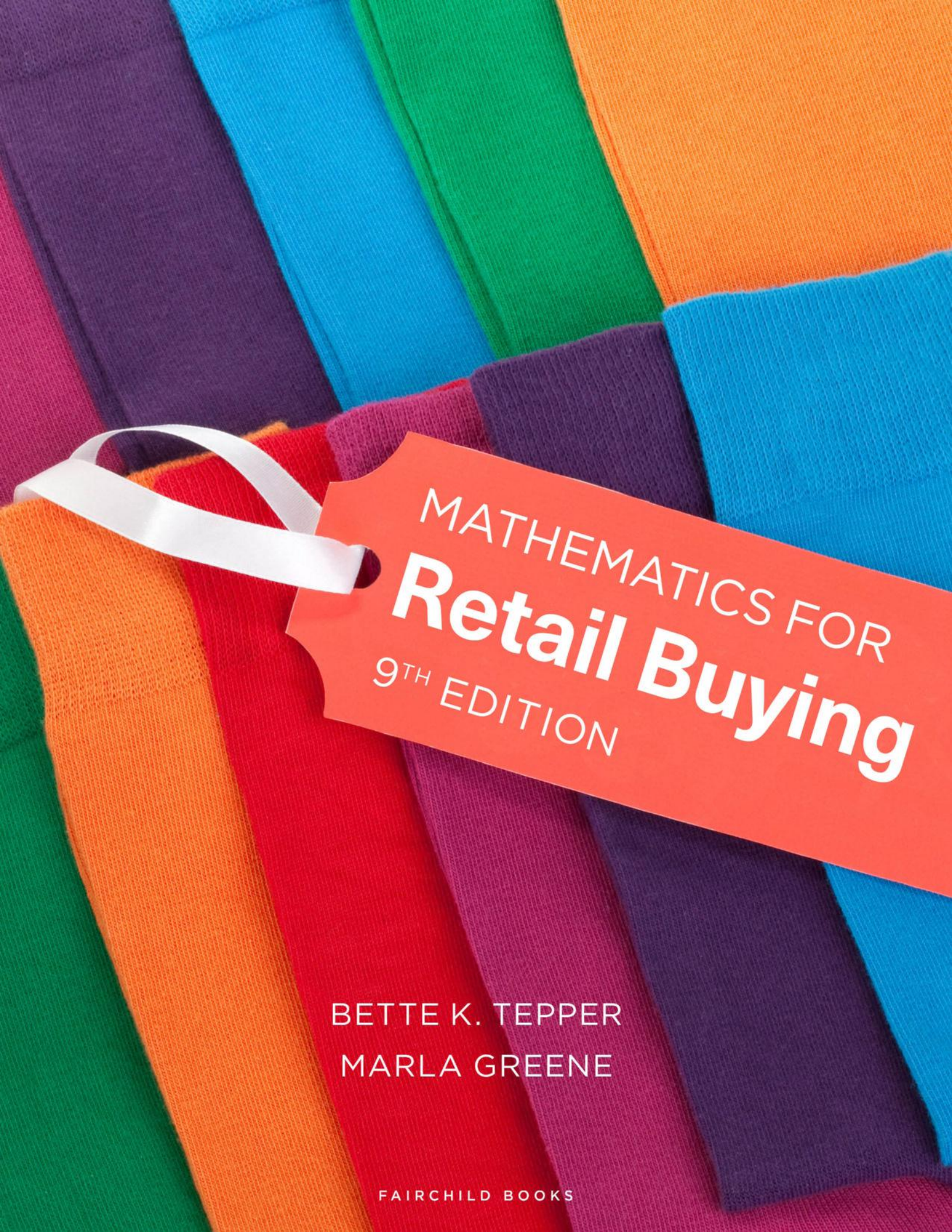
MATHEMATICS FOR
Retail Buying
9TH EDITION
BETTE K. TEPPER
MARLA GREENE
FAIRCHILD BOOKS

MATHEMATICS FOR RETAIL BUYING

ninth edition

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FAIRCHILD BOOKS
NEW YORK • LONDON • OXFORD • NEW DELHI • SYDNEY

Because of her encouragement, contribution, assistance, and support, I would like to dedicate this edition to my daughter, Rebecca Tepper Citron.

—Bette K. Tepper

I would like to dedicate this edition to my colleagues at LIM College for their support over the years and mostly for the students, this is for you for now and in your career!

—Marla Greene

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PREFACE

"When you can measure what you are speaking about and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind."

LORD KELVIN (1824–1901)

In the first edition of *Mathematics for Retail Buying*, we stated that operating figures, especially sales and gross margin, are the language of any retailer, regardless of the retail format (physical store, online site, mobile site, app). This has not changed, and in today's highly competitive retail environment, where retailers are competing for the customers' "share of wallet," it is even more important than ever to have comprehension of the mathematical factors involved in profitable merchandising. This fundamental mathematical background gives insight into how merchandising problems are solved mathematically and perception as to why merchandising decisions are made based on analytical data. While the formulas remain constant from retailer to retailer, the numbers will vary. The most experienced and skilled merchandiser knows that mastery of mathematical techniques and analysis of the numbers is an essential tool that is employed by a buyer or planner on a daily basis. Additionally, persons in related careers who comprehend the mathematics of profit will also benefit by their broader understanding of merchandising situations.

Mathematics for Retail Buying teaches the essential concepts, practices, and procedures as well as the calculations and interpretations of figures related to the many factors that produce sales and ultimately profit. The choice of material and the depth of each subject focus on that which has practical value for the performance of roles in or associated with retail buying, planning, and merchandising. It concentrates on the mathematical concepts and their relationships to the many activities involved in achieving a profitable retail buying/selling process. The concepts provide the foundation; how they are generally applied is then described in each chapter. Actual industry application will vary based on what is right for the retailer or department for which you are ultimately working. Each retailer/company has different goals and reporting

systems that incorporate the basic formulas. In addition to the obvious educational benefits to students of retailing, *Mathematics for Retail Buying* can serve as a guide in training junior executives and can be a constant source of reference for a buyer or planner or the merchant who operates a small, independent store. A guiding principle always to remember is that no matter how far along you are in your career, you always need to come back to the basics and understand how they work.

When contemplating the writing or revision of any retailing textbook, the question of practical value will inevitably arise. We feel the contents of *Mathematics for Retail Buying* are not only sensible but realistic because this text has been based on:

- The personal experience of the authors, who were merchandise managers and buyers for major retail organizations
- The knowledgeable opinions of current retail executives as to the information necessary to prepare prospective retail merchandisers
- The insights manufacturers have gained that help to provide better service and to communicate more effectively with retailers and merchandisers
- The tested use of the material by the authors and other faculty members at many universities and colleges and by retail executives and training departments
- Favorable comments about the value of the material in relation to career performance by many alumni who are retail executives in the industry

The study and comprehension of the principles and techniques contained in *Mathematics for Retail Buying* will enable the student to:

- Recognize the basic and elementary factors of the buying and selling process that affect sales, gross margin, and profit.
- Understand the relationship of the profit factors and how to improve profit performance by the manipulation of these factors.
- Understand how merchandise pricing affects the bottom line.
- Become familiar with the applications of computers and computerized forms in retailing.
- Understand and apply the basic mathematical concepts used to solve real-life merchandising problems.
- Recognize the relationship between all the formulas and metrics involved in a business.
- Comprehend the standard industry terminology employed in retailing and merchandising.

In developing and changing the book for this revised Ninth Edition, we have tried to be sensitive to and concerned about comments from colleagues and students from many other colleges relating to the material covered in our book. Taking these

comments into account, we have updated the chapters and increased learning materials to better prepare students to enter the retail industry, especially those students that want to apply for executive training programs.

There is a rather basic principle about the buying/merchandising process: There is no one beginning and no one end. It is a circular process—an unending, interrelated continuum within which all factors influence all other factors. Even though the chapters are interrelated, each can be used as a separate topic of study, and each can be shifted without losing the continuity of the process. The various facets of the merchandising cycle are an ongoing procedure of monitoring, analysis, and evaluation, directed to the purpose of meeting the merchandiser's objective of achieving a sales plan, a predetermined gross margin, which should, in turn, generate an appropriate net gross margin/profit. This is mentioned to point out to instructors and students alike (and to merchants who use our book for in-service training purposes) that the study of retail mathematics may begin at any point on the "circle."

ORGANIZATION OF THE BOOK

In this revised Ninth Edition, the material is divided into six chapters. Each chapter covers a particular, basic mathematical factor that affects the gross margin/profits that a buyer/planner or retailer will be concerned about. The relationships among these profit factors are stressed throughout the book. The sequence within some chapters has been altered to accommodate additional and/or more detailed explanations. The book begins with the basics of understanding how to achieve a gross margin/profit and the subsequent chapters build on these initial concepts. Each chapter will provide a relationship to sales and gross margin that will be beneficial to students and industry users.

The chapters of study and their subject matter are:

- Chapter 1, Merchandising for a Profit, defines, analyzes, and shows the calculations pertaining to the skeletal profit and loss statement and the components of the statement.
- Chapter 2, Retail Pricing and Repricing of Merchandise, discusses and illustrates the basic pricing factors used in buying decisions and presents the calculations used when pricing merchandise initially, initial markup and cumulative markup. The section on repricing merchandise and markdowns includes compounded markdowns. Two more sections discuss point-of-sale and permanent markdowns, and the analytical criteria for taking markdowns.
- Chapter 3, Basic Markup Equations Used in Merchandising Decisions, explains the importance of markup to profitable merchandising and illustrates the calculations of the various types of markup (i.e., cumulative, initial, and maintained) that, when understood and implemented, achieve the desired results.

- Chapter 4, The Retail Method of Inventory, presents and explains this proven, reliable procedure as a mechanism and system for determining the total value of the stock-on-hand and shortages and the effect on gross margin.
- Chapter 5, Six-Month Planning and Components, includes the methodology of how to plan sales and inventory, including turnover and GMROI. Increased focus has been placed on the six-month planning process with an example that takes students through the steps for one department. A new assortment planning section has been added with examples.
- Chapter 6, Invoice Mathematics: Terms of Sale, discusses discounts and order terms that buyers are responsible for negotiating.

