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# Building Financial Models with **Microsoft<sup>®</sup> Excel<sup>®</sup>**

A Guide for Business Professionals

**Second Edition**

**Includes CD-ROM with  
Financial Model Spreadsheets**



**K. SCOTT PROCTOR**



# **Building Financial Models with Microsoft<sup>®</sup> Excel<sup>®</sup>**

**Second Edition**

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*A Guide for Business Professionals*

K. SCOTT PROCTOR



**WILEY**

John Wiley & Sons, Inc.

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*For Kimmell, Page, and Harris*



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# Foreword

**B**efore joining Microsoft, I spent a decade in consulting, focused primarily on helping customers implement financial and customer systems. These systems were the lifeblood of a company's financial modeling and decision support systems; they were responsible for ensuring quick and reliable business decisions, making the company more competitive while driving shareholder value. Given their importance to the business, we took great care in designing and delivering the analytical and reporting capabilities of these systems.

After implementing the modeling and reporting capabilities, I always enjoyed sitting down with the users to understand how they were utilizing their new tools. To my amazement, in almost every discussion with a user, the most noted feature of the reporting capabilities we delivered was the "Export to Excel" button. The robust capabilities that we had built for users were replaced by a tool that sat on every information worker's desktop that we could not match with any amount of effort—Microsoft Office Excel.

Financial modeling represents the practice of projecting a business's operating results. The process of building, maintaining, and using financial models involves many interrelated and complex steps. The extent to which the process of building financial models is made more straightforward through the use of Excel as a financial modeling tool is captured nicely in the title of this book, *Building Financial Models with Microsoft Excel*.

As one would expect, we use Excel for financial modeling inside Microsoft. In fact, when Microsoft deployed its financial, human resources, and customer systems, we started with Excel as the primary modeling, analytical, and reporting tool. We use financial models on a regular basis inside Microsoft to achieve business goals, and financial modeling has represented a key component of Microsoft's practice of planning for, and investing in, the future.

It is impressive to see employees at Microsoft model scenarios with Excel that are completely integrated with our back-end customer, product, and financial data. In addition, employees feel empowered in their ability to spend most of their time analyzing, modeling, and making business decisions, rather than hunting for data, crunching numbers, or making assumptions because of a lack of reliable data.

Watching employees collaborate between models, leverage the power of Excel, and run complex scenarios is very satisfying. It is especially satisfying to me, since as an information technology person I do not need to build many of the modeling capabilities that employees are using. Excel's capabilities go a long way in helping to make the process of building a financial model more straightforward.

The process of building financial models, which involves many integrated calculations, is made more manageable by Excel's ability to identify and track all of the points of linkage in calculations across financial models. Excel also enables users to test assumptions underlying financial models and run sensitivity analyses in real time with a high degree of accuracy—something that was not possible before the advent of the electronic spreadsheet.

As the world becomes increasingly connected from an electronic communications perspective, the ability to share and collaborate on financial models will increase. As more people use electronic spreadsheets such as Excel, the power to build complex financial models will extend to a wider audience. As standards underlying financial models emerge, such as XBRL (eXtensible Business Reporting Language), the ability to distribute and use clearly defined and well-understood elements of financial models will increase as well.

You can help ensure the success of your business through the use of financial models. Building a financial model helps to project a business's future operating results and allows for better business decision making. Microsoft has benefited in many ways through the efficient and effective use of financial models. This book will allow you to bolster your financial modeling skills and knowledge.

Building useful, accurate, and robust financial models can help ensure the success of your business. The opportunities have never been greater to use financial modeling tools such as Excel to make your company and your career more successful. The need for reliable modeling capabilities is stronger now than it has ever been. New features and functionality embedded in Excel 2007 offer users the ability to collaborate on, secure, and integrate financial models in new and exciting ways.

I highly recommend K. Scott Proctor's book as one of the best I have seen at providing the fundamental knowledge and insight for financial modeling in Excel. The book does a great job of walking through practical examples to help you build your financial modeling skills through the use of Excel—skills that will benefit you for years to come as financial modeling in Excel advances in this interconnected world.

—RON MARKEZICH  
Corporate Vice President – MS Online, Microsoft

# Preface

## **PURPOSE OF THIS BOOK**

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*Building Financial Models with Microsoft Excel* is a step-by-step comprehensive guide to the process of building financial models using Microsoft Excel. I designed and wrote this book with the specific goal of making you an advanced financial model-builder using Excel. This is neither an accounting/finance textbook nor a “how to use Microsoft Excel” book. Rather, this book represents a real-world guide to using a powerful tool (Microsoft Excel) to accomplish a complex task (building a financial model). When you are finished reading this book, you should have a firm understanding of the steps involved in building financial models and you should know how to use Excel to put that understanding to work in the form of a working financial model.

A financial model is a quantitative representation of a company’s past, present, and future business operations. Companies of all types and sizes use financial models every day to analyze and plan their business activities. Financial models serve as the foundation and basis of standard financial accounting reports, including the Balance Sheet, the Income Statement, and the Statement of Cash Flows.

This book contains step-by-step instructions for building a financial model. As such, this book can serve as either a tutorial or a reference. It is my hope that this book helps to demystify the process of building a financial model.

Microsoft Excel is a powerful application for the collection, analysis, and presentation of data in the business world. This book aims to build on the solid functionality and usability of Excel and extend these features into a specific and focused business application—that of building a working financial model. In so doing, this book extends the how-to nature of many Excel-oriented books to the subject matter of financial modeling.

Excel is an ideal tool for the design, construction, and maintenance of financial models. While many businesspeople are familiar with the output of financial models, namely the consolidated financial statements (Balance

Sheet, Income Statement, and Statement of Cash Flows), few professionals are truly adept at building an accurate and effective financial model from the ground up. This book aims to endow you with the skills required to build a good financial model.

This book applies to two specific versions of Microsoft Excel: Microsoft Excel 2007 (running on the Microsoft Vista operating system) and Microsoft Excel 2008 for Mac (running on the Mac OS X (10.5.6 or higher) operating system). The general approach outlined in this book applies also to earlier versions of Excel, but the book is geared towards Excel 2007 (running on the Microsoft Vista operating system). Moreover, Excel 2008 for Mac interface (running on the Mac OS X (10.5.6 or higher) operating system) differs from the interface shown in this book, but the relevant functionality of Excel 2008 for Mac closely mirrors the Excel functionality covered in this book.

## **NEED FOR THIS BOOK**

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While a number of books have been written on financial modeling with Microsoft Excel, the vast majority of these books are extremely advanced, often requiring extensive technical knowledge (such as the use of VBA—Visual Basic for Applications) and/or extensive corporate finance knowledge (including the mastery of topics such as efficient frontiers, variance–covariance matrices, Monte Carlo simulations, and Value-at-Risk). This book addresses the real, immediate, and significant need for a publication that covers how to build a financial model using Microsoft Excel from the perspective of a beginning- or intermediate-level computer user.

## **TARGET AUDIENCE FOR THIS BOOK**

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*Building Financial Models with Microsoft Excel* is for business professionals, entrepreneurs, and students who currently, or would like to, create or use financial models and/or statements as a part of their work. This book is targeted at individuals with a beginning to intermediate level of experience with both Microsoft Excel and finance/accounting.

While many business professionals and students have a working knowledge of Excel, few people possess the skill set required to build and maintain a financial model from the ground up. This is surprising, given the fact that several hundred thousand new businesses are launched and several hundred thousand business students graduate each year in the United States alone.

If any of these scenarios applies to you, this book is for you:

- As a working professional, your job responsibilities include the analysis, use, and/or preparation of financial statements. Such responsibilities could include the preparation of a sales or departmental budget, the analysis of a division's financial performance compared to the rest of the company, or the valuation of a publicly traded company, among others. Examples of professionals in these scenarios could include: financial analysts, accounting managers, and vice presidents (and above) across all corporate divisions, among other professionals.
- As an entrepreneur, or someone starting a new business, you are required to prepare and submit a set of financial statement projections to your bank or other source(s) of financing, such as a venture capital firm. Nearly all business plans associated with a new (or existing) company/business are required to have a set of "pro forma," or projected, financial statements.
- As a business/management student at either the undergraduate or graduate level, you are required to build and analyze financial models. Financial literacy and skills are important in today's market; all business students should be well-versed in the use of financial models.

I have designed this book as a practical guide to get you started building a financial model quickly. As such, electronic copies of each of the examples and answers in the book are provided as Excel worksheets on a compact disc that is included with the book.

## **SUMMARY OF CONTENTS**

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Building a financial model is a step-by-step logical process—each component of the model builds on or feeds into another component of the model. This book, which is organized in a manner that follows this process, is divided into three major parts and includes an appendix that provides a general overview of Microsoft Excel's features and functionality.

Part One of the book introduces the concepts of budgets and financial models and covers the steps involved in building the Master Budget. You will learn about the various components of a Master Budget and how these components are related to one another. At the highest level of abstraction, the Master Budget contains two key components: the Operating Budget and the Financial Budget. The Master Budget template provided in this part of the book will serve as a roadmap for building each individual component of the financial model. This is the place to learn the fundamentals of the

budgeting process and the nature of the relationships between the various components of the Master Budget.

Part One also covers the steps involved in building the Operating Budget, the first of the two key components of the Master Budget. Examples are provided for each of the steps described in this part of the book. It is important to work through this part of the book in detail, as the components of the Operating Budget are required elements of the overall financial model.

The steps involved in building the Financial Budget, the second of the two key components of the Master Budget, are also covered in Part One. As with the Operating Budget, examples are provided for each of the steps associated with building the Financial Budget. Each component of the Financial Budget is a required element of the overall financial model, so it is important to work through this part of the book in detail as well.

Part Two of the book deals with a company's consolidated financial statements and free cash flows. The consolidated financial statements include the Balance Sheet, the Income Statement, and the Statement of Cash Flows. This part of the book is built on data, calculations, and work from Part One. Many businesspeople are familiar with these consolidated financial statements—this part of the book provides a guide to building these statements from the ground up based on the Operating and the Financial Budgets for a company. Free cash flow calculations are covered in this part of the book as well to provide a cash-based perspective on a company's business operations and to provide a foundation for valuation calculations at a later point in the book.

Part Three deals with several topics, including various ways to analyze a financial model, the concept of valuation, and capitalization, or ownership, charts. The analytical techniques related to financial modeling include sensitivity analyses to test the assumptions underlying the financial model, contribution margin analyses to assess the fixed- and variable-cost elements of a company's cost structure, and financial ratios analyses to measure important financial ratios such as net income to sales (profit margin).

Valuation, covered in Part Three, is a complex issue—entire books are devoted to the subject. This part aims to cover some traditional valuation methodologies and link these techniques to the financial model built earlier in Parts One and Two. A capitalization chart provides a record of a company's ownership structure. Valuation and ownership are closely related (especially if a company raises any type of equity financing) and deceptively complex topics—this part of the book addresses how these topics relate to a financial model.

Finally, the book concludes with an Appendix that provides a high-level overview of Microsoft Excel's features and functionality and detailed answers to all of the end-of-chapter questions. Note that you will often need

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to access the end-of-chapter question files on the accompanying CD-ROM to answer the questions.

## **A FINAL NOTE**

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While this book is written with United States GAAP (Generally Accepted Accounting Principles) in mind, the book's modular nature aims to help make the process of transitioning the modeling process to other accounting systems as straightforward as possible.



# Acknowledgments

I would like to thank the editorial team at John Wiley & Sons for their support and assistance with this book. Special thanks to Bill Falloon, Meg Freeborn, and Skyler Balbus for helping to turn my ideas into a book.

I would also like to thank Gene Fife, Bob Coleman, and Dimitri Azar for their training, help, and guidance over the past years. Thanks also to Bob Bruner for his role in inspiring my interest in, and pursuit of, the field of Finance. Finally, thanks to my family for their support and understanding as I put this book together.



# **Building Financial Models with Microsoft<sup>®</sup> Excel<sup>®</sup>**

**Second Edition**



PART

# One

## The Master Budget



# Overview of Budgets and Financial Models

## BUDGETS

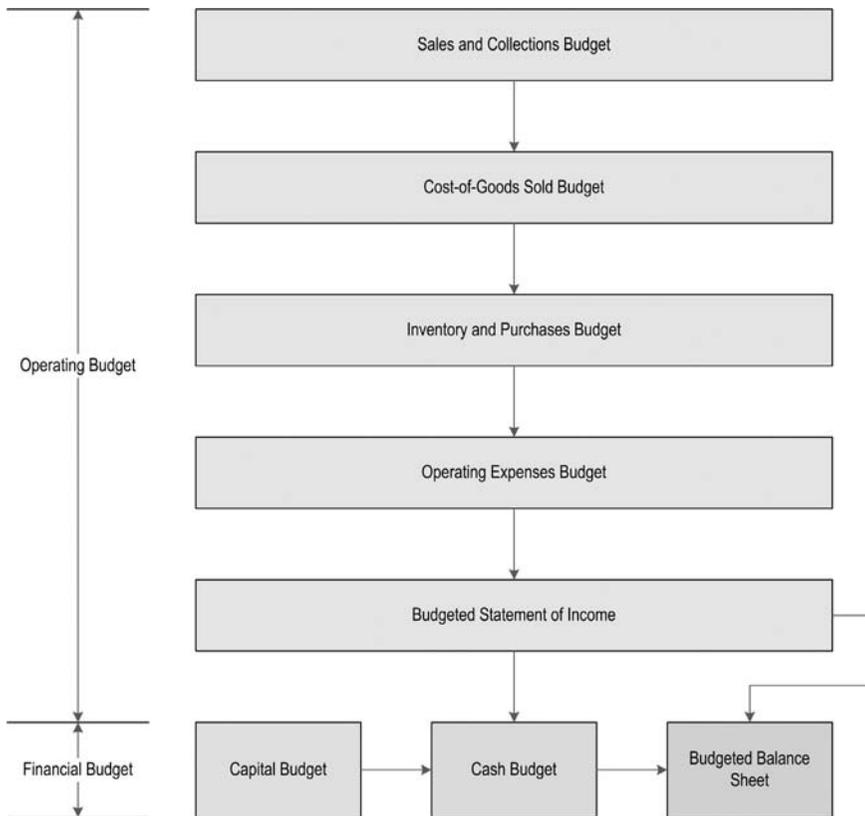
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The *Cambridge Dictionary* defines a budget as “a plan to show how much money a person or organization will earn and how much they will need or be able to spend.” Businesses use several different types of budgets to manage their operations. Whatever form various budgets may take, the primary goal of all budgets is to provide a tangible and quantifiable estimate of the receipt and allocation of resources. In the context of this book, a budget represents a core element of a financial model; financial models are discussed later in the chapter.

Businesses use several types of budgets for planning purposes. These budgets are typically categorized by the timeframe that they cover. A “long-range plan,” one type of budget, typically forecasts financial statements out 5 to 10 years into the future. Long-range plans usually evolve from “strategic plans,” which define the overall mission and goals for a business. These long-range plans are coordinated with Capital Budgets, which map out large monetary commitments for things such as facilities and large pieces of equipment.

From a budgeting perspective, this book is focused on the “Master Budget,” which forecasts a business’s complete operations over the medium-term (1–5 years). The Master Budget consists of many interrelated financial and operating schedules, including sales, purchases, and operating expenses, among many others. While some of the key outputs of a Master Budget are the consolidated financial statements (Balance Sheet, Income Statement, and Statement of Cash Flows), a vast array of supporting schedules are also part of the Master Budget. Figure 1.1 outlines the various components of the Master Budget.

As Figure 1.1 indicates, there are two key components of the Master Budget: the Operating Budget and the Financial Budget.



**FIGURE 1.1** Components of the Master Budget

## Operating Budget

The Operating Budget focuses on the Budgeted Income Statement and its supporting components and schedules—these items are described below.

**Sales and Collections Budget** The Sales and Collections Budget represents one of the first steps in the budgeting process, as items such as inventory levels and operating expenses are driven off of the Sales and Collections Budget. Effective sales budgeting is a key factor in building a useful and representative financial model for a business. Regardless of the nature of your business (for example, whether it is product- or service-based), this book takes a unit-based approach in which forecast sales are based on (1) projected unit sales and (2) projected unit prices. This topic is covered in detail later in the book.

**Cost-of-Goods-Sold Budget** The Cost-of-Goods-Sold Budget decomposes, or breaks down, the components of a business's cost of goods sold (in some cases referred to as the cost of revenues). This budget breaks out each separate factor underlying the cost of goods sold for a business.

**Inventory and Purchases Budget** The Inventory and Purchases Budget, which represents what a business plans to buy and how much inventory it intends to hold over a given timeframe, is based on three factors: a business's desired ending inventory, cost of goods sold, and beginning inventory. A business's desired ending inventory will drive that business's budgeted purchases over a given period of time. A larger desired ending inventory will typically lead to a larger Purchases Budget and vice-versa. While the Purchases Budget, a component of the Inventory and Purchases Budget, represents an estimate of future purchases, this is an accrual-based accounting figure, and it is the Disbursements for Purchases Budget (another component of the Inventory and Purchases Budget) that drives a company's cash flows. This concept is discussed in detail later in the book.

**Operating Expenses Budget** The Operating Expenses Budget forecasts all of the elements of a business's operating expenses, such as salaries, rent, depreciation, and others. Some of these expenses are fixed and some are variable (in other words, based on another measure or metric, such as revenues); this concept of fixed versus variable costs is discussed in detail later in the book. While the Operating Expenses Budget represents an estimate of future expenses, this is an accrual-based accounting figure, and it is the Disbursements for Operating Expenses Budget, a component of the Operating Expenses Budget, that drives a company's cash flows. This concept is also discussed in detail later in the book.

**Budgeted Statement of Income** The Budgeted Statement of Income (also referred to as the Budgeted Income Statement) integrates components of each of the other Operating Budget schedules. The Income Statement compares a business's revenues and costs for a given period of time and often serves as a benchmark for the performance of a business.

### **Financial Budget**

The Financial Budget is focused on capital expenditures (large purchases of assets such as equipment and facilities) and on a business's budgeted cash position and Balance Sheet.

**Capital Budget** A business's Capital Budget forecasts large expenditures for items such as machinery. Different companies set different thresholds for

what qualifies as a capital expenditure (versus an expense). If the purchase of an item (such as a piece of machinery) is classified as a capital expenditure, it is then depreciated (or amortized in some cases) over a predetermined period of time. The Capital Budget covers Capital Expenditures, Disbursements for Capital Expenditures, and Depreciation Budgets.

**Cash Budget** The Cash Budget tracks a business's anticipated cash receipts and disbursements. This is a very detailed and important schedule that draws on information in the Operating Budget.

**Budgeted Balance Sheet** The Budgeted Balance Sheet represents the final step in building the Master Budget as outlined in Figure 1.1. The budgeted Balance Sheet integrates components from both the Operating and the Financial Budgets.

## **FINANCIAL MODELS**

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A financial model is a quantitative representation of a company's past, present, and future business operations. This quantitative representation is expressed through the use of accounting—the language of business. Finance, which may be broadly defined as the science of managing money and other assets, is based on accounting. As such, it is important to recognize the central role accounting, or the enumeration of business transactions, plays in building financial models. While this book does not cover or address accounting concepts in any level of detail, it is worth noting that the consolidated financial statements (Balance Sheet, Income Statement, and Statement of Cash Flows) represent the product of a series of accounting transactions.

A financial model is a required component of nearly any business plan. Anyone interested in starting a new business, starting a new line of business within an existing company, assessing the operations of an existing or proposed business, and/or comparing the operations of two or more businesses, among other tasks, should know how to build, use, and modify a financial model.

While there are a variety of approaches to building financial models, this book will focus on the inclusion of the following sections in a financial model: (1) a Master Budget (which is made up of an Operating Budget and a Financial Budget), (2) the consolidated financial statements (Balance Sheet, Income Statement, and Statement of Cash Flows), (3) a free cash flow analysis, (4) a sensitivity analysis of the model's outputs versus inputs, (5) a contribution margin analysis, (6) a financial ratios analysis, (7) a valuation analysis, and (8) a capitalization chart.

For the sake of illustration, sample templates for each of these sections are shown below. Please note that no numbers/values have been inserted into these templates—over the course of this book, I will walk through the process of filling in all of these templates one step at a time.

A financial model integrates all of the components of a Master Budget into a working model of a company’s planned financial activities for a given time period. As this represents a significant amount of information, the components of a financial model are presented in several figures.

As discussed earlier, the components of the Master Budget are broken into the two primary budgets—the Operating Budget and the Financial Budget. Please note that the areas shaded in gray in the screenshots represent the areas in which I will fill in values to build a financial model over the course of this book. These figures are presented as a road map for the next several chapters of the book.

### **Master Budget—Operating Budget**

The following figures represent components of the Operating Budget. Note the following convention used throughout the book for time periods: “1Q X4” is to be interpreted as “the first quarter of a year ending in the number 4.” The use of “X4” for a year is a common practice in accounting and finance—it is meant to refer to a specific year without referring to an exact time period such as “94” or “04.” I also use the following convention throughout the book: “X4” is to be interpreted as “the year X4.” Again, this is meant to refer to a particular year without referring to an exact time period.

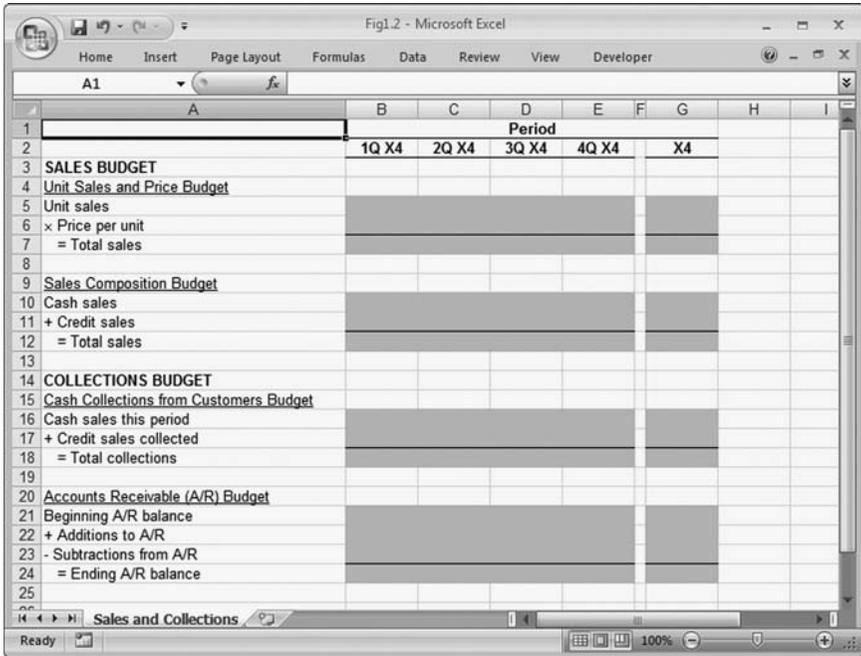
**Sales and Collections Budget** The Sales and Collections Budget, shown in Figure 1.2, consists of a Sales Budget and a Collections Budget.

**Cost-of-Goods-Sold Budget** The Cost-of-Goods-Sold Budget, shown in Figure 1.3, breaks out each component of a business’s cost of goods sold.

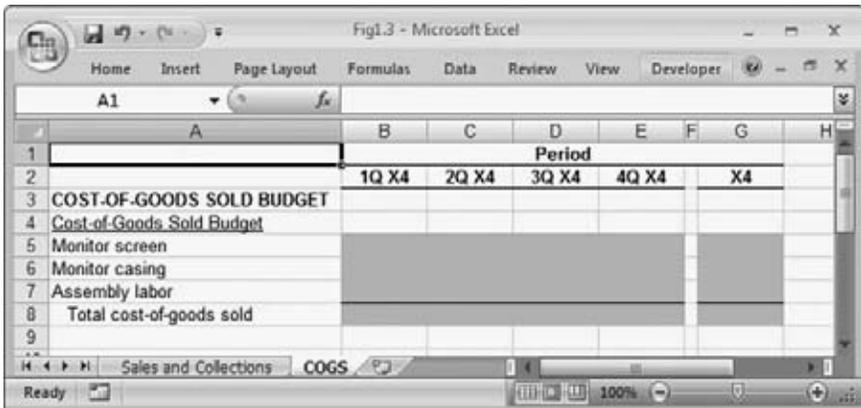
**Inventory and Purchases Budget** The Inventory and Purchases Budget, shown in Figure 1.4, consists of an Inventory Budget and a Purchases Budget.

**Operating Expenses Budget** The Operating Expenses Budget, shown in Figure 1.5, consists of an Operating Expenses Budget and a Disbursements for Operating Expenses Budget.

**Budgeted Statement of Income** The Budgeted Statement of Income, shown in Figure 1.6, compares a business’s revenues and expenses.



**FIGURE 1.2** Sales and Collections Budget



**FIGURE 1.3** Cost-of-Goods-Sold Budget

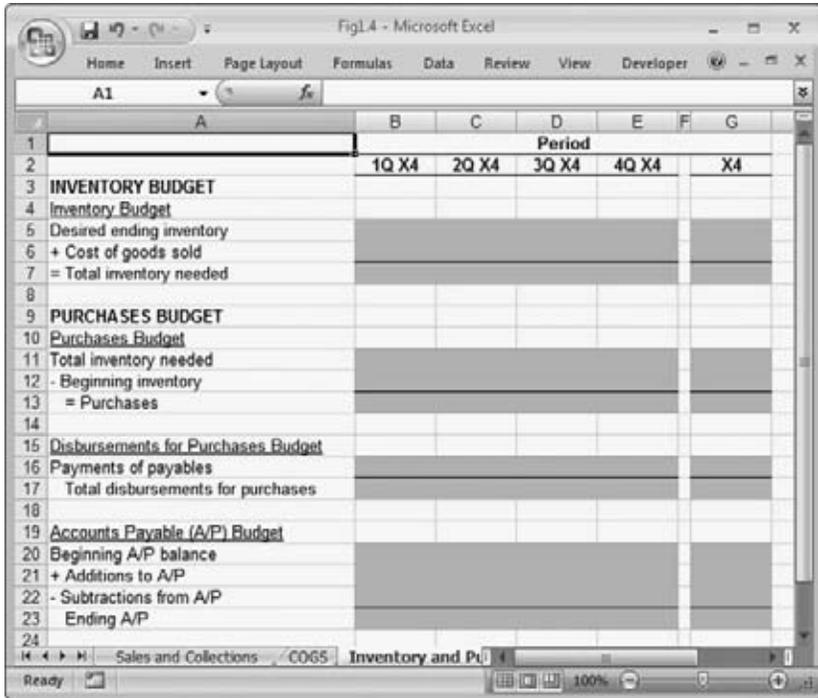


FIGURE 1.4 Inventory and Purchases Budget

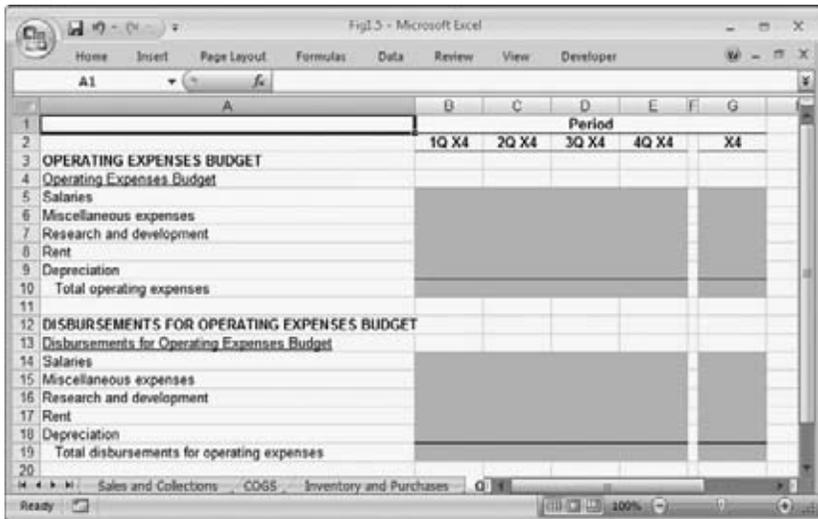


FIGURE 1.5 Operating Expenses Budget

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
1					
2					
3	Sales				
4	Cost of goods sold				
5	Gross profit				
6					
7	Salaries				
8	Miscellaneous expenses				
9	Research and development				
10	Rent				
11	Taxes				
12	Depreciation				
13	Income from operations				
14					
15	Interest expense				
16	Taxable income				
17					
18	Tax expense				
19	Net income				
20					

**FIGURE 1.6** Budgeted Statement of Income

### Master Budget—Financial Budget

The following figures represent components of the Financial Budget.

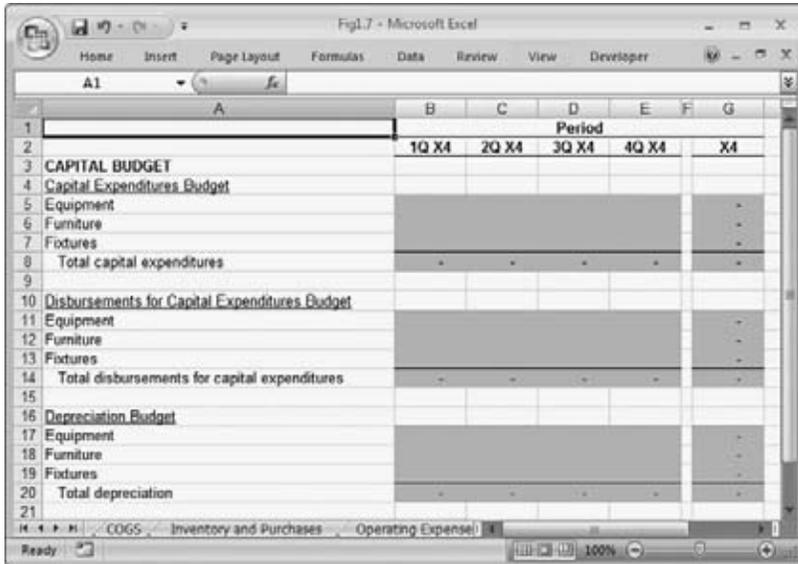
**Capital Budget** The Capital Budget, shown in Figure 1.7, consists of three components: the Capital Expenditures Budget, the Disbursements for Capital Expenditures Budget, and the Depreciation Budget.

**Cash Budget** The Cash Budget, shown in Figure 1.8, offers a detailed reconciliation of a business's beginning and ending cash balances for a given period of time.

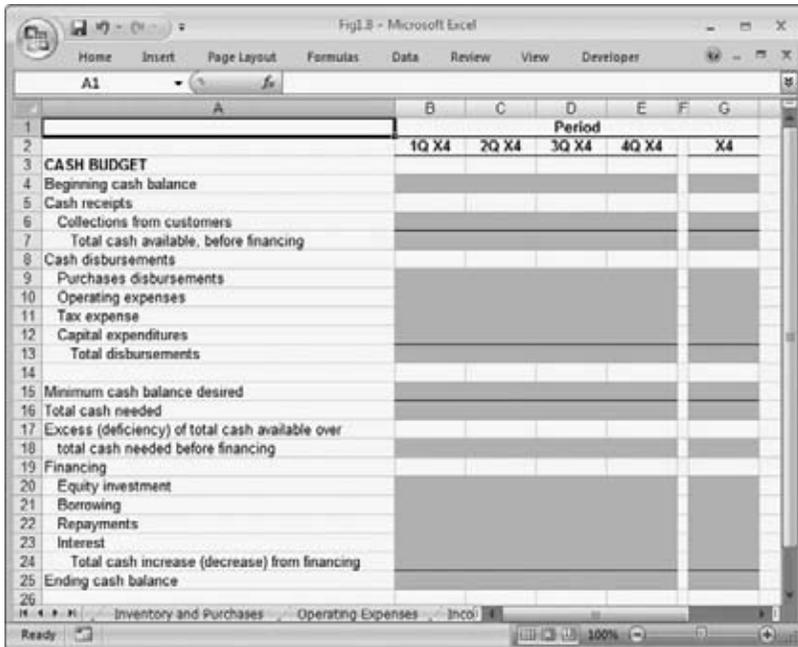
**Budgeted Balance Sheet** The Budgeted Balance Sheet, shown in Figure 1.9, compares a business's Assets, Liabilities, and Owners' Equity.

### Additional Components of a Master Budget

A working financial model should include several additional schedules beyond those presented in Figures 1.2 through 1.9. These schedules include an



**FIGURE 1.7** Capital Budget



**FIGURE 1.8** Cash Budget

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Assets</b>					
Cash					
Accounts Receivable					
Inventory					
Fixed Assets, net					
<b>Total Assets</b>					
<b>Liabilities</b>					
Accounts Payable					
Loan Payable					
<b>Total Liabilities</b>					
<b>Owners' Equity</b>					
Common Stock					
Retained Earnings					
<b>Total Owners' Equity</b>					
<b>Total Liabilities and Owners' Equity</b>					

**FIGURE 1.9** Budgeted Balance Sheet

Assumptions and Dashboard worksheet and Headcount worksheets, among others.

## Consolidated Financial Statements

The consolidated financial statements consist of the Balance Sheet, the Income Statement, and the Statement of Cash Flows. Publicly traded companies are required to report these statements to the SEC (U.S. Securities and Exchange Commission) on a regular basis, so many readers may be familiar with each of these statements. Templates for each of these financial statements are provided below.

**Balance Sheet** A Balance Sheet, shown in Figure 1.10, offers a view of a business's financial position in terms of its Assets, Liabilities, and Owners' Equity.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Assets</b>					
Cash					
Accounts Receivable					
Inventory					
Fixed Assets, net					
<b>Total Assets</b>					
<b>Liabilities</b>					
Accounts Payable					
Loan Payable					
<b>Total Liabilities</b>					
<b>Owners' Equity</b>					
Common Stock					
Retained Earnings					
<b>Total Owners' Equity</b>					
<b>Total Liabilities and Owners' Equity</b>					

**FIGURE 1.10** Balance Sheet

**Income Statement** An Income Statement, shown in Figure 1.11, presents a summary of a business’s results of operations in terms of its revenues and expenses.

**Statement of Cash Flows** A Statement of Cash Flows, shown in Figure 1.12, reconciles a business’s net income to its change in cash position over a given time period in terms of Cash Flows from Operating Activities, Cash Flows from Investing Activities, and Cash Flows from Financing Activities.

**Free Cash Flow Analysis**

The concept of free cash flows is central to modern finance. Broadly speaking, free cash flows represent the amount of cash a business generates (or, in some cases, consumes) over a given timeframe after paying all of its “required” costs for that period. I will discuss free cash flows in Chapter 9, but technically speaking, free cash flows represent the cash available to all

Fig1.11 - Microsoft Excel

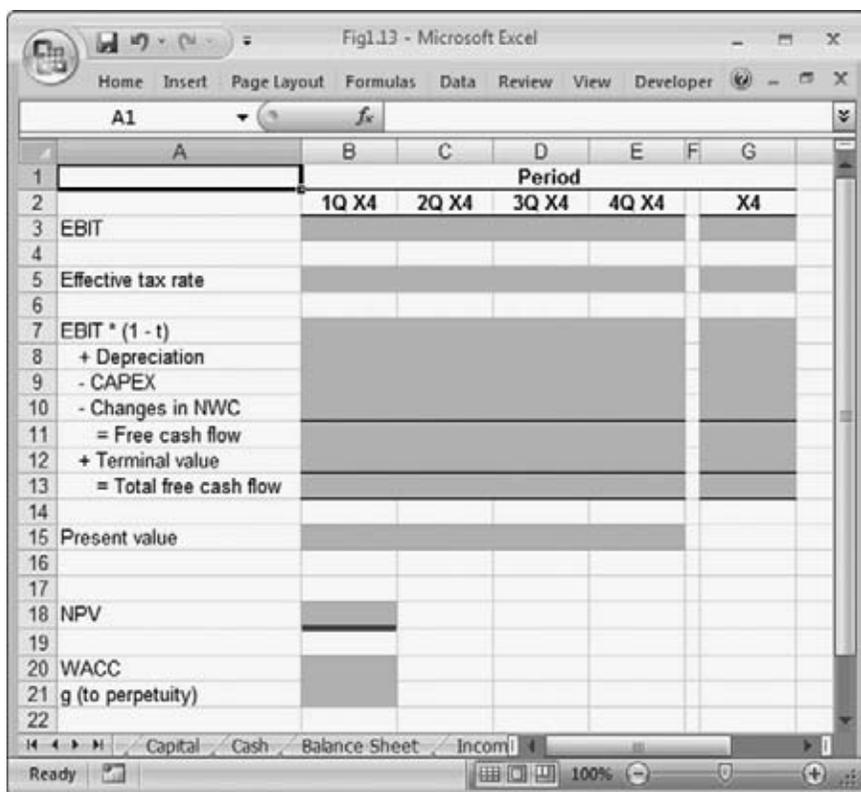
	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
1					
2					
3	Sales				
4	Cost of goods sold				
5	Gross profit				
6					
7	Salaries				
8	Miscellaneous expenses				
9	Research and development				
10	Rent				
11	Taxes				
12	Depreciation				
13	Income from operations				
14					
15	Interest expense				
16	Taxable income				
17					
18	Tax expense				
19	Net income				
20					

FIGURE 1.11 Income Statement

Fig1.12 - Microsoft Excel

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
1					
2					
3	Cash Flows from Operating Activities				
4	Net Income				
5	Adjustments to reconcile net income to cash				
6	provided from operating activities				
7	Depreciation				
8	(Increase) decrease in Accounts Receivable				
9	(Increase) decrease in Inventory				
10	Increase (decrease) in Accounts Payable				
11	Increase (decrease) in Loan Payable				
12	Cash provided (used) by operating activities				
13					
14					
15	Cash Flows from Investing Activities				
16	Purchase of capital assets				
17	Cash provided (used) by investing activities				
18					
19					
20	Cash Flows from Financing Activities				
21	Proceeds from sale of Common Stock				
22	Increase (decrease) in short-term borrowings				
23	Cash provided (used) by financing activities				
24					
25					
26	Net increase (decrease) in cash				
27	Cash, beginning of period				
28	Cash, end of period				
29					

FIGURE 1.12 Statement of Cash Flows



**FIGURE 1.13** Free Cash Flows Worksheet

providers of capital (providers of both debt and equity) after all “required” expenses have been paid. Figure 1.13 presents a view of the free cash flows worksheet. All of the terms in this worksheet will be explained and discussed in Chapter 9.

### Sensitivity Analysis

Sensitivity analyses are used to model the effect of changing input variables on some output of interest, such as net income or free cash flows. It is often helpful to build a series of sensitivity analyses to get a sense for what input variables will have a significant influence on your output measure or metric of interest (for example, net income). Figure 1.14 shows a data table template that could be used to test the effect of varying the assumed growth rate in revenues on net income. Chapter 10 is devoted entirely to the coverage of sensitivity analyses.

	A	B	C	D	E	F	G
1			Net Income				
2							
3		1.0%					
4		2.0%					
5	Revenue Growth Rate	3.0%					
6		4.0%					
7		5.0%					
8							
9							
10							
11							
12							

**FIGURE 1.14** Data Table Template

### Contribution Margin Analysis

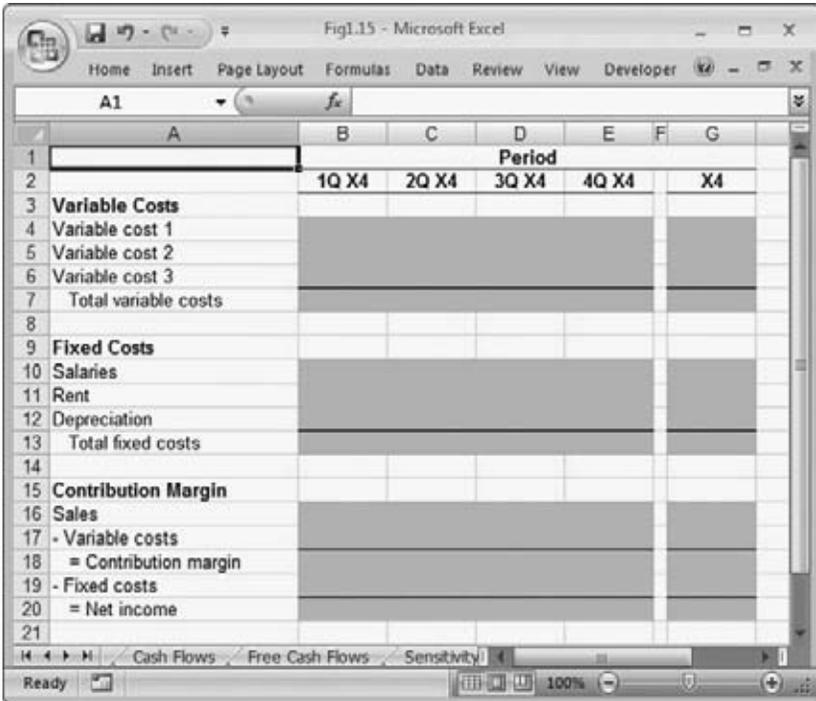
Contribution margin is defined as the extent to which each unit sale contributes to a business's fixed cost base. This is calculated as unit price – variable costs per unit. Key operating measures and metrics, such as operating leverage (calculated as fixed costs/total costs), breakeven value in units (how many units must be sold before the business reaches “breakeven,” or the point at which revenues cover all costs), and breakeven value in dollars (the level of sales, as measured in dollars, at which the business reaches breakeven), are covered in detail in Chapter 11. Figure 1.15 highlights several of these metrics.

### Financial Ratios Analysis

Financial ratios, such as gross margin (calculated as gross profit/sales), net profit margin (calculated as net income/sales), and return on equity (calculated as net income/owners' equity), among others, are often used to analyze financial models. Figure 1.16 highlights several of the financial ratios used in Chapter 12.

### Valuation Analysis

Business valuation is the process of determining how much a company is worth—in other words, determining its value. The valuation of a business is



**FIGURE 1.15** Examples of Contribution Margin Operating Metrics

a complex subject—many books have been written on this topic alone. This book will cover the concept of “triangulation,” in which several well-known valuation techniques are used—and are weighed appropriately—to estimate the value of a business. Figure 1.17 highlights a model in which various valuation techniques are used to triangulate on the value of a business. Valuation is covered in detail in Chapter 13.

### Capitalization Chart

A capitalization chart represents the ownership structure of a business. While this is one of a business’s most important documents, few books on financial modeling cover this subject. Figure 1.18 demonstrates one approach to displaying a capitalization chart. I will build a set of capitalization charts in Chapter 14 to model the effects of an investment into a business over time.

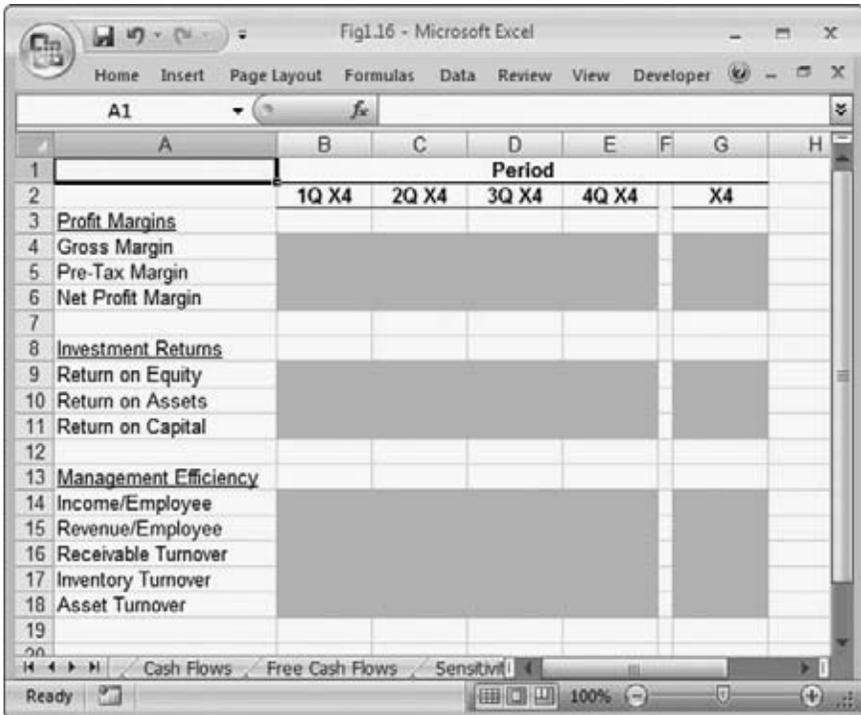


FIGURE 1.16 Financial Ratios Examples

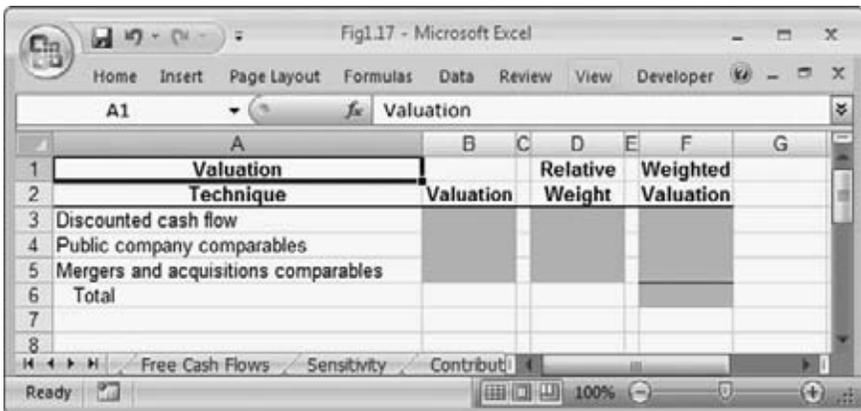
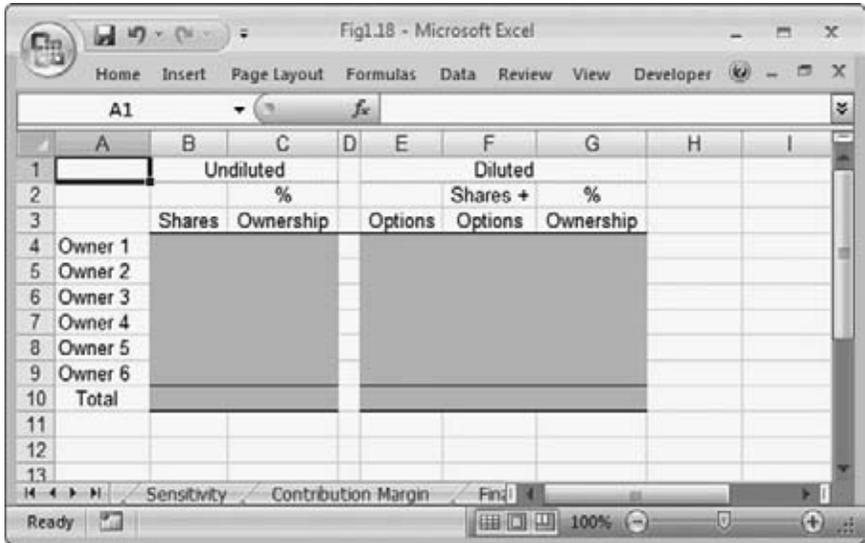


FIGURE 1.17 Valuation Model Example



**FIGURE 1.18** Capitalization Chart

## QUESTIONS

1. What is the main goal of all budgets?
2. What are the two main components of a Master Budget?
3. What is a financial model?
4. What are the names of the three components of standard consolidated financial statements?
5. What do free cash flows represent for a business?
6. Why should a business use a sensitivity analysis? A contribution margin analysis? A financial ratios analysis?
7. What is valuation?
8. What is a capitalization chart?

## Operating Budget—Assumptions, Sales, and Collections

**T**he Operating Budget, also known as a “profit plan,” focuses on a company’s Income Statement and its supporting components or “schedules.” While Chapter 1 provides an overview of the concept of a Master Budget, this chapter covers the specific steps involved in building the sales components of an Operating Budget from the ground up. Chapters 3 and 4 provide detailed coverage of the steps involved in building the cost components of an Operating Budget. Figure 2.1 highlights the separate sales-oriented components of the Operating Budget.

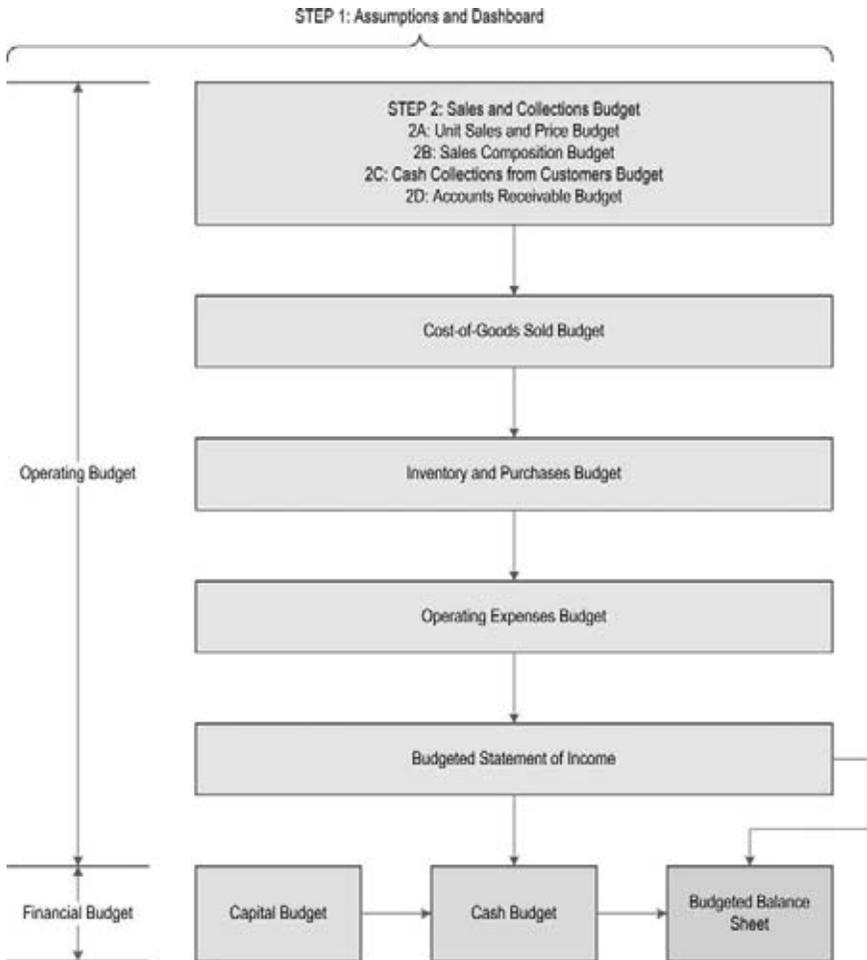
Preparing an Operating Budget is the first step in the process of building a Master Budget. The preparation of an Operating Budget is a sequential process—it is critical to follow each step outlined below in the order presented. Moreover, the preparation of a financial budget in Chapters 6 and 7 and the consolidated financial statements in Chapter 8 build on the work in this chapter.

### **NAPAVALE—BACKGROUND INFORMATION ON EXAMPLE COMPANY**

---

I will use a fictitious company named “Napavale” to illustrate the process of building a financial model. Napavale develops, markets, and sells advanced flat-screen computer monitors directly to consumers. These products are sold exclusively through a direct channel of distribution—the monitors are not sold through electronics stores or resellers, for example. Napavale offers customers several ways to purchase its monitors: through a mail-order catalog, over the telephone, or through Napavale’s web site on the Internet.

Napavale’s monitors, which are thin, lightweight, and offer excellent visibility and resolution, are sold on both cash and credit terms. Napavale’s



**FIGURE 2.1** Sales-Oriented Components of the Operating Budget

management prepares financial models so that they may run their business more efficiently and effectively.

Over the course of the next several chapters in which I will build a complete financial model for Napavale, I will project results out four quarters (one year) into the future. While most real-world budgets project results out three, and sometimes five years, the presentation of financial projections using Microsoft Excel screenshots in a book format is much more practical using four quarters of projections as opposed to using a three- or five-year time horizon. The process involved in building financial models is the same,

however, for four quarters as it is for any other timeframe. Once you have a firm grasp of the process underlying the construction of financial models, you can build your models and projections for any timeframe, be it weeks or decades.

For the sake of presentation, I am assuming Napavale was founded and began operations in the first accounting period (quarter) covered throughout Napavale's financial model. While few businesses may be able to begin functioning operationally as quickly as Napavale, Napavale's financial model is meant to address the many facets of building a financial model (as opposed to modeling an actual business).

Any forward-looking financial model will be based on a set of underlying assumptions. In the interests of simplicity and readability, I will introduce the specific assumptions underlying Napavale's financial model at the appropriate points within this chapter and Chapters 3 through 7. The remainder of this chapter will cover the construction of the Assumptions and Dashboard worksheet and the sales elements of the Operating Budget.

## **STEP 1: ASSUMPTIONS AND DASHBOARD WORKSHEET**

---

The first step involved in building a financial model is developing an "Assumptions and Dashboard" worksheet. This worksheet will contain the vast majority of the financial model's input variables. The Assumptions and Dashboard worksheet will contain, for example, projected unit sales and unit prices, projected salary levels for employees, and projected capital expenditures, among many other values. This worksheet will serve as the central point of reference for all of the input variables underlying Napavale's entire financial model.

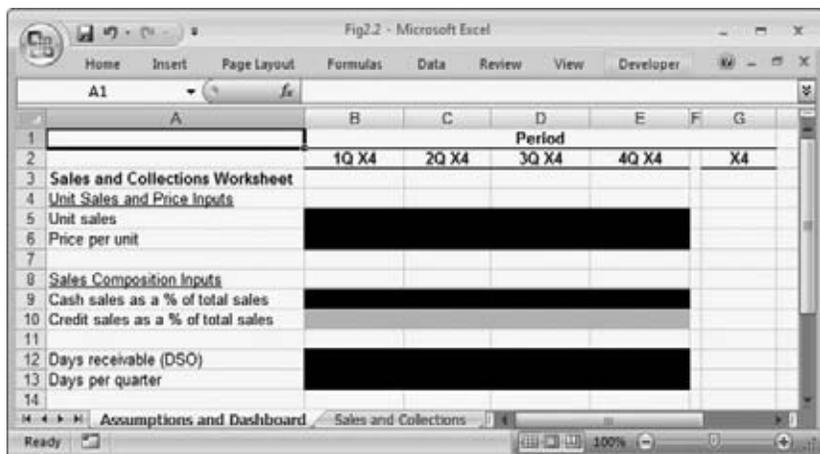
By centralizing all of the input variables of a financial model into a single location (the Assumptions and Dashboard worksheet), users can easily test and evaluate the implications of changes in the values of input variables across all elements of a financial model, including the consolidated financial statements and other metrics of interest, such as free cash flows. The use of an Assumptions and Dashboard worksheet represents a core financial modeling concept: that of avoiding "hard coding," or entering specific input variables directly into a worksheet. Whenever possible, I represent input variables as values on a separate worksheet (or area of a worksheet). If you adhere to this technique in your own financial models, you stand to save yourself significant time and effort when you modify your financial models in the future.

The Assumptions and Dashboard worksheet includes an element that I refer to as the “Dashboard.” The Dashboard offers a high-level gauge of a financial model’s condition and state of health. A Dashboard can provide a synopsis of a financial model’s key outputs, such as revenues and net income, and can also indicate, for example, whether the balance sheet is balanced. I will not cover the Dashboard, however, until Chapter 10. These are key features for all users of financial models, but especially for users that must present their financial models to audiences and executives that ask for changes in input variables in real time.

An Assumption and Dashboard worksheet allows you to, for example, change unit sales projections during a meeting and immediately evaluate the impact of this change and determine whether the model is still functioning properly—important and helpful features to have in a financial model. I refer to the Assumptions and Dashboard worksheet frequently over the course of this book.

For the sake of presentation, Figure 2.2 indicates the placeholders for some of the input variable assumptions that I will fill in with values over the next several chapters. As I work through each of the steps involved in building a financial model, I provide screenshots of the Assumptions worksheet with the relevant values indicated.

I use the following formatting convention for the remainder of the book: any input cells (those cells whose values/contents I can change) will be formatted in black with white numbers, and any output cells (those cells whose values are contingent on formulas and/or the values in other cells) will be formatted in gray with black numbers.



	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
3 Sales and Collections Worksheet					
4 Unit Sales and Price Inputs					
5 Unit sales					
6 Price per unit					
7					
8 Sales Composition Inputs					
9 Cash sales as a % of total sales					
10 Credit sales as a % of total sales					
11					
12 Days receivable (DSO)					
13 Days per quarter					
14					

**FIGURE 2.2** Placeholders for Several Input Variable Assumptions

## STEP 2A: UNIT SALES AND PRICE BUDGET

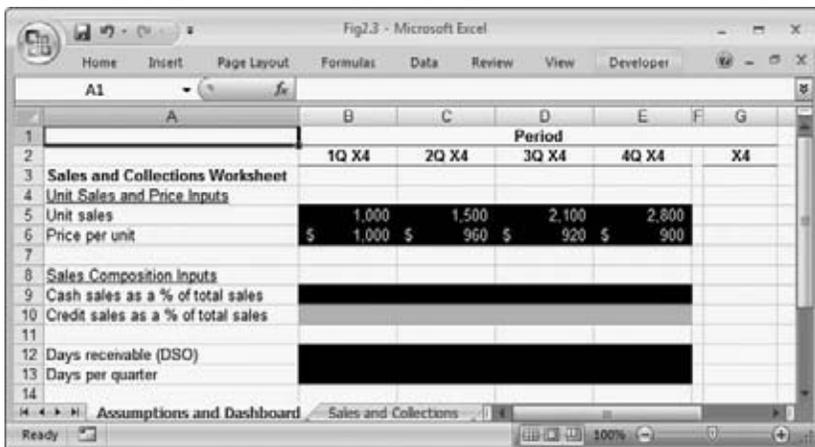
The Unit Sales and Price Budget represents a central component of a financial model. Many other elements in the financial model, including inventory levels, operating expenses, and purchases, are often based off of projected sales levels.

The first step in building a sales budget is to project total sales levels for a time period, such as a fiscal quarter, or three months. An effective way in which to project these sales is on a per-unit basis. As Napavale, my fictitious company, sells computer monitors, I will project the number of monitors sold. Thus, “number of monitors sold” represents my unit of measure for sales projections. If you are modeling a service-oriented company, such as a consulting firm, you could just as easily use a measure such as “hours billed” as your unit for sales projections.

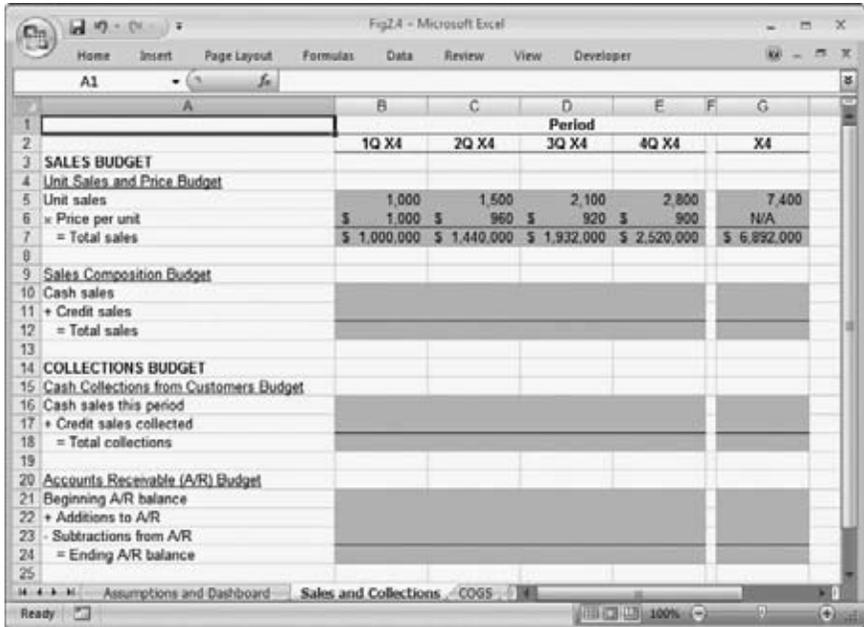
In addition to projecting unit sales of Napavale’s product, I need to project the average selling price per unit over a period of time. While Napavale sells only one product, I could easily project sales levels in terms of units and selling price per unit for a range of products. I am using only one product for Napavale in the interest of ease of presentation for Excel screenshots.

Once the unit sales and the average selling price per unit are determined, I multiply these two values together for a time period (such as a quarter) to calculate the total sales figure in dollars for this time period.

Figure 2.3 indicates the assumptions underlying Napavale’s unit sales projections (using the Assumptions and Dashboard worksheet). The Unit



**FIGURE 2.3** Assumptions Underlying Napavale’s Unit Sales Projections



**FIGURE 2.4** Unit Sales and Price Budget

Sales and Price Budget is shown in Figure 2.4. Note that I have included a row in Figure 2.4 to calculate sales in dollars for each accounting period. Dollar sales are calculated as unit sales \* price per unit.

**FORMATTING TIPS**

As you can see in Figures 2.3 to 2.7, certain formatting techniques aid in the construction of a worksheet. Take note of these uses of formatting (these formatting tips are also covered in the appendix):

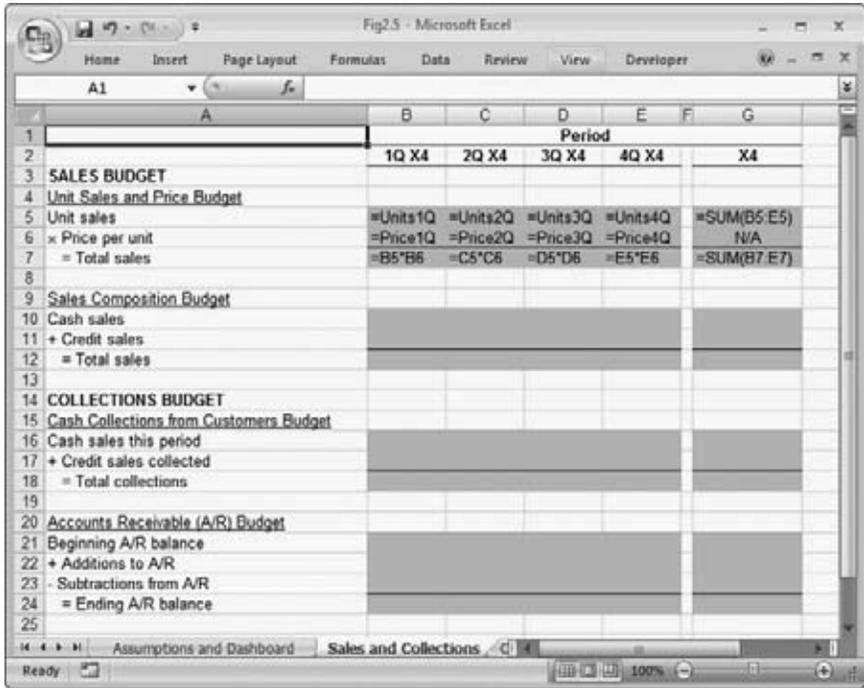
- **Bold headings**—to change text in a cell to a bold format, select the cell of interest, select the “Home” tab on the Excel ribbon, and choose the “bold” selection (usually a bold uppercase “B” icon) in the “Font” section of the ribbon.
- **Center alignment**—to center text in a cell, select the cell of interest, select the “Home” tab on the Excel ribbon, and choose the “center” selection (usually an icon with a series of centered lines) in the “Alignment” section of the ribbon.

- Borders for cells—to add a border to a cell, select the cell of interest, select the “Home” tab on the Excel ribbon, and choose the specific border that you would like to add to the selected cell (usually an icon with a box of dotted lines and one solid line on the bottom) using the drop-down “Border” icon from the “Font” section of the ribbon.
- Center text across columns—to center text across a number of columns, select the columns of interest, select the “Home” tab on the Excel ribbon, and choose the “Merge & Center” icon in the “Alignment” section of the ribbon.
- Indent text—to indent text, select the cell of interest, select the “Home” tab on the Excel ribbon, and click on the “Indent” icon (usually an icon with a blue arrow pointing to the right with a series of black lines next to the blue arrow) in the “Alignment” section of the ribbon.
- Formatting numbers as currency—to format numbers as currency, select the cell(s) of interest, select the “Home” tab on the Excel ribbon, and select the “\$” icon from the “Number” section of the ribbon.

Please note that the projected price for each monitor decreases from quarter to quarter. As in many high-technology product-oriented companies such as Napavale, price competition is severe and it is often essential to remain competitive from a pricing perspective to maintain or increase market share.

Figure 2.5 presents an alternative view of the Unit Sales and Price Budget in which the values and formulas underlying each worksheet cell are exposed. You can always switch between the original and the alternative views in your worksheets by pressing and holding the Control (CTRL) key and then pressing the “~” key. In Figure 2.5, note that equations such as that found in cell B7 (= B5 \* B6) are to be interpreted as follows: the value in cell B7 is equal to the value in B5 multiplied by the value in B6. For the sake of clarity, remember that the following symbols are used to represent arithmetic operators: + (plus/addition), – (minus/subtraction), \* (times/multiplication), and / (divided by or division). I provide many of these alternative views of worksheets over the course of this book so that you can see the specific calculations underlying Napavale’s financial model.

It is important to note that, over the course of building the financial model for Napavale, I will be naming many of the input and output cells in



**FIGURE 2.5** Alternative View of the Unit Sales and Price Budget

Excel for Napavale. One of Microsoft Excel’s more powerful features is the ability to refer to information across worksheets. I make frequent use of this feature throughout this book. The naming of cells and ranges of cells makes this ability to reference other worksheets and cells much easier.

**FEATURE TIP: NAMING CELLS AND CELL RANGES**

The ability to name cells and cell ranges is a useful and powerful feature offered by Microsoft Excel. Cell references (discussed in the Appendix) are used regularly when building financial models—the use of names instead of obscure cell references, such as \$AC165, makes it easier to build and modify models.

The easiest way to name a cell or a range of cells is to use the Name Box in Excel. The Name Box typically is found directly above the label for Column A in an open worksheet.

To name a cell or a range of cells, select the cell or range of cells that you would like to name, click on the “Formula” tab on the Excel ribbon, and choose the “Define Name” button (usually an icon labeled “Define Name” with a white tag on a string next to the label) in the “Defined Names” section of the ribbon. Next, simply type your desired name for the cell or range of cells into the “Name” field of the dialog box that appears after you click on the “Define Name” button. Note that you may not use any spaces in this name.

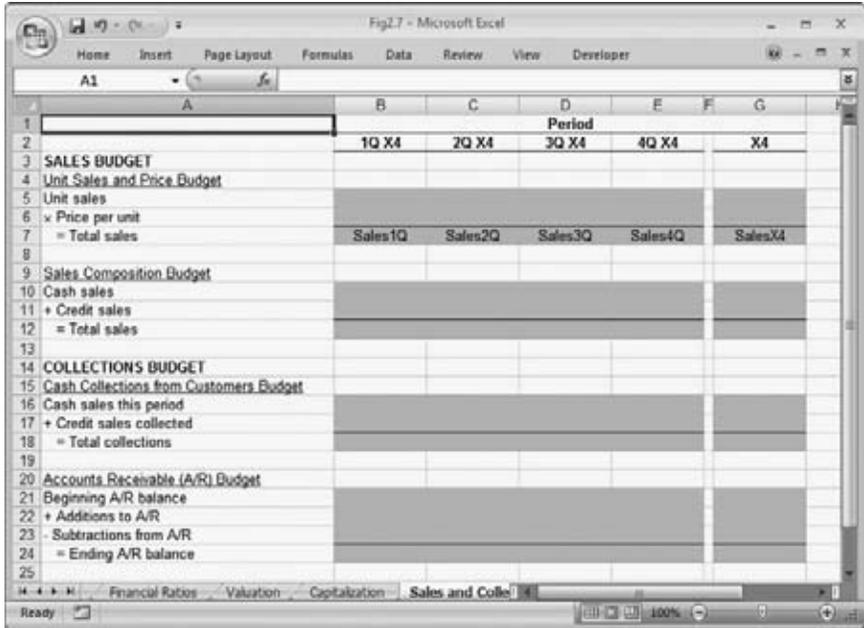
The names of each input and output cell related to the Unit Sales and Price Budget are shown in Figure 2.6 from the Assumptions and Dashboard worksheet.

Figure 2.7 shows the names for each of the input and output cells in the Unit Sales and Price Budget itself. Note that all of the figures in which I show the names of the input and output cells are for display purposes only—no calculations actually take place in such figures. I clearly note when I am presenting worksheets for the purpose of showing the names of input and output cells over the course of the book.

For the sake of clear and consistent presentation of the steps involved in building each component of Napavale’s Master Budget (covered in Chapters 2–7), I present the following figures related to each step in the Master Budget building process: (1) a view of the Assumptions and Dashboard

	Period					
	4Q X3	1Q X4	2Q X4	3Q X4	4Q X4	X4
1						
2						
3						
4						
5		Units1Q	Units2Q	Units3Q	Units4Q	
6		Price1Q	Price2Q	Price3Q	Price4Q	
7						
8						
9						
10						
11						
12						
13						
14						

**FIGURE 2.6** Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet



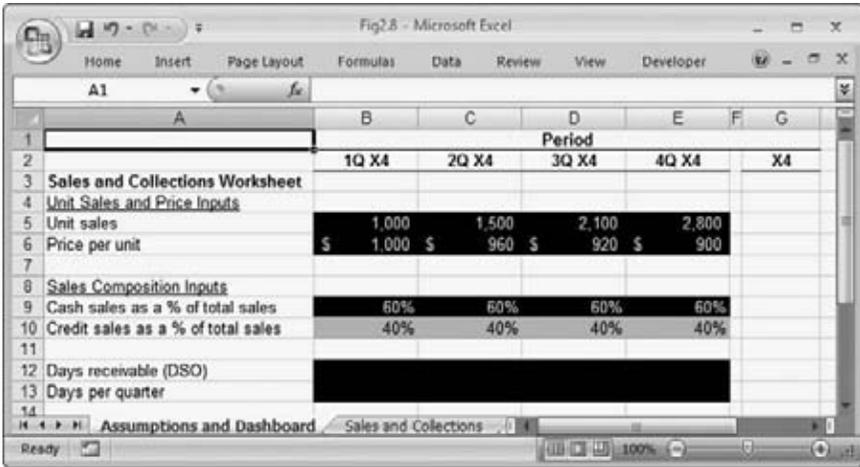
**FIGURE 2.7** Names of the Input and Output Cells in the Unit Sales and Price Budget

worksheet, with the relevant areas shown, (2) a view of the specific budget worksheet I am describing (for example, the Unit Sales and Price Budget), (3) an alternative view of the specific budget worksheet I am discussing in which the values and formulas underlying the worksheet cells are exposed and visible, (4) a view of the Assumptions and Dashboard worksheet in which the names of all of the relevant cells are shown, and (5) a view of the specific budget worksheet I am discussing in which all of the names of the relevant cells are shown.

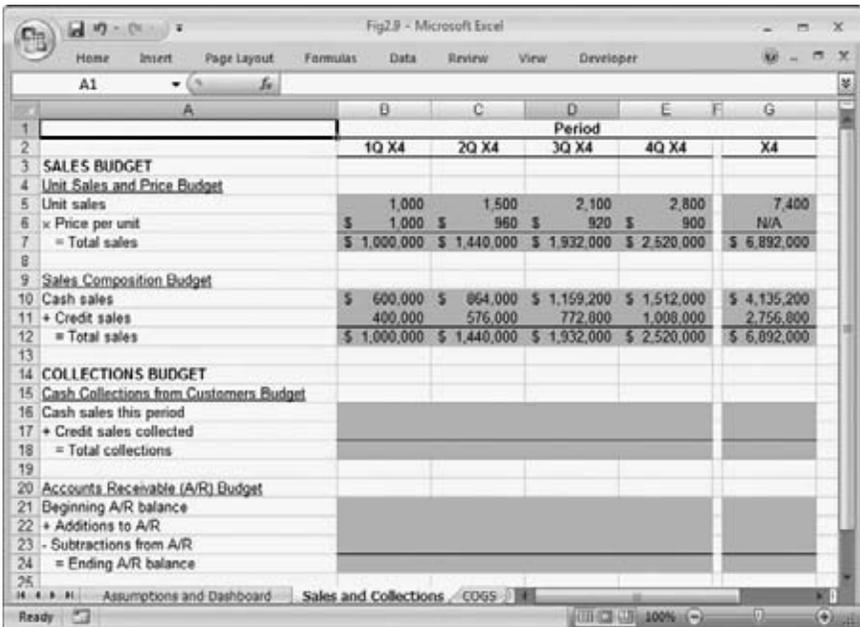
**STEP 2B: SALES COMPOSITION BUDGET**

Since a portion of Napavale’s sales will be credit sales and a portion will be cash sales, I need to calculate the relative percentage of each type of sales in the financial model. Figure 2.8 highlights the assumptions underlying the Sales Composition Budget (using the Assumptions and Dashboard worksheet). Figure 2.9 presents the Sales Composition Budget itself.

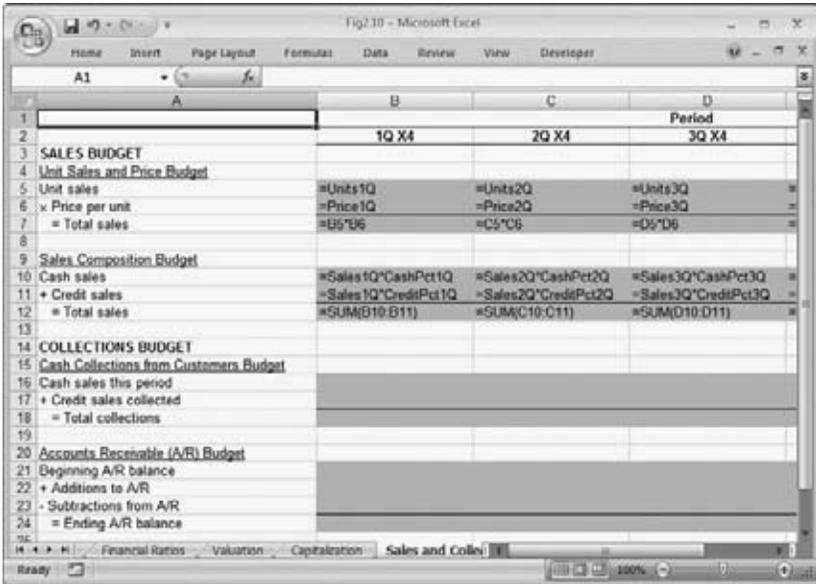
Figure 2.10 represents an alternative view of the worksheet shown in Figure 2.9. This alternative view exposes all of the formulas used to calculate



**FIGURE 2.8** Assumptions Underlying the Sales Composition Budget



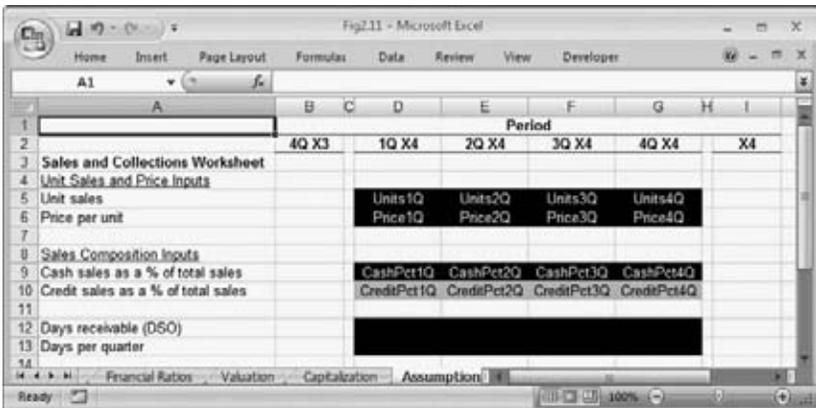
**FIGURE 2.9** Sales Composition Budget



**FIGURE 2.10** Alternative View of the Sales Composition Budget

values such as Total Sales. All of the columns in this worksheet are not visible due to the length of the formulas underlying some of the worksheet cells.

Figure 2.11 shows all of the names for the input and output cells in the Assumptions and Dashboard worksheet. Figure 2.12 highlights all of the names for the input and output cells in the Sales Composition Budget itself.



**FIGURE 2.11** Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>SALES BUDGET</b>					
Unit Sales and Price Budget					
Unit sales					
Price per unit					
= Total sales	Sales1Q	Sales2Q	Sales3Q	Sales4Q	SalesX4
<b>Sales Composition Budget</b>					
Cash sales					
+ Credit sales					
= Total sales					
<b>COLLECTIONS BUDGET</b>					
Cash Collections from Customers Budget					
Cash sales this period					
+ Credit sales collected					
= Total collections					
<b>Accounts Receivable (A/R) Budget</b>					
Beginning A/R balance					
+ Additions to A/R					
- Subtractions from A/R					
= Ending A/R balance					

**FIGURE 2.12** Names of the Input and Output Cells in the Sales Composition Budget

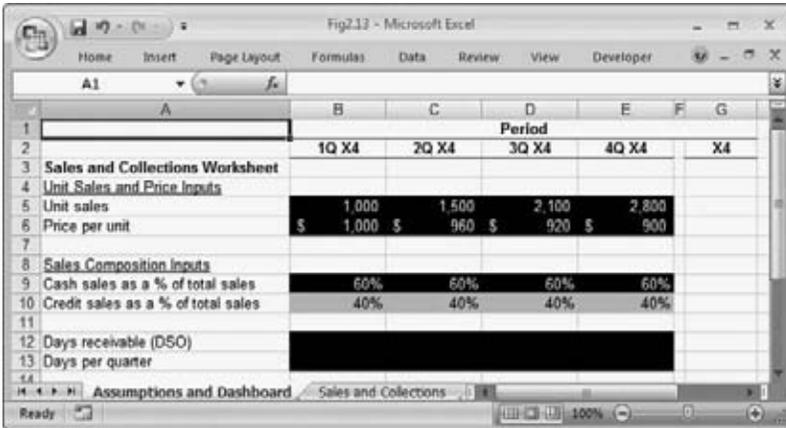
## STEP 2C: CASH COLLECTIONS FROM CUSTOMERS BUDGET

The Cash Collections from Customers Budget calculates and tracks sales on a cash basis. Cash collections from customers are calculated as: cash sales for a given time period + credit sales for a given period collected in that same period + credit sales from a previous period collected during the given period. The credit sales collections amounts are based on two assumptions: the number of days per time period and the number of days receivable.

Days receivable (also known as Days Sales Outstanding, or DSO) is a financial metric that indicates how many days sales are “outstanding” or uncollected. A company’s days receivable value is calculated as: the average accounts receivable balance for a time period/the dollar value of one day’s worth of sales. For the sake of simplicity, I will use Napavale’s Accounts Receivable balance at the end of specific accounting periods (as opposed to an average of two accounting periods) in Napavale’s financial model.

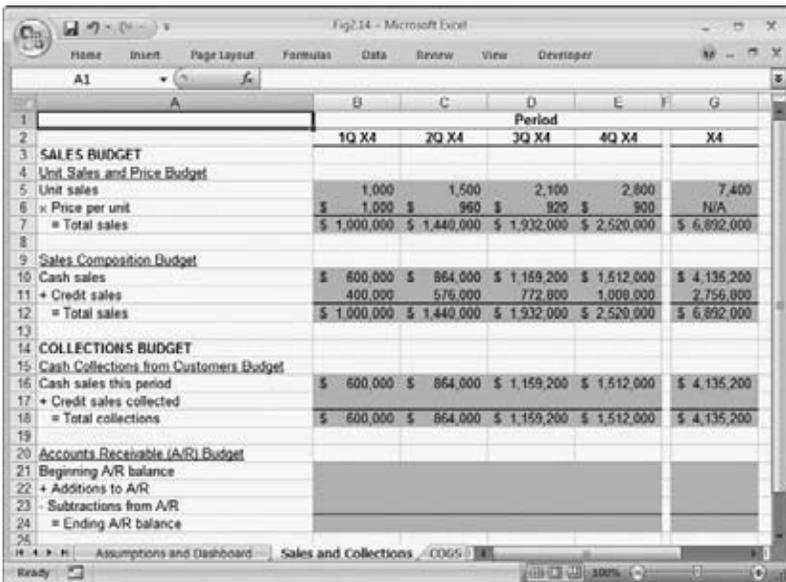
Figure 2.13 shows the assumptions underlying the cash collections calculation (using the Assumptions and Dashboard worksheet). Note that Figure 2.13 presents another view of the assumptions shown in Figure 2.8.

Figure 2.14 shows the Cash Collections Budget worksheet itself. Note that the “credit sales collected” line in the Cash Collections Budget is not completed. This is because credit sales collections are driven off of Accounts Receivable calculations, which are shown in the next step.

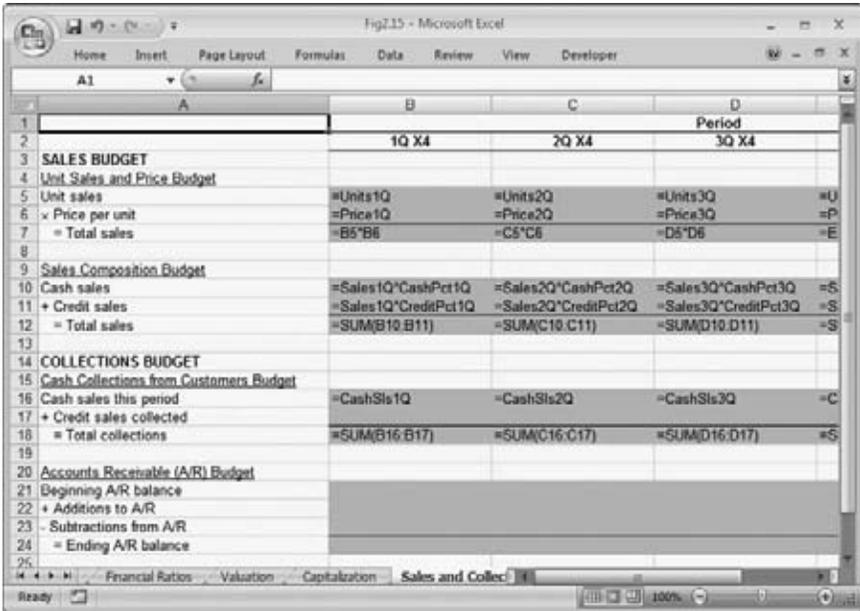


**FIGURE 2.13** Assumptions Underlying the Cash Collections Calculation

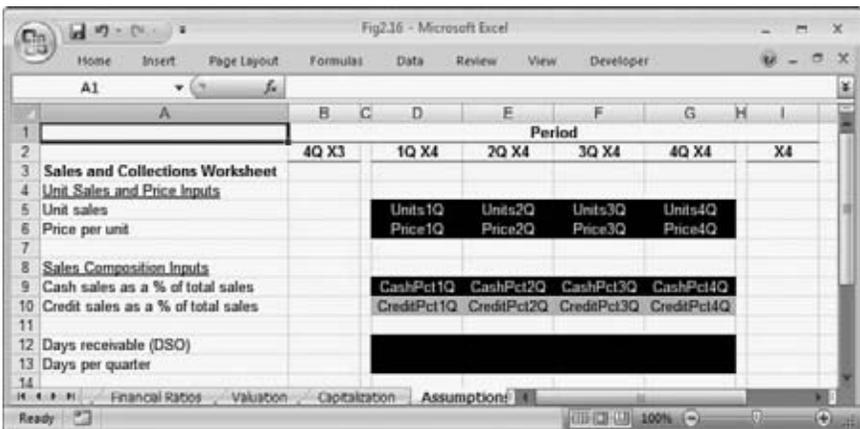
Figure 2.15 represents an alternative view (in which all of the equations are exposed) of the Cash Collections Budget worksheet. Figure 2.16 shows the names of the input and output cells in the Assumptions and Dashboard worksheet. Figure 2.17 shows the names for the input and output cells from the Cash Collections from Customers Budget worksheet.



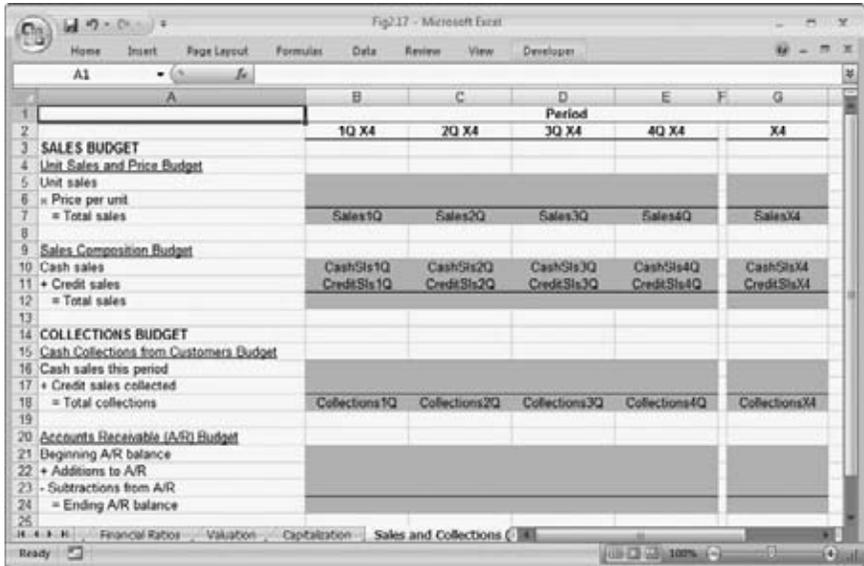
**FIGURE 2.14** Cash Collections Budget



**FIGURE 2.15** Alternative View of the Cash Collections Budget



**FIGURE 2.16** Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet



**FIGURE 2.17** Names of the Input and Output Cells in the Cash Collections from Customers Budget

## STEP 2D: ACCOUNTS RECEIVABLE BUDGET

Napavale sells its monitors on both cash and credit terms. The Accounts Receivable Budget tracks Napavale’s credit sales. As noted in Step 2C (Cash Collections from Customers Budget), credit sales collections are based on the assumptions underlying Napavale’s days receivable and days per accounting period. Figure 2.18 highlights the assumptions underlying the Accounts Receivable calculation (using the Assumptions and Dashboard worksheet).

