Contents

Preface **xiii**

Purpose of the Book xiv

Target Audience xiv

A Note to Students xv

Organization of the Book xv

Outstanding Features xvii

Pedagogical Features xviii

Supplements xviii

Typography Conventions xviii

Changes from the 7th Edition xix

A Note on the Internet xix

Acknowledgments xx

CHAPTER 1 Introduction to Excel 2016 1

Spreadsheet Uses 2

Starting Microsoft Excel 2

Parts of the Excel Screen 3

The File Tab and Quick Access Toolbar 3

The Home Tab 4

The Formula Bar 6

The Worksheet Area 6

Sheet Tabs 7

Status Bar 7

Navigating the Worksheet 8

Selecting a Range of Cells 9

Using Defined Names 9

Entering Text and Numbers 10

Formatting and Alignment Options 11

Formatting Numbers 13

Adding Borders and Shading 14

Entering Formulas 14

Copying and Moving Formulas 17

Mathematical Operators 18

Parentheses and the Order of Operations 18

С	0	n	te	n	t
•	v	•	LC		v

	I
Using Excel's Built-In Functions 20	Efficiency Ratios 73
Using the Insert Function Dialog Box 21	Inventory Turnover Ratio 73
"Dot Functions" in Excel 2016 23	Accounts Receivable Turnover Ratio 74
Using User-Defined Functions 24	Average Collection Period 74
Creating Graphics 26	Fixed Asset Turnover Ratio 75
Creating Charts in a Chart Sheet 26	Total Asset Turnover Ratio 76
Creating Embedded Charts 27	Leverage Ratios 77
Formatting Charts 28	The Total Debt Ratio 77
Changing the Chart Type 29	The Long-Term Debt Ratio 78
Creating Sparkline Charts 31	The Long-Term Debt to Total Capitalization Ratio 78
Printing 32	The Debt to Equity Ratio 79
Using Excel with Other Applications 33	The Long-Term Debt to Equity Ratio 80
Quitting Excel 34	Coverage Ratios 80
Best Practices for Spreadsheet Models 35	The Times Interest Earned Ratio 80
Summary 36	The Cash Coverage Ratio 81
Problems 37	Profitability Ratios 82
Internet Exercise 40	The Gross Profit Margin 82
internet Exercise 40	The Operating Profit Margin 83
	The Net Profit Margin 83
The Basic Financial Statements 41	Return on Total Assets 84
The Income Statement 42	Return on Equity 84 Return on Common Equity 85
Building an Income Statement in Excel 42	DuPont Analysis 85
The Balance Sheet 47	Analysis of EPI's Profitability Ratios 87
Building a Balance Sheet in Excel 47	Financial Distress Prediction 88
Improving Readability: Custom Number Formats 49	The Original Z-Score Model 88
Common-Size Financial Statements 52	The Z-Score Model for Private Firms 90
Creating Common-Size Income Statements 52	Using Financial Ratios 90
Creating Common-Size income Statements 32 Creating a Common-Size Balance Sheet 54	Trend Analysis 90
Building a Statement of Cash Flows 55	Comparing to Industry Averages 91
Using Excel's Outliner 60	Company Goals and Debt Covenants 93
Common-Size Statement of Cash Flows 62	Automating Ratio Analysis 93
Summary 65	Economic Profit Measures of Performance 95
Problems 66	Summary 98
	Problems 101
Internet Exercise 68	Internet Exercise 102
Financial Statement Analysis Tools 69	
Liquidity Ratios 70	CHAPTER 4 The Cash Budget 103
The Current Ratio 71	The Worksheet Area 105
- 10 Cm / Cm / MIIV / 1	

Contents

CHAPTER 2

CHAPTER 3

The Quick Ratio 72

Using Date Functions 105

CHAPTER 5

CHAPTER 6

Calculating Text Strings 106 Sales and Collections 107 Purchases and Payments 109 Collections and Disbursements 110 Calculating the Ending Cash Balance 112 Repaying Short-Term Borrowing 114 Using the Cash Budget for What-If Analysis 115 The Scenario Manager 117 Adding Interest and Investment of Excess Cash 121 Calculating Current Borrowing 123 Using the Formula Auditing Tools to Avoid Errors 123 Calculating Current Investing 127 Working Through the Example 128 Summary 131 Problems 133 Financial Statement Forecasting 139 The Percent of Sales Method 140 Forecasting the Income Statement 140 Forecasting Assets on the Balance Sheet 144 Forecasting Liabilities on the Balance Sheet 146 Discretionary Financing Needed 147 Using Iteration to Eliminate DFN 149 Other Forecasting Methods 152 Linear Trend Extrapolation 152 Regression Analysis 156 Statistical Significance 160 Summary 163 Problems 164 Internet Exercises 166 Forecasting Sales with Time Series Methods 167 Time Series Decomposition 168 Smoothing a Time Series with Moving Averages 169 Isolating the Seasonality of a Time Series 171 Extracting the Irregular Component 172 Time Series Forecasting Techniques 173 Measuring Forecast Errors 174 Exponential Smoothing Methods 174

