

THIRD EDITION

# **CORNERSTONES** *of* COST MANAGEMENT

**HANSEN ♦ MOWEN**

THIRD EDITION

# CORNERSTONES OF COST MANAGEMENT

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**Cornerstones of Cost Management,  
Third Edition**  
**Don R. Hansen, Maryanne M. Mowen**

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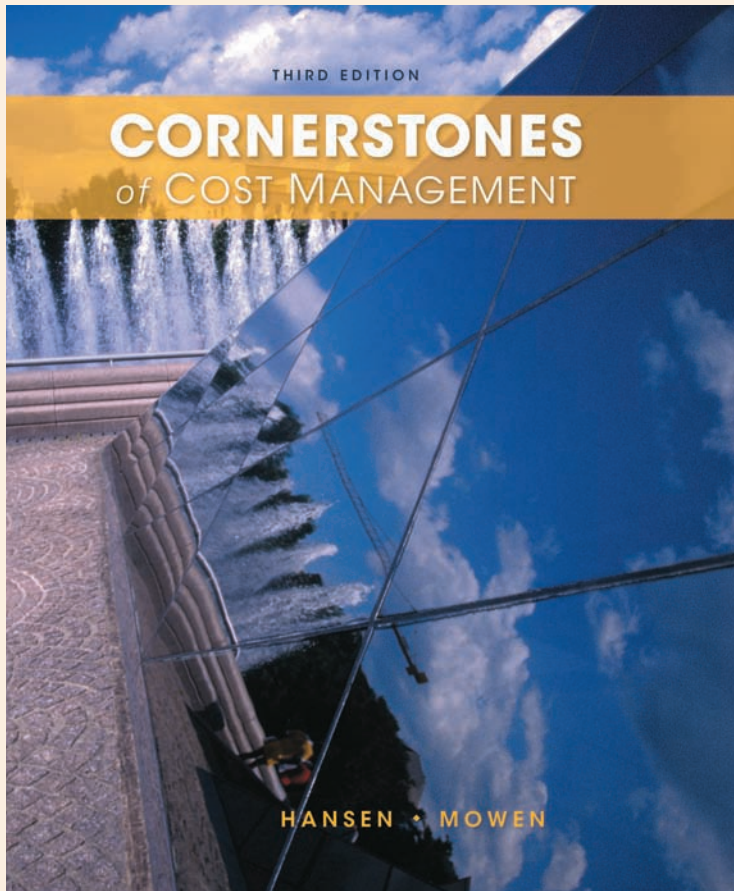


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# GET THERE WITH CORNERSTONES



◀ **Cornerstones of Cost Management, 3e** formerly titled *Cost Management: Accounting and Control*, brings accounting preparation to a new level. Don Hansen and Maryanne Mowen are able to provide the most up-to-date and thorough coverage of cost management topics through the unique Cornerstones approach. The approach provides students with a solid foundation in cost management concepts, allowing them to build on that knowledge to get to a higher understanding of cost management.

The Cornerstone pedagogy incorporates examples throughout each chapter to provide students with step-by-step coverage of the “How, Why, and What Ifs” of solving and mastering basic cost management concepts.

Students will better understand the meaning behind the numbers, be prepared for a successful future in business, and obtain a true grasp of cost concepts through Cornerstone examples and digital solutions.

## Superior Digital Solution

*Cornerstones of Cost Management, 3e* works hand-in-hand with CengageNOW—a powerful course management and online homework tool—to provide instructors and students with an outcomes-driven learning experience.

CengageNOW provides students with feedback when they need it, multimedia resources that support their understanding of core concepts, and provides instructors with a tool to easily manage students, as well as auto-graded assignments.

## Understanding the Meaning Behind the Numbers

Through the unique Cornerstones learning system, students are encouraged to not only understand the calculations involved in cost accounting, but also the conceptual meaning behind the numbers, and how decisions change as information changes. Each Cornerstone includes five parts: Information, Why, Required, What If, and Solution.

## Creating a Successful Future in Business

With the Cornerstones approach to learning, students are given the tools to bring their knowledge full-circle and practice making good business decisions. Students begin with the foundations and then are asked to use judgement by applying accounting concepts in the real world. Also included is a special homework section to prepare students for the CPA Exam.

**CENGAGENOW Superior Digital Solution**  
*CengageNOW: Providing a Better Learning Experience from Motivation to Application to Mastery*

**Motivation**

Motivate and familiarize students with key concepts so they can be prepared for class discussion.

Engage students with real-world videos and accompanying questions to get your students thinking about the topic prior to lecture.

- **Experience Accounting Videos** demonstrate how today’s top companies incorporate costing techniques to fuel better business performance. The videos offer another way to engage students and bring costing concepts to life!

When students begin the Cost course, it’s possible that they may have forgotten or had limited exposure to managerial concepts in past courses. The *Cost Accounting Bootcamp* was created to address this learning curve.

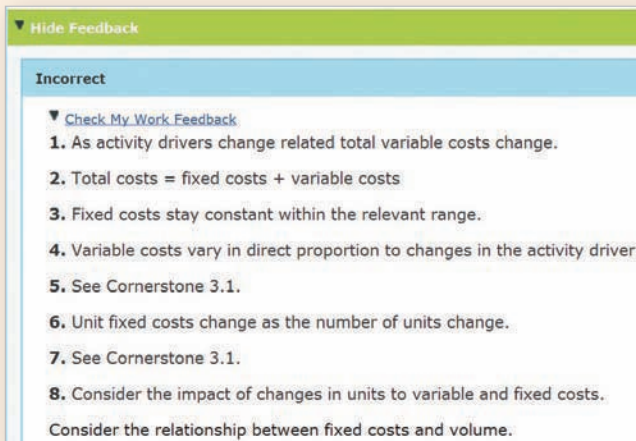
- **Cost Accounting Bootcamp** is a set of assignments and problem demonstrations designed to identify and fill knowledge gaps before getting deep into the cost course. CengageNOW is designed to allow instructors to assign common managerial exercises for practice or homework at the beginning of the course. The Bootcamp can be used as a ‘refresher’ for students who may have not just taken the managerial course or have knowledge gaps that may hamper their ability to succeed in the Cost course.