Figure 2.19 shows the Accounts Receivable Budget. Note that I am assuming Napavale began the year X4 with no (zero) accounts receivable. Also note that I am assuming Napavale’s days receivable measure is always less than the days-per-quarter measure. While this is a simplifying assumption, as you will see below, the Accounts Receivable calculations are already detailed enough and I do not want to introduce excessive complications into the financial model at this point.

In the Accounts Receivable Budget calculations, note that the “Subtractions from Accounts Receivable” row in Figure 2.19 is always equal to the

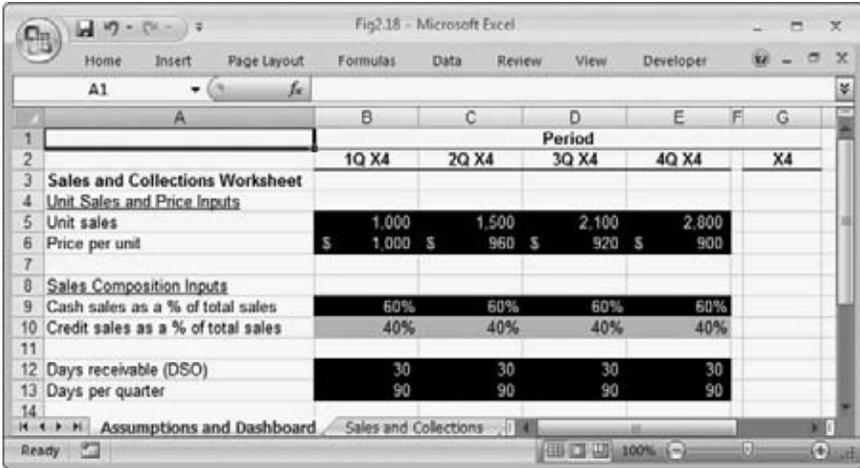


FIGURE 2.18 Assumptions Underlying the Accounts Receivable Calculation

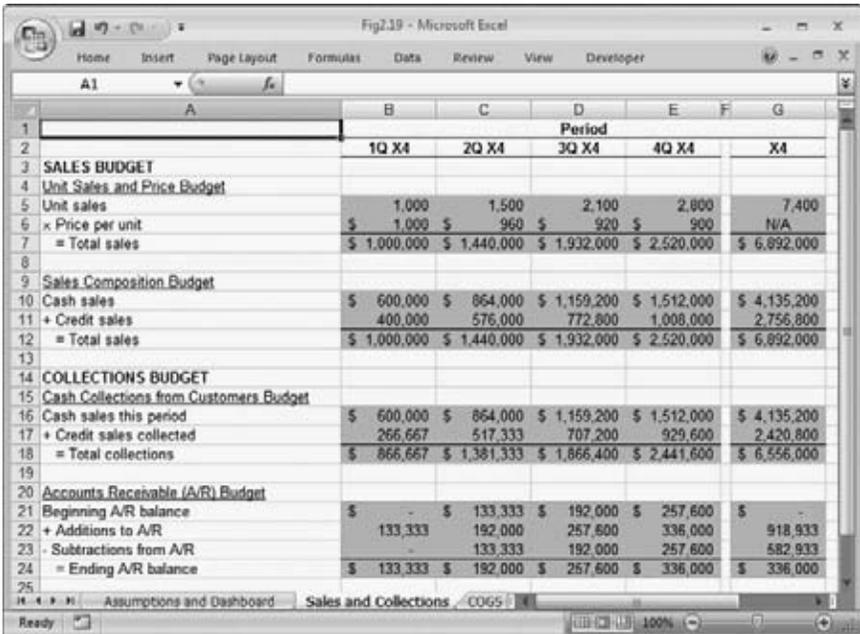
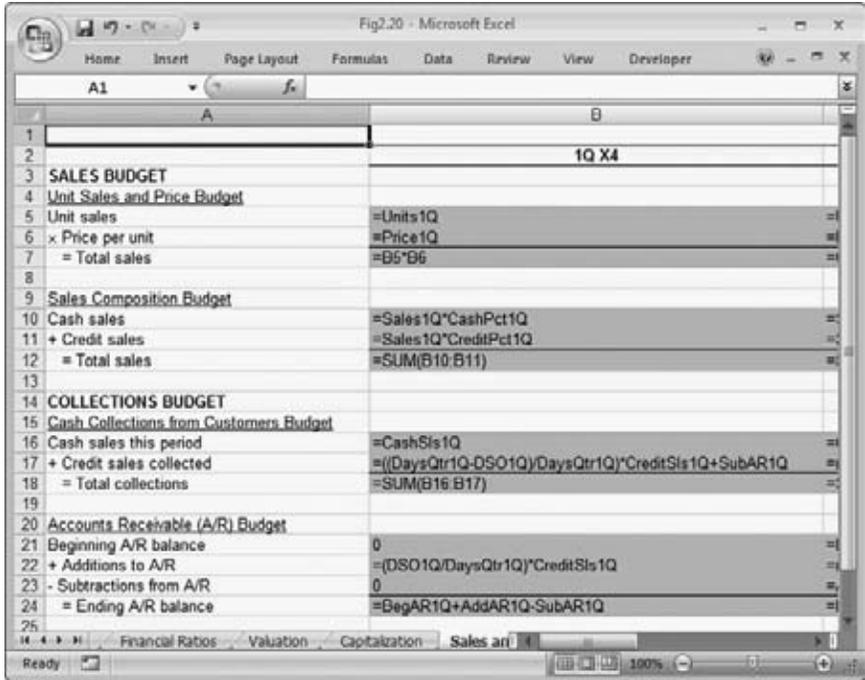


FIGURE 2.19 Accounts Receivable Budget



**FIGURE 2.20** Alternative View of the Accounts Receivable Calculations

“Additions to Accounts Receivable” row from the immediately preceding quarter. This is because, as noted above, I am assuming the days receivable metric is always less than the days-per-quarter measure. Assuming this is the case, all the Accounts Receivables added during a given period will be collected in the subsequent period.

Figure 2.20 offers an alternative view of the Accounts Receivable calculations from the Accounts Receivable Budget in which the calculations within the worksheet cells are exposed. Only a portion of the columns of the worksheet are shown due to the length of the formulas associated with the underlying calculations.

Given the complex nature of some of the calculations underlying the worksheet shown in Figure 2.20, I will walk through the logic behind the contents of two worksheet cells. The first cell that I will discuss, cell B17, calculates a value for “credit sales collected.” This represents the dollar value of credit sales collected during the 1Q X4 time period. The general

	Period					
	4Q X3	1Q X4	2Q X4	3Q X4	4Q X4	X4
1						
2						
3	<b>Sales and Collections Worksheet</b>					
4	<u>Unit Sales and Price Inputs</u>					
5	Unit sales	Units1Q	Units2Q	Units3Q	Units4Q	
6	Price per unit	Price1Q	Price2Q	Price3Q	Price4Q	
7						
8	<u>Sales Composition Inputs</u>					
9	Cash sales as a % of total sales	CashPct1Q	CashPct2Q	CashPct3Q	CashPct4Q	
10	Credit sales as a % of total sales	CreditPct1Q	CreditPct2Q	CreditPct3Q	CreditPct4Q	
11						
12	Days receivable (DSO)	DSO1Q	DSO2Q	DSO3Q	DSO4Q	
13	Days per quarter	DaysQtr1Q	DaysQtr2Q	DaysQtr3Q	DaysQtr4Q	
14						

**FIGURE 2.21** Names of the Input and Output Cells from the Assumptions and Dashboard Worksheet

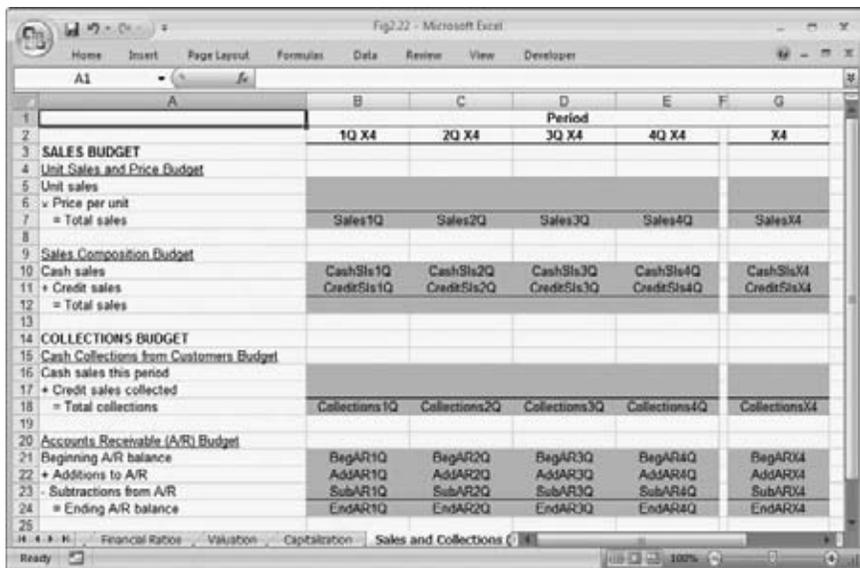
logic behind this calculation is as follows: credit sales collected for 1Q X4 are equal to: the percentage of credit sales from 1Q X4 that were collected in 1Q X4 + the subtractions from Napavale’s Accounts Receivable for 1Q X4.

Looking specifically at the formula underlying cell B17, note that the credit sales value for 1Q X4 is multiplied by:  $(\text{days per quarter} - \text{days receivable}) / (\text{days per quarter})$ . This formula will yield the dollar value of the credit sales that took place in 1Q X4 that were collected in 1Q X4. Also note in cell B17 that the result of this formula is added to the subtractions from Napavale’s Accounts Receivable balance.

The second cell, cell B22, calculates a value for “Additions to A/R.” This represents the dollar value of credit sales that took place in 1Q X4 that were not collected in 1Q X4. As the contents of cell B22 indicate, the credit sales value for 1Q X4 is multiplied by:  $(\text{days receivable}) / (\text{days per quarter})$ .

While these formulas may seem complex, their purpose is to divide up credit sales between different periods based on my assumptions regarding days receivable for Napavale. The approach that I am taking regarding Accounts Receivable and credit sales collections is one of many different ways to address the financial modeling of these topics; I am presenting this particular approach due to its utility and flexibility.

Figure 2.21 presents a view of the names of all of the input and output cells for the Accounts Receivable Budget in the Assumptions and Dashboard worksheet. Figure 2.22 offers a view of the input and output cells in the Accounts Receivable Budget itself.



**FIGURE 2.22** Names of the Input and Output Cells in the Accounts Receivable Budget

## QUESTIONS

Each of the questions for this chapter relates to a hypothetical company named Company XYZ. Company XYZ sells “tablet” Personal Computers (PCs) to the consumer market. As such, Company XYZ is a product-oriented (as opposed to a service-oriented) business. The questions will address the fiscal year X5 on a quarterly basis (four specific quarters, 1Q–4Q for the year X5).

The following questions will test your knowledge of the material covered in this chapter in an applied manner—specifically, you will be asked to build the schedules discussed in this chapter for Company XYZ.

1. Build the first section of an Assumptions and Dashboard worksheet for Company XYZ given the following projections for the four quarters in the year X5: (i) 10,500 PCs (units) will be sold in 1Q, 15,250 PCs will be sold in 2Q, 25,000 units will be sold in 3Q, and 31,200 units will be sold in 4Q, and (ii) the selling price per PC (unit) will be as follows for each quarter: \$3,100 in 1Q, \$3,050 in 2Q, \$3,000 in 3Q, and \$2,910 in 4Q.

2. Build a Unit Sales and Price Budget based on the Assumptions and Dashboard worksheet that you built in Question 1.
3. Update the Assumptions and Dashboard worksheet for Company XYZ from Question 1 given the following projections for the breakdown between cash sales (as a percentage of total sales) and credit sales (as a percentage of total sales): (i) 100 percent cash sales and 0 percent credit sales in 1Q, (ii) 90 percent cash sales and 10 percent credit sales in 2Q, (iii) 70 percent cash sales and 30 percent credit sales in 3Q, and (iv) 50 percent cash sales and 50 percent credit sales in 4Q.
4. Build a Sales Composition Budget based on the updated Assumptions and Dashboard worksheet from Question 3.
5. Update the Assumptions and Dashboard worksheet for Company XYZ from Question 3 given the following projections for the Company's Days Receivable, otherwise known as Days Sales Outstanding (DSO), and the number of days per quarter: (i) 20 days receivable and 90 days per quarter for 1Q, (ii) 25 days receivable and 90 days per quarter for 2Q, (iii) 30 days receivable and 90 days per quarter in 3Q, and (iv) 30 days receivable and 90 days per quarter in 4Q.
6. Build a Cash Collections from Customers Budget based on your work in Questions 1–5. Note that you should not be able to complete the “credit sales collected” line in this Budget until the Accounts Receivable Budget is built (in Question 7).
7. Build an Accounts Receivable Budget based on your work in Questions 1–6 and complete the Cash Collections from Customers Budget from Question 6. Assume that Company XYZ had (i) a beginning Accounts Receivable value of 0 (zero) and (ii) 0 (zero) subtractions from Accounts Receivable for 1Q X5.

## Operating Budget—Cost of Goods Sold, Inventory, and Purchases

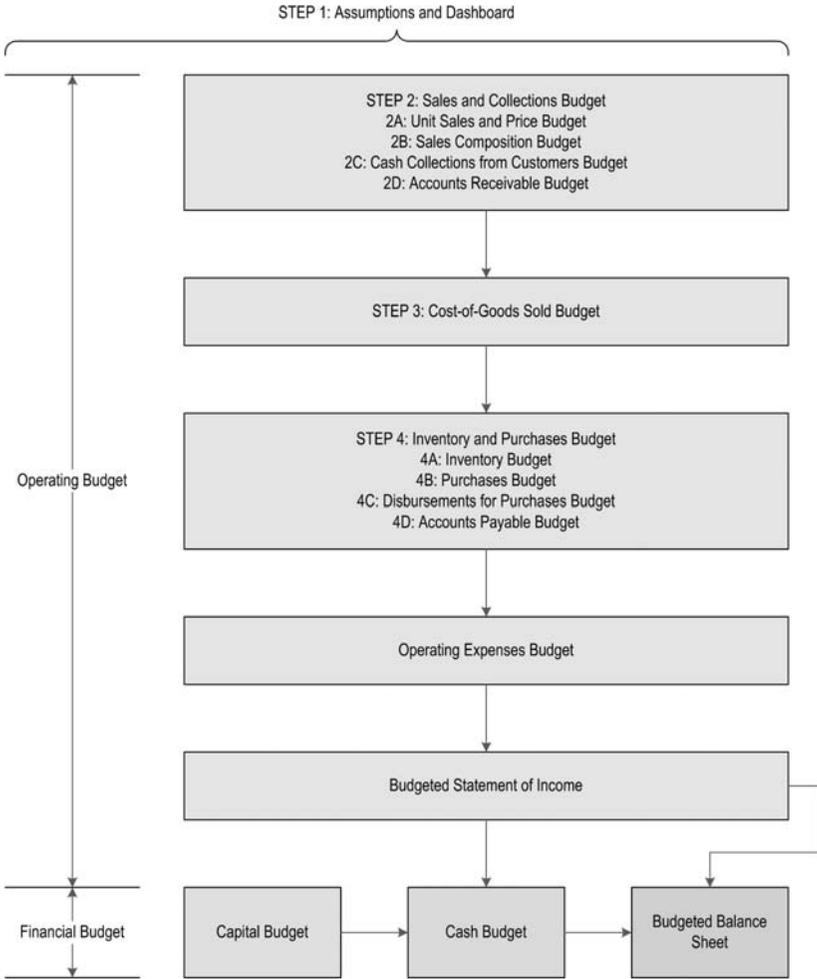
This chapter covers the first set of cost components for the Operating Budget, specifically the Cost-of-Goods-Sold Budget, the Inventory Budget, and the Purchases Budget. Whereas Chapter 2 addressed the sales components of the Operating Budget, this chapter, in conjunction with Chapters 4 and 5, addresses the budgets (in the Operating Budget) associated with planning for and purchasing the resources required to support a business's sales. Figure 3.1 highlights the separate Cost of Goods Sold, Inventory, and Purchases components of the Operating Budget in the context of the Master Budget.

As in Chapter 2, I use the Assumptions and Dashboard worksheet for Napavale to introduce and focus on important assumptions underlying Napavale's financial model. The remainder of this chapter will cover the steps involved in the continued construction of the Assumptions and Dashboard worksheet and the Cost of Goods Sold, Inventory, and Purchases elements of the Operating Budget.

### **STEP 3: COST-OF-GOODS-SOLD BUDGET**

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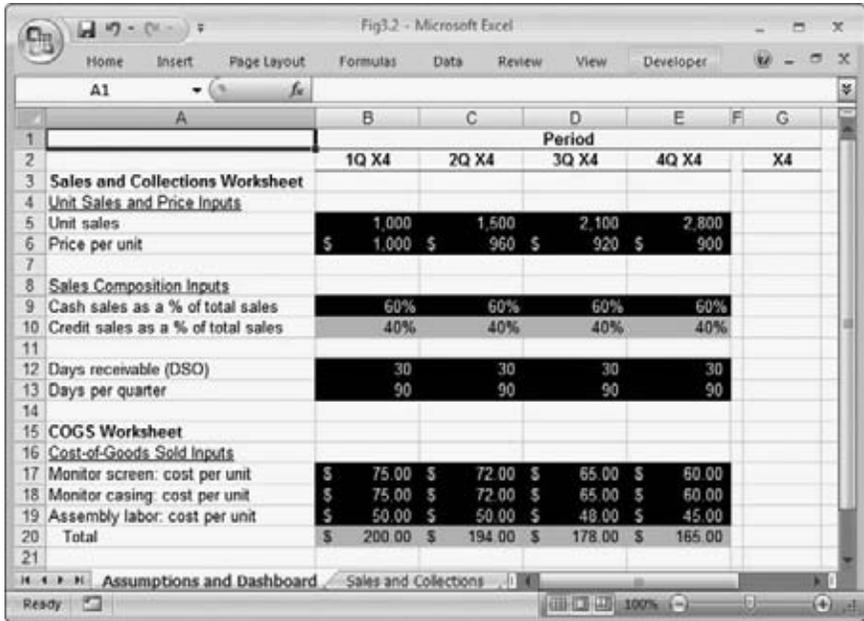
The first cost-oriented step in building Napavale's financial model, labeled Step 3 in Figure 3.1, is developing a Cost-of-Goods-Sold Budget. This budget is most applicable to product-oriented companies (as opposed to service-oriented companies), as service-oriented companies do not typically sell "goods." Some service-oriented companies refer to the cost of selling their service(s) as the "cost of revenues." In other cases, service-oriented companies may not even report a cost of revenues line item in their financial model.



**FIGURE 3.1** Cost of Goods Sold, Inventory, and Purchases Components of the Operating Budget in the Context of the Master Budget

As Napavale sells a specific product (a flat-screen computer monitor), I will be using a Cost-of-Goods-Sold Budget. If you are building a financial model for a service-oriented company, you may either identify and allocate the costs associated with service revenues to an account named “cost of revenues” or ignore this account altogether—it is up to you. It is essential, however, to account for all costs somewhere in your financial model.

Returning to my example company, Napavale has identified three specific cost components in the Cost-of-Goods-Sold Budget: monitor screen,



**FIGURE 3.2** Cost Components in the Cost-of-Goods-Sold Budget from the Assumptions and Dashboard Worksheet

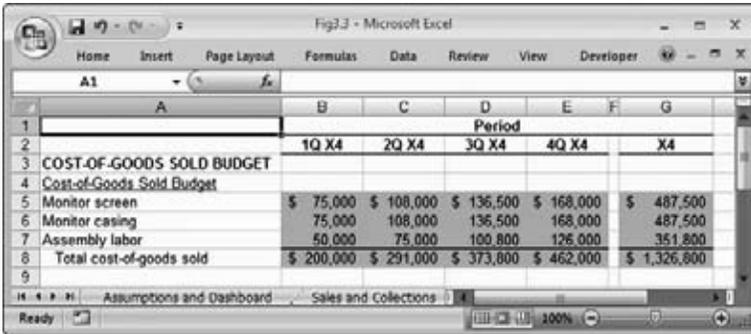
monitor casing, and assembly labor. Figure 3.2 highlights each of these components on a per-unit basis in the Assumptions and Dashboard worksheet.

Please note that the projected cost values for each of the three cost components decreases from quarter to quarter. As in many high-technology product-oriented companies such as Napavale, the cost of materials often drops quickly.

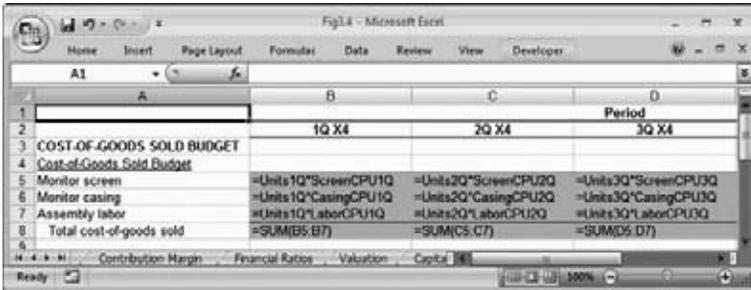
These assumptions regarding the cost components of Napavale’s cost of goods sold are fed directly from the Assumptions and Dashboard worksheet into the Cost-of-Goods-Sold Budget. The aggregate cost-of-goods-sold figure for each quarter is based on that quarter’s projected unit sales. Figure 3.3 presents the Cost-of-Goods-Sold Budget.

Figure 3.4 shows an alternative view of the Cost-of-Goods-Sold Budget in which the values and calculations underlying the worksheet cells are exposed.

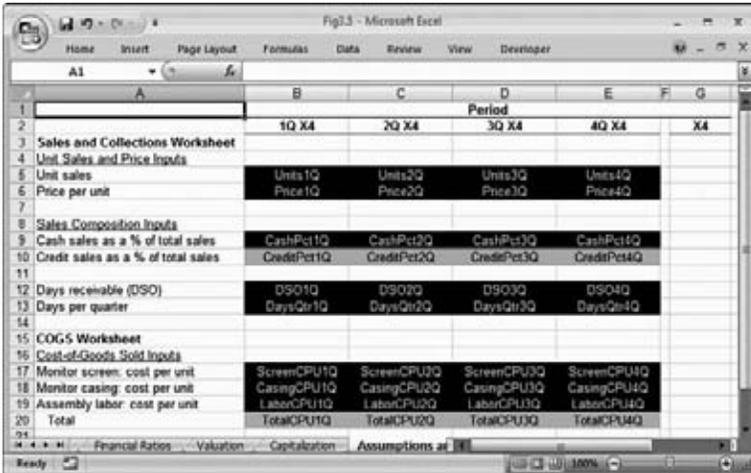
Figure 3.5 presents a view of the Assumptions and Dashboard worksheet in which the names of the input and output cells are highlighted. I have used the acronym “CPU” in several of the names in this worksheet—CPU stands for “cost per unit” in this context.



**FIGURE 3.3** Cost-of-Goods-Sold Budget



**FIGURE 3.4** Alternative View of the Cost-of-Goods-Sold Budget



**FIGURE 3.5** Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>COST-OF-GOODS SOLD BUDGET</b>					
Cost-of-Goods Sold Budget					
Monitor screen	Screen1Q	Screen2Q	Screen3Q	Screen4Q	ScreenX4
Monitor casing	Casing1Q	Casing2Q	Casing3Q	Casing4Q	CasingX4
Assembly labor	Labor1Q	Labor2Q	Labor3Q	Labor4Q	LaborX4
Total cost-of-goods sold	COGS1Q	COGS2Q	COGS3Q	COGS4Q	COGSX4

**FIGURE 3.6** Names of the Input and Output Cells in the Cost-of-Goods-Sold Budget

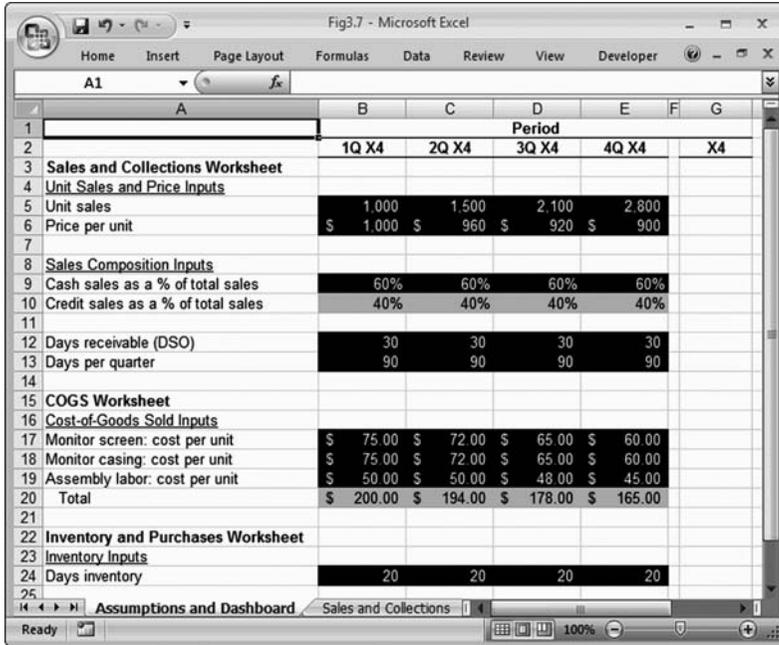
Figure 3.6 offers a view of the Cost-of-Goods-Sold Budget in which the names of the input and output cells are shown. The acronym “COGS” is used in several of these names to stand for “Cost of Goods Sold.”

### **STEP 4A: INVENTORY BUDGET**

The Inventory Budget tracks Napavale’s desired ending inventory for each of the four quarters covered in the financial model. Inventory represents goods that are, or will be, available for sale. Holding inventory has direct financial implications (specifically, it often costs money to purchase and hold inventory), so it is important to budget inventory levels appropriately. The budgeting process for inventory is often a balancing act, as a business does not want to hold too much inventory (because this often costs money), but it does want to have goods ready to sell and deliver when a customer makes a purchase.

In my financial model, I am basing a specific quarter’s desired ending inventory on Napavale’s “desired days inventory.” Days inventory is defined as a company’s average inventory level for a period of time (such as a quarter) divided by a day’s worth of cost of goods sold for that same period of time.

For the sake of simplicity, I am going to use the ending inventory value for a given time period (as opposed to the average inventory value) for Napavale’s financial model. In Napavale’s case, for a given quarter, I will use the projected cost of goods sold for the subsequent quarter and the desired days inventory for that given quarter as the basis for my calculation of Napavale’s “desired ending inventory” in the Inventory Budget.



**FIGURE 3.7** Assumptions for Desired Days Inventory in the Assumptions and Dashboard Worksheet

Figure 3.7 highlights my assumptions for Napavale’s desired days inventory in the Assumptions and Dashboard worksheet. Figure 3.8 below presents a view of the Inventory Budget itself.

Note the following assumption underlying Napavale’s financial model: The desired ending inventory for 4Q X4 is equal to the desired ending inventory for 3Q X4. As I am building a financial model for only year X4, I will not address assumptions related to year X5. As such, this assumption represents a straightforward solution to the problem of including any information related to year X5.

Figure 3.9 offers an alternative view of the Inventory Budget in which the values and calculations underlying the worksheet are exposed. Only a portion of the columns of the worksheet are shown due to the length of the formulas associated with the underlying calculations.

The names of the input and output cells in the Assumptions and Dashboard worksheet are highlighted in Figure 3.10. Figure 3.11 offers a view of the names of the input and output cells in the Inventory Budget.

For the sake of reference, the cost of goods sold projections presented in the Inventory Budget are referenced directly from the Cost-of-Goods-Sold Budget.

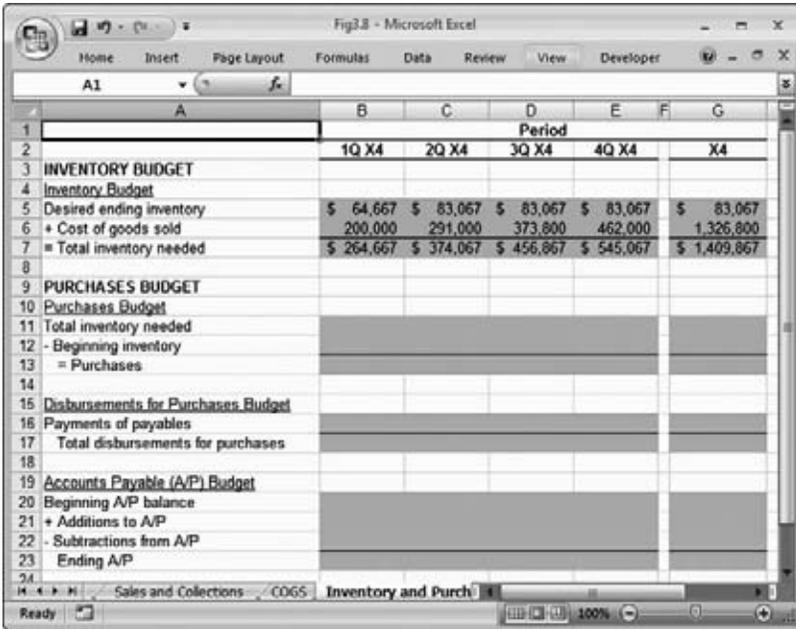


FIGURE 3.8 Inventory Budget

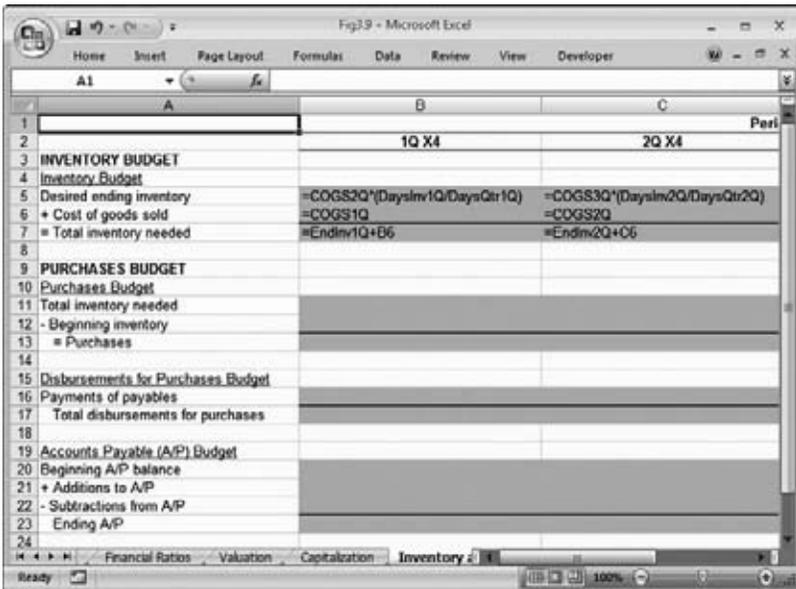
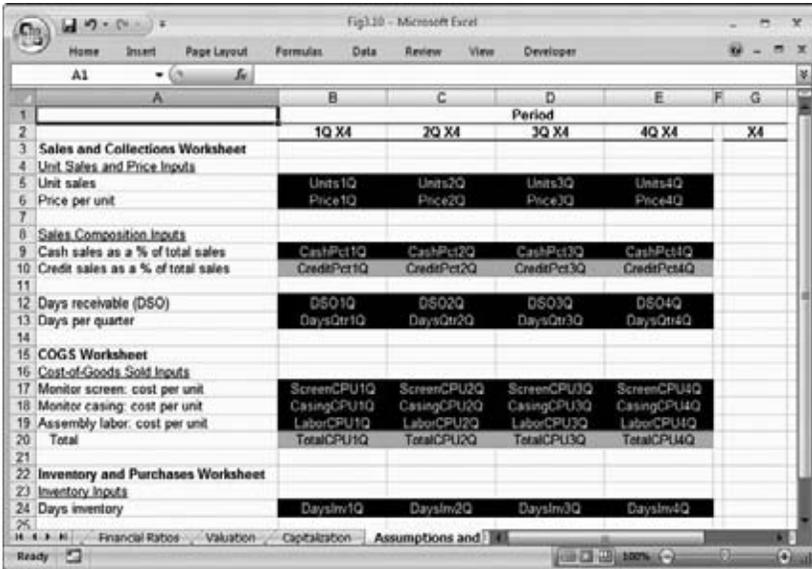
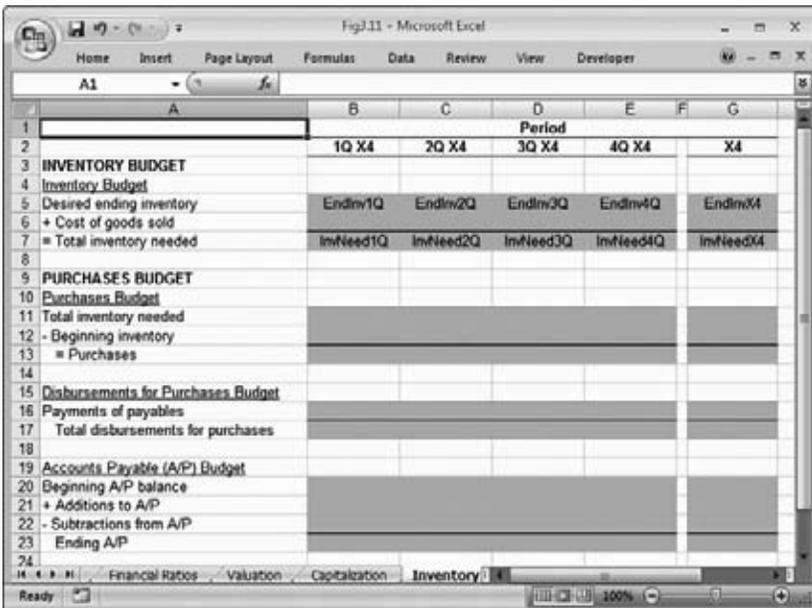


FIGURE 3.9 Alternative View of the Inventory Budget



**FIGURE 3.10** Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet



**FIGURE 3.11** Names of the Input and Output Cells in the Inventory Budget

### STEP 4B: PURCHASES BUDGET

The Purchases Budget, which deals with goods that will eventually be sold to customers, is based on Napavale’s desired ending inventory, cost of goods sold, and beginning inventory for each quarter. The specific budgeted purchases for a time period may be calculated using the following formula: Budgeted purchases = desired ending inventory + cost of goods sold – beginning inventory.

I have already calculated all of the input variables in this equation (desired ending inventory and cost of goods sold) except for Napavale’s beginning inventory for each period, so the Purchases Budget represents a straightforward calculation. Furthermore, as Napavale’s beginning inventory level for each accounting period is the result of a calculation, there are no unique assumptions underlying the Purchases Budget (beyond those contained in the previous budgeted steps). As such, I will not present another view of the Assumptions and Dashboard worksheet at this point. Figure 3.12 presents a view of the Purchases Budget. Figure 3.13 offers an alternative

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>INVENTORY BUDGET</b>					
<i>Inventory Budget</i>					
Desired ending inventory	\$ 64,667	\$ 83,067	\$ 102,667	\$ 102,667	\$ 102,667
+ Cost of goods sold	200,000	291,000	373,800	462,000	1,326,800
= Total inventory needed	\$ 264,667	\$ 374,067	\$ 476,467	\$ 564,667	\$ 1,429,467
<b>PURCHASES BUDGET</b>					
<i>Purchases Budget</i>					
Total inventory needed	\$ 264,667	\$ 374,067	\$ 476,467	\$ 564,667	N/A
- Beginning inventory	-	64,667	83,067	102,667	-
= Purchases	\$ 264,667	\$ 309,400	\$ 393,400	\$ 462,000	N/A
<b>Disbursements for Purchases Budget</b>					
<i>Disbursements for Purchases Budget</i>					
Payments of payables					
Total disbursements for purchases					
<b>Accounts Payable (A/P) Budget</b>					
<i>Accounts Payable (A/P) Budget</i>					
Beginning A/P balance					
+ Additions to A/P					
- Subtractions from A/P					
Ending A/P					

FIGURE 3.12 Purchases Budget

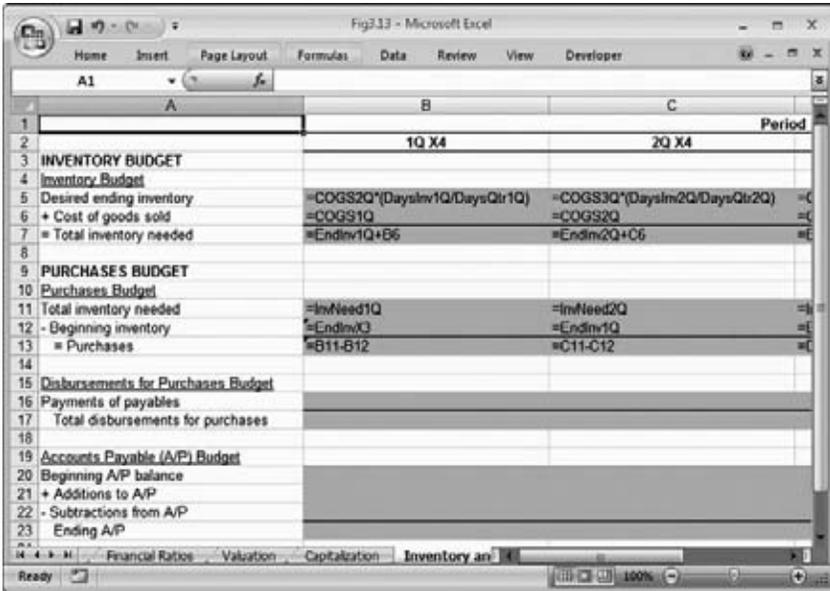


FIGURE 3.13 Alternative View of the Purchases Budget

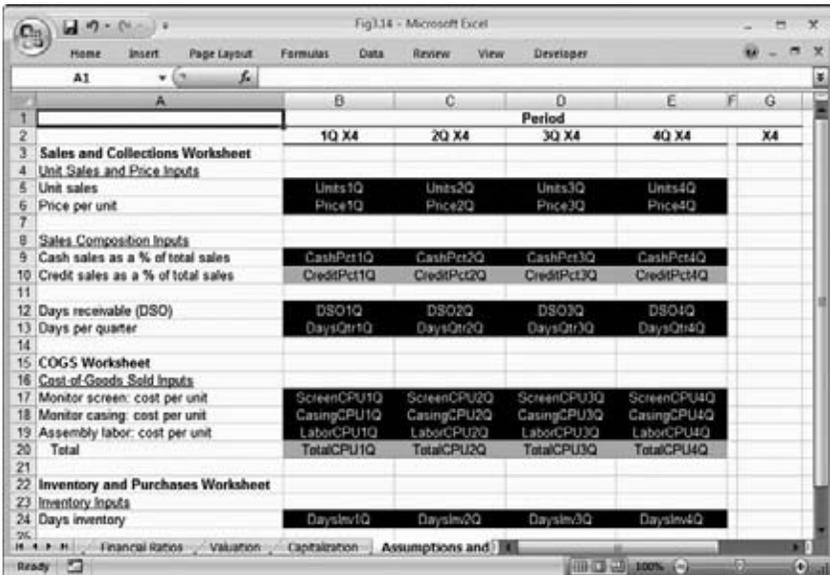


FIGURE 3.14 Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet



**FIGURE 3.15** Names of the Input and Output Cells in the Purchases Budget

view of the Purchases Budget in which the values and formulas contained in the worksheet cells are exposed and visible.

The names of the input and output cells in the Assumptions and Dashboard worksheet are shown in Figure 3.14. Figure 3.15 offers a view of the names of the input and output cells in the Purchases Budget itself.

### **STEP 4C: DISBURSEMENTS FOR PURCHASES BUDGET**

The Disbursements for Purchases Budget reconciles the accrual values from Step 4B to cash figures. This schedule ties into the creation of the Cash Budget, which is covered in Chapter 6. This section of Napavale’s financial model is based on two assumptions: the number of days per time period and the number of days payable.

Days payable is a financial metric that indicates how many days payables are “outstanding” or unpaid. A company’s days payable value is calculated as: the average Accounts Payable balance for a time period/the dollar value of one day’s worth of cost of goods sold. For the sake of simplicity, I will be using ending Accounts Payable values for a given time period (as opposed

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Sales and Collections Worksheet</b>					
<b>Unit Sales and Price Inputs</b>					
Unit sales	1,000	1,500	2,100	2,800	
Price per unit	\$ 1,000	\$ 960	\$ 920	\$ 900	
<b>Sales Composition Inputs</b>					
Cash sales as a % of total sales	60%	60%	60%	60%	
Credit sales as a % of total sales	40%	40%	40%	40%	
<b>COGS Worksheet</b>					
<b>Cost-of-Goods Sold Inputs</b>					
Monitor screen: cost per unit	\$ 75.00	\$ 72.00	\$ 65.00	\$ 60.00	
Monitor casing: cost per unit	\$ 75.00	\$ 72.00	\$ 65.00	\$ 60.00	
Assembly labor: cost per unit	\$ 50.00	\$ 50.00	\$ 48.00	\$ 45.00	
<b>Total</b>	<b>\$ 200.00</b>	<b>\$ 194.00</b>	<b>\$ 178.00</b>	<b>\$ 165.00</b>	
<b>Inventory and Purchases Worksheet</b>					
<b>Inventory Inputs</b>					
Days inventory	20	20	20	20	
<b>Disbursements for Purchases Inputs</b>					
Days payable	30	30	30	30	

**FIGURE 3.16** Assumptions in the Assumptions and Dashboard Worksheet

to average Accounts Payable values) in Napavale’s financial model. Figure 3.16 illustrates these assumptions from the Assumptions and Dashboard worksheet.

Figure 3.17 presents a view of the Disbursements for Purchases Budget worksheet. Note that the “payment of payables” line in the disbursements for purchases is not completed. This is because the payment of payables is driven off of accounts payable calculations, which are shown in the next step (Step 4D).

An alternative view of the Disbursements for Purchases Budget, in which the values and calculations underlying the worksheet cells are exposed and visible, is presented in Figure 3.18. Only a portion of the columns of the worksheet are shown due to the length of the formulas associated with the underlying calculations.

Figure 3.19 presents a view of the names of the input and output cells in the Assumptions and Dashboard worksheet. The names of the input and output cells in the Disbursements for Purchases Budget are shown in Figure 3.20.

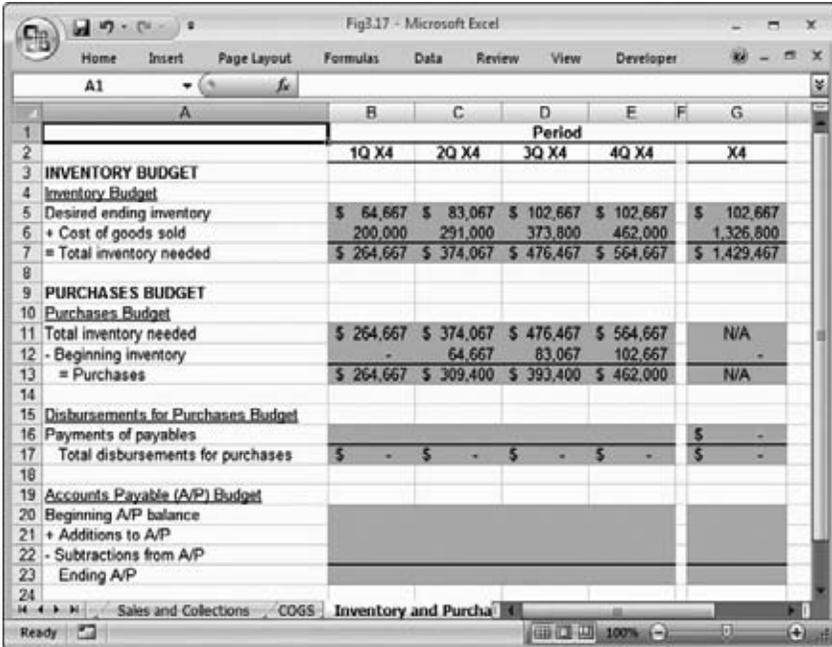


FIGURE 3.17 Disbursements for Purchases Budget

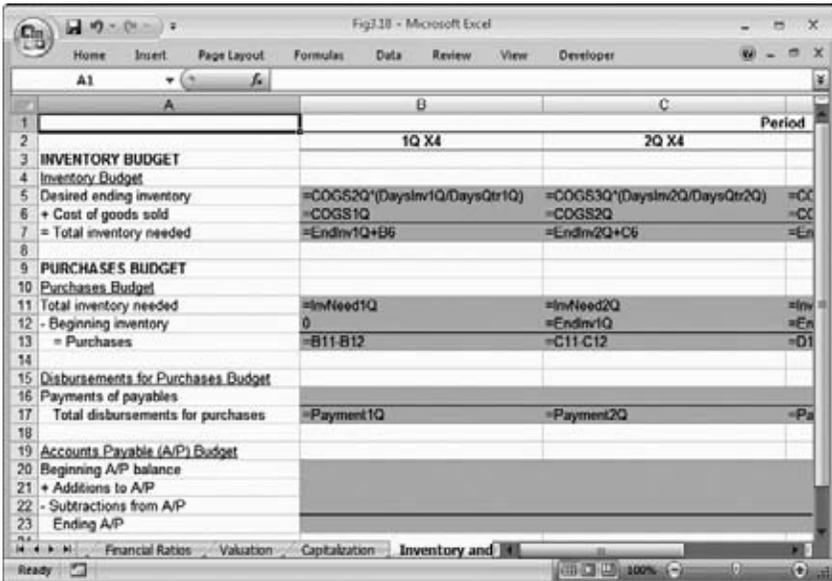
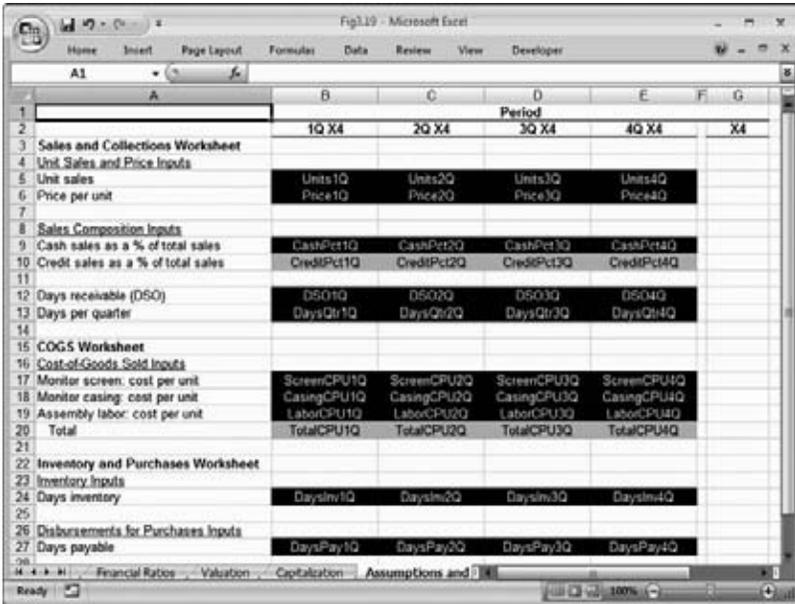
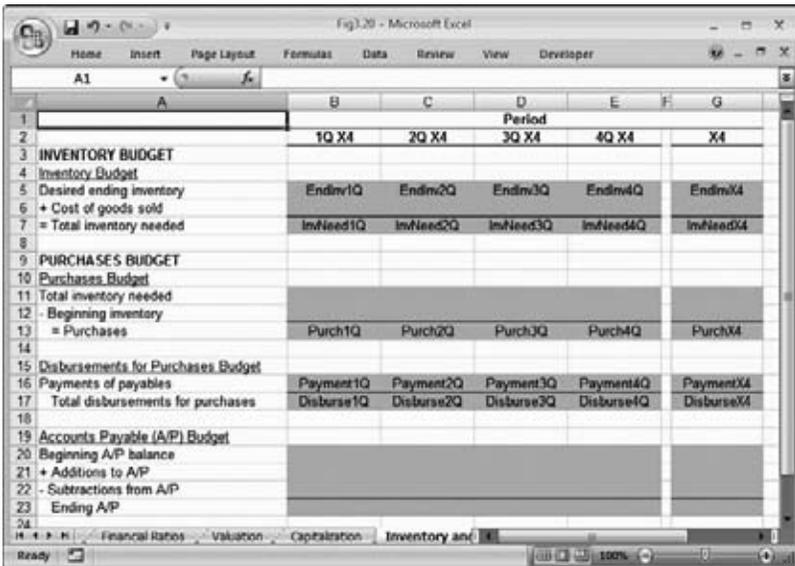


FIGURE 3.18 Alternative View of the Disbursements for Purchases Budget



**FIGURE 3.19** Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet



**FIGURE 3.20** Names of the Input and Output Cells in the Disbursements for Purchases Budget

### STEP 4D: ACCOUNTS PAYABLE BUDGET

Napavale pays for its inventory on both cash and credit terms. The Accounts Payable Budget tracks Napavale’s credit purchases. As noted in Step 4C (Disbursements for Purchases Budget), payments of Accounts Payable are based on the assumptions underlying Napavale’s days payable and days per accounting period. While there are no additional assumptions beyond those already mentioned associated with the Accounts Payable Budget, Figure 3.21 highlights the assumptions underlying the Accounts Payable calculation (using the Assumptions and Dashboard worksheet) for the sake of reference.

Figure 3.22 shows the Accounts Payable Budget worksheet. Note that I am assuming Napavale began the year X4 with no (zero) accounts payable. Also note that I am assuming Napavale’s days payable measure is always less than the days-per-quarter measure. While this is a simplifying assumption, the Accounts Payable calculations are already detailed enough (as you will

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Sales and Collections Worksheet</b>					
<b>Unit Sales and Price Inputs</b>					
Unit sales	1,000	1,500	2,100	2,800	
Price per unit	\$ 1,000	\$ 960	\$ 920	\$ 900	
<b>Sales Composition Inputs</b>					
Cash sales as a % of total sales	60%	60%	60%	60%	
Credit sales as a % of total sales	40%	40%	40%	40%	
Days receivable (DSO)	30	30	30	30	
Days per quarter	90	90	90	90	
<b>COGS Worksheet</b>					
<b>Cost-of-Goods Sold Inputs</b>					
Monitor screen: cost per unit	\$ 75.00	\$ 72.00	\$ 65.00	\$ 60.00	
Monitor casing: cost per unit	\$ 75.00	\$ 72.00	\$ 65.00	\$ 60.00	
Assembly labor: cost per unit	\$ 50.00	\$ 50.00	\$ 48.00	\$ 45.00	
Total	\$ 200.00	\$ 194.00	\$ 178.00	\$ 165.00	
<b>Inventory and Purchases Worksheet</b>					
<b>Inventory Inputs</b>					
Days inventory	20	20	20	20	
<b>Disbursements for Purchases Inputs</b>					
Days payable	30	30	30	30	

FIGURE 3.21 Assumptions Underlying the Accounts Payable Calculation

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>INVENTORY BUDGET</b>					
<i>Inventory Budget</i>					
Desired ending inventory	\$ 64,667	\$ 83,067	\$ 102,667	\$ 102,667	\$ 102,667
+ Cost of goods sold	200,000	291,000	373,800	462,000	1,326,800
= Total inventory needed	\$ 264,667	\$ 374,067	\$ 476,467	\$ 564,667	\$ 1,429,467
<b>PURCHASES BUDGET</b>					
<i>Purchases Budget</i>					
Total inventory needed	\$ 264,667	\$ 374,067	\$ 476,467	\$ 564,667	N/A
- Beginning inventory	-	64,667	83,067	102,667	-
= Purchases	\$ 264,667	\$ 309,400	\$ 393,400	\$ 462,000	N/A
<b>Disbursements for Purchases Budget</b>					
Payments of payables	\$ 176,444	\$ 294,489	\$ 365,400	\$ 439,133	\$ 1,275,467
Total disbursements for purchases	\$ 176,444	\$ 294,489	\$ 365,400	\$ 439,133	\$ 1,275,467
<b>Accounts Payable (A/P) Budget</b>					
Beginning A/P balance	\$ -	\$ 88,222	\$ 103,133	\$ 131,133	\$ -
+ Additions to A/P	88,222	103,133	131,133	154,000	476,489
- Subtractions from A/P	-	88,222	103,133	131,133	322,489
Ending A/P	\$ 88,222	\$ 103,133	\$ 131,133	\$ 154,000	\$ 154,000

**FIGURE 3.22** Accounts Payable Budget

see below) and I do not want to introduce excessive complications to the model at this point.

Figure 3.23 offers an alternative view of the Accounts Payable calculations worksheet in which the calculations within the worksheet cells are exposed. Only a portion of the columns of the worksheet are shown due to the length of the formulas associated with the underlying calculations.

Given the complex nature of some of the calculations underlying the worksheet shown in Figure 3.23, I will walk through the logic behind the contents of two worksheet cells. The first cell that I will discuss, cell B16, calculates a value for “payment of payables.” This represents the dollar value of purchases made during the 1Q X4 period that were paid for during 1Q X4. The general logic behind this calculation is as follows: The payment for purchases made during 1Q X4 is equal to: the percentage of purchases from 1Q X4 that were paid for in 1Q X4 + the subtractions from Napavale’s Accounts Payable.

Looking specifically at the formula underlying cell B16, note that the purchases value for 1Q X4 is multiplied by:  $(\text{days per quarter} - \text{days payable}) / (\text{days per quarter})$ . This formula will yield the dollar value of the purchases that took place in 1Q X4 that were paid for in 1Q X4. Also note

	A	B
1		
2		1Q X4
3	<b>INVENTORY BUDGET</b>	
4	Inventory Budget	
5	Desired ending inventory	=COGS2Q*(DaysInv1Q/DaysQtr1Q)
6	+ Cost of goods sold	=COGS1Q
7	= Total inventory needed	=EndInv1Q+B6
8		
9	<b>PURCHASES BUDGET</b>	
10	Purchases Budget	
11	Total inventory needed	=InvNeed1Q
12	- Beginning inventory	0
13	= Purchases	=B11-B12
14		
15	<b>Disbursements for Purchases Budget</b>	
16	Payments of payables	=(DaysQtr1Q-DaysPay1Q)/DaysQtr1Q)*Purch1Q+SubAP1Q
17	Total disbursements for purchases	=Payment1Q
18		
19	<b>Accounts Payable (A/P) Budget</b>	
20	Beginning A/P balance	0
21	+ Additions to A/P	=(DaysPay1Q/DaysQtr1Q)*Purch1Q
22	- Subtractions from A/P	0
23	Ending A/P	=BegAP1Q+AddAP1Q-SubAP1Q
24		

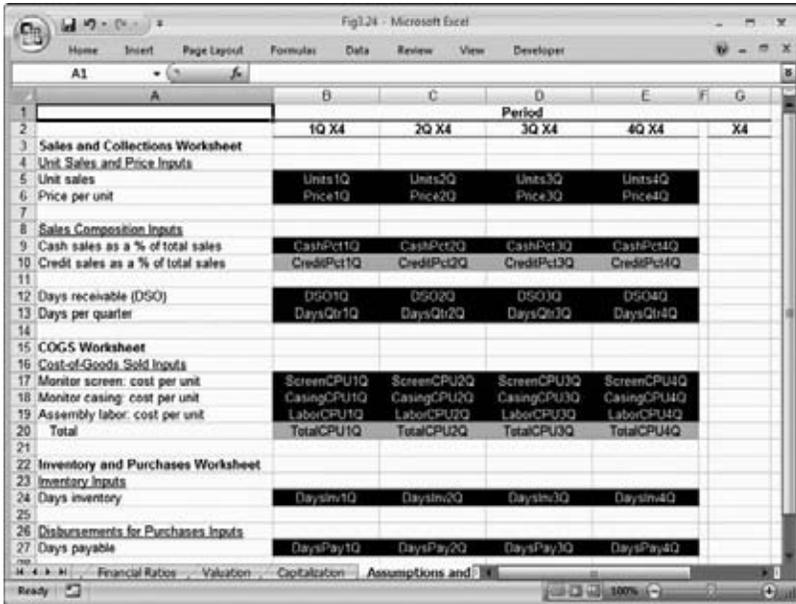
**FIGURE 3.23** Alternative View of the Accounts Payable Budget Worksheet

in cell B16 that the result of this formula is added to the subtractions from Napavale’s Accounts Payable balance.

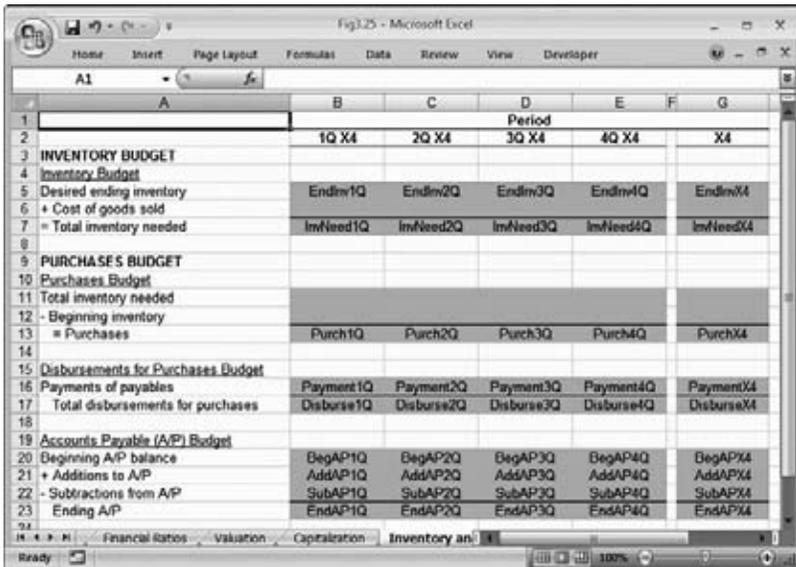
The second cell that I will discuss, cell B21, calculates a value for “additions to A/P.” This represents the dollar value of purchases that took place in 1Q X4 that were not paid for in 1Q X4. As the contents of cell B21 indicate, the purchases value for 1Q X4 is multiplied by: (days payable)/(days per quarter).

While these formulas may seem complex, their purpose is to divide up purchases between different periods based on my assumptions regarding days payable for Napavale. The approach that I am taking regarding Accounts Payable is one of many different ways to address the financial modeling of these topics—I am presenting this particular approach due to its utility and flexibility. Note that my approach for projecting Accounts Payable is similar to my approach for projecting Accounts Receivable, covered in Chapter 2.

The names of the input and output cells in the Assumptions and Dashboard worksheet are presented in Figure 3.24. Figure 3.25 offers a view of the names of the input and output cells in the Accounts Payable Budget.



**FIGURE 3.24** Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet



**FIGURE 3.25** Names of the Input and Output Cells in the Accounts Payable Budget

## QUESTIONS

Each of the questions for this chapter relates to a hypothetical company named Company ABC. Company ABC sells functional desks to the business market. As such, Company ABC is a product-oriented (as opposed to a service-oriented) business. The questions for this chapter will address fiscal year X6 on a quarterly basis (four specific quarters, 1Q–4Q for the year X6).

The following questions will test your knowledge of the material covered in this chapter in an applied manner—specifically, you will be asked to build the schedules discussed in this chapter for Company ABC.

To prepare you for this chapter’s questions, two figures provide background information related to Company ABC’s operations. Figure Q3.1 offers a view of Company ABC’s Assumptions and Dashboard worksheet. Note that there are three cost-of-goods-sold components for Company ABC’s desks: (1) desk top, (2) desk body, and (3) assembly and labor. Figure Q3.2 presents a view of Company ABC’s Unit Sales and Price Budget,

	Period				
	1Q X6	2Q X6	3Q X6	4Q X6	X6
<b>Sales and Collections Worksheet</b>					
<b>Unit Sales and Price Inputs</b>					
Unit sales	2,000	2,075	2,110	2,275	
Price per unit	\$ 2,000	\$ 2,000	\$ 1,950	\$ 1,985	
<b>Sales Composition Inputs</b>					
Cash sales as a % of total sales	30%	32%	37%	39%	
Credit sales as a % of total sales	70%	68%	63%	61%	
Days receivable (DSO)	35	37	39	39	
Days per quarter	90	90	90	90	
<b>COGS Worksheet</b>					
<b>Cost-of-Goods Sold Inputs</b>					
Desk top: cost per unit	\$ 75.00	\$ 72.00	\$ 65.00	\$ 60.00	
Desk body: cost per unit	\$ 75.00	\$ 72.00	\$ 65.00	\$ 60.00	
Assembly labor: cost per unit	\$ 50.00	\$ 50.00	\$ 48.00	\$ 45.00	
Total	\$ 200.00	\$ 194.00	\$ 178.00	\$ 165.00	
<b>Inventory and Purchases Worksheet</b>					
<b>Inventory Inputs</b>					
Days inventory	15	17	19	20	
<b>Disbursements for Purchases Inputs</b>					
Days payable	24	32	31	32	

**FIGURE Q3.1** Company ABC’s Assumptions and Dashboard Worksheet

	Period				
	1Q X6	2Q X6	3Q X6	4Q X6	X6
<b>SALES BUDGET</b>					
<b>Unit Sales and Price Budget</b>					
Unit sales	2,000	2,075	2,110	2,275	8,460
× Price per unit	\$ 2,000	\$ 2,050	\$ 2,100	\$ 2,200	N/A
= Total sales	\$ 4,000,000	\$ 4,253,750	\$ 4,431,000	\$ 5,005,000	\$ 17,689,750
<b>Sales Composition Budget</b>					
Cash sales	\$ 1,200,000	\$ 1,361,200	\$ 1,639,470	\$ 1,951,950	\$ 6,152,620
+ Credit sales	2,800,000	2,892,550	2,791,530	3,053,050	11,537,130
= Total sales	\$ 4,000,000	\$ 4,253,750	\$ 4,431,000	\$ 5,005,000	\$ 17,689,750
<b>COLLECTIONS BUDGET</b>					
<b>Cash Collections from Customers Budget</b>					
Cash sales this period	\$ 1,200,000	\$ 1,361,200	\$ 1,639,470	\$ 1,951,950	\$ 6,152,620
+ Credit sales collected	1,711,111	2,792,279	2,771,026	2,939,725	10,214,142
= Total collections	\$ 2,911,111	\$ 4,153,479	\$ 4,410,496	\$ 4,891,675	\$ 16,366,762
<b>Accounts Receivable (A/R) Budget</b>					
Beginning A/R balance	\$ -	\$ 1,088,889	\$ 1,189,159	\$ 1,209,663	\$ -
+ Additions to A/R	1,088,889	1,189,159	1,209,663	1,322,988	4,810,700
- Subtractions from A/R	-	1,088,889	1,189,159	1,209,663	3,487,711
= Ending A/R balance	\$ 1,088,889	\$ 1,189,159	\$ 1,209,663	\$ 1,322,988	\$ 1,322,988

**FIGURE Q3.2** Company ABC's Unit Sales and Price Budget

Sales Composition Budget, Cash Collections from Customers Budget, and Accounts Receivable Budget.

1. Given the information regarding Company ABC, build a Cost-of-Goods-Sold Budget for Company ABC.
2. Based on the information presented and the Cost-of-Goods-Sold Budget that you built in Question 1, build an Inventory Budget for Company ABC. Use the days inventory approach outlined in this chapter and use the assumptions regarding days inventory shown in Figure Q3.1. Furthermore, assume that Company ABC's desired ending inventory for 4Q X6 is equal to the desired ending inventory for 3Q X6.
3. Build a Purchases Budget for Company ABC based on your work in Questions 1 and 2.
4. Build an Accounts Payable Budget for Company ABC based upon the Assumptions and Dashboard worksheet and your work in Questions 1–3. Assume that Company ABC started 1Q X6 with a beginning A/P balance of 0 (zero).
5. Based on your work in Questions 1–4 and the Assumptions and Dashboard worksheet, build a Disbursements for Purchases Budget for Company ABC.

# Operating Budget— Operating Expenses

**T**his chapter covers the second set of cost components for the Operating Budget, specifically the Operating Expenses Budget. Operating expenses represent those expenses required to run, or operate, a business. These expenses typically include items such as salaries, research and development, and rent. Specific operating expenses vary from business to business and I will cover the operating expenses incurred by Napavale in this chapter. Figure 4.1 highlights the separate operating expense components of the Operating Budget in the context of the Master Budget.

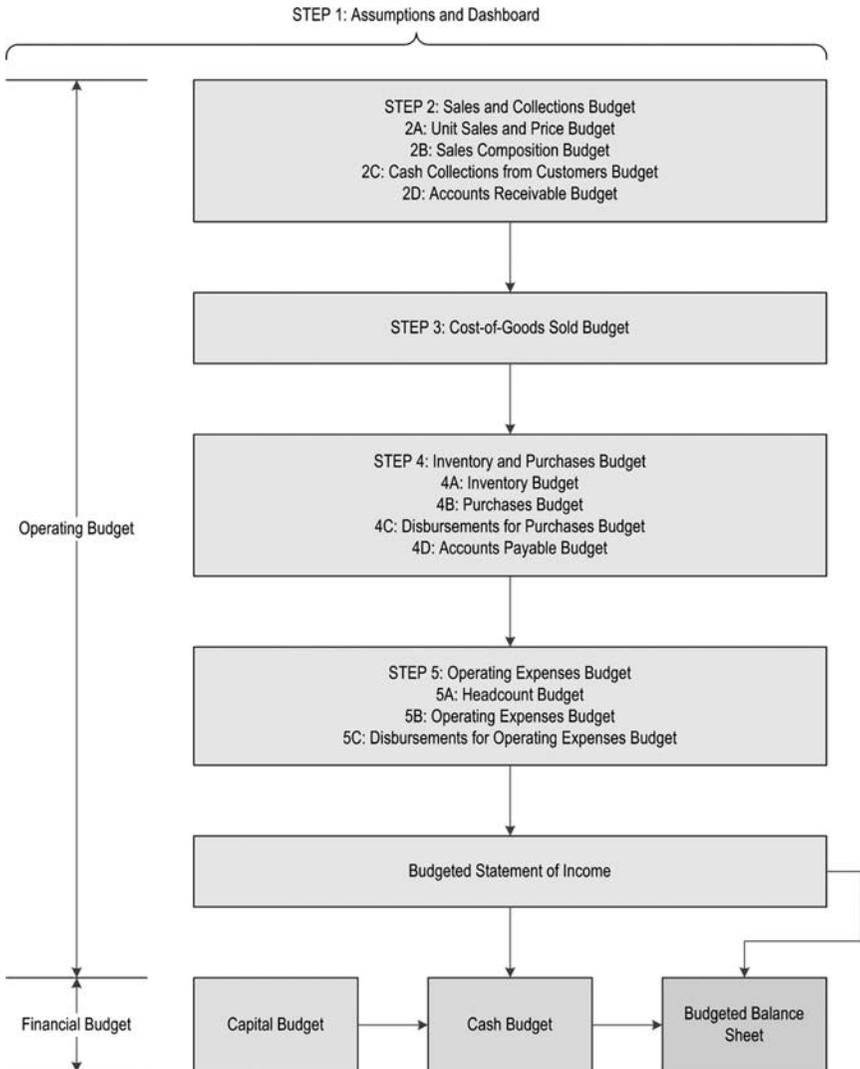
Please note that operating expenses are different from the expenses listed in the Purchases budget from Step 4B in Chapter 3. It is helpful to divide operating expenses into two categories: variable and fixed. Variable operating expenses are those expenses that are directly influenced by other drivers, such as sales volume. Fixed operating expenses are those expenses that are not affected by drivers such as sales volume. I cover the concept of fixed versus variable expenses in Chapter 11.

As in Chapters 2 and 3, I will be using the Assumptions and Dashboard worksheet for Napavale to introduce and focus on important assumptions underlying Napavale’s financial model. The remainder of this chapter will cover the steps involved in the continued construction of the Assumptions and Dashboard worksheet and the operating expense elements of the Operating Budget.

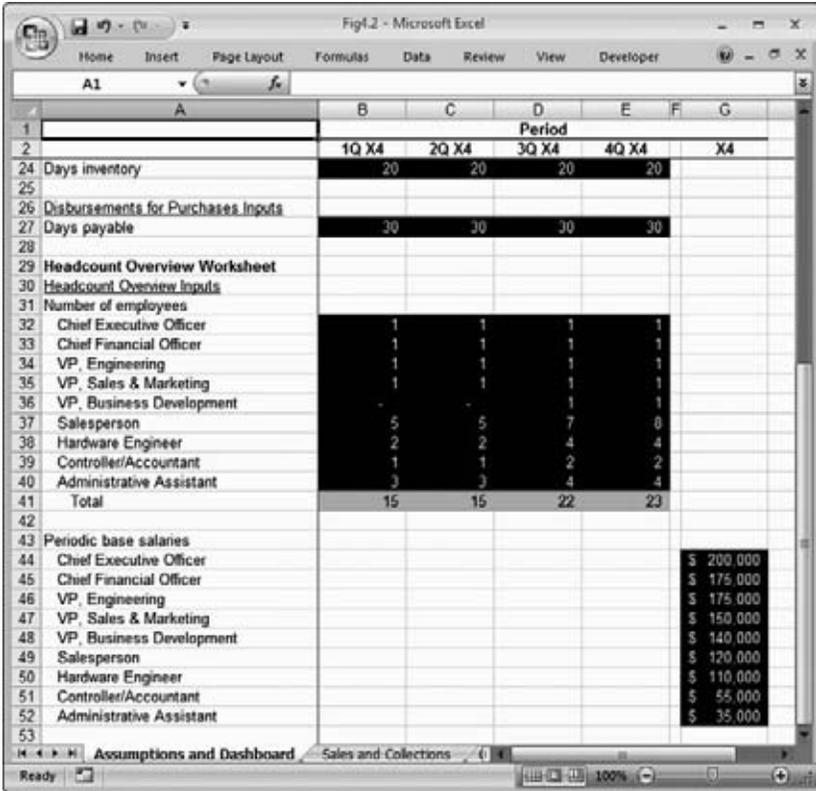
## **STEP 5A: HEADCOUNT BUDGET**

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The Headcount Budget tracks both the projected number of employees by position and the projected salary by position. This is a very important budget as the headcount expenses, which are otherwise known as “salaries,” represent a significant portion of many business’s overall operating expenses.



**FIGURE 4.1** Separate Operating Expense Components of the Operating Budget in the Context of the Master Budget



**FIGURE 4.2** Assumptions Underlying the Headcount Overview Worksheet

### Headcount Overview Worksheet

Figure 4.2 presents the assumptions underlying the Headcount Overview worksheet, the first of two headcount worksheets for Napavale that are drawn from the Assumptions and Dashboard worksheet. Note that Figure 4.2 highlights both the number of employees projected by position and the projected annualized base salary by position. Figure 4.3 shows the Headcount Overview worksheet, which includes a separate table that calculates the periodic Headcount Cost based on the projected annualized base salary and the number of accounting periods per year. (In Napavale’s case, this is four accounting periods per year as I am working with quarters as my accounting period.) Figure 4.4 offers an alternative view of the Headcount Overview worksheet in which the values and calculations underlying the worksheet are exposed and visible.

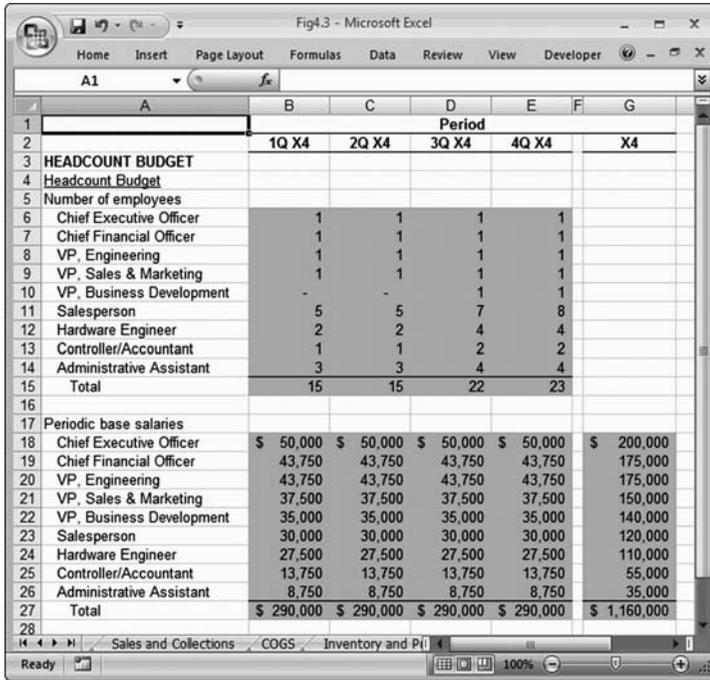


FIGURE 4.3 Headcount Overview Worksheet

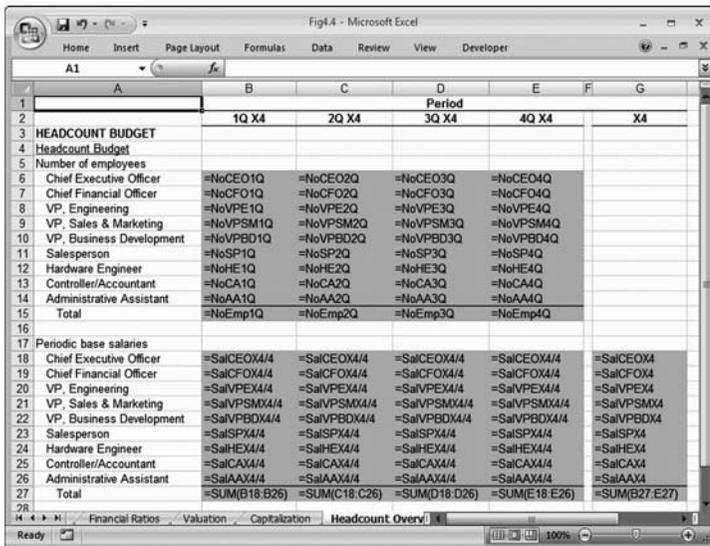
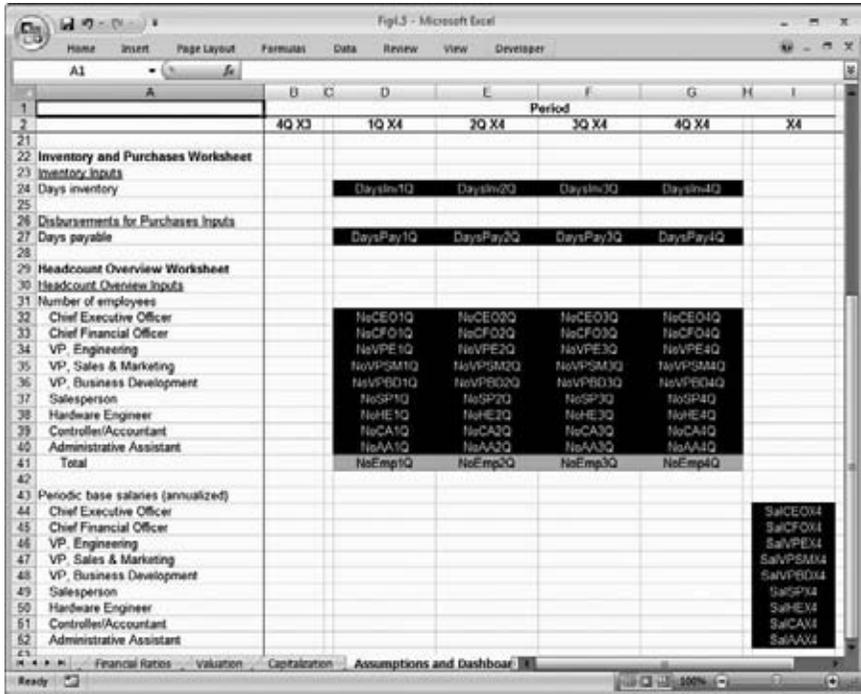


FIGURE 4.4 Alternative View of the Headcount Overview Worksheet

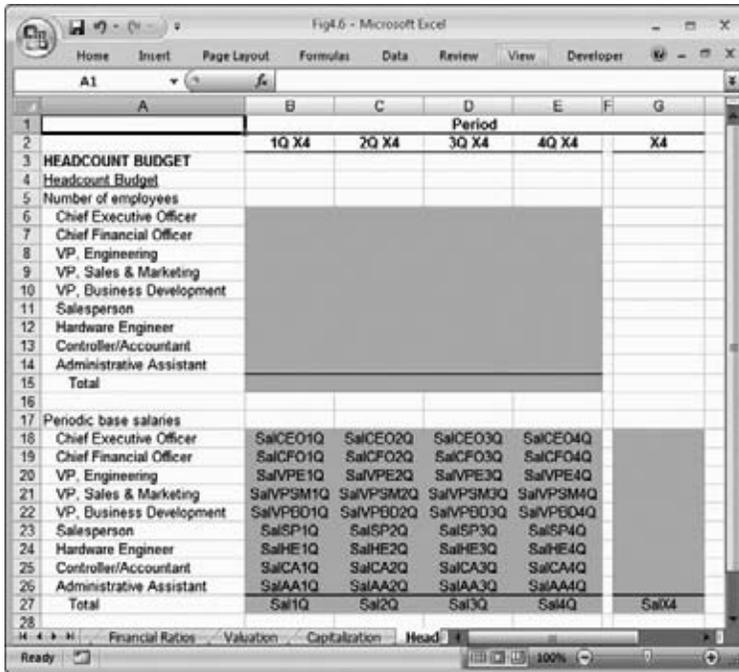


**FIGURE 4.5** Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet

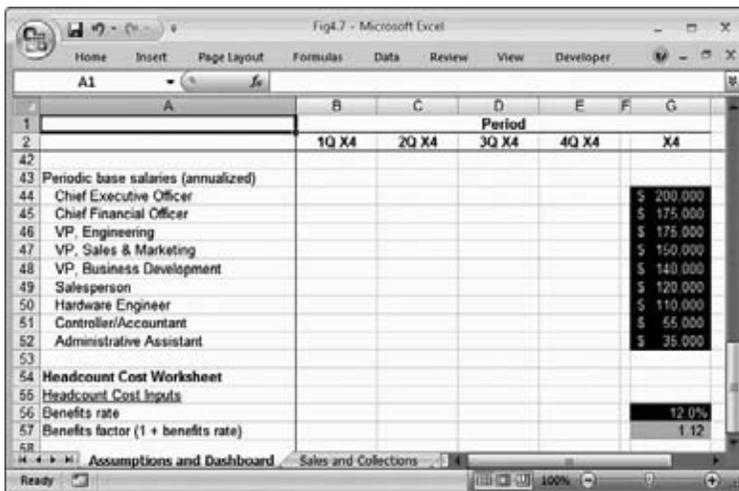
The names of the input and output cells in the Assumptions and Dashboard worksheet are highlighted in Figure 4.5. Figure 4.6 offers a view of the names of the input and output cells in the Headcount Overview worksheet.

### Headcount Cost Worksheet

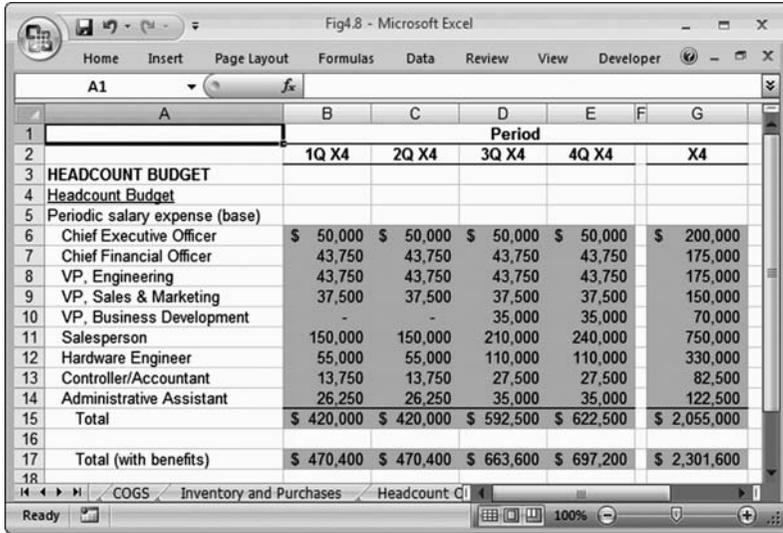
The Headcount Cost worksheet, which is the second worksheet included in the Headcount Budget, calculates the periodic Headcount Costs based on the projected number of employees by position and the projected periodic cost per position. The only new assumption underlying the Headcount Cost worksheet is that of Napavale’s benefits rate. In addition to base salaries, companies often must pay taxes and employment benefit costs (such as health care costs). As such, I am modeling these benefits costs as an incremental percentage above the base salary projections for Napavale. Figure 4.7 highlights the benefits rate assumption using the Assumptions and Dashboard worksheet.



**FIGURE 4.6** Names of the Input and Output Cells in the Headcount Overview Worksheet



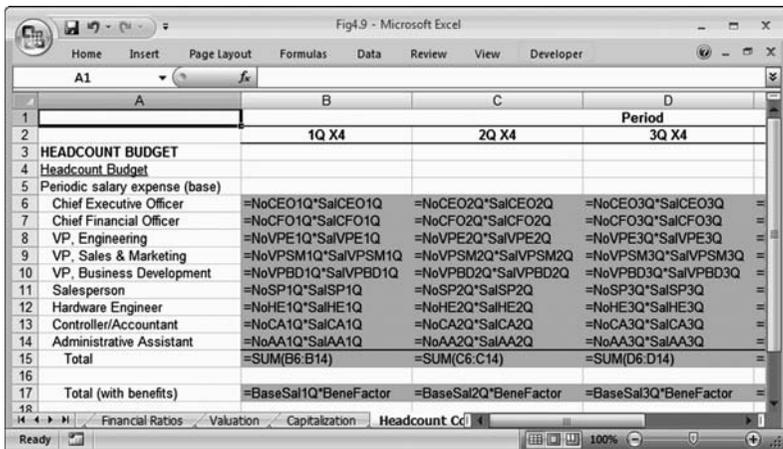
**FIGURE 4.7** Benefits Rate Assumption in the Assumptions and Dashboard Worksheet



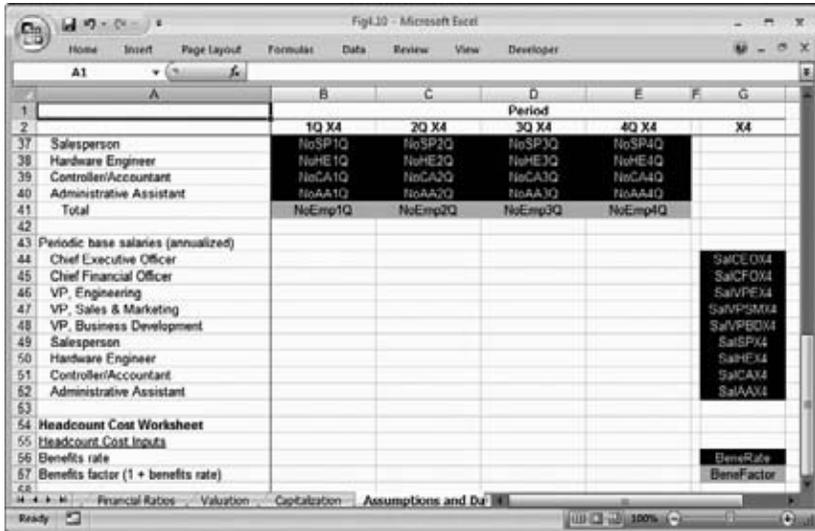
**FIGURE 4.8** Headcount Cost Worksheet

The Headcount Cost worksheet is presented in Figure 4.8. Figure 4.9 offers an alternative view of the Headcount Cost worksheet in which the values and calculations underlying the worksheet cells are exposed and visible.

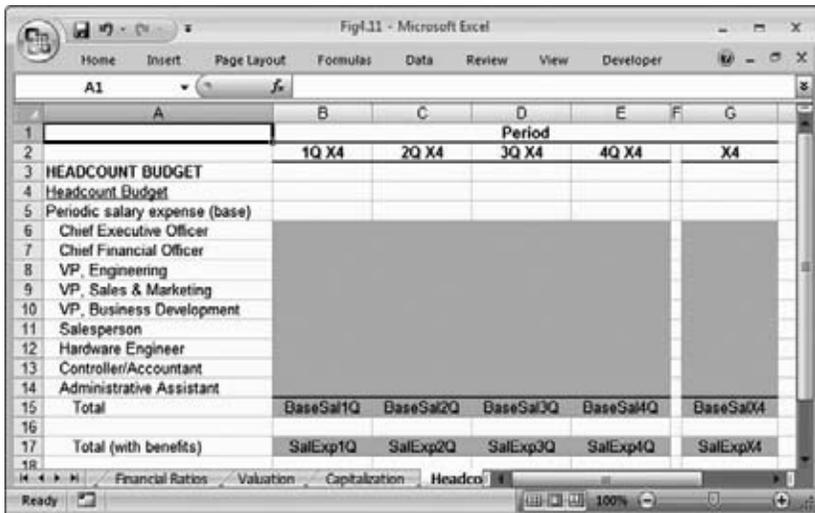
The names of the input and output cells in the Assumptions and Dashboard worksheet are shown in Figure 4.10. The names of the input and output cells in the Headcount Cost worksheet are shown in Figure 4.11.