Simple Exponential Smoothing 175 Holt's Linear Trend Exponential Smoothing Model 177 Forecasting Time Series with Both Trend and Seasonality 179 Holt-Winters Additive Seasonal Model 180 Using the Built-in ETS Model 182 Holt-Winters Multiplicative Seasonal Model 184 Time Series Forecasting Using Regression Analysis 186 Forecasting the Trend Using Regression 186 Using Seasonal Dummy Variables to Account for Seasonality 188 Summary 191 Problems 192 Internet Exercise 193 Break-Even and Leverage Analysis 195 Break-Even Points 196 Calculating Break-Even Points in Excel 197 Other Break-Even Points 199 Using Goal Seek to Calculate Break-Even Points 201 Leverage Analysis 202 The Degree of Operating Leverage 203 The Degree of Financial Leverage 205 The Degree of Combined Leverage 207 Extending the Example 208 Linking Break-Even Points and Leverage Measures 209 Summary 210 Problems 212 Internet Exercise 213 The Time Value of Money 215 Future Value 216 Using Excel to Find Future Values 217 Present Value 218 Annuities 219 Present Value of an Annuity 220 Future Value of an Annuity 222 Solving for the Annuity Payment 224 Solving for the Number of Periods in an Annuity 225

Solving for the Interest Rate in an Annuity 226

Deferred Annuities 228

CHAPTER 7

CHAPTER 8

Contents

Contents

Graduated Annuities 230 Present Value of a Graduated Annuity 230 Future Value of a Graduated Annuity 233 Solving for the Graduated Annuity Payment 234 Uneven Cash Flow Streams 234 Solving for the Yield in an Uneven Cash Flow Stream 236 Nonannual Compounding Periods 237 Continuous Compounding 241 Summary 242

CHAPTER 9 Common Stock Valuation 247

What Is Value? 248 Fundamentals of Valuation 249 Determining the Required Rate of Return 250 A Simple Risk Premium Model 251 CAPM: A More Scientific Model 251 Valuing Common Stocks 254 The Constant-Growth Dividend Discount Model 255 The Two-Stage Growth Model 260 Three-Stage Growth Models 262 Alternative Discounted Cash Flow Models 266 The Earnings Model 266 The Free Cash Flow Model 270 Relative Value Models 273 Preferred Stock Valuation 275 Summary 277 Problems 278 Internet Exercise 280

CHAPTER 10 Bond Valuation 283

Bond Valuation 284 Valuing Bonds between Coupon Dates 286 Using Excel's Advanced Bond Functions 288 Bond Return Measures 291

Current Yield 291 Yield to Maturity 292

Problems 243

viii

CHAPTER 11 The Cost of Capital 321

Yield to Call 294

Bond Price Sensitivities 300

Duration and Convexity 308

Modified Duration 310

Duration 308

Convexity 313 Summary 315

Internet Exercise 320

Problems 318

Returns on Discounted Debt Securities 296

Comparing Two Bonds with Different Maturities 305

Visualizing the Predicted Price Change 311

Comparing Two Bonds with Different Coupon Rates 307

The U.S. Treasury Yield Curve 298

Changes in the Required Return 300

Changes in Term to Maturity 302

The Appropriate Hurdle Rate 322 The Weighted Average Cost of Capital 323 Determining the Weights 324 WACC Calculations in Excel 325 Calculating the Component Costs 326

The Cost of Common Equity 327 The Cost of Preferred Equity 328

The Cost of Debt 329

Using Excel to Calculate the Component Costs 330 The After-Tax Cost of Debt 330

The Cost of Preferred Stock 332 The Cost of Common Stock 332

The Role of Flotation Costs 333 Adding Flotation Costs to Our Worksheet 334 The Cost of Retained Earnings 335

The Marginal WACC Curve 336 Finding the Break-Points 336 Creating the Marginal WACC Chart 340

