Demand-Driven Forecasting

A Structured Approach to Forecasting

Second Edition Charles W. Chase, Jr.



Contents

Foreword xi

Preface xv

Acknowledgments xix

About the Author xx

Demystifying Forecasting: Myths versus Reality 1 Chapter 1 Data Collection, Storage, and Processing Reality 5 Art-of-Forecasting Myth 8 End-Cap Display Dilemma 10 Reality of Judgmental Overrides 11 Oven Cleaner Connection 13 More Is Not Necessarily Better 16 Reality of Unconstrained Forecasts, Constrained Forecasts, and Plans 17 Northeast Regional Sales Composite Forecast 21 Hold-and-Roll Myth 22 The Plan that Was Not Good Enough 23 Package to Order versus Make to Order 25 "Do You Want Fries with That?" 26 Summary 28 Notes 28 Chapter 2 What Is Demand-Driven Forecasting? 31

Transitioning from Traditional Demand Forecasting 33
What's Wrong with The Demand-Generation Picture? 34
Fundamental Flaw with Traditional Demand Generation 37
Relying Solely on a Supply-Driven Strategy
Is Not the Solution 39
What Is Demand-Driven Forecasting? 40
What Is Demand Sensing and Shaping? 41
Changing the Demand Management Process Is Essential 57

Communication Is Key 65 > Measuring Demand Management Success 67 Benefits of a Demand-Driven Forecasting Process 68 Key Steps to Improve the Demand Management Process 70 Why Haven't Companies Embraced the Concept of Demand-Driven? 71 Summarv 74 Notes 75 Chapter 3 Overview of Forecasting Methods 77 Underlying Methodology 79 Different Categories of Methods 83 How Predictable Is the Future? 88 Some Causes of Forecast Error 91 Segmenting Your Products to Choose the Appropriate Forecasting Method 94 Summary 101 Note 101 Chapter 4 Measuring Forecast Performance 103 "We Overachieved Our Forecast, So Let's Party!" 105 Purposes for Measuring Forecasting Performance 106 Standard Statistical Error Terms 107 Specific Measures of Forecast Error 111 **Out-of-Sample Measurement** 115 Forecast Value Added 118 Summary 122 Notes 123 Chapter 5 Quantitative Forecasting Methods Using Time Series Data 125 Understanding the Model-Fitting Process 127 Introduction to Quantitative Time Series Methods 130 Ouantitative Time Series Methods 135 Moving Averaging 136 **Exponential Smoothing** 142 Single Exponential Smoothing 143 Holt's Two-Parameter Method 147 Holt's-Winters' Method 149 Winters' Additive Seasonality 151 Summary 156 Notes 158

Chapter 6 Regression Analysis 159 Regression Methods 160 Simple Regression 160 Correlation Coefficient 163 Coefficient of Determination 165 Multiple Regression 166 Data Visualization Using Scatter Plots and Line Graphs 170 Correlation Matrix 173 Multicollinearity 175 Analysis of Variance 178 F-test 178 Adjusted R² 180 Parameter Coefficients 181 t-test 184 P-values 185 Variance Inflation Factor 186 Durbin-Watson Statistic 187 Intervention Variables (or Dummy Variables) 191 Regression Model Results 197 Key Activities in Building a Multiple Regression Model 199 Cautions about Regression Models 201 Summary 201 Notes 202

Chapter? ARIMA Models 203

Phase 1: Identifying the Tentative Model 204
Phase 2: Estimating and Diagnosing the Model Parameter Coefficients 213
Phase 3: Creating a Forecast 216
Seasonal ARIMA Models 216
Box-Jenkins Overview 225
Extending ARIMA Models to Include Explanatory Variables 226
Transfer Functions 229
Numerators and Denominators 229
Rational Transfer Functions 230
ARIMA Model Results 234
Summary 235
Notes 237

Chapter 8 Weighted Combined Forecasting Methods 239

What Is Weighted Combined Forecasting? 242 Developing a Variance Weighted Combined Forecast 245 Guidelines for the Use of Weighted Combined Forecasts 248 Summary 250 Notes 251

Chapter 9 Sensing, Shaping, and Linking Demand to Supply: A Case Study Using MTCA 253

Linking Demand to Supply Using Multi-Tiered Causal Analysis 256 Case Study: The Carbonated Soft Drink Story 259 Summary 276 Appendix 9A Consumer Packaged Goods Terminology 277 Appendix 9B Adstock Transformations for Advertising GRP/TRPs 279 Notes 282

Chapter 10 New Product Forecasting: Using Structured Judgment 283

Differences between Evolutionary and Revolutionary New Products 284 General Feeling about New Product Forecasting 286 New Product Forecasting Overview 288 What Is a Candidate Product? 292 New Product Forecasting Process 293 Structured Judgment Analysis 294 Structured Process Steps 296 Statistical Filter Step 303 Model Step 305 Forecast Step 308 Summary 313 Notes 316

Chapter 11 Strategic Value Assessment: Assessing the Readiness of Your Demand Forecasting Process 317

Strategic Value Assessment Framework 319 Strategic Value Assessment Process 321 SVA Case Study: XYZ Company 323 Summary 351 Suggested Reading 352 Notes 352

index 355