Every effort is still being made to build the contents of the book into a solid foundation for ease of understanding, and not merely to display formulas. The material has been reorganized as traditional chapters with sections and subsections while keeping the structure of a simplified outline form. Within each chapter after a major topic, a series of examples with problems and solutions is presented that tests the understanding of the fundamental principles discussed in that section. This step-by-step presentation uses brief explanations stated in basic terms and precise definitions, demonstrated clearly in examples that express the mathematical principles discussed in that section. Within each chapter, after a major topic, a series of solutions is presented that tests understanding of the fundamental principles discussed in that section. After major principles are explained, students are given practice problems to solve that mirror the various channels of distribution in the retail industry. At the end of each chapter, updated case studies illustrate practical retailing situations and common obstacles and difficulties encountered in real-life merchandising. The majority of the problems presented in this text focus on apparel and accessories as the kingdom of fashion goods is explored. Among these are problems designed for and designated as spreadsheet problems and cases, which can be calculated manually, with a calculator, or on a computerized spreadsheet. A STUDIO online learning environment replaces the CD-ROM that appeared in earlier editions and includes many of the problems and cases that pertain to the fundamental concepts of profitable retailing. These features further reinforce comprehension of the specific section.

For the revised Ninth Edition, particular attention has been paid to the comments of the various users, including their own teaching experience, as well as both of the authors, and also the comments of people in the industry interviewed for the book. Bette K. Tepper is a former faculty member of the Fashion Management Department at the Fashion Institute of Technology in New York City, USA, where she taught for more than 30 years. Marla Greene is an Associate Professor of Fashion Merchandising at LIM College in New York City, USA, and a retail professional with more than 25 years of experience as a merchandise manager and buyer.

KEY LEARNING FEATURES

- The Introduction continues to connect the text contents with an overview of the growth of retailing and the mega trends of the times, accelerated by the use of computers and the cardinal principles of successful merchandising.
- "Using Computerized Spreadsheets," at the end of the Introduction, explains the advantages and usage of spreadsheets in retail mathematics. All applicable concept problems are expressed in spreadsheet as well as traditional arithmetic format.
- Problem-solving situations throughout the text illustrate the basis for decision making.
- A list of Key Concept Formulas is included at the beginning of each chapter for immediate reference and information.
- A complete Glossary of Concept Formulas at the end of the book provides easy reference.
- Important key words continue to be highlighted throughout the book to facilitate student understanding of important key concepts.
- A Glossary of Terms, defining the highlighted terms throughout the book, facilitates student understanding of important key words and provides a convenient reference.
- Selected answers to odd number practice problems are given at the end of the book.
- The adaptation of spreadsheets to the mathematical concepts gives maximum comprehension, allowing students to solve more sophisticated problems without complicated, tedious calculations.

NEW TO THIS EDITION

- Updated case studies in Chapters 1 through 5 reflect realistic and practical merchandising situations.
- Many of the practice problems in each chapter are new or have been updated to reflect current industry practice. These problems help students comprehend material, apply industry terminology, and simulate realistic current merchandising situations.
- Industry terminology and data are updated and reflected in the text and problems presented.

USING MATHEMATICS FOR RETAIL BUYING

STUDIO™ *Mathematics for Retail Buying*, Ninth Edition, includes an online STUDIO accessible via www.fairchildbooks.com.

With this resource, students will:

- Practice skills by computing practice problems from the text, now available digitally with formulas embedded in Excel spreadsheets.
- Enhance knowledge with additional real-world case studies and activities for each chapter.
- Study smarter with self-quizzes featuring scored results and personalized study tips.
- Review concepts with flash cards of terms and definitions and key formulas.

The Excel files available under "Studio Resources" should be downloaded and saved to the student's computer. Students have the freedom to play with the numbers in the concept problems to see how the concepts work, as well as to work the practice problems. If additional space is needed to work the problems out in Excel, go to Home > Insert and insert additional rows, columns, or even pages in the spreadsheet. Some problems do not warrant the development of a spreadsheet. Even so, the computer can be useful to do basic arithmetic calculations to solve problems.

TEACHING RESOURCES

To gain access to instructor resources, go to www.fairchildbooks.com and create an account *or* log in to your account. Then visit the *Mathematics for Retail Buying*, Ninth Edition, webpage on the platform and in the instructor's module on the right-hand side of the page, select "Instructor Resources" and click "Request." Within 48 hours of requesting, instructors will receive a confirming e-mail and may access requested review/exam copies, instructor's resources, and STUDIO content via the "My Course Material" section once logged in to the platform.

- The comprehensive Instructor's Answer Manual for the entire text also includes the computations and answers to the practice problems and case studies for each chapter and has been updated to correspond to the revised edition material.
- Instructor's materials include an Edition Correlation Guide that identifies changes from unit to chapter and any shifts in content to provide an easy transition to the new edition.
- Learning with STUDIO Student Registration Guide (PDF) and First Day of Class PowerPoint presentation (PPT) provide important information.

- PowerPoint presentations provide a framework for lecture and discussion.
- The Test Bank offers exams for each chapter.

If you have any difficulties accessing the site or downloading material, please contact customer service at www.bloomsburyfashioncentral.com/contact-us.

ACKNOWLEDGMENTS

The idea for this book originated with the many faculty members who helped develop some of this material to meet the needs for teaching merchandising mathematics at the various retail-oriented programs from around the country. The authors are indebted to those faculty members for their contributions, and to the many students and alumni for their constructive criticism and suggestions that were used in preparing this book. Special thanks go to the coauthor of earlier editions, Professor Newton E. Godnick. He was actively involved in sharing and participating in all phases of the original and subsequent editions. Many of his contributions are still evident in this book.

It is remarkable that we are now offering a **Ninth Edition**! I would like to thank all of the people at Bloomsbury Publishing for all their support and assistance over the years. They have been a pleasure to work with over these many editions.

In revisions of this book, it was mandatory to include information conforming with generally accepted practices regarding the adaptation, preparation, and use of computerized spreadsheets to express the text's fundamental mathematical concepts, as well as the use as a management tool in the retail merchandising process. In order to present this material, it was necessary to enlist the aid, guidance, and knowledge of an expert. We are deeply grateful and indebted to Bette's daughter, Rebecca Citron, consultant and principal of Sunnybrook Consulting, who was able to fulfill these requirements. In addition, she saw the value of summarizing Key Concept Formulas at the beginning of each chapter and including a complete Glossary of Concept Formulas at the back of the book for easy reference. She also assisted in the editing, making this textbook more readable and user friendly, adding delightful quotes to make mathematics more gratifying. It was through all of her encouragement and contributions that *Mathematics for Retail Buying* has become an industry classic.

I (Marla) would like to give a special thank you to Elizabeth Marcuse, President, Michael Londrigan, former Vice President of Academic Affairs, and Nancy Miller, Chair of Fashion Merchandising, all at LIM College, for their unequivocal support in this endeavor. In addition, I want to thank my colleagues that teach retailing and buying–related courses, coworkers, and Advisory Board members at LIM College for their support and assistance in developing the new material contained in the text. Thank you to Emily Samulski and Joseph Miranda at Fairchild Books/Bloomsbury for their support in updating the Ninth Edition and help in the entire process, and to Steve Reiss for checking the content and problems. Lastly, I thank Bette Tepper for entrusting me with updating her "baby" to better prepare students for their careers.

We also want to acknowledge and give special thanks to the following people for their valuable input and recommendations that were incorporated into the revision of this edition: Sheng Lu, University of Delaware; Keun Young Oh, Buffalo State, The State University of New York; Jaye Thompson, University of Minnesota; Miguel Martins, University for the Creative Arts, UK; and Dhona Spacinsky, Academy of Couture Art.

BETTE K. TEPPER

MARLA GREENE

INTRODUCTION

As the retail environment continues to evolve and customers tend to be influenced more by sociological and technological developments, the retailer's ultimate goal remains constant: sell merchandise profitably. As yesterday's retailers could not anticipate the rise of new formats or channels of distribution, today's retailers cannot forecast the changes that are inevitably in store. Retailing is changing at a faster pace than in the last five years. Competition, from new brands and new formats, already intense, will only increase. New markets, both domestic and global, will emerge; existing markets will evolve. How retailers adapt to this dynamic environment will be the mission for all involved in the business. Yet we can state with absolute certainty that some basic ideas will remain true: Customers will continue to have needs, and the retail industry will continue to offer rewarding and exciting career opportunities to those with the desire and ability to satisfy those needs while maintaining a solid grasp on the fundamental concepts of how profitability is achieved.

In preparation for the revised Ninth Edition of *Mathematics for Retail Buying*, much thought was given to how the text's basic mathematical concepts involved in profitable retailing—which have been and will continue to be constant, once learned and calculated to achieve a profit—could be more meaningful today. At best, retailing is volatile, and the environment continues to be exciting, stimulating, and continually changing; successful retailers constantly reinvent themselves to achieve differentiation from competition as they entice customers to their doors. This could not only be merchandise and price driven but also driven by creating an experience for the customer. The student will recognize that having learned these mathematical concepts, it is how they are applied that makes for profitable merchandising. The aim of this text is to explore in depth the mathematical concepts and procedures that achieve profitable merchandising in the retail arena. The topics integrated with the buying/selling function—such as store organization; what, when, and where to buy; and vendor relations—are covered fully in other texts that focus only on those subjects. Although the practice problems and case studies cover a variety of merchandise, fashion apparel and accessories are given the greatest attention, as these are the areas in which a new trainee or assistant buyer would most likely begin when taking on the responsibility of merchandise selection. The focus still remains on the mathematical concepts and

their relevancy to profitable merchandising. Formulas do not change—they remain the same from company to company. Plans and how the plans are implemented, however, will vary among retailers and within different channels.