**FIGURE 4.9** Alternative View of the Headcount Cost Worksheet



**FIGURE 4.10** Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet



**FIGURE 4.11** Names of the Input and Output Cells in the Headcount Cost Worksheet

## STEP 5B: OPERATING EXPENSES BUDGET

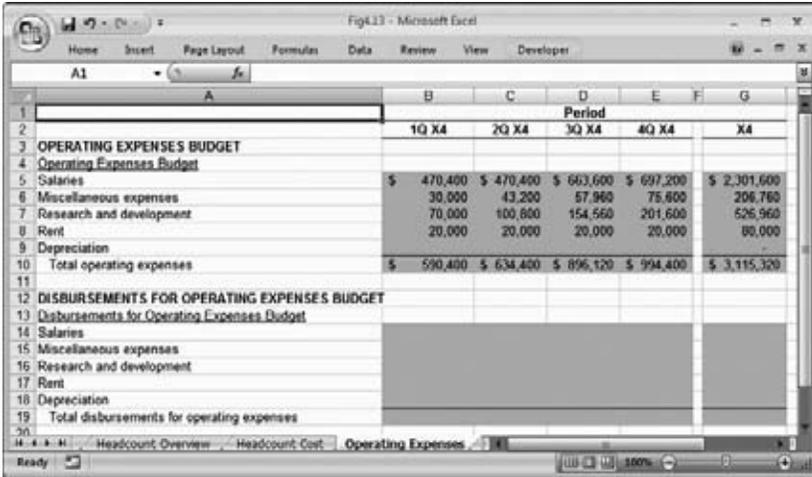
The Operating Expenses Budget covers all of Napavale’s operating expenses (salary expenses, a component of operating expenses, are covered in Step 5A: Headcount Budget). For Napavale, operating expenses include rent, research and development, depreciation, and miscellaneous expenses, among others. Specific operating expenses will vary from business to business, but the expenses covered in this Step 5B are fairly typical for product-oriented companies such as Napavale.

Please note that I am not entering any values into the depreciation line item at this point. Depreciation is an expense that is based on the Capital Budget, which is covered in Chapter 6. Once the depreciation projections have been calculated for Napavale in Chapter 6, I will revisit the Operating Expenses Budget with the inclusion of the depreciation expense projections.

Figure 4.12 highlights the assumptions underlying the operating expenses for Napavale from the Assumptions and Dashboard worksheet. The

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
43 Periodic base salaries (annualized)					
44 Chief Executive Officer					\$ 200,000
45 Chief Financial Officer					\$ 175,000
46 VP, Engineering					\$ 175,000
47 VP, Sales & Marketing					\$ 150,000
48 VP, Business Development					\$ 140,000
49 Salesperson					\$ 120,000
50 Hardware Engineer					\$ 110,000
51 Controller/Accountant					\$ 55,000
52 Administrative Assistant					\$ 35,000
53					
54 <b>Headcount Cost Worksheet</b>					
55 <b>Headcount Cost Inputs</b>					
56 Benefits rate					12.0%
57 Benefits factor (1 + benefits rate)					1.12
58					
59 <b>Operating Expenses Worksheet</b>					
60 <b>Operating Expenses Inputs</b>					
61 Miscellaneous expenses as a % of sales	3.0%	3.0%	3.0%	3.0%	
62					
63 R&D expenses as a % of sales	7.0%	7.0%	8.0%	8.0%	
64					
65 Rent expense per square foot per quarter	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	
66 Square feet of space rented	4,000	4,000	4,000	4,000	
67 Total rent expense	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	
68					
69 Tax rate	36.0%	36.0%	36.0%	36.0%	
70					

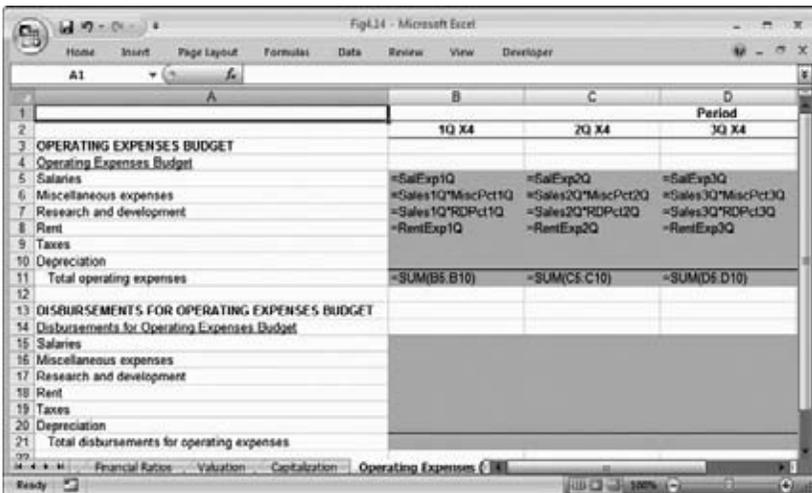
**FIGURE 4.12** Assumptions Underlying the Operating Expenses from the Assumptions and Dashboard Worksheet



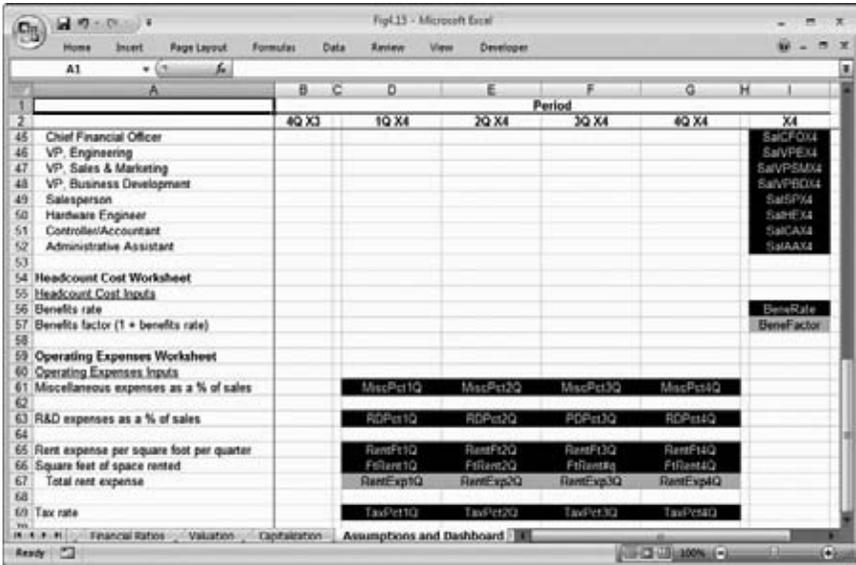
**FIGURE 4.13** Operating Expenses Budget

Operating Expenses Budget is presented in Figure 4.13. Figure 4.14 offers an alternative view of the Operating Expenses Budget in which the values and formulas underlying the worksheet cells are exposed and visible.

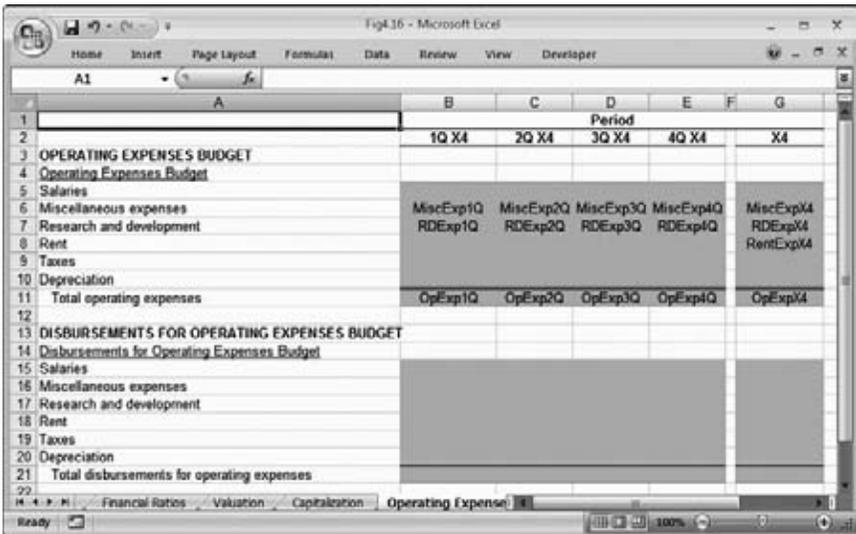
The names of the input and output cells in the Assumptions and Dashboard worksheet are shown in Figure 4.15. Figure 4.16 offers a view of the names of the input and output cells in the Operating Expenses Budget.



**FIGURE 4.14** Alternative View of the Operating Expenses Budget



**FIGURE 4.15** Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet



**FIGURE 4.16** Names of the Input and Output Cells in the Operating Expenses Budget

## STEP 5C: DISBURSEMENTS FOR OPERATING EXPENSES BUDGET

The Disbursements for Operating Expenses Budget reconciles the accrual-based values from Steps 5A and 5B to cash values. Remember that Napavale's operating expenses include both the headcount expenses calculated in Step 5A and the other operating expenses calculated in Step 5B. As there are no new assumptions underlying the Disbursements for Operating Expenses Budget, I will not present a view of the Assumptions and Dashboard worksheet at this point.

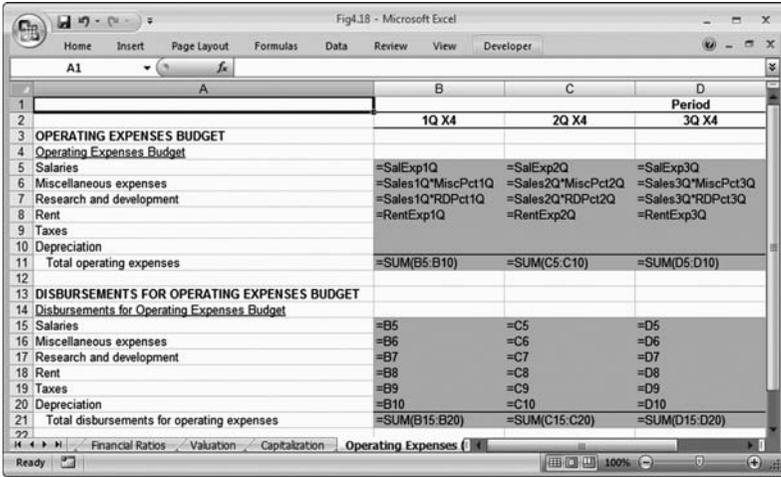
I am assuming Napavale disburses payments for its operating expenses in the periods in which such operating expenses occur. Note that I am treating disbursements for purchases (covered in Chapter 3) separately from disbursements for operating expenses. More specifically, my assumptions regarding days payable in Chapter 3 relate to purchases of goods that will eventually be sold to customers; my assumptions regarding the disbursement for operating expenses are treated as a separate category of disbursements.

As with the Disbursements for Purchases Budget covered in Step 4C in Chapter 3, the Disbursements for Operating Expenses Budget ties into the creation of the Cash Budget, which is covered in Chapter 6. I will assume that Napavale disburses 100 percent of its operating expenses in the period in which such expenses are incurred.

The Disbursements for Operating Expenses Budget is presented in Figure 4.17. Figure 4.18 presents an alternative view of the Disbursements for Operating Expenses Budget in which the formulas underlying the values

	Period				X4
	1Q X4	2Q X4	3Q X4	4Q X4	
<b>OPERATING EXPENSES BUDGET</b>					
Operating Expenses Budget					
Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200	\$ 2,301,600
Miscellaneous expenses	30,000	43,200	57,960	75,600	206,760
Research and development	70,000	100,800	154,560	201,600	526,960
Rent	20,000	20,000	20,000	20,000	80,000
Depreciation					
Total operating expenses	\$ 590,400	\$ 634,400	\$ 896,120	\$ 994,400	\$ 3,115,320
<b>DISBURSEMENTS FOR OPERATING EXPENSES BUDGET</b>					
Disbursements for Operating Expenses Budget					
Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200	\$ 2,301,600
Miscellaneous expenses	30,000	43,200	57,960	75,600	206,760
Research and development	70,000	100,800	154,560	201,600	526,960
Rent	20,000	20,000	20,000	20,000	80,000
Depreciation					
Total disbursements for operating expenses	\$ 590,400	\$ 634,400	\$ 896,120	\$ 994,400	\$ 3,115,320

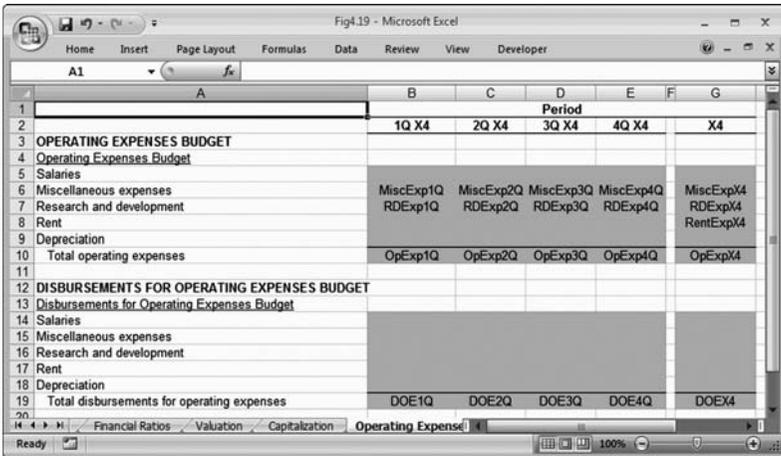
**FIGURE 4.17** Disbursements for Operating Expenses Budget



**FIGURE 4.18** Alternative View of the Disbursements for Operating Expenses Budget

are exposed. Figure 4.19 offers a view of the names of the input and output cells in the Disbursements for Operating Expenses Budget.

Steps 1 through 5C in the Master Budget building process, covered in Chapters 2–4, provide nearly all of the required information to build a budgeted Income Statement (from operations). I need to add another line item, interest expense, to complete this budgeted Income Statement, which I will cover in Chapter 6.



**FIGURE 4.19** Names of the Input and Output Cells in the Disbursements for Operating Expenses Budget

## QUESTIONS

Each of the questions for this chapter relates to a hypothetical company named Company DEF. Company DEF sells functional steering wheels to automobile manufacturers. As such, Company DEF is a product-oriented (as opposed to a service-oriented) business. Assume that company DEF disburses 100 percent of its operating expenses in the period in which such expenses are incurred. The questions for this chapter will address fiscal year X4 on a quarterly basis (four specific quarters, 1Q–4Q for year X4).

The following questions will test your knowledge of the material covered in this chapter in an applied manner—specifically, you will be asked to build the schedules discussed in this chapter for Company DEF.

To prepare you for this chapter’s questions, several figures provide background information related to Company DEF’s operations. Figure Q4.1

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Headcount Overview Worksheet</b>					
<b>Headcount Overview Inputs</b>					
Number of employees					
Chief Executive Officer	1	1	1	1	
Chief Financial Officer	1	1	1	1	
VP, Engineering	1	1	1	1	
VP, Sales & Marketing	1	1	1	1	
VP, Business Development	1	1	1	1	
Salesperson	5	5	7	8	
Hardware Engineer	4	4	5	5	
Controller/Accountant	1	2	2	2	
Administrative Assistant	2	2	3	4	
<b>Total</b>	<b>17</b>	<b>18</b>	<b>22</b>	<b>24</b>	
<b>Periodic base salaries (annualized)</b>					
Chief Executive Officer					\$ 175,000
Chief Financial Officer					\$ 150,000
VP, Engineering					\$ 150,000
VP, Sales & Marketing					\$ 135,000
VP, Business Development					\$ 125,000
Salesperson					\$ 100,000
Hardware Engineer					\$ 90,000
Controller/Accountant					\$ 45,000
Administrative Assistant					\$ 30,000
<b>Headcount Cost Worksheet</b>					
<b>Headcount Cost Inputs</b>					
Benefits rate					15.0%
Benefits factor (1 + benefits rate)					1.15
<b>Operating Expenses Worksheet</b>					
<b>Operating Expenses Inputs</b>					
Miscellaneous expenses as a % of sales	4.0%	3.5%	4.0%	3.5%	

**FIGURE Q4.1** Company DEF’s Assumptions and Dashboard Worksheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>SALES BUDGET</b>					
<u>Unit Sales and Price Budget</u>					
Unit sales	5,000	5,200	5,400	5,500	21,100
x Price per unit	\$ 200	\$ 200	\$ 195	\$ 190	N/A
= Total sales	\$ 1,000,000	\$ 1,040,000	\$ 1,053,000	\$ 1,045,000	\$ 4,138,000
<u>Sales Composition Budget</u>					
Cash sales	\$ 500,000	\$ 520,000	\$ 526,500	\$ 522,500	\$ 2,069,000
+ Credit sales	500,000	520,000	526,500	522,500	2,069,000
= Total sales	\$ 1,000,000	\$ 1,040,000	\$ 1,053,000	\$ 1,045,000	\$ 4,138,000
<b>COLLECTIONS BUDGET</b>					
<u>Cash Collections from Customers Budget</u>					
Cash sales this period	\$ 500,000	\$ 520,000	\$ 526,500	\$ 522,500	\$ 2,069,000
+ Credit sales collected	305,556	512,222	523,972	524,056	1,865,806
= Total collections	\$ 805,556	\$ 1,032,222	\$ 1,050,472	\$ 1,046,556	\$ 3,934,806
<u>Accounts Receivable (A/R) Budget</u>					
Beginning A/R balance	\$ -	\$ 194,444	\$ 202,222	\$ 204,750	\$ -
+ Additions to A/R	194,444	202,222	204,750	203,194	804,611
- Subtractions from A/R	-	194,444	202,222	204,750	601,417
= Ending A/R balance	\$ 194,444	\$ 202,222	\$ 204,750	\$ 203,194	\$ 203,194

**FIGURE Q4.2** Company DEF’s Unit Sales and Price Budget

offers a view of a portion of Company DEF’s Assumptions and Dashboard worksheet. Note that there are three cost-of-goods-sold components for Company DEF’s steering wheels: (1) wheel frame, (2) air bag, and (3) assembly and labor.

Figure Q4.2 presents a view of Company DEF’s Unit Sales and Price Budget, Sales Composition Budget, Cash Collections from Customers Budget, and Accounts Receivable Budget. Company DEF’s Cost-of-Goods-Sold Budget is shown in Figure Q4.3. Figure Q4.4 presents a view of Company

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>COST-OF-GOODS SOLD BUDGET</b>					
<u>Cost-of-Goods Sold Budget</u>					
Wheel frame	\$ 275,000	\$ 286,000	\$ 286,200	\$ 291,500	\$ 1,138,700
Air bag	275,000	275,600	270,000	264,000	1,084,600
Assembly labor	200,000	202,800	189,000	181,500	773,300
Total cost-of-goods sold	\$ 750,000	\$ 764,400	\$ 745,200	\$ 737,000	\$ 2,996,600

**FIGURE Q4.3** Company DEF’s Cost-of-Goods-Sold Budget

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>INVENTORY BUDGET</b>					
Desired ending inventory	\$ 212,333	\$ 207,000	\$ 204,722	\$ 204,722	\$ 204,722
+ Cost of goods sold	750,000	764,400	745,200	737,000	2,996,600
= Total inventory needed	\$ 962,333	\$ 971,400	\$ 949,922	\$ 941,722	\$ 3,201,322
<b>PURCHASES BUDGET</b>					
Total inventory needed	\$ 962,333	\$ 971,400	\$ 949,922	\$ 941,722	N/A
- Beginning inventory	-	212,333	207,000	204,722	-
= Purchases	\$ 962,333	\$ 759,067	\$ 742,922	\$ 737,000	N/A
<b>Disbursements for Purchases Budget</b>					
Payments of payables	\$ 641,556	\$ 826,822	\$ 748,304	\$ 738,974	\$ 2,955,656
Total disbursements for purchases	\$ 641,556	\$ 826,822	\$ 748,304	\$ 738,974	\$ 2,955,656
<b>Accounts Payable (A/P) Budget</b>					
Beginning A/P balance	\$ -	\$ 320,778	\$ 253,022	\$ 247,641	\$ -
+ Additions to A/P	320,778	253,022	247,641	245,667	1,067,107
- Subtractions from A/P	-	320,778	253,022	247,641	821,441
Ending A/P	\$ 320,778	\$ 253,022	\$ 247,641	\$ 245,667	\$ 245,667

**FIGURE Q4.4** Company DEF's Inventory Budget, Purchases Budget, Disbursements for Purchases Budget, and Accounts Payable Budget

DEF's Inventory Budget, Purchases Budget, Disbursements for Purchases Budget, and Accounts Payable Budget.

1. Given the information regarding Company DEF, build a Headcount Overview worksheet for Company DEF.
2. Based on the information presented and the headcount worksheet that you built in Question 1, build a Headcount Cost worksheet for Company DEF.
3. Build an Operating Expenses Budget for Company DEF based on the information presented and your work in Questions 1 and 2. Note that you will not be able to enter any values into the depreciation line item for the Operating Expenses Budget, as depreciation is based on the Capital Budget (which is not covered in this chapter or in the questions for this chapter).
4. Based on the information presented and your work in Questions 1–3, build a Disbursements for Operating Expenses Budget for Company DEF.

## Operating Budget— Income Statement

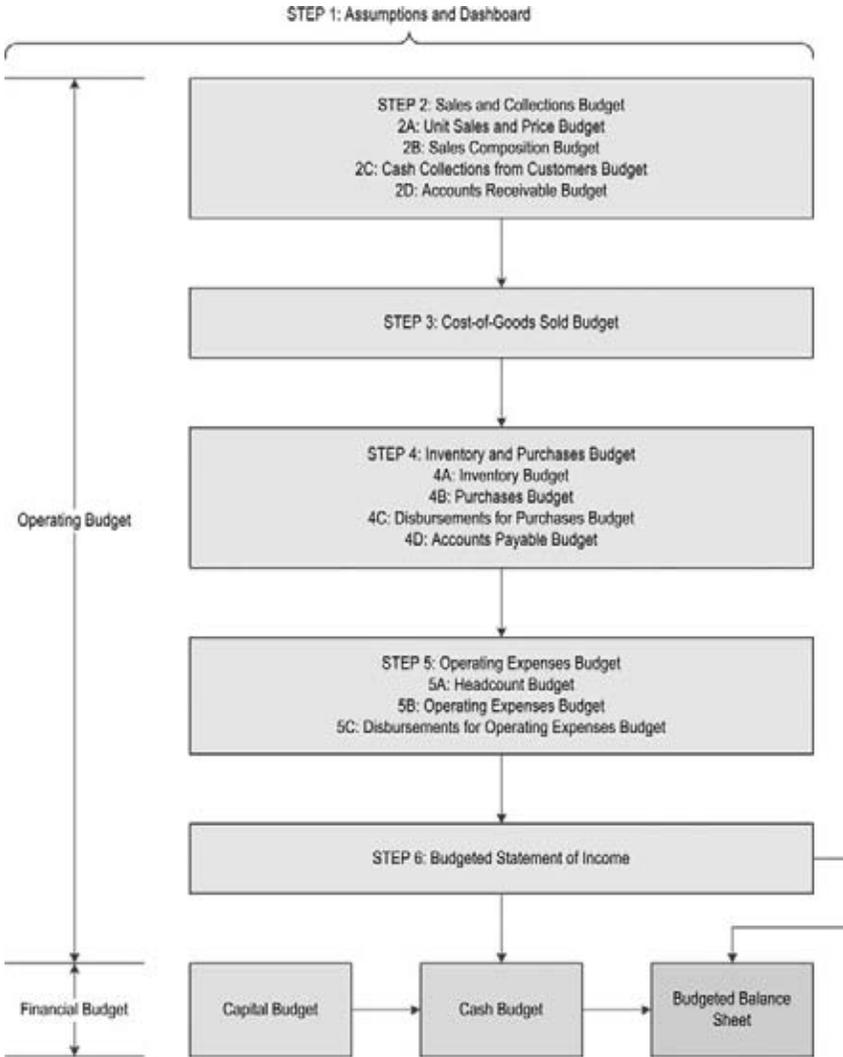
**T**his chapter covers the Budgeted Statement of Income, otherwise known as the Income Statement. The Income Statement (also called the “P&L” by financial professionals) is a central component of a financial model. The ultimate output of the Income Statement is known as “net income.” Net income represents the difference between a business’s revenues and a business’s expenses. Figure 5.1 highlights the Budgeted Statement of Income and its relative position in the Master Budget hierarchy.

### **STEP 6: BUDGETED STATEMENT OF INCOME**

The Budgeted Statement of Income combines elements from several different schedules on which I have worked thus far for Napavale. More specifically, the Income Statement draws from the Unit Sales Budget, Headcount Budget, and the Operating Expenses Budget.

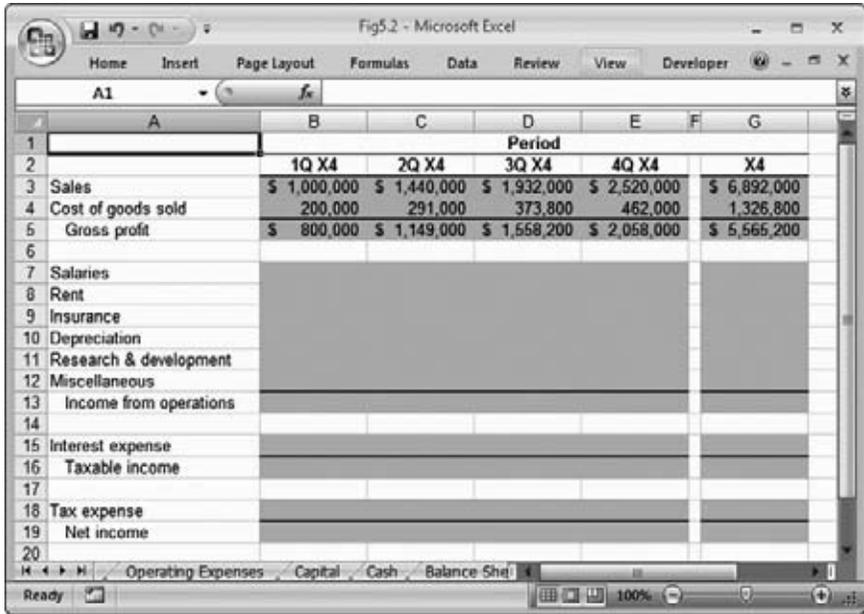
Copying the sales and cost-of-goods-sold projections for Napavale into the Income Statement worksheet is the first step in building the Budgeted Statement of Income. Figure 5.2 shows the first section of the Income Statement, highlighting the sales and cost-of-goods-sold projections in addition to the resultant gross profit projections. Remember that gross profit is calculated as sales – cost of goods sold.

As I have indicated, the proper linking of information between worksheets is essential at all stages of building a financial model, and I am going to make frequent references to alternative views of worksheets in which the values and formulas contained within each cell are exposed for viewing and to views of the worksheets in which the names of the input and outputs cells are highlighted. In so doing, it should be easier to follow the extensive references and linkages between worksheets.



**FIGURE 5.1** Budgeted Statement of Income and its Relative Position in the Master Budget Hierarchy

As I have discussed in previous chapters, I am naming all of the important cells in Napavale’s financial model. Each of these names is available across all worksheets—in other words, I am free to reference a cell named “Sales1Q” in any and all worksheets in my Napavale financial model workbook.

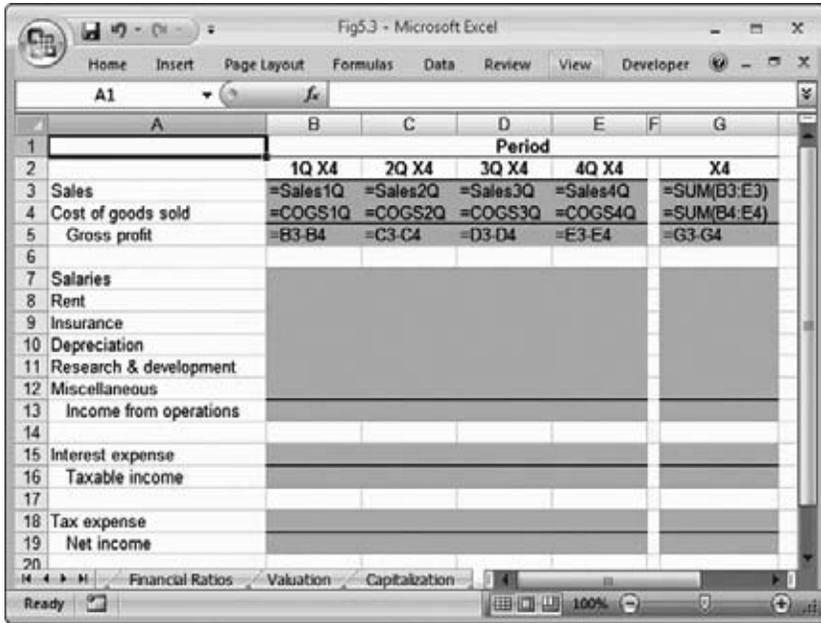


**FIGURE 5.2** First Section of the Income Statement

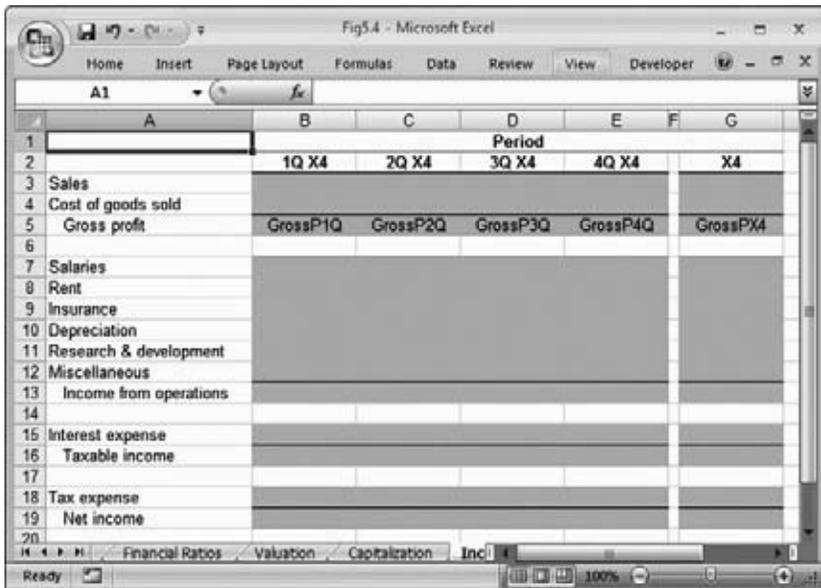
Figure 5.3 offers an alternative view of the first section of the Income Statement in which the values and formulas underlying the sales, cost-of-goods-sold, and gross margin projections are all exposed and visible. A view of the Income Statement in which the names of the input and output cells are shown is presented in Figure 5.4. “GrossP” is an abbreviation for “Gross Profit” in Figure 5.4.

Copying the salaries projections for Napavale into the Income Statement worksheet is the next step in building the Budgeted Statement of Income. The salaries projections flow out of the Headcount Cost worksheet that I built in Chapter 4. Figure 5.5 shows the inclusion of this line item in the Income Statement. An alternative view of the evolving Income Statement is presented in Figure 5.6. This view exposes the contents of the worksheet cells. Figure 5.7 offers a view of the Income Statement in which the names of the input and output cells are shown. Note that this is the same worksheet as presented in Figure 5.4.

The next step in building the Income Statement is to copy the remaining elements of the Operating Expenses Budget (other than (1) salaries, as I have just copied these values into the Income Statement as shown in Figures 5.5 through 5.7; (2) taxes, which I cover later in this chapter; and



**FIGURE 5.3** Alternative View of the First Section of the Income Statement



**FIGURE 5.4** Names of the Input and Output Cells in the Income Statement

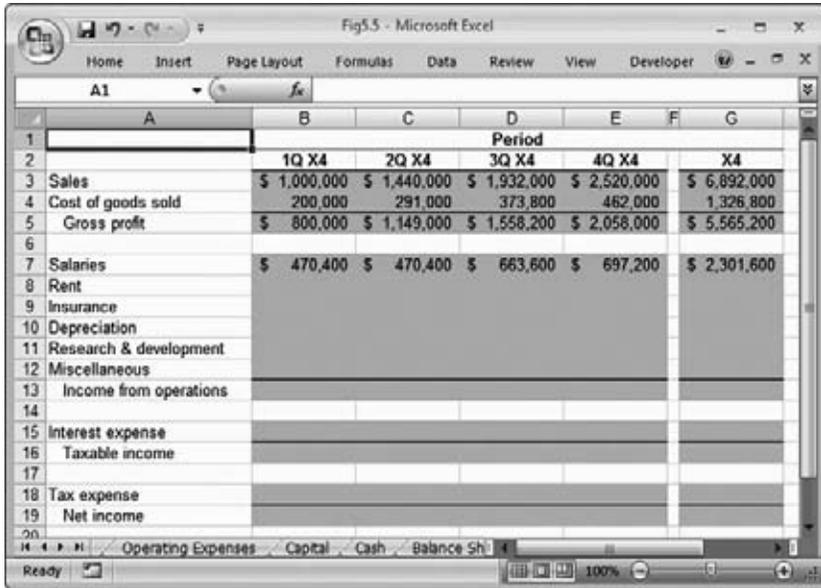


FIGURE 5.5 Income Statement

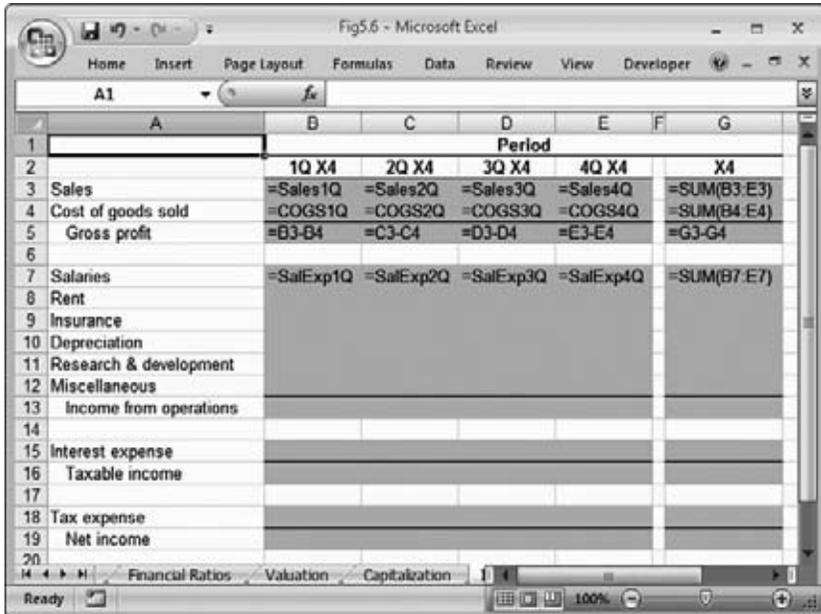


FIGURE 5.6 Alternative View of the Income Statement

The screenshot shows an Excel spreadsheet titled 'Fig5.7 - Microsoft Excel'. The worksheet displays an Income Statement with the following structure:

	A	B	C	D	E	F	G
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Sales						
4	Cost of goods sold						
5	Gross profit	GrossP1Q	GrossP2Q	GrossP3Q	GrossP4Q		GrossPX4
6							
7	Salaries						
8	Rent						
9	Insurance						
10	Depreciation						
11	Research & development						
12	Miscellaneous						
13	Income from operations						
14							
15	Interest expense						
16	Taxable income						
17							
18	Tax expense						
19	Net income						
20							

**FIGURE 5.7** Names of the Input and Output Cells in the Income Statement

(3) depreciation, which I cover in Chapter 6) into the Income Statement worksheet. Figure 5.8 highlights the inclusion of these additional other operating expense items into the Income Statement.

As you can see in Figure 5.8, there is a line entitled “income from operations” in the Income Statement. Income from operations is calculated as gross profit – operating expenses. As discussed in Chapter 4, operating expenses represent the costs required to operate a business. Figure 5.9 offers an alternative view of the growing Income Statement worksheet in which the values and formulas underlying the worksheet cells are exposed and visible. Figure 5.10 shows the names of the input and output cells in the Income Statement worksheet.

Please note that the depreciation line item does not contain any values yet. As discussed in Chapter 4, depreciation is an operating expense that is derived from the Capital Expenditures Budget, which is covered in Chapter 6. Financial models represent a set of highly integrated calculations—I am covering each of these calculations in as serial, or straightforward, a manner as possible. In this case, the vast majority of the elements of the Income Statement have been calculated. As I mentioned, I will cover the calculation of depreciation expense in Chapter 6. I will present a complete view of

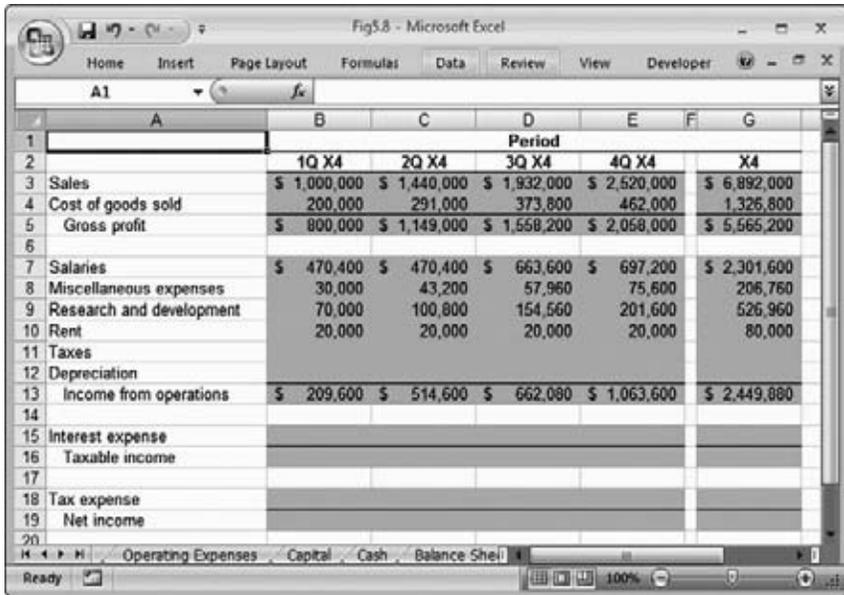


FIGURE 5.8 Income Statement

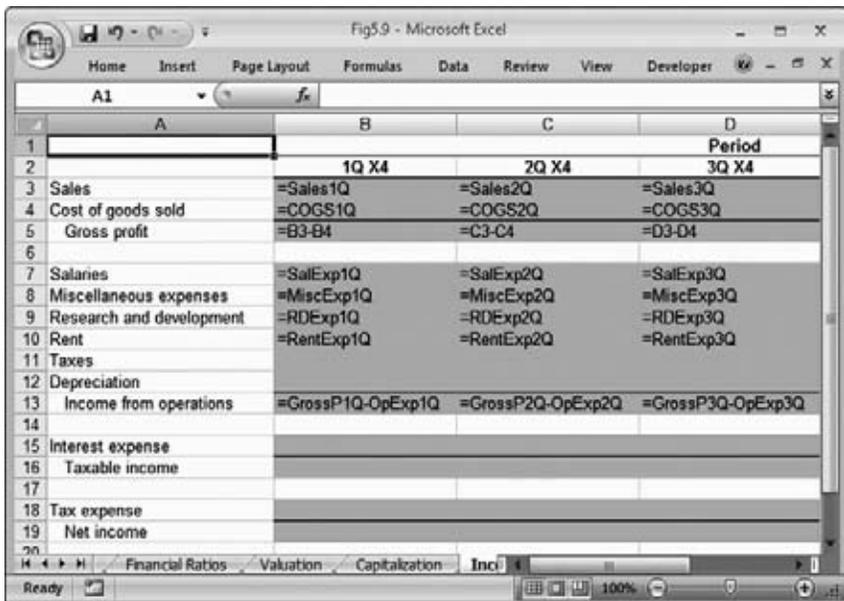


FIGURE 5.9 Alternative View of the Income Statement

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
Sales					
Cost of goods sold					
Gross profit	GrossP1Q	GrossP2Q	GrossP3Q	GrossP4Q	GrossPX4
Salaries					
Miscellaneous expenses					
Research and development					
Rent					
Taxes					
Depreciation					
Income from operations	Opinc1Q	Opinc2Q	Opinc3Q	Opinc4Q	OpincX4
Interest expense					
Taxable income					
Tax expense					
Net income					

**FIGURE 5.10** Name of the Input and Output Cells in the Income Statement

the Income Statement, including the depreciation figures, at the appropriate point in Chapter 6.

Interest expense, an item which I will also calculate in Chapter 6, represents expenses associated with borrowed funds. If a business borrows money, it is often required to pay periodic interest on these borrowed funds. Interest expense represents these expenses. I will cover interest expense in Chapter 6 as well.

Figure 5.11 shows the Income Statement with the addition of a calculation for an item entitled “taxable income.” Taxable income is calculated as income from operations – interest expense. Figure 5.12 offers an alternative view of the Income Statement in which the values and underlying formulas in the worksheet cells are exposed and visible. The names of the input and output cells in the Income Statement are shown in Figure 5.13.

Determining the periodic tax expense for Napavale represents the final calculation on the Income Statement. While calculating taxes may appear to be a simple exercise—multiply the taxable income by a tax rate—accounting for taxes is actually a complex exercise. Given the scope of this book, I am going to address the issue of taxes in a very simple and straightforward manner. Entire books have been written that address the issue

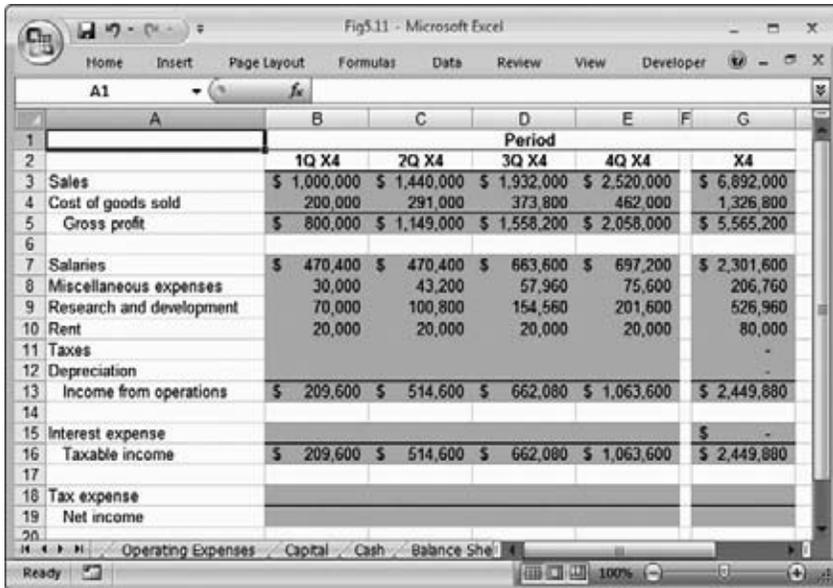


FIGURE 5.11 Income Statement

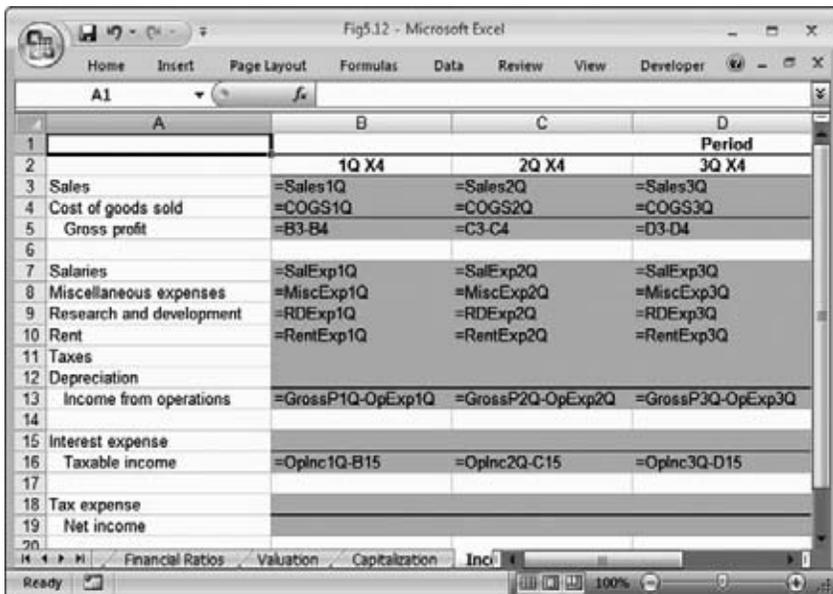
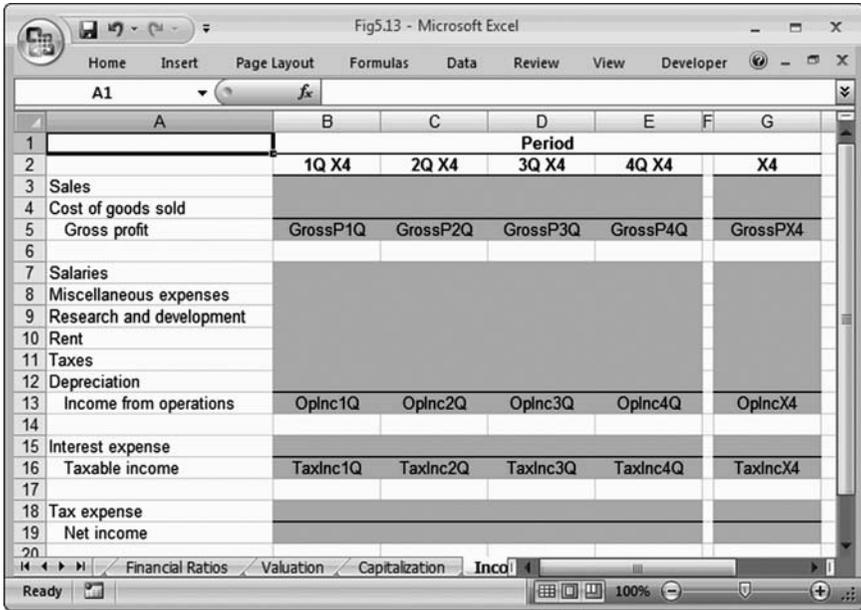


FIGURE 5.12 Alternative View of the Income Statement



**FIGURE 5.13** Names of the Input and Output Cells in the Income Statement

of income taxes; this book is not meant to cover income taxes in any detail.

I am modeling Napavale’s income taxes using the following formula: tax expense = taxable income \* tax rate. Please note that this is a very simplistic approach to income taxes that does not address the reality facing corporations today. If, for instance, you project negative taxable income for a specific period in your own financial model, you should modify this calculation to indicate a tax expense of zero as opposed to a negative tax expense. As Napavale’s taxable income is positive across all periods presented in the financial model presented in this book, negative taxable income is not an issue in this case.

Figure 5.14 shows the income tax rate assumption from the Assumptions and Dashboard worksheet. A view of the Income Statement, including the calculation of tax expense, is presented in Figure 5.15. Figure 5.16 presents an alternative view of the Income Statement in which the values and formulas underlying the worksheet cells are exposed and visible. The names of the input and output cells from the Assumptions and Dashboard worksheet are shown in Figure 5.17. Figure 5.18 offers a view of the names of the input and output cells in the Income Statement.

A	Period				
	B	C	D	E	F
	1Q X4	2Q X4	3Q X4	4Q X4	X4
43	Periodic base salaries (annualized)				
44					\$ 200,000
45					\$ 175,000
46					\$ 175,000
47					\$ 150,000
48					\$ 140,000
49					\$ 120,000
50					\$ 110,000
51					\$ 55,000
52					\$ 35,000
54	Headcount Cost Worksheet				
55	Headcount Cost Inputs				
56					12.0%
57					1.12
59	Operating Expenses Worksheet				
60	Operating Expenses inputs				
61	3.0%	3.0%	3.0%	3.0%	
62					
63	7.0%	7.0%	8.0%	8.0%	
64					
65	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	
66	4,000	4,000	4,000	4,000	
67	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	
68					
69	35.0%	35.0%	35.0%	35.0%	
70					

**FIGURE 5.14** Income Tax Rate Assumptions from the Assumptions and Dashboard Worksheet

A	Period				
	B	C	D	E	F
	1Q X4	2Q X4	3Q X4	4Q X4	X4
3	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000
4	200,000	291,000	373,800	462,000	1,326,800
5	\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000	\$ 5,565,200
7	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200	\$ 2,301,600
8	30,000	43,200	57,960	75,800	206,760
9	70,000	100,800	154,560	201,800	526,960
10	20,000	20,000	20,000	20,000	80,000
11					
12	\$ 209,600	\$ 514,600	\$ 662,080	\$ 1,063,600	\$ 2,449,880
13					
14					\$ -
15	\$ 209,600	\$ 514,600	\$ 662,080	\$ 1,063,600	\$ 2,449,880
16					
17	\$ 73,360	\$ 180,110	\$ 231,728	\$ 372,260	\$ 857,458
18	\$ 136,240	\$ 334,490	\$ 430,352	\$ 691,340	\$ 1,592,422

**FIGURE 5.15** Income Statement

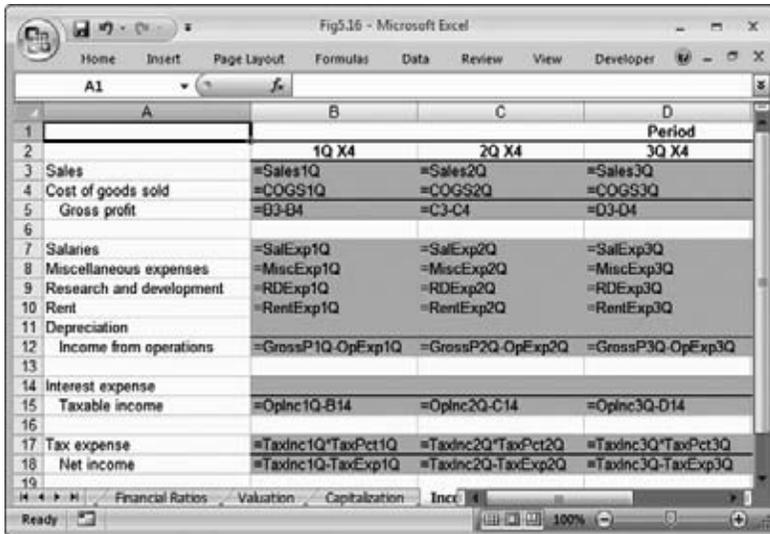


FIGURE 5.16 Alternative View of the Income Statement

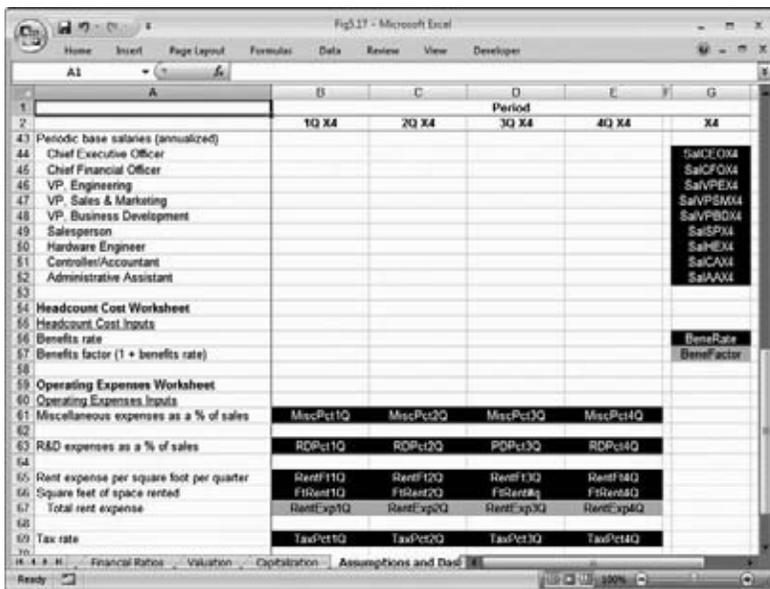
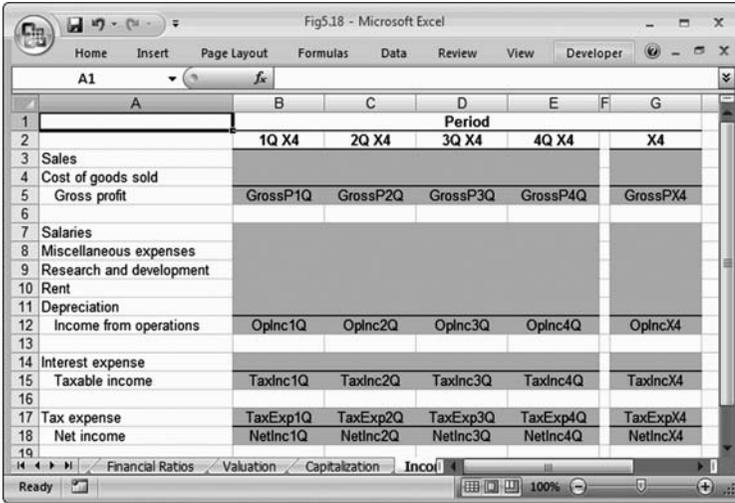
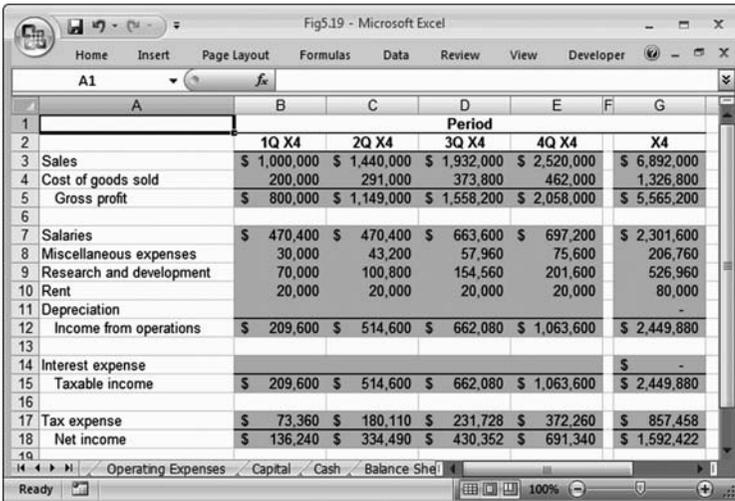


FIGURE 5.17 Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet

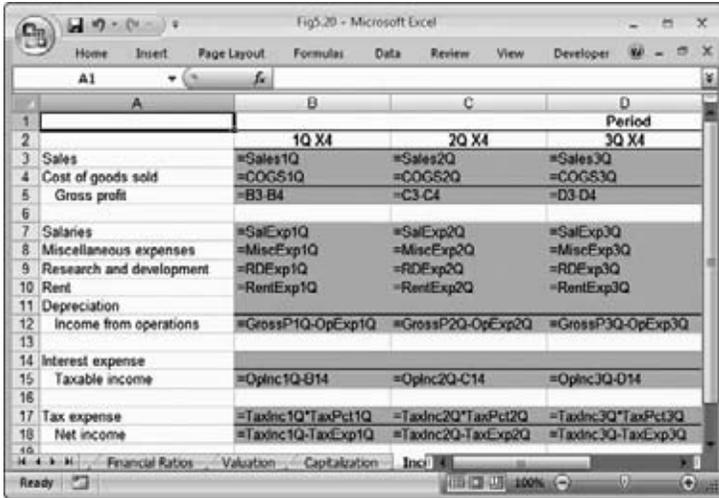


**FIGURE 5.18** Names of the Input and Output Cells in the Income Statement

The next step in building Napavale’s financial model is to calculate the company’s net income. Net income is defined as taxable income – tax expense. Figure 5.19 offers a view of the Income Statement, which is now complete except for the calculation of depreciation expense and interest expense, both of which are covered in Chapter 6.

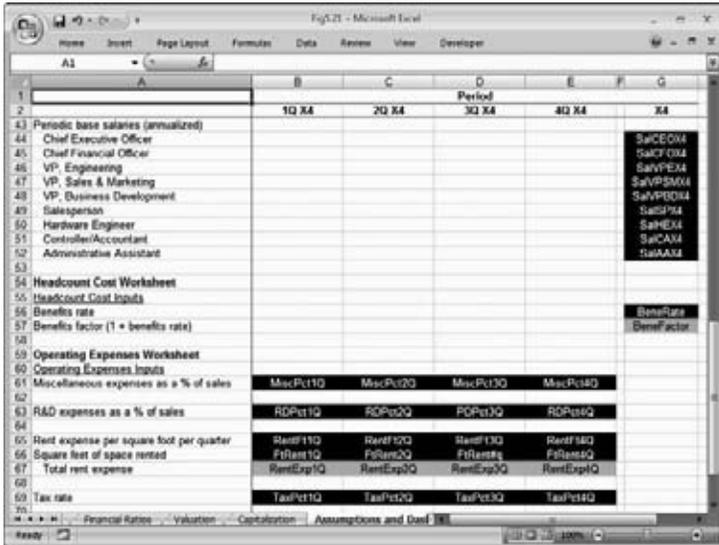


**FIGURE 5.19** Income Statement



**FIGURE 5.20** Alternative View of the Income Statement

Figure 5.20 offers an alternative view of the completed Income Statement in which the values and formulas in each cell are exposed and visible. The names associated with the input and outputs cells for the Assumptions and Dashboard worksheet are shown in Figure 5.21.



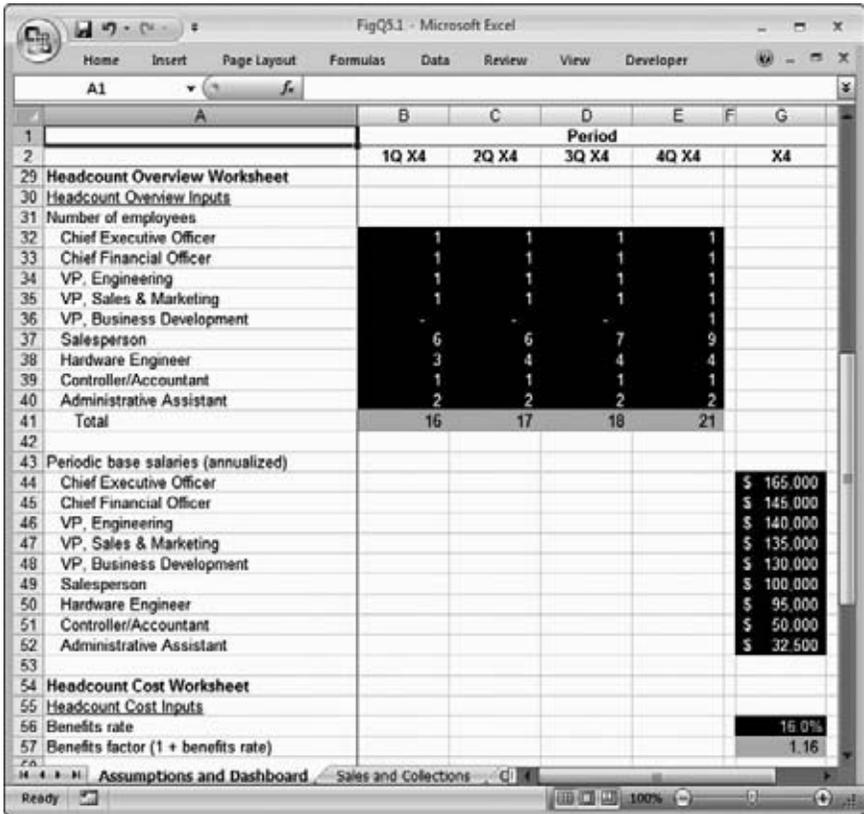
**FIGURE 5.21** Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet

**QUESTIONS**

Each of the questions for this chapter relates to a hypothetical company named Company GHI. Company GHI sells stethoscopes to physicians. As such, Company GHI is a product-oriented (as opposed to a service-oriented) business. The questions for this chapter will address fiscal year X4 on a quarterly basis (four specific quarters, 1Q–4Q for year X4).

The following questions will test your knowledge of the material covered in this chapter in an applied manner—specifically, you will be asked to build the schedules discussed in this chapter for Company GHI.

To prepare you for this chapter’s questions, several figures provide background information related to Company GHI’s operations. Figure Q5.1 offers a view of a portion of Company GHI’s Assumptions and Dashboard worksheet. Note that there are three cost-of-goods-sold components for



**FIGURE Q5.1** Company GHI’s Assumptions and Dashboard Worksheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>SALES BUDGET</b>					
<u>Unit Sales and Price Budget</u>					
Unit sales	5,500	5,400	5,400	5,300	21,600
× Price per unit	\$ 400	\$ 400	\$ 395	\$ 395	N/A
= Total sales	\$ 2,200,000	\$ 2,160,000	\$ 2,133,000	\$ 2,093,500	\$ 8,586,500
<u>Sales Composition Budget</u>					
Cash sales	\$ 1,760,000	\$ 1,728,000	\$ 1,706,400	\$ 1,674,600	\$ 6,869,200
+ Credit sales	440,000	432,000	426,600	418,700	1,717,300
= Total sales	\$ 2,200,000	\$ 2,160,000	\$ 2,133,000	\$ 2,093,500	\$ 8,586,500
<b>COLLECTIONS BUDGET</b>					
<u>Cash Collections from Customers Budget</u>					
Cash sales this period	\$ 1,760,000	\$ 1,728,000	\$ 1,706,400	\$ 1,674,600	\$ 6,869,200
+ Credit sales collected	342,222	433,778	427,800	406,499	1,610,299
= Total collections	\$ 2,102,222	\$ 2,161,778	\$ 2,134,200	\$ 2,081,299	\$ 8,479,499
<u>Accounts Receivable (A/R) Budget</u>					
Beginning A/R balance	\$ -	\$ 97,778	\$ 96,000	\$ 94,800	\$ -
+ Additions to A/R	97,778	96,000	94,800	107,001	395,579
- Subtractions from A/R	-	97,778	96,000	94,800	288,578
= Ending A/R balance	\$ 97,778	\$ 96,000	\$ 94,800	\$ 107,001	\$ 107,001

**FIGURE Q5.2** Company GHI’s Unit Sales and Price Budget

Company GHI’s stethoscopes: (1) casing, (2) sensing element, and (3) assembly and labor.

Figure Q5.2 presents a view of Company GHI’s Unit Sales and Price Budget, Sales Composition Budget, Cash Collections from Customers Budget, and Accounts Receivable Budget. Company GHI’s Cost-of-Goods-Sold Budget is shown in Figure Q5.3. Figure Q5.4 presents a view of Company GHI’s Inventory Budget, Purchases Budget, Disbursements for Purchases Budget, and Accounts Payable Budget. Company GHI’s Headcount Overview worksheet is shown in Figure Q5.5. Company GHI’s Headcount Cost worksheet is shown in Figure Q5.6. Figure Q5.7 offers a view of Company GHI’s Operating Expenses Budget and Disbursements for Operating Expenses Budget.

1. Given the information regarding Company GHI, build the first section of an Income Statement for Company GHI. This section should include sales, cost-of-goods-sold, and gross profit projections for Company GHI.
2. Given your work from Question 1 and the information presented, build an updated version of Company GHI’s Income Statement by inserting the salaries projections for Company GHI into the Income Statement.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>COST-OF-GOODS SOLD BUDGET</b>					
<u>Cost-of-Goods Sold Budget</u>					
Casing	\$ 495,000	\$ 475,200	\$ 459,000	\$ 450,500	\$ 1,879,700
Sensing element	412,500	388,800	351,000	344,500	1,496,800
Assembly labor	165,000	162,000	140,400	132,500	599,900
<b>Total cost-of-goods sold</b>	<b>\$ 1,072,500</b>	<b>\$ 1,026,000</b>	<b>\$ 950,400</b>	<b>\$ 927,500</b>	<b>\$ 3,976,400</b>

**FIGURE Q5.3** Company GHI’s Cost-of-Goods-Sold Budget

- Build an updated version of Company GHI’s Income Statement by adding in the projections for (i) miscellaneous expenses, (ii) research and development, and (iii) rent. Remember that the depreciation projections will not be added to the Income Statement until a Capital Budget is completed (which is not covered in the chapter or in the questions for

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>INVENTORY BUDGET</b>					
<u>Inventory Budget</u>					
Desired ending inventory	\$ 228,000	\$ 232,320	\$ 226,722	\$ 226,722	\$ 226,722
+ Cost of goods sold	1,072,500	1,026,000	950,400	927,500	3,976,400
<b>= Total inventory needed</b>	<b>\$ 1,300,500</b>	<b>\$ 1,258,320</b>	<b>\$ 1,177,122</b>	<b>\$ 1,154,222</b>	<b>\$ 4,203,122</b>
<b>PURCHASES BUDGET</b>					
<u>Purchases Budget</u>					
Total inventory needed	\$ 1,300,500	\$ 1,258,320	\$ 1,177,122	\$ 1,154,222	N/A
- Beginning inventory	-	228,000	232,320	226,722	-
<b>= Purchases</b>	<b>\$ 1,300,500</b>	<b>\$ 1,030,320</b>	<b>\$ 944,802</b>	<b>\$ 927,500</b>	<b>N/A</b>
<u>Disbursements for Purchases Budget</u>					
Payments of payables	\$ 722,500	\$ 1,150,400	\$ 982,810	\$ 935,190	\$ 3,790,900
<b>Total disbursements for purchases</b>	<b>\$ 722,500</b>	<b>\$ 1,150,400</b>	<b>\$ 982,810</b>	<b>\$ 935,190</b>	<b>\$ 3,790,900</b>
<u>Accounts Payable (A/P) Budget</u>					
Beginning A/P balance	\$ -	\$ 578,000	\$ 457,920	\$ 419,912	\$ -
+ Additions to A/P	578,000	457,920	419,912	412,222	1,868,054
- Subtractions from A/P	-	578,000	457,920	419,912	1,455,832
<b>Ending A/P</b>	<b>\$ 578,000</b>	<b>\$ 457,920</b>	<b>\$ 419,912</b>	<b>\$ 412,222</b>	<b>\$ 412,222</b>

**FIGURE Q5.4** Company GHI’s Inventory Budget, Purchases Budget, Disbursements for Purchases Budget, and Accounts Payable Budget

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>HEADCOUNT BUDGET</b>					
<u>Headcount Budget</u>					
Number of employees					
Chief Executive Officer	1	1	1	1	
Chief Financial Officer	1	1	1	1	
VP, Engineering	1	1	1	1	
VP, Sales & Marketing	1	1	1	1	
VP, Business Development	-	-	-	-	1
Salesperson	6	6	7	9	
Hardware Engineer	3	4	4	4	
Controller/Accountant	1	1	1	1	
Administrative Assistant	2	2	2	2	
<b>Total</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>21</b>	
Periodic base salaries					
Chief Executive Officer	\$ 41,250	\$ 41,250	\$ 41,250	\$ 41,250	\$ 165,000
Chief Financial Officer	36,250	36,250	36,250	36,250	145,000
VP, Engineering	35,000	35,000	35,000	35,000	140,000
VP, Sales & Marketing	33,750	33,750	33,750	33,750	135,000
VP, Business Development	32,500	32,500	32,500	32,500	130,000
Salesperson	25,000	25,000	25,000	25,000	100,000
Hardware Engineer	23,750	23,750	23,750	23,750	95,000
Controller/Accountant	12,500	12,500	12,500	12,500	50,000
Administrative Assistant	8,125	8,125	8,125	8,125	32,500
<b>Total</b>	<b>\$ 248,125</b>	<b>\$ 248,125</b>	<b>\$ 248,125</b>	<b>\$ 248,125</b>	<b>\$ 992,500</b>

**FIGURE Q5.5** Company GHI’s Headcount Overview Worksheet

this chapter). Be sure to calculate Company GHI’s projected income from operations in the updated version of Company GHI’s Income Statement.

4. Build another updated version of Company GHI’s Income Statement by calculating the projected tax expenses for Company GHI. Assume that Company GHI will pay taxes if it generates positive taxable income and will not pay taxes if it does not generate positive taxable income. Be sure to include line items for taxable income and for net income in your updated Income Statement. Remember that the interest expense projection will not be added to the Income Statement until Chapter 6.

	Period					
	1Q X4	2Q X4	3Q X4	4Q X4	X4	
<b>HEADCOUNT BUDGET</b>						
<u>Headcount Budget</u>						
Periodic salary expense (base)						
Chief Executive Officer	\$ 41,250	\$ 41,250	\$ 41,250	\$ 41,250	\$ 165,000	
Chief Financial Officer	36,250	36,250	36,250	36,250	145,000	
VP, Engineering	35,000	35,000	35,000	35,000	140,000	
VP, Sales & Marketing	33,750	33,750	33,750	33,750	135,000	
VP, Business Development	-	-	-	32,500	32,500	
Salesperson	150,000	150,000	175,000	225,000	700,000	
Hardware Engineer	71,250	95,000	95,000	95,000	356,250	
Controller/Accountant	12,500	12,500	12,500	12,500	50,000	
Administrative Assistant	16,250	16,250	16,250	16,250	65,000	
<b>Total</b>	<b>\$ 396,250</b>	<b>\$ 420,000</b>	<b>\$ 445,000</b>	<b>\$ 527,500</b>	<b>\$ 1,788,750</b>	
<b>Total (with benefits)</b>	<b>\$ 459,650</b>	<b>\$ 487,200</b>	<b>\$ 516,200</b>	<b>\$ 611,900</b>	<b>\$ 2,074,950</b>	

FIGURE Q5.6 Company GHI’s Headcount Cost Worksheet

	Period					
	1Q X4	2Q X4	3Q X4	4Q X4	X4	
<b>OPERATING EXPENSES BUDGET</b>						
<u>Operating Expenses Budget</u>						
Salaries	\$ 459,650	\$ 487,200	\$ 516,200	\$ 611,900	\$ 2,074,950	
Miscellaneous expenses	88,000	97,200	106,650	94,208	386,058	
Research and development	132,000	140,400	149,310	157,013	578,723	
Rent	15,750	15,750	15,750	15,750	63,000	
Depreciation	-	-	-	-	-	
<b>Total operating expenses</b>	<b>\$ 695,400</b>	<b>\$ 740,550</b>	<b>\$ 787,910</b>	<b>\$ 878,870</b>	<b>\$ 3,102,730</b>	
<b>DISBURSEMENTS FOR OPERATING EXPENSES BUDGET</b>						
<u>Disbursements for Operating Expenses Budget</u>						
Salaries	\$ 459,650	\$ 487,200	\$ 516,200	\$ 611,900	\$ 2,074,950	
Miscellaneous expenses	88,000	97,200	106,650	94,208	386,058	
Research and development	132,000	140,400	149,310	157,013	578,723	
Rent	15,750	15,750	15,750	15,750	63,000	
Depreciation	-	-	-	-	-	
<b>Total disbursements for operating expenses</b>	<b>\$ 695,400</b>	<b>\$ 740,550</b>	<b>\$ 787,910</b>	<b>\$ 878,870</b>	<b>\$ 3,102,730</b>	

FIGURE Q5.7 Company GHI’s Operating Expenses Budget and Disbursements for Operating Expenses Budget

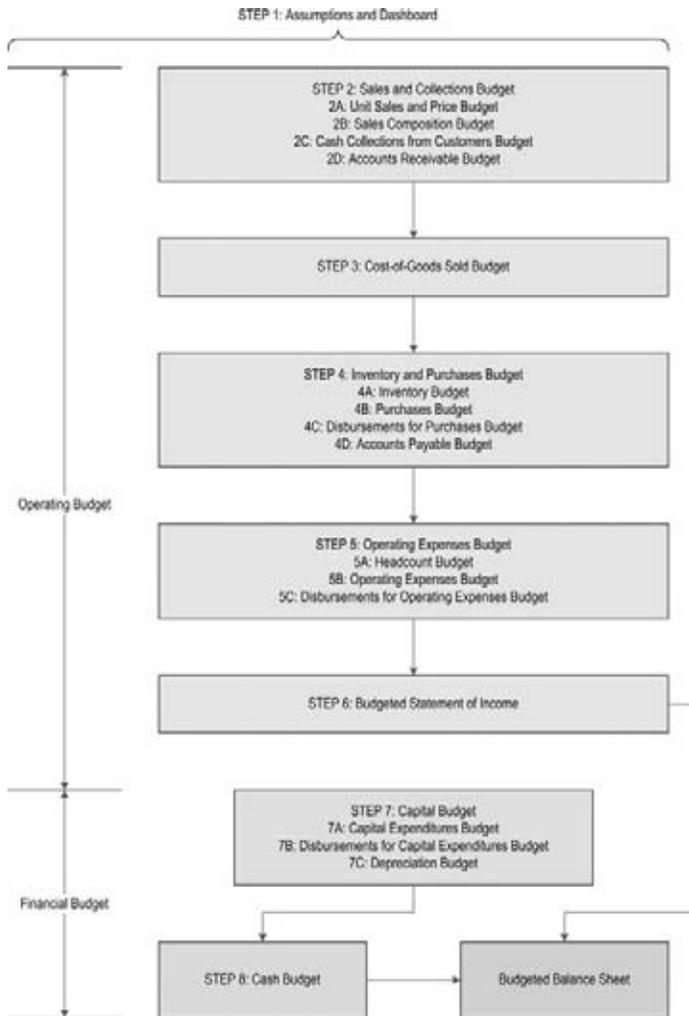
## Financial Budget—Capital Budget and Cash Budget

**T**he Financial Budget represents the second of the two components of the Master Budget (the Operating Budget represents the first component) and includes the following components: the Capital Budget, the Cash Budget, and the budgeted Balance Sheet. In conjunction with the steps outlined in Chapters 2 through 5, this chapter represents the final step in building the Master Budget. Subsequent chapters in this book will cover topics such as the consolidated financial statements, free cash flows, and a variety of financial modeling tools and techniques. Figure 6.1 highlights the components of the Financial Budget and their relative position in the Master Budget hierarchy.

### **STEP 7A: CAPITAL EXPENDITURES BUDGET**

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The Capital Expenditures Budget (also known as the “CAPEX” budget) covers Napavale’s projected purchases of large items such as equipment and furniture. When a business purchases something such as a computer or a desk for its own use, it must decide if it will expense or capitalize such an item. While many accounting regulations and pronouncements surround this issue of expensing versus capitalizing purchased goods, I will cover this topic in a very general fashion. In basic terms, Napavale’s financial model assumes that large-value purchases, such as for furniture, are capitalized. When and if you build your own financial model, the issue of capitalization versus expensing is something you must address in a manner consistent with the business for which you are building a financial model. Figure 6.2 presents a view of the Assumptions and Dashboard worksheet in which my assumptions underlying Napavale’s projected capital expenditures are shown.



**FIGURE 6.1** Components of the Financial Budget and Their Relative Position in the Master Budget

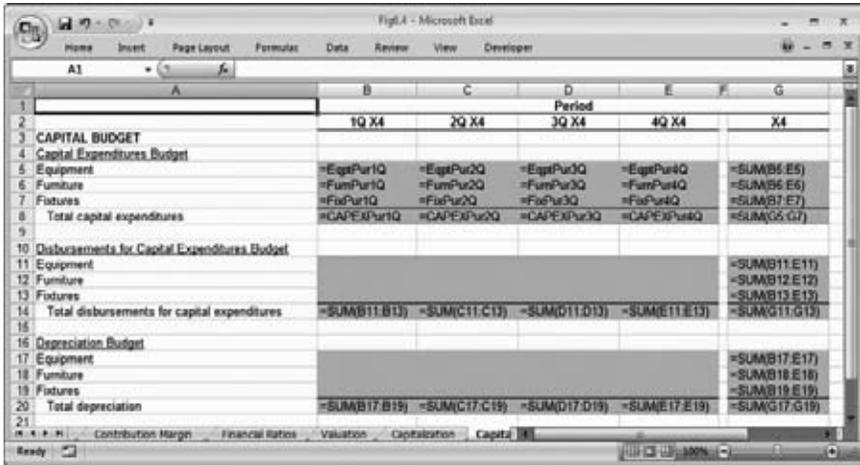
Note that I am including three line items for Napavale’s Capital Expenditures Budget: equipment (used for manufacturing and assembling Napavale’s products), furniture, and fixtures. These are broad categories for capital expenditures and you may choose to use different line items if and when you build your own financial model. Figure 6.3 presents a view of the Capital Expenditures Budget worksheet.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Operating Expenses Inputs</b>					
Miscellaneous expenses as a % of sales	3.0%	3.0%	3.0%	3.0%	
R&D expenses as a % of sales	7.0%	7.0%	8.0%	8.0%	
Rent expense per square foot per quarter	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	
Square feet of space rented	4,000	4,000	4,000	4,000	
Total rent expense	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	
Tax rate	35.0%	35.0%	35.0%	35.0%	
<b>Capital Worksheet</b>					
<b>Capital Expenditures (CAPEX) Inputs</b>					
Equipment purchases	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	
Furniture purchases	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	
Fixtures purchases	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	
Total CAPEX purchases	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	

FIGURE 6.2 Assumptions and Dashboard Worksheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>CAPITAL BUDGET</b>					
<b>Capital Expenditures Budget</b>					
Equipment	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 120,000
Furniture	10,000	10,000	10,000	10,000	40,000
Fixtures	5,000	5,000	5,000	5,000	20,000
Total capital expenditures	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 180,000
<b>Disbursements for Capital Expenditures Budget</b>					
Equipment					\$ -
Furniture					-
Fixtures					-
Total disbursements for capital expenditures	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Depreciation Budget</b>					
Equipment					\$ -
Furniture					-
Fixtures					-
Total depreciation	\$ -	\$ -	\$ -	\$ -	\$ -

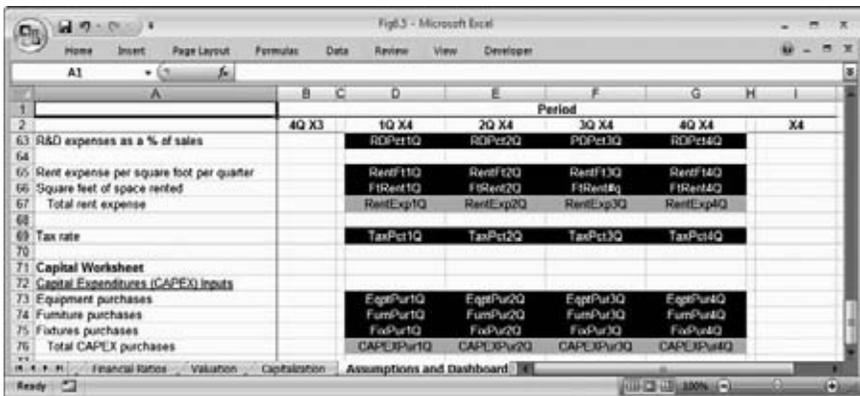
FIGURE 6.3 Capital Expenditures Budget



**FIGURE 6.4** Alternative View of the Capital Expenditures Budget

Figure 6.4 offers an alternative view of the Capital Expenditures Budget worksheet in which the values and formulas underlying the cells in the worksheet are exposed and visible. Note that I continue to name each cell that contains an important value for ease of reference.

The names of the input and output cells in the Assumptions and Dashboard worksheet are shown in Figure 6.5. Figure 6.6 offers a view of the names of the input and output cells in the Capital Expenditures Budget worksheet.



**FIGURE 6.5** Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
3 CAPITAL BUDGET					
4 Capital Expenditures Budget					
5 Equipment					EqpPurX4
6 Furniture					FurnPurX4
7 Fixtures					FixPurX4
8 Total capital expenditures					CAPEXPurX4
10 Disbursements for Capital Expenditures Budget					
11 Equipment					
12 Furniture					
13 Fixtures					
14 Total disbursements for capital expenditures					
16 Depreciation Budget					
17 Equipment					
18 Furniture					
19 Fixtures					
20 Total depreciation					

**FIGURE 6.6** Names of the Input and Output Cells in the Capital Expenditures Budget

## STEP 7B: DISBURSEMENTS FOR CAPITAL EXPENDITURES BUDGET

The Disbursements for Capital Expenditures Budget reconciles the accrual values from Step 7A to cash figures. This schedule ties into the creation of the Cash Budget, which is covered later in this chapter. My financial model makes the assumption that Napavale disburses, or pays for, 100 percent of the current period’s capital expenditures purchases. This assumption is highlighted in the Assumptions and Dashboard worksheet in Figure 6.7. Note that I am treating the disbursements for capital expenditures in a fundamentally different way than I treated the disbursements for operating expenses in Chapter 4.

While I utilized the concept of “days payable” in Chapter 4 for the Disbursements for Operating Expenses Budget, I address the issue of linking disbursements for capital expenditures to the purchases projections for capital expenditures by assuming a certain percentage of a given period’s purchases are paid for, or disbursed, in that same period.

It is important to note that I am assuming all capital expenditures will be paid for in either the period in which the item underlying the capital expenditure is bought or in the following period. As such, all capital expenditure purchases are either paid for in the period in which they were purchased or

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Operating Expenses Worksheet</b>					
<b>Operating Expenses Inputs</b>					
Miscellaneous expenses as a % of sales	3.0%	3.0%	3.0%	3.0%	
R&D expenses as a % of sales	7.0%	7.0%	8.0%	8.0%	
Rent expense per square foot per quarter	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	
Square feet of space rented	4,000	4,000	4,000	4,000	
Total rent expense	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	
Tax rate	35.0%	35.0%	35.0%	35.0%	
<b>Capital Worksheet</b>					
<b>Capital Expenditures (CAPEX) Inputs</b>					
Equipment purchases	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	
Furniture purchases	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	
Fixtures purchases	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	
Total CAPEX purchases	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	
<b>CAPEX Disbursements Inputs</b>					
% of purchases paid for in purchase period	100%	100%	100%	100%	

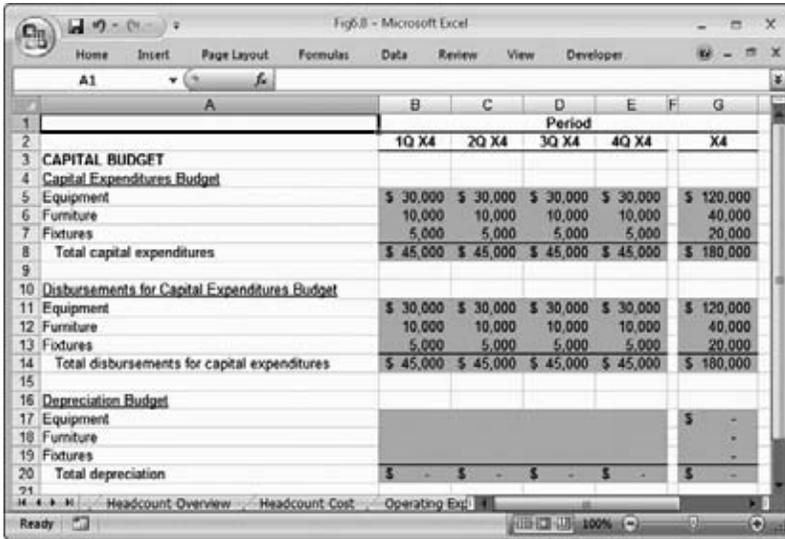
**FIGURE 6.7** Assumptions and Dashboard Worksheet

in the immediately subsequent period. This is not an issue in my financial model for Napavale as I am assuming all capital expenditure purchases are paid for in the period incurred, but you can modify this style of financial model to account for different assumptions.

This “percentage paid for in a given period” approach to linking accrual-based budget figures and actual cash disbursements for those purchases represents another approach to building a financial model as compared to the days payable approach highlighted in Chapter 4. I am presenting this percentage approach for the sake of reference. You should feel free to use whichever approach is most appropriate for your own financial models.

Figure 6.8 presents the Capital Expenditures Budget worksheet, which now includes projections for the disbursements for capital expenditures.

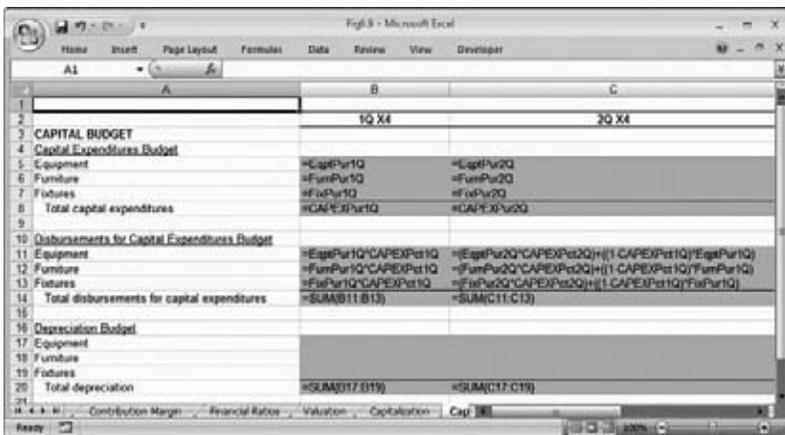
Figure 6.9 offers an alternative view of the Capital Expenditures Budget worksheet in which the values and formulas contained within the worksheet’s cells are exposed. Due to the length of several of the formulas in this worksheet, only a few of the columns are shown in Figure 6.9. Based on the manner in which the “percentage disbursement” approach for capital expenditures works, I need to account for the payment of capital expenditures incurred in prior periods using the formulas shown in the rows in



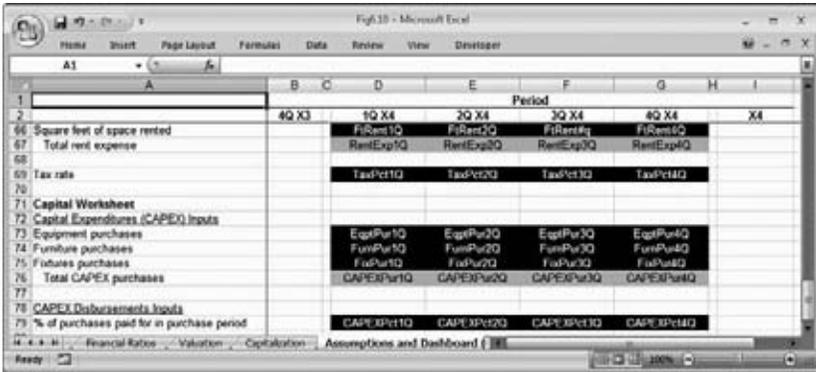
**FIGURE 6.8** Capital Expenditures Budget

the worksheet under the “Disbursements for Capital Expenditures Budget” heading.

