Fundamentals of Cost Accounting
2e

William N. Lanen
University of Michigan

Shannon W. Anderson
Rice University

Michael W. Maher
University of California at Davis
## Contents

1. **Cost Accounting: Information for Decision Making**  
   - Value Creation in Organizations  
     - Why Start with Value Creation?  
   - Value Chain  
   - Supply Chain and Distribution Chain  
   - Using Cost Information to Increase Value  
   - In Action: *Palliative Care Unit*  
   - Accounting and the Value Chain  
   - Accounting Systems  
     - Financial Accounting  
     - Cost Accounting  
     - Cost Accounting and GAAP  
     - Customers of Cost Accounting  
   - Our Framework for Assessing Cost Accounting Systems  
     - The Manager’s Job Is to Make Decisions  
     - Decision Making Requires Information  
     - Finding and Eliminating Activities That Don’t Add Value  
     - Identifying Strategic Opportunities Using Cost Analysis  
     - Owners Use Cost Information to Evaluate Managers  
   - Cost Data for Managerial Decisions  
     - Costs for Decision Making  
     - Costs for Control and Evaluation  
     - Different Data for Different Decisions  
   - Trends in Cost Accounting throughout the Value Chain  
     - Cost Accounting in Research and Development (R&D)  
     - Cost Accounting in Design  
     - Cost Accounting in Purchasing  
     - Cost Accounting in Production  
     - Cost Accounting in Marketing  
     - Cost Accounting in Distribution  
     - Cost Accounting in Customer Service  
     - Enterprise Resource Planning  
     - Creating Value in the Organization  
2. **Cost Concepts and Behavior**  
   - What Is a Cost?  
   - Cost versus Expenses  
3. **Key Financial Players in the Organization**  
4. **Choices: Ethical Issues for Accountants**  
5. **Cost Accounting and Other Business Disciplines**  
6. **Summary**  
7. **Key Terms**  
8. **Appendix: Institute of Management Accountants Code of Ethics**  
9. **Review Questions**  
10. **Critical Analysis and Discussion Questions**  
11. **Exercises**  
12. **Problems**  
13. **Solutions to Self-Study Questions**
Contents

Long-Run versus Short-Run Pricing: Is There a Difference? 108
Cost Analysis for Pricing 108
In Action: Take Back Laws in Europe 109

Legal Issues Relating to Costs and Sales Prices 109
Predatory Pricing 109
Dumping 110
Price Discrimination 111
Peak-Load Pricing 111
Price Fixing 111

Use of Differential Analysis for Production Decisions 112
Make-It or Buy-It Decisions 112
Make-or-Buy Decisions Involving Differential Fixed Costs 112
Opportunity Costs of Making 115
Decision to Add or Drop a Product Line or Close a Business Unit 117
Product Choice Decisions 118

The Theory of Constraints 122
The Debrief 124

Summary 124
Key Terms 125
Review Questions 125
Critical Analysis and Discussion Questions 126
Exercises 126
Problems 131
Integrative Case 139
Solutions to Self-Study Questions 140

5 Cost Estimation 142

Why Estimate Costs? 143
Basic Cost Behavior Patterns 143
What Methods Are Used to Estimate Cost Behavior? 143
Engineering Method 144
Account Analysis Method 144
Statistical Cost Estimation 146

In Action: Using Regression to Evaluate Cost Behavior 152
Multiple Regression 153
Practical Implementation Problems 154

Learning Phenomenon 156
In Action: Learning Curves 156
Applications 157

How Is an Estimation Method Chosen? 159
Data Problems 159
Effect of Different Methods on Cost Estimates 160
The Debrief 161
Summary 162
Key Terms 163
Appendix A: Multiple Regression 163
Appendix B: Learning Curves 167
Review Questions 168
Critical Analysis and Discussion Questions 168
Exercises 169
Problems 174
Solutions to Self-Study Questions 182

6 Fundamentals of Product and Service Costing 184

Cost Management Systems 185
Reasons to Calculate Product or Service Costs 185
In Action: Importance of Distinguishing between Production Costs and Overhead Costs 186
Cost Allocation and Product Costing 186
Cost Flow Diagram 187

Fundamental Themes Underlying the Design of Cost Systems for Managerial Purposes 187

Costing in a Single Product, Continuous Process Industry 188
Basic Cost Flow Model 188
Costing with No Work-in-Process Inventories 188
Costing with Ending Work-in-Process Inventories 189

Costing in a Multiple Product, Discrete Process Industry 190
Predetermined Overhead Rates 192
Product Costing of Multiple Products 193
Choice of the Allocation Base for Predetermined Overhead Rate 193
Choosing among Possible Allocation Bases 194