Merchandising strategies are conceived by the retailer and executed by the buyer. The buyer knows that the basic mathematical elements involved in profitable buying must be coordinated with the concepts that are applied to the function of buying at cost, selling at retail, and producing a gross margin/profit from these activities. The most cardinal principle is that it does not matter what product you buy, or which diverse retailer offers the product, or what the industry is—be it fashion, hardware, or supermarkets—the same set of concepts and mathematical calculations are connected to the three elementary factors of retail, cost, and gross margin/profit. Their application to any product in any particular store and/or industry is identical. However, the emphasis on these elements may differ because retailers' policies may not be alike. It is understandable, for example, that the calculation of a markup percentage for a specialty store like Bergdorf Goodman, a mass-market store like Target, or an off-price retailer like TJ Maxx is computed identically, yet the markup and gross margin percentages considered acceptable by each is different. We can better appreciate the interlinking of the retailer, or any other alternative merchandise distribution choice, with the buyer as we consider their common goals and their effect on each other's function.

By definition, *retailing* is the term used to describe the many activities involved in selling goods and/or services, at a profit, to the ultimate consumer. Merchandising combines having the right merchandise, in the right place, in the right quantities, at the right price, at the right time. Performed by the buyer, this task—to go into a market buying what a customer wants or needs and having it ready when it is wanted—seems simple. In practice, retail management today has become complex and increasingly sophisticated due to ever-increasing competition and the manner in which the customer is shopping (i.e., in store, online, on a tablet, on a phone, or through an app or social media). Therefore, it is more important than ever that the buyer who fulfills the merchandising function has a basic knowledge of how the customer is buying and the mathematical factors involved in profitable merchandising. Without this background, it is difficult to comprehend the operation of either a small store, a department in a large store, or a non-store–based retailer, such as a click-only retailer. This fundamental mathematical background gives insight into how merchandising problems are solved mathematically and why merchandising decisions must be based on analytics. Buyers in every major retail organization now use computer-based analytical programs and spreadsheets for analysis and profit planning. Nevertheless, the buyer's ability to understand and manipulate all the factors involved in merchandising is essential. Buyers may be challenged daily to maintain a positive sales and gross margin trend or turn around a business that is not performing to plan. In a computerized organization, the buyer can instantly retrieve a particular desired merchandising figure. However, if the data necessary to take immediate action is not available, the buyer who can compute and supply the necessary information has a decided advantage.

THE GROWTH OF RETAILING

Retailing first began in the United States with the Native American trading posts of frontier days. After 1850, such pioneers as R.H. Macy and Marshall Field established department stores. By 1900, there were department stores in all major cities, and this was the retail format recognized as the mass distributor of goods. Mail-order houses were given a substantial boost by the adoption of rural free delivery by the post office, while chain stores, established in the middle of the nineteenth century, rose to maturity in the twentieth century.

The consolidation and growth in US retailing occurred during the period between the two World Wars. After 1945, there were revolutionary changes with the appearance of planned shopping centers, which often led to direct competition among retailers. The latter part of the twentieth century saw variation in retailing format, with the inception of discounters, closeout stores, manufacturer's outlets, and warehouse clubs, to name just a few. In addition, the growth of the online and television shopping channels became convenient techniques by which to buy merchandise in a non-store environment. Another unprecedented phenomenon occurred in 1994 with the acquisition of R.H. Macy's by Federated Department Stores. This forever changed competitive strategy. Many older, well-known local stores (e.g., Filene's in Boston, Marshall Field's in Chicago, and Famous-Barr in St. Louis, to name a few) underwent name changes and are now identified as Macy's. Presently, you can find Macy's coast to coast with hundreds of locations, from the city to the suburbs, to Macys.com. Today, independent ownership of department and specialty stores has become a rare phenomenon, as ownership groups consolidate and operate their acquisitions in order to achieve better economies of scale and profitability. While many local and regional stores have disappeared, others have appeared on the scene. Competition is keen and takes many forms. Kohl's, a Midwest specialty department store, has successfully entered the East Coast and partnered with Amazon to take returns from Amazon in store; UNIQLO, Japan's largest casual apparel retailer, has opened stores in Manhattan, Boston, and Chicago with ambitions to become the top clothing retailer in the world; and Walmart looks for future growth from international expansion, technology, same-day pick up, and acquisitions in different sectors, such as Jet.com, ModCloth, and Bonobos. Today, retailing is not only fast paced, but it requires the ability to adapt and be flexible as the basic concepts and principles are applied.

MEGA TRENDS IN RETAILING

Retailing becomes more challenging and fast paced daily. Knowing your customer and how the fundamental mathematical elements that produce a profitable operation are affected by a variety of innovative strategies pursued by all retailers is a necessity. At retail conferences, the annual National Retail Federation (NRF) Big Show, as well as Shoptalk, important trends discussed are the analytical capabilities necessary to understand what and how the customer is buying. As stated above, sophisticated computerized systems, big data, and artificial intelligence (AI) reporting systems are

being used by all major retailers today. Buyers have many different reports available to them in order to analyze current business trends. It is the knowledge of how to read and react to the reports in order to create a personalized, unique customer experience that has become important for retailers. Data can be reviewed and analyzed by store, department, vendor, style, color, and size at any point in the day, week, month, season, or year. The benefits of the retail reporting system to a particular organization is the analysis of sales, productivity, and profit. The computer-generated reports provide information that enables retailers to integrate and improve merchandising, buying, store operations, communicating with the customer, and the financial management of the business in order to succeed.

The smartphone is continuing to change the way the consumer shops. Retailers today need to operate in an omnichannel environment. They need to reach the customer where they are, when they want to shop, and how they want to shop. The message needs to be clear, consistent, and compelling across all channels that they operate in. Stores are not just the place where customers go to shop, but are being used as distribution centers for online orders. Customers can buy online and pick up in store (BOPIS) or merchandise can be shipped directly from a local store to a customer to arrive quickly, sometimes within the same day or next day. How to stock merchandise in each store will be based on consumer buying patterns, store trends, and the mix of basic and fashion product sold by store based on history for that store. The control of the constant flow of suitable merchandise from manufacturers/brands to stores can be accomplished only by understanding the specific nature of the business in the reports generated by the retailer. These reports provide accurate requirements of assortment factors that pertain to classification (grouping merchandise by common distinctive features, such as men's, women's, children's, etc.), price lines, and other assortment factors in order to achieve portions consistent with customer demands. It should be noted, however, that there are differences between merchandise classifications, store locations, and in-store versus online.

The buyer continues to perform the specialized work of selection and negotiation. The buyer in all organizations makes the buying arrangements that pertain to selection of resources and product, including specifications for private branding, quantities, negotiations of cost prices, terms of sale, method of shipment, and the setting of retail prices or repricing. Deviations from these general principles are discussed with the buyer's respective divisional or general merchandise manager(s).

A significant happening took place when retailers based outside of the New York area opened offices in New York, where many best-selling clothing brands are headquartered. The retailers had a need to focus on fashion trends and increase their fashion relevance. They wanted to discover new looks quickly and incorporate them into their clothing lines. Well-known designers have shown a growing willingness to sell their clothing and household products at lower prices to a broader audience. This allows the budget-minded consumer to find clothing by Vera Wang and Chaps at Kohl's and limited-edition merchandise at H&M by designers such as Karl Lagerfeld, Stella McCartney, and Viktor & Rolf. Macy's is providing affordable luxury as it develops exclusivity with iconic names such as Tommy Hilfiger and Martha Stewart

for signature lines, and JCPenney is the exclusive provider of product from Liz Claiborne. New retail partnerships are also being formulated between department stores and specialty stores. Nordstrom has partnered with Topshop and Madewell and Macy's with STORY, Bluemercury, Finish Line, and Lids.

Merchandising policies are constantly shifting as retailers attempt to set themselves apart. The competitive advantage gained by optimizing assortments, products, and prices is appreciated by retailers who recognize the necessity for differentiation for their customer. The emphasis on private-label products has resulted in international sourcing. Through customer satisfaction, it is possible to achieve comparable store growth. To quote Charles Darwin, "It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change."

History records past events. We know the merits and influences of computer based analytics on the development of retailing today. The future is changing rapidly and how this or other major innovations will facilitate the degree or the speed of electronic progress is yet to be seen.

Mathematics for Retail Buying delineates the essential concepts, practices, and procedures as well as the calculations and interpretations of figures related to the many factors that produce and affect profit. The choice of material and the depth of each subject are deliberately confined to that which has practical value for the performance of occupations in or associated with retail merchandising. The study of retail mathematics may begin at any point in the buying/selling circle. As previously mentioned, while the six chapters in this text are interrelated with the various phases of merchandising, the chapters can be studied independently or shifted without losing the continuity of the buying process. Here is an overview of the chapters and their respective roles in the buying/selling process, followed by a section on common retail terminology, an explanation of using computerized spreadsheets, and an introduction to using the online STUDIO program.

CHAPTER 1: MERCHANDISING FOR A PROFIT

The function of the retail store is to sell merchandise to consumers. The amount of merchandise sold is the store's source of operating income, commonly known as sales or sales volume. However, before merchandise can be sold, it must be bought. The basic elements of sales volume are defined, analyzed, and calculated because their effective understanding is critical to a retailer's success. A course of study in retail buying should begin with the analysis of a profit and loss statement. This statement reports a summary of the achievements of a particular department, store, or company, revealing whether or not the activities involved in operating this unit for a specific time period have been profitable. Gross margin, a buyer's measure of profitability, is of paramount importance, and understanding how to maximize this metric is the key to success for a merchant. The factors that affect gross margin include the sales generated and the cost of the goods sold incurred in buying and selling this merchandise. The buyer is the force that buys, prices, reprices, and negotiates the

merchandise found in a retail store and/or the online store. These functions are the responsibilities of the buyer, who must understand the linkages of the profit elements. The fundamental relationships among the profit factors are repeated throughout the book.