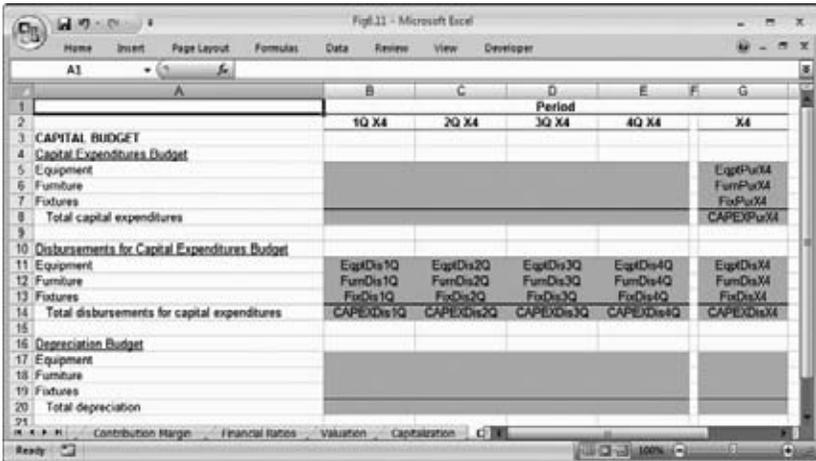
The names of the input and output cells in the Assumptions and Dashboard worksheet are presented in Figure 6.10. Figure 6.11 offers a view of the names of the input and output cells in the Disbursements for Capital Expenditures Budget worksheet.



**FIGURE 6.9** Alternative View of the Capital Expenditures Budget



**FIGURE 6.10** Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet



**FIGURE 6.11** Names of the Input and Output Cells in the Disbursements for Capital Expenditures Budget

**STEP 7C: DEPRECIATION BUDGET**

The Depreciation Budget addresses projected depreciation expenses for Navavale. When a business accounts for the purchase of an item as a capital expenditure, that item must be depreciated. The philosophy underlying the concept of depreciation is this: If a company purchases and capitalizes an asset, the benefits that accrue from that asset will be recognized over a

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>71 Capital Worksheet</b>					
<b>72 Capital Expenditures (CAPEX) Inputs</b>					
73 Equipment purchases	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	
74 Furniture purchases	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	
75 Fixtures purchases	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	
76 Total CAPEX purchases	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	
<b>78 CAPEX Disbursements Inputs</b>					
79 % of purchases paid for in purchase period	100%	100%	100%	100%	
<b>81 Depreciation Inputs</b>					
82 Equipment depreciable life (years)					5.0
83 Furniture depreciable life (years)					5.0
84 Fixtures depreciable life (years)					4.0
85					
86 Quarters per year					4.0
87					
88 Equipment depreciation multiplier	5.0%	5.0%	5.0%	5.0%	
89 Furniture depreciation multiplier	5.0%	5.0%	5.0%	5.0%	
90 Fixtures depreciation multiplier	6.3%	6.3%	6.3%	6.3%	
91					

**FIGURE 6.12** Assumptions and Dashboard Worksheet

number of accounting periods in the future—that asset is depreciated over the expected period of benefit underlying the associated asset. Depreciation is an expense that appears as an operating expense in Napavale’s Operating Budget.

Depreciation expenses, when calculated using the “straight line” method, are calculated in the following manner: the beginning value of an asset/the number of periods of expected benefit. So, for example, if a company capitalizes an asset with a value of \$100 and the company believes it will receive benefit from that asset for five accounting periods, the depreciation expense for each accounting period will be equal to  $\$100/5$ , or \$20. Figure 6.12 presents a view of the Assumptions and Dashboard worksheet in which the assumptions underlying depreciation for Napavale’s asset classes are shown.

The “depreciation multiplier” line items in Figure 6.12 represent the value by which capital expenditure purchases will be multiplied in each period over the purchases’ depreciable life. The product of this multiplication will equal the depreciation expense for each line item for each period. This process is covered in greater detail over the course of this chapter.

Figure 6.13 offers a view of Napavale’s Depreciation Budget and includes a line item that calculates the total depreciation expense for each period. Remember that this total depreciation expense flows directly into Napavale’s Income Statement from Step 6.

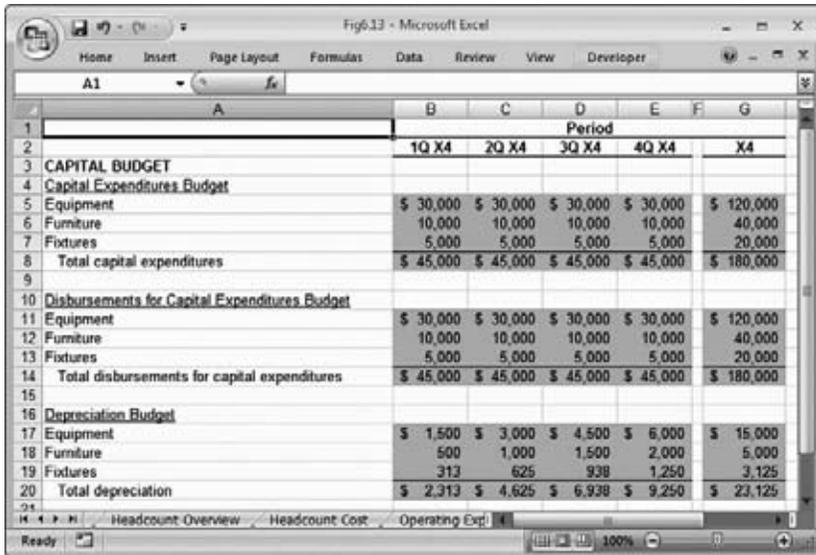


FIGURE 6.13 Depreciation Budget

An alternative view of Napavale’s Depreciation Budget in which the values and formulas underlying the contents of each worksheet cell is presented in Figure 6.14. Note the references to the asset values and the depreciation multipliers in each calculation cell. Due to the length of some of the formulas in the worksheet shown in Figure 6.14, not all of the columns in the worksheet are visible.

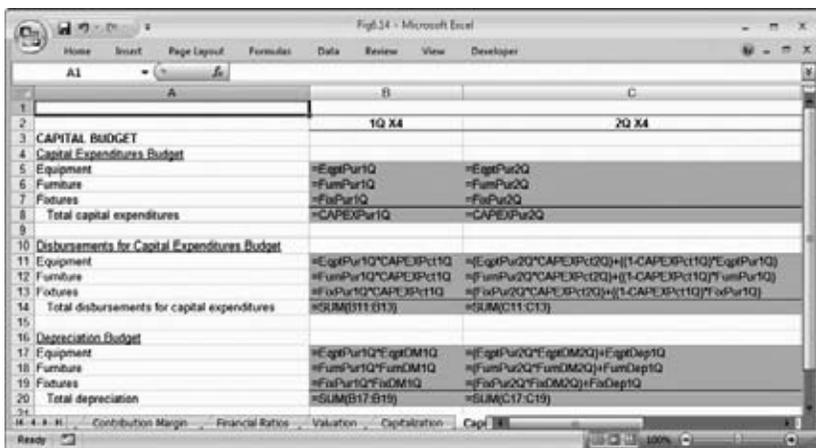


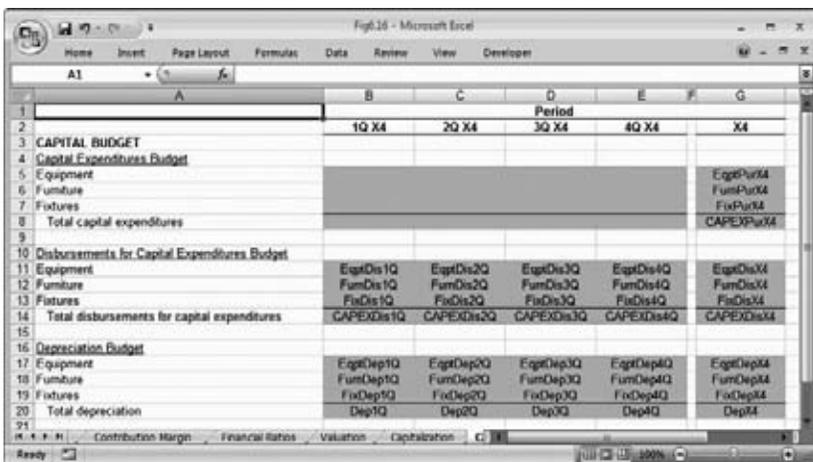
FIGURE 6.14 Alternative View of the Depreciation Budget



**FIGURE 6.15** Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet

Figure 6.15 shows the names of the input and output cells from the Assumptions and Dashboard worksheet. The names of the input and output cells in the Depreciation Budget worksheet are presented in Figure 6.16.

It is important to calculate the net effect (or total affect) of capitalized asset purchases and depreciation expenses on Napavale’s base of fixed assets. Fixed assets, which are calculated net of depreciation (or after subtracting



**FIGURE 6.16** Names of the Input and Output Cells in the Depreciation Budget

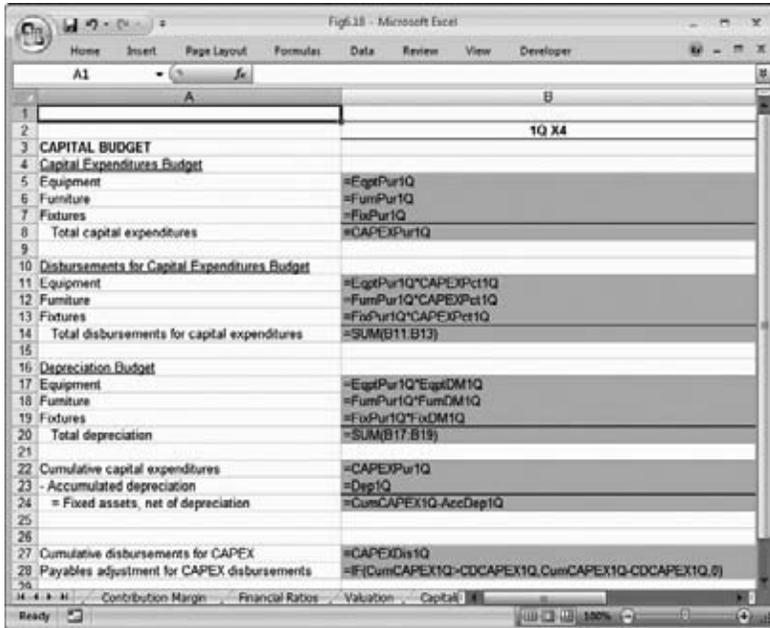
1	A	Period				G
		B	C	D	E	
2		1Q X4	2Q X4	3Q X4	4Q X4	X4
3	<b>CAPITAL BUDGET</b>					
4	<u>Capital Expenditures Budget</u>					
5	Equipment	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 120,000
6	Furniture	10,000	10,000	10,000	10,000	40,000
7	Fixtures	5,000	5,000	5,000	5,000	20,000
8	Total capital expenditures	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 180,000
9						
10	<u>Disbursements for Capital Expenditures Budget</u>					
11	Equipment	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 120,000
12	Furniture	10,000	10,000	10,000	10,000	40,000
13	Fixtures	5,000	5,000	5,000	5,000	20,000
14	Total disbursements for capital expenditures	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 180,000
15						
16	<u>Depreciation Budget</u>					
17	Equipment	\$ 1,500	\$ 3,000	\$ 4,500	\$ 6,000	\$ 15,000
18	Furniture	500	1,000	1,500	2,000	5,000
19	Fixtures	313	625	938	1,250	3,125
20	Total depreciation	\$ 2,313	\$ 4,625	\$ 6,938	\$ 9,250	\$ 23,125
21						
22	Cumulative capital expenditures	\$ 45,000	\$ 90,000	\$ 135,000	\$ 180,000	
23	- Accumulated depreciation	2,313	6,938	13,875	23,125	
24	= Fixed assets, net of depreciation	\$ 42,688	\$ 83,063	\$ 121,125	\$ 156,875	
25						
26						
27	Cumulative disbursements for CAPEX	\$ 45,000	\$ 90,000	\$ 135,000	\$ 180,000	
28	Payables adjustment for CAPEX disbursements	\$ -	\$ -	\$ -	\$ -	
29						

FIGURE 6.17 Capital Budget Worksheet

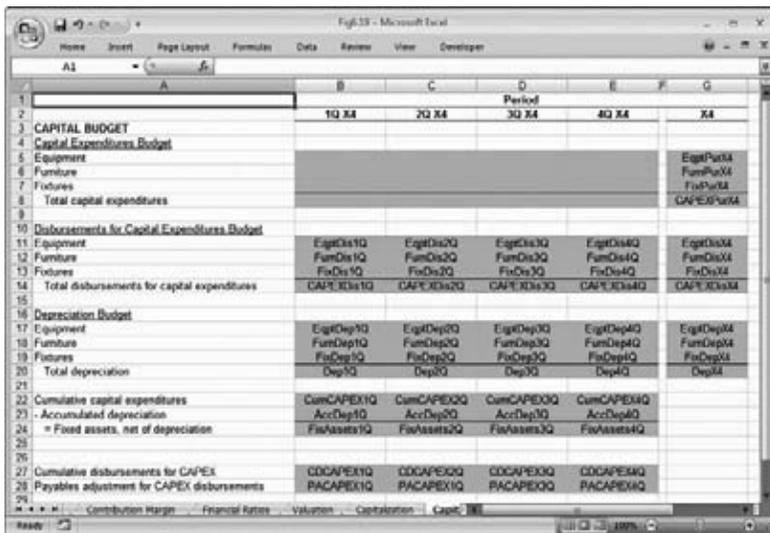
depreciation expenses), appear on Napavale’s Balance Sheet; I discuss the construction of the Balance Sheet in Chapter 7.

The calculation of Napavale’s fixed assets net of depreciation incorporates two elements: Napavale’s cumulative capital expenditures and accumulated depreciation over the time horizon of the financial model. Figure 6.17 offers a view of this calculation from the Capital Budget worksheet. Note that I have also added a calculation to determine any difference between Napavale’s capital expenditure expenses and disbursements for capital expenditures. This calculation will influence the Balance Sheet in Chapter 7.

Figure 6.18 exposes the contents of the worksheet cells for this calculation from the Capital Budget worksheet. The calculation of fixed assets net of depreciation for each time period is equal to: the running total of Napavale’s capital expenditures – the running total of Napavale’s depreciation. Note that several of the columns in the worksheet shown in Figure 6.18 are not displayed due to the length of the formulas underlying the cells in the worksheet. The evolving list of names in the Depreciation Budget worksheet is shown in Figure 6.19.



**FIGURE 6.18** Alternative View of the Capital Budget



**FIGURE 6.19** Names of the Input and Output Cells in the Depreciation Budget

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
Sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000
Cost of goods sold	200,000	291,000	373,800	462,000	1,326,800
Gross profit	\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000	\$ 5,565,200
Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200	\$ 2,301,600
Miscellaneous expenses	30,000	43,200	57,960	76,600	206,760
Research and development	70,000	100,800	154,560	201,600	526,960
Rent	20,000	20,000	20,000	20,000	80,000
Depreciation	2,313	4,625	6,938	9,250	23,125
Income from operations	\$ 207,288	\$ 509,975	\$ 655,143	\$ 1,054,350	\$ 2,426,755
Interest expense					\$ -
Taxable income	\$ 207,288	\$ 509,975	\$ 655,143	\$ 1,054,350	\$ 2,426,755
Tax expense	\$ 72,551	\$ 178,491	\$ 229,300	\$ 369,023	\$ 849,364
Net income	\$ 134,737	\$ 331,484	\$ 425,843	\$ 685,328	\$ 1,577,391

FIGURE 6.20 Income Statement

As indicated in Chapter 5, I now present an updated view of Napavale’s Income Statement, which now includes the line for depreciation expense. The only remaining line item that requires completion is that of “interest expense,” which will be covered later in this chapter. Figure 6.20 offers a view of Napavale’s updated Income Statement.

For the sake of reference, Figure 6.21 offers an alternative view of Napavale’s updated Income Statement in which the values and formulas

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
Sales	=Sales1Q	=Sales2Q	=Sales3Q	=Sales4Q	=SUM(B3:E3)
Cost of goods sold	=COGS1Q	=COGS2Q	=COGS3Q	=COGS4Q	=SUM(B4:E4)
Gross profit	=B3-B4	=C3-C4	=D3-D4	=E3-E4	=G3-G4
Salaries	=SalExp1Q	=SalExp2Q	=SalExp3Q	=SalExp4Q	=SUM(B7:F7)
Miscellaneous expenses	=MiscExp1Q	=MiscExp2Q	=MiscExp3Q	=MiscExp4Q	=SUM(B8:E8)
Research and development	=RDEExp1Q	=RDEExp2Q	=RDEExp3Q	=RDEExp4Q	=SUM(B9:F9)
Rent	=RentExp1Q	=RentExp2Q	=RentExp3Q	=RentExp4Q	=SUM(B10:E10)
Depreciation	=Dep1Q	=Dep2Q	=Dep3Q	=Dep4Q	=SUM(B11:E11)
Income from operations	=Gross1Q-COPExp1Q	=Gross2Q-COPExp2Q	=Gross3Q-COPExp3Q	=Gross4Q-COPExp4Q	=Gross1Q-COPExp1Q
Interest expense					=SUM(B14:E14)
Taxable income	=OpInc1Q-IntE	=OpInc2Q-IntE	=OpInc3Q-IntE	=OpInc4Q-IntE	=OpInc1Q-IntE
Tax expense	=TaxInc1Q-TaxPct1Q	=TaxInc2Q-TaxPct2Q	=TaxInc3Q-TaxPct3Q	=TaxInc4Q-TaxPct4Q	=SUM(B17:E17)
Net income	=TaxInc1Q-TaxExp1Q	=TaxInc2Q-TaxExp2Q	=TaxInc3Q-TaxExp3Q	=TaxInc4Q-TaxExp4Q	=SUM(B18:E18)

FIGURE 6.21 Alternative View of the Income Statement

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					

**FIGURE 6.22** Names of the Input and Output Cells in the Income Statement

underlying each cell are exposed and visible. The names underlying the Income Statement worksheet are shown in Figure 6.22.

## STEP 8: CASH BUDGET

The Cash Budget, which tracks Napavale’s cash balance at the beginning and ending of each accounting period, is an important component of the Master Budget. As is often said in finance, “cash is king,” and it is essential to maintain a detailed view of a company’s cash balance.

The Cash Budget draws on information from several schedules, including the Income Statement and the Assumptions and Dashboard worksheet. Figure 6.23 presents several input variables from the Assumptions and Dashboard worksheet that I have not yet covered for Napavale; these variables will affect the Cash Budget.

As the Cash Budget consists of several sections, I will cover each section separately. Figure 6.24 shows the first section of the Cash Budget, which includes Napavale’s beginning cash balance and cash collections for each period. Figure 6.25 offers another view of the Cash Budget in which the values of the worksheet’s cells are exposed. The names underlying the input

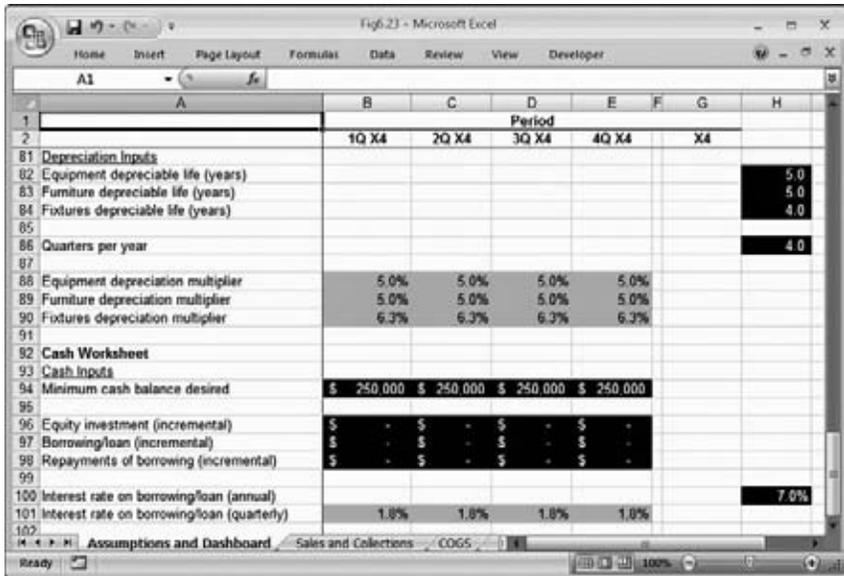


FIGURE 6.23 Assumptions and Dashboard Worksheet

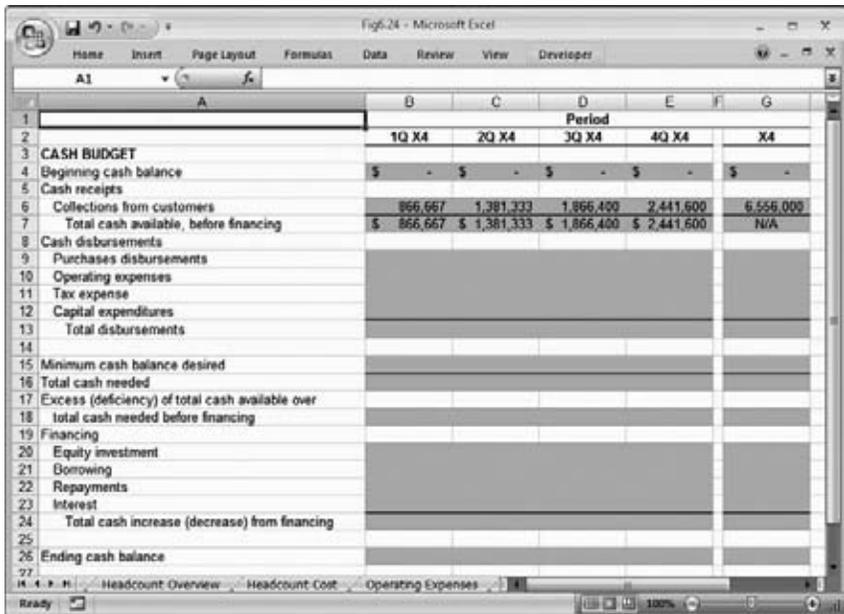


FIGURE 6.24 First Section of the Cash Budget

	1Q X4	2Q X4	3Q X4
3 CASH BUDGET			
4 Beginning cash balance	0	=EndCash1Q	=EndCash2Q
5 Cash receipts			
6 Collections from customers	=Collections1Q	=Collections2Q	=Collections3Q
7 Total cash available, before financing	=BegCash1Q+Collections1Q	=BegCash2Q+Collections2Q	=BegCash3Q+Collections3Q
8 Cash disbursements			
9 Purchases disbursements			
10 Operating expenses			
11 Tax expense			
12 Capital expenditures			
13 Total disbursements			
14			
15 Minimum cash balance desired			
16 Total cash needed			
17 Excess (deficiency) of total cash available over total cash needed before financing			
18			
19 Financing			
20 Equity investment			
21 Borrowing			
22 Repayments			
23 Interest			
24 Total cash increase (decrease) from financing			
25			
26 Ending cash balance			
27			

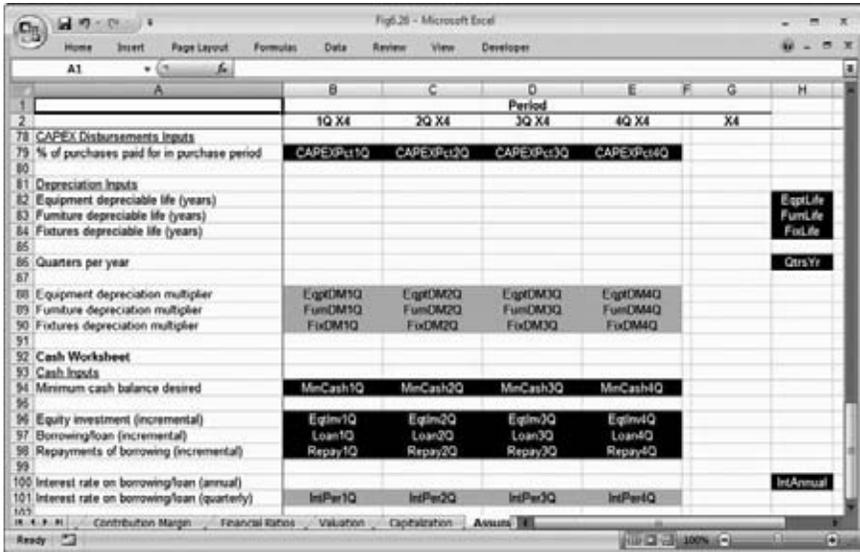
**FIGURE 6.25** Alternative View of the First Section of the Cash Budget

and output cells in the Assumptions and Dashboard worksheet are shown in Figure 6.26. Figure 6.27 highlights the names of the input and output cells from the Cash Budget itself.

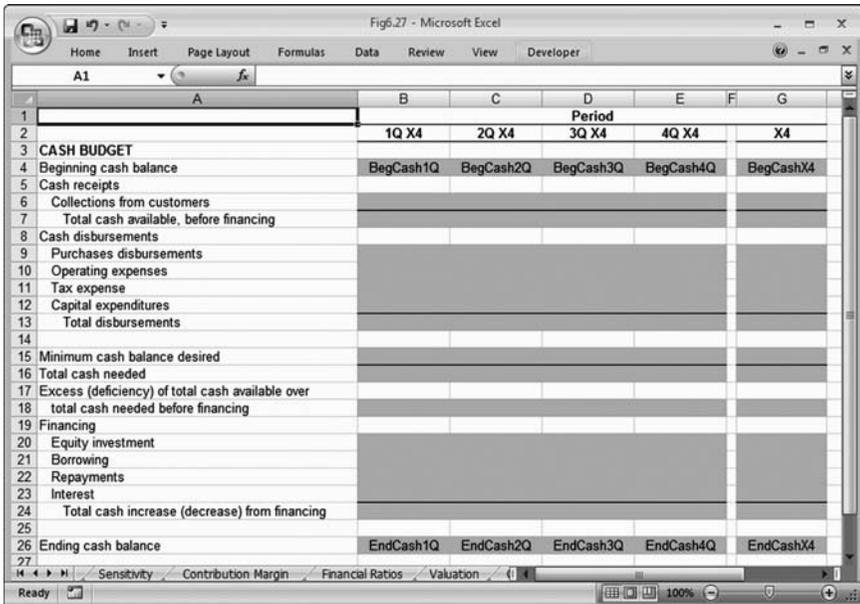
The next section of the Cash Budget is presented in Figure 6.28. This section identifies Napavale’s cash disbursements for each period and calculates the excess or deficiency of total cash available compared to the total cash required by the business (as stated on the Assumptions and Dashboard worksheet) before any financing takes place. Note that the “minimum cash balance” desired may be influenced by loan covenants if a company borrows money. Figure 6.29 offers an alternative view of the evolving Cash Budget in which the values and formulas in the worksheet cells are exposed and visible.

Note the formulas underlying the calculation of “total cash needed” and “excess (deficiency) of total cash available over total cash needed before financing.” These calculations draw from both Napavale’s projected cash receipts and cash disbursements as well as from the assumption underlying the “minimum cash balance desired.” The evolving lists of names of the input and output cells in the Cash Budget are shown in Figure 6.30.

A final calculation to determine the “loan value used for interest calculations” in the Assumptions and Dashboard worksheet is shown in Figure 6.31. This calculation is used to simplify the calculation of periodic interest expenses associated with Napavale’s borrowings (if any) for the Cash



**FIGURE 6.26** Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet



**FIGURE 6.27** Names of the Input and Output Cells in the Cash Budget

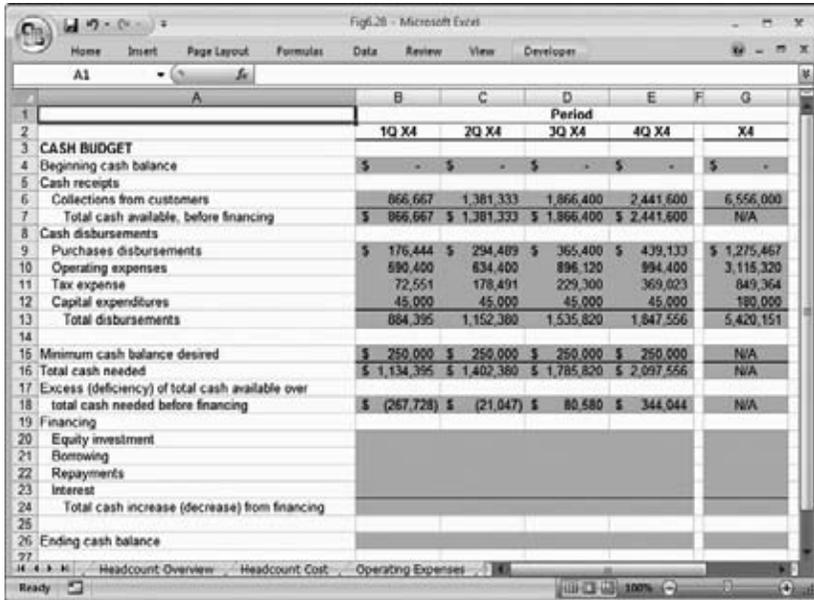


FIGURE 6.28 Next Section of the Cash Budget

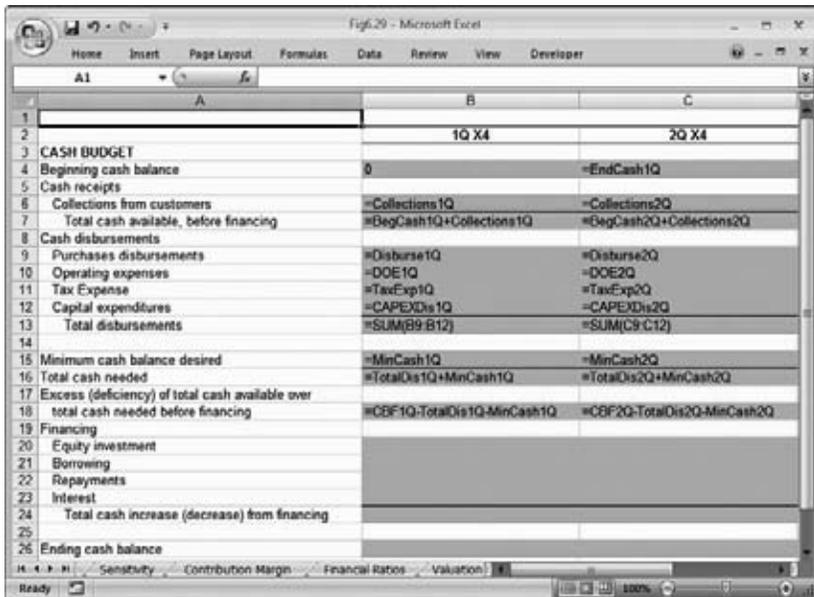


FIGURE 6.29 Alternative View of the Next Section of the Cash Budget

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>CASH BUDGET</b>					
Beginning cash balance	BegCash1Q	BegCash2Q	BegCash3Q	BegCash4Q	BegCashX4
Cash receipts					
Collections from customers					
Total cash available, before financing	CBF1Q	CBF2Q	CBF3Q	CBF4Q	
Cash disbursements					
Purchases disbursements					
Operating expenses					
Tax expense					
Capital expenditures					
Total disbursements	TotalDis1Q	TotalDis2Q	TotalDis3Q	TotalDis4Q	TotalDisX4
Minimum cash balance desired					
Total cash needed	CashNeed1Q	CashNeed2Q	CashNeed3Q	CashNeed4Q	
Excess (deficiency) of total cash available over total cash needed before financing					
Financing					
Equity investment					
Borrowing					
Repayments					
Interest					
Total cash increase (decrease) from financing					
Ending cash balance	EndCash1Q	EndCash2Q	EndCash3Q	EndCash4Q	EndCashX4

FIGURE 6.30 Names of the Input and Output Cells in the Cash Budget

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>CAPEX Disbursements Inputs</b>					
% of purchases paid for in purchase period	100%	100%	100%	100%	
<b>Depreciation Inputs</b>					
Equipment depreciable life (years)					5.0
Furniture depreciable life (years)					5.0
Fixtures depreciable life (years)					4.0
Quarters per year					4.0
Equipment depreciation multiplier	5.0%	5.0%	5.0%	5.0%	
Furniture depreciation multiplier	5.0%	5.0%	5.0%	5.0%	
Fixtures depreciation multiplier	6.3%	6.3%	6.3%	6.3%	
<b>Cash Worksheet</b>					
<b>Cash Inputs</b>					
Minimum cash balance desired	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	
Equity investment (incremental)	\$ -	\$ -	\$ -	\$ -	
Borrowing/loan (incremental)	\$ -	\$ -	\$ -	\$ -	
Repayments of borrowing (incremental)	\$ -	\$ -	\$ -	\$ -	
Interest rate on borrowing/loan (annual)					7.0%
Interest rate on borrowing/loan (quarterly)	1.8%	1.8%	1.8%	1.8%	
Loan value used for interest calculations	\$ -	\$ -	\$ -	\$ -	

FIGURE 6.31 Assumptions and Dashboard Worksheet

Budget. An alternative view of the Assumptions and Dashboard worksheet is presented in Figure 6.32 to highlight the calculations underlying the periodic interest expense figures mentioned in Figure 6.31.

The final section of the Cash Budget is presented in Figure 6.33. This section incorporates assumptions regarding the equity investments into Napavale, Napavale’s borrowings, repayments, and interest payments. This section also calculates the change in Napavale’s cash balance due to financing (including equity and debt activity) as well as Napavale’s ending cash balance for each period.

Please note that for the calculation of interest on borrowings, Napavale’s financial model calculates interest only if there is at least one period separating a borrowing and a repayment. If money is borrowed in one period and repaid in the subsequent period, one period of interest is computed for that borrowing. There are many ways to calculate interest on borrowings; my approach is simple and straightforward.

The ending cash balance is a very important figure that flows directly into Napavale’s Balance Sheet, covered in Chapter 7. Figure 6.34 offers an alternative view of the Cash Budget in which the values and formulas contained within the cells in the worksheet are exposed and visible.

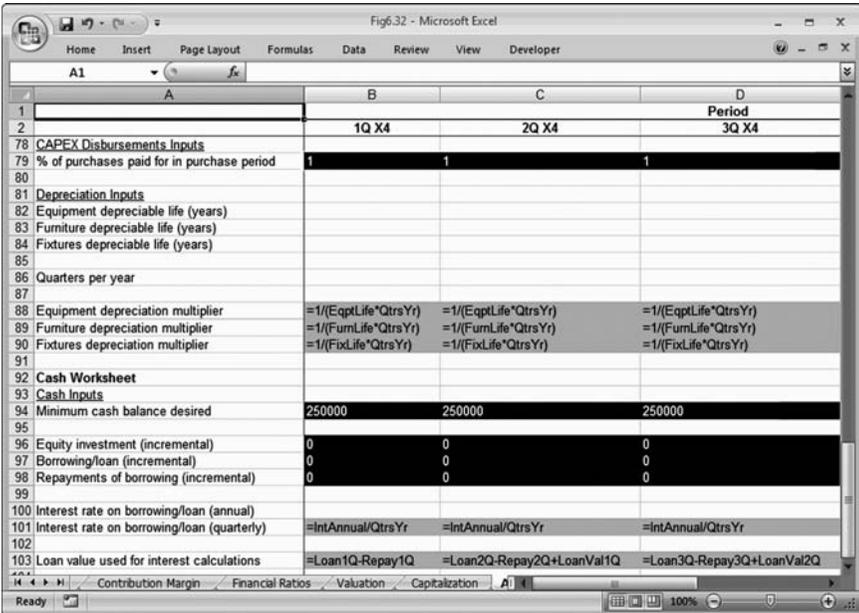


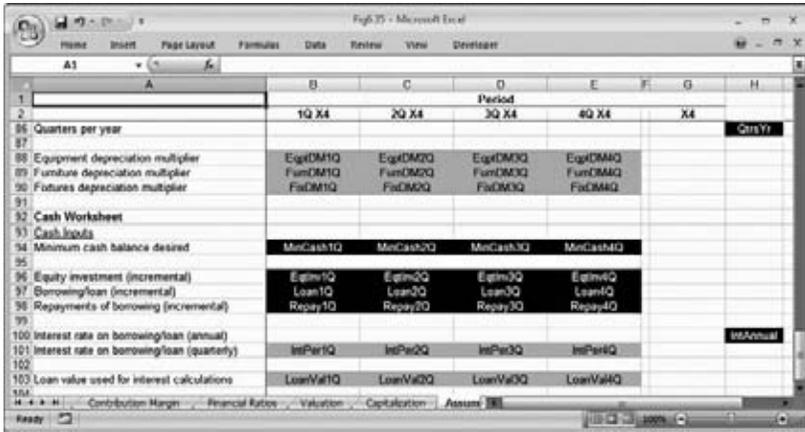
FIGURE 6.32 Alternative View of the Assumptions and Dashboard Worksheet

	Period				X4
	1Q X4	2Q X4	3Q X4	4Q X4	
<b>CASH BUDGET</b>					
Beginning cash balance	\$ -	\$ 982,272	\$ 1,260,350	\$ 1,540,930	\$ -
Cash receipts					
Collections from customers	866,667	1,381,333	1,866,400	2,441,600	6,556,000
Total cash available, before financing	\$ 866,667	\$ 2,363,605	\$ 3,126,750	\$ 3,982,530	N/A
Cash disbursements					
Purchases disbursements	\$ 176,444	\$ 294,489	\$ 365,400	\$ 439,133	\$ 1,275,467
Operating expenses	590,400	634,400	896,120	994,400	3,115,320
Tax expense	72,551	178,491	229,300	369,023	849,364
Capital expenditures	45,000	45,000	45,000	45,000	180,000
Total disbursements	884,395	1,152,380	1,535,820	1,847,556	5,420,151
Minimum cash balance desired	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	N/A
Total cash needed	\$ 1,134,395	\$ 1,402,380	\$ 1,785,820	\$ 2,097,556	N/A
Excess (deficiency) of total cash available over total cash needed before financing	\$ (267,728)	\$ 961,225	\$ 1,340,930	\$ 1,884,974	N/A
Financing					
Equity investment	\$ 1,000,000	\$ -	\$ -	\$ -	\$ 1,000,000
Borrowing	-	50,000	-	-	50,000
Repayments	-	-	(50,000)	-	(50,000)
Interest	-	(875)	-	-	(875)
Total cash increase (decrease) from financing	\$ 1,000,000	\$ 49,125	\$ (50,000)	\$ -	\$ 999,125
Ending cash balance	\$ 982,272	\$ 1,260,350	\$ 1,540,930	\$ 2,134,974	\$ 2,134,974

FIGURE 6.33 Final Section of the Cash Budget

	1Q X4	2Q X4
<b>CASH BUDGET</b>		
Beginning cash balance	0	=EndCash1Q
Cash receipts		
Collections from customers	=Collections1Q	=Collections2Q
Total cash available, before financing	=BegCash1Q+Collections1Q	=BegCash2Q+Collections2Q
Cash disbursements		
Purchases disbursements	=Disburse1Q	=Disburse2Q
Operating expenses	=OOE1Q	=OOE2Q
Tax expense	=TaxExp1Q	=TaxExp2Q
Capital expenditures	=CAPEXDis1Q	=CAPEXDis2Q
Total disbursements	=SUM(B9:B12)	=SUM(C9:C12)
Minimum cash balance desired	=MinCash1Q	=MinCash2Q
Total cash needed	=TotalDis1Q+MinCash1Q	=TotalDis2Q+MinCash2Q
Excess (deficiency) of total cash available over total cash needed before financing	=CBF1Q>TotalDis1Q-MinCash1Q	=CBF2Q>TotalDis2Q-MinCash2Q
Financing		
Equity investment	=EqInv1Q	=EqInv2Q
Borrowing	=Loan1Q	=Loan2Q
Repayments	=Repay1Q	=Repay2Q
Interest	=-(LoanVal1Q*IntPer1Q)	=-(LoanVal2Q*IntPer2Q)
Total cash increase (decrease) from financing	=SUM(B20:B23)	=SUM(C20:C23)
Ending cash balance	=CBF1Q>TotalDis1Q+FinCashChg1Q	=CBF2Q>TotalDis2Q+FinCashChg2Q

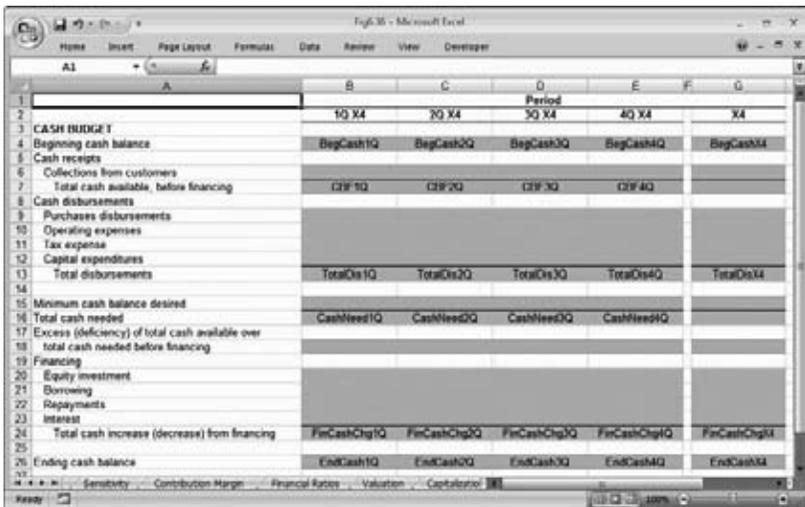
FIGURE 6.34 Alternative View of the Final Section of the Cash Budget



**FIGURE 6.35** Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet

Figure 6.35 offers a view of the names of the input and output cells from the Assumptions and Dashboard worksheet. The final list of the names of the input and output cells from the Cash Budget is presented in Figure 6.36.

Now that I have calculated Napavale’s periodic interest expenses, the last step in this chapter is to present the completed Income Statement. Figure 6.37 presents a view of the completed Income Statement, which now includes projections for interest expense.



**FIGURE 6.36** Names of the Input and Output Cells in the Cash Budget

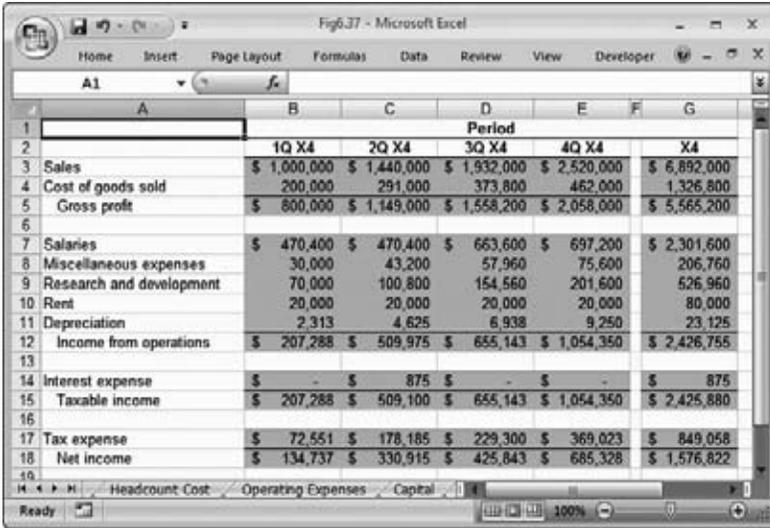


FIGURE 6.37 Income Statement

I named the cells associated with the periodic interest expense figures using the Cash Budget worksheet—these projections flow into the completed Income Statement. Take careful note of the fact that the “named” interest expense figures are negative values, so I have to place a negative sign in front of the referenced value in the Income Statement. Figure 6.38 presents a view of the Cash Budget worksheet with the names of the cells indicated.

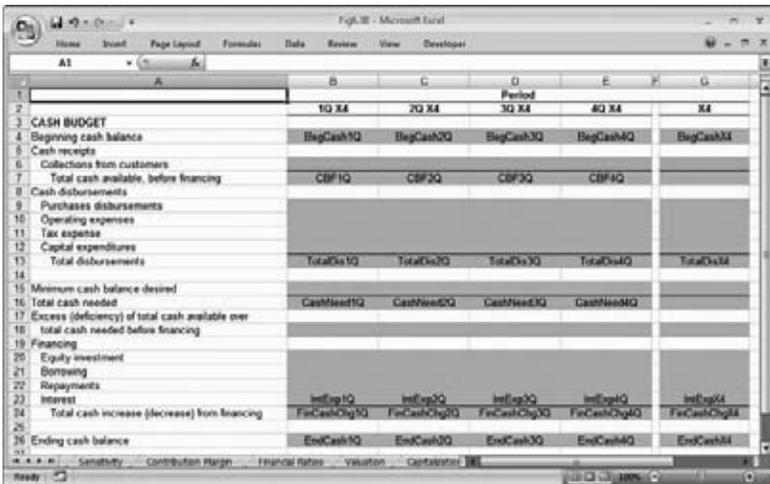


FIGURE 6.38 Names of the Input and Output Cells in the Cash Budget

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
3 Sales	=Sales1Q	=Sales2Q	=Sales3Q	=Sales4Q	=SUM(B3:E3)
4 Cost of goods sold	=COGS1Q	=COGS2Q	=COGS3Q	=COGS4Q	=SUM(B4:E4)
5 Gross profit	=B3-B4	=C3-C4	=D3-D4	=E3-E4	=G3-G4
7 Salaries	=SalExp1Q	=SalExp2Q	=SalExp3Q	=SalExp4Q	=SUM(B7:E7)
8 Miscellaneous expenses	=MiscExp1Q	=MiscExp2Q	=MiscExp3Q	=MiscExp4Q	=SUM(B8:E8)
9 Research and development	=RDExp1Q	=RDExp2Q	=RDExp3Q	=RDExp4Q	=SUM(B9:E9)
10 Rent	=RentExp1Q	=RentExp2Q	=RentExp3Q	=RentExp4Q	=SUM(B10:E10)
11 Depreciation	=Dsp1Q	=Dsp2Q	=Dsp3Q	=Dsp4Q	=SUM(B11:E11)
12 Income from operations	=GrossP1Q-OpExp1Q	=GrossP2Q-OpExp2Q	=GrossP3Q-OpExp3Q	=GrossP4Q-OpExp4Q	=GrossP44-OpExp44
13					
14 Interest expense	=IntExp1Q	=IntExp2Q	=IntExp3Q	=IntExp4Q	=SUM(B14:E14)
15 Taxable income	=Opinc1Q-B14	=Opinc2Q-C14	=Opinc3Q-D14	=Opinc4Q-E14	=Opinc44-G14
16					
17 Tax expense	=TaxInc1Q*TaxPct1Q	=TaxInc2Q*TaxPct2Q	=TaxInc3Q*TaxPct3Q	=TaxInc4Q*TaxPct4Q	=SUM(B17:E17)
18 Net income	=TaxInc1Q-TaxExp1Q	=TaxInc2Q-TaxExp2Q	=TaxInc3Q-TaxExp3Q	=TaxInc4Q-TaxExp4Q	=TaxInc44-TaxExp44
19					

**FIGURE 6.39** Alternative View of the Income Statement

An alternative view of the completed Income Statement is presented in Figure 6.39 in which the values and formulas underlying the worksheet cells are exposed and visible.

## QUESTIONS

Each of the questions for this chapter relate to a hypothetical company named Company JKL. Company JKL sells rain jackets to consumers. As such, Company JKL is a product-oriented (as opposed to a service-oriented) business. The questions for this chapter will address fiscal year X4 on a quarterly basis (four specific quarters, 1Q–4Q for year X4).

The following questions will test your knowledge of the material covered in this chapter in an applied manner—specifically, you will be asked to build the schedules discussed in this chapter for Company JKL.

To prepare you for this chapter's questions, several figures provide background information related to Company JKL's operations. Figure Q6.1 offers a view of a portion of Company JKL's Assumptions and Dashboard worksheet. Note that there are three cost-of-goods-sold components for Company JKL's rain jackets: (1) exterior, (2) interior, and (3) assembly and labor.

Figure Q6.2 presents a view of Company JKL's Unit Sales and Price Budget, Sales Composition Budget, Cash Collections from Customers Budget, and Accounts Receivable Budget. Company JKL's Cost-of-Goods-Sold Budget is shown in Figure Q6.3. Figure Q6.4 presents a view of Company JKL's Inventory Budget, Purchases Budget, Disbursements for Purchases Budget,

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Capital Worksheet</b>					
<b>Capital Expenditures (CAPEX) Inputs</b>					
Equipment purchases	\$ 9,000	\$ 5,000	\$ 3,000	\$ 3,000	
Furniture purchases	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,000	
Fixtures purchases	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	
Total CAPEX purchases	\$ 13,000	\$ 9,000	\$ 7,000	\$ 6,500	
<b>CAPEX Disbursements Inputs</b>					
% of purchases paid for in purchase period	100%	100%	100%	100%	
<b>Depreciation Inputs</b>					
Equipment depreciable life (years)					6.0
Furniture depreciable life (years)					5.0
Fixtures depreciable life (years)					5.0
Quarters per year					4.0
Equipment depreciation multiplier	4.2%	4.2%	4.2%	4.2%	
Furniture depreciation multiplier	5.0%	5.0%	5.0%	5.0%	
Fixtures depreciation multiplier	5.0%	5.0%	5.0%	5.0%	
<b>Cash Worksheet</b>					
<b>Cash Inputs</b>					
Minimum cash balance desired	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	
Equity investment (incremental)	\$ 500,000	\$ -	\$ -	\$ -	
Borrowing/loan (incremental)	\$ -	\$ -	\$ 25,000	\$ -	
Repayments of borrowing (incremental)	\$ -	\$ -	\$ -	\$ 25,000	

FIGURE Q6.1 Company JKL’s Assumptions and Dashboard Worksheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>SALES BUDGET</b>					
<b>Unit Sales and Price Budget</b>					
Unit sales	10,000	10,400	10,900	11,100	42,400
Price per unit	\$ 275	\$ 270	\$ 260	\$ 260	N/A
Total sales	\$ 2,750,000	\$ 2,808,000	\$ 2,834,000	\$ 2,886,000	\$ 11,278,000
<b>Sales Composition Budget</b>					
Cash sales	\$ 1,650,000	\$ 1,404,000	\$ 1,700,400	\$ 1,731,600	\$ 6,486,000
Credit sales	1,100,000	1,404,000	1,133,600	1,154,400	4,792,000
Total sales	\$ 2,750,000	\$ 2,808,000	\$ 2,834,000	\$ 2,886,000	\$ 11,278,000
<b>COLLECTIONS BUDGET</b>					
<b>Cash Collections from Customers Budget</b>					
Cash sales this period	\$ 1,650,000	\$ 1,404,000	\$ 1,700,400	\$ 1,731,600	\$ 6,486,000
Credit sales collected	794,444	1,360,356	1,224,089	1,149,778	4,535,467
Total collections	\$ 2,444,444	\$ 2,770,356	\$ 2,925,289	\$ 2,881,378	\$ 11,021,467
<b>Accounts Receivable (A/R) Budget</b>					
Beginning A/R balance	\$ -	\$ 305,556	\$ 343,200	\$ 251,911	\$ -
Additions to A/R	305,556	343,200	251,911	256,533	1,157,200
Subtractions from A/R	-	305,556	343,200	251,911	900,667
Ending A/R balance	\$ 305,556	\$ 343,200	\$ 251,911	\$ 256,533	\$ 256,533

FIGURE Q6.2 Company JKL’s Unit Sales and Price Budget

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>COST-OF-GOODS SOLD BUDGET</b>					
<u>Cost-of-Goods Sold Budget</u>					
Exterior	\$ 750,000	\$ 717,600	\$ 708,500	\$ 666,000	\$ 2,842,100
Interior	750,000	728,000	708,500	666,000	2,852,500
Assembly labor	500,000	509,600	523,200	499,500	2,032,300
<b>Total cost-of-goods sold</b>	<b>\$ 2,000,000</b>	<b>\$ 1,955,200</b>	<b>\$ 1,940,200</b>	<b>\$ 1,831,500</b>	<b>\$ 7,726,900</b>

**FIGURE Q6.3** Company JKL’s Cost-of-Goods-Sold Budget

and Accounts Payable Budget. Company JKL’s Headcount Overview worksheet is shown in Figure Q6.5. Company JKL’s Headcount Cost worksheet is shown in Figure Q6.6. Figure Q6.7 offers a view of Company JKL’s Operating Expenses Budget and Disbursements for Operating Expenses Budget. Figure Q6.8 presents a view of Company JKL’s Income Statement (except for the depreciation and interest expense calculations, both of which will be covered later in the questions for this chapter).

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>INVENTORY BUDGET</b>					
<u>Inventory Budget</u>					
Desired ending inventory	\$ 325,867	\$ 431,156	\$ 386,650	\$ 386,650	\$ 386,650
+ Cost of goods sold	2,000,000	1,955,200	1,940,200	1,831,500	7,726,900
<b>= Total inventory needed</b>	<b>\$ 2,325,867</b>	<b>\$ 2,386,356</b>	<b>\$ 2,326,850</b>	<b>\$ 2,218,150</b>	<b>\$ 8,113,550</b>
<b>PURCHASES BUDGET</b>					
<u>Purchases Budget</u>					
Total inventory needed	\$ 2,325,867	\$ 2,386,356	\$ 2,326,850	\$ 2,218,150	N/A
- Beginning inventory	- 325,867	431,156	386,650	386,650	-
<b>= Purchases</b>	<b>\$ 2,325,867</b>	<b>\$ 2,060,489</b>	<b>\$ 1,895,694</b>	<b>\$ 1,831,500</b>	<b>N/A</b>
<u>Disbursements for Purchases Budget</u>					
Payments of payables	\$ 1,550,578	\$ 2,217,631	\$ 1,924,070	\$ 1,810,772	\$ 7,503,050
<b>Total disbursements for purchases</b>	<b>\$ 1,550,578</b>	<b>\$ 2,217,631</b>	<b>\$ 1,924,070</b>	<b>\$ 1,810,772</b>	<b>\$ 7,503,050</b>
<u>Accounts Payable (A/P) Budget</u>					
Beginning A/P balance	\$ -	\$ 775,289	\$ 618,147	\$ 589,772	\$ -
+ Additions to A/P	775,289	618,147	589,772	610,500	2,593,707
- Subtractions from A/P	-	775,289	618,147	589,772	1,983,207
<b>Ending A/P</b>	<b>\$ 775,289</b>	<b>\$ 618,147</b>	<b>\$ 589,772</b>	<b>\$ 610,500</b>	<b>\$ 610,500</b>

**FIGURE Q6.4** Company JKL’s Inventory Budget, Purchases Budget, Disbursements for Purchases Budget, and Accounts Payable Budget

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>HEADCOUNT BUDGET</b>					
Headcount Budget					
Number of employees					
Chief Executive Officer	1	1	1	1	
Chief Financial Officer	1	1	1	1	
VP, Engineering	1	1	1	1	
VP, Sales & Marketing	1	1	1	1	
VP, Business Development	-	-	1	1	
Salesperson	5	5	6	7	
Hardware Engineer	1	1	1	1	
Controller/Accountant	1	1	2	2	
Administrative Assistant	1	1	2	2	
<b>Total</b>	<b>12</b>	<b>12</b>	<b>16</b>	<b>17</b>	
Periodic base salaries					
Chief Executive Officer	\$ 47,500	\$ 47,500	\$ 47,500	\$ 47,500	\$ 190,000
Chief Financial Officer	42,500	42,500	42,500	42,500	170,000
VP, Engineering	42,500	42,500	42,500	42,500	170,000
VP, Sales & Marketing	36,250	36,250	36,250	36,250	145,000
VP, Business Development	32,500	32,500	32,500	32,500	130,000
Salesperson	27,500	27,500	27,500	27,500	110,000
Hardware Engineer	25,000	25,000	25,000	25,000	100,000
Controller/Accountant	12,500	12,500	12,500	12,500	50,000
Administrative Assistant	8,125	8,125	8,125	8,125	32,500
<b>Total</b>	<b>\$ 274,375</b>	<b>\$ 274,375</b>	<b>\$ 274,375</b>	<b>\$ 274,375</b>	<b>\$ 1,097,500</b>

**FIGURE Q6.5** Company JKL's Headcount Overview Worksheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>HEADCOUNT BUDGET</b>					
Headcount Budget					
Periodic salary expense (base)					
Chief Executive Officer	\$ 47,500	\$ 47,500	\$ 47,500	\$ 47,500	\$ 190,000
Chief Financial Officer	42,500	42,500	42,500	42,500	170,000
VP, Engineering	42,500	42,500	42,500	42,500	170,000
VP, Sales & Marketing	36,250	36,250	36,250	36,250	145,000
VP, Business Development	-	-	32,500	32,500	65,000
Salesperson	137,500	137,500	165,000	192,500	632,500
Hardware Engineer	25,000	25,000	25,000	25,000	100,000
Controller/Accountant	12,500	12,500	25,000	25,000	75,000
Administrative Assistant	8,125	8,125	16,250	16,250	48,750
<b>Total</b>	<b>\$ 351,875</b>	<b>\$ 351,875</b>	<b>\$ 432,500</b>	<b>\$ 460,000</b>	<b>\$ 1,596,250</b>
<b>Total (with benefits)</b>	<b>\$ 399,378</b>	<b>\$ 399,378</b>	<b>\$ 490,888</b>	<b>\$ 522,100</b>	<b>\$ 1,811,744</b>

**FIGURE Q6.6** Company JKL's Headcount Cost Worksheet

Period	Period				X4
	1Q X4	2Q X4	3Q X4	4Q X4	
<b>OPERATING EXPENSES BUDGET</b>					
Operating Expenses Budget					
Salaries	\$ 399,378	\$ 399,378	\$ 490,888	\$ 522,100	\$ 1,811,744
Miscellaneous expenses	82,500	98,280	99,190	101,010	380,980
Research and development	137,500	140,400	141,700	144,300	563,900
Rent	16,500	16,500	16,500	16,500	66,000
Depreciation					
Total operating expenses	\$ 635,878	\$ 654,558	\$ 748,278	\$ 783,910	\$ 2,822,624
<b>DISBURSEMENTS FOR OPERATING EXPENSES BUDGET</b>					
Disbursements for Operating Expenses Budget					
Salaries	\$ 399,378	\$ 399,378	\$ 490,888	\$ 522,100	\$ 1,811,744
Miscellaneous expenses	82,500	98,280	99,190	101,010	380,980
Research and development	137,500	140,400	141,700	144,300	563,900
Rent	16,500	16,500	16,500	16,500	66,000
Depreciation					
Total disbursements for operating expenses	\$ 635,878	\$ 654,558	\$ 748,278	\$ 783,910	\$ 2,822,624

**FIGURE Q6.7** Company JKL’s Operating Expenses Budget and Disbursements for Operating Expenses Budget

Period	Period				X4
	1Q X4	2Q X4	3Q X4	4Q X4	
Sales	\$ 2,750,000	\$ 2,808,000	\$ 2,834,000	\$ 2,886,000	\$ 11,278,000
Cost of goods sold	2,000,000	1,955,200	1,940,200	1,831,500	7,726,900
Gross profit	\$ 750,000	\$ 852,800	\$ 893,800	\$ 1,054,500	\$ 3,551,100
Salaries	\$ 399,378	\$ 399,378	\$ 490,888	\$ 522,100	\$ 1,811,744
Miscellaneous expenses	82,500	98,280	99,190	101,010	380,980
Research and development	137,500	140,400	141,700	144,300	563,900
Rent	16,500	16,500	16,500	16,500	66,000
Depreciation					
Income from operations	\$ 114,122	\$ 198,242	\$ 145,523	\$ 270,590	\$ 728,476
Interest expense					
Taxable income	\$ 114,122	\$ 198,242	\$ 145,523	\$ 270,590	\$ 728,476
Tax expense	\$ 37,090	\$ 65,420	\$ 47,295	\$ 89,295	\$ 239,099
Net income	\$ 77,032	\$ 132,822	\$ 98,228	\$ 181,295	\$ 489,377

**FIGURE Q6.8** Company JKL’s Income Statement

1. Given the information regarding Company JKL, build the Capital Expenditures Budget for Company JKL. Note that this Capital Budget should include projections for three separate items: equipment, furniture, and fixtures.
2. Based on your work in Question 1 and the information presented, build a Disbursements for Capital Expenditures for Company JKL. Use the “percentage paid for a given period” approach as described in this chapter to project the disbursements associated with capital expenditures. The relevant assumptions related to these percentage assumptions are shown in Company JKL’s Assumptions and Dashboard worksheet (Figure Q6.1).
3. Build a Depreciation Budget for Company JKL based on the information presented and your work in Questions 1 and 2. Use the same approach outlined in this chapter (using depreciation multipliers) to build the Depreciation Budget for Company JKL. Include a calculation of Company JKL’s fixed assets, net of depreciation for each accounting period (quarter) in the Depreciation Budget.
4. Based on your work in Questions 1–3 and the information presented, build the first section of Company JKL’s Cash Budget, which should include the beginning cash balance and cash collections for each accounting period (quarter) for Company JKL.
5. Build an updated Cash Budget for Company JKL in which the cash disbursements for each accounting period (quarter) and the excess or deficiency of total cash available compared to the total cash required before any financing takes place are calculated for Company JKL.
6. Build an updated Cash Budget for Company JKL in which the projections regarding equity investments, borrowings, repayment of borrowings, and interest expenses are included. Be sure to calculate the ending cash balance for Company JKL for each accounting period (quarter) as well.
7. Complete Company JKL’s Income Statement by adding in the depreciation and interest expense projections for each accounting period (quarter).

## Financial Budget—Balance Sheet

This chapter covers the construction of Napavale’s Balance Sheet. Building the Balance Sheet, which provides a view of Napavale’s sources and uses of funds, represents the final step in the Master Budget framework. Figure 7.1 highlights the Budgeted Balance Sheet and its relative position in the Master Budget hierarchy.

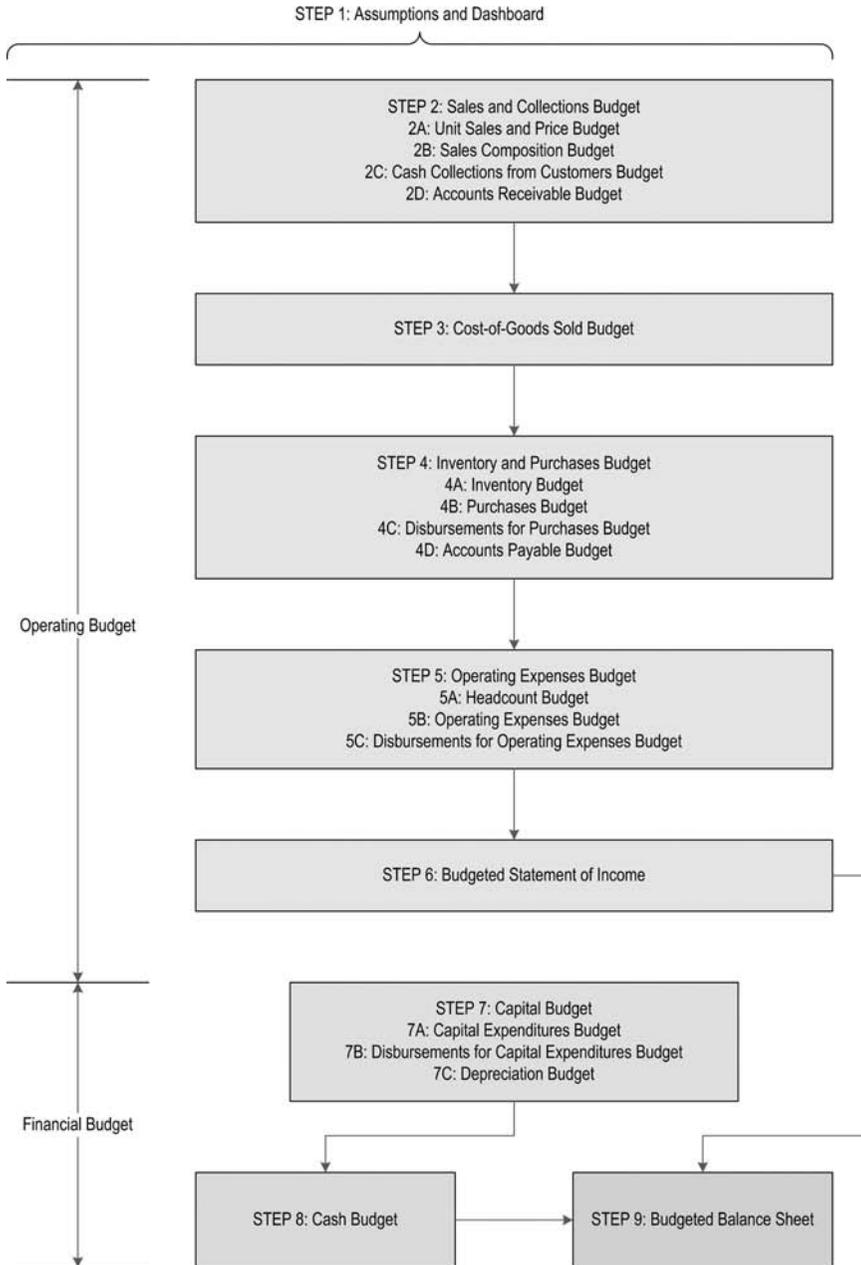
### **STEP 9: BUDGETED BALANCE SHEET**

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The budgeted Balance Sheet incorporates components from several different schedules, including the Cash Budget, Accounts Receivable Budget, Inventory Budget, and Income Statement, among several others. While it is not a specific line item or account on the Balance Sheet, I also introduce and discuss the concept of “net working capital” later in this chapter. Net working capital calculations flow directly into the calculation of free cash flows, discussed in Chapter 9.

It is worth noting that a balance sheet offers a tangible representation of the central accounting identity:  $\text{Assets} = \text{Liabilities} + \text{Owners' Equity}$ . This equation will always balance; if it does not, there is an error in a calculation underlying the Balance Sheet. In general terms, there are two potential sources of funds for a business: Liabilities or Owners’ Equity. Also in general terms, there is one use of funds for a business: Assets. While this book is not intended to cover (and does not cover) accounting concepts, I will try to point out major concepts at the appropriate points, such as the central accounting identity mentioned above.

As in previous chapters, I make frequent references to alternative views of worksheets in which the values and formulas contained within each cell are exposed for viewing and to the names of the input and output cells across



**FIGURE 7.1** Budgeted Balance Sheet and the Master Budget

various worksheets. In so doing, it should be easier to follow the extensive references and linkages between worksheets.

The first step in building the Balance Sheet is to identify and paste the elements of the Asset side (also called the “left-hand side,” as Assets are often shown to the left of the Liabilities and Owners’ Equity accounts of a balance sheet) of the Balance Sheet into a worksheet. In Napavale’s case, I am including the following accounts in Assets: cash, accounts receivable, inventory, and fixed Assets, net. Depending on the nature of your business, the components of your Assets (and Liabilities and Owners’ Equity for that matter) may vary. Figure 7.2 presents the Asset components of Napavale’s Balance Sheet.

Figure 7.3 offers an alternative view of the asset components of the Balance Sheet in which the values and formulas in the worksheet cells are exposed and visible. I have calculated a total for the Asset components of the Balance Sheet in Figures 7.2 and 7.3. The names of the input and output cells underlying the Balance Sheet are shown in Figure 7.4.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Assets</b>					
Cash	\$ 1,064,822	\$ 1,511,392	\$ 2,021,272	\$ 2,984,338	\$ 2,984,338
Accounts Receivable	133,333	192,000	257,600	336,000	336,000
Inventory	64,667	83,067	102,667	102,667	102,667
Fixed Assets, net	42,688	83,063	121,125	156,875	156,875
<b>Total Assets</b>	<b>\$ 1,295,510</b>	<b>\$ 1,869,521</b>	<b>\$ 2,502,663</b>	<b>\$ 3,579,880</b>	<b>\$ 3,579,880</b>
<b>Liabilities</b>					
Accounts Payable					
Payables from Capital Budget					
Loan Payable					
<b>Total Liabilities</b>					
<b>Owners' Equity</b>					
Common Stock					
Retained Earnings					
<b>Total Owners' Equity</b>					
<b>Total Liabilities and Owners' Equity</b>					

**FIGURE 7.2** Asset Components of the Balance Sheet

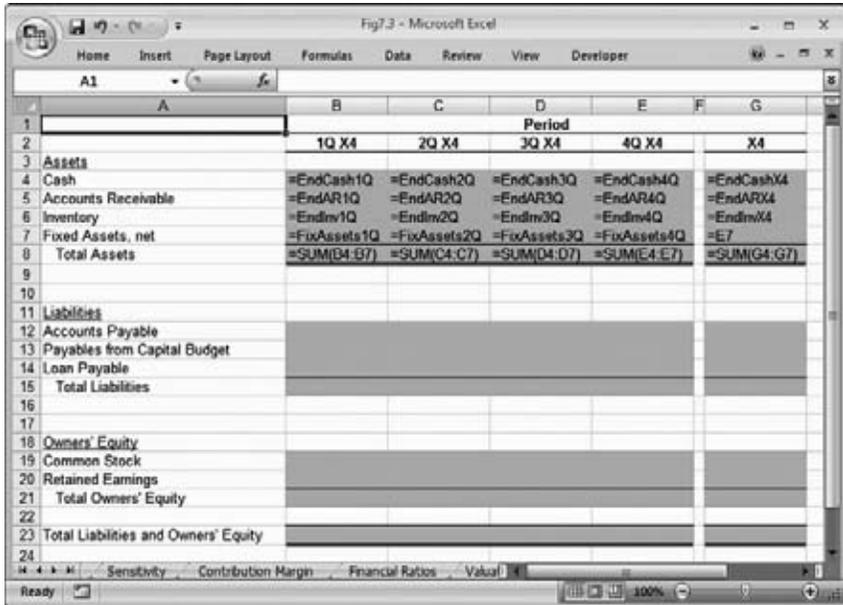


FIGURE 7.3 Alternative View of the Asset Components of the Balance Sheet

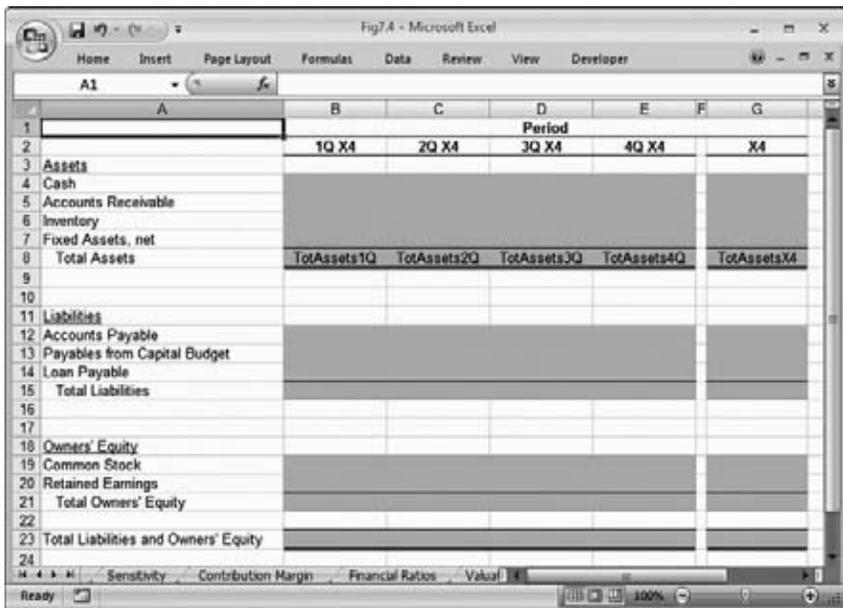


FIGURE 7.4 Names of the Input and Output Cells in the Balance Sheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Assets</b>					
Cash	\$ 1,054,822	\$ 1,511,392	\$ 2,021,272	\$ 2,984,338	\$ 2,984,338
Accounts Receivable	133,333	192,000	257,600	336,000	336,000
Inventory	64,667	83,067	102,667	102,667	102,667
Fixed Assets, net	42,688	83,063	121,125	156,875	156,875
<b>Total Assets</b>	<b>\$ 1,295,510</b>	<b>\$ 1,869,521</b>	<b>\$ 2,502,663</b>	<b>\$ 3,579,880</b>	<b>\$ 3,579,880</b>
<b>Liabilities</b>					
Accounts Payable	\$ 88,222	\$ 103,133	\$ 131,133	\$ 154,000	\$ 154,000
Payables from Capital Budget	-	-	-	-	-
Loan Payable	-	50,000	-	-	-
<b>Total Liabilities</b>	<b>\$ 88,222</b>	<b>\$ 153,133</b>	<b>\$ 131,133</b>	<b>\$ 154,000</b>	<b>\$ 154,000</b>
<b>Owners' Equity</b>					
Common Stock					
Retained Earnings					
<b>Total Owners' Equity</b>					
<b>Total Liabilities and Owners' Equity</b>					

**FIGURE 7.5** Liabilities Components of the Balance Sheet

Note the various sources associated with each component of the Assets identified in Napavale’s Balance Sheet: cash (Cash Budget), accounts receivable (Accounts Receivable Budget), inventory (Inventory Budget), and fixed Assets, net (Depreciation Budget).

Identifying and pasting the elements of the Liabilities section of the Balance Sheet represents the next step in building Napavale’s Balance Sheet. The following Liabilities are included in Napavale’s Balance Sheet: accounts payable, payables from Capital Budget, and loan payable. Figure 7.5 presents a view of the Balance Sheet with the addition of the components of the Liabilities section.

Figure 7.6 highlights the values and formulas underlying the worksheet cells by exposing the cell contents for viewing. A total for the Liabilities components of the Balance Sheet is calculated in Figures 7.5 and 7.6. The names of the input and output cells underlying the evolving Balance Sheet are shown in Figure 7.7.

Note the sources of each of the accounts in the Liabilities section of Napavale’s Balance Sheet: accounts payable (Accounts Payable Budget),

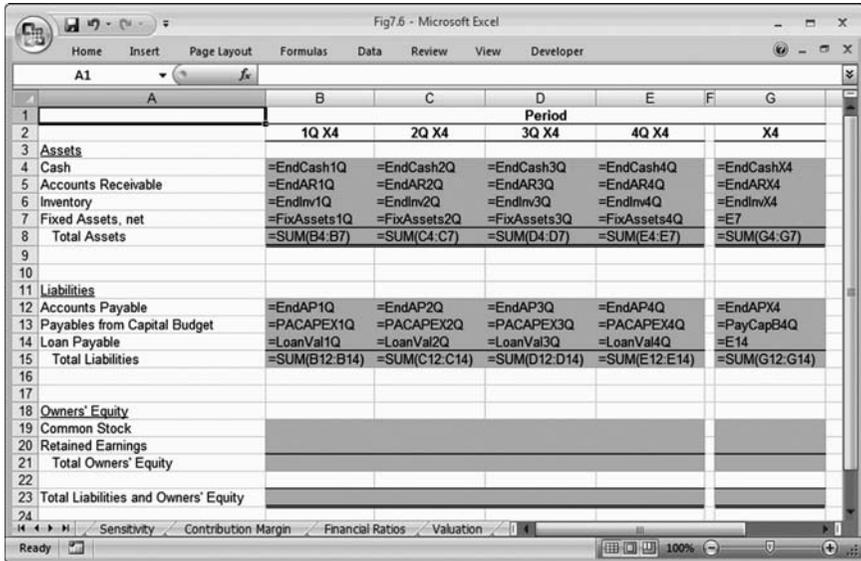


FIGURE 7.6 Alternative View of the Liabilities Components of the Balance Sheet

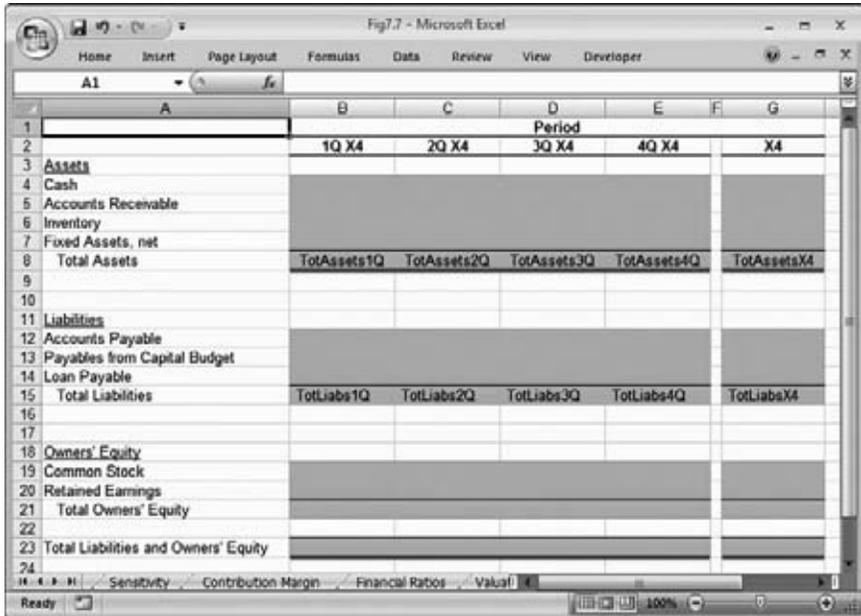


FIGURE 7.7 Names of the Input and Output Cells in the Balance Sheet

payables from capital budget (Capital Budget), and loan payable (Assumptions and Dashboard Worksheet).

The final step in building Napavale's Balance Sheet is to identify and paste the elements of the Owners' Equity section of the Balance Sheet into the Balance Sheet worksheet. I have included a common stock and a retained earnings account in the Owners' Equity section of Napavale's Balance Sheet. The common stock account represents equity investments into Napavale and the retained earnings account represents, broadly speaking, a "running total" of Napavale's net income over time.

Figure 7.8 shows Napavale's Balance Sheet with the inclusion of the Owners' Equity section. Calculations for total Owners' Equity as well as a total for Liabilities + Owners' Equity are included in Figure 7.8 as well. Remember that in a "balanced" Balance Sheet,  $\text{Assets} = \text{Liabilities} + \text{Owners' Equity}$ . An alternative view of Napavale's completed Balance Sheet, in which the values and formulas contained within the worksheet cells are exposed for viewing, is presented in Figure 7.9. Figure 7.10 presents a view of the names of the input and output cells underlying the evolving Balance Sheet for Napavale.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Assets</b>					
Cash	\$ 982,272	\$ 1,260,656	\$ 1,541,236	\$ 2,135,280	\$ 2,135,280
Accounts Receivable	133,333	192,000	257,600	336,000	336,000
Inventory	64,667	83,067	102,667	102,667	102,667
Fixed Assets, net	42,688	83,063	121,125	156,875	156,875
<b>Total Assets</b>	<b>\$ 1,222,959</b>	<b>\$ 1,618,785</b>	<b>\$ 2,022,628</b>	<b>\$ 2,730,822</b>	<b>\$ 2,730,822</b>
<b>Liabilities</b>					
Accounts Payable	\$ 88,222	\$ 103,133	\$ 131,133	\$ 154,000	\$ 154,000
Payables from Capital Budget	-	-	-	-	-
Loan Payable	-	50,000	-	-	-
<b>Total Liabilities</b>	<b>\$ 88,222</b>	<b>\$ 153,133</b>	<b>\$ 131,133</b>	<b>\$ 154,000</b>	<b>\$ 154,000</b>
<b>Owners' Equity</b>					
Common Stock	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000
Retained Earnings	134,737	465,652	891,495	1,576,822	1,576,822
<b>Total Owners' Equity</b>	<b>\$ 1,134,737</b>	<b>\$ 1,465,652</b>	<b>\$ 1,891,495</b>	<b>\$ 2,576,822</b>	<b>\$ 2,576,822</b>
<b>Total Liabilities and Owners' Equity</b>	<b>\$ 1,222,959</b>	<b>\$ 1,618,785</b>	<b>\$ 2,022,628</b>	<b>\$ 2,730,822</b>	<b>\$ 2,730,822</b>

**FIGURE 7.8** Balance Sheet

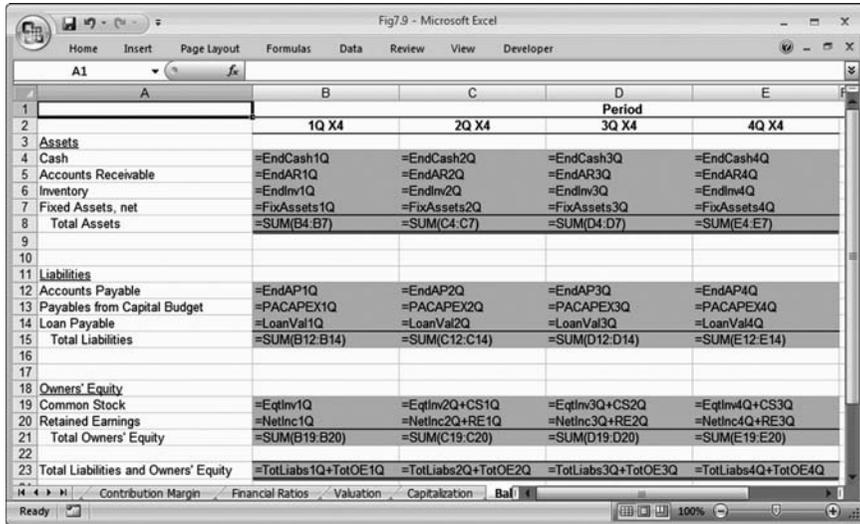


FIGURE 7.9 Alternative View of the Balance Sheet

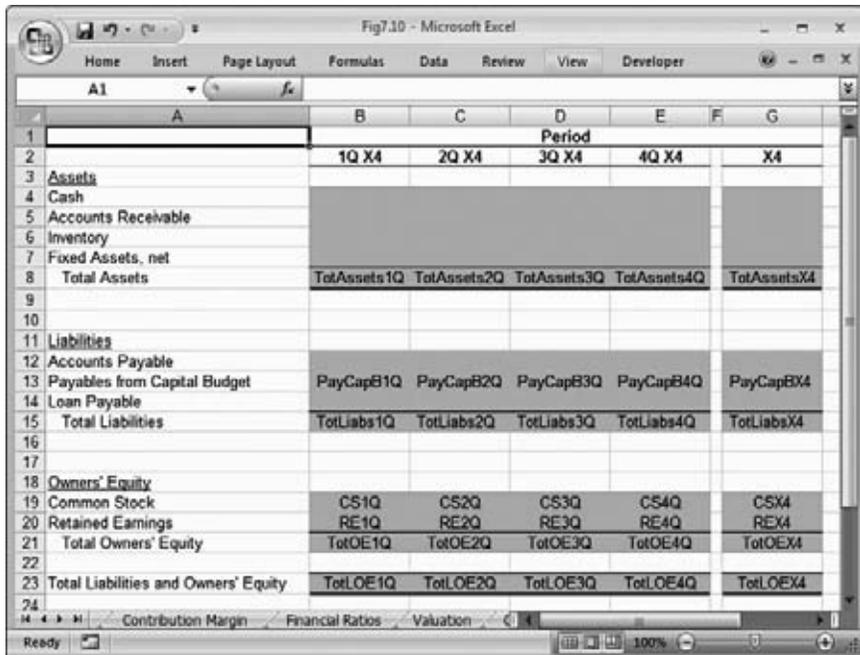


FIGURE 7.10 Names of the Input and Output Cells in the Balance Sheet

Now that the Balance Sheet is completed, I will calculate an item known as “net working capital.” Net working capital, which is defined as: current Assets – current Liabilities, represents a company’s surplus (or deficiency) of current Assets as compared to current Liabilities. Broadly speaking, current Assets and current Liabilities are defined as those Assets and Liabilities that will come due within the accounting period in which they are classified as current. Net working capital is an important metric that will come into play in Chapter 9 when I cover free cash flows.

The first step in calculating net working capital is to identify Napavale’s current Assets and current Liabilities. For Napavale, I am defining accounts receivable and inventory as current Assets and accounts payable as current Liabilities. Note that I am not including “payables from capital budget” as a component of current Liabilities. My assumption is that any payables associated with capital purchases would represent longer-term liabilities, which typically are not included in net working capital calculations.

In addition, I am not considering the loan payable as a source of required funding for Napavale’s day-to-day operations. Loan payable, therefore, is not included in the calculation of net working capital.

Different users often include different accounts in the calculation of net working capital. Many people often include the cash account in current Assets; I am not doing so here as Napavale is a recently formed business and its cash balance is a direct result of the formation capital that was invested into the business. For more stable and established businesses, including cash in a calculation of net working capital may indeed make sense.

Figure 7.11 presents a worksheet in which the components of net working capital are identified and net working capital itself is calculated as current Assets – current Liabilities. Note that net working capital can be either a positive or a negative number.

Figure 7.12 offers an alternative view of the worksheet presented in Figure 7.11 by exposing the values and formulas underlying the worksheet cells. The names of the input and output cells underlying the components of net working capital are presented in Figure 7.13.

As will be explained in Chapter 9 in the coverage of free cash flows, it is the change in net working capital across accounting periods that is of particular interest. As such, the change in net working capital across accounting periods is presented in Figure 7.14. An alternative view of the change in net working capital calculation, in which the values and formulas underlying the worksheet cells are exposed, is presented in Figure 7.15. Figure 7.16 offers a view of the names of the input and output cells underlying the calculation of the change in net working capital.