**Application**

Students sometimes need additional help as they work to apply course concepts. CengageNOW provides robust feedback at key points to keep students on track.

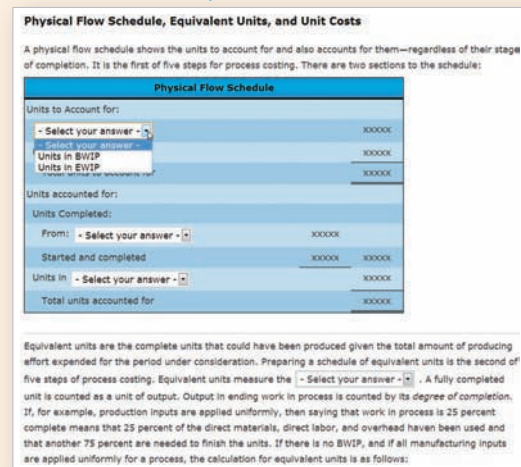
- **Robust Feedback** provides immediate feedback so students can learn as they go. Written guidance is offered before the student submits the problem for grading by clicking the **Check My Work** button. **Post-Submission feedback** is also provided to enable students to receive source calculations alongside the solution so that students can better troubleshoot their errors.



Students often do not come to class prepared for the lecture. Instructors can assign *Blueprint Problems* to get students thinking about the material prior to lecture.

- **Blueprint Problems**, created by Don Hansen and Maryanne Mowen specifically for their text, are teaching problems that cover the primary learning objectives and help students understand the fundamental accounting concepts and their associated building blocks—not just memorizing the formulas.

**Blueprint Problem**







## Mastery

Once students are comfortable with applying what they have learned as single concepts, they need to be able to move a step further and make connections between previously learned concepts and understand relationships between multiple topics.

Often times, students have a hard time visualizing interrelationships between core concepts. Instructors can encourage critical thinking skills and conceptual learning by assigning *Analyzing Relationship Problems*.

- **Analyzing Relationship Problems** are included in various chapters and are designed to allow for more student interaction for tougher concepts, such as how relationships work in Cost Volume Profit analysis and Overhead Variances. Drag and drop functionality, and interactive graphing allow for visually appealing assignable problems. Students manipulate different variables to see the impact of changes. ▼

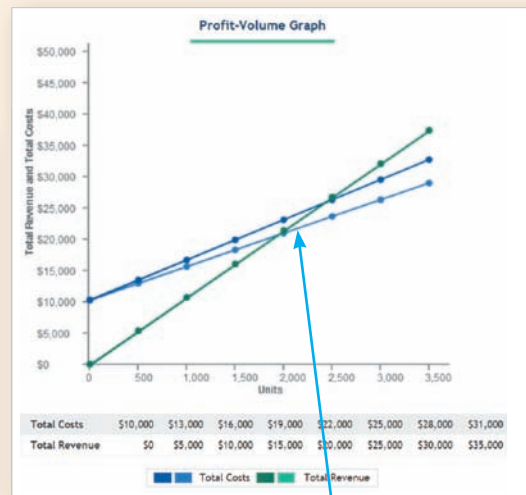
When student moves the slider here

|  |          |                  |
|--|----------|------------------|
|  | \$10.00  | Unit Sales Price |
|  | \$6.00   | Unit Costs       |
|  | \$10,000 | Fixed Costs      |

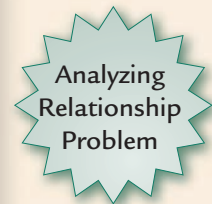
  

| Units | Fixed Costs | Unit Costs | Total Costs | Total Revenue | Gain or Loss |
|-------|-------------|------------|-------------|---------------|--------------|
| 0     | \$10,000    | \$0        | \$10,000    | \$0           | (\$10,000)   |
| 500   | \$10,000    | \$3,000    | \$13,000    | \$5,000       | (\$8,000)    |
| 1,000 | \$10,000    | \$6,000    | \$16,000    | \$10,000      | (\$6,000)    |
| 1,500 | \$10,000    | \$9,000    | \$19,000    | \$15,000      | (\$4,000)    |
| 2,000 | \$10,000    | \$12,000   | \$22,000    | \$20,000      | (\$2,000)    |
| 2,500 | \$10,000    | \$15,000   | \$25,000    | \$25,000      | \$0          |
| 3,000 | \$10,000    | \$18,000   | \$28,000    | \$30,000      | \$2,000      |
| 3,500 | \$10,000    | \$21,000   | \$31,000    | \$35,000      | \$4,000      |

Costs change here



Line graph changes when costs change



Since many instructors teach the Cost course in different chapter orders, instructors now can assign an *Integrative Problem* that covers two or three of the topics most important to the course.

- **Integrative Problems**, built in CengageNOW, offer a gradable solution for assigning problems that incorporate concepts from multiple chapters to test the student's ability to build upon prior knowledge. Because the topics are presented in different tabs, students can easily navigate from one part of the problem to the next. Alternative versions are available for flexibility in assigning problems. Integrative Problems are important in helping students develop critical decision-making and analytical skills.

## Additional CengageNOW features

- **Outcomes Reporting** to measure student learning and performance. Content is tagged by, learning objectives, level of difficulty, estimated time of completion, Bloom's Taxonomy, AICPA, ACBSP, and other common business program outcomes.
- **Additional Algorithmic Problems** are added to the third addition to allow for greater assignability.
- **And More:**
  - Integrated eBook, Personalized Study Plan and Multimedia Study Tools, Course Management Tools and Flexible Assignment Options, Reporting and Gradebook options, and Test Bank are all available for students and instructors in CengageNOW.



## Understanding the Meaning Behind the Numbers

Where other texts bury their examples in blocks of text, **Cornerstone examples** are easy to find, clear, and consistently formatted to help students digest material better and faster.

The “**Why**” section explains the importance behind each exercise and how the topics fit into the big picture of cost accounting.

The “**What If**” requirement challenges students to consider the implications if a variable or variables were to change. This helps to reinforce the concepts behind the calculations and the impact on decision making, encouraging students to practice judgment as they work.