CHAPTER 2: RETAIL PRICING AND REPRICING OF MERCHANDISE

This chapter presents the relationship and calculations of the basic pricing factors, the various pricing situations used in making buying decisions, the techniques involved in initially pricing merchandise, repricing product (markdowns), and the effect of each on gross margin (the difference between the sales and the cost of those sales) and profit. The approach to pricing is presented from the standpoint of who sets the selling price on merchandise purchased for resale.

The buyer, guided by a prescribed price line structure, plans purchases and merchandise offerings that fit into this framework. The buyer sets the retail price of both initial and subsequent prices on each item purchased. Markdowns, the repricing of merchandise, are increasingly important in today's retail environment to drive sales. The types of markdowns are discussed as well as the analytical criteria used to take markdowns. The effect of markdowns on the gross margin is of primary importance for the buyer.

CHAPTER 3: BASIC MARKUP EQUATIONS USED IN MERCHANDISING DECISIONS

The overall effectiveness of buying and pricing is measured by the buyer's ability to achieve a markup plan established by management, designed to produce the desired profit. As merchandise is purchased, it is neither common nor desirable to require that each item within a merchandise department be retailed with the same price or markup percentage. The results would be disastrous! Yet it is the buyer's responsibility to meet the overall target figure for profit. The buyer cannot ever forget that goods must be priced to sell. Therefore, during a season there are many considerations that affect the pricing of merchandise at the time of purchase, and many of these actually cause goods to sell at a lower price. The ability to recognize that this results in different markups allows the buyer to make the necessary adjustments. The buyer constantly has the opportunity to average high and low markups to reach the required predetermined average.

CHAPTER 4: THE RETAIL METHOD OF INVENTORY

An essential feature of retail merchandising is to determine the total value of stock-on-hand at the beginning of the retailer's fiscal month. The value of inventory is

significant for planning sales, markdowns, and how much to buy in order to determine the proper valuation of inventory for profit figuring purposes. Chapter 4 discusses the retail method of inventory because it is the accepted, proven system that provides this information. We familiarize ourselves with the general procedures used in implementing this system and the calculation and records required to maintain it. A probable amount of stock-on-hand can be known at any time without counting the merchandise, and a shortage figure can easily be derived through a comparison between the actual physical inventory and the book or maintained records. The mathematical calculations involved in this method are important for the buyer to understand in order to know how he or she can plan for future months based on current business trends. The accuracy of the book inventory depends on the buyer's prompt and accurate classifying of records that pertain to price changes, receiving merchandise, and updating key reports. This system helps the buyer to constantly track the amount of stock-on-hand while protecting the gross margin (the difference between sales and the cost of those sales to be attained).

CHAPTER 5: SIX-MONTH PLANNING AND COMPONENTS

The most talked-about topic in retailing is the budget of stocks and sales, more commonly known as a six-month dollar plan. This is the subject of Chapter 5. The six-month plan is an attempt to set in advance realistic projected goals for stocks in ratio to sales, the amount and timing of markdowns, planned cumulative markup, turnover for the season, and the correct amount and proper timing of purchases. This "calendar" plans, forecasts, and controls the purchase and sale of merchandise. It is designed to protect the store's inventory investment and produce a profit as it controls the above factors. The projection of planned sales is the hub of the buying/selling wheel, and all of the other elements are predicated on this figure. Although the estimation is based on actual past performance plus external and internal sales-related conditions, it is not an exact process. It is a process that requires making judgmental decisions, and therefore it is not always possible to predict all contingencies.

The buyer, who is responsible for interpreting and achieving the goals set, constantly monitors the sales in order to adjust the elements of the plan that rely on the amount of sales generated. The six-month dollar plan, in action, helps the buyer to keep score of whether the correct balance between sales and stocks is maintained. The procedure of planning the various elements and the calculations that produce the desired outcome give insight into why and how this technique produces a profitable operation. After a buyer creates a six-month plan in preparation for a new season, it is necessary to break down the department's business into its component parts, called merchandise classifications or categories. Assortment planning will provide the buyer with the path to create the plan for sales and purchases in the various classifications for which he or she is responsible. In any department, no two classifications sell the same in both dollars and units. It is important for the buyer to "buy correctly" in order to achieve the goals set.

CHAPTER 6: INVOICE MATHEMATICS: TERMS OF SALE

When buyers purchase merchandise, they also negotiate the terms with vendors on how the merchandise is to be shipped and paid for. This chapter discusses the various discounts and payment terms that a buyer would negotiate for and how they affect the cost of goods sold.

The practice problems, case studies, and spreadsheet solutions to be solved in *Mathematics for Retail Buying* focus mainly on situations prevalent in the women's, children's, and men's apparel and home furnishing industries because fashion is such an important factor in our economic system. It affects the major industries of retailing, manufacturing, and marketing. Practical and realistic examples follow the theories, principles, concepts, and calculations that through application test the reader's understanding of the fundamentals of each major topic discussed in that section.

TERMINOLOGY

In retailing, different terms are used interchangeably depending on the formula or how a buyer "talks" about his or her business. Therefore, we provide a list of commonly used terms that have the same meaning.

Sales/Revenues—for the most part, retailers talk sales. Both terms speak to the amount collected from consumers from the sale of merchandise.

Merchandise/Product/Goods—what a buyer is purchasing to sell to the consumer.

Inventory/Stock-on-Hand—the merchandise that is available in retail stores or online for sale to the consumer.

Shortage/Shrinkage—the amount of merchandise that is missing from stock after a physical inventory is taken.

Units/Pieces/Each—buyers place orders in single costs (except for certain categories, such as socks, which may be bought in dozens) and sell for a specific single price.

Transportation/Freight/Shipping—the cost to move product from the factory to the final destination.

Purchases/Receipts—what the buyer is buying based on his or her budgets for a specific period of time.

Original Retail Price/Initial Retail Price—the first price placed on the ticket before any markdowns are taken.

New Price/Sale Price/Markdown Price—the price that the merchandise is being sold for at that time including any markdowns or coupons.

Build/Percentage Change/Trend/Acceleration—a comparison between two different points in time.

Plan/Goal/Budget—what is provided to the buyer at the beginning of a time period that the company needs to achieve.

Actual/Spent—what actually has occurred.

Categories/Classifications—the different merchandise segments within a specific department.

USING COMPUTERIZED SPREADSHEETS

Just as we have become more and more accustomed to using computers and smart devices in our everyday activities, so too it becomes apparent that the use of computerized spreadsheets in doing retail mathematics offers many advantages. Buyers use spreadsheets on a daily basis to monitor businesses and write new purchase orders. Computerized spreadsheets can make repetitive, lengthy mathematical calculations quick, easy, and accurate. Organizing data in spreadsheet format provides a visual summary of important information that is easily read and understood. They are particularly valuable when there is a large amount of data to organize and assimilate. Once spreadsheets are set up, key assumptions and/or variables can be changed in order to do quick "what if" analyses, testing various scenarios, thereby resulting in better decision making. Spreadsheets enable the user to test sensitivities such as:

- "If we make a small change in the price, how much will it impact our profitability?"
- "If we take a larger markdown, what will be the impact?"
- "What effect will it have if we reduce the markdown percentage slightly?"

Computerized spreadsheets will test your ability to understand mathematical concepts. While computerized spreadsheets will reduce your need to do basic arithmetic, it is essential to understand how the formulas work. Concept formulas must be entered absolutely correctly, and once they are properly entered your answers will always be correct. If your answers are not right, you did not enter the concept formula correctly.

In this edition of *Mathematics for Retail Buying*, solutions to the concept problems are also given, where appropriate, in both spreadsheet and the more traditional arithmetic format. Not every concept problem lends itself to preparing a spreadsheet, and only arithmetic solutions are given for those problems.

When solving the concept problems, we cannot easily show the spreadsheet formulas in the written text. When a spreadsheet is open on the computer, however, and a specific cell is highlighted, the formula that was used to compute the number appearing in that cell will appear at the top of the page in the formula bar. So that you will be able

to check the concept problem spreadsheet formulas, these concept problems appear in the companion STUDIO program. These problems are solved using Microsoft Excel. With Excel, as well as other spreadsheet software, please remember that there may be multiple ways in which a particular spreadsheet can be set up and a problem solved.

USING THE STUDIO RESOURCES

The STUDIO companion to the text is a learning tool that allows the student to practice the concepts presented in an online/Excel-based capacity. Its organization mirrors that of this textbook, with each chapter having a matching folder. Thus, as one moves through the textbook, the corresponding concept problems and practice problems can be easily found. Several of the practice problems found in the text appear in the STUDIO so that you can work the problems directly.

Within the "Studio Resources" section online, you will find downloadable spreadsheets for the chapter practice problems. You have the freedom to play with the numbers in the concept problems to see how the concepts work, as well as to work the practice problems, but you cannot save your work in the program. If you need additional space to work the problems, in Excel go to Home > Insert and insert additional rows, columns, or even pages. Some problems do not warrant the development of a spreadsheet. Even so, the computer can be useful to do basic arithmetic calculations to solve the problem.

Remember: Be sure to save your review problems to your hard drive.
You cannot save your work in the STUDIO program!

In the future, the function in retailing of maintaining assortments appropriate for selected customers, in quantities that provide efficient use of investment, at prices that create a constant flow of merchandise while ensuring a profit focused on the buying/selling process will continue. The principles by which this will be achieved will remain constant as they adjust to the mode and tempo of life in the twenty-first century. As the retail industry evolves with new technology and ways to attract customers, retailers of all different types will be adapting and changing to consumers and how they are buying. However, the basic profit elements as we know them will continue to guide and measure success.

MERCHANDISING FOR A PROFIT

CHAPTER 1

"The entrepreneur always searches for change, responds to it, and sees it as an opportunity."

