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Material Handling &amp; Requisition</td>
<td>30,000</td>
<td>No. of parts</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>Packaging &amp; Shipping</td>
<td>60,000</td>
<td>#Units Shipped</td>
<td>45,000</td>
<td>75,000</td>
</tr>
<tr>
<td>Total Overhead</td>
<td>$210,000</td>
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<tr>
<td>Direct labor hours</td>
<td>140,000</td>
<td></td>
<td>35,000</td>
<td>105,000</td>
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</tbody>
</table>
Using Traditional Costing System

Allocate Total OH based on labor hours
(35,000 hours for travel clocks; 105,000 hours for watches.)

OH Rate:
$210,000 / 140,000 hours = $1.50/hour

OH cost per Travel Clock:
($1.50/hr * 35,000 hrs) / 45,000 units = $1.167

OH cost per Watch:
($1.50/hr * 105,000 hrs) / 75,000 units = $2.10

Using ABC

Allocation of:
Production Setup Costs: $120,000 / (10+15) setups = $4,800/setup
Material Handling Costs: $30,000 / (18+36) part numbers = $555.56/part
Packing/shipping Costs: $60,000 / (45,000+75,000) units = $0.50/unit shipped

<table>
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<tbody>
<tr>
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Summary

- Managerial accounting focuses on decision making and control:
  - Decision making: initiating and implementing decisions.
  - Control: ratifying and monitoring decisions.
  - Important: Organizational structure of firm should separate both functions.

- Characteristics of good internal accounting system:
  - Provide information necessary to identify most profitable products.
  - Provide information necessary to identify production inefficiencies to ensure production at minimum cost.
  - Combine measurement of performance with evaluation of performance to create incentives for managers that maximize firm value.