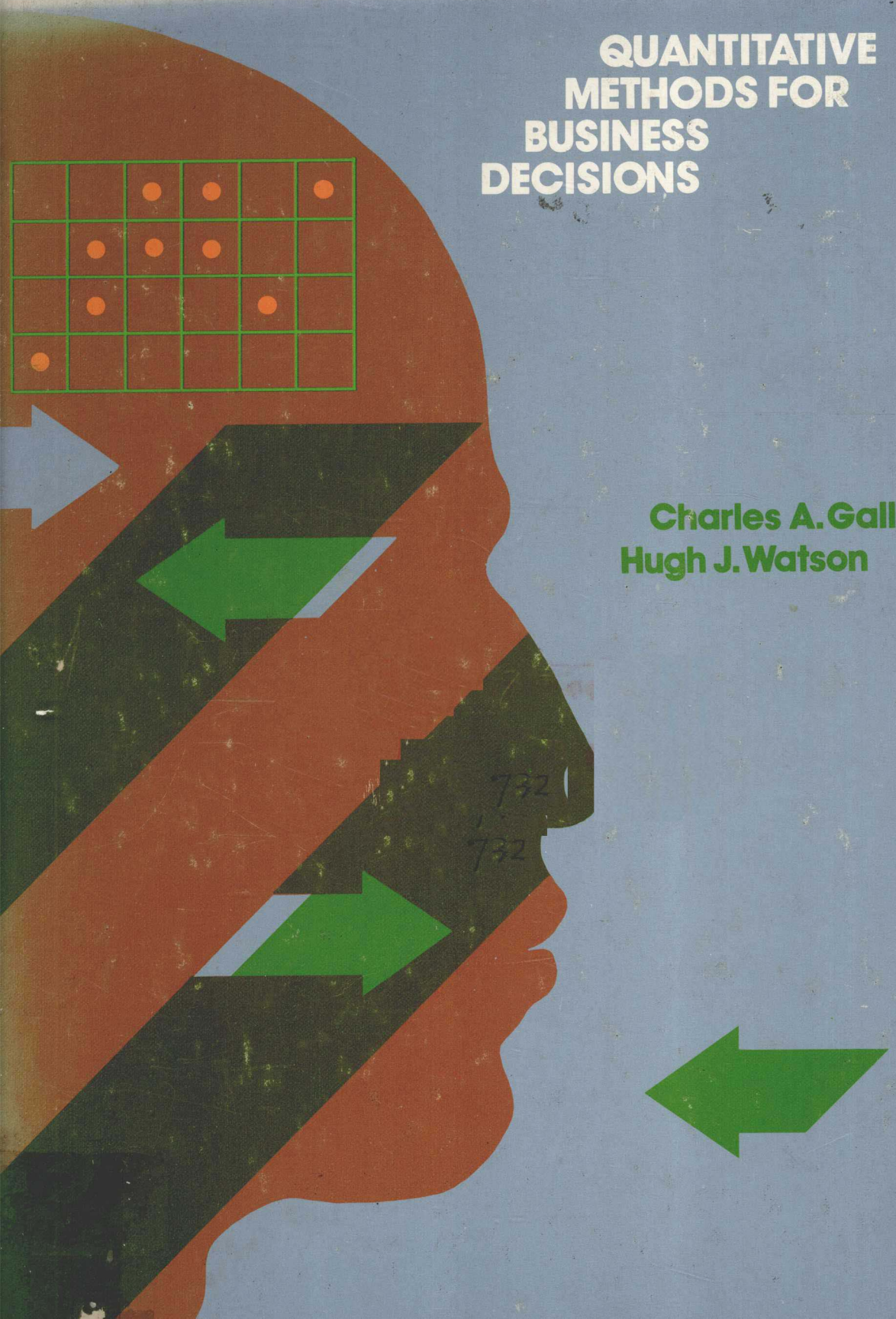
QUANTITATIVE METHODS FOR BUSINESS DECISIONS



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QUANTITATIVE METHODS FOR BUSINESS DECISIONS

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To Our Parents

PREFACE

"Learning without thought is labor lost;
thought without learning is perilous."