### The HOW and WHY of Using the Regression Results for Fixed Cost and Variable Rate to Construct and Use a Cost Formula

**Information:**

Anderson Company had 10 months of data on materials handling cost and number of moves, as shown in Cornerstone 3.4. Regression was run on these data and the coefficients shown by the regression program results in Exhibit 3.12 are:

|              |          |
|--------------|----------|
| Intercept    | 854.4994 |
| X variable 1 | 12.39153 |

**Why:**

Regression gives the best linear unbiased estimates of the intercept and slope for a set of data points. These can be used to find the fixed cost and variable rate in a cost scenario, and can be used to predict cost for a given amount of the independent variable.

**Required:**

1. Construct the cost formula for the materials handling activity showing the fixed cost and the variable rate.
2. If Anderson Company estimates that November will have 350 moves, what is the total estimated materials handling cost for that month?
3. *What if* Anderson wants to estimate materials handling cost for the coming year and expects 3,940 moves? What will estimated total materials handling cost be? What is the total fixed materials handling cost? Why doesn't it equal the fixed cost calculated in Requirement 2?



### Cornerstone Exercise 3.5 Using Regression Results to Construct and Apply a Cost

**Formula**

Refer to Cornerstone Exercise 3.4 for data on Dohini Manufacturing Company's purchasing cost and number of purchase orders.

The controller for Dohini Manufacturing ran regression on the data, and the coefficients shown by the regression program are:

|              |  |
|--------------|--|
| Intercept    | 15,021 (rounded to the nearest dollar) |
| X variable 1 | 9.74 (rounded to the nearest cent)     |

**Required:**

1. Construct the cost formula for the purchasing activity showing the fixed cost and the variable rate.
2. If Dohini Manufacturing Company estimates that next month will have 430 purchase orders, what is the total estimated purchasing cost for that month? (Round your answer to the nearest dollar.)
3. *What if* Dohini Manufacturing wants to estimate purchasing cost for the coming year and expects 5,340 purchase orders? What will estimated total purchasing cost be? (Round your answer to the nearest dollar.) What is the total fixed purchasing cost? Why doesn't it equal the fixed cost calculated in Requirement 1?

OBJECTIVE 4

CORNERSTONE 3.5

**Cornerstone Exercises** in the end-of-chapter materials are linked to specific Cornerstone examples in the text, providing valuable references for students as they work. These exercises also include requirements that ask students to consider how their answers will change based on changing variables and encourages higher-order thinking as they complete their homework.

**Exercise 3.22 Multiple Regression**

OBJECTIVE 6

Ginnian and Fitch, a regional accounting firm, performs yearly audits on a number of different for-profit and not-for-profit entities. Two years ago, Luisa Mellina, Ginnian's partner in charge of operations, became concerned about the amount of audit time required by not-for-profit entities. As a result, she instituted a series of training programs focusing on the auditing of not-for-profit entities. Now, she would like to see if the training seemed to work. So, she ran a multiple regression on 22 months of data for Ginnian for three variables: the total monthly cost of audit professional time, the number of not-for-profit audits, and the hours of training in the audit of not-for-profit entities. The following printout was obtained:

| Parameter                       | Estimate | $t$ for $H_0$<br>Parameter = 0 | $Pr >  t $ | Standard Error<br>of Parameter |
|---------------------------------|----------|--------------------------------|------------|--------------------------------|
| Intercept                       | 286,700  | 70.00                          | 0.0001     | 345.00                         |
| Number of not-for-profit audits | 790      | 3.60                           | 0.0050     | 27.45                          |
| Hours of training               | -45.50   | -1.96                          | 0.0250     | 5.13                           |
| $R^2 = 0.79$                    |          |                                |            |                                |
| $S_e = 12,030$                  |          |                                |            |                                |
| Observations: 22                |          |                                |            |                                |

**Required:**

- Write out the cost equation for Ginnian's audit professional time.
- If Ginnian expects to have 9 audits of not-for-profits next month and expects that audit professionals will have a total of 130 hours of not-for-profit training, what is the anticipated cost of professional time?
- Calculate a 99 percent confidence interval for the prediction made in Requirement 2.
- Are the hours spent auditing not-for-profit entities positively or negatively correlated with audit professional costs? Is percentage of experienced team members positively or negatively correlated with audit professional cost?
- What does  $R^2$  mean in this equation? Overall, what is your evaluation of the cost equation that was developed for the cost of audit professionals?

After students "warm up" with Cornerstone exercises, they move on to **more difficult problems and exercises** that cover multiple learning objectives and do not reference the related Cornerstone examples.

OBJECTIVE 2 4 5 **Problem 3.40 Simple and Multiple Regression, Evaluating Reliability of an Equation**

CMA

The Lockit Company manufactures door knobs for residential homes and apartments. Lockit is considering the use of simple (single-driver) and multiple regression analyses to forecast annual sales because previous forecasts have been inaccurate. The new sales forecast will be used to initiate the budgeting process and to identify more completely the underlying process that generates sales.

Larry Husky, the controller of Lockit, has considered many possible independent variables and equations to predict sales and has narrowed his choices to four equations. Husky used annual observations from 20 prior years to estimate each of the four equations.