Summary 342 Problems 342 Internet Exercise 344

	The Initial Outlay 349										
	The Annual After-Tax Operating Cash Flows 350										
	The Terminal Cash Flow 351										
	Estimating the Cash Flows: An Example 352										
	Calculating the Relevant Cash Flows 357										
	Making the Decision 358										
	The Payback Method 359										
	The Discounted Payback Period 361										
	Net Present Value 363										
	The Profitability Index 365										
	The Internal Rate of Return 366										
	Problems with the IRR 367										
	The Modified Internal Rate of Return 369 Sensitivity and Scenario Analysis 372 NPV Profile Charts 372 Scenario Analysis 373 The Optimal Capital Budget 376										
							Optimal Capital Budget without Capital Rationing 378 Optimal Capital Budget under Capital Rationing 378				
							Other Techniques 383				
							Summary 383				
							Problems 384				
CHAPTER 13	Risk and Capital Budgeting 389										
	Review of Some Useful Statistical Concepts 390										
	The Expected Value 390										
	Measures of Dispersion 392										
	Using Excel to Measure Risk 395										
	The Freshly Frozen Fish Company Example 395										
	Introducing Uncertainty 399										

Sensitivity Analysis 399

Monte Carlo Simulation 410

Calculating the Expected NPV from the Scenarios 406

Calculating the Variance and Standard Deviation 407

Calculating the Probability of a Negative NPV 409

The Risk-Adjusted Discount Rate Method 417

The Certainty-Equivalent Approach 418

Scenario Analysis 404

Estimating the Cash Flows 348

CHAPTER 12 Capital Budgeting 347

```
Portfolio Statistics and Diversification 425
CHAPTER 14
                     Portfolio Diversification Effects 426
                     Determining Portfolio Risk and Return 428
                         Portfolio Standard Deviation 429
                         Changing the Weights 432
                     Portfolios with More than Two Securities 434
                         Creating a Variance/Covariance Matrix 434
                         Calculating the Portfolio Standard Deviation 438
                      The Efficient Frontier 439
                         Locating Portfolios on the Efficient Frontier in Excel 440
                         Charting the Efficient Frontier 443
                     The Capital Market Line 445
                         Charting the Capital Market Line 448
                         Identifying the Market Portfolio 449
                      Utility Functions and the Optimal Portfolio 452
                         Charting Indifference Curves 452
                      The Capital Asset Pricing Model 454
                         The Security Market Line 455
                     Summary 457
                      Problems 458
                      Internet Exercise 461
                   Writing User-Defined Functions with VBA 463
CHAPTER 15
                      What Is a Macro? 464
                         Two Types of Macros 464
                      The Visual Basic Editor 466
                          The Project Explorer 467
                          The Code Window 468
                      The Parts of a Function 468
                      Writing Your First User-Defined Function 469
                      Writing More Complicated Functions 473
                          Variables and Data Types 473
                          The If-Then-Else Statement 475
                          Looping Statements 478
```

Using Worksheet Functions in VBA 481

Using Optional Arguments 482

Summary 420 Problems 422

Using ParamArray for Unlimited Arguments 483 Debugging VBA Code 484 Breakpoints and Code Stepping 484 The Watch Window 485 The Immediate Window 486 Creating Excel Add-Ins 487 Best Practices for VBA 488 Summary 489 Problems 490 **CHAPTER 16** Analyzing Datasets with Tables and Pivot Tables 493 Creating and Using an Excel Table 494 Removing Duplicate Records from the Table 496 Filtering the Table 497 Sorting and Filtering Numeric Fields 498 Structured Referencing for Formulas in Tables 500 Using Get & Transform 501 Cleaning the Dataset 503 An Example Data Query 503 Using Pivot Tables 505 Creating a Pivot Table 505 Formatting the Pivot Table 507 Rearranging the Pivot Table and Adding Fields 510 Transforming the Data Field Presentation 511 Calculations in Pivot Tables 512 Pivot Tables for Financial Statements 513 Grouping Data by Date 515 Using Pivot Charts to Show Trends Over Time 517 Displaying Multiple Subtotals 518 Using Calculated Fields for Financial Ratios 519 Filtering Data with Slicers and Timelines 521 Extracting Data from a Pivot Table 522 Summary 523 Problems 524 Internet Exercise 527 Directory of User-Defined Functions in **APPENDIX** FameFncs.xlam 529

INDEX

533