Multiple Allocation Bases and Two-Stage Systems 195
Choice of Allocation Bases 196

Different Companies, Different Production and Costing Systems 197
Operations Costing: An Illustration 199
The Debrief 200

Summary 200
Key Terms 201
Review Questions 201
Critical Analysis and Discussion Questions 201
Exercises 202
Problems 206
Solutions to Self-Study Questions 208

Ethical Issues and Job Costing 225
Misstating Stage of Completion 226
Charging Costs to the Wrong Jobs 226
Misrepresenting the Cost of Jobs 226

Managing Projects 227
In Action: Determination of the Cost of Large Projects and Ethical Implications 229
The Debrief 229

Summary 229
Key Terms 230
Review Questions 230
Critical Analysis and Discussion Questions 230
Exercises 231
Problems 234
Integrative Case 244
Solutions to Self-Study Questions 245

8
Process Costing 246

Determining Equivalent Units 248

Using Product Costing in a Process Industry 249
Step 1: Measure the Physical Flow of Resources 249
Step 2: Compute the Equivalent Units of Production 249

In Action: Overstating Equivalent Units to Commit Fraud 250
Step 3: Identify the Product Costs for Which to Account 251
Time Out! We Need to Make an Assumption about Costs and the Work-in-Process Inventory 251
Step 4: Compute the Costs per Equivalent Unit: Weighted Average 252
Step 5: Assign Product Cost to Batches of Work: Weighted-Average Process Costing 253

Reporting This Information to Managers: The Production Cost Report 253
Sections 1 and 2: Managing the Physical Flow of Units 255
Sections 3, 4, and 5: Managing Costs 255
### Assigning Costs Using First-In, First-Out (FIFO) Process Costing 255
- Step 1: Measure the Physical Flow of Resources 256
- Step 2: Compute the Equivalent Units of Production 256
- Step 3: Identify the Product Costs for Which to Account 258
- Step 4: Compute the Costs per Equivalent Unit: FIFO 258
- Step 5: Assign Product Cost: FIFO 259
  - How This Looks in T-Accounts 259

### Determining Which Is Better: FIFO or Weighted Average? 260

### Computing Product Costs: Summary of the Steps 260

### Using Costs Transferred in from Prior Departments 261
- Who Is Responsible for Costs Transferred in from Prior Departments? 262

### Choosing between Job and Process Costing 264

### Operation Costing 264
- Product Costing in Operations 265
- Operation Costing Illustration 265

### Comparing Job, Process, and Operation Costing 268
- The Debrief 268

### Two-Stage Cost Allocation 290
- Two-Stage Cost Allocation and the Choice of Cost Drivers 291
- Plantwide versus Department-Specific Rates 293
- Choice of Cost Allocation Methods: A Cost-Benefit Decision 294

### Activity-Based Costing 295
- In Action: Activity-Based Costing in a Not for Profit 296
- Developing Activity-Based Costs 296

### Cost Hierarchies 298

### Activity-Based Costing Illustrated 299
- Step 1: Identify the Activities 299
- Step 2: Identify the Cost Drivers 300
- Step 3: Compute the Cost Driver Rates 300
- Step 4: Assign Costs Using Activity-Based Costing 300
- Unit Costs Compared 302

### Cost Flows through Accounts 302

### Choice of Activity Bases in Modern Production Settings 304
- In Action: Evidence on the Benefits of Activity-Based Costing 305

### Activity-Based Costing in Administration 305

### Who Uses ABC? 306
- The Debrief 307

### 9 Activity-Based Costing 286

### Reported Product Costs and Decision Making 287
- Dropping a Product 287
- The Death Spiral 289

### Activity-Based Costing in Action: Activity-Based Costing in a Not for Profit 296

### Developing Activity-Based Costs 296

### Cost Hierarchies 298

### Activity-Based Costing Illustrated 299

### Cost Flows through Accounts 302

### Choice of Activity Bases in Modern Production Settings 304

### Activity-Based Costing in Administration 305

### Who Uses ABC? 306

### 10 Fundamentals of Cost Management 326

### Using Activity-Based Cost Management to Add Value 327
Using Activity-Based Cost Information to Improve Processes 329
Using Cost Hierarchies 330

Managing the Cost of Customers and Suppliers 330
Using Activity-Based Costing to Determine the Cost of Customers and Suppliers 331
Determining Why the Cost of Customers Matters 334
Using Cost of Customer Information to Manage Costs 334
In Action: Analyzing Customer Profitability at Best Buy 334