FIGURE 7.11 Calculation of Net Working Capital

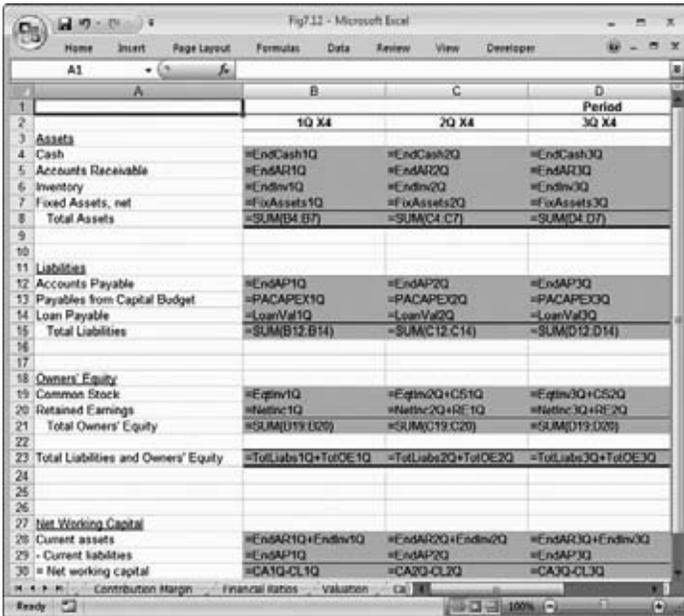


FIGURE 7.12 Alternative View of the Calculation of Net Working Capital

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Assets</b>					
Cash					
Accounts Receivable					
Inventory					
Fixed Assets, net					
Total Assets	TotAssets1Q	TotAssets2Q	TotAssets3Q	TotAssets4Q	TotAssetsX4
<b>Liabilities</b>					
Accounts Payable					
Payables from Capital Budget	PayCapB1Q	PayCapB2Q	PayCapB3Q	PayCapB4Q	PayCapBX4
Loan Payable					
Total Liabilities	TotLiabs1Q	TotLiabs2Q	TotLiabs3Q	TotLiabs4Q	TotLiabsX4
<b>Owners' Equity</b>					
Common Stock	CS1Q	CS2Q	CS3Q	CS4Q	CSX4
Retained Earnings	RE1Q	RE2Q	RE3Q	RE4Q	REX4
Total Owners' Equity	TotOE1Q	TotOE2Q	TotOE3Q	TotOE4Q	TotOEX4
Total Liabilities and Owners' Equity	TotLOE1Q	TotLOE2Q	TotLOE3Q	TotLOE4Q	TotLOEX4
<b>Net Working Capital</b>					
Current assets	CA1Q	CA2Q	CA3Q	CA4Q	CAX4
Current liabilities	CL1Q	CL2Q	CL3Q	CL4Q	CLX4
= Net working capital	NWC1Q	NWC2Q	NWC3Q	NWC4Q	NWCX4

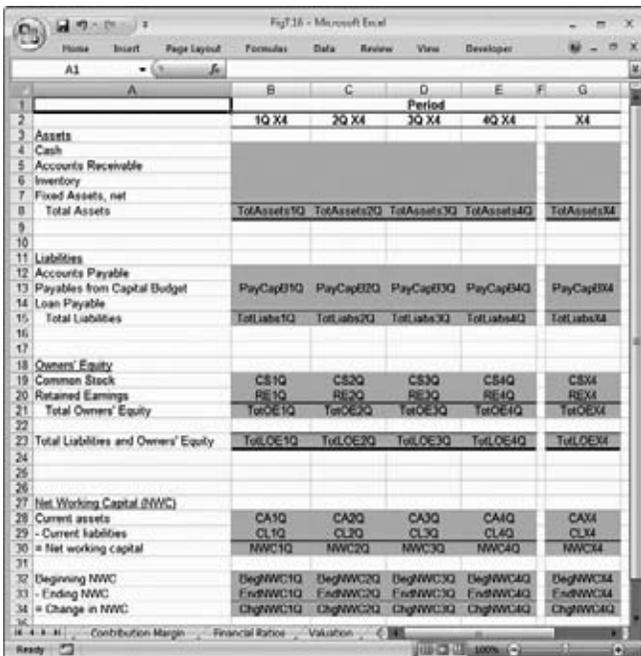
**FIGURE 7.13** Names of the Input and Output Cells Underlying the Calculation of Net Working Capital

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Assets</b>					
Cash	\$ 982,272	\$ 1,280,656	\$ 1,541,236	\$ 2,135,280	\$ 2,135,280
Accounts Receivable	133,333	192,000	257,500	336,000	336,000
Inventory	64,667	83,067	102,567	102,667	102,667
Fixed Assets, net	42,688	83,063	121,125	156,875	156,875
Total Assets	\$ 1,222,959	\$ 1,618,786	\$ 2,022,628	\$ 2,730,822	\$ 2,730,822
<b>Liabilities</b>					
Accounts Payable	\$ 88,222	\$ 103,133	\$ 131,133	\$ 154,000	\$ 154,000
Payables from Capital Budget					
Loan Payable		\$ 0,000			
Total Liabilities	\$ 88,222	\$ 103,133	\$ 131,133	\$ 154,000	\$ 154,000
<b>Owners' Equity</b>					
Common Stock	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000
Retained Earnings	134,737	465,652	891,495	1,576,822	1,576,822
Total Owners' Equity	\$ 1,134,737	\$ 1,465,652	\$ 1,891,495	\$ 2,576,822	\$ 2,576,822
Total Liabilities and Owners' Equity	\$ 1,222,959	\$ 1,618,786	\$ 2,022,628	\$ 2,730,822	\$ 2,730,822
<b>Net Working Capital (NWC)</b>					
Current assets	\$ 198,000	\$ 275,967	\$ 360,267	\$ 438,667	N/A
Current liabilities	\$ 88,222	\$ 103,133	\$ 131,133	\$ 154,000	N/A
= Net working capital	\$ 109,778	\$ 171,933	\$ 229,133	\$ 284,667	N/A
Beginning NWC	\$ -	\$ 109,778	\$ 171,933	\$ 229,133	N/A
Ending NWC	\$ 109,778	\$ 171,933	\$ 229,133	\$ 284,667	N/A
= Change in NWC	\$ (109,778)	\$ (82,156)	\$ (57,200)	\$ (55,533)	N/A

**FIGURE 7.14** Calculation of the Change in Net Working Capital



**FIGURE 7.15** Alternative View of the Calculation of the Change in Net Working Capital



**FIGURE 7.16** Names of the Input and Output Cells Underlying the Calculation of the Change in Net Working Capital

**QUESTIONS**

Each of the questions for this chapter relates to a hypothetical company named Company MNO. Company MNO sells coffee machines to businesses. As such, Company MNO is a product-oriented (as opposed to a service-oriented) business. The questions for this chapter will address fiscal year X4 on a quarterly basis (four specific quarters, 1Q–4Q for year X4).

The following questions will test your knowledge of the material covered in this chapter in an applied manner—specifically, you will be asked to build the schedules discussed in this chapter for Company MNO.

To prepare you for this chapter’s questions, several figures provide background information related to Company MNO’s operations. Figure Q7.1 offers a view of a portion of Company MNO’s Assumptions and Dashboard worksheet. Note that there are three cost-of-goods-sold

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>71 Capital Worksheet</b>					
<b>72 Capital Expenditures (CAPEX) Inputs</b>					
73 Equipment purchases	\$ 10,000	\$ 7,500	\$ 6,000	\$ 6,000	
74 Furniture purchases	\$ 4,000	\$ 3,500	\$ 3,500	\$ 3,250	
75 Fixtures purchases	\$ 3,000	\$ 2,500	\$ 2,750	\$ 2,000	
76 Total CAPEX purchases	\$ 17,000	\$ 13,500	\$ 12,250	\$ 11,250	
<b>77 CAPEX Disbursements Inputs</b>					
79 % of purchases paid for in purchase period	100%	100%	100%	100%	
<b>81 Depreciation Inputs</b>					
82 Equipment depreciable life (years)					5.0
83 Furniture depreciable life (years)					5.0
84 Fixtures depreciable life (years)					4.0
85					
86 Quarters per year					4.0
87					
88 Equipment depreciation multiplier	5.0%	5.0%	5.0%	5.0%	
89 Furniture depreciation multiplier	5.0%	5.0%	5.0%	5.0%	
90 Fixtures depreciation multiplier	6.3%	6.3%	6.3%	6.3%	
91					
<b>92 Cash Worksheet</b>					
<b>93 Cash Inputs</b>					
94 Minimum cash balance desired	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	
95					
96 Equity investment (incremental)	\$ 200,000	\$ -	\$ -	\$ -	
97 Borrowing/loan (incremental)	\$ -	\$ -	\$ -	\$ -	
98 Repayments of borrowing (incremental)	\$ -	\$ -	\$ -	\$ -	
99					
100 Interest rate on borrowing/loan (annual)					7.5%
101 Interest rate on borrowing/loan (quarterly)	1.9%	1.9%	1.9%	1.9%	

**FIGURE Q7.1** Company MNO’s Assumptions and Dashboard Worksheet

components for Company MNO’s coffee machines: (1) exterior, (2) interior, and (3) assembly and labor.

Figure Q7.2 presents a view of Company MNO’s Unit Sales and Price Budget, Sales Composition Budget, Cash Collections from Customers Budget, and Accounts Receivable Budget. Company MNO’s Cost-of-Goods-Sold Budget is shown in Figure Q7.3. Figure Q7.4 presents a view of Company MNO’s Inventory Budget, Purchases Budget, Disbursements for Purchases Budget, and Accounts Payable Budget. Company MNO’s Headcount Overview worksheet is shown in Figure Q7.5. Company MNO’s Headcount Cost worksheet is shown in Figure Q7.6. Figure Q7.7 offers a view of Company MNO’s Operating Expenses Budget and Disbursements for Operating Expenses Budget. Figure Q7.8 presents a view of Company MNO’s Income Statement. Company MNO’s Capital Expenditures Budget, Disbursements for Capital Expenditures Budget, and Depreciation Budget are shown in Figure Q7.9. Figure Q7.10 offers a view of Company MNO’s Cash Budget.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>SALES BUDGET</b>					
<u>Unit Sales and Price Budget</u>					
Unit sales	11,500	11,700	12,000	11,900	47,100
× Price per unit	\$ 300	\$ 300	\$ 300	\$ 295	N/A
= Total sales	\$ 3,450,000	\$ 3,510,000	\$ 3,600,000	\$ 3,510,500	\$ 14,070,500
<u>Sales Composition Budget</u>					
Cash sales	\$ 1,380,000	\$ 1,579,500	\$ 1,800,000	\$ 1,755,250	\$ 6,514,750
+ Credit sales	2,070,000	1,930,500	1,800,000	1,755,250	7,555,750
= Total sales	\$ 3,450,000	\$ 3,510,000	\$ 3,600,000	\$ 3,510,500	\$ 14,070,500
<u>COLLECTIONS BUDGET</u>					
<u>Cash Collections from Customers Budget</u>					
Cash sales this period	\$ 1,380,000	\$ 1,579,500	\$ 1,800,000	\$ 1,755,250	\$ 6,514,750
+ Credit sales collected	1,035,000	2,043,150	1,822,350	1,875,139	6,775,639
= Total collections	\$ 2,415,000	\$ 3,622,650	\$ 3,622,350	\$ 3,630,389	\$ 13,290,389
<u>Accounts Receivable (A/R) Budget</u>					
Beginning A/R balance	\$ -	\$ 1,035,000	\$ 922,350	\$ 900,000	\$ -
+ Additions to A/R	1,035,000	922,350	900,000	780,111	3,637,461
- Subtractions from A/R	-	1,035,000	922,350	900,000	2,857,350
= Ending A/R balance	\$ 1,035,000	\$ 922,350	\$ 900,000	\$ 780,111	\$ 780,111

**FIGURE Q7.2** Company MNO’s Unit Sales and Price Budget, Sales Composition Budget, Cash Collections from Customers Budget, and Accounts Receivable Budget

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>COST-OF-GOODS SOLD BUDGET</b>					
Cost-of-Goods Sold Budget					
Exterior	\$ 747,500	\$ 737,100	\$ 756,000	\$ 749,700	\$ 2,990,300
Interior	690,000	655,200	660,000	654,500	2,659,700
Assembly labor	575,000	585,000	540,000	511,700	2,211,700
Total cost-of-goods sold	\$ 2,012,500	\$ 1,977,300	\$ 1,956,000	\$ 1,915,900	\$ 7,861,700

**FIGURE Q7.3** Company MNO’s Cost-of-Goods-Sold Budget

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>INVENTORY BUDGET</b>					
Inventory Budget					
Desired ending inventory	\$ 461,370	\$ 478,133	\$ 468,331	\$ 468,331	\$ 468,331
+ Cost of goods sold	2,012,500	1,977,300	1,956,000	1,915,900	7,861,700
= Total inventory needed	\$ 2,473,870	\$ 2,455,433	\$ 2,424,331	\$ 2,384,231	\$ 8,330,031
<b>PURCHASES BUDGET</b>					
Purchases Budget					
Total inventory needed	\$ 2,473,870	\$ 2,455,433	\$ 2,424,331	\$ 2,384,231	N/A
- Beginning inventory	-	461,370	478,133	468,331	-
= Purchases	\$ 2,473,870	\$ 1,994,063	\$ 1,946,198	\$ 1,915,900	N/A
<b>Disbursements for Purchases Budget</b>					
Disbursements for purchases	\$ 1,621,759	\$ 2,070,705	\$ 1,899,939	\$ 1,886,117	\$ 7,478,520
Total disbursements for purchases	\$ 1,621,759	\$ 2,070,705	\$ 1,899,939	\$ 1,886,117	\$ 7,478,520
<b>Accounts Payable (A/P) Budget</b>					
Accounts Payable (A/P) Budget					
Beginning A/P balance	\$ -	\$ 852,111	\$ 775,469	\$ 821,728	\$ -
+ Additions to A/P	852,111	775,469	821,728	851,511	3,300,819
- Subtractions from A/P	-	852,111	775,469	821,728	2,449,308
Ending A/P	\$ 852,111	\$ 775,469	\$ 821,728	\$ 851,511	\$ 851,511

**FIGURE Q7.4** Company MNO’s Inventory Budget, Purchases Budget, Disbursements for Purchases Budget, and Accounts Payable Budget

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>HEADCOUNT BUDGET</b>					
Headcount Budget					
Number of employees					
Chief Executive Officer	1	1	1	1	
Chief Financial Officer	1	1	1	1	
VP, Engineering	1	1	1	1	
VP, Sales & Marketing	1	1	1	1	
VP, Business Development	-	-	-	-	1
Salesperson	6	6	6	7	
Hardware Engineer	1	1	1	2	
Controller/Accountant	1	1	1	1	
Administrative Assistant	1	2	2	2	
<b>Total</b>	<b>13</b>	<b>14</b>	<b>14</b>	<b>17</b>	
Periodic base salaries					
Chief Executive Officer	\$ 37,500	\$ 37,500	\$ 37,500	\$ 37,500	\$ 150,000
Chief Financial Officer	31,250	31,250	31,250	31,250	125,000
VP, Engineering	27,500	27,500	27,500	27,500	110,000
VP, Sales & Marketing	25,000	25,000	25,000	25,000	100,000
VP, Business Development	22,500	22,500	22,500	22,500	90,000
Salesperson	22,500	22,500	22,500	22,500	90,000
Hardware Engineer	17,500	17,500	17,500	17,500	70,000
Controller/Accountant	11,250	11,250	11,250	11,250	45,000
Administrative Assistant	8,750	8,750	8,750	8,750	35,000
<b>Total</b>	<b>\$ 203,750</b>	<b>\$ 203,750</b>	<b>\$ 203,750</b>	<b>\$ 203,750</b>	<b>\$ 815,000</b>

FIGURE Q7.5 Company MNO’s Headcount Overview Worksheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>HEADCOUNT BUDGET</b>					
Headcount Budget					
Periodic salary expense (base)					
Chief Executive Officer	\$ 37,500	\$ 37,500	\$ 37,500	\$ 37,500	\$ 150,000
Chief Financial Officer	31,250	31,250	31,250	31,250	125,000
VP, Engineering	27,500	27,500	27,500	27,500	110,000
VP, Sales & Marketing	25,000	25,000	25,000	25,000	100,000
VP, Business Development	-	-	-	22,500	22,500
Salesperson	135,000	135,000	135,000	157,500	562,500
Hardware Engineer	17,500	17,500	17,500	35,000	87,500
Controller/Accountant	11,250	11,250	11,250	11,250	45,000
Administrative Assistant	8,750	17,500	17,500	17,500	61,250
<b>Total</b>	<b>\$ 293,750</b>	<b>\$ 302,500</b>	<b>\$ 302,500</b>	<b>\$ 365,000</b>	<b>\$ 1,263,750</b>
<b>Total (with benefits)</b>	<b>\$ 336,344</b>	<b>\$ 346,363</b>	<b>\$ 346,363</b>	<b>\$ 417,925</b>	<b>\$ 1,446,994</b>

FIGURE Q7.6 Company MNO’s Headcount Cost Worksheet

1	A	B	C	Period			G
				1Q X4	2Q X4	3Q X4	
2							
3	<b>OPERATING EXPENSES BUDGET</b>						
4	Operating Expenses Budget						
5	Salaries	\$ 336,344	\$ 346,363	\$ 346,363	\$ 417,925	\$ 1,446,994	
6	Miscellaneous expenses	86,250	105,300	108,000	105,315	404,865	
7	Research and development	155,250	157,950	180,000	175,525	668,725	
8	Rent	13,000	13,000	13,000	13,000	52,000	
9	Depreciation	888	1,594	2,241	2,828	7,550	
10	Total operating expenses	\$ 591,731	\$ 624,206	\$ 649,603	\$ 714,593	\$ 2,580,134	
11							
12	<b>DISBURSEMENTS FOR OPERATING EXPENSES BUDGET</b>						
13	Disbursements for Operating Expenses Budget						
14	Salaries	\$ 336,344	\$ 346,363	\$ 346,363	\$ 417,925	\$ 1,446,994	
15	Miscellaneous expenses	86,250	105,300	108,000	105,315	404,865	
16	Research and development	155,250	157,950	180,000	175,525	668,725	
17	Rent	13,000	13,000	13,000	13,000	52,000	
18	Depreciation	-	-	-	-	-	
19	Total disbursements for operating expenses	\$ 590,844	\$ 622,613	\$ 647,363	\$ 711,765	\$ 2,572,584	

**FIGURE Q7.7** Company MNO’s Operating Expenses Budget and Disbursements for Operating Expenses Budget

1	A	B	C	Period			G
				1Q X4	2Q X4	3Q X4	
2							
3	Sales	\$ 3,450,000	\$ 3,510,000	\$ 3,600,000	\$ 3,510,500	\$ 14,070,500	
4	Cost of goods sold	2,012,500	1,977,300	1,956,000	1,915,900	7,861,700	
5	Gross profit	\$ 1,437,500	\$ 1,532,700	\$ 1,644,000	\$ 1,594,600	\$ 6,208,800	
6							
7	Salaries	\$ 336,344	\$ 346,363	\$ 346,363	\$ 417,925	\$ 1,446,994	
8	Miscellaneous expenses	86,250	105,300	108,000	105,315	404,865	
9	Research and development	155,250	157,950	180,000	175,525	668,725	
10	Rent	13,000	13,000	13,000	13,000	52,000	
11	Depreciation	888	1,594	2,241	2,828	7,550	
12	Income from operations	\$ 845,769	\$ 908,494	\$ 994,397	\$ 880,007	\$ 3,628,666	
13							
14	Interest expense	\$ -	\$ -	\$ -	\$ -	\$ -	
15	Taxable income	\$ 845,769	\$ 908,494	\$ 994,397	\$ 880,007	\$ 3,628,666	
16							
17	Tax expense	\$ 274,875	\$ 299,803	\$ 348,039	\$ 308,002	\$ 1,230,719	
18	Net income	\$ 570,894	\$ 608,691	\$ 646,358	\$ 572,004	\$ 2,397,947	

**FIGURE Q7.8** Company MNO’s Income Statement

1	A	Period				G
		B	C	D	E	
2		1Q X4	2Q X4	3Q X4	4Q X4	X4
3	<b>CAPITAL BUDGET</b>					
4	Capital Expenditures Budget					
5	Equipment	\$ 10,000	\$ 7,500	\$ 6,000	\$ 6,000	\$ 29,500
6	Furniture	4,000	3,500	3,500	3,250	14,250
7	Fixtures	3,000	2,500	2,750	2,000	10,250
8	Total capital expenditures	\$ 17,000	\$ 13,500	\$ 12,250	\$ 11,250	\$ 54,000
9						
10	Disbursements for Capital Expenditures Budget					
11	Equipment	\$ 10,000	\$ 7,500	\$ 6,000	\$ 6,000	\$ 29,500
12	Furniture	4,000	3,500	3,500	3,250	14,250
13	Fixtures	3,000	2,500	2,750	2,000	10,250
14	Total disbursements for capital expenditures	\$ 17,000	\$ 13,500	\$ 12,250	\$ 11,250	\$ 54,000
15						
16	Depreciation Budget					
17	Equipment	\$ 500	\$ 875	\$ 1,175	\$ 1,475	\$ 4,025
18	Furniture	200	375	550	713	1,838
19	Fixtures	188	344	516	641	1,688
20	Total depreciation	\$ 888	\$ 1,594	\$ 2,241	\$ 2,828	\$ 7,550
21						
22	Cumulative capital expenditures	\$ 17,000	\$ 30,500	\$ 42,750	\$ 54,000	
23	- Accumulated depreciation	888	2,481	4,722	7,550	
24	= Fixed assets, net of depreciation	\$ 16,113	\$ 28,019	\$ 38,028	\$ 46,450	
25						
26						
27	Cumulative disbursements for CAPEX	\$ 17,000	\$ 36,500	\$ 42,750	\$ 54,000	
28	Payables adjustment for CAPEX disbursements	\$ -	\$ -	\$ -	\$ -	

**FIGURE Q7.9** Company MNO’s Capital Expenditures Budget, Disbursements for Capital Expenditures Budget, and Depreciation Budget

1	A	Period				G
		B	C	D	E	
2		1Q X4	2Q X4	3Q X4	4Q X4	X4
3	<b>CASH BUDGET</b>					
4	Beginning cash balance	\$ -	\$ 110,522	\$ 726,552	\$ 1,441,311	\$ -
5	Cash receipts					
6	Collections from customers	2,415,000	3,622,650	3,622,350	3,636,389	13,296,389
7	Total cash available, before financing	\$ 2,415,000	\$ 3,733,172	\$ 4,348,902	\$ 5,073,700	N/A
8	Cash disbursements					
9	Purchases disbursements	\$ 1,621,750	\$ 2,076,705	\$ 1,899,939	\$ 1,886,117	\$ 7,478,520
10	Operating expenses	590,844	622,613	647,363	711,765	2,572,584
11	Tax expense	274,875	299,803	348,039	308,002	1,230,719
12	Capital expenditures	17,000	13,500	12,250	11,250	54,000
13	Total disbursements	2,504,478	3,006,620	2,907,590	2,917,134	11,335,823
14						
15	Minimum cash balance desired	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	N/A
16	Total cash needed	\$ 2,604,478	\$ 3,106,620	\$ 3,007,590	\$ 3,017,134	N/A
17	Excess (deficiency) of total cash available over					
18	total cash needed before financing	\$ (189,478)	\$ 626,552	\$ 1,341,311	\$ 2,056,566	N/A
19	Financing					
20	Equity investment	\$ 200,000	\$ -	\$ -	\$ -	\$ 200,000
21	Borrowing (at beginning of quarter)	-	-	-	-	-
22	Repayments (at end of quarter)	-	-	-	-	-
23	Interest	-	-	-	-	-
24	Total cash increase (decrease) from financing	\$ 200,000	\$ -	\$ -	\$ -	\$ 200,000
25						
26	Ending cash balance	\$ 110,522	\$ 726,552	\$ 1,441,311	\$ 2,154,566	\$ 2,154,566

**FIGURE Q7.10** Company MNO’s Cash Budget

1. Given the information presented, build the Asset components of Company MNO's Balance Sheet.
2. Build the Liabilities components of Company MNO's Balance Sheet given the information provided.
3. Build the Owners' Equity components of Company MNO's Balance Sheet given the information provided.
4. Calculate the change in Company MNO's Net Working Capital using the information provided and your answers to Questions 1–3.

PART

# Two

## Financial Statements and Free Cash Flows



# Consolidated Financial Statements

**T**his chapter covers Napavale’s consolidated financial statements: the Balance Sheet, the Income Statement, and Statement of Cash Flows. Many readers may be familiar with these financial statements as they are widely used to assess a business’s financial condition and the SEC (U.S. Securities and Exchange Commission) requires publicly traded companies to file these financial statements on a regular basis.

As I covered the Balance Sheet in Chapter 7 and the Income Statement in Chapter 5, the majority of this chapter will be focused on the Statement of Cash Flows. I will, however, provide a review of the source of each line item in Napavale’s Balance Sheet and Income Statement. By identifying the budget from which values flow into the Balance Sheet and Income Statement, I hope to provide some perspective on the interrelated nature of financial statements (and financial models in general).

## **BALANCE SHEET**

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The Balance Sheet, as noted in Chapter 7, presents a business’s Assets, Liabilities, and Owners’ Equity accounts. To be correct, a Balance Sheet must always “balance”—in other words, the value of a business’s Assets must be equal to the value of that business’s Liabilities plus its Owners’ Equity. This, as you may remember, is also referred to as the central accounting identity ( $\text{Assets} = \text{Liabilities} + \text{Owners' Equity}$ ). Figure 8.1 offers a view of Napavale’s Balance Sheet as of the end of Chapter 7.

Figure 8.2 presents another view of Napavale’s Balance Sheet, in this case with the source of each line item labeled. More specifically, the budgets from which each element of the Balance Sheet comes are listed next to each of these elements in Figure 8.2.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Assets</b>					
Cash	\$ 982,272	\$ 1,260,656	\$ 1,541,236	\$ 2,135,280	\$ 2,135,280
Accounts Receivable	133,333	192,000	257,600	336,000	336,000
Inventory	64,667	83,067	102,667	102,667	102,667
Fixed Assets, net	42,688	83,063	121,125	156,875	156,875
<b>Total Assets</b>	<b>\$ 1,222,959</b>	<b>\$ 1,618,785</b>	<b>\$ 2,022,628</b>	<b>\$ 2,730,822</b>	<b>\$ 2,730,822</b>
<b>Liabilities</b>					
Accounts Payable	\$ 88,222	\$ 103,133	\$ 131,133	\$ 154,000	\$ 154,000
Payables from Capital Budget	-	-	-	-	-
Loan Payable	-	50,000	-	-	-
<b>Total Liabilities</b>	<b>\$ 88,222</b>	<b>\$ 153,133</b>	<b>\$ 131,133</b>	<b>\$ 154,000</b>	<b>\$ 154,000</b>
<b>Owners' Equity</b>					
Common Stock	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000
Retained Earnings	134,737	465,652	891,495	1,576,822	1,576,822
<b>Total Owners' Equity</b>	<b>\$ 1,134,737</b>	<b>\$ 1,465,652</b>	<b>\$ 1,891,495</b>	<b>\$ 2,576,822</b>	<b>\$ 2,576,822</b>
<b>Total Liabilities and Owners' Equity</b>	<b>\$ 1,222,959</b>	<b>\$ 1,618,785</b>	<b>\$ 2,022,628</b>	<b>\$ 2,730,822</b>	<b>\$ 2,730,822</b>
<b>Net Working Capital (NWC)</b>					
Current assets	\$ 198,000	\$ 275,067	\$ 360,267	\$ 438,667	N/A
- Current liabilities	88,222	103,133	131,133	154,000	N/A
<b>= Net working capital</b>	<b>\$ 109,778</b>	<b>\$ 171,933</b>	<b>\$ 229,133</b>	<b>\$ 284,667</b>	<b>N/A</b>
Beginning NWC	\$ -	\$ 109,778	\$ 171,933	\$ 229,133	N/A
- Ending NWC	109,778	171,933	229,133	284,667	N/A
<b>= Change in NWC</b>	<b>\$ (109,778)</b>	<b>\$ (62,156)</b>	<b>\$ (67,200)</b>	<b>\$ (55,533)</b>	<b>N/A</b>

**FIGURE 8.1** Balance Sheet

## INCOME STATEMENT

The Income Statement, discussed in Chapter 5, represents the difference between a business's revenues and a business's expenses. The "bottom line," or final output of the Income Statement, is the metric known as Net Income. As covered in Chapter 7, Net Income affects the Retained Earnings account in Napavale's Balance Sheet. The Income Statement also affects the Statement of Cash Flows. I will discuss the relationship between Napavale's Income Statement, Balance Sheet, and Statement of Cash Flows later in this chapter. Figure 8.3 offers a view of Napavale's Income Statement as of the end of Chapter 7. A view of Napavale's Income Statement in which the source of each line item is identified by budget is presented in Figure 8.4.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Assets</b>					
Cash	Cash Budget				
Accounts Receivable	Accounts Receivable (A/R) Budget				
Inventory	Inventory Budget				
Fixed Assets, net	Capital Budget				
Total Assets					
<b>Liabilities</b>					
Accounts Payable	Accounts Payable (A/P) Budget				
Payables from Capital Budget	Capital Budget				
Loan Payable	Assumptions and Dashboard Worksheet				
Total Liabilities					
<b>Owners' Equity</b>					
Common Stock	Assumptions and Dashboard Worksheet				
Retained Earnings	Income Statement				
Total Owners' Equity					
Total Liabilities and Owners' Equity					
<b>Net Working Capital (NWC)</b>					
Current assets	Accounts Receivable Budget and Inventory Budget				
Current liabilities	Accounts Payable Budget				
= Net working capital					
Beginning NWC					
- Ending NWC					
= Change in NWC					

FIGURE 8.2 Source of Each Line Item in the Balance Sheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
Sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000
Cost of goods sold	200,000	291,000	373,800	462,000	1,326,800
Gross profit	\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000	\$ 5,565,200
Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200	\$ 2,301,600
Miscellaneous expenses	30,000	43,200	57,960	75,600	206,760
Research and development	70,000	100,800	154,560	201,600	526,960
Rent	20,000	20,000	20,000	20,000	80,000
Depreciation	2,313	4,625	6,938	9,250	23,125
Income from operations	\$ 207,288	\$ 509,975	\$ 655,143	\$ 1,054,350	\$ 2,426,756
Interest expense	\$ -	\$ 875	\$ -	\$ -	\$ 875
Taxable income	\$ 207,288	\$ 509,100	\$ 655,143	\$ 1,054,350	\$ 2,425,880
Tax expense	\$ 72,551	\$ 178,185	\$ 229,300	\$ 369,023	\$ 849,058
Net income	\$ 134,737	\$ 330,915	\$ 425,843	\$ 685,328	\$ 1,576,822

FIGURE 8.3 Income Statement

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
1					
2					
3	Sales	Unit Sales and Price Budget			
4	Cost of goods sold	Cost-of-Goods Sold Budget			
5	Gross profit				
6					
7	Salaries	Headcount Budget			
8	Miscellaneous expenses	Operating Expenses Budget			
9	Research and development	Operating Expenses Budget			
10	Rent	Assumptions and Dashboard Worksheet			
11	Depreciation	Depreciation Budget			
12	Income from operations				
13					
14	Interest expense	Cash Budget			
15	Taxable income				
16					
17	Tax expense	Assumptions and Dashboard Worksheet			
18	Net income				
19					

**FIGURE 8.4** Source of Each Line Item in the Income Statement

## STATEMENT OF CASH FLOWS

The Statement of Cash Flows, which is based on information contained in the Balance Sheet, Income Statement, and various other budgets and financial schedules, is an important financial statement. The goal of the Statement of Cash Flows is to reconcile Net Income, an accrual-based figure, with a business's changes in cash position.

The Statement of Cash Flows is divided into three sections: Cash Flows from Operating Activities, Cash Flows from Investing Activities, and Cash Flows from Financing Activities. This division of the Statement of Cash Flows into three separate sections identifies the sources and uses of cash across a variety of functions (operating activities, investing activities, and financing activities). I will cover the contents of each of these sections over the course of this chapter.

It is worth noting that there are two approaches to presenting a business's Statement of Cash Flows: the indirect method and the direct method. These methods are identical in structure for the Cash Flows from Investing Activities and Cash Flows from Financing Activities sections, but differ in the Cash Flows from Operating Activities section. The indirect method begins the Cash Flows from Operating Activities section with Net Income while the direct method compares "sources of cash" and "uses of cash" in the Cash Flows from Operating Activities section. I will use the indirect

method throughout this book—this method is often used by publicly traded companies in their financial statements as filed with the SEC.

I will now walk through the process of building each of the three sections (Cash Flows from Operating Activities, Cash Flows from Investing Activities, and Cash Flows from Financing Activities) for Napavale. As in earlier chapters, I will make frequent references to alternative views of worksheets in which the values and formulas contained within each cell are exposed for viewing and to the names of the input and output cells across various worksheets. This should make it easier to follow the extensive references and linkages between worksheets.

### **Cash Flows from Operating Activities**

The first section of the Statement of Cash Flows, Cash Flows from Operating Activities, reconciles Net Income to cash provided by operating activities. “Operating activities” include, in this context, those activities undertaken in the normal course of business operations. In the case of Napavale, these activities are captured through several Income Statement accounts and several Balance Sheet accounts.

As the Statement of Cash Flows is based on information found in other budgets and schedules, I will not present views of Napavale’s Assumptions and Dashboard worksheet in this Chapter. I will instead focus on (1) views of the Statement of Cash Flows, (2) alternative views of the Statement of Cash Flows in which the values and formulas underlying the worksheet cells are exposed and visible, and (3) views of the Statement of Cash Flows in which the names of the worksheet cells are shown.

Figure 8.5 presents a view of the Statement of Cash Flows in which the Net Income and depreciation values are shown. As the calculations associated with values that underly the remainder of the Cash Flows from Operating Activities section are more involved, I will discuss these accounts later in this section of the chapter. An alternative view of the Statement of Cash Flows is shown in Figure 8.6 in which the values and formulas underlying the worksheet are exposed and visible.

To calculate the increase or decrease in several Balance Sheet accounts for the Cash Flows from Operating Activities section of the Statement of Cash Flows, I am going to build an additional section in the Statement of Cash Flows. This section will paste the periodic (quarterly) values for each of the relevant accounts from the Balance Sheet into the Statement of Cash Flows. I will then calculate the increase or decrease in each of these accounts for use in the Cash Flows from Operating Activities section of the Statement of Cash Flows. Figure 8.7 presents a view of these calculations related to the relevant Balance Sheet accounts.

Period	Period				X4
	1Q X4	2Q X4	3Q X4	4Q X4	
Cash Flows from Operating Activities					
Net Income	134,737	330,915	425,843	686,328	1,576,822
Adjustments to reconcile net income to cash provided from operating activities					
Depreciation	2,313	4,625	6,938	9,250	23,125
(Increase) decrease in Accounts Receivable					
(Increase) decrease in Inventory					
Increase (decrease) in Accounts Payable					
Increase (decrease) in Loan Payable					
Cash provided (used) by operating activities					
Cash Flows from Investing Activities					
Purchase of capital assets					
Cash provided (used) by investing activities					
Cash Flows from Financing Activities					
Proceeds from sale of Common Stock					
Cash provided (used) by financing activities					
Net increase (decrease) in cash					
Cash, beginning of period					
Cash, end of period					

FIGURE 8.5 Statement of Cash Flows

Period	Period				X4
	1Q X4	2Q X4	3Q X4	4Q X4	
Cash Flows from Operating Activities					
Net Income	=NetInc1Q	=NetInc2Q	=NetInc3Q	=NetInc4Q	=NetIncX4
Adjustments to reconcile net income to cash provided from operating activities					
Depreciation	=Dep1Q	=Dep2Q	=Dep3Q	=Dep4Q	=DepX4
(Increase) decrease in Accounts Receivable					
(Increase) decrease in Inventory					
Increase (decrease) in Accounts Payable					
Increase (decrease) in Loan Payable					
Cash provided (used) by operating activities					
Cash Flows from Investing Activities					
Purchase of capital assets					
Cash provided (used) by investing activities					
Cash Flows from Financing Activities					
Proceeds from sale of Common Stock					
Cash provided (used) by financing activities					
Net increase (decrease) in cash					
Cash, beginning of period					
Cash, end of period					

FIGURE 8.6 Alternative View of the Statement of Cash Flows

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
31 Changes in Balance Sheet Accounts					
32 Accounts Receivable beginning value	-	133,333	192,000	257,600	
33 Accounts Receivable ending value	133,333	192,000	257,600	336,000	
34 (Increase) decrease in Accounts Receivable	(133,333)	(58,667)	(65,600)	(78,400)	
35					
36 Inventory beginning value	-	64,667	83,067	102,667	
37 Inventory ending value	64,667	83,067	102,667	102,667	
38 (Increase) decrease in Inventory	(64,667)	(18,400)	(19,600)	-	
39					
40 Accounts Payable beginning value	-	88,222	103,133	131,133	
41 Accounts Payable ending value	88,222	103,133	131,133	154,000	
42 (Increase) decrease in Accounts Payable	(88,222)	(14,911)	(28,000)	(22,867)	
43					
44 Loan Payable beginning value	-	-	50,000	-	
45 Loan Payable ending value	-	50,000	-	-	
46 (Increase) decrease in Loan Payable	-	(50,000)	50,000	-	

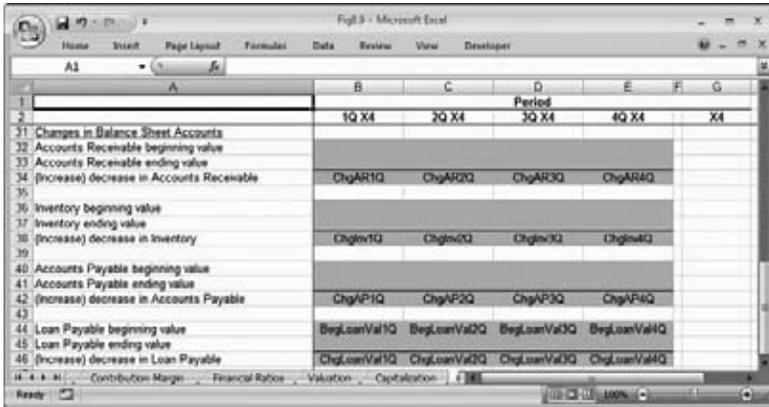
**FIGURE 8.7** Calculations Related to Balance Sheet Accounts

Note that “payables from capital budget” are not included in these calculations; as mentioned in Chapter 7, I am not including this account as a component of current liabilities. Also note that I am including changes in loan payable in cash flows from Operating Activities. I am assuming these cash flows are a part of Napavale’s normal business operations. Changes in loan payable could alternatively be considered a part of financing cash flows.

An alternative view of the worksheet shown in Figure 8.7 (in which the values and formulas underlying the worksheet cells are exposed and visible) is presented in Figure 8.8. Figure 8.9 offers a view of the names of the input and output cells underlying the calculations associated with the increase

	1Q X4	2Q X4	3Q X4	4Q X4
31 Changes in Balance Sheet Accounts				
32 Accounts Receivable beginning value	=BegAR1Q	=BegAR2Q	=BegAR3Q	=BegAR4Q
33 Accounts Receivable ending value	=EndAR1Q	=EndAR2Q	=EndAR3Q	=EndAR4Q
34 (Increase) decrease in Accounts Receivable	=EndAR1Q-EndAR1Q	=EndAR2Q-EndAR2Q	=EndAR3Q-EndAR3Q	=EndAR4Q-EndAR4Q
35				
36 Inventory beginning value	=BegInv1Q	=BegInv2Q	=BegInv3Q	=BegInv4Q
37 Inventory ending value	=EndInv1Q	=EndInv2Q	=EndInv3Q	=EndInv4Q
38 (Increase) decrease in Inventory	=EndInv1Q-EndInv1Q	=EndInv2Q-EndInv2Q	=EndInv3Q-EndInv3Q	=EndInv4Q-EndInv4Q
39				
40 Accounts Payable beginning value	=BegAP1Q	=BegAP2Q	=BegAP3Q	=BegAP4Q
41 Accounts Payable ending value	=EndAP1Q	=EndAP2Q	=EndAP3Q	=EndAP4Q
42 (Increase) decrease in Accounts Payable	=EndAP1Q-EndAP1Q	=EndAP2Q-EndAP2Q	=EndAP3Q-EndAP3Q	=EndAP4Q-EndAP4Q
43				
44 Loan Payable beginning value	0	=LoanPay1Q	=LoanPay2Q	=LoanPay3Q
45 Loan Payable ending value	=LoanPay1Q	=LoanPay2Q	=LoanPay3Q	=LoanPay4Q
46 (Increase) decrease in Loan Payable	=LoanPay1Q-LoanPay1Q	=LoanPay2Q-LoanPay2Q	=LoanPay3Q-LoanPay3Q	=LoanPay4Q-LoanPay4Q

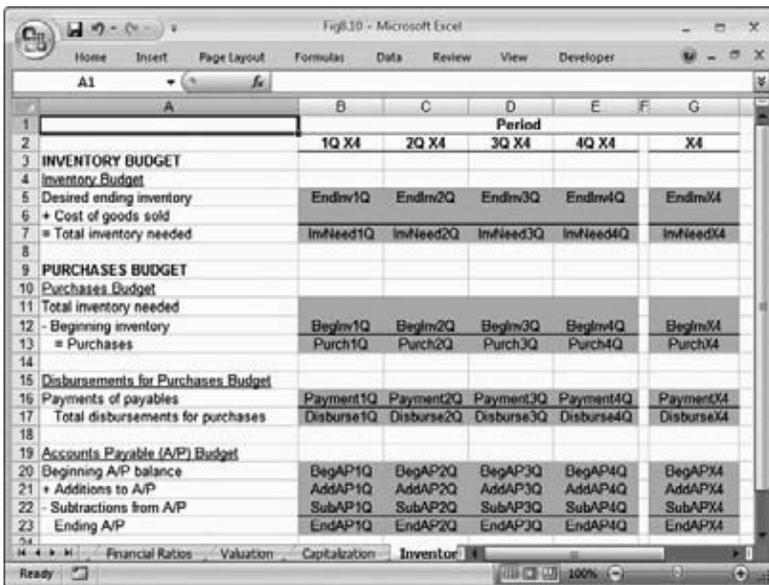
**FIGURE 8.8** Alternative View of the Calculations Related to Balance Sheet Accounts



**FIGURE 8.9** Names of the Input and Output Cells in the Calculations Related to Balance Sheet Accounts

or decrease in the Balance Sheet accounts related to the Cash Flows from Operating Activities section of the Statement of Cash Flows.

As I added a set of names to several worksheet cells in the Inventory and Purchases Budget worksheet, Figure 8.10 presents an updated view of the names underlying the Inventory and Purchases worksheet. The completed



**FIGURE 8.10** Names of the Input and Output Cells in the Inventory and Purchases Worksheet

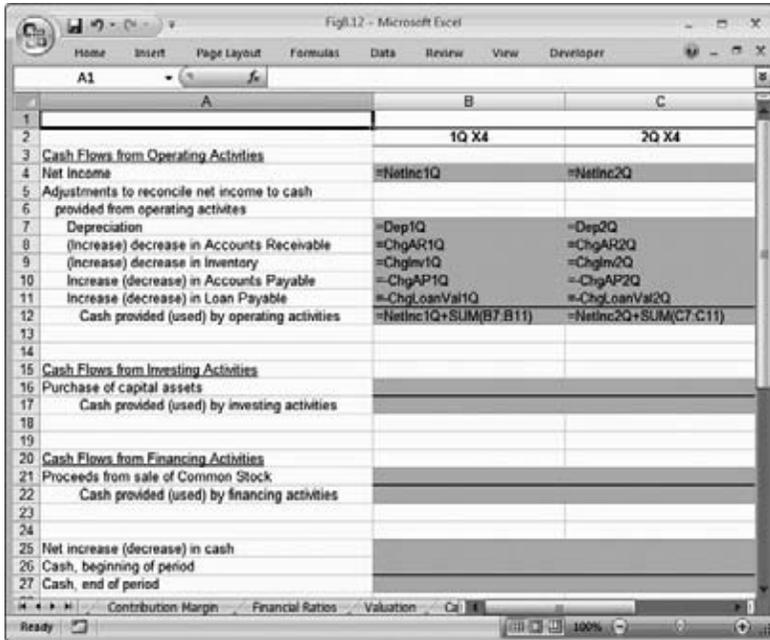
	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Cash Flows from Operating Activities</b>					
Net Income	134,737	330,915	425,843	685,328	1,576,822
Adjustments to reconcile net income to cash provided from operating activities					
Depreciation	2,313	4,625	6,938	9,250	23,125
(Increase) decrease in Accounts Receivable	(133,333)	(58,667)	(65,600)	(78,400)	(336,000)
(Increase) decrease in Inventory	(64,667)	(18,400)	(19,600)	-	(102,667)
Increase (decrease) in Accounts Payable	88,222	14,911	28,000	22,867	154,000
Increase (decrease) in Loan Payable	-	50,000	(50,000)	-	-
Cash provided (used) by operating activities	27,272	323,384	325,580	639,044	1,315,280
<b>Cash Flows from Investing Activities</b>					
Purchase of capital assets					
Cash provided (used) by investing activities					
<b>Cash Flows from Financing Activities</b>					
Proceeds from sale of Common Stock					
Cash provided (used) by financing activities					
Net increase (decrease) in cash					
Cash, beginning of period					
Cash, end of period					

**FIGURE 8.11** Cash Flows from Operating Activities

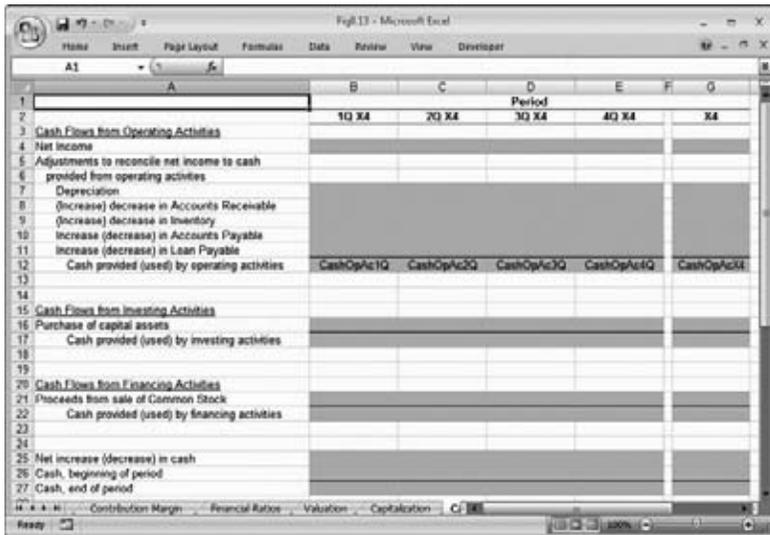
Cash Flows from Operating Activities section of the Statement of Cash Flows is shown in Figure 8.11. A view of the values and formulas underlying the Cash Flows from Operating Activities section is presented in Figure 8.12. To summarize the Cash Flows from Operating Activities, a view of the names underlying the input and output cells in this section is shown in Figure 8.13.

### Cash Flows from Investing Activities

The second section of the Statement of Cash Flows, Cash Flows from Investing Activities, reflects Napavale’s disbursements for and/or proceeds from capital assets. Capital assets include, in this context, large-value purchases such as furniture or equipment that are capitalized as opposed to expensed. This topic of capitalizing versus expensing was discussed in Chapter 6. Napavale’s disbursements for capital expenditures are captured through the Disbursements for Capital Expenditures Budget.



**FIGURE 8.12** Alternative View of the Cash Flows from Operating Activities



**FIGURE 8.13** Names of the Input and Output Cells in the Cash Flows from Operating Activities

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Cash Flows from Operating Activities</b>					
Net Income	134,737	330,915	425,843	685,328	1,576,822
Adjustments to reconcile net income to cash provided from operating activities					
Depreciation	2,313	4,625	6,938	9,250	23,125
(Increase) decrease in Accounts Receivable	(133,333)	(58,667)	(65,600)	(78,400)	(336,000)
(Increase) decrease in Inventory	(64,667)	(18,400)	(19,600)	-	(102,667)
Increase (decrease) in Accounts Payable	88,222	14,911	28,000	22,867	154,000
Increase (decrease) in Loan Payable	-	50,000	(50,000)	-	-
Cash provided (used) by operating activities	27,272	323,384	325,580	639,044	1,315,280
<b>Cash Flows from Investing Activities</b>					
Purchase of capital assets	(45,000)	(45,000)	(45,000)	(45,000)	(180,000)
Cash provided (used) by investing activities	(45,000)	(45,000)	(45,000)	(45,000)	(180,000)
<b>Cash Flows from Financing Activities</b>					
Proceeds from sale of Common Stock					
Cash provided (used) by financing activities					
Net increase (decrease) in cash					
Cash, beginning of period					
Cash, end of period					

**FIGURE 8.14** Cash Flows from Investing Activities

Figure 8.14 presents a view of Napavale’s Cash Flows from Investing Activities section of the Statement of Cash Flows. An alternative view of Napavale’s Cash Flows from Investing Activities in which the values and formulas underlying the worksheet cells are exposed and visible is presented in Figure 8.15. The names of the input and output worksheet cells for the Cash Flows from Investing Activities are shown in Figure 8.16.

**Cash Flows from Financing Activities**

The third (and final) section of the Statement of Cash Flows, Cash Flows from Financing Activities, tracks Napavale’s issuance(s) of common stock and borrowing and repayment of any short-term borrowings. Note that this section of the Statement of Cash Flows may include different and/or additional accounts for other companies. Specifically, some companies may issue several types of equity (stock) and/or debt (borrowings), in which case each class of equity and/or debt may be accounted for separately in the Cash Flows from Financing Activities section.

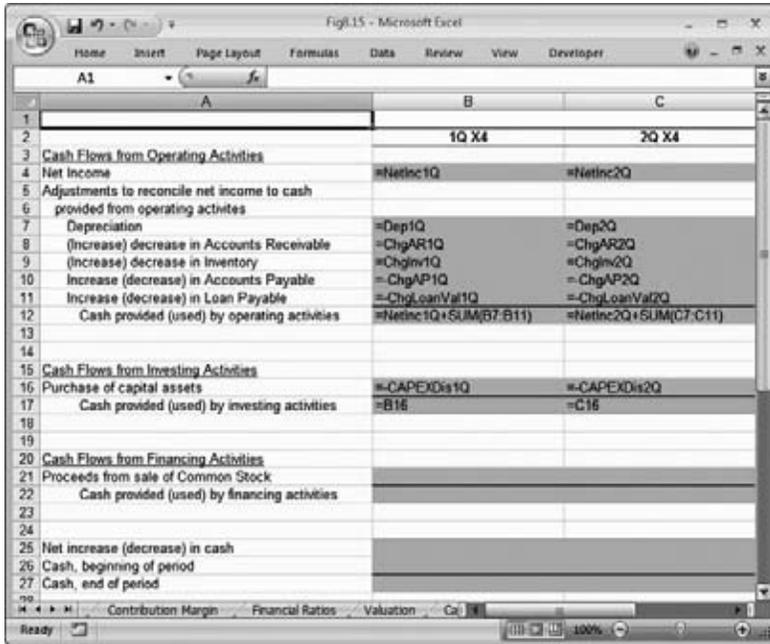


FIGURE 8.15 Alternative View of the Cash Flows from Investing Activities

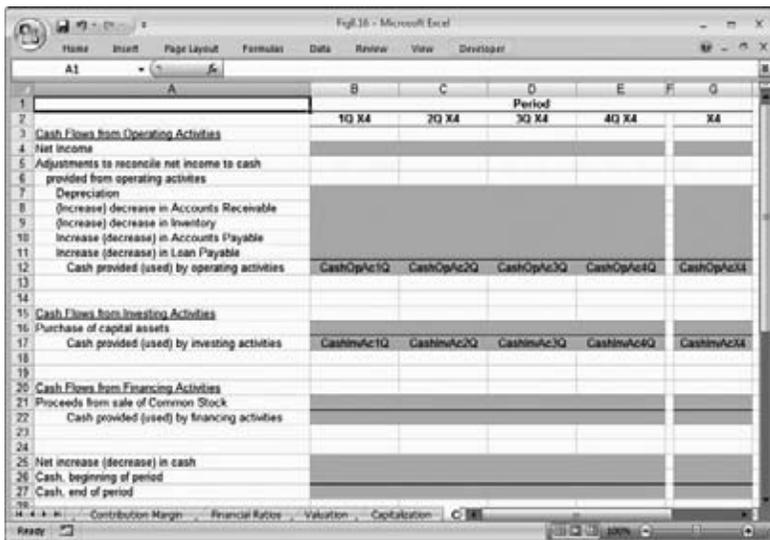


FIGURE 8.16 Names of the Input and Output Cells in the Cash Flows from Investing Activities

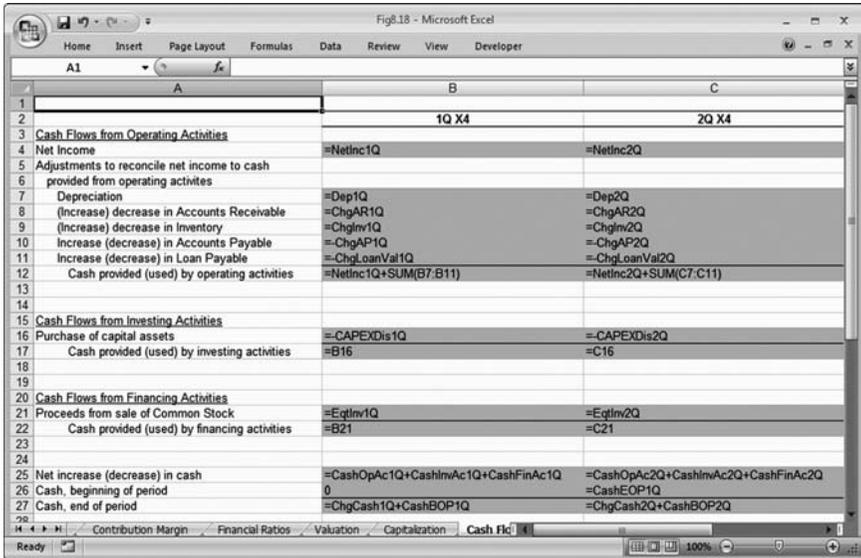
	Period				X4
	1Q X4	2Q X4	3Q X4	4Q X4	
<b>Cash Flows from Operating Activities</b>					
Net Income	134,737	330,915	425,843	685,328	1,576,822
Adjustments to reconcile net income to cash provided from operating activities					
Depreciation	2,313	4,625	6,938	9,250	23,125
(Increase) decrease in Accounts Receivable	(133,333)	(58,667)	(65,600)	(78,400)	(336,000)
(Increase) decrease in Inventory	(64,667)	(18,400)	(19,600)	-	(102,667)
Increase (decrease) in Accounts Payable	88,222	14,911	28,000	22,867	154,000
Increase (decrease) in Loan Payable	-	50,000	(50,000)	-	-
Cash provided (used) by operating activities	27,272	323,384	325,560	639,044	1,315,280
<b>Cash Flows from Investing Activities</b>					
Purchase of capital assets	(45,000)	(45,000)	(45,000)	(45,000)	(180,000)
Cash provided (used) by investing activities	(45,000)	(45,000)	(45,000)	(45,000)	(180,000)
<b>Cash Flows from Financing Activities</b>					
Proceeds from sale of Common Stock	1,000,000	-	-	-	1,000,000
Cash provided (used) by financing activities	1,000,000	-	-	-	1,000,000
Net increase (decrease) in cash	982,272	278,384	280,560	594,044	2,135,280
Cash, beginning of period	-	982,272	1,260,656	1,541,236	-
Cash, end of period	982,272	1,260,656	1,541,236	2,135,280	2,135,280

**FIGURE 8.17** Cash Flows from Financing Activities and Completed Statement of Cash Flows

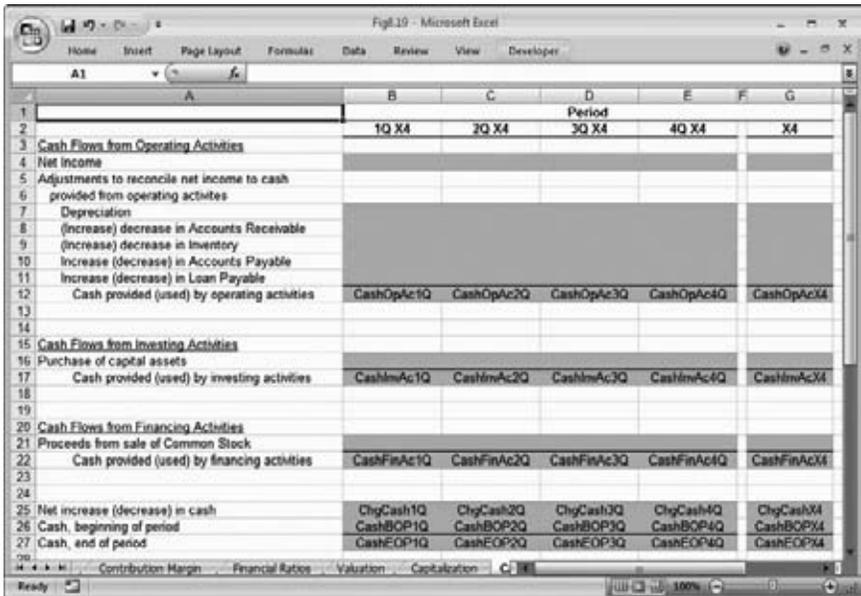
The values relevant to the Cash Flows from Financing Activities are captured in the Cash Budget (based directly on inputs from the Assumptions and Dashboard worksheet). Figure 8.17 presents a view of the Cash Flows from Financing Activities section for Napavale; as this is the final section of the Statement of Cash Flows, Figure 8.17 also represents a completed view of the Statement of Cash Flows. Note the calculation related to Napavale’s net increase or decrease in cash for each period in Figure 8.17.

Napavale’s Balance Sheet value for cash for each accounting period (quarter) must be equal to the “cash, end of period” value as calculated in Figure 8.17. If these values are not equal, there is an error in the financial model.

Figure 8.18 presents an alternative view of the completed Statement of Cash Flows (including the Cash Flows from Financing section) in which the values and formulas underlying the worksheet cells are exposed and visible. Finally, the names of the input and output cells in the completed Statement of Cash Flows (including the Cash Flows from Financing section) are shown in Figure 8.19.



**FIGURE 8.18** Alternative View of the Cash Flows from Financing Activities and Completed Statement of Cash Flows



**FIGURE 8.19** Names of the Input and Output Cells in the Cash Flows from Financing Activities and Completed Statement of Cash Flows

## QUESTIONS

Each of the questions for this chapter relates to a hypothetical company named Company PQR. Company PQR sells camping tents to consumers. As such, Company PQR is a product-oriented (as opposed to a service-oriented) business. The questions for this chapter will address fiscal year X4 on a quarterly basis (four specific quarters, 1Q–4Q for year X4).

The following questions will test your knowledge of the material covered in this chapter in an applied manner—specifically, you will be asked to build Company PQR’s Statement of Cash Flows.

To prepare you for this chapter’s questions, several figures provide background information related to Company PQR’s operations. Figure Q8.1 offers a view of Company PQR’s Income Statement. Note that there are three cost-of-goods-sold components for Company PQR’s camping tents: (1) fabric, (2) frame, and (3) assembly and labor.

Figure Q8.2 presents a view of Company PQR’s Balance Sheet. Company PQR’s Sales and Collections worksheet is presented in Figure Q8.3. Figure Q8.4 offers a view of Company PQR’s Inventory and Purchases worksheet. A portion of Company PQR’s Assumptions and Dashboard worksheet is presented in Figure Q8.5. The Capital Budget worksheet for Company PQR is shown in Figure Q8.6.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
Sales	\$ 3,000,000	\$ 3,171,250	\$ 3,392,500	\$ 3,480,000	\$ 13,043,750
Cost of goods sold	1,300,000	1,397,500	1,437,500	1,500,000	5,635,000
Gross profit	\$ 1,700,000	\$ 1,773,750	\$ 1,955,000	\$ 1,980,000	\$ 7,408,750
Salaries	\$ 319,125	\$ 356,500	\$ 559,188	\$ 587,938	\$ 1,822,750
Miscellaneous expenses	90,000	95,138	101,775	104,400	391,313
Research and development	180,000	190,275	169,625	174,000	713,900
Rent	25,000	25,000	25,000	25,000	100,000
Depreciation	1,625	3,000	4,875	5,750	15,250
Income from operations	\$ 1,094,250	\$ 1,103,838	\$ 1,094,538	\$ 1,082,913	\$ 4,365,538
Interest expense	\$ 875	\$ -	\$ -	\$ -	\$ 875
Taxable income	\$ 1,083,375	\$ 1,103,838	\$ 1,094,538	\$ 1,082,913	\$ 4,364,663
Tax expense	\$ 379,181	\$ 386,343	\$ 383,098	\$ 379,019	\$ 1,527,632
Net income	\$ 704,194	\$ 717,494	\$ 711,449	\$ 703,893	\$ 2,837,031

**FIGURE Q8.1** Company PQR’s Income Statement

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Assets</b>					
Cash	\$ 846,597	\$ 1,344,153	\$ 2,000,040	\$ 2,699,281	\$ 2,699,281
Accounts Receivable	250,000	264,271	282,708	290,000	290,000
Inventory	465,833	479,167	500,000	500,000	500,000
Fixed Assets, net	30,375	54,375	86,500	97,750	97,750
<b>Total Assets</b>	<b>\$ 1,592,805</b>	<b>\$ 2,141,966</b>	<b>\$ 2,869,249</b>	<b>\$ 3,587,031</b>	<b>\$ 3,587,031</b>
<b>Liabilities</b>					
Accounts Payable	\$ 588,611	\$ 470,278	\$ 486,111	\$ 500,000	\$ 500,000
Payables from Capital Budget	-	-	-	-	-
Loan Payable	50,000	-	-	-	-
<b>Total Liabilities</b>	<b>\$ 638,611</b>	<b>\$ 470,278</b>	<b>\$ 486,111</b>	<b>\$ 500,000</b>	<b>\$ 500,000</b>
<b>Owners' Equity</b>					
Common Stock	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000
Retained Earnings	704,194	1,421,688	2,133,138	2,837,031	2,837,031
<b>Total Owners' Equity</b>	<b>\$ 954,194</b>	<b>\$ 1,671,688</b>	<b>\$ 2,383,138</b>	<b>\$ 3,087,031</b>	<b>\$ 3,087,031</b>
<b>Total Liabilities and Owners' Equity</b>	<b>\$ 1,592,805</b>	<b>\$ 2,141,966</b>	<b>\$ 2,869,249</b>	<b>\$ 3,587,031</b>	<b>\$ 3,587,031</b>

FIGURE Q8.2 Company PQR's Balance Sheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>SALES BUDGET</b>					
<b>Unit Sales and Price Budget</b>					
Unit sales	10,000	10,750	11,500	12,000	44,250
× Price per unit	\$ 300	\$ 295	\$ 295	\$ 290	N/A
= Total sales	\$ 3,000,000	\$ 3,171,250	\$ 3,392,500	\$ 3,480,000	\$ 13,043,750
<b>Sales Composition Budget</b>					
Cash sales	\$ 2,280,000	\$ 2,378,438	\$ 2,544,375	\$ 2,610,000	\$ 9,782,813
+ Credit sales	750,000	792,813	848,125	870,000	3,260,938
= Total sales	\$ 3,000,000	\$ 3,171,250	\$ 3,392,500	\$ 3,480,000	\$ 13,043,750
<b>COLLECTIONS BUDGET</b>					
<b>Cash Collections from Customers Budget</b>					
Cash sales this period	\$ 2,280,000	\$ 2,378,438	\$ 2,544,375	\$ 2,610,000	\$ 9,782,813
+ Credit sales collected	500,000	778,542	829,688	862,708	2,970,938
= Total collections	\$ 2,750,000	\$ 3,156,979	\$ 3,374,063	\$ 3,472,708	\$ 12,753,750
<b>Accounts Receivable (A/R) Budget</b>					
Beginning A/R balance	\$ -	\$ 250,000	\$ 264,271	\$ 282,708	\$ -
+ Additions to A/R	250,000	264,271	282,708	290,000	1,086,979
- Subtractions from A/R	-	250,000	264,271	282,708	796,979
= Ending A/R balance	\$ 250,000	\$ 264,271	\$ 282,708	\$ 290,000	\$ 290,000

FIGURE Q8.3 Company PQR's Sales and Collections Worksheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>INVENTORY BUDGET</b>					
<b>Inventory Budget</b>					
Desired ending inventory	\$ 486,833	\$ 479,167	\$ 500,000	\$ 500,000	\$ 500,000
+ Cost of goods sold	1,300,000	1,397,500	1,437,500	1,500,000	5,635,000
= Total inventory needed	\$ 1,786,833	\$ 1,876,667	\$ 1,937,500	\$ 2,000,000	\$ 6,135,000
<b>PURCHASES BUDGET</b>					
<b>Purchases Budget</b>					
Total inventory needed	\$ 1,786,833	\$ 1,876,667	\$ 1,937,500	\$ 2,000,000	N/A
- Beginning inventory	-	465,833	479,167	500,000	-
= Purchases	\$ 1,786,833	\$ 1,410,833	\$ 1,458,333	\$ 1,500,000	N/A
<b>Disbursements for Purchases Budget</b>					
Payments of payables	\$ 1,177,222	\$ 1,529,167	\$ 1,442,500	\$ 1,486,111	\$ 5,635,000
Total disbursements for purchases	\$ 1,177,222	\$ 1,529,167	\$ 1,442,500	\$ 1,486,111	\$ 5,635,000
<b>Accounts Payable (A/P) Budget</b>					
Beginning A/P balance	\$ -	\$ 588,611	\$ 470,278	\$ 486,111	\$ -
+ Additions to A/P	588,611	470,278	486,111	500,000	2,045,000
- Subtractions from A/P	-	588,611	470,278	486,111	1,545,000
Ending A/P	\$ 588,611	\$ 470,278	\$ 486,111	\$ 500,000	\$ 500,000

FIGURE Q8.4 Company PQR’s Inventory and Purchases Worksheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Sales and Collections Worksheet</b>					
<b>Unit Sales and Price Inputs</b>					
Unit sales	10,000	10,750	11,500	12,000	
Price per unit	\$ 300	\$ 295	\$ 295	\$ 290	
<b>Sales Composition Inputs</b>					
Cash sales as a % of total sales	75%	75%	75%	75%	
Credit sales as a % of total sales	25%	25%	25%	25%	
Days receivable (DSO)	30	30	30	30	
Days per quarter	90	90	90	90	
<b>COGS Worksheet</b>					
<b>Cost-of-Goods Sold Inputs</b>					
Fabric: cost per unit	\$ 45.00	\$ 45.00	\$ 45.00	\$ 45.00	
Frame: cost per unit	\$ 45.00	\$ 45.00	\$ 40.00	\$ 40.00	
Assembly labor: cost per unit	\$ 40.00	\$ 40.00	\$ 40.00	\$ 40.00	
Total	\$ 130.00	\$ 130.00	\$ 125.00	\$ 125.00	
<b>Inventory and Purchases Worksheet</b>					
<b>Inventory Inputs</b>					
Days inventory	30	30	30	30	
<b>Disbursements for Purchases Inputs</b>					
Days payable	30	30	30	30	

FIGURE Q8.5 Company PQR’s Assumptions and Dashboard Worksheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>CAPITAL BUDGET</b>					
<b>Capital Expenditures Budget</b>					
Equipment	\$ 25,000	\$ 20,000	\$ 30,000	\$ 10,000	\$ 85,000
Furniture	5,000	5,000	5,000	5,000	20,000
Fixtures	2,000	2,000	2,000	2,000	8,000
<b>Total capital expenditures</b>	<b>\$ 32,000</b>	<b>\$ 27,000</b>	<b>\$ 37,000</b>	<b>\$ 17,000</b>	<b>\$ 113,000</b>
<b>Disbursements for Capital Expenditures Budget</b>					
Equipment	\$ 25,000	\$ 20,000	\$ 30,000	\$ 10,000	\$ 85,000
Furniture	5,000	5,000	5,000	5,000	20,000
Fixtures	2,000	2,000	2,000	2,000	8,000
<b>Total disbursements for capital expenditures</b>	<b>\$ 32,000</b>	<b>\$ 27,000</b>	<b>\$ 37,000</b>	<b>\$ 17,000</b>	<b>\$ 113,000</b>
<b>Depreciation Budget</b>					
Equipment	\$ 1,250	\$ 2,250	\$ 3,750	\$ 4,250	\$ 11,500
Furniture	250	500	750	1,000	2,500
Fixtures	125	250	375	500	1,250
<b>Total depreciation</b>	<b>\$ 1,625</b>	<b>\$ 3,000</b>	<b>\$ 4,875</b>	<b>\$ 5,750</b>	<b>\$ 15,250</b>
Cumulative capital expenditures	\$ 32,000	\$ 59,000	\$ 96,000	\$ 113,000	
- Accumulated depreciation	1,625	4,625	9,500	15,250	
<b>= Fixed assets, net of depreciation</b>	<b>\$ 30,375</b>	<b>\$ 54,375</b>	<b>\$ 86,500</b>	<b>\$ 97,750</b>	
Cumulative disbursements for CAPEX	\$ 32,000	\$ 59,000	\$ 96,000	\$ 113,000	
Payables adjustment for CAPEX disbursements	\$ -	\$ -	\$ -	\$ -	

**FIGURE Q8.6** Company PQR's Capital Worksheet

1. Given the information presented, build the Cash Flows from Operating Activities section of Company PQR's Statement of Cash Flows.
2. Given the information presented, build the Cash Flows from Investing Activities section of Company PQR's Statement of Cash Flows.
3. Given the information presented, build the Cash Flows from Financing Activities section of Company PQR's Statement of Cash Flows.

## Free Cash Flows and Dashboard

**W**hile Chapters 2 through 8 covered the creation of Napavale’s Master Budget, Operating Budget, Financial Budget, and Consolidated Financial Statements (Balance Sheet, Income Statement, and Statement of Cash Flows), this chapter is focused on Napavale’s free cash flows and the Dashboard section of the Assumptions and Dashboard worksheet. The calculation of Napavale’s projected free cash flows represents the final stage in building all of the components required for the analysis and evaluation of Napavale as a business. As such, after calculating Napavale’s free cash flows, I will build the first Dashboard section of Napavale’s Assumptions and Dashboard worksheet in which various outputs of the financial model are checked for consistency.

As mentioned briefly in Chapter 1, free cash flows represent the funds available to “all providers of capital”— a group that includes a company’s equity (stock) owners and debt holders. The concept of free cash flows, which is a key component of traditional MBA finance classes, is central to the modeling and analysis of any company’s operations. In essence, free cash flows represent the cash left over after all of a company’s required expenses and obligations have been paid and fulfilled. I will revisit the concept of free cash flows later in the book when I cover the concept of valuation in Chapter 13.

The calculation and analysis of Napavale’s free cash flows represent one way to assess and evaluate Napavale as a business. Note that the calculation of free cash flows is based largely on information that I have already calculated in previous chapters. I will present updated views of Napavale’s Assumptions and Dashboard worksheet when new assumptions are introduced over the course of this chapter.

You may remember from Chapter 2 that the Dashboard offers a sense of a financial model’s condition and “state of health.” A Dashboard can provide both a synopsis of a financial model’s key outputs, such as revenues and net income, and can also indicate, for example, whether the Balance Sheet is balanced. I will cover the synopsis of key outputs from the financial

model in Chapter 10 and the indication of the financial model’s accuracy and consistency later in this chapter.

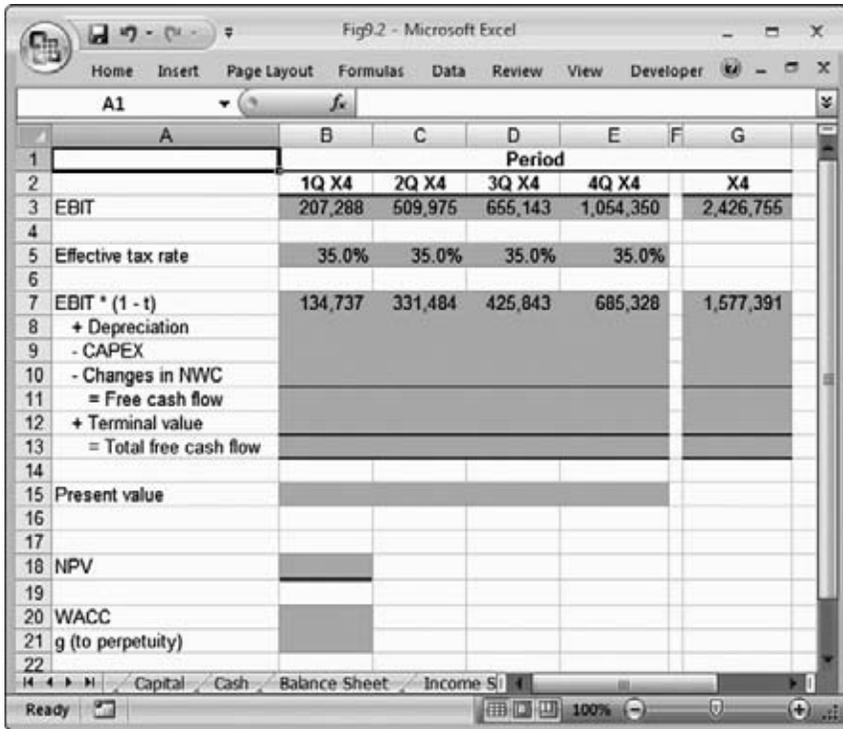
## CALCULATION OF FREE CASH FLOWS

There are several different ways to calculate free cash flows and the actual definition of free cash flows (and the components of free cash flows) can vary from person to person and from company to company. The definition and calculation of free cash flows that I present in this chapter are widely used in both academia and in industry. Do not be surprised, however, if you come across a different way of defining or calculating free cash flows as compared to the discussion of free cash flows in this book. The important thing to remember is the core meaning of free cash flows—namely, the funds available to all providers of capital after all required expenses have been paid.

The first step in calculating Napavale’s free cash flows is to determine a metric known as EBIT (Earnings Before Interest and Taxes). In Napavale’s case, EBIT is equivalent to “income from operations” on the Income Statement. For the sake of reference, Figure 9.1 presents a view of Napavale’s Income Statement with the names of the worksheet cells indicated.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
Sales					
Cost of goods sold					
Gross profit	GrossP1Q	GrossP2Q	GrossP3Q	GrossP4Q	GrossPX4
Salaries					
Miscellaneous expenses					
Research and development					
Rent					
Depreciation					
Income from operations	OpInc1Q	OpInc2Q	OpInc3Q	OpInc4Q	OpIncX4
Interest expense					
Taxable income	TaxInc1Q	TaxInc2Q	TaxInc3Q	TaxInc4Q	TaxIncX4
Tax expense	TaxExp1Q	TaxExp2Q	TaxExp3Q	TaxExp4Q	TaxExpX4
Net income	NetInc1Q	NetInc2Q	NetInc3Q	NetInc4Q	NetIncX4

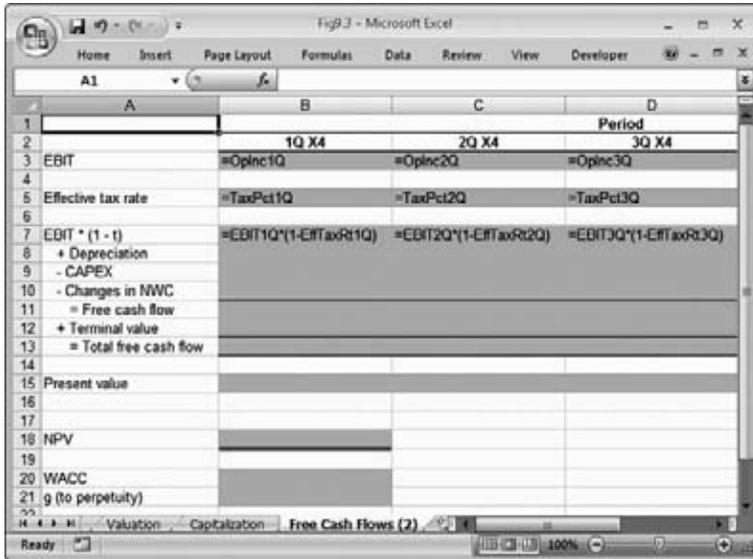
FIGURE 9.1 Names of the Input and Output Cells in the Income Statement



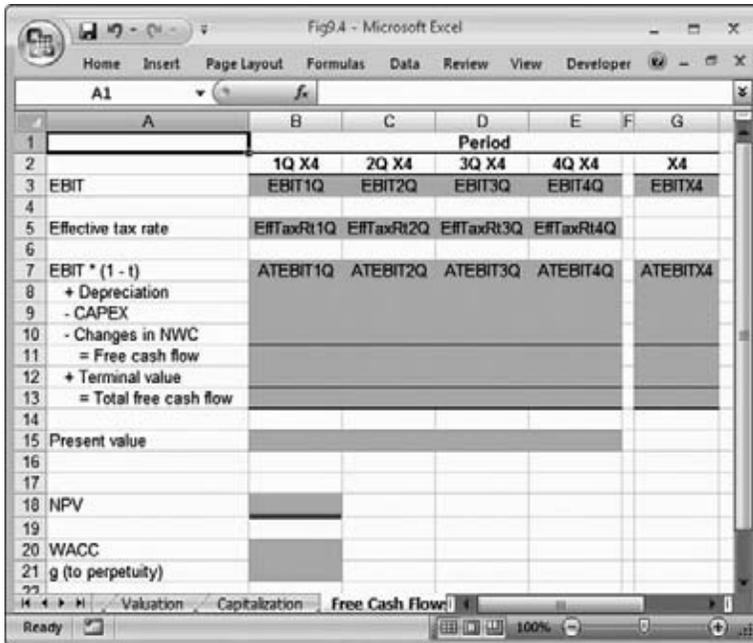
**FIGURE 9.2** First Section of the Free Cash Flows Worksheet

The next step in calculating Napavale’s free cash flows is to adjust EBIT for any taxes that are paid. Taxes are expenses that must be paid to the tax authorities; interest payments are not removed from the EBIT figure because free cash flows represent the funds available to all providers of capital (including those providing debt, to whom interest payments are made). Figure 9.2 offers a view of the first section of Napavale’s free cash flows worksheet in which “after-tax EBIT” is calculated. An alternative view of Napavale’s free cash flows worksheet in which the values and formulas underlying the worksheet cells are exposed and visible is shown in Figure 9.3. The names of the input and output worksheet cells in Napavale’s free cash flows worksheet are presented in Figure 9.4.

After calculating Napavale’s “after-tax EBIT,” several additional adjustments are required to determine the free cash flow projections for Napavale. Each of these adjustments reconciles the after-tax EBIT figure to a cash-based value. I will highlight each of these adjustments in the order in which I have included them in Napavale’s free cash flows worksheet.



**FIGURE 9.3** Alternative View of the First Section of the Free Cash Flows Worksheet

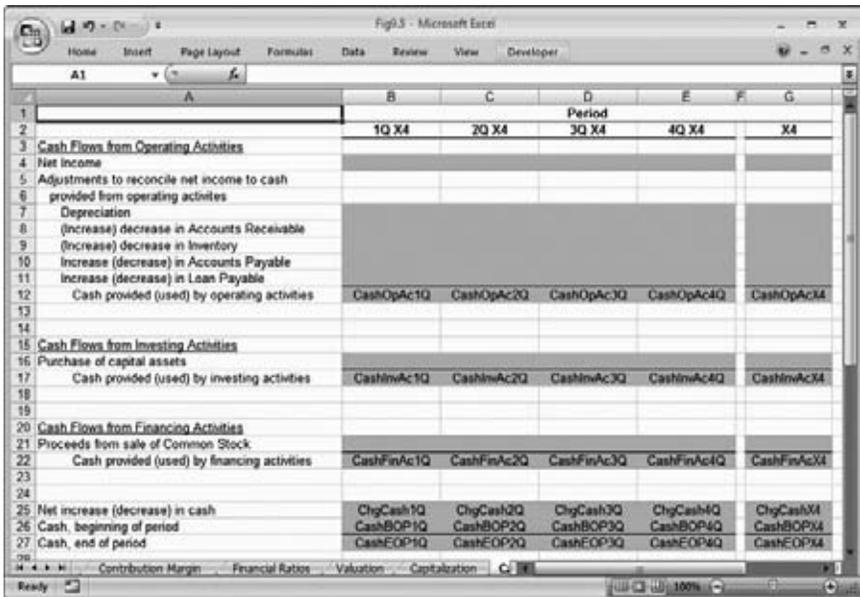


**FIGURE 9.4** Names of the Input and Output Cells in the First Section of the Free Cash Flows Worksheet

The first adjustment to after-tax EBIT is to add the depreciation expense for each accounting period (quarter) back into the after-tax EBIT. Depreciation is a non-cash expense and thus does not represent an outflow of cash from Napavale. Depreciation expense is a line item in Napavale’s Income Statement; the names of the worksheet cells in Napavale’s Income Statement are shown in Figure 9.1.

The second adjustment to after-tax EBIT is to subtract disbursements for capital expenditures for each accounting period (quarter) out of the after-tax EBIT. Capital expenditures do not appear directly as a component of EBIT (depreciation expenses related to capital expenditures, however, do show up in EBIT), so these disbursements must be accounted for as they represent cash outflows for Napavale. For the sake of reference, Figure 9.5 presents a view of Napavale’s Statement of Cash Flows with the names of the worksheet cells indicated.

The final adjustment to after-tax EBIT is to subtract any positive changes in Napavale’s net working capital for each accounting period (quarter) out of after-tax EBIT. The concept of net working capital and the calculations underlying the changes in Napavale’s net working capital were covered in Chapter 7. An increase in net working capital represents a cash outflow for Napavale (and vice-versa), so any increase in net working capital must be



**FIGURE 9.5** Names of the Input and Output Cells in the Statement of Cash Flows

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Assets</b>					
Cash					
Accounts Receivable					
Inventory					
Fixed Assets, net					
<b>Total Assets</b>	<b>TotAssets1Q</b>	<b>TotAssets2Q</b>	<b>TotAssets3Q</b>	<b>TotAssets4Q</b>	<b>TotAssetsX4</b>
<b>Liabilities</b>					
Accounts Payable					
Payables from Capital Budget	PayCapB1Q	PayCapB2Q	PayCapB3Q	PayCapB4Q	PayCapBX4
Loan Payable					
<b>Total Liabilities</b>	<b>TotLiabs1Q</b>	<b>TotLiabs2Q</b>	<b>TotLiabs3Q</b>	<b>TotLiabs4Q</b>	<b>TotLiabsX4</b>
<b>Owners' Equity</b>					
Common Stock	CS1Q	CS2Q	CS3Q	CS4Q	CSX4
Retained Earnings	RE1Q	RE2Q	RE3Q	RE4Q	REX4
<b>Total Owners' Equity</b>	<b>TotOE1Q</b>	<b>TotOE2Q</b>	<b>TotOE3Q</b>	<b>TotOE4Q</b>	<b>TotOEX4</b>
<b>Total Liabilities and Owners' Equity</b>	<b>TotLOE1Q</b>	<b>TotLOE2Q</b>	<b>TotLOE3Q</b>	<b>TotLOE4Q</b>	<b>TotLOEX4</b>
<b>Net Working Capital (NWC)</b>					
Current assets	CA1Q	CA2Q	CA3Q	CA4Q	CAX4
- Current liabilities	CL1Q	CL2Q	CL3Q	CL4Q	CLX4
<b>= Net working capital</b>	<b>NWC1Q</b>	<b>NWC2Q</b>	<b>NWC3Q</b>	<b>NWC4Q</b>	<b>NWCX4</b>
<b>Beginning NWC</b>	<b>BegNWC1Q</b>	<b>BegNWC2Q</b>	<b>BegNWC3Q</b>	<b>BegNWC4Q</b>	<b>BegNWCX4</b>
- Ending NWC	EndNWC1Q	EndNWC2Q	EndNWC3Q	EndNWC4Q	EndNWCX4
<b>= Change in NWC</b>	<b>ChgNWC1Q</b>	<b>ChgNWC2Q</b>	<b>ChgNWC3Q</b>	<b>ChgNWC4Q</b>	<b>ChgNWCX4Q</b>

**FIGURE 9.6** Names of the Input and Output Cells in the Balance Sheet

accounted for as a cash outflow in the calculation of Napavale's free cash flows. For the sake of reference, Figure 9.6 presents a view of Napavale's Balance Sheet with the names of the worksheet cells indicated.

Napavale's free cash flows worksheet is shown in Figure 9.7. Note that I have calculated the free cash flows for each accounting period (quarter) in Figure 9.7.

Napavale's free cash flows worksheet now includes adjustments for depreciation, capital expenditures, and changes in net working capital. An alternative view of Napavale's free cash flows worksheet in which the values and formulas underlying the worksheet cells are exposed and visible is presented in Figure 9.8. Figure 9.9 highlights the names of the input and output worksheet cells underlying Napavale's free cash flows worksheet.