PETER DRUCKER, ONE OF THE TWENTIETH CENTURY'S MOST INFLUENTIAL AND RESPECTED THINKERS, ON MANAGEMENT THEORY AND PRACTICE

OBJECTIVES

- Recognize the importance of profit calculations in merchandising decisions.
- Identify components of a profit and loss statement, including the calculation of:
  - Net sales
  - Cost of goods sold
  - Gross margin
  - Operating expenses
  - Net profit
- Complete a profit and loss statement.
- Identify types of business expenses and their impact on profit.
- Utilize profit calculations to:
  - Make comparisons between departments and/or stores
  - Detect trends
  - Make changes in merchandising strategy to achieve an increase in profits

KEY TERMS

alteration and workroom costs
balance sheet
billed cost
build/percentage change/trend
cash discounts
closing inventory
contribution
controllable expenses
controllable margin
cost

cost of goods sold (COGS)
cost of merchandise sold
customer allowance or markdown
customer returns
customer returns and allowances
direct expenses
final profit and loss statement
gross margin
gross sales
income statement
indirect expenses
inward freight
key performance indicators (KPIs)
net loss
net operating profit
net profit
net sales
opening inventory
operating expenses
operating income
profit and loss statement
reductions
retail
sales volume
skeletal profit and loss statement
total cost of goods purchased
total cost of goods sold
total merchandise handled

Key Concept Formulas

Cost of Goods Sold

$$\text{Total cost of goods sold \$} = \text{Billed cost \$} + \text{Inward freight charges \$} + \text{Workroom costs \$} - \text{Cash discount \$}$$

$$\text{Cost of goods sold \%} = \frac{\text{Cost of goods sold \$}}{\text{Net sales \$}} \times 100$$

$$\text{Cost of goods sold \$} = \text{Cost of goods \%} \times \text{Net sales \$}$$

Billed cost

$$\text{Billed cost} = \text{List price} - \text{Trade discount(s)}$$

$$\text{Billed cost} = \text{\# Units purchased} \times \text{Invoice cost}$$

Classification Net Sales

$$\text{Classification net sales \% of total department sales} = \frac{\text{Classification's net dollar sales}}{\text{Department's total net dollar sales}} \times 100$$

Customer returns and allowances

$$\text{Customer returns and allowances \$} = \text{Total of all refunds or credits to the customer on individual items of merchandise \$} \times \text{Number of units actually returned}$$

$$\text{Customer returns and allowances \%} = \frac{\text{Customer returns and allowances \$}}{\text{Gross sales \$}} \times 100$$

$$\text{Customer returns and allowances \$} = \text{Gross sales \$} \times \text{Customer returns and allowances \%}$$

Department's net sales

$$\text{Department's net sales \% of total store sales} = \frac{\text{Department's net dollar sales}}{\text{Store's total net dollar sales}} \times 100$$

Gross sales

$$\text{Gross sales} = \text{Total of all the prices charged to consumers on individual items} \times \text{Number of units actually sold}$$

$$\text{Gross sales \$} = \frac{\text{Net sales \$}}{(100\% - \text{Customer returns and allowance \%})}$$

Net cost

$$\text{Net cost \$} = \text{Billed cost \$} - \text{Cash discount \$}$$

$$\text{Net cost \$} = \text{List price \$} - \text{Trade discount(s) \$} - \text{Cash discount \$}$$

Net sales

$$\text{Net sales \$} = \text{Gross sales \$} - \text{Customer returns and allowances \$}$$

Build/percentage change/trend

$$\text{Build/percentage change/trend} = \frac{\text{This year sales} - \text{Last year sales}}{\text{Last year sales}} \times 100$$

$$= \frac{\text{This year sales} - \text{Planned sales}}{\text{Planned sales}} \times 100$$

Gross margin

$$\text{Gross margin} = \text{Net sales} - \text{Total cost of goods sold}$$

$$\text{Gross margin \$} = \text{Gross margin \%} \times \text{Net sales \$}$$

$$\text{Gross margin \%} = \frac{\text{Gross margin \$}}{\text{Net sales \$}} \times 100$$

Operating expenses

$$\text{Operating expenses} = \text{Direct expenses} + \text{Indirect expenses}$$

$$\text{Operating expenses \$} = \text{Operating expenses \%} \times \text{Net sales \$}$$

$$\text{Operating expenses \%} = \frac{\text{Direct and indirect expenses in dollars}}{\text{Net sales \$}} \times 100$$

Net profit

$$\text{Net profit} = \text{Net sales} - \text{Cost of goods sold} - \text{Operating expenses}$$

$$\text{Net operating profit or net profit} = \text{Gross margin} - \text{All operating expenses}$$

$$\text{Net profit \$} = \text{Net profit \%} \times \text{Net sales \$}$$

$$\text{Net profit \%} = \frac{\text{Net profit \$}}{\text{Net sales \$}} \times 100$$

The function of the retail store is to sell merchandise to consumers. The amount of merchandise sold is the store's source of operating income, commonly known as sales or sales volume. However, before merchandise can be sold, it must be bought. In this opening chapter, the basic elements of sales volume and a buyer's profitability (gross margin) are defined, analyzed, and calculated, because their effective understanding is critical to a retailer's success.

1.1 Profit Components

Why is the study of the calculation of profit necessary? An individual involved in retailing will inevitably have many opportunities to become involved with the concept of profit. An employee of a private organization should be aware of profit. For example, many companies offer a profit-sharing plan, which is now a frequent form of incentive in many industries. An individual may invest personal funds in publicly owned corporations. To an employee of a publicly owned corporation, profit is a significant goal in the sale of shares. Since the beginning of the twentieth century, the US government has requested that all entrepreneurs declare profits or losses of all business ventures. Profits are taxed. Competent accounting methods require a statement of net profit before and after taxes.

Because one of the major responsibilities of a merchandiser/buyer/planner in retailing is to attain a sales and profit/gross margin plan for the specific department and classification responsibility they have, or retail business being supervised, it is logical to recognize that this can be achieved only by knowing the **Key Performance Indicators (KPIs)** of profit, their calculation, and their importance. It does not matter if the merchandiser/buyer/planner is employed by a department store, specialty store, off-price retailer or online retailer, the goal is the same: meet and/or exceed your sales and gross margin plans along with turnover, inventory, and markdown plans (covered in subsequent chapters).

USE OF PROFIT CALCULATIONS

The merchandising executive uses the calculation of profits to:

1. Exchange data and compare stores, departments, product classifications, and vendors to determine relative strengths and weaknesses in order to maximize business based on sales and profitability.
2. Indicate the direction of the business and whether it is prosperous, struggling for survival, or bankrupt.
3. Provide a statement for analysis so that knowledgeable changes in management or policy can be made.
4. Improve the profit margin by using this analysis.

This chapter examines the basic profit elements, defines them, shows their relationships to one another in profit and loss statements, and describes methods practiced to manipulate these elements to improve profits.

DEFINING THE BASIC PROFIT FACTORS

The function of the retail store is to sell merchandise to consumers at a profit. These sales are the store's source of operating income. Before merchandise can be sold, however, it must be bought. Even in a computerized organization in which financial personnel may preset programs and spreadsheets, the buyer is ultimately responsible for creating a merchandise assortment. This selection occurs after planning and predicting what, when, where, and how much to buy, and what to pay for these purchases. **Cost** is the amount the retailer pays a vendor/manufacturer for these purchases. **Retail** is the price, either regular or sale price, at which stores offer merchandise for sale to the consumer.

Because the buyer buys and prices the merchandise offered for sale in a retail store, the buyer must have the ability to understand and manipulate five basic profit factors: **Operating income**, also known as **net sales** or **sales volume**, indicates in dollars how much merchandise has been sold. **Cost of goods sold (COGS)** (also referred to as **cost of merchandise sold**) shows the amount paid for the goods sold. This results in **gross margin**, in which the total cost of goods is subtracted from the net sales. **Operating expenses** refer to those expenses, other than the cost of the goods, incurred in the buying/selling process. When all the operating expenses are deducted from the gross margin figure, the result is called **net operating profit** or **net profit**.

To properly compare profits among retailers, it is necessary to know how expenses are treated. In accounting, there are acceptable variations in how expenses are recorded. In this text, expenses are listed individually or referred to merely as operating expenses. In performing the calculations necessary to answer the practice problems that apply to the profit concepts and principles, the focus is on adjusting the proper element to the appropriate basic profit factor. For example, cash discount is an adjustment to the cost-of-goods factor. When there is other net income that does not result directly from the everyday operation of the retail business, it is added to or subtracted from net operating profit to get "net profit before taxes." This income does not result from the everyday operation but rather reflects financial or non-trading earnings and deductions.

Gross sales are the entire dollar amount received for goods sold during a given period before any reductions are taken. Gross sales can also be thought of as the total sales based on the initial or regular retail price. This total sales figure is calculated by multiplying the retail price of the individual items of merchandise by the number of pieces actually sold to consumers before any reductions are taken. The accurate calculation of gross sales, however, must also take into account adjustments due to returns and price reductions. Retailers typically give customers the privilege of returning merchandise for a given amount of time. When merchandise is returned

to stock and the customer receives a cash refund or a charge credit, these returns of sales are called **customer returns**. This process is now automatic for stores with sophisticated computer systems. In addition, if a customer receives a price reduction, it is known as a **customer allowance or markdown**. These two adjustments are referred to collectively as **reductions** or **customer returns and allowances**. When customer returns and allowances are subtracted from gross sales, the resulting total is the net sales figure. Thus, net sales are the sales total after all reductions and customer returns and allowances have been deducted from gross sales. Net sales represent the amount of sales a retailer collects from the customer from the sale of merchandise that actually remains sold. When retailers calculate profit, the net sales figure is the more significant because a firm can realize a profit only on goods that remain sold at the retail price. For this reason, the term "sales volume" is always a net sales figure.