Determining the Cost of Suppliers 334
Capturing the Cost Savings 335

Managing the Cost of Capacity 336
Using and Supplying Resources 336
Computing the Cost of Unused Capacity 338
Assigning the Cost of Unused Capacity 340
Seasonal Demand and the Cost of Unused Capacity 340

Managing the Cost of Quality 342
How Can We Limit Conflict between Traditional Managerial Accounting Systems and Total Quality Management? 342
What Is Quality? 343
What Is the Cost of Quality? 343
Trade-Offs, Quality Control, and Failure Costs 345
In Action: Cost Elements Included in Reported Quality Costs 346
The Debrief 347

Methods of Allocating Service Department Costs 363
Allocation Bases 363
Direct Method 363
Step Method 366
In Action: Step Method at Stanford University 369
Reciprocal Method 369
Comparison of Direct, Step, and Reciprocal Methods 372

Allocation of Joint Costs 373
Joint Costing Defined 373
Reasons for Allocating Joint-Costs 374

Joint Cost Allocation Methods 375
Net Realizable Value Method 375
Physical Quantities Method 377
Evaluation of Joint Cost Methods 378

Deciding Whether to Sell Goods Now or Process Them Further 378
In Action: Different Demands for Different Parts 379

Decision of What to Do with By-Products 379
The Debrief 381

Summary 381
Key Terms 382
Appendix: Calculation of the Reciprocal Method Using Computer Spreadsheets 382
Review Questions 384
Critical Analysis and Discussion Questions 385
Exercises 385
Problems 389
Integrative Case 396
Solutions to Self-Study Questions 397

12 Fundamentals of Management Control Systems 400

Why a Management Control System? 401
Alignment of Managerial and Organizational Interests 401
Evolution of the Control Problem: An Example 402
Decentralized Organizations 402
- Why Decentralize the Organization? 403
- Advantages of Decentralization 403
- Disadvantages of Decentralization 403

Framework for Evaluating Management Control Systems 404
- Organizational Environment and Strategy 404
- Results of the Management Control System 405
- Elements of a Management Control System 405
- Balancing the Elements 406

Delegated Decision Authority: Responsibility Accounting 406
- Cost Centers 406
- Discretionary Cost Centers 407
- Revenue Centers 407
- Profit Centers 408
- Investment Centers 408
- Responsibility Centers and Organization Structure 408

Measuring Performance 408
- Two Basic Questions 409
- In Action: Teacher Pay and Student Performance 409
- Cost Centers 409
- Revenue Centers 410
- Profit Centers 410
- Investment Centers 411

Evaluating Performance 411
- Relative Performance versus Absolute Performance Standards 411
- Evaluating Managers’ Performance versus Economic Performance of the Responsibility Center 411
- Relative Performance Evaluations in Organizations 412

Compensation Systems 412
- In Action: Beware of the “Kink” 413

Illustration: Corporate Cost Allocation 413
- Incentive Problems with Allocated Costs 413
- Effective Corporate Cost Allocation System 414

Do Performance Evaluation Systems Create Incentives to Commit Fraud? 415

Internal Controls to Protect Assets and Provide Quality Information 416
- Internal Auditing 417
- The Debrief 418

Summary 418
Key Terms 419
Review Questions 419
Critical Analysis and Discussion Questions 419
Exercises 420
Problems 423
Integrative Cases 426
Solutions to Self-Study Questions 431

13 Planning and Budgeting 432

How Strategic Planning Increases Competitiveness 433

Overall Plan 434
- Organization Goals 434
- Strategic Long-Range Profit Plan 434
- Master Budget (Tactical Short-Range Profit Plan): Tying the Strategic Plan to the Operating Plan 434

Human Element in Budgeting 435
- Value of Employee Participation 436

Developing the Master Budget 436

Where to Start? 436
- Sales Forecasting 437

Comprehensive Illustration 438
- Forecasting Production 438
- Forecasting Production Costs 439
- Direct Labor 440
- Overhead 440
- Completing the Budgeted Cost of Goods Sold 441
- Revising the Initial Budget 443
Advantages and Disadvantages of Divisional Income 475
Some Simple Financial Ratios 475

Return on Investment 476
Performance Measures for Control: A Short Detour 477
Limitations of ROI 477

Residual Income Measures 480
Limitations of Residual Income 481

Economic Value Added (EVA) 482
In Action: EVA at Best Buy 482
Limitations of EVA 484
In Action: Does Using Residual Income as a Performance Measure Affect Managers’ Decisions? 484