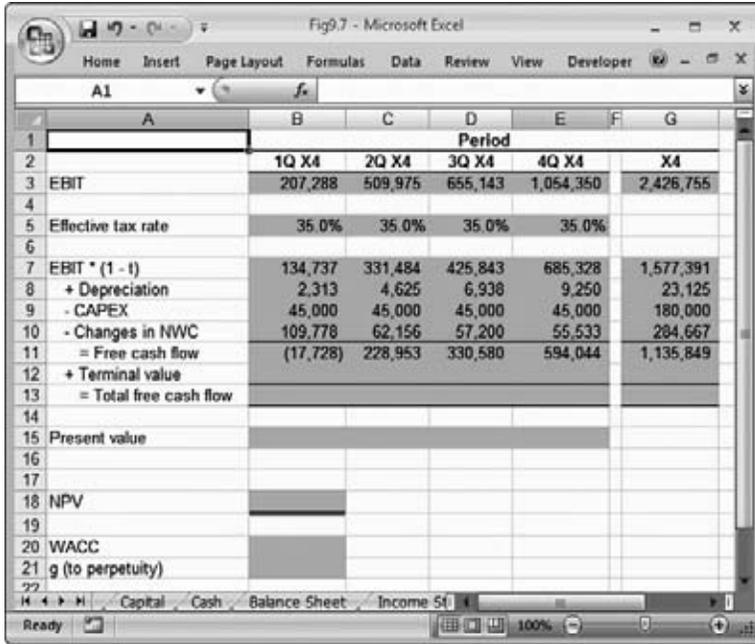


FIGURE 9.7 Free Cash Flows Worksheet

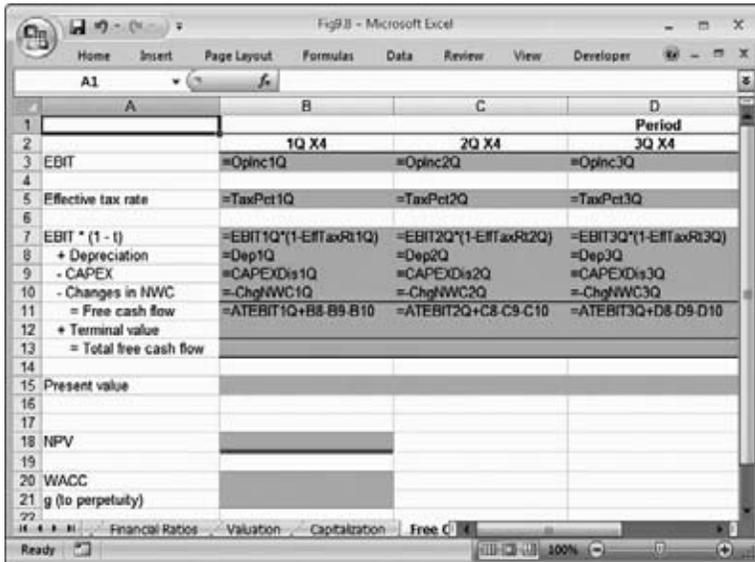


FIGURE 9.8 Alternative View of the Free Cash Flows Worksheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
EBIT	EBIT1Q	EBIT2Q	EBIT3Q	EBIT4Q	EBITX4
Effective tax rate	EffTaxRt1Q	EffTaxRt2Q	EffTaxRt3Q	EffTaxRt4Q	
EBIT * (1 - t)	ATEBIT1Q	ATEBIT2Q	ATEBIT3Q	ATEBIT4Q	ATEBITX4
+ Depreciation					
- CAPEX					
- Changes in NWC					
= Free cash flow	FCF1Q	FCF2Q	FCF3Q	FCF4Q	FCFX4
+ Terminal value					
= Total free cash flow					
Present value					
NPV					
WACC					
g (to perpetuity)					

**FIGURE 9.9** Names of the Input and Output Cells in the Free Cash Flows Worksheet

## DASHBOARD

Now that I have calculated Napavale’s projected free cash flows, I will build the first section of the Dashboard portion of the Assumptions and Dashboard worksheet. This section of the Dashboard, as mentioned at the beginning of this chapter, will give a sense of the accuracy and consistency of the internal workings of Napavale’s financial model. Note that this will not give any indication of the reasonableness of the assumptions underlying Napavale’s financial model. The Dashboard is simply meant to indicate whether the financial model is working properly.

The key indicators that I will use to determine if Napavale’s financial model is working properly are (1) whether the Balance Sheet balances and (2) whether the “cash” values from the Balance Sheet equal the “cash, end of period” values from the Statement of Cash Flows. These two key indicators give a quick and good view into the inner workings of the financial model.

While you can always look at the Balance Sheet and/or the Statement of Cash Flows after any changes are made to a financial model to make sure the financial model is working properly, using a Dashboard makes this process more efficient and potentially less error-prone.

## Balance Sheet Status

To determine whether the Balance Sheet balances, I must first add a calculation to the Balance Sheet itself. Remember that a Balance Sheet must always “balance” if it is working properly; in other words, a business’s Assets must always equal its Liabilities + Owners’ Equity. As such, I will calculate the differences between Napavale’s Assets and Napavale’s Liabilities and Owners’ Equity. If this difference is any value other than zero, the model is not functioning properly. Figure 9.10 presents an updated view of

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Assets</b>					
Cash	\$ 982,272	\$ 1,260,656	\$ 1,541,236	\$ 2,135,280	\$ 2,135,280
Accounts Receivable	133,333	192,000	257,600	336,000	336,000
Inventory	64,667	83,067	102,667	102,667	102,667
Fixed Assets, net	42,888	83,063	121,125	156,875	156,875
<b>Total Assets</b>	<b>\$ 1,222,959</b>	<b>\$ 1,618,785</b>	<b>\$ 2,022,628</b>	<b>\$ 2,730,822</b>	<b>\$ 2,730,822</b>
<b>Liabilities</b>					
Accounts Payable	\$ 88,222	\$ 103,133	\$ 131,133	\$ 154,000	\$ 154,000
Payables from Capital Budget	-	-	-	-	-
Loan Payable	-	50,000	-	-	-
<b>Total Liabilities</b>	<b>\$ 88,222</b>	<b>\$ 153,133</b>	<b>\$ 131,133</b>	<b>\$ 154,000</b>	<b>\$ 154,000</b>
<b>Owners' Equity</b>					
Common Stock	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000
Retained Earnings	134,737	465,652	891,495	1,576,822	1,576,822
<b>Total Owners' Equity</b>	<b>\$ 1,134,737</b>	<b>\$ 1,465,652</b>	<b>\$ 1,891,495</b>	<b>\$ 2,576,822</b>	<b>\$ 2,576,822</b>
<b>Total Liabilities and Owners' Equity</b>	<b>\$ 1,222,959</b>	<b>\$ 1,618,785</b>	<b>\$ 2,022,628</b>	<b>\$ 2,730,822</b>	<b>\$ 2,730,822</b>
Balance Sheet calculation check	-	-	-	-	-
<b>Net Working Capital (NWC)</b>					
Current assets	\$ 198,000	\$ 275,067	\$ 360,267	\$ 438,667	N/A
- Current liabilities	88,222	103,133	131,133	154,000	N/A
= Net working capital	<b>\$ 109,778</b>	<b>\$ 171,933</b>	<b>\$ 229,133</b>	<b>\$ 284,667</b>	<b>N/A</b>
Beginning NWC	\$ -	\$ 109,778	\$ 171,933	\$ 229,133	N/A
Ending NWC	109,778	171,933	229,133	284,667	N/A
= Change in NWC	<b>\$ (109,778)</b>	<b>\$ (62,156)</b>	<b>\$ (57,200)</b>	<b>\$ (55,533)</b>	<b>N/A</b>

FIGURE 9.10 Balance Sheet

Napavale's Balance Sheet in which the calculation that checks if the Balance Sheet balances is included.

An alternative view of Napavale's updated Balance Sheet in which the values and formulas underlying the worksheet cells are exposed and visible is presented in Figure 9.11. Figure 9.12 presents a view of the names of the worksheet cells in Napavale's updated Balance Sheet.

I now need to include an indicator in Napavale's Dashboard that displays the "status" of the Balance Sheet. Specifically, the Dashboard must display whether the Balance Sheet is balanced. To do so, I will reference the calculation highlighted in Figures 9.10 through 9.12 and I will use a function known as the "IF" function in Excel. Figure 9.13 presents a view of the Dashboard from Napavale's Assumptions and Dashboard worksheet.

The screenshot shows an Excel spreadsheet titled 'Fig9.11 - Microsoft Excel'. The spreadsheet displays a Balance Sheet for three quarters (1Q X4, 2Q X4, 3Q X4). The formulas are visible in the cells, showing calculations for various assets, liabilities, and equity components. A 'Balance Sheet calculation check' row is highlighted, showing the difference between total assets and total liabilities plus owners' equity for each quarter.

	1Q X4	2Q X4	3Q X4
<b>Assets</b>			
Cash	=EndCash1Q	=EndCash2Q	=EndCash3Q
Accounts Receivable	=EndAR1Q	=EndAR2Q	=EndAR3Q
Inventory	=EndInv1Q	=EndInv2Q	=EndInv3Q
Fixed Assets, net	=FixAssets1Q	=FixAssets2Q	=FixAssets3Q
<b>Total Assets</b>	=SUM(B4:B7)	=SUM(C4:C7)	=SUM(D4:D7)
<b>Liabilities</b>			
Accounts Payable	=EndAP1Q	=EndAP2Q	=EndAP3Q
Payables from Capital Budget	=PACAPEX1Q	=PACAPEX2Q	=PACAPEX3Q
Loan Payable	=LoanVal1Q	=LoanVal2Q	=LoanVal3Q
<b>Total Liabilities</b>	=SUM(B12:B14)	=SUM(C12:C14)	=SUM(D12:D14)
<b>Owners' Equity</b>			
Common Stock	=Eqtlv1Q	=Eqtlv2Q+CS1Q	=Eqtlv3Q+CS2Q
Retained Earnings	=Netinc1Q	=Netinc2Q+RE1Q	=Netinc3Q+RE2Q
<b>Total Owners' Equity</b>	=SUM(B19:B20)	=SUM(C19:C20)	=SUM(D19:D20)
<b>Total Liabilities and Owners' Equity</b>	=TotLiabs1Q+TotOE1Q	=TotLiabs2Q+TotOE2Q	=TotLiabs3Q+TotOE3Q
<b>Balance Sheet calculation check</b>	=TotAssets1Q-TotLOE1Q	=TotAssets2Q-TotLOE2Q	=TotAssets3Q-TotLOE3Q
<b>Net Working Capital (NWC)</b>			
Current assets	=EndAR1Q+EndInv1Q	=EndAR2Q+EndInv2Q	=EndAR3Q+EndInv3Q
- Current liabilities	=EndAP1Q	=EndAP2Q	=EndAP3Q
= Net working capital	=CA1Q-CL1Q	=CA2Q-CL2Q	=CA3Q-CL3Q
Beginning NWC	0	=NWC1Q	=NWC2Q
- Ending NWC	=NWC1Q	=NWC2Q	=NWC3Q
= Change in NWC	=BegNWC1Q-EndNWC1Q	=BegNWC2Q-EndNWC2Q	=BegNWC3Q-EndNWC3Q

**FIGURE 9.11** Alternative View of the Balance Sheet

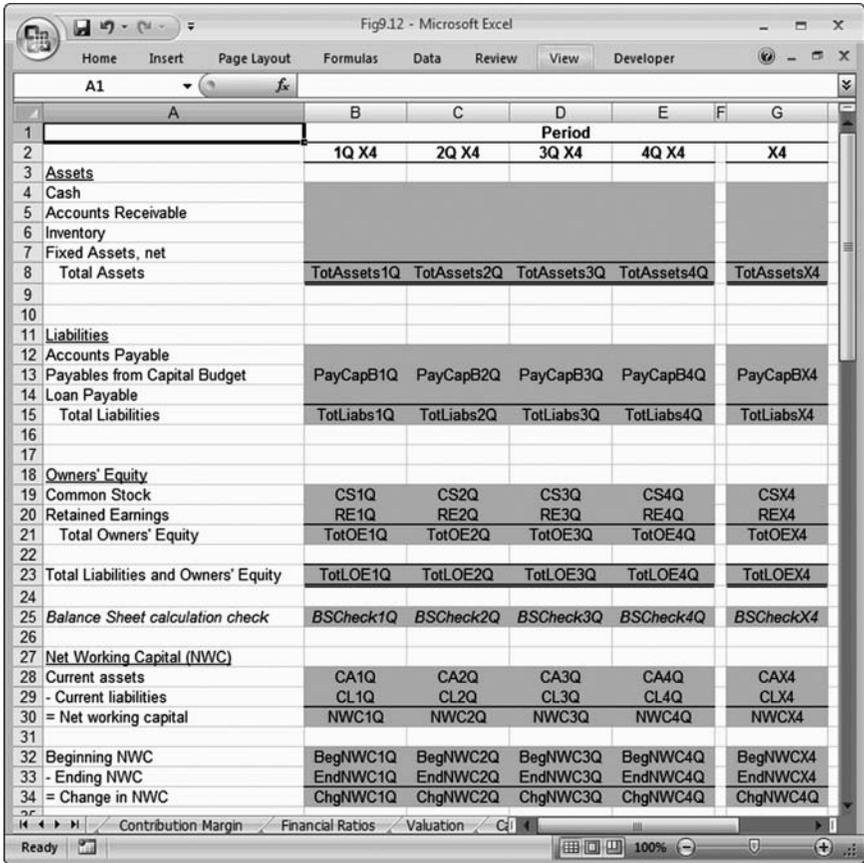


FIGURE 9.12 Names of the Input and Output Cells in the Balance Sheet

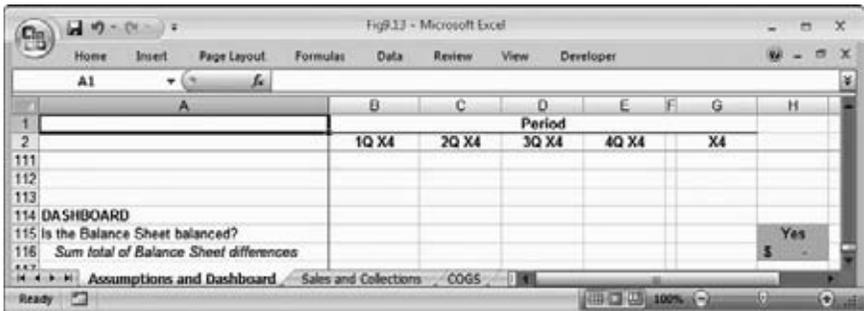
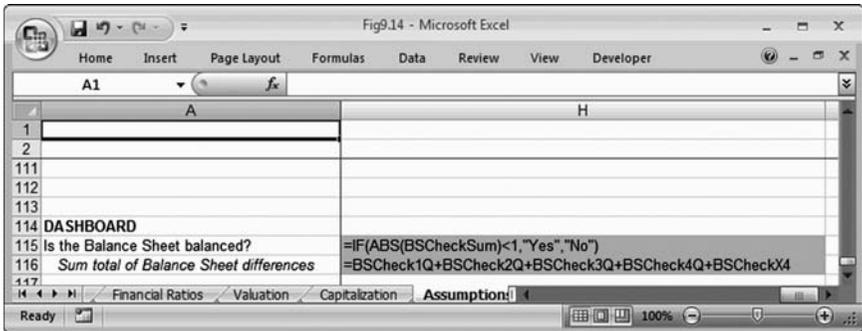


FIGURE 9.13 Dashboard

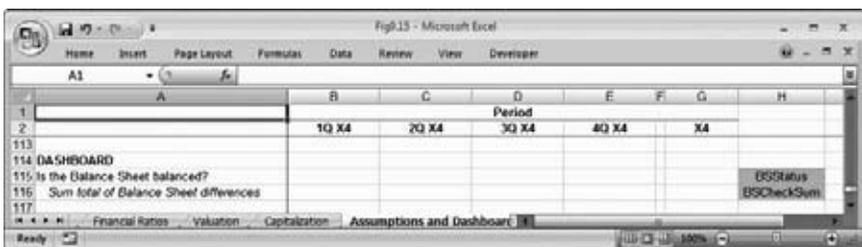


**FIGURE 9.14** Alternative View of the Assumptions and Dashboard Worksheet

Note that the Balance Sheet status output cell contains the word “Yes.” This is a result of the IF function, which I will discuss later in this section. Figure 9.14 presents an alternative view of Napavale’s Assumptions and Dashboard worksheet in which the values and formulas underlying the worksheet cells are exposed and visible. The names of the input and output cells in Napavale’s Assumptions and Dashboard worksheet are shown in Figure 9.15.

The IF function shown in Figure 9.14 evaluates a condition, such as whether a variable is equal to a specified value, and then returns a result based on the evaluation of that condition. The specific syntax of the IF function is as follows: = IF (Condition, True, False). “Condition” represents the condition to be evaluated, “true” represents the output of this function if the condition is true, and “false” represents the output of this function if the condition is false.

The IF function has many uses in financial modeling. In the context of Figures 9.13 through 9.15, the IF function determines if the absolute value (indicated by the use of the ABS, or absolute value, function) of the sum



**FIGURE 9.15** Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet

of the differences between Napavale's Assets and Napavale's Liabilities + Owners' Equity is less than 1 (I used "less than 1" instead of 0 here to account for any minor rounding errors). If the absolute value sum of these differences is greater than 1, Napavale's Balance Sheet is not balanced in some period (or periods).

The output of the IF function used in the Balance Sheet Status section of Napavale's Dashboard thus displays "Yes" if the Balance Sheet balances across all accounting periods (quarters) and "No" if the Balance Sheet is not balanced in one or more accounting periods (quarter(s)).

### **Statement of Cash Flows Status**

To determine whether the "cash" values from the Balance Sheet equal the "cash, end of period" values from the Statement of Cash Flows, I will compare the cash values from the Balance Sheet with the cash values from the Statement of Cash Flows. This comparison of the cash figures from the Balance Sheet and the Statement of Cash Flows is meant to serve as a check on the internal consistency of Napavale's financial model. If the difference in cash values across these worksheets is any value other than zero, the model is not functioning properly.

Figure 9.16 presents an updated view of Napavale's Statement of Cash Flows in which the calculation that checks if the cash values are equal in both the Balance Sheet and the Statement of Cash Flows is included. An alternative view of Napavale's updated Statement of Cash Flows in which the values and formulas underlying the worksheet cells are exposed and visible is presented in Figure 9.17. Figure 9.18 presents a view of the names of the worksheet cells in Napavale's updated Statement of Cash Flows.

I now need to include an indicator in Napavale's Dashboard that displays the "status" of the Statement of Cash Flows. Specifically, the Dashboard must display whether the cash values in the Statement of Cash Flows are equal to the cash values in the Balance Sheet. To do so, I will reference the calculation highlighted in Figures 9.16 through 9.18 and I will use an IF function as I did in the Balance Sheet Status section of this chapter. Figure 9.19 presents a view of the Dashboard from Napavale's Assumptions and Dashboard worksheet.

Note that the Statement of Cash Flows Status output cell contains the word "Yes." This is a result of the IF function, which is covered in the Balance Sheet Status section of this chapter. Figure 9.20 presents an alternative view of Napavale's Assumptions and Dashboard worksheet in which the values and formulas underlying the worksheet cells are exposed and visible. The names of the input and output cells in Napavale's Assumptions and Dashboard worksheet are shown in Figure 9.21.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Cash Flows from Operating Activities</b>					
Net Income	134,737	330,915	425,843	685,328	1,576,822
Adjustments to reconcile net income to cash provided from operating activities					
Depreciation	2,313	4,625	6,938	9,250	23,125
(Increase) decrease in Accounts Receivable	(133,333)	(58,667)	(65,600)	(78,400)	(336,000)
(Increase) decrease in Inventory	(64,667)	(18,400)	(19,600)	-	(102,667)
Increase (decrease) in Accounts Payable	88,222	14,911	28,000	22,867	154,000
Increase (decrease) in Loan Payable	-	50,000	(50,000)	-	-
Cash provided (used) by operating activities	27,272	323,384	325,580	639,044	1,315,280
<b>Cash Flows from Investing Activities</b>					
Purchase of capital assets	(45,000)	(45,000)	(45,000)	(45,000)	(180,000)
Cash provided (used) by investing activities	(45,000)	(45,000)	(45,000)	(45,000)	(180,000)
<b>Cash Flows from Financing Activities</b>					
Proceeds from sale of Common Stock	1,000,000	-	-	-	1,000,000
Cash provided (used) by financing activities	1,000,000	-	-	-	1,000,000
Net increase (decrease) in cash	982,272	278,384	280,580	594,044	2,135,280
Cash, beginning of period	-	982,272	1,260,656	1,541,236	-
Cash, end of period	982,272	1,260,656	1,541,236	2,135,280	2,135,280
Cash Flows calculation check	-	-	-	-	-
<b>Changes in Balance Sheet Accounts</b>					
Accounts Receivable beginning value	-	133,333	192,000	257,600	-
Accounts Receivable ending value	133,333	192,000	257,600	336,000	-
(Increase) decrease in Accounts Receivable	(133,333)	(58,667)	(65,600)	(78,400)	-
Inventory beginning value	-	64,667	83,067	102,667	-
Inventory ending value	64,667	83,067	102,667	102,667	-
(Increase) decrease in Inventory	(64,667)	(18,400)	(19,600)	-	-

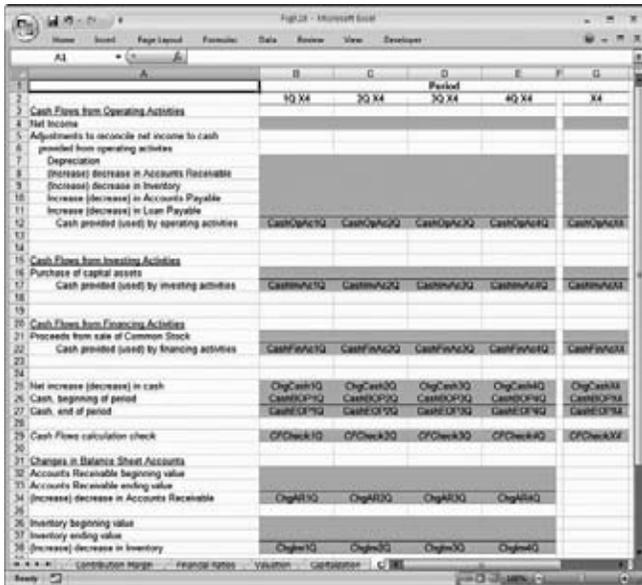
**FIGURE 9.16** Statement of Cash Flows

In the context of Figures 9.19 through 9.21, the IF function determines if the absolute value of the sum of the differences between Napavale’s cash values from the Statement of Cash Flows and the Balance Sheet is greater than 1 (I used 1 instead of 0 here to account for any minor rounding errors). If the absolute value of the sum of these differences is greater than 1, there is an error somewhere in Napavale’s financial model.

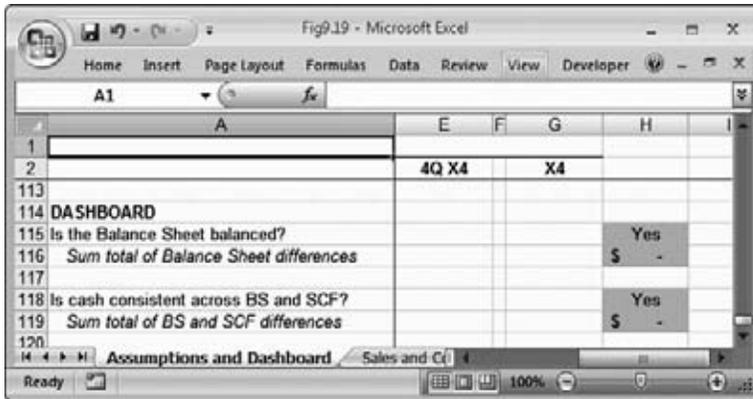
The output of the IF function used in the Statement of Cash Flows Status section of Napavale’s Dashboard thus displays “Yes” if the cash values are equal between the Statement of Cash Flows and the Balance Sheet across all accounting periods (quarters) and “No” if the cash values are not equal in one or more accounting periods (quarter(s)).



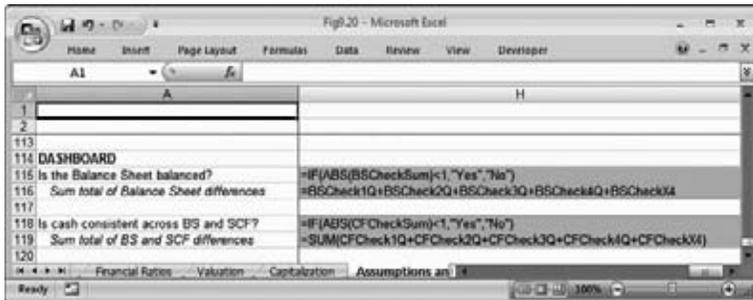
**FIGURE 9.17** Alternative View of the Statement of Cash Flows



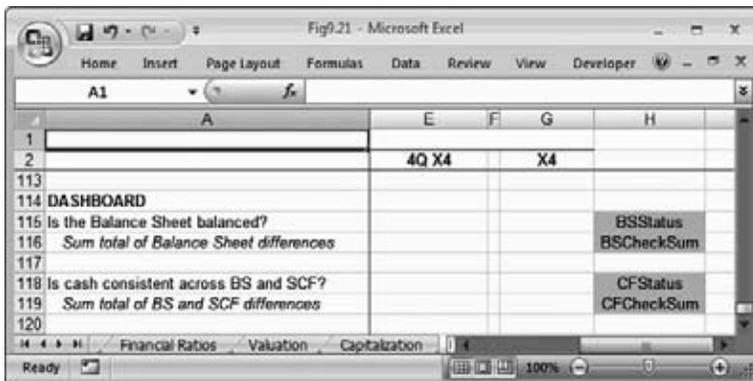
**FIGURE 9.18** Names of the Input and Output Cells in the Statement of Cash Flows



**FIGURE 9.19** Dashboard



**FIGURE 9.20** Alternative View of the Assumptions and Dashboard Worksheet



**FIGURE 9.21** Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet

## QUESTIONS

Each of the questions for this chapter relates to a hypothetical company named Company STU. Company STU sells satellite radios to consumers. As such, Company STU is a product-oriented (as opposed to a service-oriented) business. The questions for this chapter will address fiscal year X4 on a quarterly basis (four specific quarters, 1Q–4Q for year X4).

The following questions will test your knowledge of the material covered in this chapter in an applied manner—specifically, you will be asked to calculate Company STU’s free cash flows.

To prepare you for this chapter’s questions, several figures provide background information related to Company STU’s operations. Figure Q9.1 presents a view of Company STU’s Income Statement. Note that there are three cost-of-goods-sold components for Company STU’s satellite radios: (1) electronics, (2) casing, and (3) assembly and labor.

Figure Q9.2 presents a view of Company STU’s Statement of Cash Flows. Company STU’s Balance Sheet is shown in Figure Q9.3.

	Period				X4
	1Q X4	2Q X4	3Q X4	4Q X4	
Sales	\$ 20,000,000	\$ 25,000,000	\$ 29,250,000	\$ 39,000,000	\$ 113,250,000
Cost of goods sold	7,500,000	9,000,000	9,750,000	13,000,000	39,250,000
Gross profit	\$ 12,500,000	\$ 16,000,000	\$ 19,500,000	\$ 26,000,000	\$ 74,000,000
Salaries	\$ 3,080,025	\$ 3,379,838	\$ 3,695,738	\$ 3,995,550	\$ 14,151,150
Miscellaneous expenses	1,000,000	1,250,000	1,462,500	1,950,000	5,662,500
Research and development	2,000,000	2,500,000	2,925,000	3,900,000	11,325,000
Rent	120,000	120,000	120,000	132,000	492,000
Depreciation	9,063	18,125	27,188	36,250	90,625
Income from operations	\$ 6,290,913	\$ 8,732,038	\$ 11,269,575	\$ 15,986,200	\$ 42,278,725
Interest expense	\$ -	\$ -	\$ -	\$ -	\$ -
Taxable income	\$ 6,290,913	\$ 8,732,038	\$ 11,269,575	\$ 15,986,200	\$ 42,278,725
Tax expense	\$ 2,201,819	\$ 3,056,213	\$ 3,944,351	\$ 5,595,170	\$ 14,797,554
Net income	\$ 4,089,093	\$ 5,675,824	\$ 7,325,224	\$ 10,391,030	\$ 27,481,171

**FIGURE Q9.1** Company STU’s Income Statement

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Cash Flows from Operating Activities</b>					
1 Net income	4,089,093	5,675,824	7,325,204	10,391,030	27,481,171
2 Adjustments to reconcile net income to cash provided from operating activities					
3 Depreciation	9,061	18,125	27,189	36,250	90,625
4 (Increase) decrease in Accounts Receivable	(2,666,667)	(566,667)	(647,917)	(1,327,083)	(5,308,333)
5 (Increase) decrease in Inventory	(3,000,000)	(260,000)	(1,805,556)	-	(5,065,556)
6 Increase (decrease) in Accounts Payable	4,083,333	(496,111)	896,695	591,728	5,055,556
7 Increase (decrease) in Loan Payable	-	-	-	-	-
8 Cash provided (used) by operating activities	2,514,822	4,291,172	5,795,544	9,661,925	22,263,463
<b>Cash Flows from Investing Activities</b>					
9 Purchase of capital assets	(175,000)	(175,000)	(175,000)	(175,000)	(700,000)
10 Cash provided (used) by investing activities	(175,000)	(175,000)	(175,000)	(175,000)	(700,000)
<b>Cash Flows from Financing Activities</b>					
11 Proceeds from sale of Common Stock	4,000,000	-	-	-	4,000,000
12 Cash provided (used) by financing activities	4,000,000	-	-	-	4,000,000
13 Net increase (decrease) in cash	6,339,822	4,116,172	5,620,544	9,486,925	25,563,463
14 Cash, beginning of period	-	6,379,822	10,495,994	16,076,538	-
15 Cash, end of period	6,339,822	10,495,994	16,076,538	25,563,463	25,563,463
16 Cash Flows calculation check	-	-	-	-	-

FIGURE Q9.2 Company STU's Statement of Cash Flows

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Assets</b>					
1 Cash	\$ 6,339,822	\$ 10,495,994	\$ 16,076,538	\$ 25,563,463	\$ 25,563,463
2 Accounts Receivable	2,666,667	3,333,333	3,981,250	5,308,333	5,308,333
3 Inventory	3,000,000	3,250,000	5,055,556	5,055,556	5,055,556
4 Fixed Assets, net	165,938	322,813	470,625	629,375	629,375
5 Total Assets	\$ 12,172,426	\$ 17,362,140	\$ 25,583,968	\$ 36,536,727	\$ 36,536,727
<b>Liabilities</b>					
6 Accounts Payable	\$ 4,083,333	\$ 3,597,222	\$ 4,493,827	\$ 5,055,556	\$ 5,055,556
7 Payables from Capital Budget	-	-	-	-	-
8 Loan Payable	-	-	-	-	-
9 Total Liabilities	\$ 4,083,333	\$ 3,597,222	\$ 4,493,827	\$ 5,055,556	\$ 5,055,556
<b>Owners' Equity</b>					
10 Common Stock	\$ 4,000,000	\$ 4,000,000	\$ 4,000,000	\$ 4,000,000	\$ 4,000,000
11 Retained Earnings	4,089,093	9,764,918	17,090,141	27,481,171	27,481,171
12 Total Owners' Equity	\$ 8,089,093	\$ 13,764,918	\$ 21,090,141	\$ 31,481,171	\$ 31,481,171
13 Total Liabilities and Owners' Equity	\$ 12,172,426	\$ 17,362,140	\$ 25,583,968	\$ 36,536,727	\$ 36,536,727
14 Balance Sheet calculation check	-	-	-	-	-
<b>Net Working Capital (NWC)</b>					
15 Current assets	\$ 5,666,667	\$ 6,583,333	\$ 9,036,896	\$ 10,363,899	N/A
16 - Current liabilities	4,083,333	3,597,222	4,493,827	5,055,556	N/A
17 = Net working capital	\$ 1,583,333	\$ 2,986,111	\$ 4,542,978	\$ 5,308,333	N/A
18 Beginning NWC	\$ -	\$ 1,583,333	\$ 2,986,111	\$ 4,542,978	N/A
19 - Ending NWC	1,583,333	2,986,111	4,542,978	5,308,333	N/A
20 = Change in NWC	\$ (1,583,333)	\$ (1,402,778)	\$ (1,556,867)	\$ (766,355)	N/A

FIGURE Q9.3 Company STU's Balance Sheet

1. Given the information presented, build a free cash flows worksheet for Company STU.
2. Given the information presented, build a Balance Sheet status indicator in Company STU's Assumptions and Dashboard worksheet.
3. Given the information presented, build a Statement of Cash Flows status indicator in Company STU's Assumptions and Dashboard worksheet.



PART

# Three

## Analysis of a Financial Model



## Sensitivity Analysis

**A**fter working through all of the steps in Chapters 2 through 9, I now have a financial model for Napavale that will generate consolidated projected financial statements (Balance Sheet, Income Statement, and Statement of Cash Flows) and free cash flows based on a series of assumptions and inputs (found in Napavale’s Assumptions and Dashboard worksheet). Chapters 10 through 14 will cover ways in which I can evaluate and analyze Napavale as a business.

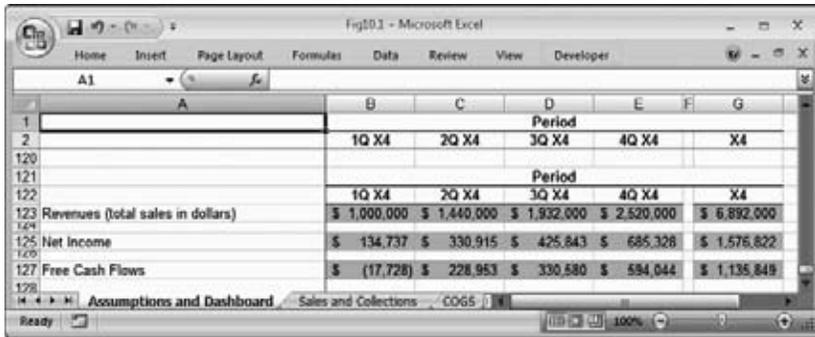
This chapter addresses an analytical technique known as “sensitivity analysis” in which I will evaluate the extent to which changes in assumptions and inputs affect various outputs of interest, such as revenues, net income, and free cash flows. In other words, a sensitivity analysis determines how sensitive an output variable is (or output variables are) to an input variable (or input variables). I will use the term “revenues” in place of “sales” (in dollars—not unit sales) throughout this chapter and Chapter 11 to avoid confusion. While revenues and sales may represent different meanings in some cases, I will use these terms interchangeably.

While there are a variety of ways to build sensitivity analyses in Microsoft Excel, one of the more efficient techniques is through the use of a tool known as a “data table.” Data tables are well-suited to sensitivity analyses in that they enable the direct evaluation of how different values for an input variable would affect values for an output variable. To build data tables, however, I need to consolidate some information in Napavale’s growing financial model into one Excel worksheet. I will consolidate this information in the Dashboard component of Napavale’s Assumptions and Dashboard worksheet.

### **DASHBOARD**

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As I mentioned in Chapter 9, a Dashboard can provide a synopsis of a financial model’s key outputs, such as revenues and net income, and can also



	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
Revenues (total sales in dollars)	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000
Net Income	\$ 134,737	\$ 330,915	\$ 425,843	\$ 685,328	\$ 1,576,822
Free Cash Flows	\$ (17,728)	\$ 228,953	\$ 330,580	\$ 584,044	\$ 1,135,849

**FIGURE 10.1** Dashboard

indicate the accuracy and consistency of a financial model, such as whether the Balance Sheet is balanced. While I covered the use of the Dashboard to determine the accuracy and consistency of a financial model in Chapter 9, I discuss the synopsis of key outputs from the financial model in this chapter.

I am going to summarize several of Napavale's key financial metrics in the Dashboard section of the Assumptions and Dashboard worksheet. Specifically, I am going to consolidate Napavale's projected revenues, net income, and free cash flows for each accounting period (quarter). It is a matter of preference and relevance when it comes to choosing which financial metrics to include (if any) in the Dashboard. I chose these three metrics (revenues, net income, and free cash flows) for Napavale because I believe they are important determinants of the business's operational performance and because I am going to run sensitivity analyses on each of these metrics.

Figure 10.1 presents a view of the Dashboard section of Napavale's Assumptions and Dashboard worksheet. The Dashboard shown in Figure 10.1 now includes summary projections for revenues, net income, and free cash flows. An alternative view of the Dashboard in which the values and formulas underlying the worksheet cells are exposed is shown in Figure 10.2.

Figure 10.3 presents a view of the names of the worksheet cells in the Dashboard section of the Assumptions and Dashboard worksheet. Note that I am naming cells in the Dashboard that refer directly to other named cells (from the Income Statement and Free Cash Flows worksheets) so that the data tables presented later in this chapter are easier to understand.

The projections for Napavale's revenues and net income are drawn from the Income Statement. For the sake of reference, the names of the worksheet cells in the Income Statement are shown in Figure 10.4. Napavale's projected free cash flows figures are drawn from the Free Cash Flows worksheet, so the names of the cells in the Free Cash Flows worksheet are presented in Figure 10.5.

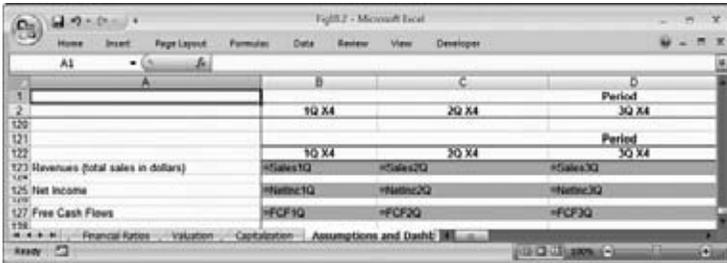


FIGURE 10.2 Alternative View of the Dashboard

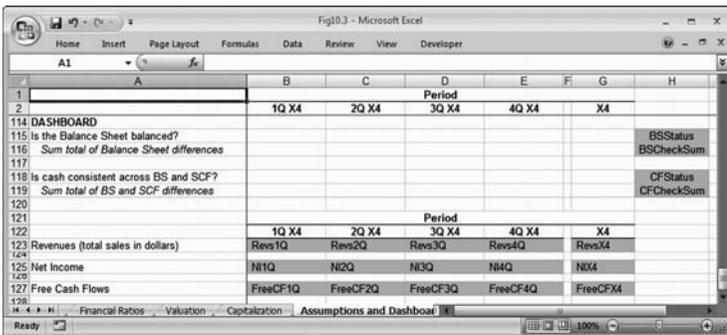


FIGURE 10.3 Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet

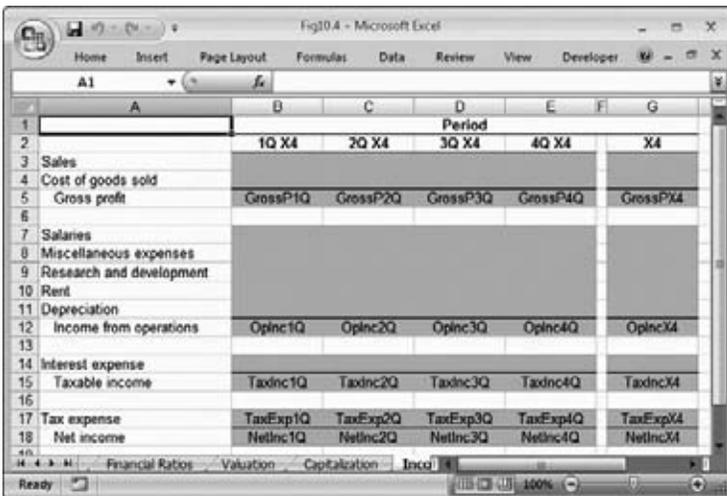


FIGURE 10.4 Names of the Input and Output Cells in the Income Statement

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
EBIT	EBIT1Q	EBIT2Q	EBIT3Q	EBIT4Q	EBITX4
Effective tax rate	EffTaxRt1Q	EffTaxRt2Q	EffTaxRt3Q	EffTaxRt4Q	
EBIT * (1 - t)	ATEBIT1Q	ATEBIT2Q	ATEBIT3Q	ATEBIT4Q	ATEBITX4
+ Depreciation					
- CAPEX					
- Changes in NWC					
= Free cash flow	FCF1Q	FCF2Q	FCF3Q	FCF4Q	FCFX4
+ Terminal value					
= Total free cash flow					
Present value					
NPV					
WACC					
g (to perpetuity)					

**FIGURE 10.5** Names of the Input and Output Cells in the Free Cash Flows Worksheet

## DATA TABLES

Now that I have incorporated the projections for Napavale's revenues, net income, and free cash flows into the Dashboard, I will run sensitivity analyses on each of these metrics through the use of data tables. Given the large number of variables involved in Napavale's financial model, there are many different types of sensitivity analyses that I could undertake. I am, however, going to focus on the sensitivity of one output variable (revenues for 1Q X4, for example) to one input variable (unit sales for 1Q X4, for example).

I hope to make the process of running sensitivity analyses using data tables as straightforward as possible by limiting the scope of input and output variables. If you build a financial model on your own, you may want to run sensitivity analyses on a wide array of input and output variables.

It is possible to build both one-variable and two-variable data tables in Microsoft Excel. One-variable data tables measure the change in one output variable based on a change in one input variable. Two-variable data tables measure the change in one output variable based on changes in two input variables. To keep things as simple as possible, I am going to discuss only one-variable data tables in this book. I will provide an overview of how to build data tables using revenues, net income, and free cash flows as separate output metrics of interest.

## Revenues Data Table

To determine the sensitivity of Napavale's projected revenues to input variables in the financial model, I am going to vary the projected unit sales for 1Q X4 and measure the corresponding changes in revenues for 1Q X4. The first step in building a data table is to properly arrange both the output formula of interest (revenues for 1Q X4 in this case) and the various alternative values for the input variable of interest (unit sales for 1Q X4 in this case). While this may sound complex, it is actually fairly straightforward. Figure 10.6 presents a view of the properly arranged revenues data table for Napavale.

The screenshot shows an Excel spreadsheet with a data table. The data table is located in the range B129:H137. It has a header row (B129) with columns for '1Q X4', '2Q X4', '3Q X4', '4Q X4', and 'X4'. The first cell of the data table (B130) is 'Revenues (total sales in dollars)'. The values for this row are \$ 1,000,000, \$ 1,440,000, \$ 1,832,000, \$ 2,520,000, and \$ 6,892,000. The second row (B131) is 'Net Income' with values \$ 134,737, \$ 330,915, \$ 425,843, \$ 685,328, and \$ 1,576,822. The third row (B132) is 'Free Cash Flows' with values \$ (17,728), \$ 228,953, \$ 330,580, \$ 594,044, and \$ 1,135,849. The data table is titled 'Revenues Data Table' in cell B129. The input variable 'Unit sales for 1Q X4' is listed in cells B133:B137 with values 800, 900, 1,000, 1,100, and 1,200. The output variable 'Revenues for 1Q X4' is listed in cells C130:C132 with values \$ 1,000,000, \$ 1,440,000, and \$ 1,832,000.

	1Q X4	2Q X4	3Q X4	4Q X4	X4
Revenues (total sales in dollars)	\$ 1,000,000	\$ 1,440,000	\$ 1,832,000	\$ 2,520,000	\$ 6,892,000
Net Income	\$ 134,737	\$ 330,915	\$ 425,843	\$ 685,328	\$ 1,576,822
Free Cash Flows	\$ (17,728)	\$ 228,953	\$ 330,580	\$ 594,044	\$ 1,135,849
Revenues Data Table					
		Revenues for 1Q X4			
		\$ 1,000,000			
	800				
	900				
Unit sales for 1Q X4	1,000				
	1,100				
	1,200				

**FIGURE 10.6** Revenues Data Table

Note that I have arranged the data table in Figure 10.6 with the input values listed in a single column. It is also possible to list the input values in a single row. It is a matter of preference as to which format to use when building data tables. I will use “downward” formatted data tables in which the input values are listed in a single column throughout this chapter.

I hardcoded, or entered directly, the input values in Figure 10.6. You are free to choose whatever values may be of interest and you can even change these values after you have built a complete data table. I chose the specific input values in Figure 10.6 to get a sense of how moderate changes in Napavale’s projected 1Q X4 unit sales will affect revenues for 1Q X4.

The next step in building a data table is to select all of the input values and the formula of interest in Microsoft Excel. The selection of the appropriate cells for Napavale’s revenues data table is shown in Figure 10.7

After I select the appropriate cells in Excel, the next step is to select the “Data” tab on the Excel ribbon, click on the “What-If Analysis” drop-down button (usually an icon labeled “What-If Analysis” with a grid and question mark next to the label) in the “Data Tools” section of the ribbon, and choose the “Data Table...” option from the drop-down menu.

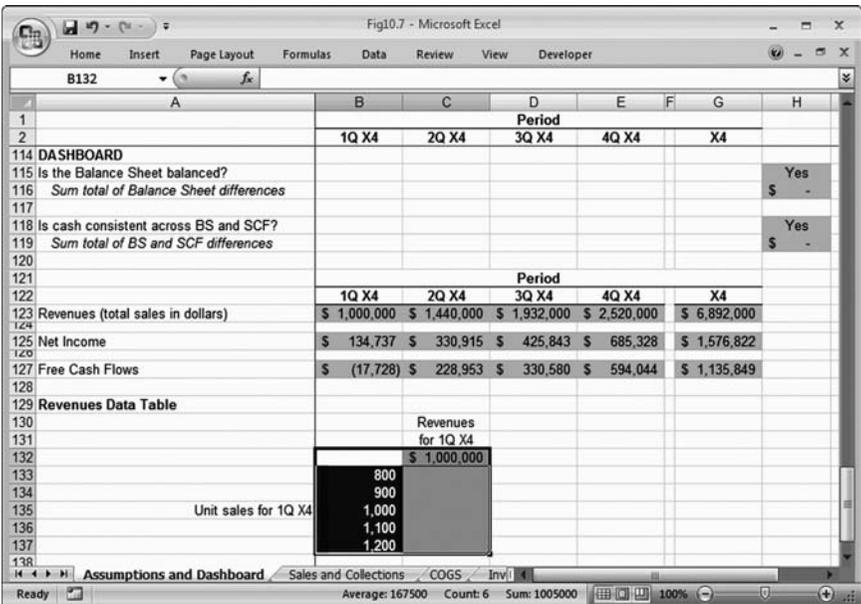
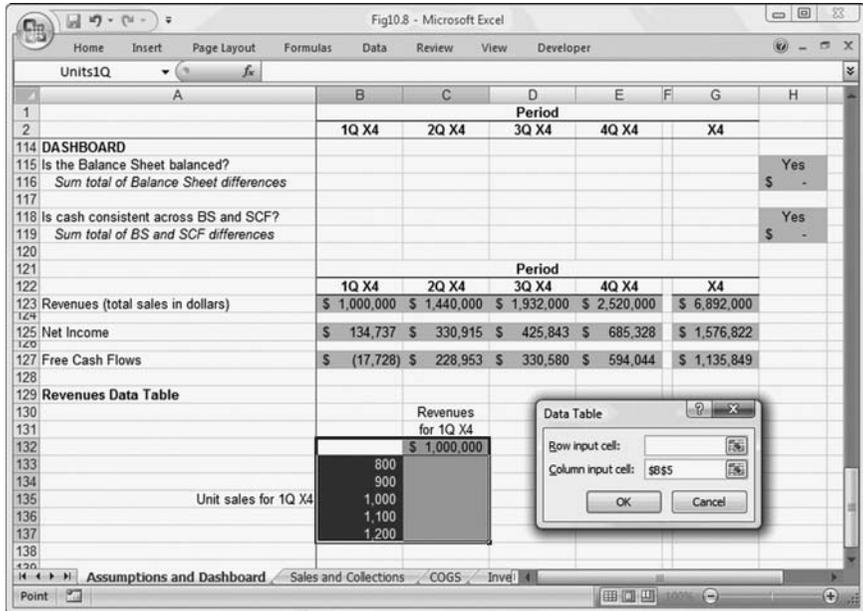


FIGURE 10.7 Revenues Data Table

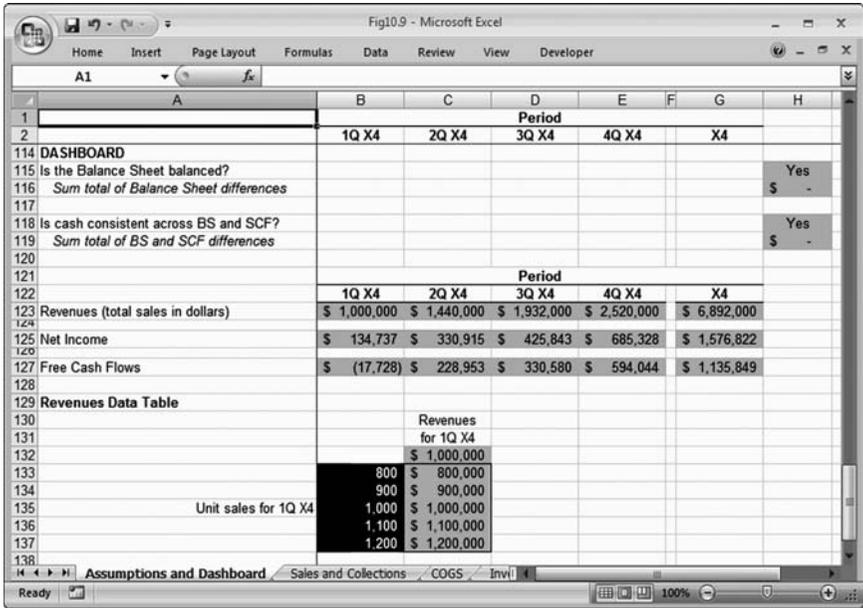


**FIGURE 10.8** Data Table Dialog Box and the Assumptions and Dashboard Worksheet

This will bring up a “Data Table” dialog box, into which I will enter the worksheet cell reference for the input variable (in the “Column input cell:” field) that I would like to vary in the data table. Figure 10.8 presents a view of the Table dialog box along with the properly referenced input cell in front of the Assumptions and Dashboard worksheet.

After entering the proper cell reference into the Table dialog box, I will click “OK.” Napavale’s revenue data table is now complete. It is important to press the F9 key on the keyboard after the data table is complete—this ensures that the values in the data table are current and up to date. (The F9 function key initiates a recalculation of all worksheet cells in an open workbook.) Napavale’s completed revenues data table is shown in Figure 10.9.

The way in which a data table is to be interpreted is as follows: Reading across from the input variables (assuming you are using a column layout as I am in this chapter) into the data table itself, you will see how the output variable of interest (1Q X4 revenues in this case) would change for the various values of the input variable. The data table presents a tabular arrangement of what-if scenarios. In this case, the revenues data table shows



**FIGURE 10.9** Revenues Data Table

what Napavale’s 1Q X4 revenues would equal if the unit sales for 1Q X4 were changed to a different value.

Figure 10.10 presents an alternative view of the revenues data table from the Assumptions and Dashboard worksheet in which the values and formulas underlying the worksheet cells are exposed. Note the “TABLE” references in the revenues data table—this indicates that a data table has been used in Excel.

**Net Income Data Table**

To determine the sensitivity of Napavale’s projected net income to input variables in the financial model, I am going to vary the projected price per unit for 1Q X4 and measure the corresponding changes in net income for 1Q X4. As with the revenues data table, the first step in building the net income data table is to properly arrange both the output formula of interest (net income for 1Q X4 in this case) and the various alternative values for the input variable of interest (price per unit for 1Q X4 in this case). Figure 10.11 presents a view of the properly arranged net income data table for Napavale.

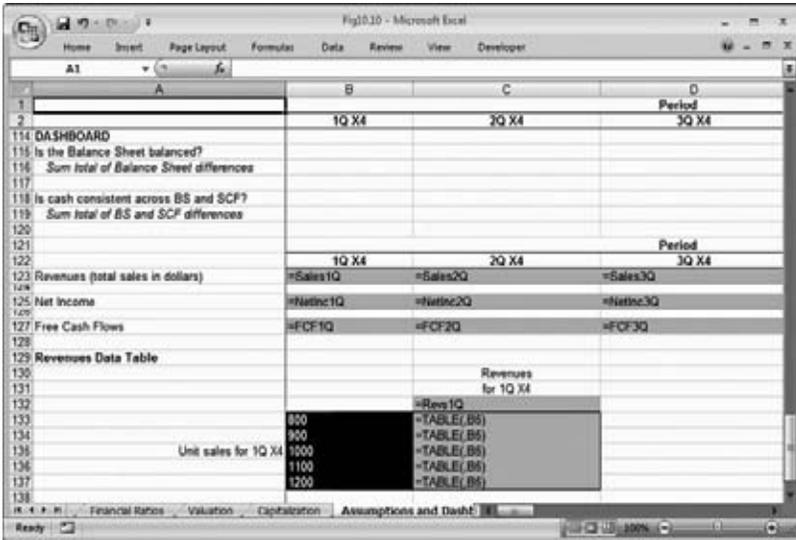


FIGURE 10.10 Alternative View of the Revenues Data Table

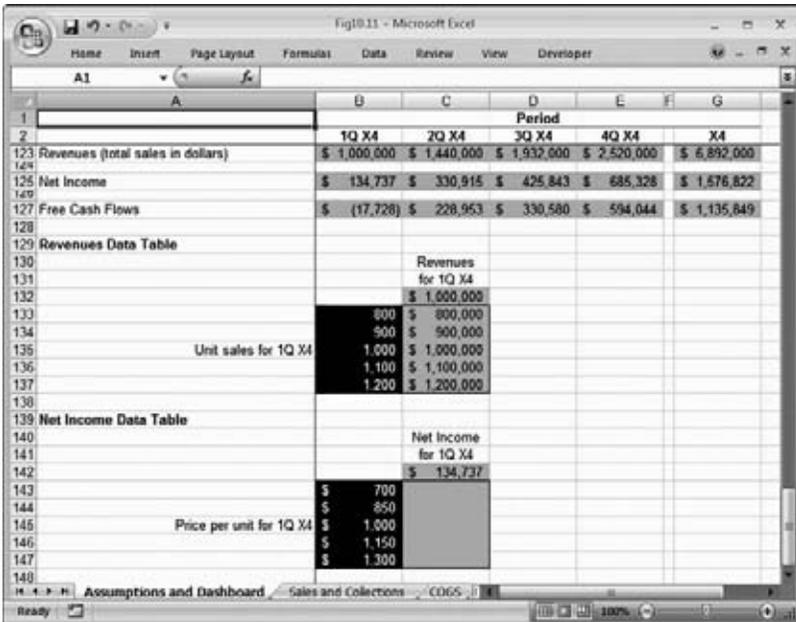
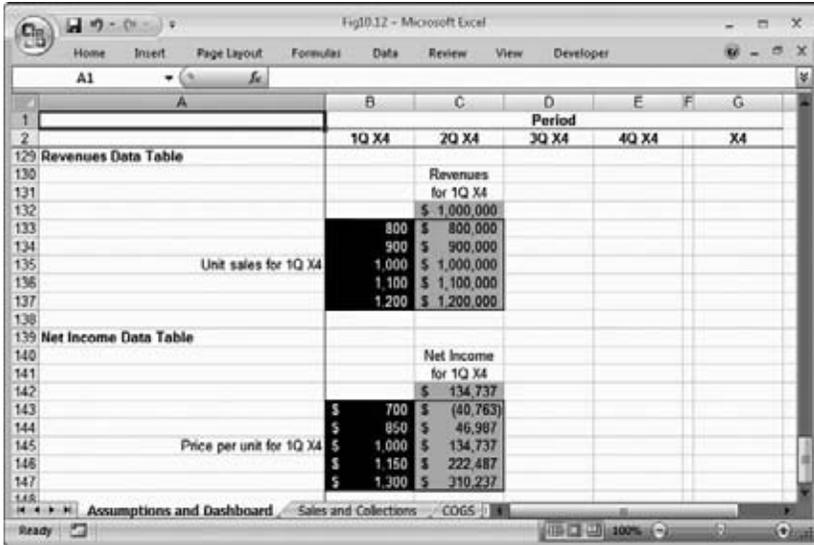


FIGURE 10.11 Net Income Data Table



**FIGURE 10.12** Net Income Data Table

The subsequent steps involved in building the net income data table for Napavale are the same as those involved in building the revenues data table as outlined earlier in this chapter. Napavale’s completed net income data table is presented in Figure 10.12.

In terms of interpreting Napavale’s net income data table, the net income data table shows what Napavale’s 1Q X4 net income would equal if the price per unit for 1Q X4 was changed to a different value. An alternative view of Napavale’s net income data table, in which the values and formulas underlying the worksheet cells are exposed, is presented in Figure 10.13.

**Free Cash Flows Data Table**

To determine the sensitivity of Napavale’s projected free cash flows to input variables in the financial model, I am going to vary the projected monitor screen: cost per unit for 1Q X4, and measure the corresponding changes in free cash flows for 1Q X4. As with the revenues data table and the net income data table, the first step in building the free cash flows data table is to properly arrange both the output formula of interest (free cash flows for 1Q X4 in this case) and the various alternative values for the input variable of interest (monitor screen: cost per unit for 1Q X4 in this case). Figure 10.14 presents a view of the properly arranged free cash flows data table for Napavale.

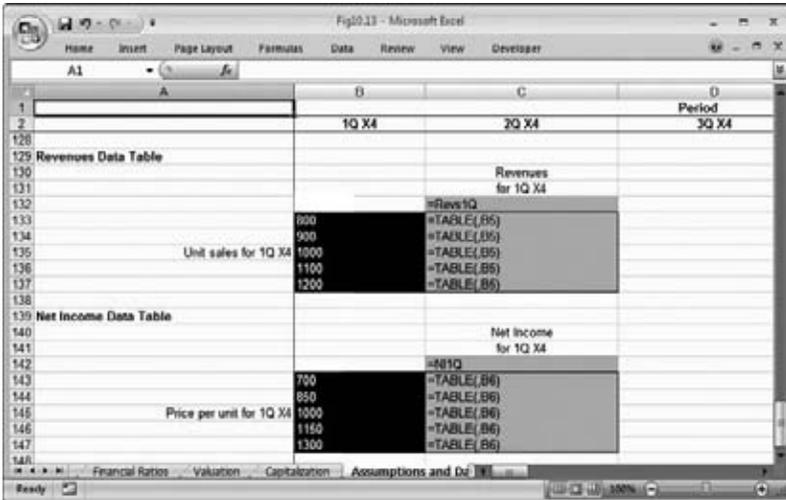


FIGURE 10.13 Alternative View of the Net Income Data Table

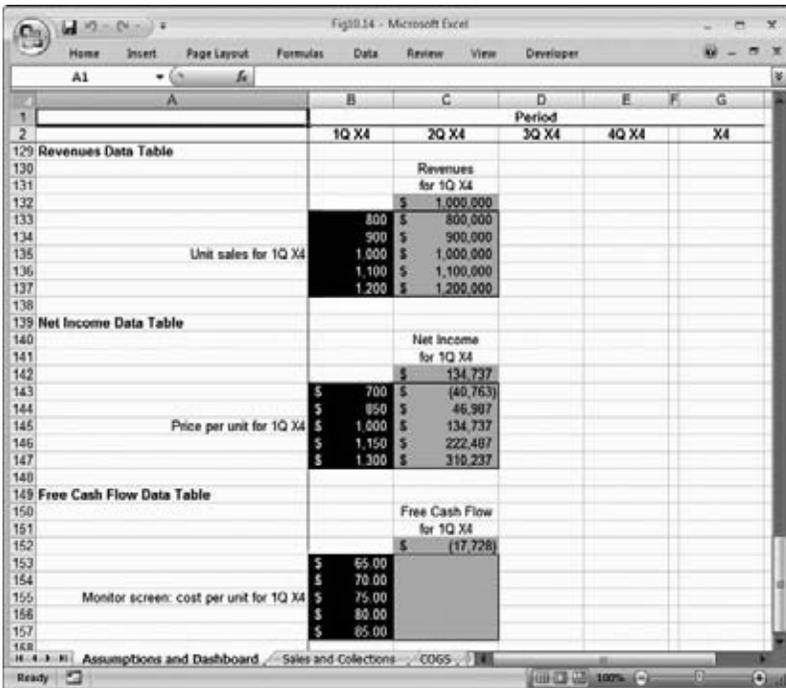


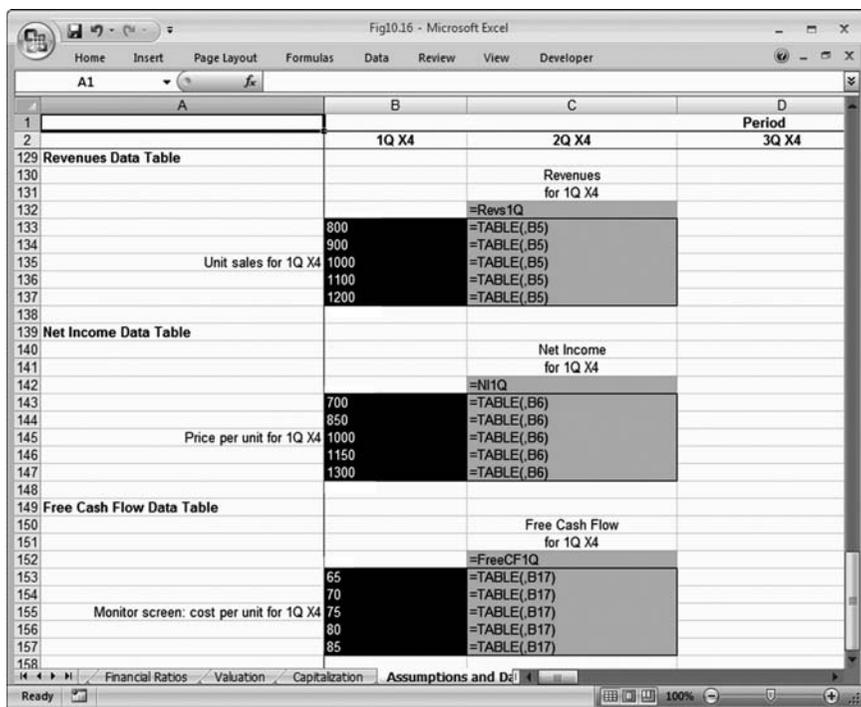
FIGURE 10.14 Free Cash Flows Data Table

		Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Revenues Data Table</b>						
			Revenues for 1Q X4			
			\$ 1,000,000			
		800	\$ 800,000			
		900	\$ 900,000			
	Unit sales for 1Q X4	1,000	\$ 1,000,000			
		1,100	\$ 1,100,000			
		1,200	\$ 1,200,000			
<b>Net Income Data Table</b>						
			Net Income for 1Q X4			
			\$ 134,737			
		\$ 700	\$ (40,763)			
		\$ 850	\$ 46,987			
	Price per unit for 1Q X4	\$ 1,000	\$ 134,737			
		\$ 1,150	\$ 222,487			
		\$ 1,300	\$ 310,237			
<b>Free Cash Flow Data Table</b>						
			Free Cash Flow for 1Q X4			
			\$ (17,728)			
		\$ 65.00	\$ (14,562)			
		\$ 70.00	\$ (16,145)			
	Monitor Screen: cost per unit for 1Q X4	\$ 75.00	\$ (17,728)			
		\$ 80.00	\$ (19,312)			
		\$ 85.00	\$ (20,895)			

**FIGURE 10.15** Free Cash Flows Data Table

The subsequent steps involved in building the free cash flows data table for Napavale are the same as those involved in building the revenues data table and the net income data table as outlined earlier in this chapter. Napavale’s completed free cash flows data table is presented in Figure 10.15.

In terms of interpreting Napavale’s free cash flows data table, the free cash flows data table shows what Napavale’s 1Q X4 free cash flows would equal if the monitor screen: cost per unit for 1Q X4 were changed to a different value. An alternative view of Napavale’s free cash flows data table, in which the values and formulas underlying the worksheet cells are exposed, is presented in Figure 10.16.

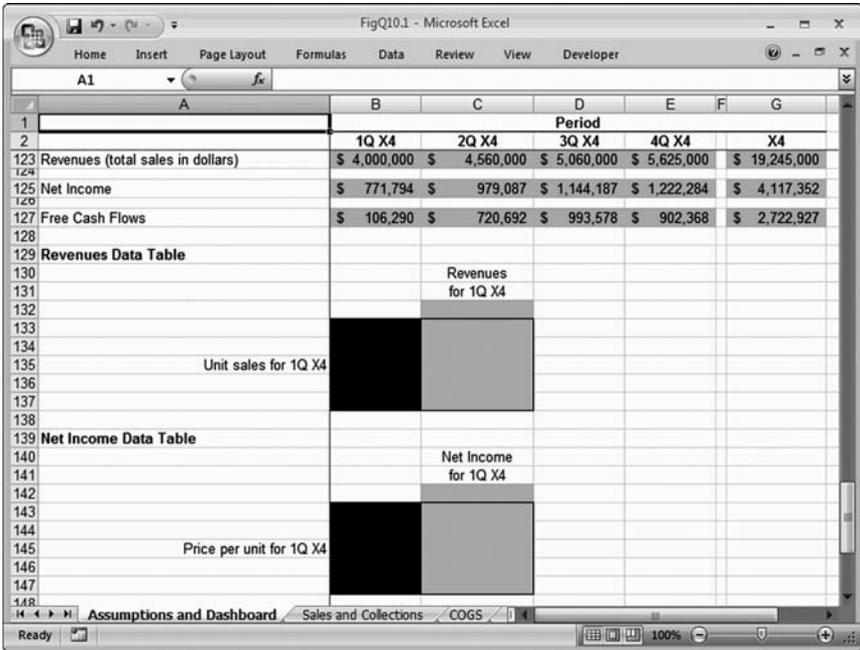


**FIGURE 10.16** Alternative View of the Free Cash Flows Data Table

## QUESTIONS

Each of the questions for this chapter relates to a hypothetical company named Company VWX. Company VWX sells laser printers to consumers. As such, Company VWX is a product-oriented (as opposed to a service-oriented) business. Note that there are three cost-of-goods-sold components for Company VWX’s laser printers: (1) electronics, (2) casing, and (3) assembly and labor.

The questions for this chapter will address fiscal year X4 on a quarterly basis (four specific quarters, 1Q–4Q for year X4). The following questions will test your knowledge of the material covered in this chapter in an applied manner—specifically, you will be asked to build sensitivity analyses related to revenues, net income, and free cash flows, in the form of data tables, for Company VWX. To prepare you for this chapter’s questions, Figure Q10.1 offers a view of a portion of Company VWX’s Assumptions and Dashboard



**FIGURE Q10.1** Company VWX’s Assumptions and Dashboard Worksheet

worksheet to provide some background information related to Company VWX’s operations.

1. Given the information presented, build a revenues data table for 1Q X4 for Company VWX.
2. Given the information presented, build a net income data table for 1Q X4 for Company VWX.
3. Given the information presented, build a free cash flows data table for 1Q X4 for Company VWX.

# Contribution Margin Analysis

This chapter addresses an analytical metric known as “contribution margin.” As noted in Chapter 1, contribution margin is defined as the extent to which each unit sale contributes to a business’s fixed cost base. In other words, a business’s contribution margin is equal to: unit price – variable costs per unit. Calculating a business’s contribution margin enables the calculation of several important metrics such as operating leverage (fixed costs/total costs), breakeven value in units, and breakeven value in dollars. I will calculate each of these metrics for Napavale over the course of this chapter.

Using Napavale’s financial model, I will cover the concept of fixed versus variable costs and I will calculate these costs for Napavale. After delineating Napavale’s cost base between variable and fixed costs, I will then discuss the calculation of Napavale’s contribution margin, operating leverage, and breakeven point in both units and dollars.

## **FIXED AND VARIABLE COSTS**

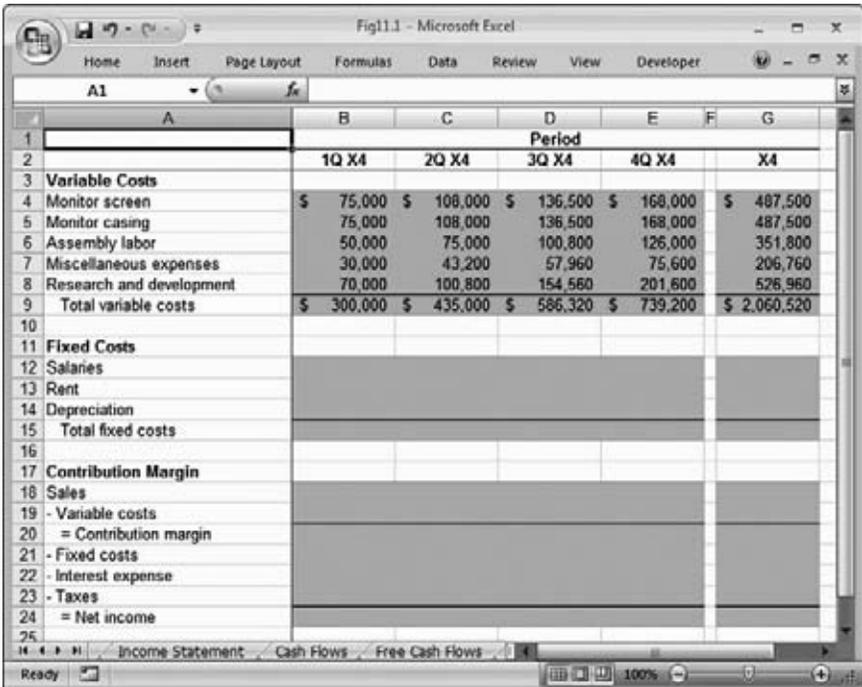
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In order to calculate Napavale’s contribution margin, I must first determine which of Napavale’s costs are fixed and which are variable. Fixed costs are defined as costs that are incurred regardless of anything else that may be happening at a company. Fixed costs are, in other words, fixed—they do not vary based on other factors. Examples of fixed costs may include salaries and rent.

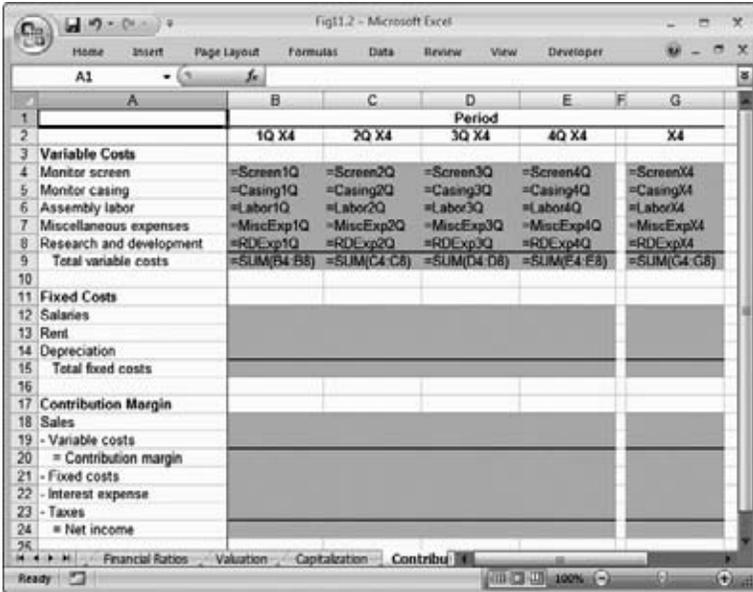
Variable costs are defined as costs that vary in magnitude based on other factors, such as a company’s level of revenues. Examples of variable costs may include cost of goods sold and miscellaneous expenses. There is an old

saying, “In the long run, all costs are variable.” While a company ultimately can vary all of its costs, fixed costs typically represent those costs that will not change based on other factors (such as the level of revenues) and variable costs typically represent those costs whose values depend on other factors (such as unit sales).

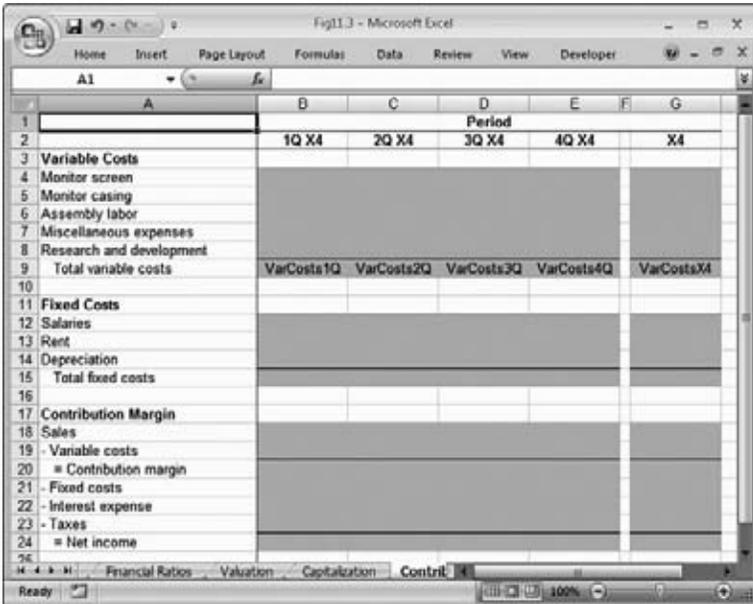
Figure 11.1 presents a view of Napavale’s Contribution Margin worksheet in which I have identified Napavale’s variable costs. An alternative view of the Contribution Margin worksheet in which the values and formulas underlying the worksheet cells are exposed and visible is presented in Figure 11.2. The names of the input and output cells in the Contribution Margin worksheet are shown in Figure 11.3. Napavale’s fixed costs are identified and shown in the Contribution Margin worksheet in Figure 11.4. The values and formulas underlying the worksheet cells in the Contribution Margin worksheet are shown in Figure 11.5. Figure 11.6 presents a view of the names of the input and output cells underlying Napavale’s Contribution Margin worksheet.



**FIGURE 11.1** Contribution Margin Worksheet with Variable Costs Identified



**FIGURE 11.2** Alternative View of the Contribution Margin Worksheet



**FIGURE 11.3** Names of the Input and Output Cells in the Contribution Margin Worksheet

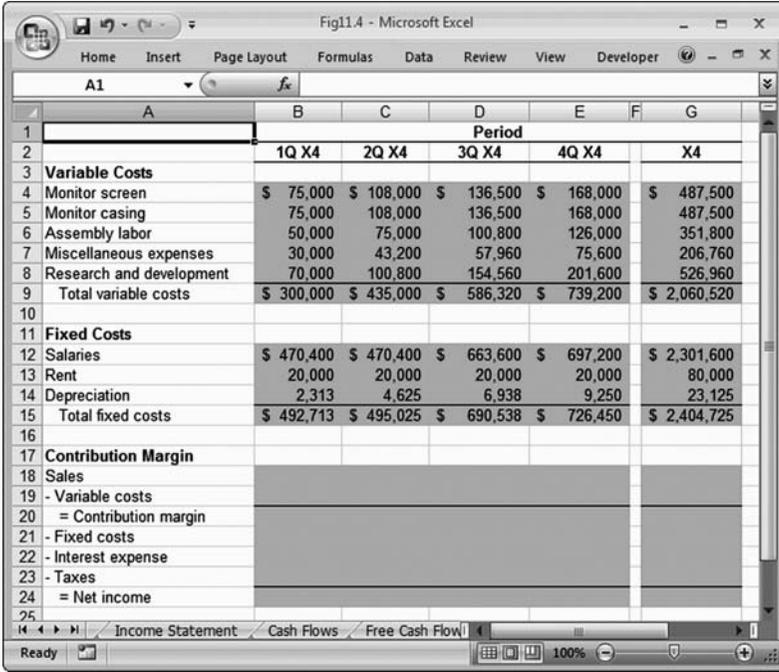


FIGURE 11.4 Contribution Margin Worksheet with Fixed Costs Identified

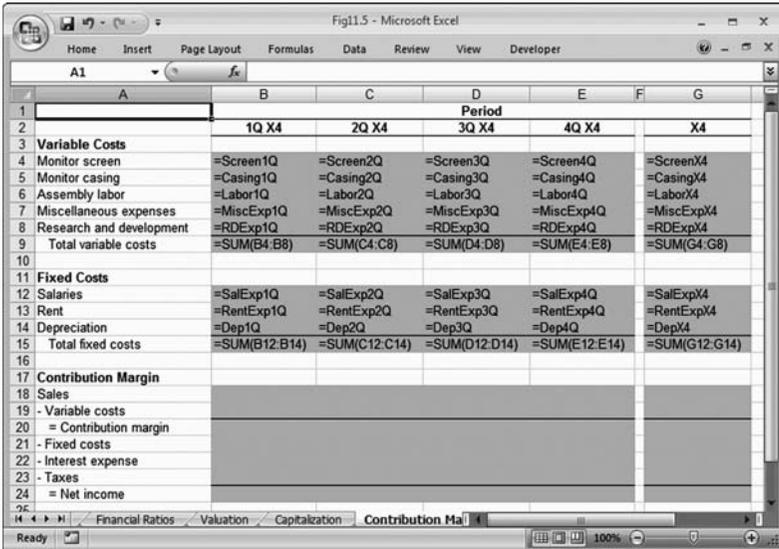
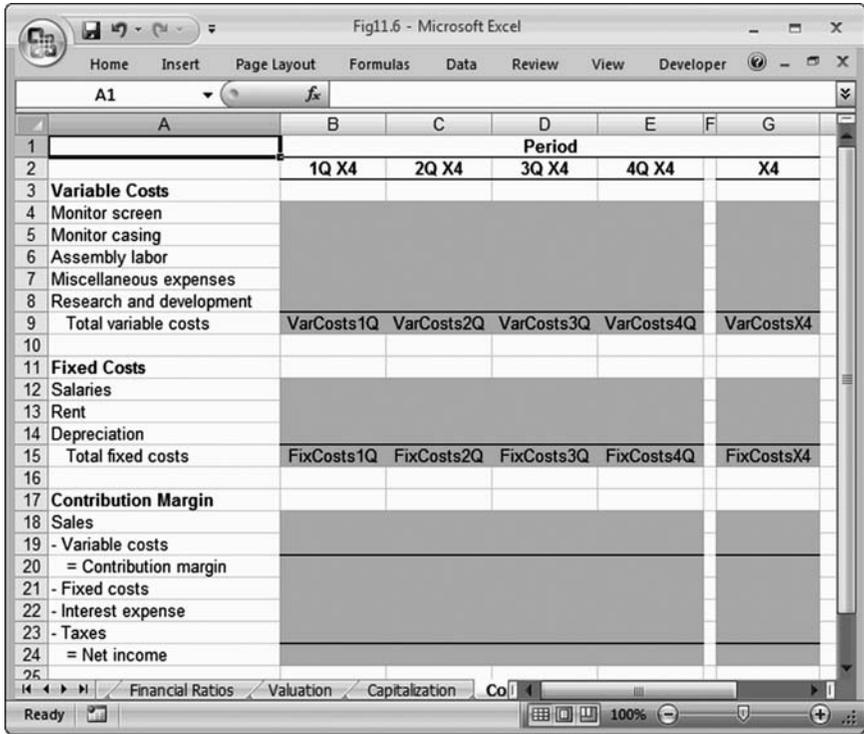


FIGURE 11.5 Alternative View of the Contribution Margin Worksheet



**FIGURE 11.6** Names of the Input and Output Cells in the Contribution Margin Worksheet

## CONTRIBUTION MARGIN

Napavale’s contribution margin, which represents the amount that each unit sale contributes to the business’s fixed cost base, is equal to: unit price – variable costs per unit. I am going to calculate Napavale’s contribution margin at the “company” level as opposed to the unit level, so I calculate contribution margin as: sales (in dollars) – total variable costs (in dollars). The calculation of Napavale’s contribution margin is presented in Figure 11.7.

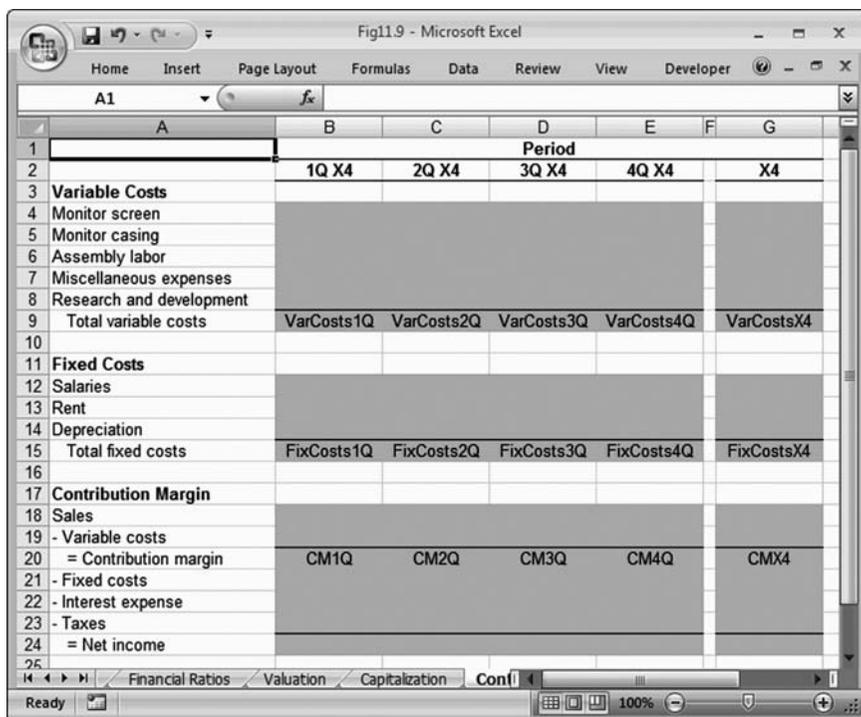
An alternative view of the calculation of Napavale’s contribution margin, in which the values and formulas underlying the worksheet cells are exposed and visible, is shown in Figure 11.8. The names of the input and output cells in Napavale’s Contribution Margin worksheet are shown in Figure 11.9.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Variable Costs</b>					
Monitor screen	\$ 75,000	\$ 108,000	\$ 136,500	\$ 168,000	\$ 487,500
Monitor casing	75,000	108,000	136,500	168,000	487,500
Assembly labor	50,000	75,000	100,800	126,000	351,800
Miscellaneous expenses	30,000	43,200	57,960	75,600	206,760
Research and development	70,000	100,800	154,560	201,600	526,960
<b>Total variable costs</b>	<b>\$ 300,000</b>	<b>\$ 435,000</b>	<b>\$ 586,320</b>	<b>\$ 739,200</b>	<b>\$ 2,060,520</b>
<b>Fixed Costs</b>					
Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200	\$ 2,301,600
Rent	20,000	20,000	20,000	20,000	80,000
Depreciation	2,313	4,625	6,938	9,250	23,125
<b>Total fixed costs</b>	<b>\$ 492,713</b>	<b>\$ 495,025</b>	<b>\$ 690,538</b>	<b>\$ 726,450</b>	<b>\$ 2,404,725</b>
<b>Contribution Margin</b>					
Sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000
- Variable costs	300,000	435,000	586,320	739,200	2,060,520
<b>= Contribution margin</b>	<b>\$ 700,000</b>	<b>\$ 1,005,000</b>	<b>\$ 1,345,680</b>	<b>\$ 1,780,800</b>	<b>\$ 4,831,480</b>
- Fixed costs					
- Interest expense					
- Taxes					
<b>= Net income</b>					

FIGURE 11.7 Calculation of the Contribution Margin

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Variable Costs</b>					
Monitor screen	=Screen1Q	=Screen2Q	=Screen3Q	=Screen4Q	=ScreenX4
Monitor casing	=Casing1Q	=Casing2Q	=Casing3Q	=Casing4Q	=CasingX4
Assembly labor	=Labor1Q	=Labor2Q	=Labor3Q	=Labor4Q	=LaborX4
Miscellaneous expenses	=MiscExp1Q	=MiscExp2Q	=MiscExp3Q	=MiscExp4Q	=MiscExpX4
Research and development	=RDEExp1Q	=RDEExp2Q	=RDEExp3Q	=RDEExp4Q	=RDEExpX4
<b>Total variable costs</b>	<b>=SUM(B4:B8)</b>	<b>=SUM(C4:C8)</b>	<b>=SUM(D4:D8)</b>	<b>=SUM(E4:E8)</b>	<b>=SUM(G4:G8)</b>
<b>Fixed Costs</b>					
Salaries	=SalExp1Q	=SalExp2Q	=SalExp3Q	=SalExp4Q	=SalExpX4
Rent	=RentExp1Q	=RentExp2Q	=RentExp3Q	=RentExp4Q	=RentExpX4
Depreciation	=Dep1Q	=Dep2Q	=Dep3Q	=Dep4Q	=DepX4
<b>Total fixed costs</b>	<b>=SUM(B12:B14)</b>	<b>=SUM(C12:C14)</b>	<b>=SUM(D12:D14)</b>	<b>=SUM(E12:E14)</b>	<b>=SUM(G12:G14)</b>
<b>Contribution Margin</b>					
Sales	=Sales1Q	=Sales2Q	=Sales3Q	=Sales4Q	=SalesX4
- Variable costs	=VarCosts1Q	=VarCosts2Q	=VarCosts3Q	=VarCosts4Q	=VarCostsX4
<b>= Contribution margin</b>	<b>=Sales1Q-VarCosts1Q</b>	<b>=Sales2Q-VarCosts2Q</b>	<b>=Sales3Q-VarCosts3Q</b>	<b>=Sales4Q-VarCosts4Q</b>	<b>=SalesX4-VarCostsX4</b>
- Fixed costs					
- Interest expense					
- Taxes					
<b>= Net income</b>					

FIGURE 11.8 Alternative View of the Calculation of the Contribution Margin



**FIGURE 11.9** Names of the Input and Output Cells in the Contribution Margin Worksheet

For the sake of reference, I reconcile Napavale’s contribution margin with the business’s net income. Napavale’s operating cost base is made up of two different types of costs: fixed costs and variable costs. In addition to operating costs, Napavale is also projected to incur interest and tax expenses in the future. As such, if I subtract out fixed costs, variable costs, and interest and tax expenses from Napavale’s total sales, I will have calculated net income. This calculation is presented in Figure 11.10. Figure 11.11 presents an alternative view of the Contribution Margin worksheet in which the values and formulas underlying the worksheet cells are exposed and visible.