Following are definitions of the variables used in the four equations and a statistical summary of these equations:

**Statistical Summary of Four Equations**

| Equation | Dependent Variable | Independent Variable (s) | Intercept  | Independent Variable (Rate) | Standard Error | R Square | t-Value |
|----------|--------------------|--------------------------|------------|-----------------------------|----------------|----------|---------|
| 1        | $S_t$              | $S_{t-1}$                | \$ 500,000 | \$ 1.10                     | \$500,000      | 0.94     | 5.50    |
| 2        | $S_t$              | $G_t$                    | 1,000,000  | 0.00001                     | 510,000        | 0.90     | 10.00   |
| 3        | $S_t$              | $G_{t-1}$                | 900,000    | 0.000012                    | 520,000        | 0.81     | 5.00    |
| 4        | $S_t$              | $N_{t-1}$                | 600,000    | 10.00                       | 490,000        | 0.96     |         |
|          |                    | $G_t$                    |            | 0.000002                    |                |          | 4.00    |
|          |                    | $G_{t-1}$                |            | 0.000003                    |                |          | 1.50    |
|          |                    |                          |            |                             |                |          | 3.00    |

- $S_t$  = Forecasted sales in dollars for Lockit in period  $t$
- $S_{t-1}$  = Actual sales in dollars for Lockit in period  $t - 1$
- $G_t$  = Forecasted U.S. gross domestic product in period  $t$
- $G_{t-1}$  = Actual U.S. gross domestic product in period  $t - 1$
- $N_{t-1}$  = Lockit's net income in period  $t - 1$

**Required:**

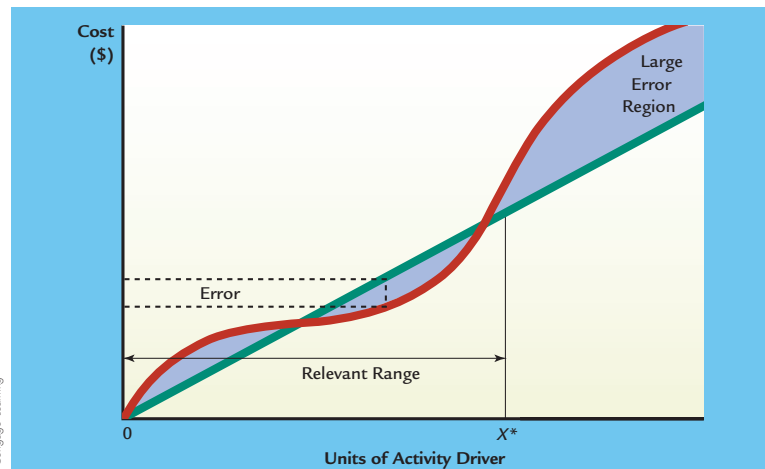
- Write Equations 2 and 4 in the form  $Y = a + bx$ .
- If actual sales are \$1,500,000 in 2013, what would be the forecasted sales for Lockit in 2014?
- Explain why Larry Husky might prefer Equation 3 to Equation 2.
- Explain the advantages and disadvantages of using Equation 4 to forecast sales.

(CMA adapted)


Informative and easy to understand **graphs** and **exhibits** are placed where appropriate throughout the book to explain difficult concepts in a visual way. Analyzing Relationship Problems within CengageNOW allow for student interaction and enhances the learning experience.

**Relevant Range for Variable Costs**

(EXHIBIT 3.4)



## Creating a Successful Future in Business



REAL-WORLD EXAMPLE

The Internet has fundamentally changed the way companies do business with their suppliers and customers. Price competition is severe so firms cannot, typically, succeed using only a low-price strategy. Instead, they use a customer-service strategy. Internet-based companies strive to provide a shopping experience that is user friendly, with an abundance of information tailored to customer needs, and a secure payment system. Ideally, the company provides a seamless interface for customers, taking them from information search, through product/service choice, payment, and post-sale follow-up. Software that tracks ongoing customer preferences is a large part of the enhanced customer shopping experience. *Amazon.com* is an excellent example of this, as it welcomes new and returning customers and makes the shopping experience fun and easy. As a result, "Internet-based firms rely much less on traditional infrastructure assets, such as buildings, and more on computers, specialized software, and intellectual capital that cater to customers in cyberspace." This means that the customer is the appropriate cost object, and activities and drivers that are tied to customer service are important data to Internet-based firms.<sup>1</sup>

**CPA-Type Exercises** – This feature, in each end-of-chapter section, includes exercises taken directly from past CPA Exams to provide examples of what students can expect to encounter on the exam, preparing them for a successful future in accounting.

### MAKING THE CONNECTION

INTEGRATIVE EXERCISES

**Part 1**  
Chapters 1-4

CableTech Bell Corporation (CTB) operates in the telecommunications industry. CTB has two divisions: the Phone Division and the Cable Service Division. The Phone Division manufactures telephones in several plants located in the Midwest. The product lines run from relatively inexpensive touch-tone wall and desk phones to expensive, high-quality cellular phones. CTB also operates a cable TV service in Ohio. The Cable Service Division offers three products: a basic package with 25 channels; an enhanced package, which is the basic package plus 15 additional channels and two movie channels; and a premium package, which is the basic package plus 25 additional channels and three movie channels.

The Cable Service Division reported the following activity for the month of March:

|                 | Basic  | Enhanced | Premium |
|-----------------|--------|----------|---------|
| Sales (units)   | 50,000 | 500,000  | 300,000 |
| Price per unit  | \$16   | \$30     | \$40    |
| Unit costs:     |        |          |         |
| Directly traced | \$ 3   | \$ 5     | \$ 7    |
| Driver traced   | \$ 2   | \$ 4     | \$ 6    |
| Allocated       | \$10   | \$13     | \$15    |

**Real World Data shown in Excel**—Excel is used throughout the text to show students how cost analysis information is used in the real world.

**Real-World Examples** – Integrated throughout chapter content, these examples provide students with context to help them see how concepts apply to actual businesses, strengthening their understanding of why cost concepts are important in the real world.

### CPA-TYPE EXERCISES



**Exercise 3.26**

Starling Co. manufactures one product with a selling price of \$18 and variable cost of \$12. Starling's total annual fixed costs are \$38,400. If operating income last year was \$28,800, what was the number of units Starling sold?

- a. 4,800
- b. 6,400
- c. 5,600
- d. 11,200

**Exercise 3.27** (2009 CPA Exam)

Which of the following costs would decrease if production levels were increased within the relevant range?