Divisional Performance Measurement: A Summary 484

Measuring the Investment Base 485
Gross Book Value versus Net Book Value 485
Historical Cost versus Current Cost 485
Beginning, Ending, or Average Balance 486

Other Issues in Divisional Performance Measurement 488
The Debrief 488

Summary 489
Key Terms 489
Review Questions 489
Critical Analysis and Discussion Questions 490
Exercises 490
Problems 493
Integrative Cases 496
Solutions to Self-Study Questions 502

15
Transfer Pricing 504

What Is Transfer Pricing and Why Is It Important? 505
Determining the Optimal Transfer Price 506
The Setting 506
Determining Whether a Transfer Price Is Optimal 506
Case 1: A Perfect Intermediate Market for Wood 508
In Action: Transfer Pricing in State-Owned Enterprises 510
Case 2: No Intermediate Market 510

Optimal Transfer Price: A General Principle 513
Other Market Conditions 514

Applying the General Principle 514

How to Help Managers Achieve Their Goals While Achieving the Organization’s Goals 515

Top-Management Intervention in Transfer Pricing 516

Centrally Established Transfer Price Policies 516
Establishing a Market Price Policy 516
Establishing a Cost-Basis Policy 517
Alternative Cost Measures 518
Remedying Motivational Problems of Transfer Pricing Policies 519

Negotiating the Transfer Price 519

Imperfect Markets 520

Global Practices 520

Multinational Transfer Pricing 521
In Action: Management Control and Tax Considerations in Transfer Pricing 522

Segment Reporting 522
The Debrief 523

Summary 523
Key Terms 524
Review Questions 524
Critical Analysis and Discussion Questions 524
Exercises 525
Problems 527
Integrative Cases 532
Solutions to Self-Study Questions 534

16
Fundamentals of Variance Analysis 536

Using Budgets for Performance Evaluation 537

Profit Variance 538
In Action: When a Favorable Variance Might Not Mean “Good” News 538
Why Are Actual and Budgeted Results Different? 539

Flexible Budgeting 540
Comparing Budgets and Results 541
Sales Activity Variance 541

Profit Variance Analysis as a Key Tool for Managers 542
Sales Price Variance 544
Variable Production Cost Variances 544
Fixed Production Cost Variance 544
Marketing and Administrative Variances 544

Performance Measurement and Control in a Cost Center 544
Variable Production Costs 545

Variable Cost Variance Analysis 546
General Model 546
Direct Materials 547
Direct Labor 550
Variable Production Overhead 551
Variable Cost Variances Summarized in Graphic Form 552

Fixed Cost Variances 553
Fixed Cost Variances with Variable Costing 554
Absorption Costing: The Production Volume Variance 554

Summary of Overhead Variances 556
Key Points 557
In Action: Does Standard Costing Lead to Waste? 557
The Debrief 557

Summary 558
Key Terms 559
Additional Topics in Variance Analysis 580

Profit Variance Analysis When Units Produced Do Not Equal Units Sold 581.
- In Action: Financial Analysis and Variance Analysis 583
- Reconciling Variable Costing Budgets and Full Absorption Income Statements 583

Materials Purchases Do Not Equal Materials Used 584

Market Share Variance and Industry Volume Variance 586

Sales Activity Variances with Multiple Products 588
- Evaluating Product Mix 588
- Evaluating Sales Mix and Sales Quantity 588
- In Action: Sales Mix and Financial Reporting 590

Production Mix and Yield Variances 590
- Mix and Yield Variances in Manufacturing 590

Variance Analysis in Nonmanufacturing Settings 593
- Using the Profit Variance Analysis in Service and Merchandise Organizations 593
- Efficiency Measures 593
- Mix and Yield Variances in Service Organizations 594

Keeping an Eye on Variances and Standards 595
- How Many Variances to Calculate 595

Nonfinancial and Multiple Measures of Performance 610

Beyond the Accounting Numbers 611

Organizational Environment and Business Strategy 612

Responsibilities According to Level of Organization 612

Business Model 613

Multiple Measures or a Single Measure of Performance? 614
- Balanced Scorecard 615
- Continuous Improvement and Benchmarking 618
- In Action: Supplier Scorecards at Sun Microsystems 621
- In Action: Sources and Uses of Benchmarking Data 622

Performance Measurement for Control 623

Some Common Nonfinancial Performance Measures 623
- Customer Satisfaction Performance Measures 623
- Functional Performance Measures 624
- Nonfinancial Performance and Activity-Based Management 625
- Objective and Subjective Performance Measures 625