As no new names have been added to the Contribution Margin worksheet since the calculation of Napavale’s contribution margin, I will not present another view of the names of the input and output cells underlying Napavale’s Contribution Margin worksheet at this point.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Variable Costs</b>					
Monitor screen	\$ 75,000	\$ 108,000	\$ 136,500	\$ 168,000	\$ 487,500
Monitor casing	75,000	108,000	136,500	168,000	487,500
Assembly labor	50,000	75,000	100,800	126,000	351,800
Miscellaneous expenses	30,000	43,200	57,960	75,600	206,760
Research and development	70,000	100,800	154,560	201,600	526,960
<b>Total variable costs</b>	<b>\$ 300,000</b>	<b>\$ 435,000</b>	<b>\$ 586,320</b>	<b>\$ 739,200</b>	<b>\$ 2,060,520</b>
<b>Fixed Costs</b>					
Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200	\$ 2,301,600
Rent	20,000	20,000	20,000	20,000	80,000
Depreciation	2,313	4,625	6,938	9,250	23,125
<b>Total fixed costs</b>	<b>\$ 492,713</b>	<b>\$ 495,025</b>	<b>\$ 690,538</b>	<b>\$ 726,450</b>	<b>\$ 2,404,725</b>
<b>Contribution Margin</b>					
Sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000
- Variable costs	300,000	435,000	586,320	739,200	2,060,520
<b>= Contribution margin</b>	<b>\$ 700,000</b>	<b>\$ 1,005,000</b>	<b>\$ 1,345,680</b>	<b>\$ 1,780,800</b>	<b>\$ 4,831,480</b>
- Fixed costs	492,713	495,025	690,538	726,450	2,404,725
- Interest expense	-	875	-	-	875
- Taxes	72,551	178,195	229,300	369,023	849,059
<b>= Net income</b>	<b>\$ 134,737</b>	<b>\$ 330,915</b>	<b>\$ 425,843</b>	<b>\$ 685,328</b>	<b>\$ 1,576,822</b>

**FIGURE 11.10** Reconciliation of Contribution Margin with Net Income

	1Q X4	2Q X4
<b>Variable Costs</b>		
Monitor screen	=Screen1Q	=Screen2Q
Monitor casing	=Casing1Q	=Casing2Q
Assembly labor	=Labor1Q	=Labor2Q
Miscellaneous expenses	=MiscExp1Q	=MiscExp2Q
Research and development	=RDEExp1Q	=RDEExp2Q
<b>Total variable costs</b>	<b>=SUM(B4:B8)</b>	<b>=SUM(C4:C8)</b>
<b>Fixed Costs</b>		
Salaries	=SalExp1Q	=SalExp2Q
Rent	=RentExp1Q	=RentExp2Q
Depreciation	=Dep1Q	=Dep2Q
<b>Total fixed costs</b>	<b>=SUM(B12:B14)</b>	<b>=SUM(C12:C14)</b>
<b>Contribution Margin</b>		
Sales	=Sales1Q	=Sales2Q
- Variable costs	=VarCosts1Q	=VarCosts2Q
<b>= Contribution margin</b>	<b>=Sales1Q-VarCosts1Q</b>	<b>=Sales2Q-VarCosts2Q</b>
- Fixed costs	=FixCosts1Q	=FixCosts2Q
- Interest expense	=IntExp1Q	=IntExp2Q
- Taxes	=TaxExp1Q	=TaxExp2Q
<b>= Net income</b>	<b>=CM1Q-FixCosts1Q+IntExp1Q-TaxExp1Q</b>	<b>=CM2Q-FixCosts2Q+IntExp2Q-TaxExp2Q</b>

**FIGURE 11.11** Alternative View of the Reconciliation of Contribution Margin with Net Income

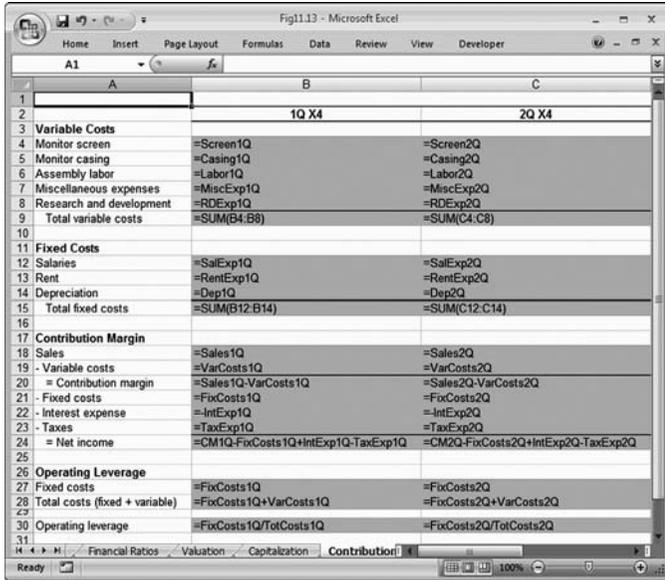
## OPERATING LEVERAGE

Operating leverage is defined as the ratio of a company’s fixed costs to its overall costs. A company’s level of operating leverage indicates what percentage of its total cost base is represented by fixed costs. Operating leverage is an important metric that indicates how leveraged a company is operationally. The calculation of Napavale’s operating leverage is shown in Figure 11.12. The values and formulas underlying the worksheet cells related to the calculation of Napavale’s operating leverage are shown in Figure 11.13. The names of the input and output cells associated with the calculation of Napavale’s operating leverage are shown in Figure 11.14.

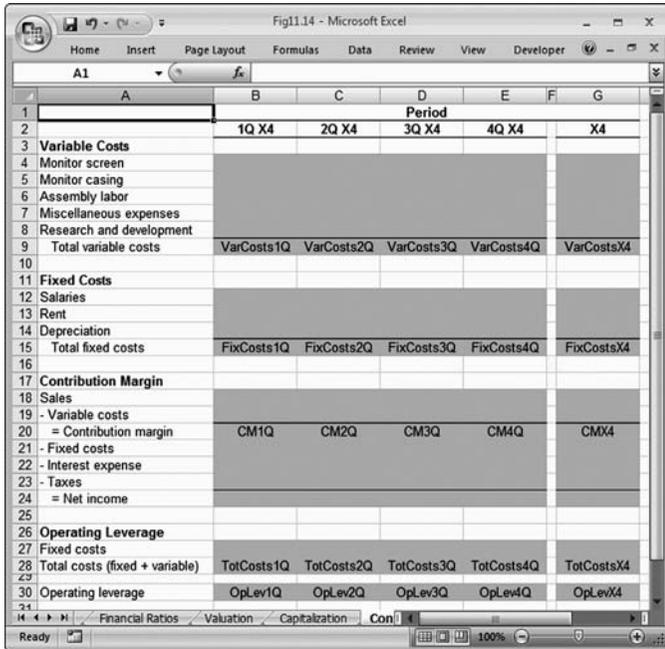
Note that I am not including interest expenses or taxes in my calculation of Napavale’s total costs to determine the company’s operating leverage. I am utilizing this approach so that I might focus on and assess the operational dynamics (as opposed to the operational and financial dynamics) of Napavale as a business.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Variable Costs</b>					
Monitor screen	\$ 75,000	\$ 108,000	\$ 136,500	\$ 168,000	\$ 487,500
Monitor casing	75,000	108,000	136,500	168,000	487,500
Assembly labor	50,000	75,000	100,800	126,000	351,800
Miscellaneous expenses	30,000	43,200	57,960	75,600	206,760
Research and development	70,000	100,800	154,560	201,600	526,960
<b>Total variable costs</b>	<b>\$ 300,000</b>	<b>\$ 435,000</b>	<b>\$ 586,320</b>	<b>\$ 739,200</b>	<b>\$ 2,060,520</b>
<b>Fixed Costs</b>					
Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200	\$ 2,301,600
Rent	20,000	29,000	20,000	20,000	80,000
Depreciation	2,313	4,625	6,938	9,250	23,125
<b>Total fixed costs</b>	<b>\$ 492,713</b>	<b>\$ 495,025</b>	<b>\$ 690,538</b>	<b>\$ 726,450</b>	<b>\$ 2,404,725</b>
<b>Contribution Margin</b>					
Sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000
- Variable costs	300,000	435,000	586,320	739,200	2,060,520
<b>= Contribution margin</b>	<b>\$ 700,000</b>	<b>\$ 1,005,000</b>	<b>\$ 1,345,680</b>	<b>\$ 1,780,800</b>	<b>\$ 4,831,480</b>
- Fixed costs	492,713	495,025	690,538	726,450	2,404,725
- Interest expense	-	875	-	-	875
- Taxes	72,551	178,185	229,300	369,023	849,058
<b>= Net income</b>	<b>\$ 134,737</b>	<b>\$ 330,915</b>	<b>\$ 425,843</b>	<b>\$ 688,328</b>	<b>\$ 1,576,822</b>
<b>Operating Leverage</b>					
Fixed costs	\$ 492,713	\$ 495,025	\$ 690,538	\$ 726,450	\$ 2,404,725
Total costs (fixed + variable)	\$ 792,713	\$ 930,025	\$ 1,276,858	\$ 1,465,650	\$ 4,465,245
<b>Operating leverage</b>	<b>62.2%</b>	<b>53.2%</b>	<b>54.1%</b>	<b>49.6%</b>	<b>53.9%</b>

FIGURE 11.12 Calculation of Operating Leverage



**FIGURE 11.13** Alternative View of the Calculation of Operating Leverage



**FIGURE 11.14** Names of the Input and Output Cells Underlying the Calculation of Operating Leverage

## BREAKEVEN POINTS IN UNITS

A company’s breakeven point is the point at which its revenues cover all of its costs. Breakeven point is an important metric that indicates how many units a company must sell, or the dollar value of revenues a company must generate, to cover all of its costs (both fixed and variable). A company’s breakeven point in units is calculated as:  $(\text{total fixed costs}) / (\text{contribution margin per unit})$ . Note that I am calculating Napavale’s breakeven point on an operating profit basis. In other words, I am not including interest expenses or taxes in my calculation of Napavale’s breakeven point. This is because I am interested in assessing the operational dynamics of Napavale as a business; you may find it useful to include interest and tax expenses in your calculation of breakeven point. If you do decide to include such expenses in your calculation of a breakeven point, be sure to clearly note this fact in your calculation.

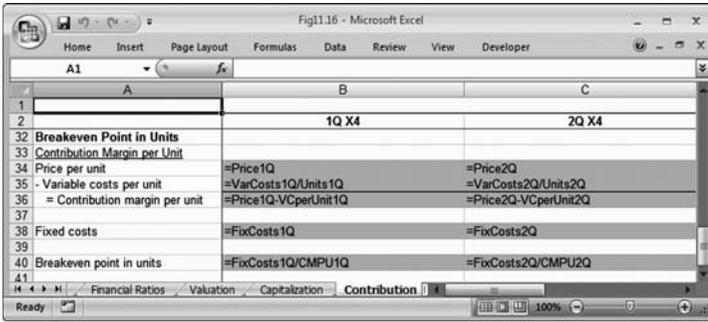
The calculations of Napavale’s contribution margin per unit and breakeven point in units are shown in Figure 11.15. Note that Napavale’s contribution margin per unit, and breakeven point, varies across accounting periods (quarters) due to the fluctuation in fixed costs, variable costs, and revenues over each of the accounting periods.

The breakeven points shown for each accounting period (quarter) apply to each accounting period separately; they are not cumulative in nature.

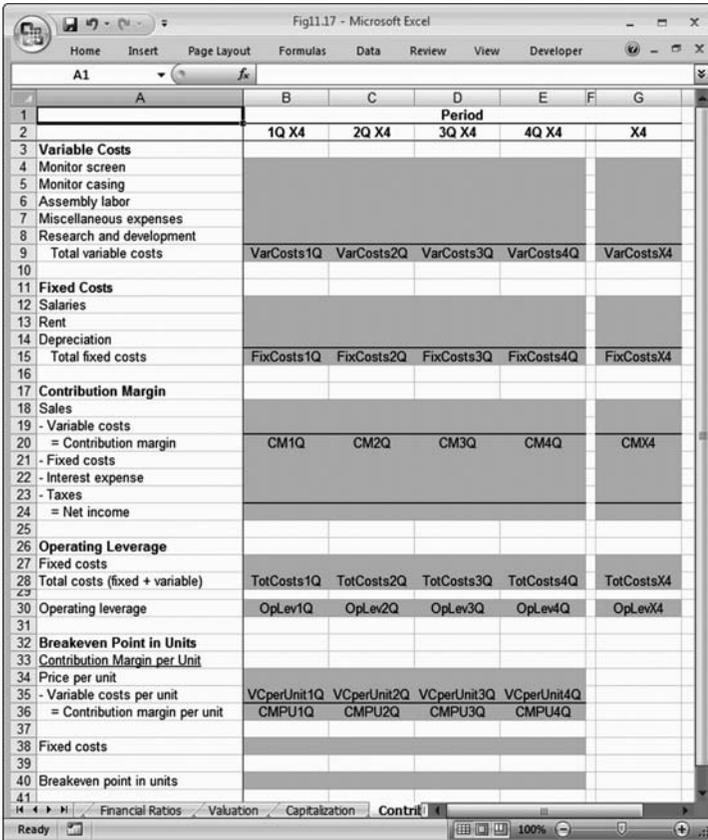
An alternative view of Figure 11.15 in which the values and formulas underlying the worksheet cells are visible is shown in Figure 11.16. Figure 11.17 presents the names of the input and output cells associated with the calculation of Napavale’s breakeven point in units.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Breakeven Point in Units</b>					
<b>Contribution Margin per Unit</b>					
Price per unit	\$ 1,000.00	\$ 960.00	\$ 920.00	\$ 900.00	
- Variable costs per unit	300	290	279	264	
= Contribution margin per unit	\$ 700.00	\$ 670.00	\$ 640.90	\$ 636.00	
Fixed costs	\$ 492,713	\$ 496,025	\$ 690,538	\$ 726,450	
Breakeven point in units	704	739	1,078	1,142	

**FIGURE 11.15** Calculation of the Breakeven Point in Units



**FIGURE 11.16** Alternative View of the Calculation of the Breakeven Point in Units



**FIGURE 11.17** Names of the Input and Output Cells Underlying the Calculation of the Breakeven Point in Units

## BREAKEVEN POINT IN DOLLARS

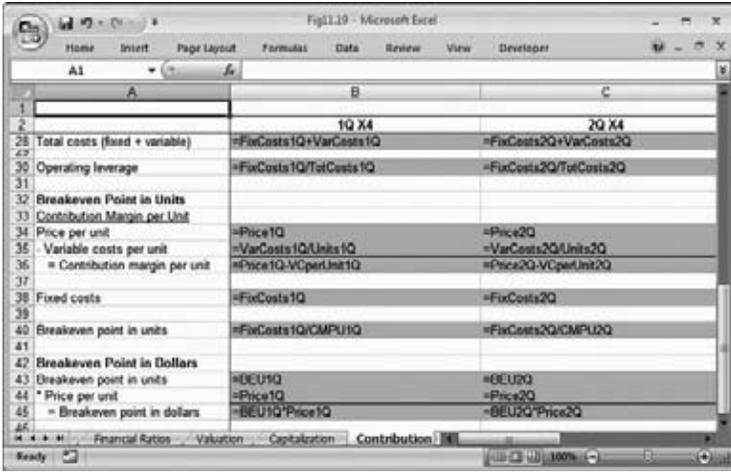
Another way to calculate a company’s breakeven point is in terms of dollars of revenues. Calculating Napavale’s breakeven point in dollars of revenues does not change the breakeven point; it simply offers another metric (in addition to breakeven in units) by which Napavale may be analyzed and assessed. A company’s breakeven point in dollars of revenues is equal to: (breakeven point in units) \* (price per unit).

The price per unit used in this case is the average selling price per unit over each accounting period (quarter). This is the same price-per-unit approach as utilized in Chapter 2. As with the breakeven point in units, the breakeven points shown for each accounting period (quarter) apply to each accounting period separately; they are not cumulative in nature.

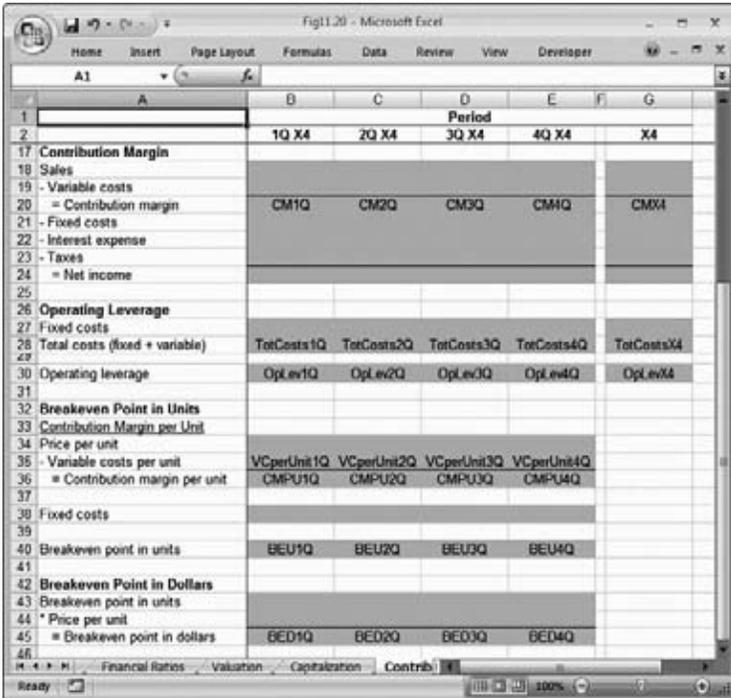
The calculation of Napavale’s breakeven point in dollars of revenue is presented in Figure 11.18. The values and formulas underlying the calculation of Napavale’s breakeven point in dollars of revenue are shown in Figure 11.19. Figure 11.20 presents a view of the names of the input and output cells underlying the calculation of Napavale’s breakeven point in dollars of revenues.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Breakeven Point in Units</b>					
<b>Contribution Margin per Unit</b>					
Price per unit	\$ 1,000.00	\$ 960.00	\$ 920.00	\$ 900.00	
- Variable costs per unit	300	290	279	264	
= Contribution margin per unit	\$ 700.00	\$ 670.00	\$ 640.80	\$ 636.00	
Fixed costs	\$ 492,713	\$ 495,025	\$ 690,538	\$ 726,450	
Breakeven point in units	704	739	1,078	1,142	
<b>Breakeven Point in Dollars</b>					
Breakeven point in units	704	739	1,078	1,142	
* Price per unit	\$ 1,000	\$ 960	\$ 920	\$ 900	
= Breakeven point in dollars	\$ 703,875	\$ 709,290	\$ 991,408	\$ 1,027,995	

**FIGURE 11.18** Calculation of the Breakeven Point in Dollars of Revenue



**FIGURE 11.19** Alternative View of the Calculation of the Breakeven Point in Dollars of Revenue



**FIGURE 11.20** Names of the Input and Output Cells Underlying the Calculation of the Breakeven Point in Dollars of Revenue

## QUESTIONS

Each of the questions for this chapter relates to a hypothetical company named Company 123. Company 123 sells GPS navigation systems to consumers. As such, Company 123 is a product-oriented (as opposed to a service-oriented) business. Note that there are three cost-of-goods-sold components for Company 123’s GPS navigation systems: (1) electronics, (2) casing, and (3) assembly and labor.

The questions for this chapter will address fiscal year X4 on a quarterly basis (four specific quarters, 1Q–4Q for year X4). The following questions will test your knowledge of the material covered in this chapter in an applied manner—specifically, you will be asked to identify the fixed and variable costs, calculate the contribution margin, calculate the operating leverage, and calculate the breakeven point (in terms of both units and dollars) for Company 123.

To prepare you for this chapter’s questions, Figure Q11.1 offers a view of Company 123’s Cost-of-Goods-Sold Budget worksheet to provide some background information related to Company 123’s operations. Figure Q11.2 provides a view of Company 123’s Operating Expenses Budget. Company 123’s Headcount Cost worksheet is shown in Figure Q11.3. Figure Q11.4 provides a view of a portion of Company 123’s Assumptions and Dashboard worksheet. Company 123’s Capital Budget worksheet is shown in Figure Q11.5. Company 123’s Sales Budget is shown in Figure Q11.6. Figure Q11.7 provides a view of Company 123’s Cash Budget. Figure Q11.8 provides a view of Company 123’s Income Statement.

Note that I am assuming Company 123 generates a negative income tax expense in 1Q X4 and 2Q X4 to simplify these questions. While this does

		Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>COST-OF-GOODS SOLD BUDGET</b>						
<i>Cost-of-Goods Sold Budget</i>						
5	Electronics	\$ 60,000	\$ 90,000	\$ 121,800	\$ 159,600	\$ 431,400
6	Casing	60,000	88,500	115,500	148,400	412,400
7	Assembly labor	40,000	60,000	79,800	103,600	283,400
8	Total cost-of-goods sold	\$ 160,000	\$ 238,500	\$ 317,100	\$ 411,600	\$ 1,127,200

**FIGURE Q11.1** Company 123’s Cost-of-Goods-Sold Budget

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>OPERATING EXPENSES BUDGET</b>					
Operating Expenses Budget					
Salaries	\$ 447,063	\$ 461,438	\$ 526,125	\$ 526,125	\$ 1,960,750
Miscellaneous expenses	20,000	30,000	39,900	51,520	141,420
Research and development	25,000	37,500	49,875	64,400	176,775
Rent	18,000	18,000	18,000	18,000	72,000
Depreciation	1,375	3,000	4,575	5,950	14,900
Total operating expenses	\$ 511,438	\$ 549,938	\$ 638,475	\$ 665,995	\$ 2,365,845
<b>DISBURSEMENTS FOR OPERATING EXPENSES BUDGET</b>					
Disbursements for Operating Expenses Budget					
Salaries	\$ 447,063	\$ 461,438	\$ 526,125	\$ 526,125	\$ 1,960,750
Miscellaneous expenses	20,000	30,000	39,900	51,520	141,420
Research and development	25,000	37,500	49,875	64,400	176,775
Rent	18,000	18,000	18,000	18,000	72,000
Depreciation	-	-	-	-	-
Total disbursements for operating expenses	\$ 510,063	\$ 546,938	\$ 633,900	\$ 660,045	\$ 2,350,945

FIGURE Q11.2 Company 123's Operating Expenses Budget

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>HEADCOUNT BUDGET</b>					
Headcount Budget					
Periodic salary expense (base)					
Chief Executive Officer	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 180,000
Chief Financial Officer	41,250	41,250	41,250	41,250	165,000
VP, Engineering	40,000	40,000	40,000	40,000	160,000
VP, Sales & Marketing	35,000	35,000	35,000	35,000	140,000
VP, Business Development	30,000	30,000	30,000	30,000	120,000
Salesperson	100,000	100,000	125,000	125,000	450,000
Hardware Engineer	67,500	67,500	90,000	90,000	315,000
Controller/Accountant	12,500	25,000	25,000	25,000	87,500
Administrative Assistant	17,500	17,500	26,250	26,250	87,500
Total	\$ 388,750	\$ 401,250	\$ 457,500	\$ 457,500	\$ 1,705,000
Total (with benefits)	\$ 447,063	\$ 461,438	\$ 526,125	\$ 526,125	\$ 1,960,750

FIGURE Q11.3 Company 123's Headcount Cost Worksheet

	Period			
	1Q X4	2Q X4	3Q X4	4Q X4
<b>Operating Expenses Worksheet</b>				
<b>Operating Expenses Inputs</b>				
Miscellaneous expenses as a % of sales	4.0%	4.0%	4.0%	4.0%
R&D expenses as a % of sales	5.0%	5.0%	5.0%	5.0%
Rent expense per square foot per quarter	\$ 4.50	\$ 4.50	\$ 4.50	\$ 4.50
Square feet of space rented	4,000	4,000	4,000	4,000
Total rent expense	\$ 18,000	\$ 18,000	\$ 18,000	\$ 18,000
Tax rate	30.0%	30.0%	35.0%	35.0%
<b>Capital Worksheet</b>				
<b>Capital Expenditures (CAPEX) Inputs</b>				
Equipment purchases	\$ 20,000	\$ 25,000	\$ 25,000	\$ 20,000
Furniture purchases	\$ 5,000	\$ 5,000	\$ 4,000	\$ 5,000
Fixtures purchases	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000
Total CAPEX purchases	\$ 27,000	\$ 32,000	\$ 31,000	\$ 27,000
<b>CAPEX Disbursements Inputs</b>				
% of purchases paid for in purchase period	100%	100%	100%	100%
<b>Depreciation Inputs</b>				
Equipment depreciable life (years)				5.0
Furniture depreciable life (years)				5.0
Fixtures depreciable life (years)				4.0
Quarters per year				4.0
Equipment depreciation multiplier	5.0%	5.0%	5.0%	5.0%
Furniture depreciation multiplier	5.0%	5.0%	5.0%	5.0%
Fixtures depreciation multiplier	6.3%	6.3%	6.3%	6.3%

FIGURE Q11.4 Company 123's Assumptions and Dashboard Worksheet

	Period			
	1Q X4	2Q X4	3Q X4	4Q X4
<b>CAPITAL BUDGET</b>				
<b>Capital Expenditures Budget</b>				
Equipment	\$ 20,000	\$ 25,000	\$ 25,000	\$ 20,000
Furniture	\$ 5,000	\$ 5,000	\$ 4,000	\$ 5,000
Fixtures	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000
Total capital expenditures	\$ 27,000	\$ 32,000	\$ 31,000	\$ 27,000
<b>Disbursements for Capital Expenditures Budget</b>				
Equipment	\$ 20,000	\$ 25,000	\$ 25,000	\$ 20,000
Furniture	\$ 5,000	\$ 5,000	\$ 4,000	\$ 5,000
Fixtures	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000
Total disbursements for capital expenditures	\$ 27,000	\$ 32,000	\$ 31,000	\$ 27,000
<b>Depreciation Budget</b>				
Equipment	\$ 1,000	\$ 2,250	\$ 3,500	\$ 4,500
Furniture	250	500	700	950
Fixtures	125	250	375	500
Total depreciation	\$ 1,375	\$ 3,000	\$ 4,575	\$ 5,950
Cumulative capital expenditures	\$ 27,000	\$ 59,000	\$ 90,000	\$ 117,000
- Accumulated depreciation	1,375	4,375	8,950	14,900
= Fixed assets, net of depreciation	\$ 25,625	\$ 54,625	\$ 81,050	\$ 102,100
Cumulative disbursements for CAPEX	\$ 27,000	\$ 59,000	\$ 90,000	\$ 117,000
Payables adjustment for CAPEX disbursements	\$ -	\$ -	\$ -	\$ -

FIGURE Q11.5 Company 123's Capital Budget Worksheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>SALES BUDGET</b>					
<b>Unit Sales and Price Budget</b>					
Unit sales	1,000	1,500	2,100	2,800	7,400
x Price per unit	\$ 500	\$ 500	\$ 475	\$ 460	N/A
= Total sales	\$ 500,000	\$ 750,000	\$ 997,500	\$ 1,288,000	\$ 3,535,500
<b>Sales Composition Budget</b>					
Cash sales	\$ 200,000	\$ 300,000	\$ 399,000	\$ 515,200	\$ 1,414,200
+ Credit sales	300,000	450,000	598,500	772,800	2,121,300
= Total sales	\$ 500,000	\$ 750,000	\$ 997,500	\$ 1,288,000	\$ 3,535,500
<b>COLLECTIONS BUDGET</b>					
<b>Cash Collections from Customers Budget</b>					
Cash sales this period	\$ 200,000	\$ 300,000	\$ 399,000	\$ 515,200	\$ 1,414,200
+ Credit sales collected	216,667	413,333	652,250	724,383	1,906,633
= Total collections	\$ 416,667	\$ 713,333	\$ 951,250	\$ 1,239,583	\$ 3,320,833
<b>Accounts Receivable (A/R) Budget</b>					
Beginning A/R balance	\$ -	\$ 83,333	\$ 120,000	\$ 166,250	\$ -
+ Additions to A/R	83,333	120,000	166,250	214,667	584,250
- Subtractions from A/R		83,333	120,000	166,250	369,883
= Ending A/R balance	\$ 83,333	\$ 120,000	\$ 166,250	\$ 214,667	\$ 214,667

FIGURE Q11.6 Company 123's Sales Budget

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>CASH BUDGET</b>					
Beginning cash balance	\$ -	\$ 597,411	\$ 439,838	\$ 400,203	\$ -
Cash receipts					
Collections from customers	416,667	713,333	951,250	1,239,583	3,320,833
Total cash available, before financing	\$ 416,667	\$ 1,310,744	\$ 1,391,088	\$ 1,639,787	N/A
Cash disbursements					
Purchases disbursements	\$ 133,056	\$ 253,500	\$ 311,311	\$ 383,600	\$ 1,081,467
Operating expenses	510,083	546,938	633,900	660,045	2,350,945
Tax expense	(51,675)	(11,531)	14,674	73,642	25,109
Capital expenditures	27,000	32,000	31,000	27,000	117,000
Total disbursements	619,443	829,969	990,885	1,144,287	3,574,521
Minimum cash balance desired	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	N/A
Total cash needed	\$ 868,443	\$ 1,079,969	\$ 1,240,885	\$ 1,394,287	N/A
Excess (deficiency) of total cash available over total cash needed before financing	\$ (451,776)	\$ 239,838	\$ 150,203	\$ 245,500	N/A
Financing					
Equity investment	\$ 750,000	\$ -	\$ -	\$ -	\$ 750,000
Borrowing (at beginning of quarter)	50,000				50,000
Repayments (at end of quarter)		(50,000)			(50,000)
Interest	(813)				(813)
Total cash increase (decrease) from financing	\$ 799,188	\$ (50,000)	\$ -	\$ -	\$ 749,188
Ending cash balance	\$ 597,411	\$ 439,838	\$ 400,203	\$ 495,500	\$ 495,500

FIGURE Q11.7 Company 123's Cash Budget

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
Sales	\$ 500,000	\$ 750,000	\$ 997,500	\$ 1,288,000	\$ 3,535,500
Cost of goods sold	160,000	238,500	317,100	411,600	1,127,200
Gross profit	\$ 340,000	\$ 511,500	\$ 680,400	\$ 876,400	\$ 2,408,300
Salaries	\$ 447,063	\$ 461,438	\$ 526,125	\$ 526,125	\$ 1,960,750
Miscellaneous expenses	20,000	30,000	39,900	51,620	141,420
Research and development	25,000	37,500	49,875	64,400	176,775
Rent	18,000	18,000	18,000	18,000	72,000
Depreciation	1,375	3,000	4,575	5,950	14,900
Income from operations	\$ (171,438)	\$ (38,438)	\$ 41,925	\$ 210,405	\$ 42,455
Interest expense	\$ 813	\$ -	\$ -	\$ -	\$ 813
Taxable income	\$ (172,250)	\$ (38,438)	\$ 41,925	\$ 210,405	\$ 41,643
Tax expense	\$ (51,675)	\$ (11,531)	\$ 14,674	\$ 73,642	\$ 25,109
Net income	\$ (120,575)	\$ (26,906)	\$ 27,251	\$ 136,763	\$ 16,533

**FIGURE Q11.8** Company 123's Income Statement

not represent a real-world scenario, it should help to make these exercises easier to follow.

1. Given the information presented, identify Company 123's variable costs.
2. Using the information presented, identify Company 123's fixed costs.
3. Given the information presented, calculate Company 123's contribution margin and reconcile Company 123's contribution margin with its Net Income.
4. Calculate, using the information presented, Company 123's operating leverage.
5. Given the information presented, calculate Company 123's breakeven point in terms of units.
6. Calculate, using the information presented, Company 123's breakeven point in terms of dollars of revenues.

## Financial Ratios Analysis

This chapter covers the use of financial ratios to analyze and assess Napavale's operations. Financial ratios are metrics that compare various elements of a business's operations; one example would include Gross Margin, which is calculated as:  $(\text{Gross Profit})/(\text{Sales})$ . Financial ratios are used in several productive ways: They enable the comparison of ratios for a specific company across various accounting periods and they enable the comparison of a specific company to competitors and/or a broad set of companies, such as those included in an index such as the S&P 500 (Standard & Poor's 500, which is an index used to track a set of companies), among other uses.

Using Napavale's financial model, I will calculate three sets of financial ratios: profit margins, investment returns and management efficiency. The ratios covered in this chapter represent a small subset of the range of ratios used in the financial community. Depending on the nature of your own financial model, you may find it useful to use different or additional ratios to analyze and assess the operations of your own company. Regardless of the ratios you use, the process described in this chapter should apply to a wide array of financial ratios calculations.

### **PROFIT MARGINS—FINANCIAL RATIOS**

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The first set of financial ratios that I cover in this chapter, those related to profit margins, measure Napavale's relative profitability in several different ways. The first ratio, Gross Margin, compares Napavale's Gross Profit (which is equal to Sales – Cost of Goods Sold) to Sales. Gross Margin is calculated as:  $(\text{Gross Profit})/(\text{Sales})$ .

Figure 12.1 presents a view of the calculation of Napavale's Gross Margin. An alternative view of the calculation of Napavale's Gross Margin in which the values and formulas underlying the worksheet cells are revealed is shown in Figure 12.2. The names of the input and output cells underlying

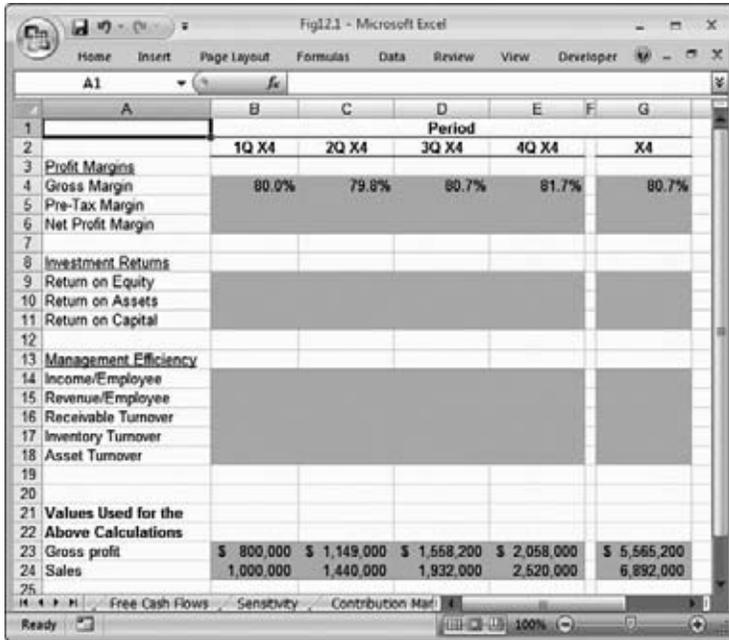


FIGURE 12.1 Calculation of Gross Margin

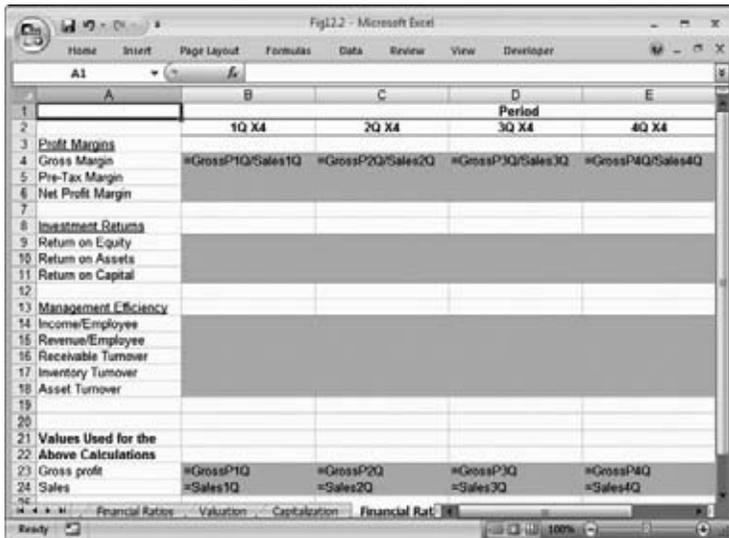
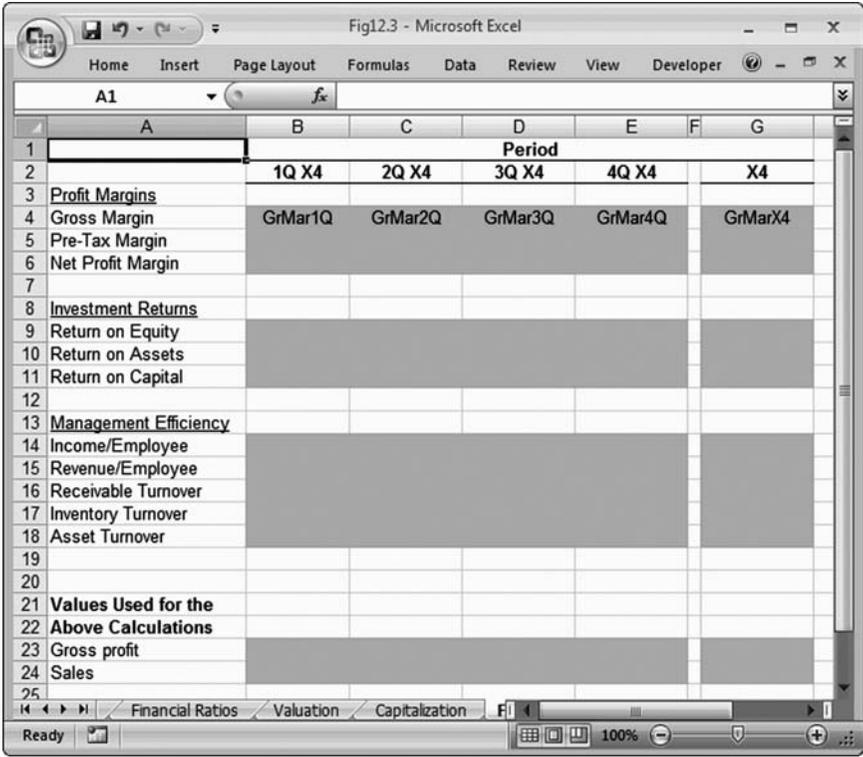


FIGURE 12.2 Alternative View of the Calculation of Gross Margin

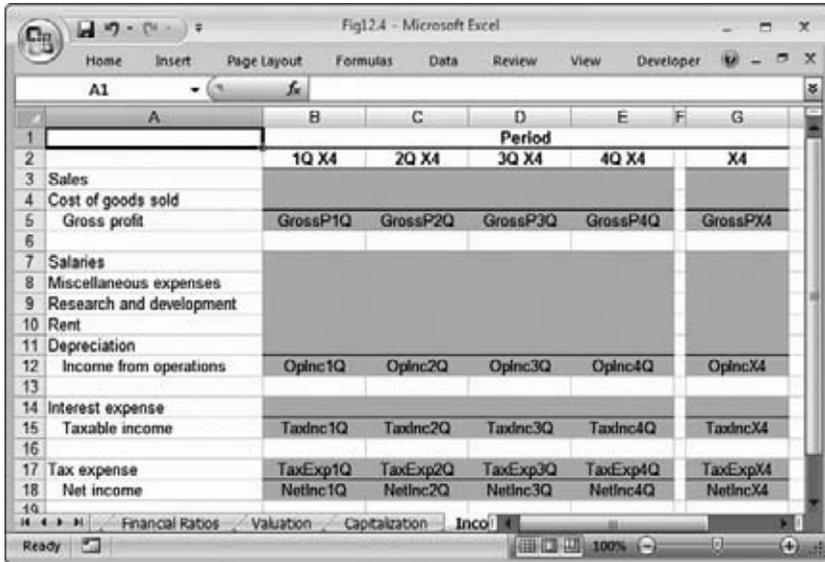


**FIGURE 12.3** Names of the Input and Output Cells Underlying the Calculation of Gross Margin

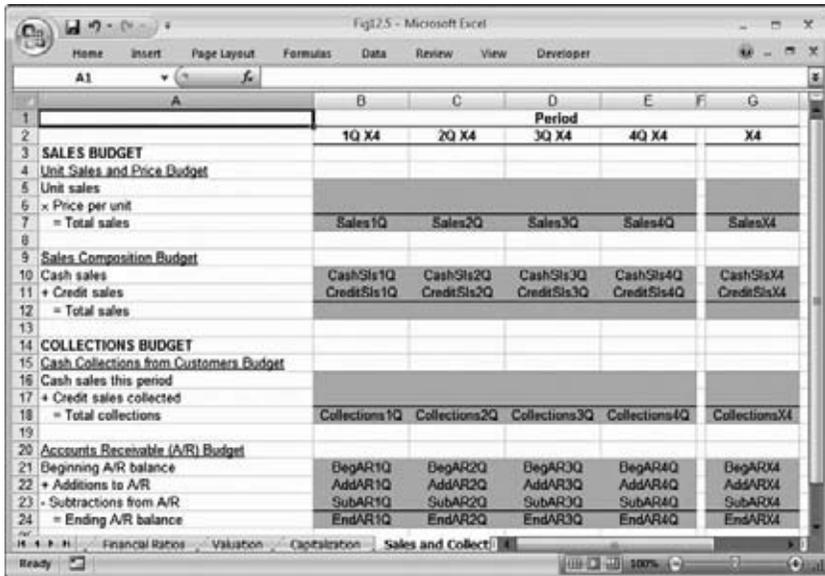
the calculation of Napavale’s Gross Margin are presented in Figure 12.3. For the sake of reference, Figure 12.4 presents a view of the names of the input and output cells from Napavale’s Income Statement.

Also for the sake of reference, Figure 12.5 presents a view of the names of the input and output cells from Napavale’s Sales and Collections worksheet. Note the source of the inputs into the Gross Margin calculation—Sales values are drawn from the Sales and Collections worksheet and Gross Profit values are drawn from the Income Statement.

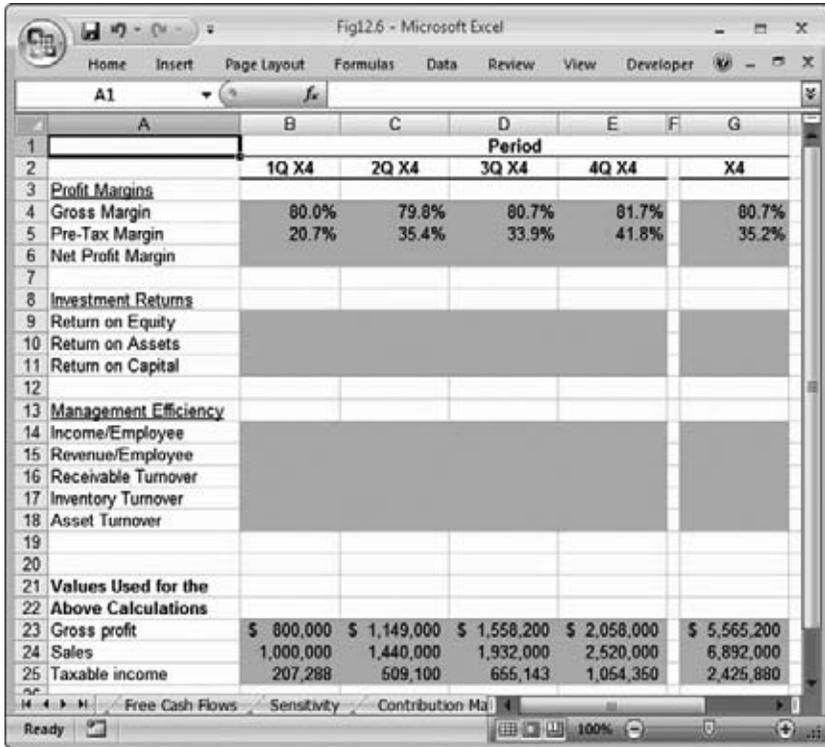
The next profit margin ratio, Pre-Tax Margin, compares Napavale’s pre-tax income (also referred to as “Taxable Income”) to Sales. I calculated Napavale’s Taxable Income in Chapter 5—another way to think of Taxable Income is “Net Income + Tax Expense.” In other words, the only difference between Taxable Income and Net Income is that Net Income incorporates the deduction of any tax expenses. As such, Pre-Tax Margin is



**FIGURE 12.4** Names of the Input and Output Cells Underlying the Income Statement



**FIGURE 12.5** Names of the Input and Output Cells Underlying the Sales and Collections Worksheet



**FIGURE 12.6** Calculation of Pre-Tax Margin

calculated as: (Taxable Income)/(Sales). Figure 12.6 presents a view of the calculation of Napavale’s Pre-Tax Margin. Figure 12.7 presents a view of the values and formulas underlying the calculation of Napavale’s Pre-Tax Margin.

The names of the input and output cells associated with the calculation of Napavale’s Pre-Tax Margin are shown in Figure 12.8. Note the source of the input values in this calculation—Taxable Income values are drawn from the Income Statement and Sales values are drawn from the Sales and Collections worksheet.

Net Profit Margin, the third profit margin ratio, compares Napavale’s Net Income to Sales. This is a widely used financial ratio that is also referred to as “Net Margin” or “Net Income Margin,” among other names. Net Profit Margin is calculated as: (Net Income)/(Sales). Figure 12.9 presents a view of the calculation of Napavale’s Net Profit Margin.

A view of the values and formulas underlying the calculation of Napavale’s Net Profit Margin is shown in Figure 12.10. Figure 12.11 presents

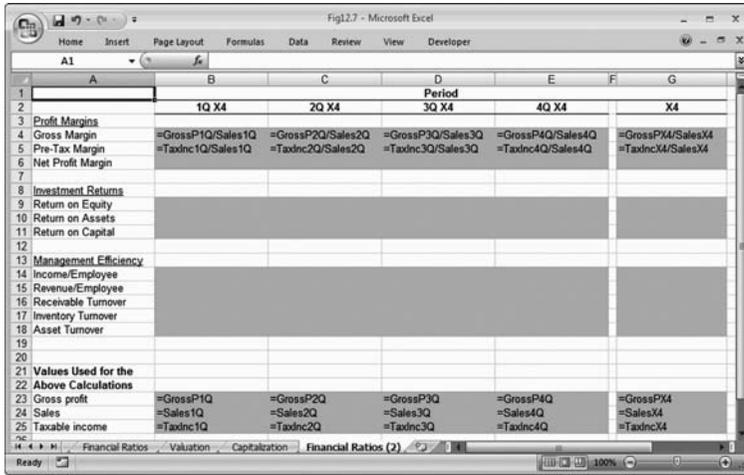


FIGURE 12.7 Alternative View of the Calculation of Pre-Tax Margin

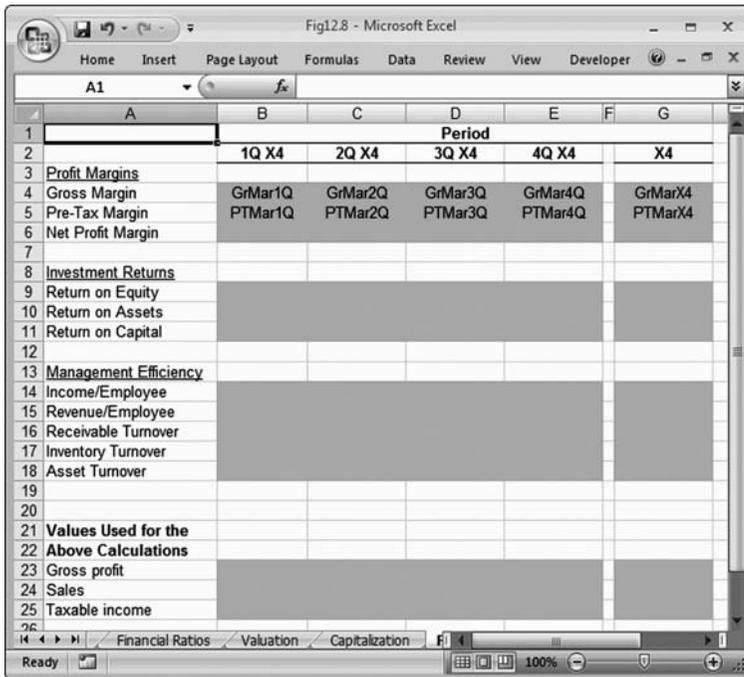


FIGURE 12.8 Names of the Input and Output Cells Underlying the Calculation of Pre-Tax Margin

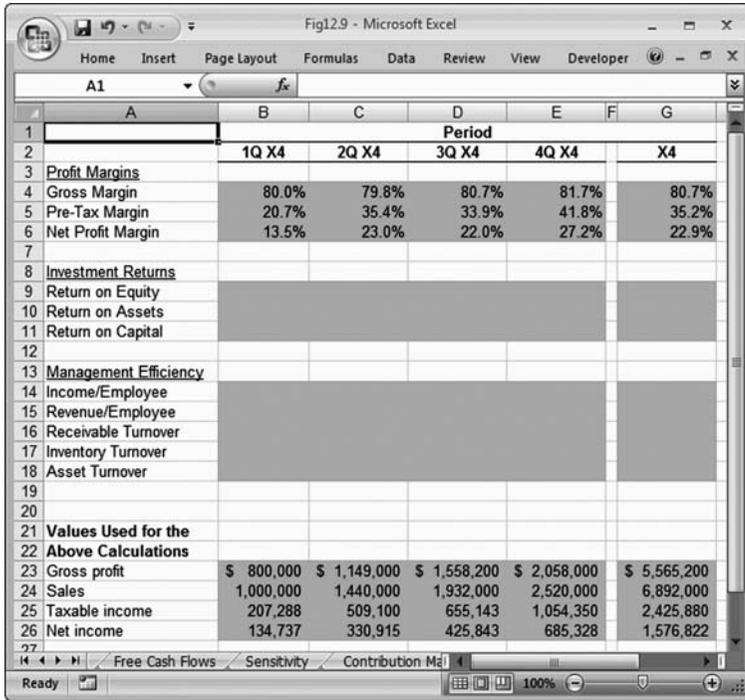


FIGURE 12.9 Calculation of Net Profit Margin

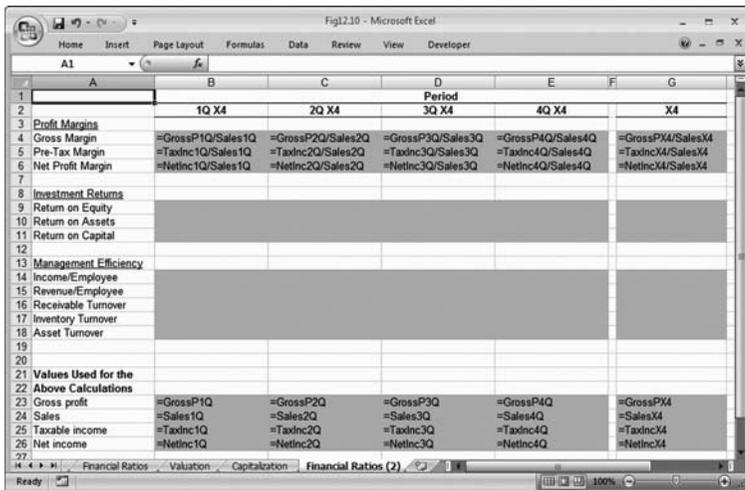
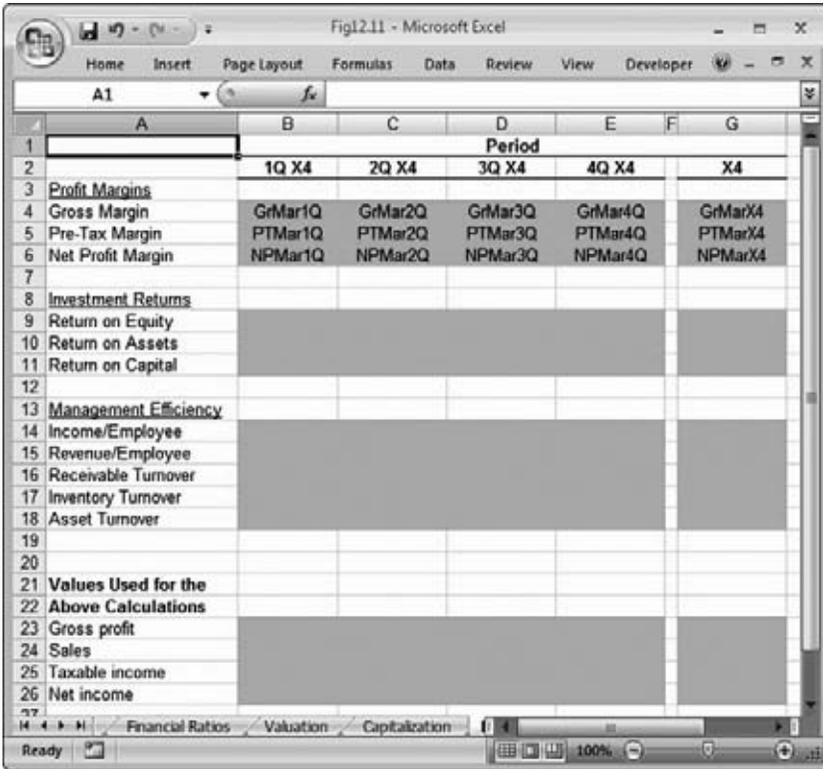


FIGURE 12.10 Alternative View of the Calculation of Net Profit Margin

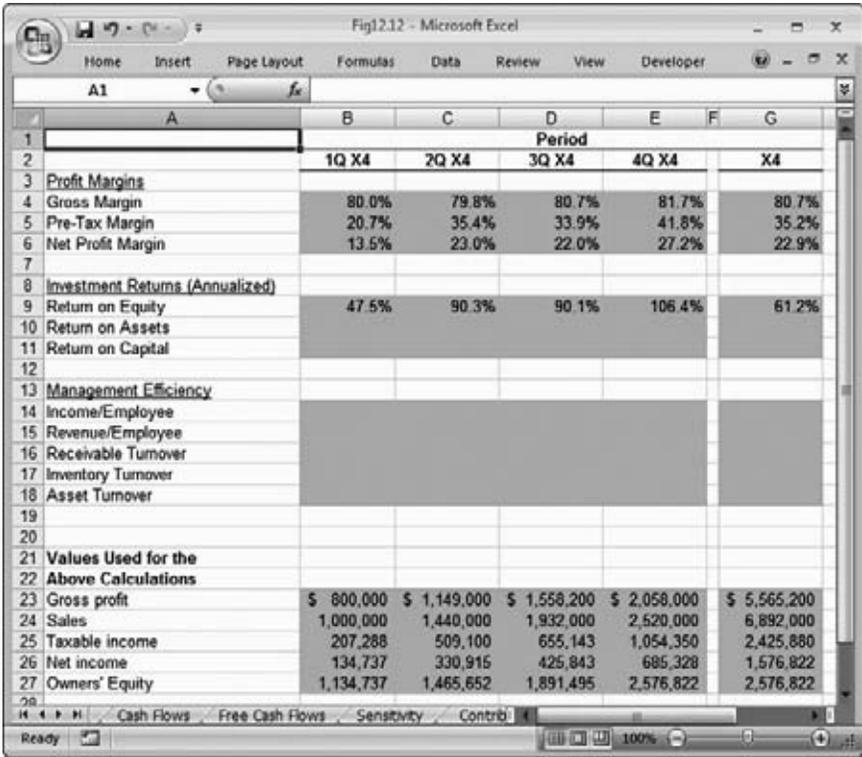


**FIGURE 12.11** Names of the Input and Output Cells Underlying the Calculation of Net Profit Margin

a view of the names of the input and output cells associated with the calculation of Napavale’s Net Profit Margin. The Net Income values are drawn from Napavale’s Income Statement and the Sales values are drawn from the Sales and Collections worksheet.

**INVESTMENT RETURNS—FINANCIAL RATIOS**

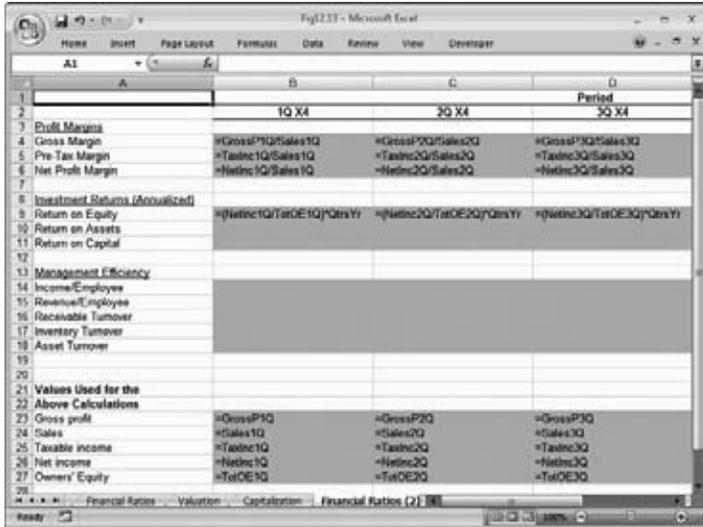
Financial ratios related to investment returns measure how efficiently a business uses (or used) its financial resources. In this context, financial resources may include equity, debt, or assets (remember that assets represent the use of funds and equity and debt represent the source of funds for a business). Investment returns ratios typically relate an Income Statement account, such as Net Income, to a Balance Sheet account, such as Owners’ Equity.



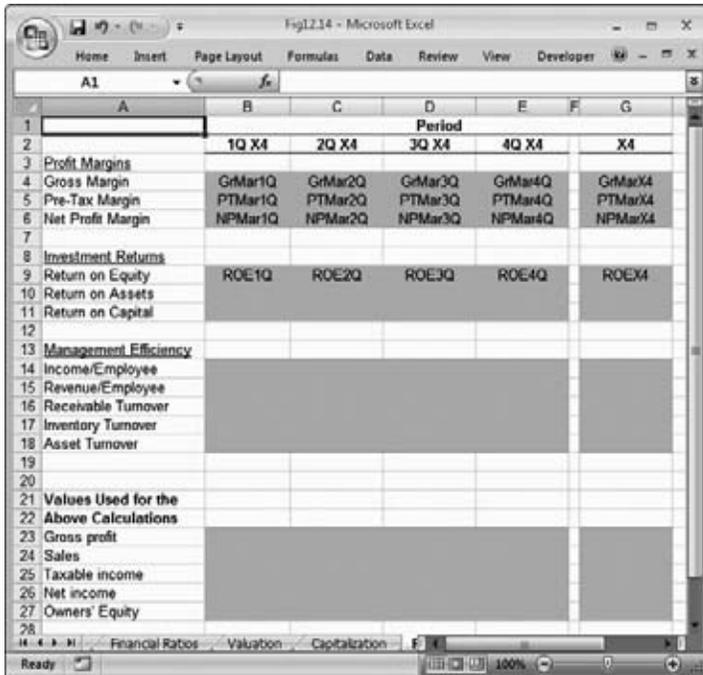
**FIGURE 12.12** Calculation of Return on Equity

The first investment returns ratio, Return on Equity, compares Napavale’s Net Income to its Owners’ Equity account. Return on Equity provides a measure of how effectively Napavale used its equity base in terms of generating profits (or Net Income). Return on Equity is calculated as:  $(\text{Net Income})/(\text{Owners' Equity})$ . Figure 12.12 presents the calculation of Napavale’s Return on Equity. Note that I am “annualizing” each quarter’s investment returns ratio (for each of the three investment returns covered in this section) by multiplying the ratio by four (as there are four quarters in each year). I am interested in measuring Napavale’s investment returns, such as Return on Equity, on an annual basis. As such, I need to adjust the quarterly calculations to reflect my focus on annualized figures.

The values and formulas underlying the worksheet cells associated with the calculation of Napavale’s Return on Equity are shown in Figure 12.13. Figure 12.14 presents a view of the names of the input and output cells related to the calculation of Napavale’s Return on Equity.



**FIGURE 12.13** Alternative View of the Calculation of Return on Equity



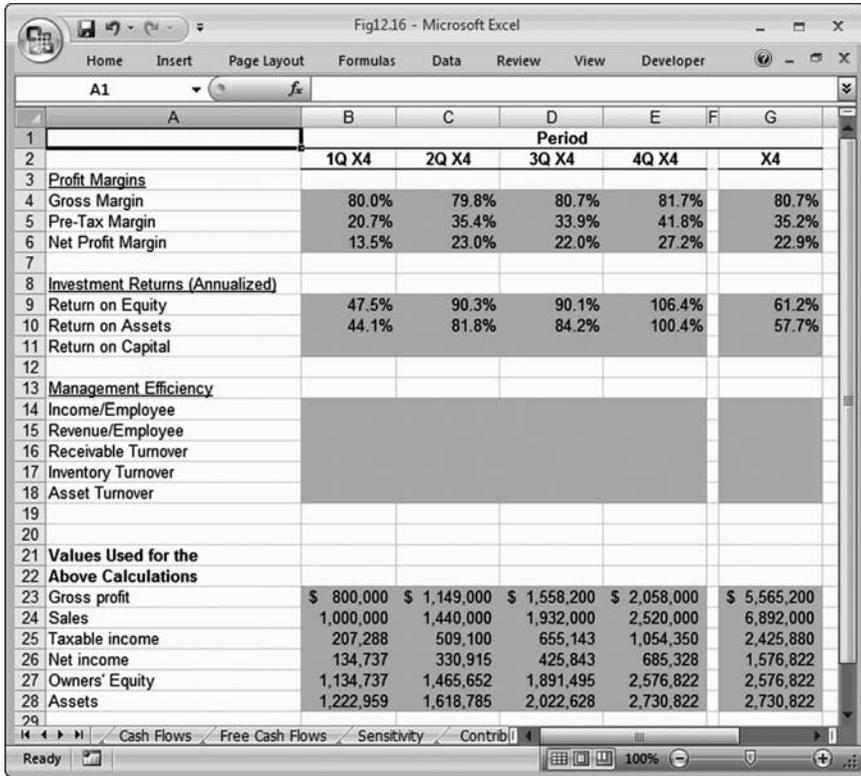
**FIGURE 12.14** Names of the Input and Output Cells Underlying the Calculation of Return on Equity

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Assets</b>					
Cash					
Accounts Receivable					
Inventory					
Fixed Assets, net					
<b>Total Assets</b>	<b>TotAssets1Q</b>	<b>TotAssets2Q</b>	<b>TotAssets3Q</b>	<b>TotAssets4Q</b>	<b>TotAssetsX4</b>
<b>Liabilities</b>					
Accounts Payable					
Payables from Capital Budget	PayCapB1Q	PayCapB2Q	PayCapB3Q	PayCapB4Q	PayCapBX4
Loan Payable					
<b>Total Liabilities</b>	<b>TotLiabs1Q</b>	<b>TotLiabs2Q</b>	<b>TotLiabs3Q</b>	<b>TotLiabs4Q</b>	<b>TotLiabsX4</b>
<b>Owners' Equity</b>					
Common Stock	CS1Q	CS2Q	CS3Q	CS4Q	CSX4
Retained Earnings	RE1Q	RE2Q	RE3Q	RE4Q	REX4
<b>Total Owners' Equity</b>	<b>TotOE1Q</b>	<b>TotOE2Q</b>	<b>TotOE3Q</b>	<b>TotOE4Q</b>	<b>TotOEX4</b>
<b>Total Liabilities and Owners' Equity</b>	<b>TotLOE1Q</b>	<b>TotLOE2Q</b>	<b>TotLOE3Q</b>	<b>TotLOE4Q</b>	<b>TotLOEX4</b>
<b>Balance Sheet calculation check</b>	<b>BSCheck1Q</b>	<b>BSCheck2Q</b>	<b>BSCheck3Q</b>	<b>BSCheck4Q</b>	<b>BSCheckX4</b>
<b>Net Working Capital (NWC)</b>					
Current assets	CA1Q	CA2Q	CA3Q	CA4Q	CAX4
- Current liabilities	CL1Q	CL2Q	CL3Q	CL4Q	CLX4
<b>= Net working capital</b>	<b>NWC1Q</b>	<b>NWC2Q</b>	<b>NWC3Q</b>	<b>NWC4Q</b>	<b>NWCX4</b>
Beginning NWC	BegNWC1Q	BegNWC2Q	BegNWC3Q	BegNWC4Q	BegNWCX4
- Ending NWC	EndNWC1Q	EndNWC2Q	EndNWC3Q	EndNWC4Q	EndNWCX4
<b>= Change in NWC</b>	<b>ChgNWC1Q</b>	<b>ChgNWC2Q</b>	<b>ChgNWC3Q</b>	<b>ChgNWC4Q</b>	<b>ChgNWCX4</b>

**FIGURE 12.15** Names of the Input and Output Cells Underlying the Balance Sheet

Note that the Net Income values are drawn from the Income Statement and the Owners' Equity values are drawn from the Balance Sheet. A view of the names of the input and output worksheet cells from Napavale's Balance Sheet is presented in Figure 12.15 for the sake of reference.

The next investment returns ratio, Return on Assets, compares Napavale's Net Income to its Assets. Return on Assets provides an indication of how effectively Napavale utilized its Assets in generating Net Income. Return on Assets is calculated as:  $(\text{Net Income})/(\text{Assets})$ . Figure 12.16 presents a view of the calculation of Napavale's Return on Assets. An alternative view of the calculation of Napavale's Return on Assets in which the values and formulas underlying the worksheet cells are exposed and visible is



**FIGURE 12.16** Calculation of Return on Assets

presented in Figure 12.17. The names of the input and output cells related to the calculation of Napavale’s Return on Assets are shown in Figure 12.18. The Net Income values are drawn from Napavale’s Income Statement and the Assets values are drawn from Napavale’s Balance Sheet.

Return on Capital, the third investment returns ratio, measures how effectively Napavale utilized its Capital (defined as equity + debt in this case) in generating Net Income. As Capital includes both equity and debt in this context, a specific company’s Return on Equity may be very similar to or very different from its Return on Capital depending upon how much debt that company has in its capital structure. Return on Capital is calculated as:  $(\text{Net Income}) / (\text{Owners' Equity} + \text{Debt})$ . The calculation of Napavale’s Return on Capital is shown in Figure 12.19. Figure 12.20 presents a view of the calculation of Napavale’s Return on Capital in which the values and formulas underlying the calculation are visible. The names of the input and

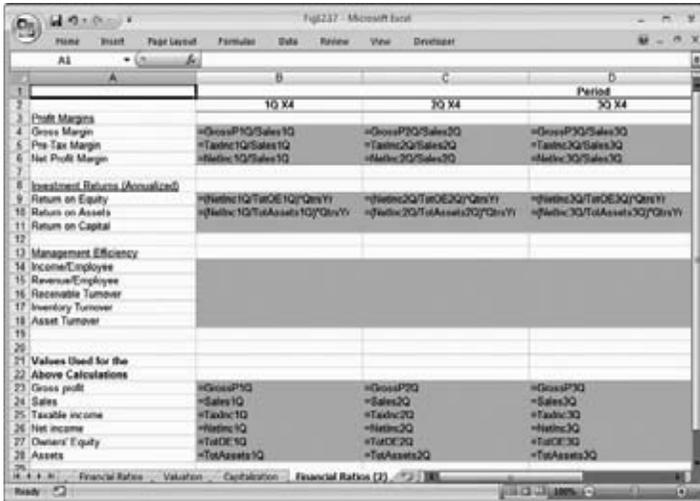


FIGURE 12.17 Alternative View of the Calculation of Return on Assets



FIGURE 12.18 Names of the Input and Output Cells Underlying the Calculation of Return on Assets

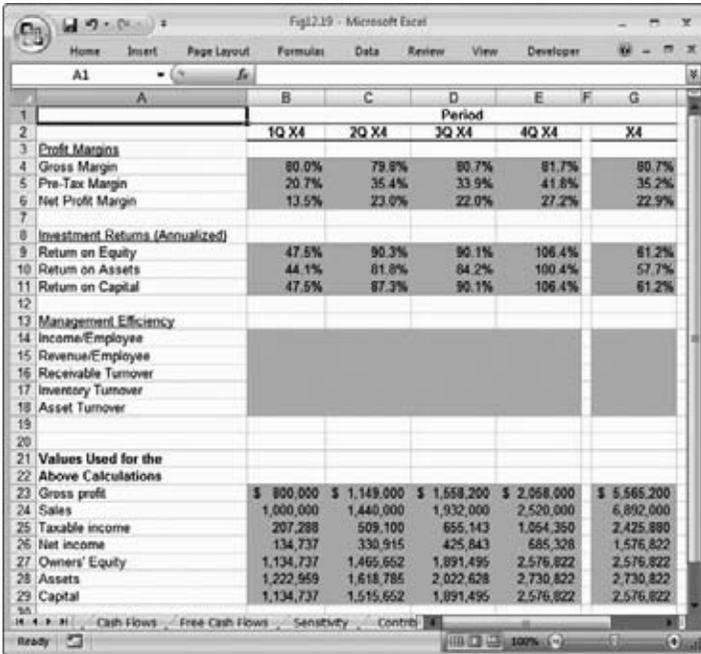


FIGURE 12.19 Calculation of Return on Capital

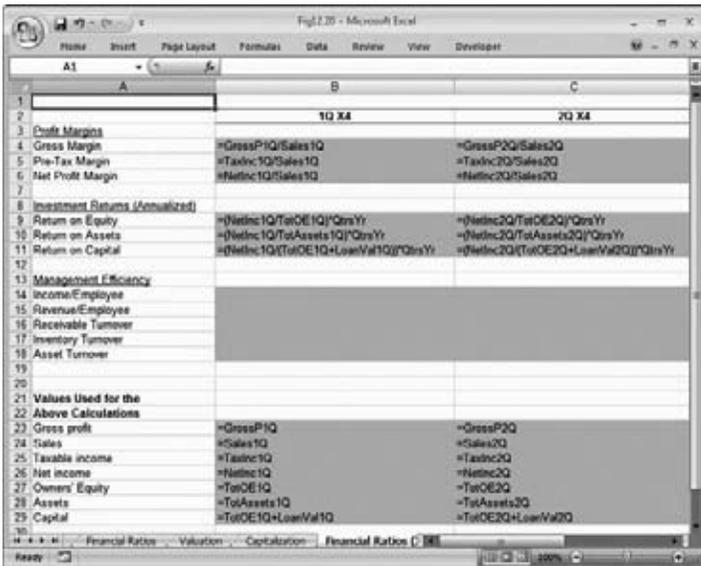


FIGURE 12.20 Alternative View of the Calculation of Return on Capital

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Profit Margins</b>					
Gross Margin	GrMar1Q	GrMar2Q	GrMar3Q	GrMar4Q	GrMarX4
Pre-Tax Margin	PTMar1Q	PTMar2Q	PTMar3Q	PTMar4Q	PTMarX4
Net Profit Margin	NPMar1Q	NPMar2Q	NPMar3Q	NPMar4Q	NPMarX4
<b>Investment Returns (Annualized)</b>					
Return on Equity	ROE1Q	ROE2Q	ROE3Q	ROE4Q	ROEX4
Return on Assets	ROA1Q	ROA2Q	ROA3Q	ROA4Q	ROAX4
Return on Capital	ROC1Q	ROC2Q	ROC3Q	ROC4Q	ROCX4
<b>Management Efficiency</b>					
Income/Employee					
Revenue/Employee					
Receivable Turnover					
Inventory Turnover					
Asset Turnover					
<b>Values Used for the Above Calculations</b>					
Gross profit					
Sales					
Taxable income					
Net income					
Owners' Equity					
Assets					
Capital					

**FIGURE 12.21** Names of the Input and Output Cells Underlying the Calculation of Return on Capital

output cells related to the calculation of Napavale’s Return on Capital are shown in Figure 12.21. Note that the Net Income values are drawn from Napavale’s Income Statement and the values underlying the calculation of Napavale’s Capital are drawn from the Balance Sheet.

**MANAGEMENT EFFICIENCY—FINANCIAL RATIOS**

Financial ratios related to management efficiency measure how efficiently a business has been managed. While a wide array of management efficiency ratios are used, I focus on two types of ratios for Napavale: “per-employee” ratios and “turnover” ratios. Per-employee ratios compare operating metrics and measures such as Net Income and Sales to the number of employees at Napavale. Turnover ratios compare various Balance Sheet accounts, such as

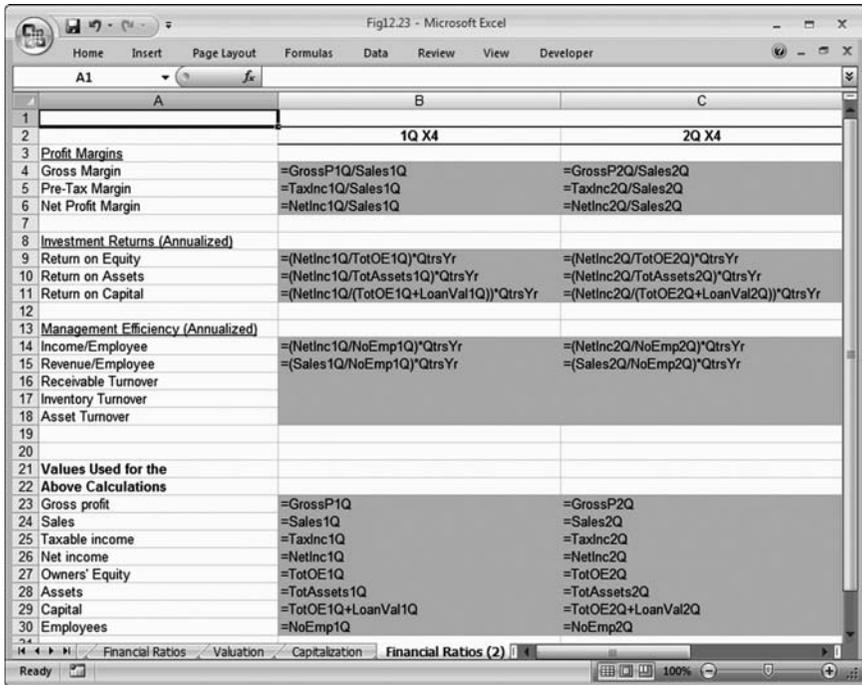
Accounts Receivable and Inventory, to Sales or Cost of Goods Sold (Income Statement accounts).

As I did with the investment returns, I will annualize each of the quarterly calculations by multiplying the quarterly results by four (as there are four quarters in a year). Also, while some of these management efficiency ratios technically call for the use of an average value, such as the average number of employees over a given period of time (such as a year), I am going to use period-end figures for the sake of simplicity.

The two per-employee management efficiency ratios that I cover for Napavale are Income/Employee and Revenue/Employee. Income/Employee compares Napavale’s Income (or Net Income) to the number of employees at Napavale—this ratio is calculated as: (Net Income)/(Number of Employees). Revenue/Employee compares Napavale’s Revenue (or Sales) to the number of employees at Napavale—this ratio is calculated as (Sales)/(Number of Employees). Figure 12.22 presents a view of the calculation of Napavale’s Income/Employee and Revenue/Employee.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Profit Margins</b>					
Gross Margin	80.0%	79.8%	80.7%	81.7%	80.7%
Pre-Tax Margin	20.7%	35.4%	33.9%	41.8%	35.2%
Net Profit Margin	13.5%	23.0%	22.0%	27.2%	22.9%
<b>Investment Returns (Annualized)</b>					
Return on Equity	47.5%	90.3%	90.1%	106.4%	61.2%
Return on Assets	44.1%	81.8%	84.2%	100.4%	57.7%
Return on Capital	47.5%	87.3%	90.1%	106.4%	61.2%
<b>Management Efficiency (Annualized)</b>					
Income/Employee	\$ 35,930	\$ 88,244	\$ 77,426	\$ 119,187	\$ 68,557
Revenue/Employee	\$ 266,667	\$ 384,000	\$ 351,273	\$ 438,261	\$ 299,652
Receivable Turnover					
Inventory Turnover					
Asset Turnover					
<b>Values Used for the Above Calculations</b>					
Gross profit	\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000	\$ 5,565,200
Sales	1,000,000	1,440,000	1,932,000	2,520,000	6,892,000
Taxable income	207,288	509,100	655,143	1,054,350	2,425,880
Net income	134,737	330,915	425,843	685,328	1,576,822
Owners' Equity	1,134,737	1,465,652	1,891,495	2,576,822	2,576,822
Assets	1,222,959	1,618,785	2,022,628	2,730,822	2,730,822
Capital	1,134,737	1,515,652	1,891,495	2,576,822	2,576,822
Employees	15	15	22	23	23

**FIGURE 12.22** Calculation of Income/Employee and Revenue/Employee

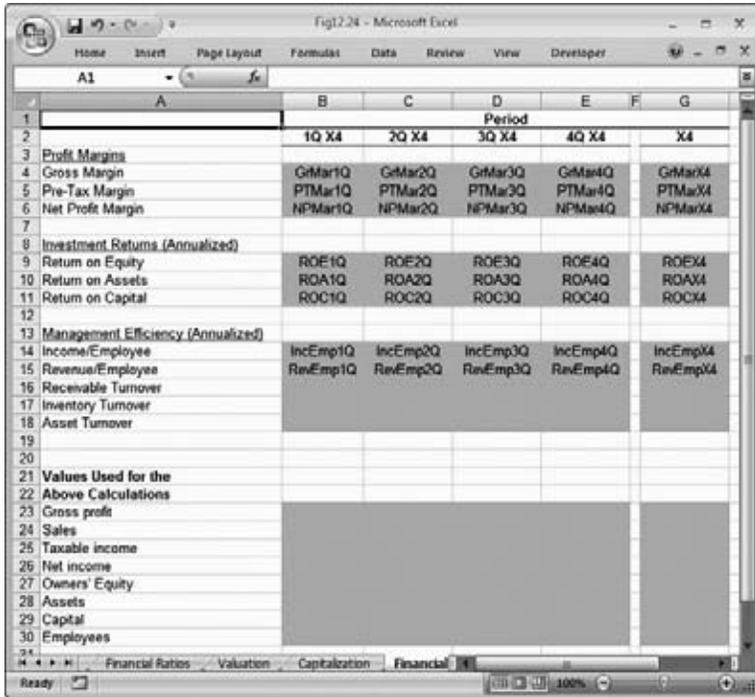


**FIGURE 12.23** Alternative View of the Calculation of Income/Employee and Revenue/Employee

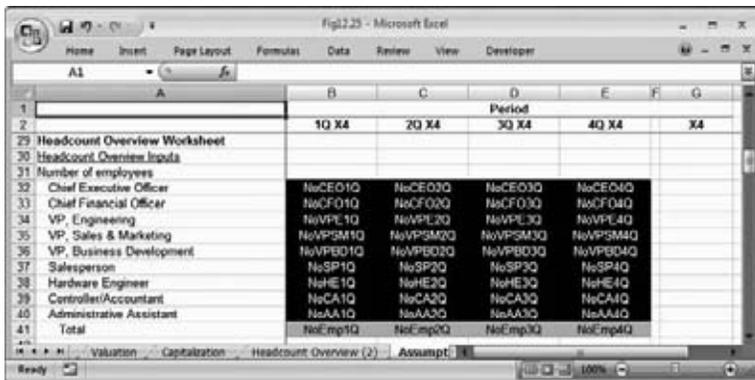
A view of the values and formulas underlying the worksheet cells associated with the calculation of Napavale’s Income/Employee and Revenue/Employee is presented in Figure 12.23. Figure 12.24 offers a view of the input and output worksheet cells related to the calculation of Napavale’s Income/Employee and Revenue/Employee.

Note that the Net Income values are drawn from Napavale’s Income Statement, the Sales values are drawn from Napavale’s Sales and Collections worksheet, and the Number of Employees values are drawn from Napavale’s Assumptions and Dashboard worksheet. For the sake of reference, Figure 12.25 presents a view of the names of the worksheet cells underlying the Assumptions and Dashboard worksheet.

The three turnover management efficiency ratios that I cover for Napavale are Receivable Turnover, Inventory Turnover, and Asset Turnover. Receivable Turnover, which compares Napavale’s Sales to its Accounts Receivable, is calculated as: (Sales)/(Accounts Receivable). Inventory Turnover, which compares Napavale’s Cost of Goods Sold to its



**FIGURE 12.24** Names of the Input and Output Cells Underlying the Calculation of Income/Employee and Revenue/Employee



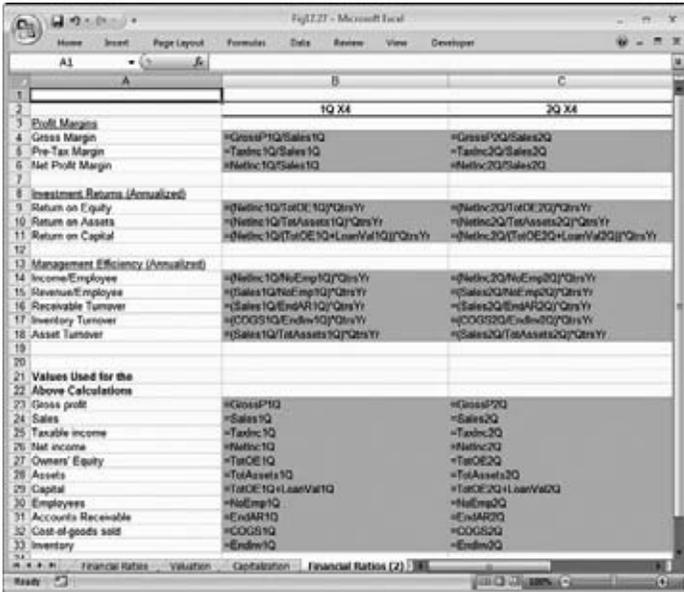
**FIGURE 12.25** Names of the Input and Output Cells Underlying the Assumptions and Dashboard Worksheet

Inventory, is calculated as:  $(\text{Cost of Goods Sold})/(\text{Inventory})$ . The third turnover management efficiency ratio, Asset Turnover, compares Napavale's Sales to its Assets and is calculated as:  $(\text{Sales})/(\text{Assets})$ .

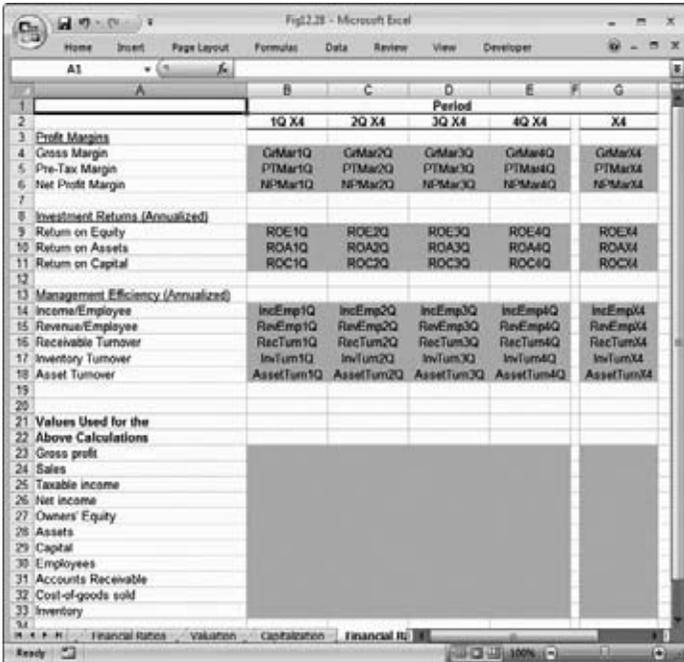
Figure 12.26 presents a view of the calculation of Napavale's Receivable Turnover, Inventory Turnover, and Asset Turnover. A view of the values and formulas underlying the calculation of Napavale's Receivable Turnover, Inventory Turnover, and Asset Turnover is presented in Figure 12.27. Figure 12.28 offers a view of the names of the input and output cells underlying the calculation of Napavale's Receivable Turnover, Inventory Turnover, and Asset Turnover.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Profit Margins</b>					
Gross Margin	80.0%	79.8%	80.7%	81.7%	80.7%
Pre-Tax Margin	20.7%	35.4%	33.9%	41.8%	35.2%
Net Profit Margin	13.5%	23.0%	22.0%	27.2%	22.9%
<b>Investment Returns (Annualized)</b>					
Return on Equity	47.5%	90.3%	90.1%	106.4%	61.2%
Return on Assets	44.1%	81.8%	84.2%	100.4%	57.7%
Return on Capital	47.5%	87.3%	90.1%	106.4%	61.2%
<b>Management Efficiency (Annualized)</b>					
Income/Employee	\$ 35,930	\$ 88,244	\$ 77,426	\$ 119,187	\$ 68,557
Revenue/Employee	\$ 266,667	\$ 384,000	\$ 351,273	\$ 438,261	\$ 299,652
Receivable Turnover	30.0	30.0	30.0	30.0	20.5
Inventory Turnover	12.4	14.0	14.6	18.0	12.9
Asset Turnover	3.3	3.6	3.8	3.7	2.5
<b>Values Used for the Above Calculations</b>					
Gross profit	\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000	\$ 5,565,200
Sales	1,000,000	1,440,000	1,932,000	2,520,000	6,892,000
Taxable income	207,288	509,100	655,143	1,054,350	2,425,880
Net income	134,737	330,915	425,843	685,328	1,576,822
Owners' Equity	1,134,737	1,465,652	1,891,495	2,576,822	2,576,822
Assets	1,222,959	1,618,785	2,022,628	2,730,822	2,730,822
Capital	1,134,737	1,515,652	1,891,495	2,576,822	2,576,822
Employees	15	15	22	23	23
Accounts Receivable	133,333	192,000	257,600	336,000	336,000
Cost-of-goods sold	200,000	291,000	373,800	462,000	1,326,800
Inventory	64,667	83,067	102,667	102,667	102,667

**FIGURE 12.26** Calculation of Receivables Turnover, Inventory Turnover, and Asset Turnover



**FIGURE 12.27** Alternative View of the Calculation of Receivables Turnover, Inventory Turnover, and Asset Turnover



**FIGURE 12.28** Names of the Input and Output Cells Underlying the Calculation of Receivables Turnover, Inventory Turnover, and Asset Turnover

## QUESTIONS

Each of the questions for this chapter relates to a hypothetical company named Company 456. Company 456 sells display monitors to physicians. As such, Company 456 is a product-oriented (as opposed to a service-oriented) business. Note that there are three cost-of-goods-sold components for Company 456's display monitors: (1) monitor screen, (2) monitor casing, and (3) assembly and labor.