Confucius

The purpose of this book is to provide a basic learning resource for the study of quantitative methods. To this end we have incorporated a number of unique features designed to make the book interesting, readable, and useful:

Thorough explanations that appeal to intuition rather than use mathematical proof

Behavioral learning objectives for each chapter

In-chapter practice exercises with complete solutions

Case studies to expand learning horizons

Chapter sections on "real world" experiences that illustrate the implementation of quantitative methods

Many end-of-chapter exercises

Part I, Fundamentals of Quantitative Methods, sets the stage with discussions of quantitative methods, models, and data. It reflects our philosophy that quantitative methods can *assist* managerial decision making but cannot replace experienced judgment.

Part II, Making Rational Decisions, looks at elements of statistical decision theory. A treatment of the payoff matrix and decision trees is provided. Game Theory is also included here for its conceptual contributions to decision making.

Part III, Planning Business Activities, includes explanations of the methods most commonly used to aid managerial planning, together with examples of their application. Topics include forecasting, linear programming, Markov analysis, and project planning.

Part IV, Balancing Cost and Service, focuses on two common decision areas: inventory control and waiting lines. In these areas we have tried to develop the reader's intuitive understanding of the decisions to be made. This is important if quantitative methods are to be truly effective.

Part V, Solving Problems by Modeling System Behavior, focuses on the important topic of simulation. We close with *Part VI, Maintaining a Managerial Perspective*, a title which expresses one of our goals throughout the book.

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The level of mathematics has been held to a minimum throughout. Neither calculus nor matrix algebra is used. Algebra plus an elementary knowledge of probability and statistics are all that will be needed.

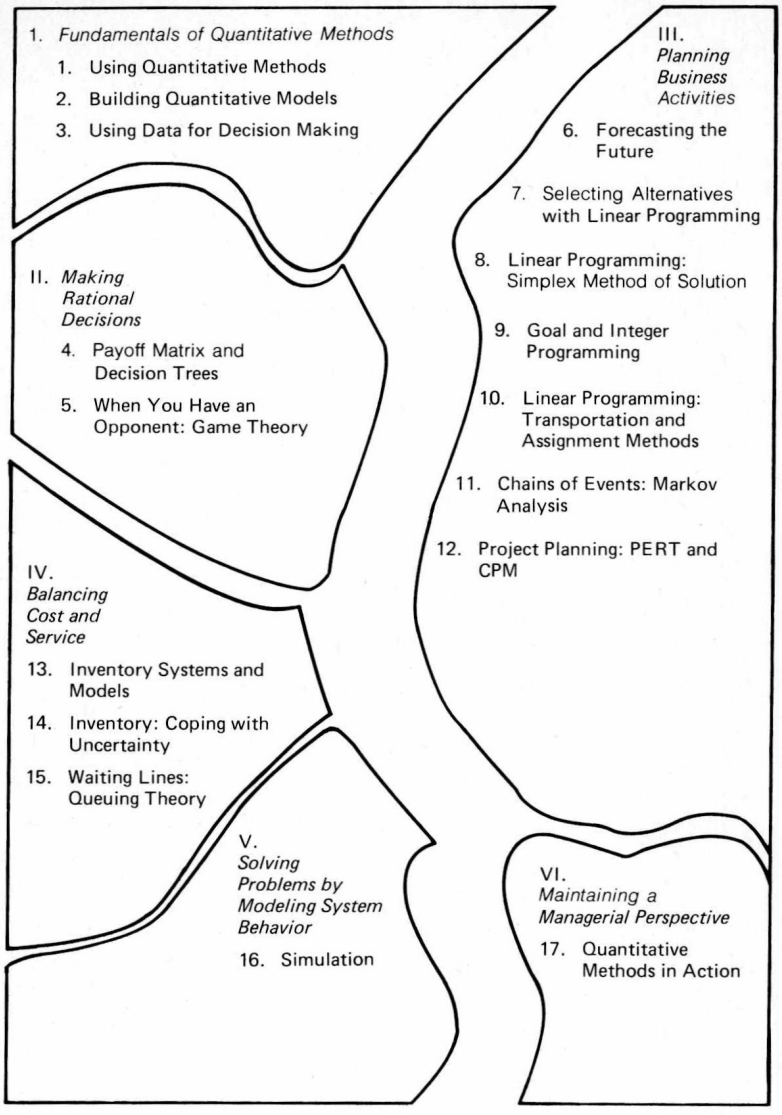
There is sufficient material in the book for a one-semester or two-quarter course at either the undergraduate or graduate level. Selective material could be ommitted if only a one-quarter course is desired. The order in which chapters are covered can be greatly varied since many of the chapters are independent of the others.