- a. total fixed costs
- b. variable costs per unit
- c. total variable costs
- d. fixed costs per unit

**Exercise 3.28** (2009 CPA Exam)

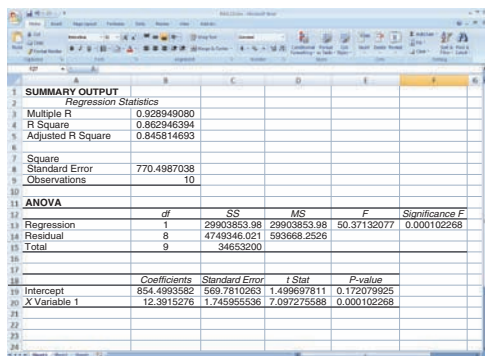
The regression analysis results for ABC Co. are shown as  $y = 90x + 45$ . The standard error ( $S_e$ ) is 30, and coefficient of determination ( $R^2$ ) is 0.81. The budget calls for production of 100 units. What is ABC's estimate of total costs?

- a. \$3,090
- b. \$9,045
- c. \$9,030
- d. \$4,590
- e. \$11,200

**Making the Connection: Integrative Exercises** – These chapter-spanning assignments present opportunities to integrate concepts from several chapters to analyze cost accounting information in a broader context. These exercises are found following Chapters 4, 10, 15, and 20.

(EXHIBIT 3.12)

**Regression Results for Anderson Company's Materials Handling Cost**



| SUMMARY OUTPUT        |             |                |             |             |                |
|-----------------------|-------------|----------------|-------------|-------------|----------------|
| Regression Statistics |             |                |             |             |                |
| Multiple R            | 0.928949090 |                |             |             |                |
| R Square              | 0.862946394 |                |             |             |                |
| Adjusted R Square     | 0.845814693 |                |             |             |                |
| Square                |             |                |             |             |                |
| Standard Error        | 770.4987038 |                |             |             |                |
| Observations          | 10          |                |             |             |                |
| ANOVA                 |             |                |             |             |                |
|                       | df          | SS             | MS          | F           | Significance F |
| Regression            | 1           | 29903853.98    | 29903853.98 | 50.37132077 | 0.000102268    |
| Residual              | 8           | 4749346.021    | 593668.2526 |             |                |
| Total                 | 9           | 34653200       |             |             |                |
| Coefficients          |             |                |             |             |                |
|                       |             | Standard Error | t Stat      | P-value     |                |
| Intercept             | 854.4993582 | 1569.7810263   | 1.498957811 | 0.172079825 |                |
| X Variable 1          | 12.3915276  | 1.745955536    | 7.097275588 | 0.000102268 |                |



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## CHAPTER 1

### Introduction to Cost Management 1

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## CHAPTER

# 1

## Introduction to Cost Management

### FINANCIAL ACCOUNTING VERSUS COST MANAGEMENT: A SYSTEMS FRAMEWORK

A systems framework helps us understand the variety of topics that appear in the field of cost management. It also facilitates our ability to understand the differences between financial accounting and cost management. An **accounting information system** consists of interrelated manual and computer parts and uses processes such as collecting, recording, summarizing, analyzing, and managing data to transform inputs into information that is provided to users.

The accounting information system within an organization has two major subsystems: (1) *the financial accounting information system* and

After studying this chapter, you should be able to:

- 1 Describe cost management and explain how it differs from financial accounting.
- 2 Identify the current factors affecting cost management.
- 3 Describe how management accountants function within an organization.
- 4 Understand the importance of ethical behavior for management accountants.
- 5 Identify the three forms of certification available to internal accountants.

**OBJECTIVE 1**

Describe cost management and explain how it differs from financial accounting.

(2) *the cost management accounting information system*. One of the major differences between the two systems is the targeted user.

## Financial Accounting Information System

The **financial accounting** information system is primarily concerned with producing outputs for external users. It uses well-specified economic events as inputs, and its processes follow certain rules and conventions. For financial accounting, the nature of the inputs and the rules and conventions governing processes are defined by the Securities and Exchange Commission (SEC) and the Financial Accounting Standards Board (FASB). Among its outputs are financial statements such as the balance sheet, income statement, and statement of cash flows for external users (investors, creditors, government agencies, and other outside users). Financial accounting information is used for investment decisions, stewardship evaluation, activity monitoring, and regulatory measures.

## The Cost Management Information System

The **cost management** information system is primarily concerned with producing outputs for internal users using inputs and processes needed to satisfy management objectives. The cost management information system is not bound by externally imposed criteria that define inputs and processes. Instead, the criteria that govern the inputs and processes are set by people in the company. The cost management information system has three broad objectives that provide information for:

1. Costing out services, products, and other objects of interest to management
2. Planning and control
3. Decision making

The information requirements for satisfying the first objective depend on the nature of the object being costed and the reason management wants to know the cost. For example, product costs that satisfy the FASB rules are needed to value inventories for the balance sheet and to calculate the cost of goods sold expense on the income statement. These product costs include the cost of materials, labor, and overhead. In other cases, managers may want to know all costs that are associated with a product for purposes of tactical and strategic profitability analysis. If so, then additional cost information may be needed concerning product design, development, marketing, and distribution. For example, pharmaceutical companies may want to associate research and development costs with individual drugs or drug families.

Cost information is also used for planning and control. It should help managers decide what should be done, why it should be done, how it should be done, and how well it is being done. For example, information about the expected revenues and costs for a new product could be used as an input for target costing. At this stage, the expected revenues and costs may cover the entire life of the new product. Thus, projected costs of design, development, testing, production, marketing, distribution, and servicing would be essential information.

Finally, cost information is a critical input for many managerial decisions. For example, a manager may need to decide whether to continue making a component internally or to buy it from an external supplier. In this case, the manager would need to know the cost of materials, labor, and other productive inputs associated with the manufacture of the component and which of these costs would vanish if the product is no longer produced. Also needed is information concerning the cost of purchasing the component, including any increase in cost for internal activities such as receiving and storing goods.

Cost management has a much broader focus than that found in traditional costing systems. It is concerned not only with how much something costs but also with the factors that drive costs, such as cycle time, quality, and process productivity. Thus, cost management requires a deep understanding of a firm's cost structure. Managers must be able to determine the long- and short-run costs of activities and processes as well as the costs of goods, services, customers, suppliers, and other objects of interest. Causes of these costs are also carefully studied.