Merchandisers must determine and balance the retail price for the items they purchase for sale to customers with, among other factors, how much they can afford to pay a vendor for merchandise. Cost of goods sold is simply the cost of the merchandise that has been sold during a given time period. This concept is simple, but the actual calculation is complex because other necessary adjustments must be made to the cost or purchase price that appears on the bill or invoice (vendor's bill). These adjustments are transportation costs, also known as **inward freight**, which is the amount a vendor may charge for transporting merchandise to the designated warehouse or individual store for the retailer; **alteration and workroom costs**, which is a charge made to a selling department when it is necessary to treat merchandise so that it will be in condition for sale (i.e., ticketing, hanging, assembling, etc.); and **cash discounts**, which is a negotiated percentage or dollar amount deducted from the invoice or **billed cost** that vendors agree to when buyers place orders. The negotiated discounts may be on all product or for specific styles purchased or for the payment of an invoice within a specified period of time.

Gross margin is the difference between net sales and the total cost of goods sold. It is a figure that indicates the buyer's ability to purchase the "right" merchandise, negotiate the "right" cost and credit terms, and put the "right" retail price on these purchases. Gross margin is the measure of the buyer's profitability. Therefore, to maximize gross margin, it is a buyer's responsibility to drive sales and negotiate the best possible cost. In order to secure the lowest total cost of goods sold, the buyer will need to work with vendors to obtain the lowest billed cost on merchandise, negotiate substantial discounts on purchase orders, or find a way to lower shipping costs. If gross margin goals are not achieved, buyers are challenged to negotiate additional assistance from vendors.

In addition, the retailer must maintain a place of business from which the goods are sold, and to maintain this place, it must incur operating expenses. Operating expenses usually fall into two major categories and are charged to a merchandise department to determine the net profit for that department. Expenses that are specific to a given department, and which would cease if that department were discontinued, are called **direct expenses**. These include salaries of the buyer, assistant buyer, and salespeople; departmental advertising; selling supplies; and customer delivery

expenses. Store expenses that exist whether a department is added or discontinued are **indirect expenses**. These include store expenses that are prorated to all selling departments on the basis of their sales volume, such as store maintenance, insurance, and salaries of top management.

The operating expenses, which refer to those expenses, other than the cost of the goods incurred in the buying/selling process, are deducted from the gross margin, resulting in net operating profit or net profit.

ELEMENTS OF BASIC PROFIT FACTORS

Each of the basic profit factors needs to be dissected because each consists of elements that contribute to profit. The calculations involved highlight the meaning and importance of each factor. The fifth factor (net profit) and its elements will be explored in Section 1.2. We explore the other four factors here.

Sales (Operating Income)

Gross Sales

Gross sales are the total *initial* dollars received for merchandise sold during a given period.

CONCEPT

Gross sales $ = Total of all the initial prices charged to consumers on individual items × Number of units actually sold

PROBLEM

During the week (Sunday–Saturday), a toy department sold 30 dolls (Group A) priced at $15 each, 25 dolls (Group B) priced at $25 each, and 5 dolls (Group C) priced at $30 each. What were the gross sales for the dolls for that week?

SOLUTION: *Spreadsheet format*

Item	Quantity	Unit retail price	Income
Dolls (A)	30	$15	$450
Dolls (B)	25	$25	$625
Dolls (C)	5	$30	$150
Gross Sales			$1,225

SOLUTION: *Arithmetic format*

30 dolls @ $15 each	=	$450
25 dolls @ $25 each	=	625
5 dolls @ $30 each	=	150
Total gross sales	=	$1,225

Customer Returns and Allowances

Customer returns and allowances are elements of the operating income profit factor because the customer receives either a complete refund of the purchase price or a reduction of the selling price of the product. Thus, the retailer must make a corresponding deduction from the gross sales figure because these transactions result in some cancellation of sales and inventory value. This dollar figure is usually expressed as a percentage of gross sales.

Although these transactions may seem insignificant, they are considered a daily happening in the buying/selling process, and they should be scrutinized and evaluated. If returns and allowances are excessively numerous, they can ultimately affect profit because it is costly to sell, process returns, and, hopefully, resell the same merchandise. The causes of returns should be examined, and an attempt should be made to reduce them to a reasonable percentage, which is the yardstick used for comparison. In addition, reductions or markdowns to the selling price are commonplace in retailing. They are used by buyers to drive sales. Markdowns will be addressed in more detail in Chapter 2.

CONCEPT

Customer returns and allowances $	=	Total of all refunds or credits to the customer on individual items of merchandise $	×	Number of units actually returned or reduced

PROBLEM

On Saturday, the junior petite department refunded $98 for one leather jacket, $75 each for two wool skirts, and $55 each for two knit tops. Other returns for the week amounted to $400, and the weekly total of markdowns given was $1,687. What was the dollar amount of customer returns and allowances for Saturday? For the week?

SOLUTION: *Spreadsheet format*

Item	Quantity	Unit retail	Customer returns and allowances
Leather jackets	1	$98	$98
Wool skirts	2	$75	$150
Knit tops	2	$55	$110
Saturday total			$358
Other weekly returns			$400
Weekly customer allowances/markdowns			$1,687
Total customer returns and allowances and reductions			$2,445

SOLUTION:
Arithmetic format

$98	×	1 Leather jacket	=	$98
$75	×	2 Wool skirts	=	150
$55	×	2 Knit tops	=	110
		Customer returns for Saturday	=	$358
+		Total weekly customer returns	=	400
+		Total weekly customer allowances/markdowns	=	1,687
Customer returns and allowances (for week)			=	$2,445

CONCEPT

Customer returns and allowances percentage = Dollar sum of customer returns and allowances expressed as a percentage of gross sales

$$\text{Customer returns and allowances \%} = \frac{\text{Customer returns and allowances \$}}{\text{Gross sales \$}} \times 100$$

PROBLEM

Last week, the junior petite department had gross sales of $20,375. Customer returns and allowances for the week totaled $2,445. What was the combined percentage of allowances and merchandise returns for the week?

SOLUTION

$$\text{Customer returns and allowances \%} = \frac{\$2{,}445 \text{ Customer returns and allowances}}{\$20{,}375 \text{ Gross sales}} \times 100$$

Customer returns and allowances % = 12%

Conversely, the dollar sum of customer returns and allowances can be computed when the gross sales and customer returns and allowances percentage are known.

CONCEPT

Dollar sum of customer returns and allowances = Gross sales $ × Customer returns and allowances %

PROBLEM

Last week, the junior petite department reported gross sales of $20,375, with customer returns and allowances of 12%. What was the dollar amount of customer returns and allowances?

SOLUTION

Dollar sum of customer returns and allowances = $20,375 Gross sales × 12% Customer returns and allowances

Dollar sum of customer returns and allowances = $2,445

Net Sales

Net sales are the sales total for a given period after customer returns and allowances have been deducted from gross sales.

CONCEPT

Net sales $ = Gross sales $ – Customer returns and allowances $

PROBLEM

A shoe department sold $65,000 worth of merchandise. Customer returns and allowances and reductions were $16,250. What were the net sales of this department?

SOLUTION

Net sales = $65,000 – $16,250

Net sales = $48,750

In retailing, the operating income is known as net sales. The net sales figure, also called sales volume, is used to designate the size of a particular store, merchandise department, classification, or vendor. For example, last year Department #37 had a sales volume of $1,000,000. Net sales are the barometer of success versus the plan for a day, week, month, quarter, season, or year. If Department #37's planned sales for last year were $900,000, they exceeded their plan by $100,000 or 11.1%.

Retailers use net sales to measure a department's performance or productivity. It is common practice to calculate the percentage of sales that an individual department has contributed to the store's or company's net sales. This type of analysis allows a retailer to compare a particular department of one store with other departments or stores within the company, as well as to compare this selected department's sales with industry figures. This formula is also used when comparing merchandise classifications within a department to the total department's sales and can be used to calculate their vendor's contribution of sales to the total department or corporation.

CONCEPT

The individual department's net sales are expressed as a percentage of the store's total net sales.

$$\text{Department's net sales \% of total store sales} = \frac{\text{Department's net sales \$}}{\text{Store's total net sales \$}} \times 100$$

or

$$\text{\% of total store sales} = \frac{\text{Department's net sales \$}}{\text{Company's total net sales \$}} \times 100$$

PROBLEM

The costume jewelry department had net sales of $900,000. For the same period, total store sales were $45,000,000. What is the costume jewelry department's net sales percentage of the total store's net sales?

SOLUTION

$$\text{Department's net sales} = \$900{,}000$$

$$\text{Total store net sales} = \$45{,}000{,}000$$

$$\text{Department's net sales \% of total store sales} = \frac{\$900{,}000}{\$45{,}000{,}000} \times 100$$

Department's net sales % of total store sales = 2%

Because net sales are determined by the adjustment of customer returns and allowances to gross sales, it is also possible through this relationship to calculate, when desired, a gross sales amount—provided that an amount of the dollar net sales and the percentage of customer returns and allowances are known.

CONCEPT

$$\text{Gross sales} = \frac{\text{Net sales}}{(100\% - \text{Customer returns and allowance \%})}$$

PROBLEM

The net sales of Department #39 were $460,000. The customer returns and allowances were 8%. What were the gross sales of the department?

SOLUTION

$$\text{Net sales} = \$460{,}000$$

$$\text{Gross sales} = \frac{\text{Net sales}}{100\%\ (\text{Gross sales}) - 8\%\ \text{Customer returns and allowances}}$$

$$\text{Gross sales} = \frac{\$460{,}000}{92\%}$$

Gross sales = $500,000

Comparing merchandise classifications to the total department's net sales are expressed as a percentage of the department's net sales.

CONCEPT

$$\text{Classification \% of department's net sales} = \frac{\text{Classification net sales \$}}{\text{Department net sales \$}} \times 100$$

PROBLEM

In men's for the fall season, knit tops/polos achieved net sales of $550,000 and woven shirts sales accounted for $720,000. Total men's sales for the fall season were $2,400,000. Calculate the knit top/polo and woven shirt percent to total sales for fall in the men's department.