We have been fortunate in receiving important help from many people. Our thanks go, especially, to Samuel Newman for his help in planning the book. Also to Eugene T. Byrne, Janet C. Goulet, David C. Murphy, and Diane R. Walker for their help in review; and to Paul R. Merry who made many excellent comments and helpful criticisms. Last but not least, our thanks go to Susie Findell, Cynthia Downing, Martha Simkins, Martha Tyler, and Nicky O'Hair for their help in typing the manuscript. Of course, the authors are solely responsible for errors in content.

Charles A. Gallagher

Hugh J. Watson

SOLVING THE QUANTITATIVE METHODS PUZZLE



CONTENTS

Preface xv

PART I FUNDAMENTALS OF QUANTITATIVE METHODS

1 USING QUANTITATIVE METHODS 2

Learning Objectives 3
The Rational Decision-Making Process 4
How People Actually Solve Problems 6
The Role of Quantitative Methods 7
Organizational Use of Quantitative Methods 8
Rounding Off: Precision versus Accuracy 9
Keeping Magnitude in Perspective 11
Calculators and Computers 11
A Short History of Quantitative Methods 12
Summary 13
Assignments 13
References 14

2 BUILDING QUANTITATIVE MODELS 15

Learning Objectives 16
Characteristics of Business Systems 17
Models 18
Dimensionality of Models 20
Decision-Making Models 21
Decision Making under Certainty 21

Decision Making under Risk 22
Decision Making under Uncertainty 23
Decision Making under Conflict 24
Summary 25
Assignments 25
References 26

3 USING DATA FOR DECISION MAKING 27

Learning Objectives 28
What Is Data? 29
Types of Data 29
Data Requirements at Different Organizational Levels 30
Sources of Data 31
Data as Input to Models 32
Contributions from the Accountants 32
Accounting-Type Relationships 33
Linear Break-Even Analysis 36
Practice Exercise(3–1) 40
Nonlinear Break-Even Analysis 40
Practice Exercise (3–2) 42
Break-Even Analysis with Multiple Products 42
Practice Exercise (3–3) 44
Make-versus-Buy Decisions 45
Practice Exercise (3–4) 46
Excess Plant Capacity 47
Dumping the Product 48
Summary 48
Assignments 49
References 53

PART II MAKING RATIONAL DECISIONS

4 PAYOFF MATRIX AND DECISION TREES 56

Learning Objectives 58
Sources of Probabilities 58
Practice Exercise (4–1) 61
Expected Value 61
Practice Exercise (4–2) 63
The Payoff Matrix 63

Practice Exercise (4–3) 67
Decision Trees 67
Practice Exercise (4–4) 75
A Caution about Using Expected Monetary Value 75
Real-World Experiences 77
Summary 79
Assignments 80
Case Study: Key West or Hawaii 85
References 86

5 WHEN YOU HAVE AN OPPONENT: GAME THEORY 87

Learning Objectives 88
The Payoff Matrix for a Game 89
Pure Strategy Games 90
Practice Exercise (5–1) 92
Mixed Strategy Games 93
Practice Exercise (5–2) 97
Special Cases 97
Games with More than Two Persons 98
Nonzero Sum Games 99
Practice Exercise (5–3) 100
Real-World Experiences 101
Summary 102
Assignments 102
Case Study: Faculty Unions 107
References 109

