

- Preface p. xiii
- 1. Introduction
 - Profit Planning p. 2
 - Typical Oil Company Objectives p. 3
 - The Role of Management in Planning p. 4
 - Planning of Capital Expenditures p. 5
 - Some Basic Principles of Economics p. 6
 - Demand, Supply, and Price Equilibrium p. 7
 - Inflation p. 14
 - Uncertainty and Risk p. 18
 - Questions and Problems p. 20
- 2. The Time Value of Money
 - The Concept of Interest p. 24
 - Simple and Compound Interest p. 26
 - Nominal and Effective Interest Rate p. 30
 - Cash-Flow Diagram p. 33
 - The Time Value of Money p. 35
 - Present Value of Future Sum p. 37
 - Future Value of Present Sum p. 44
 - Present Value of an Annuity p. 47
 - Future Value of an Annuity p. 50
 - Present Value of Deferred Annuity p. 53
 - Annuity from Present Value p. 56
 - Annuity from Future Value p. 59
 - Present Value of Uniform Gradient Series p. 60
 - Present Value of Shifted Gradient Series p. 62
 - Calculation of Unknown Interest Rate p. 64
 - Loan Amortization Schedule p. 65
 - Funds Flow and Compounding/Discounting p. 67
 - Spreadsheet Application p. 70
 - Questions and Problems p. 78
- 3. Before-Tax Cash-Flow Models
 - Cash-Flow Model p. 86
 - Data Required for Project Evaluation p. 88
 - Forecasting Product Stream p. 89
 - Volumetric Calculations p. 91
 - Decline Curve Analysis p. 93
 - Exponential Decline p. 95
 - Hyperbolic Decline p. 97
 - Harmonic Decline p. 103
 - Low-Permeability (Tight) Gas Reservoirs p. 104
 - Rate-Cumulative Production Plot p. 108
 - Cumulative Gas (Gp)--Cumulative Oil (Np) Plot p. 110
 - Water Cut Versus Cumulative Oil Plot p. 112

- Gas Reservoir Material Balance p. 114
- Production Forecast by Analogy p. 119
- Product Pricing p. 123
- Capital Expenditures (CAPEX) p. 126
- Geological and Geophysical (G&G) Costs p. 127
- Estimating Drilling Costs p. 127
- Facility Costs p. 129
- Operating Expenditures (OPEX) p. 132
- Abandonment Costs and Sunk Costs p. 136
- Opportunity Costs p. 138
- Types of Cost Estimates p. 139
- Order of Magnitude Estimate p. 139
- Optimization Study Estimate p. 140
- Budget Estimate p. 141
- Control Estimate p. 141
- Cost Overrun p. 142
- The Accuracy of the Estimates p. 142
- Contingencies and Allowances p. 143
- Transfer Pricing p. 145
- Transfer Price at Cost p. 147
- General Formula for Computing Transfer Price p. 148
- Transfer at Market Price p. 149
- Aspects of Leasing p. 150
- System of Land Ownership Identification p. 151
- Ownership Interest Computation p. 154
- Severance and Ad Valorem Taxes p. 158
- Cash-Flow Estimation Bias p. 163
- Cash-Flow Analysis of Foreign Investments p. 165
- Cash-Flow Analysis and Inflation p. 166
- The Cost of Capital p. 168
- The Cash-Flow Spreadsheet p. 171
- Questions and Problems p. 175
- 4. After-Tax Cash-Flow Model
- Depreciation p. 189
- Tangible Property p. 189
- Intangible Property p. 189
- Modified Accelerated Cost Recovery System p. 190
- Accelerated Cost Recovery System p. 195
- Straight-Line Depreciation p. 195
- Declining Balance Depreciation p. 196
- Sum-of-the-Years'-Digits Depreciation p. 197
- Units of Production Depreciation p. 200
- Amortization and Depletion p. 201
- Amortization p. 201

- Depletion p. 202
- Cost Depletion p. 203
- Percentage Depletion p. 204
- Intangible Drilling Costs p. 206
- 5. International Petroleum Economics
 - Types of Contract Arrangements p. 219
 - The Concessionary System p. 220
 - The Production-Sharing System p. 224
 - Government and Contractor Take p. 234
 - Sample PSC Cash-Flow Spreadsheet p. 237
 - Risk Service Contracts p. 240
 - Rate of Return (ROR) Contracts p. 241
 - Effects of Various Fiscal Terms p. 242
 - Efficient Fiscal Regime p. 243
 - The Effect of Cost Recovery Ceiling p. 245
 - Questions and Problems p. 248
- 6. Capital Budgeting Techniques
 - Accounting Approaches p. 257
 - Payback Period p. 257
 - Average Return on Investment (AROI) p. 261
 - Discounted Cash-Flow Approaches p. 262
 - Discounted Payback Period p. 262
 - Net Present Value (NPV) p. 264
 - Internal Rate of Return (IRR) p. 269
 - Dual Rate of Return p. 271
 - Reinvestment in the IRR Calculation p. 275
 - Specific Characteristics of IRR p. 278
 - Profitability Index (PI) p. 280
 - Unit Technical Cost (TC) p. 283
 - Growth Rate of Return (GRR) p. 286
 - Adjusted Net Present Value (ANPV) p. 291
 - Effect of Discounting Frequency p. 293
 - Treatment of Financing Mix p. 298
 - Pattern of Project Debt Repayment Schedule p. 300
 - After-Tax Weighted Average Cost of Capital Method p. 304
 - Equity Residual Method--NPV[subscript ER] p. 307
 - Arditti-Levy Method--NPV[subscript AL] p. 309
 - Adjusted Net Present Value Method--NPV[subscript A] p. 310
 - Comparison of the Four Methods p. 312
 - Questions and Problems p. 315
- 7. Investment Selection Decision-Making
 - Service-Producing Investments p. 326
 - Equivalent Cost Analysis p. 326
 - Rate of Return Analysis p. 329

- Present Value Ratio or PI Analysis p. 331
- Service Life Breakeven Analysis p. 332
- Unequal Life Service-Producing Alternatives p. 333
- Lease Versus Buy Decision Analysis p. 336
- Income-Producing Investments p. 342
- Project Screening Economics p. 342
- Mutually Exclusive Investment Analysis p. 346
- Non-Mutually Exclusive Investment Analysis p. 355
- Questions and Problems p. 360
- Appendix A Interest Factors for Annual Interest Compounding p. 369
- Appendix B Overview for CD-ROM programs that accompany Volume 2 p. 375
- Index p. 379