## Different Systems for Different Purposes

The financial accounting and cost management systems show us that different systems exist to satisfy different purposes. As indicated, these two systems are subsystems of the accounting information system. The cost management information system also has two major subsystems: the *cost accounting information system* and the *operational control information system*. The objectives of these two subsystems correspond to the first and second objectives mentioned earlier for the cost management information system (the costing and control objectives). The output of these two cost systems satisfies the third objective (the decision-making objective).

The **cost accounting information system** is a cost management subsystem designed to assign costs to individual products and services and other objects as specified by management. For external financial reporting, the cost accounting system must assign costs to products in order to value inventories and determine cost of sales. Furthermore, these assignments must conform to the rules and conventions set by the SEC and the FASB. These rules and conventions do not require that all costs assigned to individual products be causally related to the demands of individual products. Thus, using financial accounting principles to define product costs may lead to under- and overstatements of individual product costs. For reporting inventory values and cost of sales, this may not matter. Inventory values and cost of sales are reported in the aggregate, and the under- and overstatements may wash out to the extent that the values reported on the financial statements are reasonably accurate.

At the individual product level, however, distorted product costs can cause managers to make significant decision errors. For example, a manager might erroneously deemphasize and overprice a product that is, in reality, highly profitable. For decision making, accurate product costs are needed. If possible, the cost accounting system should produce product costs that simultaneously are accurate and satisfy financial reporting conventions. If not, then the cost system must produce two sets of product costs: one that satisfies financial reporting criteria and one that satisfies management decision-making needs.

The **operational control information system** is a cost management subsystem designed to provide accurate and timely feedback concerning the performance of managers and others relative to their planning and control of activities. Operational control is concerned with what activities should be performed and assessing how well they are performed. It focuses on identifying opportunities for improvement and helping to find ways to improve. A good operational control information system provides information that helps managers engage in a program of continuous improvement of all aspects of their businesses.

Product cost information plays a role in this process but, by itself, is not sufficient. The information needed for planning and control is broader and encompasses the entire value chain. For example, every profit-making manufacturing and service organization exists to serve customers. Thus, one objective of an operational control system is to improve the value received by customers. Products and services should be produced that fit specific customer needs. (Observe how this affects the design and development system in the value chain.) Quality, affordable prices, and low post-purchase costs for operating and maintaining the product are also important to customers.



A second, related objective is to improve profits by providing this value. Well-designed, quality products that are affordable can be offered only if they also provide an acceptable return to the owners of the company. Cost information concerning quality, different product designs, and post-purchase customer needs is vital for managerial planning and control.

## OBJECTIVE 2

Identify the current factors affecting cost management.

## FACTORS AFFECTING COST MANAGEMENT

Worldwide competitive pressures, deregulation, growth in the service industry, and advances in information and manufacturing technology have changed the nature of our economy and caused many manufacturing and service industries to dramatically change the way in which they operate. These changes, in turn, have prompted the development of innovative and relevant cost management practices. For example, activity-based accounting systems have been developed and implemented in many organizations. Additionally, the focus of cost management accounting systems has been broadened to enable managers to better serve the needs of customers and manage the firm's business processes that are used to create customer value. A firm can establish a competitive advantage by providing more customer value for less cost than its competitors. To secure and maintain a competitive advantage, managers seek to improve time-based performance, quality, and efficiency. Accounting information must be produced to support these three fundamental organizational goals.

### Global Competition

Vastly improved transportation and communication systems have led to a global market for many manufacturing and service firms. Several decades ago, firms neither knew nor cared what similar firms in Japan, Brazil, Germany, and China were producing. These foreign firms were not competitors since their markets were separated by geographical distance. Now, both small and large firms are affected by the opportunities offered by global competition. [Stillwater Designs](#), a small firm that designs and markets Kicker speakers, has significant markets in Europe. The manufacture of the Kicker speakers is mostly outsourced to Asian producers. At the other end of the size scale, [Procter & Gamble](#), [The Coca-Cola Company](#), and [Mars, Incorporated](#) are developing sizable markets in China. Automobiles, currently being made in Japan, can be in the United States in two weeks. Investment bankers and management consultants can communicate with foreign offices instantly. Improved transportation and communication in conjunction with higher quality products that carry lower prices have upped the ante for all firms. This global competitive environment has increased the demand not only for more cost information but also for more accurate cost information. Cost information plays a vital role in reducing costs, improving productivity, and assessing product-line profitability.

### Growth of the Service Industry

As traditional industries have declined in importance, the service sector of the economy has increased in importance. The service sector now comprises approximately three quarters of the U.S. economy and employment. Many services—among them accounting services, transportation, telecommunications, and medical services—are exported to other countries such as India and Argentina. Experts predict that this sector will continue to expand in size and importance as service productivity grows. Deregulation of many services (e.g., airlines and telecommunications in the past and utilities in the present) has increased competition in the service industry. Many service organizations are scrambling to survive. The increased competition has made managers in this industry



more conscious of the need to have accurate cost information for planning, controlling, continuous improvement, and decision making. Thus, the changes in the service sector add to the demand for innovative and relevant cost management information.

## Advances in Information Technology

Three significant advances relate to information technology. One is intimately connected with computer-integrated applications. With automated manufacturing, computers are used to monitor and control operations. Because a computer is being used, a considerable amount of useful information can be collected, and managers can be informed about what is happening within an organization almost as it happens. It is now possible to track products continuously as they move through the factory and to report (on a real-time basis) such information as units produced, material used, scrap generated, and product cost. The outcome is an operational information system that fully integrates manufacturing with marketing and accounting data.

**Enterprise resource planning (ERP) software** has the objective of providing an integrated system capability—a system that can run all the operations of a company and provide access to real-time data from the various functional areas of a company. Using this real-time data enables managers to continuously improve the efficiency of organizational units and processes. To support continuous improvement, information that is timely, accurate, and detailed is needed.

Automation and integration increase both the quantity (detail) and the timeliness of information. For managers to fully exploit the value of the more complex information system, they must have access to the data of the system—they must be able to extract and analyze the data from the information system quickly and efficiently. This, in turn, implies that the tools for analysis must be powerful.