PART III PLANNING BUSINESS ACTIVITIES

6 FORECASTING THE FUTURE 112

Learning Objectives 113
Categorizing Forecasting Methods 114
Selecting a Forecasting Method 115
Time-Series Methods 115
Practice Exercise (6–1) 120
Practice Exercise (6–2) 122
Practice Exercise (6–3) 125
Practice Exercise (6–4) 130
Causal Methods 130

Practice Exercise (6–5) 135
Qualitative Methods 137
Real-World Experiences 140
Summary 143
Assignments 144
Case Study: United Buyers Service 149
References 151

7 SELECTING ALTERNATIVES WITH LINEAR PROGRAMMING 152

Learning Objectives 154
Formulating the Constraints 154
The Objective Function 156
Three Examples 156
Practice Exercise (7–1) 161
Solving LP Problems 161
The Graphical Method 162
Practice Exercise (7–2) 170
Using the Graphical Method for Minimization 170
Practice Exercise (7–3) 174
Multiple Solutions 174
No Solution 174
Integral Solutions 175
Limitations of the Graphical Method 175
Other Methods of Solution 176
Duality and Shadow Prices 176
Assumptions and Limitations of LP 179
Applications of LP 180
Real-World Experiences 185
Summary 187
Assignments 187
Case Study: Madison Wire Company 192
References 193

8 LINEAR PROGRAMMING: SIMPLEX METHOD OF SOLUTION 194

Learning Objectives 196
Getting Ready: Augmenting Constraints 196
Overview of the Simplex Method 198
Setting Up the Initial Simplex Table 200
Practice Exercise (8–1) 202

此为试读，需要完整PDF请访问：www.ertongbook.com

Simplex Method (Maximizing) 203
Practice Exercise (8–2) 213
Minimizing with Simplex 213
Practice Exercise (8–3) 215
Dealing with Special Cases 215
Shadow Prices and the Dual Solution 218
Sensitivity Analysis 222
Computer Solution 228
Summary 229
Assignments 229
Case Study: Bithlo Electric 232
References 233

9 GOAL AND INTEGER PROGRAMMING 234

Learning Objectives 236
Goal Programming 236
Practice Exercise (9–1) 240
Practice Exercise (9–2) 243
Simplex Method for Goal Programming 243
Practice Exercise (9–3) 247
Applications of Goal Programming 248
Integer Programming 256
Branch and Bound 257
Practice Exercise (9–4) 262
Branch and Bound Applied to Assignment Problems 263
Practice Exercise (9–5) 266
Real-World Experiences 267
Summary 268
Assignments 268
Case Study: John's Investment Model 273
References 275

10 LINEAR PROGRAMMING: TRANSPORTATION AND ASSIGNMENT METHODS 276

Learning Objectives 279
Characteristics of a Transportation Problem 279
The Transportation Method of Solution 281
Practice Exercise (10–1) 284
Practice Exercise (10–2) 291
Practice Exercise (10–3) 292
Practice Exercise (10–4) 296

Practice Exercise (10–5) 298
Other Types of Transportation Problems 303
Characteristics of Assignment Problems 306
The Assignment Method of Solution 306
Practice Exercise (10–6) 312
Real-World Experiences 313
Summary 314
Assignments 315
Case Study: You-Drive Truck Rental Company 325
References 326

11 CHAINS OF EVENTS: MARKOV ANALYSIS 327

Learning Objectives 328
Describing a Markov Chain 328
Calculating Transient Probabilities 330
Practice Exercise (11–1) 333
Calculating Steady-State Probabilities 333
Practice Exercise (11–2) 339
Practice Exercise (11–3) 340
Special Cases 340
Practice Exercise (11–4) 346
Management Application: Personnel Planning 346
Real-World Experiences 348
Summary 349
Assignments 349
Case Study: Archie's Quarks 353
References 353