SOLUTION

Men's knit tops/polos net sales for fall = $550,000

Men's woven shirts net sales for fall = $720,000

Department's net sales for fall = $2,400,000

$$\text{Knit tops/polos \% of men's sales} = \frac{\$550{,}000 \times 100}{\$2{,}400{,}000} \times 100 = 22.9\%$$

$$\text{Woven shirts \% of men's sales} = \frac{\$720{,}000 \times 100}{\$2{,}400{,}000} \times 100 = 30.0\%$$

MOST COMMON RETAIL SALES KEY PERFORMANCE INDICATORS (KPIS) PERTAINING TO SALES PERFORMANCE

Sales versus Plan and Last Year Sales

The first performance indicator for sales is the comparison of actual sales for a specific period versus sales plan for that period—for example, sales this week versus plan sales for this week, sales for the month versus plan sales for the month, sales for the quarter versus plan sales for the quarter, sales for the season versus plan sales for the season, and sales year-to-date (YTD) versus plan sales YTD. Are sales sufficient to cover expenses and leave a profit?

Buyers will have to calculate the comparison of how the sales are actually performing for the time period. This formula is called **build/percentage change/trend**.

The formula compares current sales versus the planned sales or two different points in time. The formulas are:

$$\text{Build/percentage change/trend} = \frac{\text{This year sales} - \text{Last year sales}}{\text{Last year sales}} \times 100$$

$$\text{Build/percentage change/trend} = \frac{\text{This year sales} - \text{Planned sales}}{\text{Planned sales}} \times 100$$

Same Store or Comparable Store Sales

This refers to sales for a specific period of time (week, month, quarter, season, year) versus the same period last year, comparing stores open for at least one year. Store openings or closings do not impact this comparison. The fact that each company handles online and mobile channel sales in different ways must be taken into consideration when making comparisons. With the rise of the omni-channel retail format, online and mobile sales may be considered a "store" for a retail corporation.

Sales per Square Foot

This figure is calculated by dividing the dollar gross sales figure by the square footage of selling space. Retailers can improve return on the total space their stores or departments occupy by:

- Allocating more space to selling or decreasing space for departments not performing to plan
- Increasing sales from existing space
- Selling more profitable items

Sales per Linear Foot

This figure measures the selling space by linear feet and is used mainly by food and cosmetics retailers.

Inventory Turnover

Inventory turnover refers to the number of times that the average inventory is sold and replaced.

Sell Through Percentage

This is calculated by dividing the number of items sold by the number of items bought and multiplying by 100.

The mathematics required to calculate these key performance indicators (KPI) will be examined in appropriate chapters that pertain to each topic.

COST OF GOODS SOLD (ALSO REFERRED TO AS COST OF MERCHANDISE SOLD)

The control of the cost of goods sold is crucial to profitability. The buyer, who decides what merchandise to buy, also makes decisions regarding the cost, transportation, and credit terms as they relate to these purchases. In actual practice, to determine the accurate **total cost of goods sold**, there must be a complete calculation to represent the **total cost of goods purchased**, which begins with an invoice or billed cost, to which the following factors are adjusted.

Calculation of Total Cost of Goods Sold

Billed Cost

This is the purchase price that appears on the invoice (i.e., vendor's bill). Buyers may need to calculate the total billed cost for the merchandise they are purchasing. The calculation is as follows:

Total billed cost = # Units purchased × Invoice cost

This formula is also used when calculating cumulative markup, which is discussed in Chapter 2.

PLUS

Inward Freight or Transportation Costs

This is the amount that a vendor may charge for delivery of merchandise. Inward freight or transportation costs plus billed cost is called the billed delivered cost.

PLUS

Alteration and Workroom Costs

It is accepted practice to treat this figure as an additional cost, as the alteration cost applies only to merchandise that has been sold and any workroom costs apply to all purchases.

MINUS

Cash Discounts

Discounts are a negotiated price concession given to a buyer by a vendor. This is usually a percentage of the total *billed* cost and *must* be converted into a *dollar* amount. This discount is *not* taken on the transportation cost. This is a normal operating process for a buyer to secure the best possible cost price.

Vendors may grant these discounts on individual styles, a total order written by a buyer, or for payment of an invoice within a specified time. For example, a vendor may offer a 2% cash discount (deducted from the billed cost) if payment is made within a designated time period. The discounts are offered in the form of a percentage and are deducted from only the billed cost, but the dollar discount earned is used in the calculation of the total cost of sales. For example, a 2% cash discount given on a billed cost of $1,000 translates into a $20 cash discount or deduction:

$1,000 Billed cost × 2% Cash discount = $20 Cash discount

CONCEPT

Total cost of goods sold $ = Billed cost $ + Inward freight charges $ + Workroom costs $ − Cash discounts $

PROBLEM

An activewear department, for the first month of the period, had billed costs of merchandise amounting to $80,000, inward freight charges of $2,000, negotiated cash discounts of 7.5%, and workroom costs of $500. Calculate the total cost of merchandise purchased.

SOLUTION

	Billed costs	=	$80,000
+	Inward freight	=	+ 2,000
	Billed delivered cost	=	$82,000
+	Workroom costs	=	+ 500
	Gross merchandise costs	=	$82,500
−	Cash discount (7.5% × $80,000)	=	− 6,000
	Total cost of goods sold	=	$76,500

GROSS MARGIN

The difference between the total *amount* of goods sold (net sales) and the total *cost* of the goods sold is the gross margin. It is calculated for a given period of time by subtracting the total cost of goods from the net sales for the period under consideration. It is a critical profit factor because it can be an indicator of the final results, and it is frequently known as gross profit. This figure must be large enough to cover operating expenses and allow for a reasonable profit. If the difference is not large enough to cover operating expenses, a **net loss** will result. It is a yardstick to measure the performance of a buyer.

Gross margin is important in both dollars and percentage. Both need to be looked at together and related back to actual net sales versus plan net sales. The percentage is frequently shown on merchandising reports in order to allow buyers to compare plan versus actual gross margin dollars as well as percentage, that is, what should be collected versus what is collected.

CONCEPT

$$\text{Gross margin \$} = \text{Net sales \$} - \text{Total cost of goods sold \$}$$

$$\text{Gross margin \%} = \frac{\text{Gross margin \$}}{\text{Net sales \$}} \times 100$$

PROBLEM

A department had net sales of $300,000, with the total cost of goods sold at $180,000. Determine the gross margin dollars and percentage.

SOLUTION

Net sales	=	$300,000
– Total cost of goods sold	=	– $180,000
Gross margin	=	$120,000

$$\text{Gross margin \%} = \frac{\$120{,}000}{\$300{,}000} \times 100 = 40\%$$

Operating Expenses

Because the expenses of operating a business determine whether or not a net profit is achieved, the control and management of operating expenses are of major concern. For the purpose of analysis, the expenses incurred by the retailer (e.g., maintenance of store space, salaries, etc.) are classified to measure the performance of the designated function or activity. There are various approaches to classifying these items and, although there are many different kinds of expenses, each can be easily identified. However, there is variation in the format used to record them. Traditionally, operating expenses fall into two major categories and are charged to a merchandise department to determine its net profit. These major categories are direct and indirect expenses.

Direct Expenses

Direct expenses exist only within a given department and cease if that department is discontinued. These might include salespeople's and buyers' salaries, buyers' traveling expenses, advertising, selling supplies, delivery to customers, and selling space. For the purpose of expense analysis in retailing, the amount of floor space occupied that generates a given department's sales volume is allotted by the square foot and charged directly to that department, even though there is no cash outlay. Each expense and/or the total direct expenses are expressed as a percentage of net sales. For example, if the net sales of a department are $100,000 and $3,500 is spent on advertising, the percentage of advertising expenses would be $3,500 ÷ $100,000, or 3.5%.

Indirect Expenses

Indirect expenses are store expenses that will continue to exist even if the particular department is discontinued. These might include store maintenance, insurance, security, depreciation of equipment, and salaries of senior executives. Many indirect expenses are distributed among individual departments on the basis of their sales volume (e.g., if a department contributes 1.5% to the store's total sales, the indirect expenses charged to this department are 1.5%).

Operating expenses = Direct expenses + Indirect expenses

PROBLEM

A children's department has net sales of $300,000, and indirect expenses are 10% of net sales. Direct expenses are:

- Selling salaries = $24,000
- Advertising expenses = $6,000
- Buying salaries = $12,000
- Other direct expenses = $18,000

Find the total operating expenses of the department in dollars and as a percentage.

SOLUTION

Indirect expenses (10% × $300,000) = $30,000

Direct expenses:

Selling salaries	=	24,000
Advertising expenses	=	6,000
Buying salaries	=	12,000
Other	=	18,000
Total dollar operating expenses	=	$90,000

$$\text{Operating expense \%} = \frac{\$90{,}000 \text{ Operating expenses}}{\$300{,}000 \text{ Net sales}} \times 100$$

Operating expense % = 30%

Controllable and Noncontrollable Expenses

There are additional expenses that further complicate expense assignments. Many, but not all, direct expenses are **controllable expenses**. For example, the rent for Branch Store Y is directly related to this store, but it is not under the control of the present store manager because this expense was previously negotiated. Utilities are another example of a direct expense to a store, but an indirect expense to a particular department. The rates are not controllable, but the utilization is.

Store associates' hours are also considered to be controllable. These hours are subject to change based on whether that particular store is meeting its sales goals for the week or month. If stores are exceeding their sales plans, the manager may be given more hours to allocate among the associates. If stores are not meeting their plans, unfortunately, sales associates' hours are decreased and the salaried management team will be responsible for covering the store.

Because retailers do not always agree on the handling of expenses, some firms use the contribution technique to evaluate the performance of a buyer or store manager. **Contribution**, also known as **controllable margin**, includes those expenses that are direct, controllable, or a combination of direct and controllable (e.g., selling salaries). Contribution is the amount the department contributes to indirect expenses and profit, as seen in Figure 1.

In learning situations, it is more important to identify expense items and to understand the control, management, and relevancy to profit of those expenses than to make the accounting decision as to which expense is direct, indirect, controllable, or non-controllable. To eliminate the confusion of how to classify and charge a particular expense item, in this text, expenses are listed individually or are referred to simply as operating expenses.