The second major advance supplies the required tools: the availability of personal computers (PCs), online analytic programs (OLAP), and decision-support systems (DSS). The PC serves as a communications link to the company's information system, and OLAP and DSS supply managers with the capability to use that information. PCs and software aids are available to managers in all types of organizations. Often, a PC acts as a networking terminal and is connected to an organization's database, allowing managers to access information more quickly, do their own analyses, and prepare many of their own reports. The ability to enhance the accuracy of product costing is now available. Because of advances in information technology, cost accountants have the flexibility to respond to the managerial need for more complex product costing methods such as activity-based costing (ABC). Even with the information technology, however, many firms have not embraced ABC because of its cost and complexity. Simplified and improved costing systems such as time-driven activity-based costing (TDABC) have been developed in order to deal with these issues, while preserving the benefits of enhanced accuracy.

ABC software is classified as online analytic software. Online analytic applications function independently of an organization's core transactions but at the same time are dependent on the data resident in an ERP system. ABC software typically interfaces with DSS software and other online analytic software to facilitate applications such as cost estimating, product pricing, and planning and budgeting. This vast computing capability now makes it possible for accountants to generate individualized reports on an as-needed basis. Many firms have found that the increased responsiveness of a contemporary cost management system has allowed them to realize significant cost savings by eliminating the huge volume of internally generated monthly financial reports.

The third major advance is the emergence of electronic commerce. **Electronic commerce (e-commerce)** is any form of business that is executed using information and communications technology. Internet trading, electronic data interchange, and bar coding are examples of e-commerce. Internet trading allows buyers and sellers to come together and execute transactions from diverse locations and circumstances. Internet

trading allows a company to act as a virtual organization, thus reducing overhead. **Electronic data interchange (EDI)** involves the exchange of documents between computers using telephone lines and is widely used for purchasing and distribution. The sharing of information among trading partners reduces costs and improves customer relations, thus leading to a stronger competitive position. EDI is an integral part of supply chain management (value-chain management). **Supply chain management** is the management of products and services from the acquisition of raw materials through manufacturing, warehousing, distribution, wholesaling, and retailing. The emergence of EDI and supply chain management has increased the importance of costing out activities in the value chain and determining the cost to the company of different suppliers and customers.

## Advances in the Manufacturing Environment

Manufacturing management approaches such as the theory of constraints and just-in-time have allowed firms to increase quality, reduce inventories, eliminate waste, and reduce costs. Automated manufacturing has produced similar outcomes. The impact of improved manufacturing technology and practices on cost management is significant. Product costing systems, control systems, allocation, inventory management, cost structure, capital budgeting, variable costing, and many other accounting practices are being affected.

**Theory of Constraints** The **theory of constraints** is a method used to continuously improve manufacturing and nonmanufacturing activities. It is characterized as a “thinking process” that begins by recognizing that all resources are finite. Some resources, however, are more critical than others. The most critical limiting factor, called a constraint, becomes the focus of attention. By managing this constraint, performance can be improved. To manage the constraint, it must be identified and exploited (i.e., performance must be maximized subject to the constraint). All other actions are subordinate to the exploitation decision. Finally, to improve performance, the constraint must be elevated. The process is repeated until the constraint is eliminated (i.e., it is no longer the critical performance-limiting factor). The process then begins anew with the resource that has now become the critical limiting factor. Using this method, lead times and, thus, inventories can be reduced.

**Just-in-Time Manufacturing** A demand-pull system, **just-in-time (JIT) manufacturing**, strives to produce a product only when it is needed and only in the quantities demanded by customers. Demand, measured by customer orders, pulls products through the manufacturing process. Each operation produces only what is necessary to satisfy the demand of the succeeding operation. No production takes place until a signal from a succeeding process indicates the need to produce. Parts and materials arrive just in time to be used in production.

JIT manufacturing typically reduces inventories to much lower levels (theoretically to insignificant levels) than those found in conventional systems, increases the emphasis on quality control, and produces fundamental changes in the way production is organized and carried out. Basically, JIT manufacturing focuses on continual improvement by reducing inventory costs and dealing with other economic problems. Reducing inventories frees up capital that can be used for more productive investments. Increasing quality enhances the competitive ability of the firm. Finally, changing from a traditional manufacturing setup to JIT manufacturing allows the firm to focus more on quality and productivity and, at the same time, allows a more accurate assessment of what it costs to produce products.

**Lean Manufacturing** JIT is a critical part of a more comprehensive approach referred to as *lean manufacturing*. **Lean manufacturing** is the persistent pursuit and elimination of waste that simultaneously embodies respect for people. Waste is anything that

does not add value to the end user (customer). As a result of eliminating waste, lead time is decreased, production processes are streamlined, and costs are decreased. Depending on the nature of the value streams created in lean manufacturing, a more accurate assessment of product costs may result.

**Computer-Integrated Manufacturing** Automation of the manufacturing environment allows firms to reduce inventory, increase productive capacity, improve quality and service, decrease processing time, and increase output. Automation can produce a competitive advantage for a firm. The implementation of an automated manufacturing facility typically follows JIT and is a response to the increased needs for quality and shorter response times. As more firms automate, competitive pressures will force other firms to do likewise. For many manufacturing firms, automation may be equivalent to survival.

The three possible levels of automation are (1) the stand-alone piece of equipment, (2) the cell, and (3) the completely integrated factory. Before a firm attempts any level of automation, it should first do all it can to produce a more focused, simplified manufacturing process. For example, most of the benefits of going to a completely integrated factory can often be achieved simply by implementing JIT manufacturing.

If automation is justified, it may mean installation of a computer-integrated manufacturing (CIM) system. CIM implies the following capabilities: (1) the products are designed through the use of a computer-assisted design (CAD) system, (2) a computer-assisted engineering (CAE) system is used to test the design, (3) the product is manufactured using a computer-assisted manufacturing (CAM) system (CAMs use computer-controlled machines and robots), and (4) an information system connects the various automated components.

A particular type of CAM is the flexible manufacturing system. Flexible manufacturing systems are capable of producing a family of products from start to finish using robots and other automated equipment under the control of a mainframe computer. This ability to produce a variety of products with the same set of equipment is clearly advantageous.