12 PROJECT PLANNING: PERT AND CPM 355

Learning Objectives 356
Gantt Charts 357
Drawing Project Networks 358
Finding the Critical Path 362
Practice Exercise (12–1) 366
Practice Exercise (12–2) 370
Managerial Uses of Network Diagrams 370
PERT: Using Probabilistic Networks 371
Practice Exercise (12–3) 375
Practice Exercise (12–4) 376
CPM: Making Time/Cost Trade-offs 377

Practice Exercise (12–5) 381
Practice Exercise (12–6) 382
Need for Computers 382
Other Project Techniques 383
Real-World Experiences 383
Summary 385
Assignments 385
Case Study: Xylon Electronics 394
References 396

PART IV BALANCING COST AND SERVICE

13 INVENTORY SYSTEMS AND MODELS 398

Learning Objectives 400
Classifying Inventory Systems 400
Classifying Inventory Models 401
Inventory Costs 401
EOQ: A Fixed-Order Quantity Model 404
Practice Exercise (13–1) 409
Three Special Cases 410
Practice Exercise (13–2, 13–3, and 13–4) 416
A Fixed-Order Period Model 416
Practice Exercise (13–5) 419
Summary 419
Assignments 420
References 425

14 INVENTORY: COPING WITH UNCERTAINTY 426

Learning Objectives 427
Two Fixed-Order Quantity Models 427
Practice Exercise (14–1) 432
Practice Exercise (14–2) 435
A Fixed-Order Period Model 436
Practice Exercise (14–3) 440
Selecting an Inventory Model 440
Multiple Items 443
Other Inventory Systems 446
Real-World Experiences 447
Summary 448

Assignments 449
Case Study: Wonderworld 453
References 455

15 WAITING LINES: QUEUING THEORY 456

Learning Objectives 458
The Costs of Queuing Systems 458
Typical Structures 460
A Single-Line–Single-Server Model 462
Practice Exercise (15–1) 466
System Evaluation When Waiting Cost Is Known 466
System Evaluation with Unknown Waiting Cost 468
A Single Server Model with Constant Service Time 471
Practice Exercise (15–2) 472
Comparing Exponential and Constant Service Times 472
A Model with Multiple Servers 473
Practice Exercise (15–3) 475
Comparing One Fast Server with Two Slow Servers 475
Poisson and Exponential Distributions 476
Solution by Simulation 478
Real-World Experiences 479
Summary 480
Assignments 480
Case Study: Drive-in Tellers 483
References 484

PART V SOLVING PROBLEMS BY MODELING SYSTEM BEHAVIOR

16 SIMULATION 488

Learning Objectives 490
A Simulation Example: Profit Analysis 490
The Simulation Procedure 494
Generating Values of a Random Variable 496
Monte Carlo Process 496
Practice Exercise (16–1) 501
Practice Exercise (16–2) 501
Building a Model 502
Model Reliability and Validity 503

Introduction to Some Examples 503
A Queuing System Example 503
An Inventory Example 507
A Simulation of Human Decision Making 512
An Example of a Car Rental Agency 515
Real-World Experiences 518
Summary 520
Assignments 521
Case Study: But, Will It Make a Profit? 528
References 528

PART VI MAINTAINING A MANAGERIAL PERSPECTIVE

17 QUANTITATIVE METHODS IN ACTION 532

Learning Objectives 533
When to Use Quantitative Methods 534
Choosing an Appropriate Quantitative Method 535
The Model Development Process 536
Barriers to Using Quantitative Methods 539
Computer-Based Information Systems 542
The Impact of Quantitative Methods 547
The Future of Quantitative Methods 549
Summary 549
Assignments 550
Case Study: National Tool Company 552
References 554

APPENDIXES

A Review of Probability and Statistics 555

B Area under the Standard Normal Curve 570

C Table of Random Numbers 572

D Answers to Practice Exercises 574

Indexes 593
Name Index
Subject Index

PART ONE

FUNDAMENTALS OF QUANTITATIVE METHODS

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