Figure 1. Contribution Operating Statement

		Dollars	Percentages	
Net Sales		$500,000	100.0%	
(minus) **Cost of Merchandise Sold**		– $266,000	– 53.2%	
		$234,000	46.8%	
(minus) **Direct Expenses**				
Payroll	$73,000			
Advertising	$13,000			
Supplies	$7,000			
Travel	$5,000			
Other	$12,000			
		– $110,000	– 22.0%	$\left(\frac{\$110,000}{\$500,000}\right)$
Contribution		$124,000	24.8%	$\left(\frac{\$124,000}{\$500,000}\right)$
(minus) **Indirect Expenses**		– $106,500	– 21.3%	$\left(\frac{\$106,500}{\$500,000}\right)$
Operating Profit		$17,500	3.5%	

Operating Income (Gross Sales and Net Sales) Practice Problems

1. Customer returns and allowances for Department #620 came to $4,500. Gross sales in the department were $90,000. What percentage of merchandise sold was returned?

2. For Family Department Stores, gross sales for the year were $369,000 and total reductions were $79,704. What is the reduction % for Family Department Stores for the year?

3. If gross sales for Store A are $1,150,000 and reductions are $245,000, what are the net sales?

4. The gross sales for Store B were $876,500. The customer returns and allowances were 10%.

    a. What was the dollar amount of returns and allowances?

    b. What were net sales?

5. If gross sales for Main Street Men's Store were $298,000 and the reduction % was 15%, calculate the following:

    a. The dollar amount of reductions.

    b. The net sales.

6. The net sales of Department X were $46,780. The customer returns were $2,342. What were gross sales?

7. The gross sales of Store C were $2,500,000. The customer returns and allowances were $11,360. What were net sales?

8. The net sales of Department Y were $36,000. The customer returns and allowances were 10%. What were gross sales?

9. After Mother's Day this year, the loungewear department had customer returns of 10.5%. The department's net sales amounted to $635,380. As the buyer reviewed last year's figures for the same period, the customer returns were 12.5%, with gross sales of $726,149.

    a. Compute the department's performance in dollars and percentages for this year and last year, in regard to gross sales, customer returns, and net sales.

    b. Compare this year's results to last year's performance. Discuss the performance from a profit viewpoint.

10. The hosiery department's net sales are $30,000 and the total store net sales are $1,200,000. What is the hosiery department's % to total sales?

11. The towel department represents 4% of total store sales, which are $4,500,000. What are the net sales planned for the towel department?

12. Total store sales are $15,000,000. Missy sportswear sales are $6,000,000 and junior sportswear sales are $2,800,000. What is the percentage of sales for each department?

13. Casual sneaker sales represent 4.5% and athletic shoe sales represent 3.2% of total store sales. If the total store sales are $900,000, what are the dollar sales for each department?

14. For this year, Store G's sales volume was $550,000,000. The juniors' dress department had net sales of $8,250,000, and the misses' dress department had net sales of $24,750,000. What were the net sales percentages of each department to the total store?

15. Branch Store H had total sales of $30,000,000. The small leather goods department's sales were 1.5% of Store H's total sales. The handbag department's sales were 3.5% of the total branch sales. What were the dollar net sales for each department?

16. Discussion Problem: Explain why a merchant should be alarmed if customer returns are excessive. How does a merchant determine what is an excessive percentage of returns? What can be done by the department itself to correct a problematic rate of returns?

17. The customer returns for the fall season were 10% on gross sales of $900,000. For the spring season, gross sales were $850,000 and customer returns were $70,000. What was the percentage of customer returns for the entire year?

Cost of Goods Sold Practice Problems

18. The missy tops buyer is placing an order for T-shirts. The buyer will be purchasing 10,000 units of solid T-shirts at a billed cost of $10.75 per unit and 8,400 units of printed T-shirts at a billed cost of $11.50 per unit. Calculate the total billed cost for the T-shirt order.

19. The girls' buyer placed an order for the following merchandise:

    120 sweaters with a billed cost of $7.75 each

    180 knit tops with a billed cost of $4.50 each

    150 leggings with a billed cost of $6.25 each

    Calculate the total billed cost for this order.

20. Marjorie's Baby Store placed an order for infant blankets that totaled $4,800. Discounts earned were $480, and shipping charges were $100. What is the total cost of goods sold for this order?

21. The kitchen textiles buyer placed an order for 12,000 holiday motif towels at a billed cost of $1.70 each. The shipping charges on the order amounted to $300. The buyer negotiated a cost discount of 12%. What is the cost of goods sold for this order?

22. The petite sportswear buyer placed the following order:

    - 36 pants costing $10.75 each
    - 48 pants costing $15.50 each
    - 24 pants costing $17.50 each

    Shipping charges (paid by the store) were 6% of the billed cost. Find:

    a. The dollar amount of shipping charges.

    b. The delivered cost of the total order.

23. A specialty store placed an order for the following merchandise:

    600 pants with a billed cost of $29.00 each

    500 pants with a billed cost of $32.00 each

    There was an 8% discount secured for the order. Shipping charges were $1,670 of the total order. The merchandise needed to be ticketed, and the store incurred a $150 workroom cost.

    a. What is the total billed cost for the order?

    b. What is the discount in dollars?

    c. What is the cost of goods sold for this order?

24. A luggage buyer purchased 72 attaché cases that cost $40 each. The cash discount earned was 2%, and the store paid inward freight of $95. Find the total cost of the merchandise on this order.

25. A gift shop has workroom costs of $575. The billed cost of merchandise sold amounted to $59,000, with cash discounts earned of $1,180 and freight charges of $650. Find the total cost of the merchandise.

26. A specialty dress shop made purchases amounting to $3,700 at cost, with 8% cash discounts earned, workroom costs of $100, and no inward freight. Determine the total cost of the merchandise.

27. A sporting goods buyer placed the following order:

    - 18 nylon backpacks costing $22 each
    - 12 two-person tents costing $54 each
    - 6 camp stoves costing $55 each

    Shipping costs paid by the store were $60, and a cash discount of 1% was taken. Find:

    a. Billed cost on the total order.

    b. Total delivered cost of the merchandise.

28. Discussion Problem: Explain why control of inward freight costs and workroom (alterations) costs is vital. Can a merchandiser help to control these factors? If so, how? Why is cash discount calculated on billed cost?

Gross Margin Practice Problems

29. Calculate the gross margin in dollars and percentage for the shoe department given the following:

Net sales	=	$510,000
Cost of goods sold	=	$315,200

30. Calculate the gross margin in both dollars and percentage for the swim department if net sales are $1,150,000 and cost of goods sold is $638,400.

31. Calculate the gross margin in dollars and percentage for the home department if:

Net sales	=	$140,000
Billed cost of merchandise	=	$84,000
Cost discount	=	7.5%
Shipping charges	=	$240

Operating Expense Practice Problems

32. Analyze the following information:

JOHNSTON CANDY COMPANY

Operating expenses	*This Year*	*Plan*	*Last Year*
Advertising	$24,300	$27,700	$28,500
Sales salaries	$75,100	$75,300	$74,000
Misc. selling costs	$8,300	$8,500	$8,300
Total	$107,700	$111,500	$110,800
Net sales	$1,140,000	$980,000	$900,000

Find the following:

a. What is the percentage of advertising expenses for each year?

b. What is the percentage of sales salary expenses for each year?

c. What is the percentage of miscellaneous selling costs for each year?

d. What is the yearly percentage of total operating expenses shown?

e. What is the percentage change of operating expenses for this year to plan and this year to last year?

f. What is the percentage change of net sales for this year to plan and this year to last year?

33. Analyze the following information:

	This Year (TY)	*Plan*	*Last Year (LY)*
Net sales	$495,000	$517,500	$450,000
Advertising costs	$82,000	$80,000	$86,000
Salaries	$96,000	$90,000	$91,000

Find the following:

a. What are the total expenses in $ and % for TY, Plan, and LY?

b. What is the comparison (build) of sales for TY versus Plan and TY versus LY?

1.2 Profit and Loss Statements

Businesses must keep accurate records of sales income, merchandise costs, and operating expenses to calculate profit. In retailing, one of the most important financial records is the **profit and loss statement**. Income and expenses are summarized in the form known in retailing as a profit and loss statement (for other types of organizations, this statement is frequently called an **income statement**). This statement, prepared periodically by the department, store, or organization, summarizes the basic merchandising factors that affect profit results, showing the difference between income and expenses. Generally, the accounting department keeps a continuous record of sales income and expenses. At set intervals, this statement is analyzed to determine whether these transactions have resulted in a profit or loss. (The interval might be a year, three months [quarter], or six months [season].) If income exceeds expenses, the result is profit. If expenses exceed income, the result is a loss. Thus, it is a summary of the business transactions during a given period of time expressed in terms of making or losing money. It is used to measure profitability, as it evaluates the results of current performance and allows for comparison of present and possible future trends.

In the calculation of a profit and loss statement, there is emphasis on an exact and rigid order of the factors included. Although adding and subtracting the appropriate figures can determine a correct profit result, the standard arrangement provides an analytical picture that allows a determination of the store's strengths and weaknesses and facilitates comparisons with other counterparts. The buyer must critically examine these figures and then make a determination of causes from these results. A profit and loss statement should not be confused with a **balance sheet**, which shows the assets, liabilities, and net worth of a business.

Because this is a retailing text, the profit and loss statement will not be analyzed as a bookkeeping procedure, but in terms of how a merchant can use the data it contains to improve a merchandising operation. It is a fundamental merchandising concept that one of a buyer's chief responsibilities is to ensure that a store or department earns a profit on the merchandise sold specifically during the accounting period under consideration. For the most part, buyers will not have control on expenses; therefore, gross margin is their fiscal responsibility to monitor profitability.

Profit and loss statements can show the performance of a department, division, branch, or the entire organization. The basic format of a profit and loss statement is as follows:

Net sales

– Cost of goods sold

= Gross margin

– Operating expenses

= Net profit or loss