## Customer Orientation

Firms are concentrating on the delivery of value to the customer with the objective of establishing a competitive advantage. Accountants and managers refer to a firm's **value chain** as the set of activities required to design, develop, produce, market, and deliver products and services to customers. As a result, a key question to be asked about any process or activity is whether it is important to the customer. The cost management system must track information relating to a wide variety of activities important to customers (e.g., product quality, environmental performance, new product development, and delivery performance). Customers now count the delivery of the product or service as part of the product. Companies must compete not only in technological and manufacturing terms but also in terms of the speed of delivery and response. Firms such as [FedEx](#) have exploited this desire by identifying and developing a market the [U.S. Postal Service](#) could not serve.

Companies have internal customers as well. The staff functions of a company exist to serve the line functions. The accounting department creates cost reports for production managers. Accounting departments that are "customer driven" assess the value of the reports to be sure that they communicate significant information in a timely and readable fashion. Reports that do not measure up are dropped.

## New Product Development

A high proportion of production costs is committed during the development and design stage of new products. The effects of product development decisions on other parts of

the firm's value chain are now widely acknowledged. This recognition has produced a demand for more sophisticated cost management procedures relating to new product development—procedures such as target costing and activity-based management. **Target costing** encourages managers to assess the overall cost impact of product designs over the product's life cycle and simultaneously provides incentives to make design changes to reduce costs. **Activity-based management** identifies the activities produced at each stage of the development process and assesses their costs. Activity-based management is complimentary to target costing because it enables managers to identify the activities that do not add value and then eliminate them so that overall life cycle costs can be reduced.

## Total Quality Management

Continuous improvement and elimination of waste are the two foundation principles that govern a state of manufacturing excellence. Manufacturing excellence is the key to survival in today's world-class competitive environment. Producing products and services that actually perform according to specifications<sup>1</sup> and with little waste are the twin objectives of world-class firms. A philosophy of **total quality management**, in which managers strive to create an environment that will enable organizations to produce defect-free products and services, has replaced the acceptable quality attitudes of the past. The emphasis on quality applies to services as well as products.



REAL-WORLD  
EXAMPLE

**Advocate Good Samaritan Hospital** is an acute care facility located in Downers Grove, Illinois. In 2010, Good Samaritan received the Malcolm Baldrige National Quality Award in the health care category. This award is presented to organizations that demonstrate quality and performance excellence. Good Samaritan Hospital improved its mortality rate (actual mortality/expected mortality) from 0.73 in 2004 to 0.25 in 2010. Furthermore, the ratio of observed to expected renal failures decreased from 3.0 in 2007 to 0.86 in 2009. By creating a culture of patient safety, Good Samaritan Hospital decreased its malpractice expenses by 83 percent from 2005 to 2010, saving \$10 million.

The message is clear. Pursuing an objective of high quality promises major benefits. Cost management supports this objective by providing crucial information concerning quality-related activities and quality costs. Savings associated with quality initiatives can be reported as well. Managers need to know which quality-related activities add value and which ones do not. They also need to know what quality costs are and how they change over time.

## Time as a Competitive Element

Time is a crucial element in all phases of the value chain. Firms can reduce time to market by redesigning products and processes, by eliminating waste, and by eliminating non-value-added activities. Firms can reduce the time spent on delivery of products or services, reworking a product, and unnecessary movements of materials and subassemblies.

Decreasing non-value-added time appears to go hand in hand with increasing quality. With quality improvements, the need for rework decreases, and the time to produce a good product decreases. The overall objective is to increase customer responsiveness.

<sup>1</sup>As reported at [http://www.nist.gov/baldrige/award\\_recipients/good-samaritan\\_profile.cfm](http://www.nist.gov/baldrige/award_recipients/good-samaritan_profile.cfm) on August 1, 2011.



Time and product life cycles are related. The rate of technological innovation has increased for many industries, and the life of a particular product can be quite short. Managers must be able to respond quickly and decisively to changing market conditions. Information to allow them to accomplish this goal must be available. [Hewlett-Packard](#) has found that it is better to be 50 percent over budget in new product development than to be six months late. This correlation between cost and time is a part of the cost management system.

## Efficiency

While quality and time are important, improving these dimensions without corresponding improvements in financial performance may be futile, if not fatal. Improving efficiency is also a vital concern. Both financial and nonfinancial measures of efficiency are needed. Cost is a critical measure of efficiency. Trends in costs over time and measures of productivity changes can provide important measures of the efficacy of continuous improvement decisions. For these efficiency measures to be of value, costs must be properly defined, measured, and accurately assigned.

Production of output must be related to the inputs required, and the overall financial effect of productivity changes should be calculated. Activity-based costing and profit-linked productivity measurement are responses to these demands. Activity-based costing is a relatively new approach to cost accounting that provides more accurate and meaningful cost assignments. By analyzing underlying activities and processes, eliminating those that do not add value, and enhancing those that do add value, dramatic increases in efficiency can be realized.

## THE ROLE OF THE MANAGEMENT ACCOUNTANT

World-class firms are those that are at the cutting edge of customer support. They know their market and their product. They strive continually to improve product design, manufacture, and delivery. These companies can compete with the best of the best in a global environment. Accountants, too, can be termed world class. Those who merit this designation are intelligent and well prepared. They not only have the education and training to accumulate and provide financial information, but also stay up to date in their field and in business. In addition, world-class accountants must be familiar with the customs and financial accounting rules of the countries in which their firm operates.

### OBJECTIVE 3

Describe how management accountants function within an organization.

## Line and Staff Positions

The role of cost and management accountants in an organization is one of support and teamwork. They assist those who are responsible for carrying out an organization's basic objectives. Positions that have direct responsibility for the basic objectives of an organization are referred to as **line positions**. In general, individuals in line positions participate in activities that produce and sell their company's product or service. Positions that are supportive in nature and have only indirect responsibility for an organization's basic objectives are called **staff positions**.

In an organization whose basic mission is to produce and sell laser printers, the vice presidents of manufacturing and marketing, the factory manager, and the assemblers are all line positions. The vice presidents of finance and human resources, the cost accountant, and the purchasing manager are all staff positions.