The questions for this chapter will address fiscal year X4 on a quarterly basis (four specific quarters, 1Q–4Q for year X4). The following questions will test your knowledge of the material covered in this chapter in an applied manner—specifically, you will be asked to calculate a set of financial ratios for Company 456.

To prepare you for this chapter's questions, Figure Q12.1 offers a view of Company 456's Income Statement to provide some background information related to Company 456's operations. Company 456's Sales and Collections worksheet is shown in Figure Q12.2. Figure Q12.3 offers a view of Company 456's Balance Sheet. A section of Company 456's Assumptions and Dashboard worksheet is shown in Figure Q12.4. Company 456's Cost-of-Goods Sold worksheet is shown in Figure Q12.5. Figure Q12.6 provides a view of Company 456's Inventory and Purchases worksheet.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
Sales	\$ 7,500,000	\$ 8,250,000	\$ 8,625,000	\$ 8,555,000	\$ 32,930,000
Cost of goods sold	3,650,000	3,954,500	4,065,250	4,171,300	15,841,050
Gross profit	\$ 3,850,000	\$ 4,295,500	\$ 4,559,750	\$ 4,383,700	\$ 17,088,950
Salaries	\$ 991,800	\$ 991,800	\$ 1,329,650	\$ 1,407,950	\$ 4,721,200
Miscellaneous expenses	300,000	330,000	258,750	256,650	1,145,400
Research and development	450,000	577,500	690,000	684,400	2,401,900
Rent	35,000	35,000	35,000	35,000	140,000
Depreciation	1,950	4,150	6,150	8,200	20,450
Income from operations	\$ 2,071,250	\$ 2,357,050	\$ 2,240,200	\$ 1,991,500	\$ 8,660,000
Interest expense	\$ -	\$ -	\$ -	\$ -	\$ -
Taxable income	\$ 2,071,250	\$ 2,357,050	\$ 2,240,200	\$ 1,991,500	\$ 8,660,000
Tax expense	\$ 724,938	\$ 824,968	\$ 784,070	\$ 697,025	\$ 3,031,000
Net income	\$ 1,346,313	\$ 1,532,083	\$ 1,456,130	\$ 1,294,475	\$ 5,629,000

**FIGURE Q12.1** Company 456's Income Statement

1	Period					
	2	3Q X4	4Q X4	X4		
3	<b>SALES BUDGET</b>					
4	Unit Sales and Price Budget					
5	Unit sales	600	650	878	690	2,218
6	x Price per unit	\$ 15,000	\$ 15,000	\$ 15,000	\$ 14,500	N/A
7	= Total sales	\$ 7,500,000	\$ 8,250,000	\$ 8,625,000	\$ 8,555,000	\$ 32,930,000
9	<b>Sales Composition Budget</b>					
10	Cash sales	\$ 3,750,000	\$ 4,125,000	\$ 4,312,500	\$ 4,277,500	\$ 16,465,000
11	+ Credit sales	3,750,000	4,125,000	4,312,500	4,277,500	16,465,000
12	= Total sales	\$ 7,500,000	\$ 8,250,000	\$ 8,625,000	\$ 8,555,000	\$ 32,930,000
14	<b>COLLECTIONS BUDGET</b>					
15	Cash Collections from Customers Budget					
16	Cash sales this period	\$ 3,750,000	\$ 4,125,000	\$ 4,312,500	\$ 4,277,500	\$ 16,465,000
17	+ Credit sales collected	2,083,333	2,958,333	4,229,167	4,293,056	14,663,889
18	= Total collections	\$ 5,833,333	\$ 7,083,333	\$ 8,541,667	\$ 8,570,556	\$ 31,528,889
20	<b>Accounts Receivable (A/R) Budget</b>					
21	Beginning A/R balance	\$ -	\$ 1,666,667	\$ 1,833,333	\$ 1,916,667	\$ -
22	+ Additions to A/R	1,666,667	1,833,333	1,916,667	1,901,111	7,317,778
23	- Subtractions from A/R	-	1,666,667	1,833,333	1,916,667	5,416,667
24	= Ending A/R balance	\$ 1,666,667	\$ 1,833,333	\$ 1,916,667	\$ 1,901,111	\$ 1,901,111

FIGURE Q12.2 Company 456's Sales and Collections Worksheet

1	Period					
	2	3Q X4	4Q X4	X4		
3	<b>Assets</b>					
4	Cash	\$ 783,803	\$ 1,639,041	\$ 2,892,164	\$ 4,301,817	\$ 4,301,817
5	Accounts Receivable	1,666,667	1,833,333	1,916,667	1,901,111	1,901,111
6	Inventory	1,318,167	1,355,083	1,390,433	1,390,433	1,390,433
7	Fixed Assets, net	38,550	74,900	107,750	139,550	139,550
8	Total Assets	\$ 3,804,387	\$ 4,902,358	\$ 6,407,014	\$ 7,732,911	\$ 7,732,911
11	<b>Liabilities</b>					
12	Accounts Payable	\$ 2,208,074	\$ 1,773,963	\$ 1,822,489	\$ 1,853,911	\$ 1,853,911
13	Payables from Capital Budget	-	-	-	-	-
14	Loan Payable	-	-	-	-	-
15	Total Liabilities	\$ 2,208,074	\$ 1,773,963	\$ 1,822,489	\$ 1,853,911	\$ 1,853,911
18	<b>Owners' Equity</b>					
19	Common Stock	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000
20	Retained Earnings	1,346,313	2,878,395	4,334,525	5,629,000	5,629,000
21	Total Owners' Equity	\$ 1,596,313	\$ 3,128,395	\$ 4,584,525	\$ 5,879,000	\$ 5,879,000
23	Total Liabilities and Owners' Equity	\$ 3,804,387	\$ 4,902,358	\$ 6,407,014	\$ 7,732,911	\$ 7,732,911
25	Balance Sheet calculation check					
26		-	-	-	-	-
27	<b>Net Working Capital (NWC)</b>					
28	Current assets	\$ 2,984,833	\$ 3,188,417	\$ 3,307,190	\$ 3,291,544	N/A
29	- Current liabilities	2,208,074	1,773,963	1,822,489	1,853,911	N/A
30	= Net working capital	\$ 776,759	\$ 1,414,454	\$ 1,484,611	\$ 1,437,633	N/A
32	Beginning NWC	\$ -	\$ 776,759	\$ 1,414,454	\$ 1,484,611	N/A
33	- Ending NWC	776,759	1,414,454	1,484,611	1,437,633	N/A
34	= Change in NWC	\$ (776,759)	\$ (637,694)	\$ (70,157)	\$ (46,978)	N/A

FIGURE Q12.3 Company 456's Balance Sheet

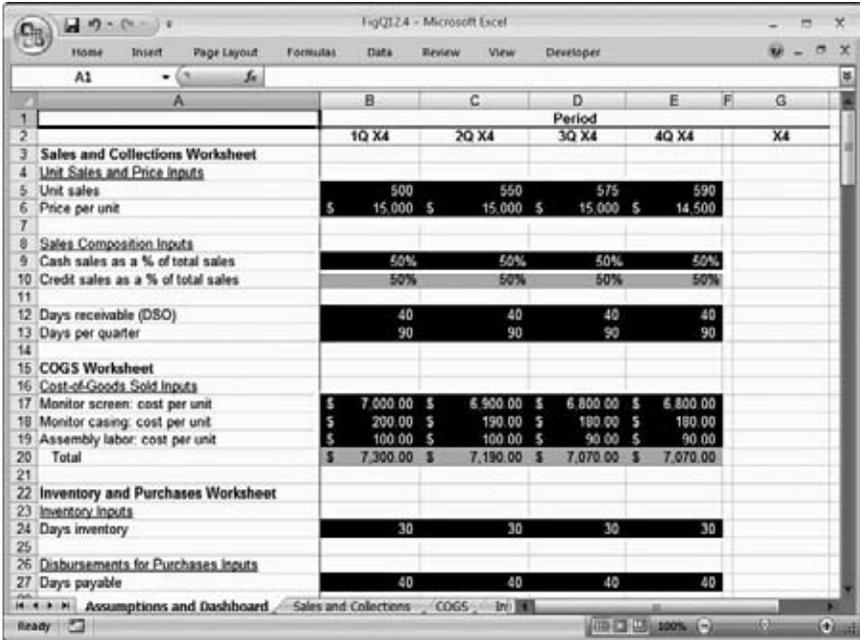


FIGURE Q12.4 Company 456’s Assumptions and Dashboard Worksheet

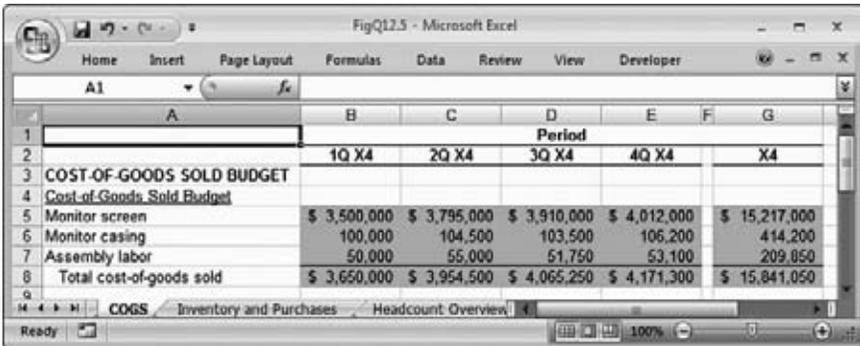


FIGURE Q12.5 Company 456’s Cost-of-Goods-Sold Worksheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>INVENTORY BUDGET</b>					
<u>Inventory Budget</u>					
Desired ending inventory	\$ 1,318,167	\$ 1,355,083	\$ 1,390,433	\$ 1,390,433	\$ 1,390,433
+ Cost of goods sold	3,650,000	3,954,500	4,065,250	4,171,300	15,841,050
= Total inventory needed	\$ 4,968,167	\$ 5,309,583	\$ 5,455,683	\$ 5,561,733	\$ 17,231,483
<b>PURCHASES BUDGET</b>					
<u>Purchases Budget</u>					
Total inventory needed	\$ 4,968,167	\$ 5,309,583	\$ 5,455,683	\$ 5,561,733	N/A
- Beginning inventory	-	1,318,167	1,355,083	1,390,433	-
= Purchases	\$ 4,968,167	\$ 3,991,417	\$ 4,100,600	\$ 4,171,300	N/A
<u>Disbursements for Purchases Budget</u>					
Payments of payables	\$ 2,760,093	\$ 4,425,528	\$ 4,052,074	\$ 4,139,878	\$ 15,377,572
Total disbursements for purchases	\$ 2,760,093	\$ 4,425,528	\$ 4,052,074	\$ 4,139,878	\$ 15,377,572
<u>Accounts Payable (A/P) Budget</u>					
Beginning A/P balance	\$ -	\$ 2,208,074	\$ 1,773,963	\$ 1,822,489	\$ -
+ Additions to A/P	2,208,074	1,773,963	1,822,489	1,853,911	7,658,437
- Subtractions from A/P	-	2,208,074	1,773,963	1,822,489	5,804,526
Ending A/P	\$ 2,208,074	\$ 1,773,963	\$ 1,822,489	\$ 1,853,911	\$ 1,853,911

**FIGURE Q12.6** Company 456’s Inventory and Purchases Worksheet

1. Given the information presented, calculate Company 456’s Gross Margin, Pre-Tax Margin, and Net Profit Margin.
2. Given the information presented, calculate Company 456’s Return on Equity, Return on Assets, and Return on Capital.
3. Given the information presented, calculate Company 456’s Income per Employee, Revenue per Employee, Receivable Turnover, Inventory Turnover, and Asset Turnover.

# Valuation

**T**his chapter covers the topic of valuation, or the practice of placing a value on a business. Valuation is a vast and complex topic—many books have been written on this subject alone. My goal in this chapter is to introduce several of the most commonly used valuation approaches, including discounted cash flow, public company comparables, and mergers and acquisitions comparables.

Beyond the coverage of specific valuation methodologies, a core concept of valuation is this: The best valuation approach is often a combination of approaches. In other words, it is often best to use several valuation techniques to assess the value of a business. In so doing, it is possible to triangulate on the value of a business by weighting various valuation approaches. I address the valuation of Napavale in this chapter by triangulating on the value of Napavale—by using and weighing several valuation methodologies.

I cover the discounted cash flow, public company comparables, and mergers and acquisitions comparables valuation methodologies separately and then discuss the concept of triangulation and weighing these various approaches at the end of the chapter.

## **DISCOUNTED CASH FLOW**

---

The discounted cash flow (DCF) valuation approach is widely used and is covered in many undergraduate and graduate-level finance classes in the United States. In essence, the general premise of the DCF approach is this: The value of a business is equal to the present value of the cash flows generated by that business in the future. There are two key concepts in this definition—“present value” and “cash flows.”

While various interpretations of the meaning of “cash flows” exist, I will use Napavale’s free cash flows (as covered in Chapter 9) as the proxy for “cash flows” in this context. Using free cash flows in a DCF approach is

a common practice and it builds on my work in Chapter 9 on the Free Cash Flows worksheet.

The concept of present value, which I have not yet covered in this book, is central to the discipline of finance. Present value and the related concept of future value both deal with the value of something at a particular point in time. While present value may seem like a simple concept, it is actually deceptively complex.

One way to think about the concept of present value is in terms of the value of a dollar now and the value of that same dollar in the future. Generally speaking, a dollar today is worth more than a dollar tomorrow. Please note, this is a broad and sweeping statement that incorporates a variety of assumptions and complex economic theories. My intent here is only to convey the essence of the concept of present value—nothing more. In an inflationary economic environment (meaning, among other things, one in which prices increase), a dollar's buying power will decrease over time. As such, if a dollar's buying power decreases over time, it is worth more today than it is in the future.

The equation that defines the relationship between present value and future value quantifies this concept of the changing value of a dollar (or any other good or service) over time. This equation is:

$$\text{Present Value} = \frac{\text{Future Value}}{(1 + \text{Discount Rate})^{\text{Time Period}}}$$

Using this equation, it is possible to determine the present value of an asset given the following: its future value, a discount rate, and the time period (such as the number of years into the future) associated with the future value. The use of this equation should become clear as I walk through the DCF approach for Napavale.

The first step in building a DCF model for Napavale is to calculate the free cash flows for each of the accounting periods (quarters) covered in Napavale's financial model. I calculated the free cash flows in Chapter 9 and Figure 13.1 presents a view of the Free Cash Flows worksheet as I left it in Chapter 9.

Figure 13.2 presents a view of the values and formulas underlying the worksheet cells in Napavale's Free Cash Flows worksheet. The names of the input and output worksheet cells in Napavale's Free Cash Flows worksheet are shown in Figure 13.3. Please refer to the coverage of free cash flows in Chapter 9 if you need to review the elements of the Free Cash Flows worksheet.

Calculating something known as a "terminal value" for Napavale is the next step in building the DCF model. A terminal value represents the present value of all of a company's future free cash flows (until perpetuity,

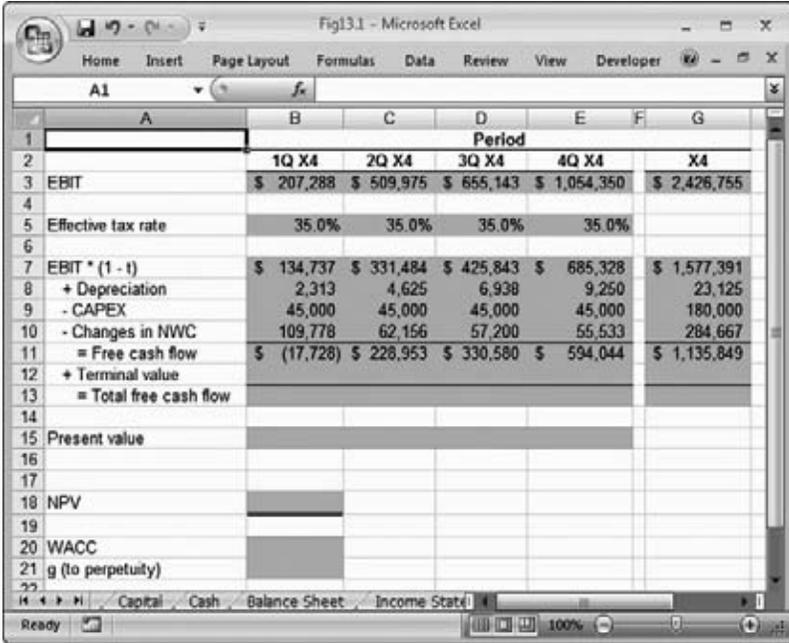


FIGURE 13.1 Free Cash Flows Worksheet

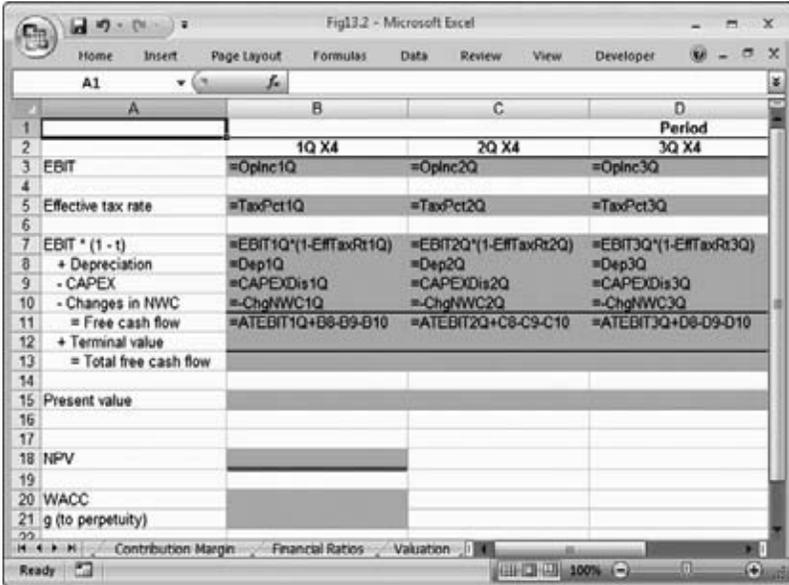
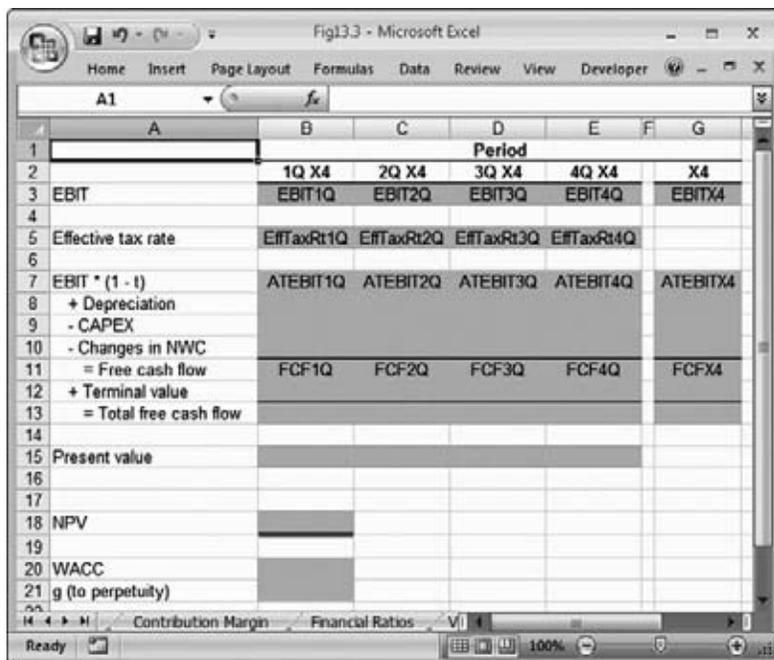


FIGURE 13.2 Alternative View of the Free Cash Flows Worksheet



**FIGURE 13.3** Names of the Input and Output Cells Underlying the Free Cash Flows Worksheet

or the end of time) at some point in the future. Since I cannot build a financial model out indefinitely into time, a terminal value encapsulates assumptions regarding future free cash flows (beyond the timeframe covered by the financial model) in a single number. The terminal value is calculated for the final accounting period covered by the financial model. In essence, the terminal value represents the present value of Napavale’s free cash flows into perpetuity at some point in the future.

I have calculated Napavale’s terminal value using the following formula:

$$\text{Terminal Value} = \frac{(\text{Free Cash Flow for X4}) * (1 + \text{Growth Rate to Perpetuity})}{\text{Discount Rate} - \text{Growth Rate to Perpetuity}}$$

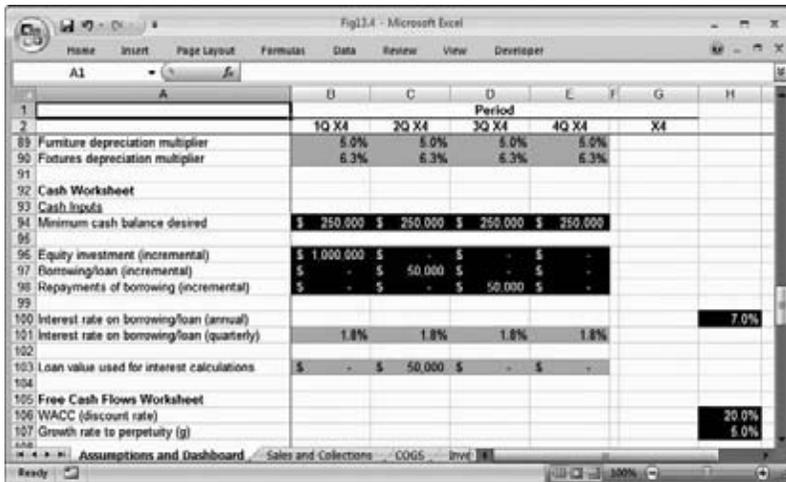
This is a well-known formula, but many different approaches may be used to calculate a terminal value. Please note that I am using free cash flow for X4 in this calculation. Technically speaking, this terminal value calculation is meant to project out free cash flow for the time period subsequent to the final period (typically a particular year) covered in the financial model. As such, I have based my terminal value calculation on the free cash flow that is generated in all of X4.

When you build your own financial models, it is important to be clear on how you are calculating free cash flow projections in your terminal value calculation. Generally speaking, the free cash flow value used in this terminal value calculation relates to a year time period.

Figure 13.4 presents a view of the Assumptions and Dashboard worksheet with the addition of the assumptions related to Napavale’s discount rate and growth rate to perpetuity. Napavale’s updated Free Cash Flows worksheet is presented in Figure 13.5. Note that I have calculated Napavale’s total free cash flows by adding the terminal value to the free cash flows calculated in Chapter 9. An alternative view of the Free Cash Flows worksheet in which the values and formulas underlying the worksheet cells are exposed is presented in Figure 13.6. The names of the input and output worksheet cells in Napavale’s Free Cash Flows worksheet are shown in Figure 13.7. Figure 13.8 offers a view of the names of the input cells in the Assumptions and Dashboard worksheet.

The final step in building Napavale’s DCF model is to calculate and add the present values for each accounting period (quarter) based on the “total free cash flows” that incorporate the terminal value. The present value of each of Napavale’s free cash flows is calculated using the present value formula described earlier in this chapter:

$$\text{Present Value} = \frac{\text{Future Value}}{(1 + \text{Discount Rate})^{\text{Time Period}}}$$



**FIGURE 13.4** Assumptions and Dashboard Worksheet

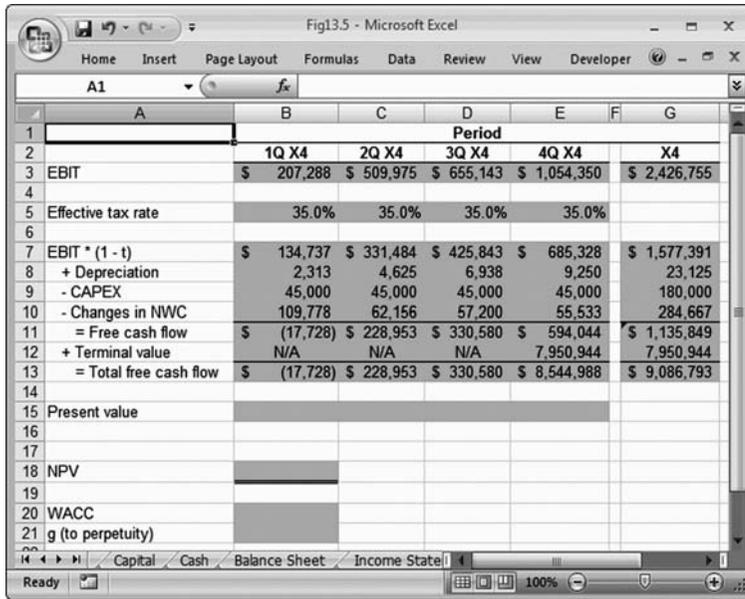


FIGURE 13.5 Updated Free Cash Flows Worksheet

Using the assumption that today is the first day of 1Q X4 and each accounting period (quarter) represents one quarter (0.25) of a year, Figure 13.9 presents Napavale’s updated Free Cash Flows worksheet in which the present value of each accounting period’s (quarter’s) free cash flow is calculated. Note that Napavale’s NPV—in other words, Napavale’s

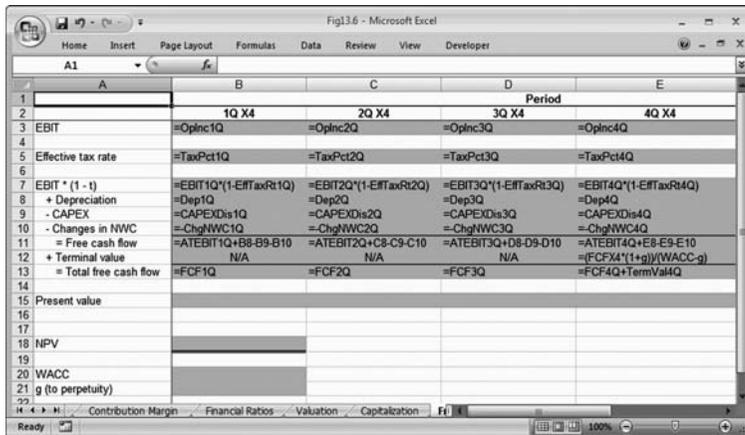
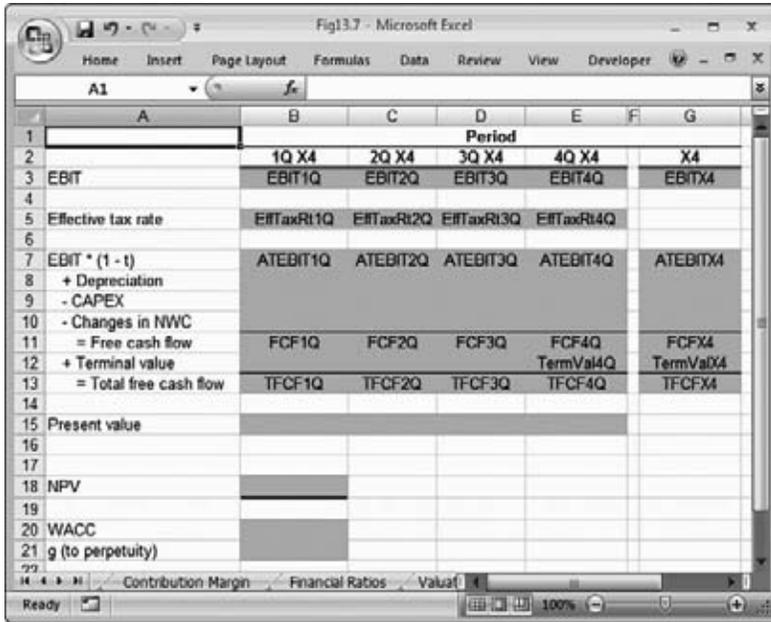
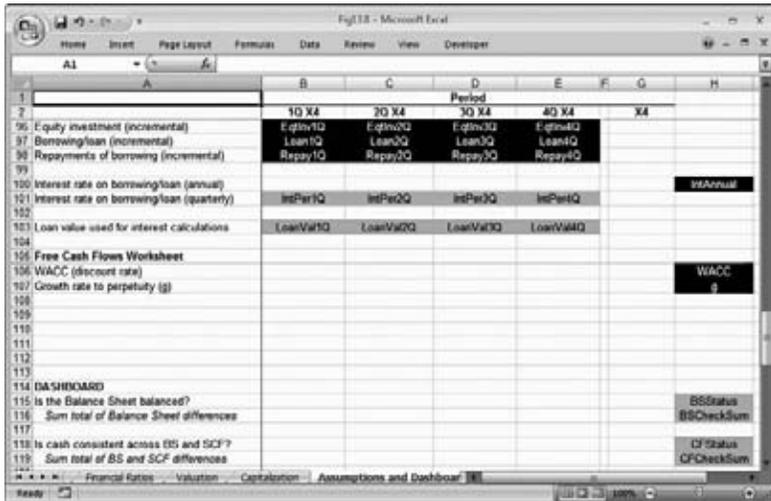


FIGURE 13.6 Alternative View of the Free Cash Flows Worksheet



**FIGURE 13.7** Names of the Input and Output Cells Underlying the Free Cash Flows Worksheet



**FIGURE 13.8** Names of the Input and Output Cells Underlying the Assumptions and Dashboard Worksheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
EBIT	\$ 207,288	\$ 509,975	\$ 655,143	\$ 1,054,350	\$ 2,426,755
Effective tax rate	35.0%	35.0%	35.0%	35.0%	
EBIT * (1 - t)	\$ 134,737	\$ 331,484	\$ 425,843	\$ 685,328	\$ 1,577,391
+ Depreciation	2,313	4,625	6,938	9,250	23,125
- CAPEX	45,000	45,000	45,000	45,000	180,000
- Changes in NWC	109,778	62,156	57,200	55,533	284,667
= Free cash flow	\$ (17,728)	\$ 228,953	\$ 330,580	\$ 594,044	\$ 1,135,849
+ Terminal value	N/A	N/A	N/A	7,950,944	7,950,944
= Total free cash flow	\$ (17,728)	\$ 228,953	\$ 330,580	\$ 8,544,988	\$ 9,086,793
Present value	\$ (16,938)	\$ 209,005	\$ 288,331	\$ 7,120,823	
NPV	\$ 7,601,220				
WACC	20.0%				
g (to perpetuity)	5.0%				

**FIGURE 13.9** Updated Free Cash Flows Worksheet

“value” as determined by the DCF model—is equal to the sum of all of the present values of each of the accounting period’s (quarter’s) free cash flows.

Please note that I am not incorporating the equity investment of \$1 million into the discounted cash flow valuation of Napavale. I am calculating the “post-money” valuation here—in other words, this discounted cash flow approach values Napavale assuming the \$1 million has already been invested into the company.

As with many valuation techniques, you can include the equity investment into the valuation, but you must take such an investment into consideration when you create and calculate the capitalization chart and ownership percentages of the company. (These topics are discussed in Chapter 14.)

My approach with regard to the equity investment is one way to value Napavale. While there are other ways to run such a valuation, remember to be clear about how investments into a company are accounted for when valuing the company.

Figure 13.10 presents a view of Napavale’s updated Free Cash Flows worksheet in which the values and formulas underlying the worksheet cells are visible. The names of the input and output worksheet cells in Napavale’s updated Free Cash Flows worksheet are shown in Figure 13.11.

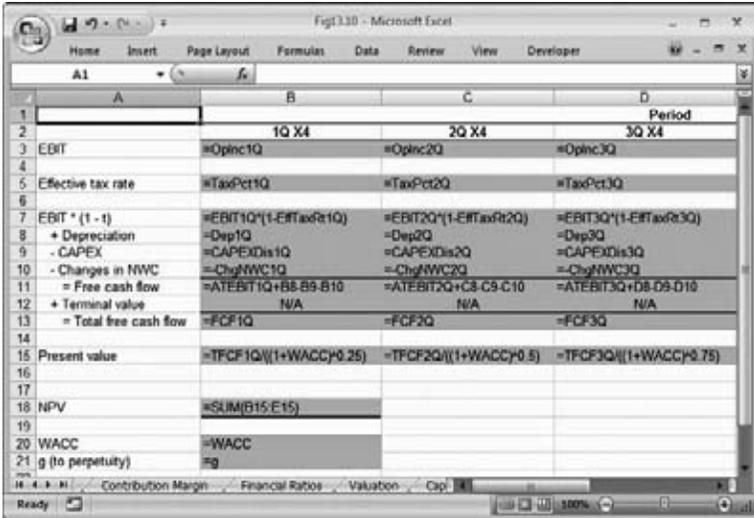


FIGURE 13.10 Alternative View of the Updated Free Cash Flows Worksheet

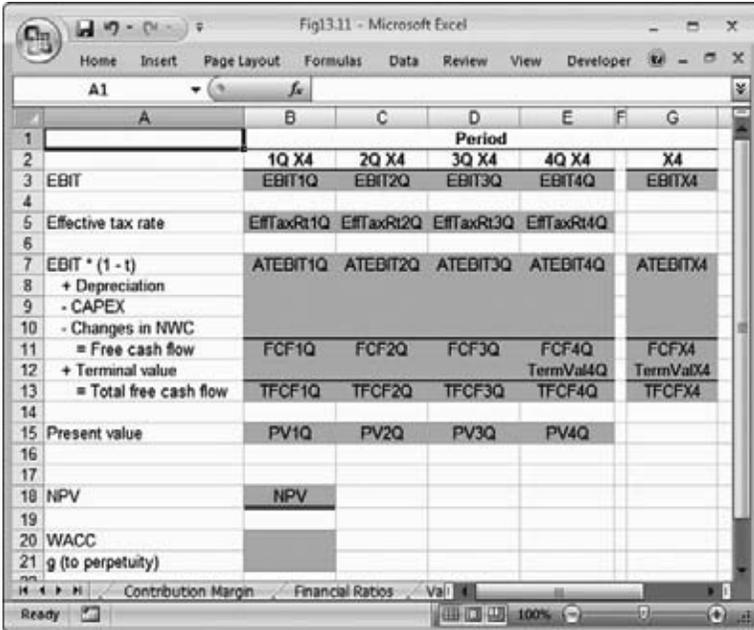


FIGURE 13.11 Names of the Input and Output Cells Underlying the Updated Free Cash Flows Worksheet

## PUBLIC COMPANY COMPARABLES

The public company comparables valuation approach is a comparative methodology in which the values of publicly traded companies are used as proxies for Napavale's valuation. More specifically, the manner in which publicly traded companies' valuations are related to certain measures and metrics, such as sales, net income, or free cash flows, is used to estimate a value for Napavale as a company.

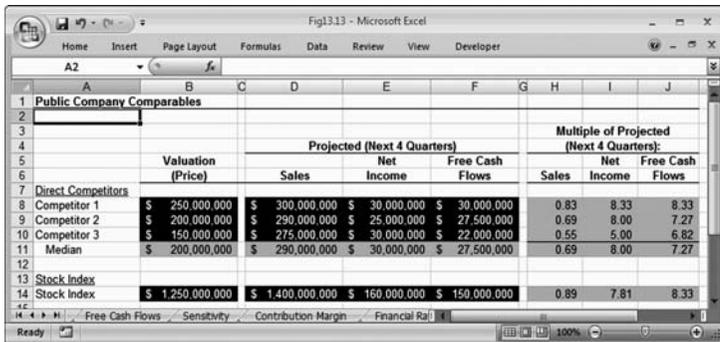
I am going to use fictitious companies and numbers in this analysis, but the methodology outlined in this section of the book may be easily applied to the use of actual market-based numbers as well. I will use two types of fictitious public companies for the public company comparables approach: direct competitors to Napavale and companies included in a fictitious index similar to the S&P 500. Using direct competitors should give a sense of how investors value companies in Napavale's industry and using an index of stocks should provide some perspective on how investors value the market as a whole.

The first step in building a public companies comparables analysis is to collect relevant data for the public companies against which Napavale will be compared. I am going to collect data on companies' valuations, sales, net income, and free cash flows. Note that this data will represent projections for each of these companies' next 12 months (four quarters) of operations. Using this data will allow a more direct comparison of Napavale with the competitors and the stock index. Figure 13.12 provides a view of this data

The screenshot shows an Excel spreadsheet titled 'Fig13.12 - Microsoft Excel'. The spreadsheet contains the following data:

Public Company Comparables				
Projected (Next 4 Quarters)				
	Valuation (Price)	Sales	Net Income	Free Cash Flows
<b>Direct Competitors</b>				
Competitor 1	\$ 250,000,000	\$ 300,000,000	\$ 30,000,000	\$ 30,000,000
Competitor 2	\$ 200,000,000	\$ 290,000,000	\$ 25,000,000	\$ 27,500,000
Competitor 3	\$ 150,000,000	\$ 275,000,000	\$ 30,000,000	\$ 22,000,000
Median	\$ 200,000,000	\$ 290,000,000	\$ 30,000,000	\$ 27,500,000
<b>Stock Index</b>				
Stock Index	\$ 1,250,000,000	\$ 1,400,000,000	\$ 160,000,000	\$ 150,000,000

**FIGURE 13.12** Data for Fictitious Companies and Fictitious Index of Stocks



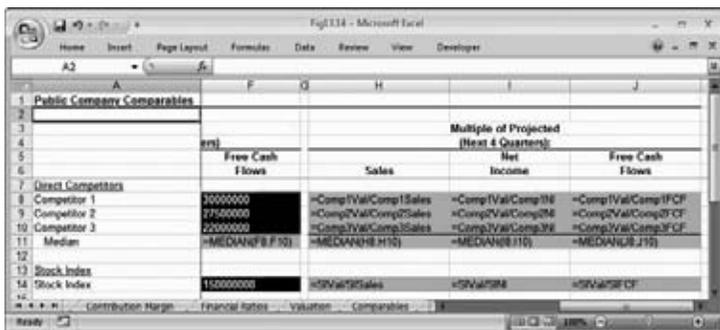
**FIGURE 13.13** Calculations of Multiples of Various Operational Measures

for the fictitious companies and the fictitious index of stocks that I use in my valuation of Napavale.

The next step involved in building a public company comparables valuation model is to calculate the “multiples” for each of these operational measures (sales, net income, and free cash flows) as represented by each of the competitor company’s and stock index’s valuation. Figure 13.13 provides a view of these calculations.

Note that I have also included a calculation of the median for each of the respective multiple calculations—I will use these median figures to value Napavale using the public company comparables methodology later in this chapter. I ordered companies in descending order by valuation (price).

A view of the values and formulas underlying the worksheet cells associated with the multiple calculations is shown in Figure 13.14. Figure 13.15 provides a view of the names of the input and output cells associated with the calculation of the “multiple” values.

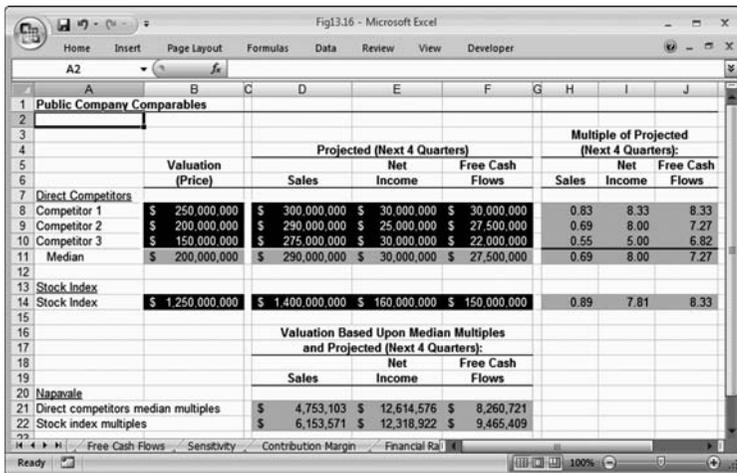


**FIGURE 13.14** Alternative View of the Calculations of Multiples of Various Operational Measures

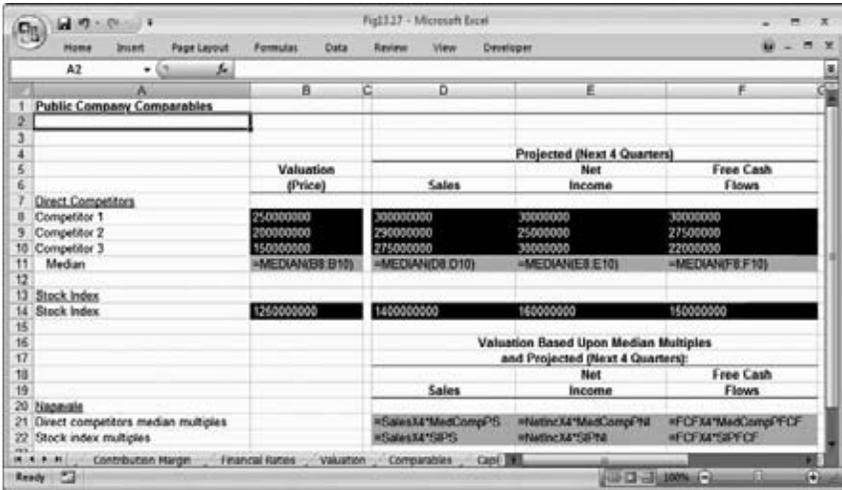


**FIGURE 13.15** Names of the Input and Output Cells Underlying the Calculations of Multiples of Various Operational Measures

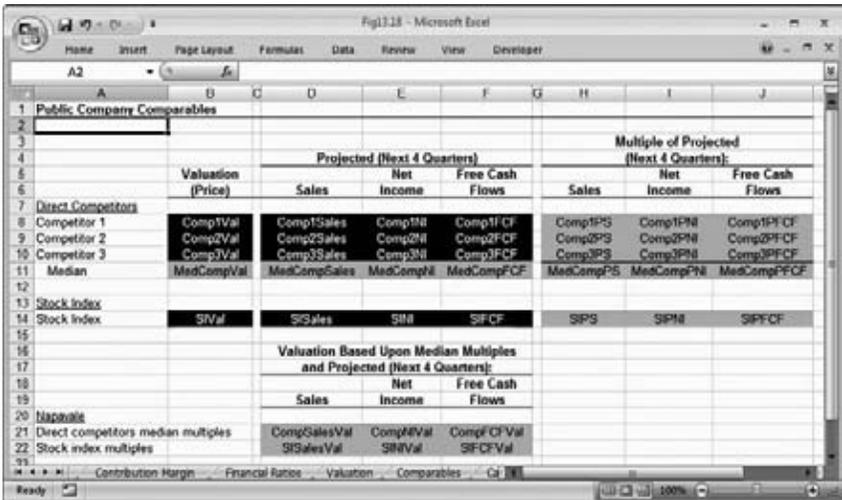
The final step in the public company comparables valuation approach is to apply the appropriate multiples of chosen measures and metrics (sales, net income, and free cash flows in this case) to Napavale. I use the median multiples that I calculated for Napavale’s competitors and the value that I calculated for the stock index to value Napavale using the public comparables valuation approach. Figure 13.16 shows the completed public company comparables valuation worksheet. The values and formulas underlying the worksheet cells in the public company comparables valuation worksheet are shown in Figure 13.17. Figure 13.18 offers a view of the names underlying the public company comparables valuation worksheet.



**FIGURE 13.16** Completed Public Company Comparables Valuation Worksheet



**FIGURE 13.17** Alternative View of the Completed Public Company Comparables Valuation Worksheet



**FIGURE 13.18** Names of the Input and Output Cells Underlying the Completed Public Company Comparables Valuation Worksheet

Note that when I triangulate on a value for Napavale later in this chapter, I use the value derived for Napavale's direct competitors using the public company comparables valuation approach and not the value derived for the stock index. I believe Napavale's direct competitors provide a better sense of how the market would value Napavale than does the stock index value—I calculated the stock index value for the sake of reference only.

## **MERGERS AND ACQUISITIONS COMPARABLES**

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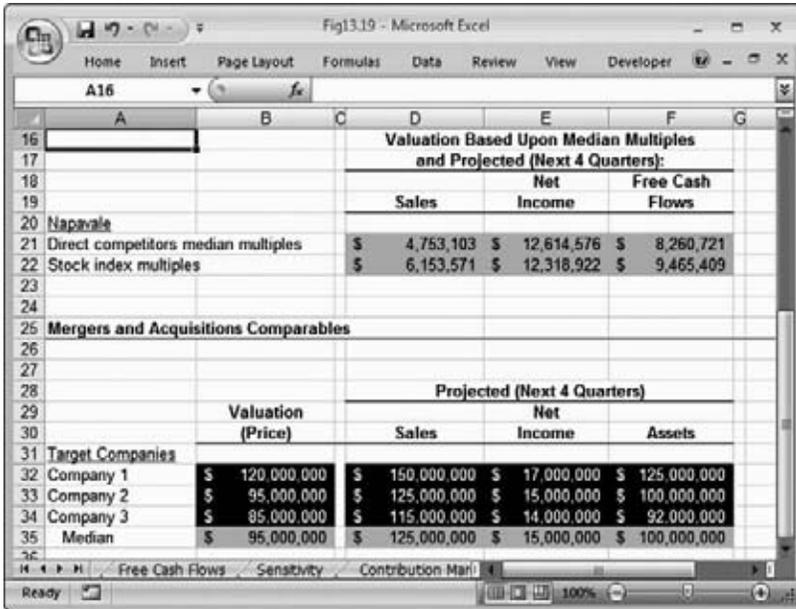
The mergers and acquisitions comparables valuation approach, like the public company comparables valuation approach, is a comparative methodology. In the case of the mergers and acquisitions valuation approach, data from recent mergers and acquisitions in Napavale's market is used to estimate a value for Napavale as a company. The term “mergers and acquisitions” refers to the combination or acquisition of businesses.

As with the public company comparables approach, I am going to use fictitious companies and numbers in this analysis, but the methodology outlined in this section of the book may be easily applied to the use of actual market-based numbers as well. I will use data related to fictitious mergers and acquisitions within Napavale's market (also called “industry”).

The first step in building a mergers and acquisitions comparables analysis is to collect relevant data for mergers and acquisitions transactions in Napavale's market. I am going to collect data on companies' valuations (as determined by mergers and acquisitions “prices”), sales, net income, and asset values. Note that this data will represent projections for each of these companies' next 12 months (four quarters) of operations. Using this data will allow a more direct comparison of Napavale with its competitors. Figure 13.19 provides a view of this data for the fictitious mergers and acquisitions transactions that I use in my valuation of Napavale.

The second step involved in building a mergers and acquisitions comparables valuation model is to calculate the multiple for each of these operational measures (sales, net income, and asset values) as represented by each of the transactions' prices (which is the same idea as their valuations). Figure 13.20 provides a view of these calculations.

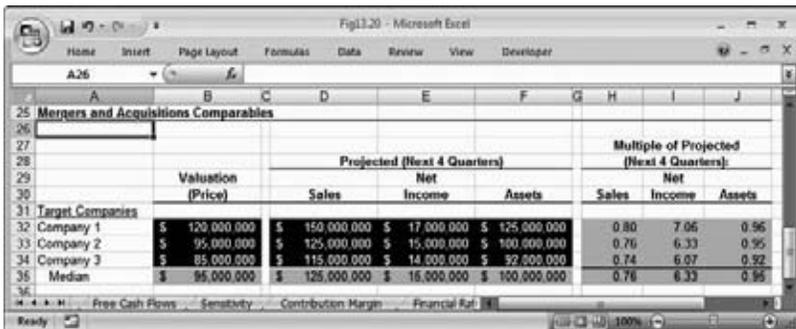
Note that I have also included a calculation of the median for each of the respective multiple calculations—I will use these median figures to value Napavale using the mergers and acquisitions comparables methodology



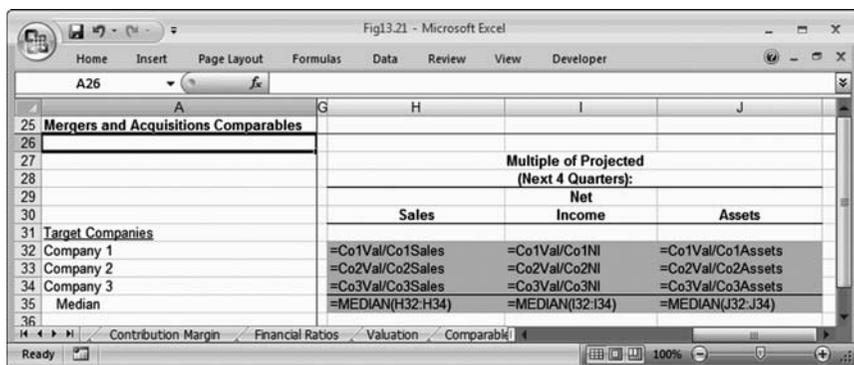
**FIGURE 13.19** Data for Fictitious Mergers and Acquisitions Transactions

later in this chapter. I ordered companies in descending order by valuation (price).

A view of the values and formulas underlying the worksheet cells associated with the multiple calculations is shown in Figure 13.21. Figure 13.22 provides a view of the names of the input and output cells associated with the calculation of the multiple values.



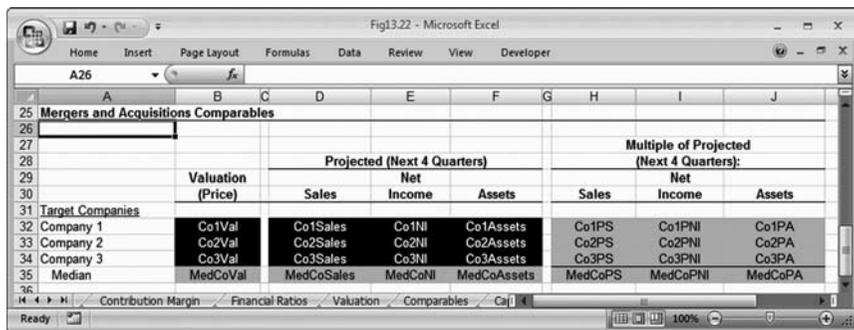
**FIGURE 13.20** Calculations of Multiples of Various Operational Measures



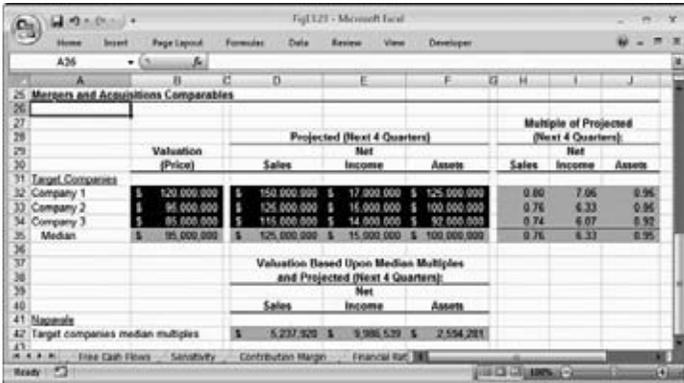
**FIGURE 13.21** Alternative View of the Calculations of Multiples of Various Operational Measures

The final step in the mergers and acquisitions comparables valuation approach is to apply the appropriate multiples of chosen measures/metrics (sales, net income, and asset values in this case) to Napavale. I use the median multiples that I calculated for the mergers and acquisitions transactions to value Napavale in this case. Figure 13.23 shows the completed mergers and acquisitions comparables valuation worksheet.

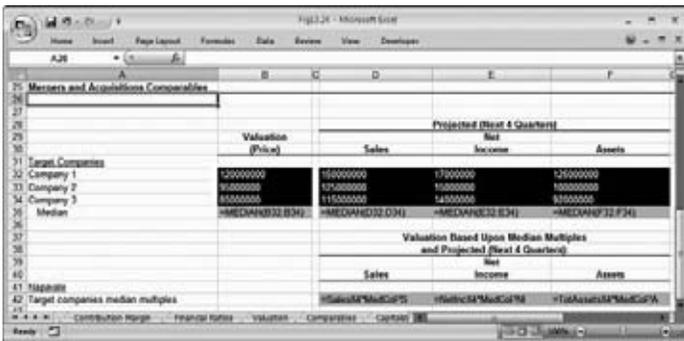
The values and formulas underlying the worksheet cells in the mergers and acquisitions comparables valuation worksheet are shown in Figure 13.24. Figure 13.25 offers a view of the names underlying the mergers and acquisitions comparables valuation worksheet.



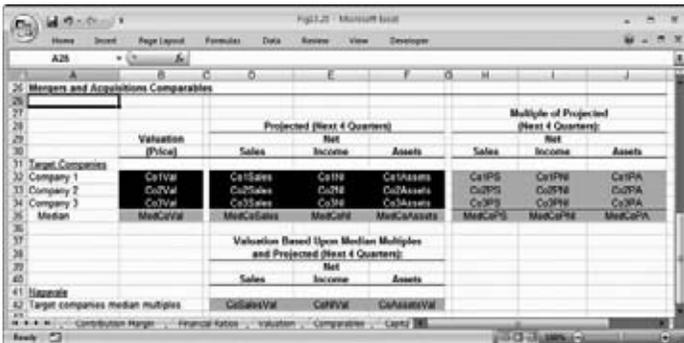
**FIGURE 13.22** Names of the Input and Output Cells Underlying the Calculations of Multiples of Various Operational Measures



**FIGURE 13.23** Completed Mergers and Acquisitions Comparables Valuation Worksheet



**FIGURE 13.24** Alternative View of the Completed Mergers and Acquisitions Comparables Valuation Worksheet



**FIGURE 13.25** Names of the Input and Output Cells Underlying the Completed Mergers and Acquisitions Comparables Valuation Worksheet

## WEIGHTED VALUATION

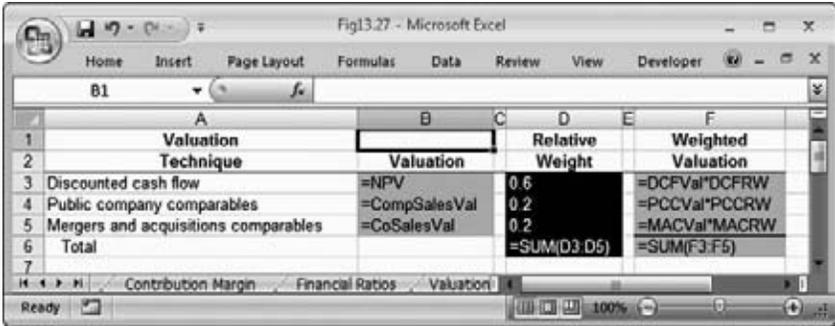
Now that I have calculated Napavale’s estimated valuation using the discounted cash flow technique, public company comparables approach, and mergers and acquisitions comparables approach, I apply a relative weight to each of these valuation methodologies to triangulate on an overall valuation for Napavale. Determining the appropriate weighting for each of these valuation methodologies is a matter of judgment—the weightings that I apply to the methodologies reflect my bias as to the relative importance of each valuation approach. You should use whatever relative weightings seem most appropriate for your own company.

Figure 13.26 presents a view of Napavale’s Valuation worksheet in which the valuation results of each of the three valuation approaches covered in this chapter are shown. I have chosen to use the Price to Sales median multiple value for Napavale’s direct competitors for the “public company comparables” valuation and the Price to Sales median multiple value for the “mergers and acquisitions comparables” valuation. This is only a matter of preference and you are free to choose which multiples to use in the valuations of your own companies. I have also included relative weights and “weighted valuations” for each of these valuation approaches. The weighted valuations are calculated as:  $(\text{Weighted Valuation}) = (\text{Valuation}) * (\text{Relative Weight})$ . Note that I have also totaled the weighted valuation figures to determine a total or final valuation for Napavale as a business.

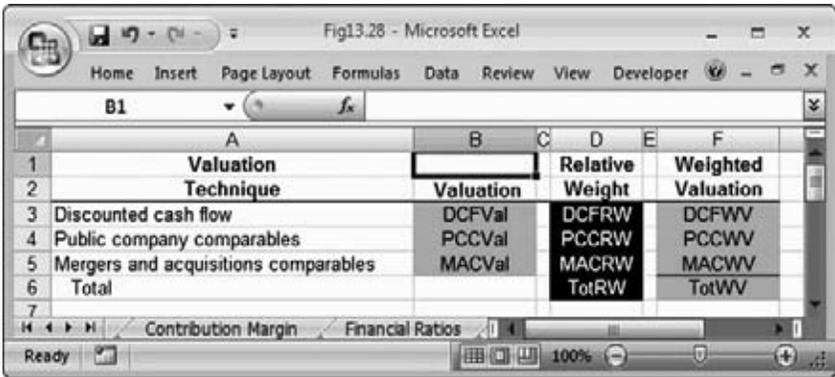
The values and formulas underlying Napavale’s Valuation worksheet are exposed in Figure 13.27. Figure 13.28 offers a view of the names of the worksheet cells underlying Napavale’s Valuation worksheet.

Valuation Technique	Valuation	Relative Weight	Weighted Valuation
Discounted cash flow	\$ 7,601,220	60.0%	\$ 4,560,732
Public company comparables	\$ 4,753,103	20.0%	\$ 950,621
Mergers and acquisitions comparables	\$ 5,237,920	20.0%	\$ 1,047,584
<b>Total</b>		<b>100.0%</b>	<b>\$ 6,558,937</b>

**FIGURE 13.26** Valuation Worksheet



**FIGURE 13.27** Alternative View of the Valuation Worksheet



**FIGURE 13.28** Names of the Input and Output Cells Underlying the Valuation Worksheet

Please note that the “total” valuation shown in Figure 13.26 represents my estimate of Napavale’s valuation. This value represents a weighted total of the three valuation approaches (discounted cash flow, public company comparables, and mergers and acquisitions comparables) covered in this chapter.

### QUESTIONS

Each of the questions for this chapter relates to the hypothetical company named Company 456—this company was used in the Questions section of Chapter 12. To review, Company 456 sells display monitors to physicians. As such, Company 456 is a product-oriented (as opposed to a service-oriented) business.

The questions for this chapter will address fiscal year X4 on a quarterly basis (four specific quarters, 1Q–4Q for year X4). The following questions will test your knowledge of the material covered in this chapter in an applied manner—specifically, you will be asked to triangulate on a valuation for Company 456 using discounted cash flow, public company comparables, and mergers and acquisitions valuation methodologies.

To prepare you for this chapter's questions, Figure Q13.1 offers a view of Company 456's Free Cash Flows worksheet to provide some background information related to Company 456's operations. A portion of Company 456's Assumptions and Dashboard worksheet is shown in Figure Q13.2. Figure Q13.3 presents a view of the data associated with fictitious companies and a fictitious stock index that will be used in the public company comparables valuation for Company 456. Data associated with fictitious mergers and acquisitions transactions that will be used in the mergers and acquisitions comparables valuation for Company 456 is presented in Figure Q13.4. The relative weightings to be used in Chapter 13's questions for each of the valuation approaches are shown in Figure Q13.5.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
EBIT	\$ 2,071,250	\$ 2,357,050	\$ 2,240,200	\$ 1,991,500	\$ 8,660,000
Effective tax rate	35.0%	35.0%	35.0%	35.0%	
EBIT * (1 - t)	\$ 1,346,313	\$ 1,532,083	\$ 1,456,130	\$ 1,294,475	\$ 5,629,000
+ Depreciation	1,950	4,150	6,150	8,200	20,450
- CAPEX	38,000	43,000	39,000	40,000	160,000
- Changes in NWC	776,759	637,694	70,157	(46,979)	1,437,633
= Free cash flow	\$ 533,503	\$ 865,538	\$ 1,353,123	\$ 1,309,653	\$ 4,051,817
+ Terminal value					
= Total free cash flow					
Present value					
NPV					
WACC	25.0%				
g (to perpetuity)	5.0%				

**FIGURE Q13.1** Company 456's Free Cash Flows Worksheet

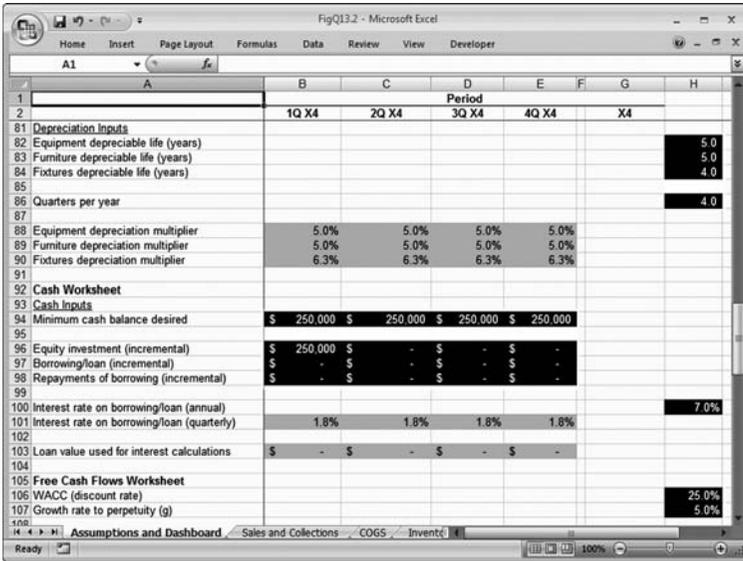


FIGURE Q13.2 Company 456’s Assumptions and Dashboard Worksheet

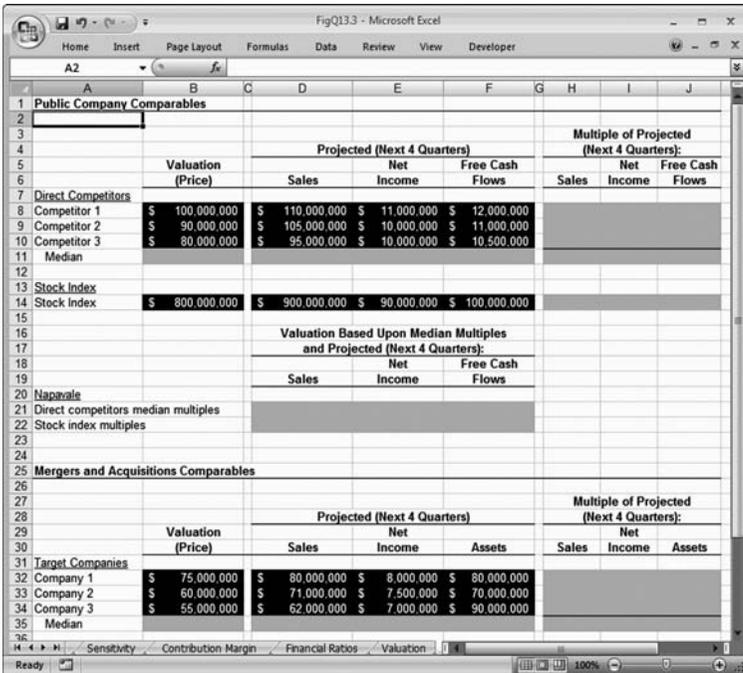


FIGURE Q13.3 Data for Fictitious Companies and Fictitious Index of Stocks

The screenshot shows an Excel spreadsheet with the following data:

Public Company Comparables					Multiple of Projected (Next 4 Quarters):		
	Valuation (Price)	Projected (Next 4 Quarters)			Sales	Net Income	Free Cash Flows
		Sales	Net Income	Free Cash Flows			
Direct Competitors							
Competitor 1	\$ 100,000,000	\$ 110,000,000	\$ 11,000,000	\$ 12,000,000			
Competitor 2	\$ 90,000,000	\$ 105,000,000	\$ 10,000,000	\$ 11,000,000			
Competitor 3	\$ 80,000,000	\$ 95,000,000	\$ 10,000,000	\$ 10,500,000			
Median							
Stock Index							
Stock Index	\$ 800,000,000	\$ 900,000,000	\$ 90,000,000	\$ 100,000,000			
Valuation Based Upon Median Multiples and Projected (Next 4 Quarters):							
		Sales	Net Income	Free Cash Flows			
Napavale							
Direct competitors median multiples							
Stock index multiples							
Mergers and Acquisitions Comparables							
Projected (Next 4 Quarters)					Multiple of Projected (Next 4 Quarters):		
	Valuation (Price)	Sales	Net Income	Assets	Sales	Net Income	Assets
Target Companies							
Company 1	\$ 75,000,000	\$ 80,000,000	\$ 8,000,000	\$ 80,000,000			
Company 2	\$ 60,000,000	\$ 71,000,000	\$ 7,500,000	\$ 70,000,000			
Company 3	\$ 55,000,000	\$ 62,000,000	\$ 7,000,000	\$ 90,000,000			
Median							

FIGURE Q13.4 Data for Fictitious Mergers and Acquisitions Transactions

The screenshot shows an Excel spreadsheet with the following data:

Valuation Technique	Valuation	Relative Weight	Weighted Valuation
Discounted cash flow		60.0%	\$ -
Public company comparables		20.0%	\$ -
Mergers and acquisitions comparables		20.0%	\$ -
Total		100.0%	\$ -

FIGURE Q13.5 Relative Weightings for Each Valuation Approach

1. Given the information presented, calculate Company 456's total free cash flows.
2. Given the information presented, calculate Company 456's net present value.
3. Calculate, using the information presented, the multiple of (i) sales, (ii) Net Income, and (iii) free cash flows for each of the comparable public companies and the stock index. Also calculate the median value for the multiples of the public company comparables as a group.
4. Apply the median multiple and the stock index multiple as calculated in Question 3 to Company 456 to derive a public company comparable valuation for Company 456.
5. Calculate, using the information presented, the multiple of (i) sales, (ii) Net Income, and (iii) Asset values for each of the mergers and acquisitions transactions. Also calculate the median value for the multiples of the mergers and acquisitions transactions as a group.
6. Apply the median multiples as calculated in Question 5 to Company 456 to derive a mergers and acquisitions comparable valuation for Company 456.
7. Calculate the weighted valuations and total valuation for Company 456 using the DCF valuation, the public company comparables valuation (multiple of sales for competitors method), and the mergers and acquisitions valuation (multiple of sales for competitors method).

## Capitalization Chart

This chapter covers the topic of a Capitalization Chart, which is a schedule that tracks the ownership structure of a company. A Capitalization Chart (also referred to as a “Cap Chart”) is an important, and deceptively complex, schedule that has traditionally received little attention in finance-oriented books and textbooks. As such, I will cover this subject using the financial and valuation models developed over the course of this book.

I address the following specific issues related to Napavale’s Cap Chart in this chapter: the “founding” Cap Chart, the effect of an equity investment into Napavale on the Cap Chart and the effect of issuing stock options to employees on Napavale’s Cap Chart.

### **FOUNDING CAPITALIZATION CHART**

---

As discussed in Chapter 2, Napavale was founded and began operations in the first accounting period (1Q X4) covered by the financial model used in this book. Upon its formation, the founders of Napavale determined their initial ownership percentages in Napavale. This initial ownership structure is captured and described in the founding Cap Chart.

I am assuming that Napavale was founded by three individuals and that each of these individuals received an identical allocation of stock in Napavale upon its formation. As such, each of the three founders received 33.3 percent of Napavale’s equity upon the formation of the company. I am also assuming that there was an initial pool of 100,000 shares of “founder’s stock.” Thus, each of the three founders received 33,333 shares of stock in Napavale. Napavale’s founding Cap Chart is shown in Figure 14.1.

Figure 14.2 offers a view of the values and formulas underlying Napavale’s founding Cap Chart. Note that I have included a section in

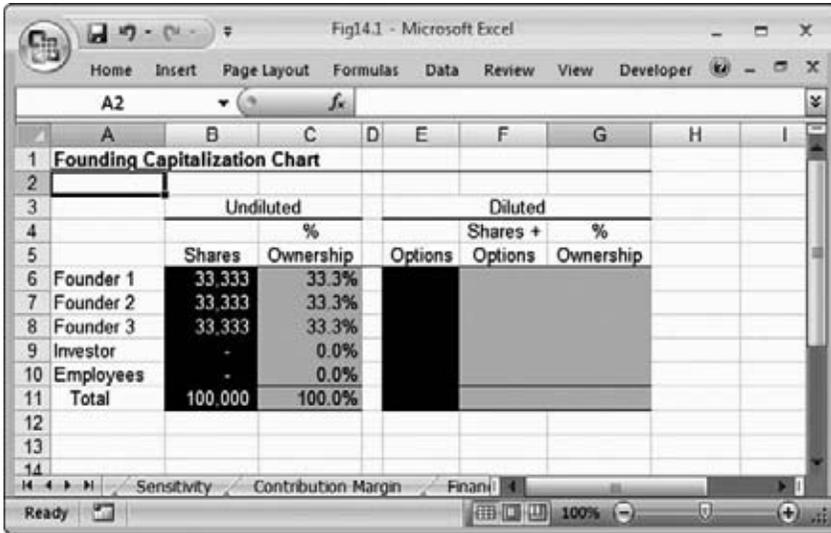


FIGURE 14.1 Founding Cap Chart

the founding Cap Chart to account for any issued and outstanding stock options. While no stock options were issued upon Napavale’s formation, the inclusion of stock options in Napavale’s capital structure will be covered later in this chapter. The names of the input and output cells associated with Napavale’s founding Cap Chart are shown in Figure 14.3.

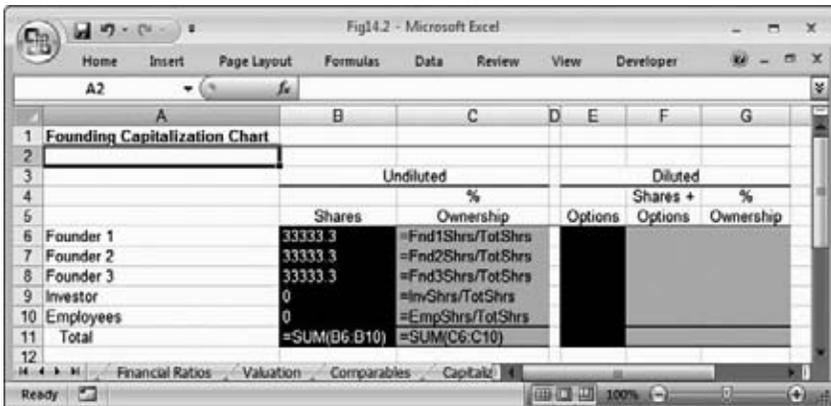
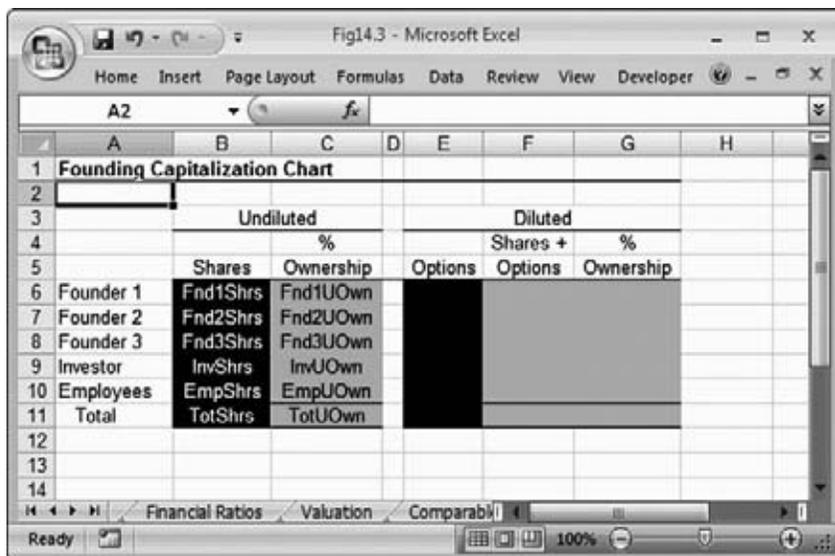


FIGURE 14.2 Alternative View of the Founding Cap Chart



**FIGURE 14.3** Names of the Input and Output Cells Underlying the Founding Cap Chart

### EQUITY INVESTMENT'S EFFECT ON CAPITALIZATION CHART

Now that Napavale’s founding Cap Chart is complete, I will cover the effect of an equity investment into Napavale on Napavale’s Cap Chart. You may remember that I covered an equity investment into Napavale in Chapter 6 while discussing Napavale’s Cash Budget. Specifically, \$1 million was invested into Napavale in 1Q X4. Figure 14.4 provides a view of Napavale’s Cash Budget for the sake of reference.

When an equity investment is made into a company, the ownership structure (and the Cap Chart) changes as well. In order to determine how Napavale’s Cap Chart will change after the projected equity investment of \$1 million in 1Q X4, I must calculate how much of Napavale as a company was “sold” to the investor providing this \$1 million of equity capital. To do this, I must know Napavale’s value when this investor will make this equity investment into Napavale.

Napavale’s value was determined in Chapter 13; Figure 14.5 offers a view of Napavale’s Valuation worksheet for the sake of reference.

The valuation of Napavale as covered in Chapter 13 incorporated the assumption that a \$1 million investment was made into the company. As such, the value of Napavale as shown in Figure 14.5 represents what is

	B	C	D	E	F	G
	Period					
	1Q X4	2Q X4	3Q X4	4Q X4	X4	
<b>CASH BUDGET</b>						
Beginning cash balance	\$ -	\$ 982,272	\$ 1,260,656	\$ 1,541,236	\$ -	
Cash receipts						
Collections from customers	866,667	1,301,333	1,856,400	2,441,600	6,556,000	
Total cash available, before financing	\$ 866,667	\$ 2,363,605	\$ 3,127,056	\$ 3,982,836	N/A	
Cash disbursements						
Purchases disbursements	\$ 176,444	\$ 294,489	\$ 365,400	\$ 439,133	\$ 1,275,467	
Operating expenses	590,400	634,400	896,120	994,400	3,115,320	
Tax expense	72,551	178,185	229,300	369,023	849,058	
Capital expenditures	45,000	45,000	45,000	45,000	180,000	
Total disbursements	884,395	1,152,074	1,535,820	1,847,556	5,419,845	
Minimum cash balance desired	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	N/A	
Total cash needed	\$ 1,134,395	\$ 1,402,074	\$ 1,785,820	\$ 2,097,556	N/A	
Excess (deficiency) of total cash available over						
total cash needed before financing	\$ (267,728)	\$ 961,531	\$ 1,341,236	\$ 1,885,280	N/A	
Financing						
Equity investment	\$ 1,000,000	\$ -	\$ -	\$ -	\$ 1,000,000	
Borrowing (at beginning of quarter)	-	50,000	-	-	50,000	
Repayments (at end of quarter)	-	-	(50,000)	-	(50,000)	
Interest	-	(875)	-	-	(875)	
Total cash increase (decrease) from financing	\$ 1,000,000	\$ 49,125	\$ (50,000)	\$ -	\$ 999,125	
Ending cash balance	\$ 982,272	\$ 1,260,656	\$ 1,541,236	\$ 2,135,280	\$ 2,135,280	

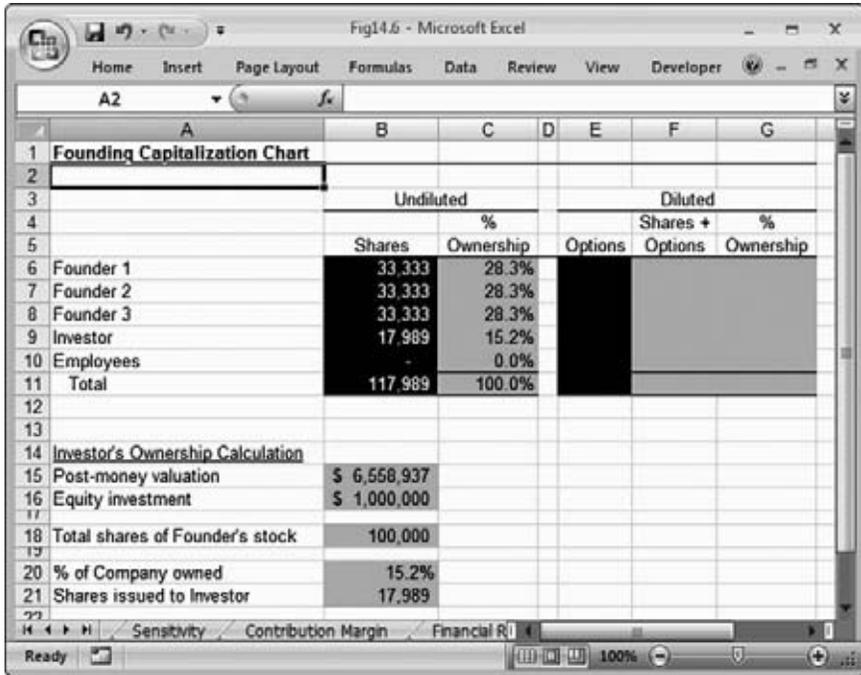
FIGURE 14.4 Cash Budget

known as the “post-money valuation.” In other words, the valuation of Napavale as covered in Chapter 13 includes the value of the \$1 million equity investment.

Thus, the percentage of Napavale purchased by the \$1 million equity investment is calculated by answering the following question: What percentage of Napavale’s post-money valuation does \$1 million represent? This

	B	C	D	E	F
	Valuation	Relative	Weighted		
	Valuation	Weight	Valuation		
Discounted cash flow	\$ 7,601,220	60.0%	\$ 4,560,732		
Public company comparables	\$ 4,753,103	20.0%	\$ 950,621		
Mergers and acquisitions comparables	\$ 5,237,920	20.0%	\$ 1,047,584		
Total		100.0%	\$ 6,558,937		

FIGURE 14.5 Valuation Worksheet



**FIGURE 14.6** Calculation Related to Post-Money Valuation

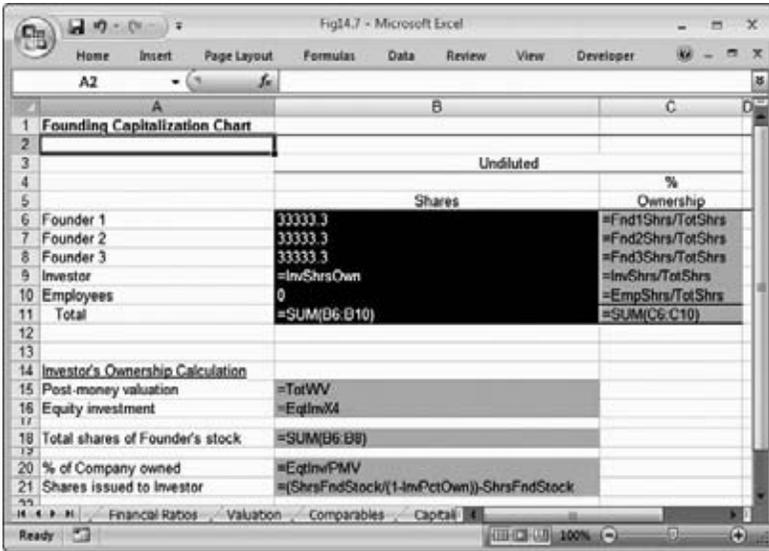
calculation, in addition to a related calculation that yields the number of shares issued to the equity investor and Napavale’s updated Cap Chart, are all shown in Figure 14.6. The values and formulas underlying the calculation shown in Figure 14.6 are revealed in Figure 14.7. Figure 14.8 offers a view of the names of the input and output cells underlying the calculation shown in Figure 14.6.

An algebraic representation of the calculation of the number of shares issued to the equity investor is:

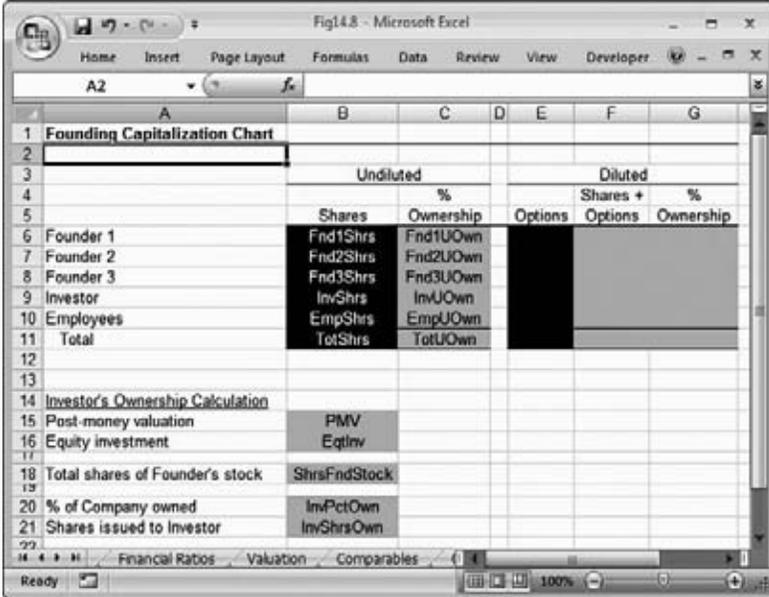
- $v$  = post-money valuation
- $i$  = equity investment by investors
- $f$  = shares of founder’s stock
- $p$  = percent of company owned by investors
- $s$  = shares issued to investor
- $t$  = total shares outstanding

$$p = \frac{i}{v}$$

$$f = (1 - p) \times t$$



**FIGURE 14.7** Alternative View of the Calculation Related to Post-Money Valuation



**FIGURE 14.8** Names of the Input and Output Cells Underlying the Calculation Related to Post-Money Valuation

$$t = \frac{f}{(1 - p)}$$
$$s = t - f$$
$$s = \left[ \frac{f}{(1 - p)} \right] - f$$

## **STOCK OPTIONS' EFFECT ON CAPITALIZATION CHART**

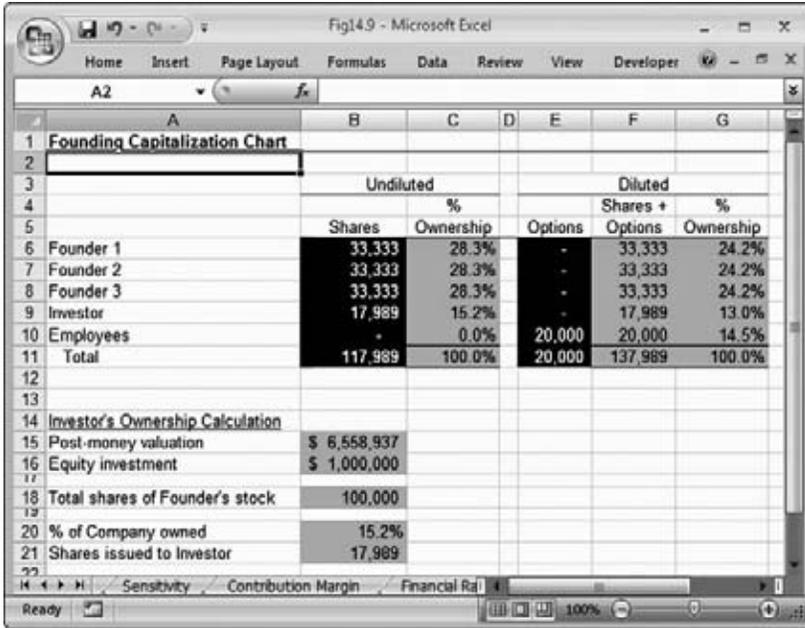
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The final step in building Napavale's Cap Chart is to track and reflect the effect of issuing stock options to employees on Napavale's Cap Chart. Stock options, a popular form of equity-based compensation in many companies, represent financial instruments that give the holder the right, but not the obligation, to purchase the stock of a company at a given price during a specified period of time.

Stock options are often "granted," or given to employees, at an exercise price equal to the then-market value of the underlying stock. In other words, when stock options are given to employees, the price at which the recipient may eventually purchase stock of the company is often equal to the then-current market price of the underlying stock. Accounting for stock options is a complex and somewhat controversial topic. This book is not meant to cover any of the issues surrounding the accounting for stock options and this section of the book does not affect any other sections of Napavale's financial model (except for the Cap Chart).

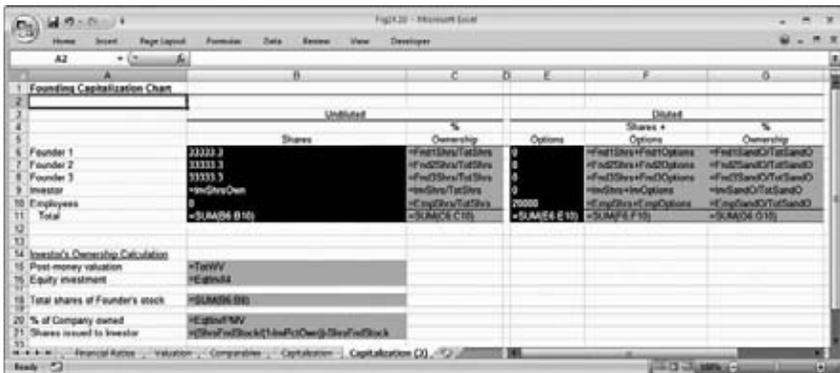
Many stock options "vest" over time, which means they are not "exercisable" until some point in the future. This is another way of saying that option holders may not exercise their options until a specified period of time has elapsed since they were granted the options (often 2 to 3 years from the date of option grant). As such, while stock options may be issued and outstanding, generally speaking, stock options do not count toward a company's number of shares outstanding and thus do not affect a company's Cap Chart using "issued and outstanding" stock as a basis for measuring the ownership structure of a company.

To account for this issue of stock options and a company's ownership, I have measured Napavale's ownership on both an undiluted and a diluted basis. Undiluted means the ownership of Napavale taking into account only issued and outstanding stock in the company. Diluted ownership means the ownership of Napavale taking into account outstanding future potential claims on equity of the company (such as stock options).

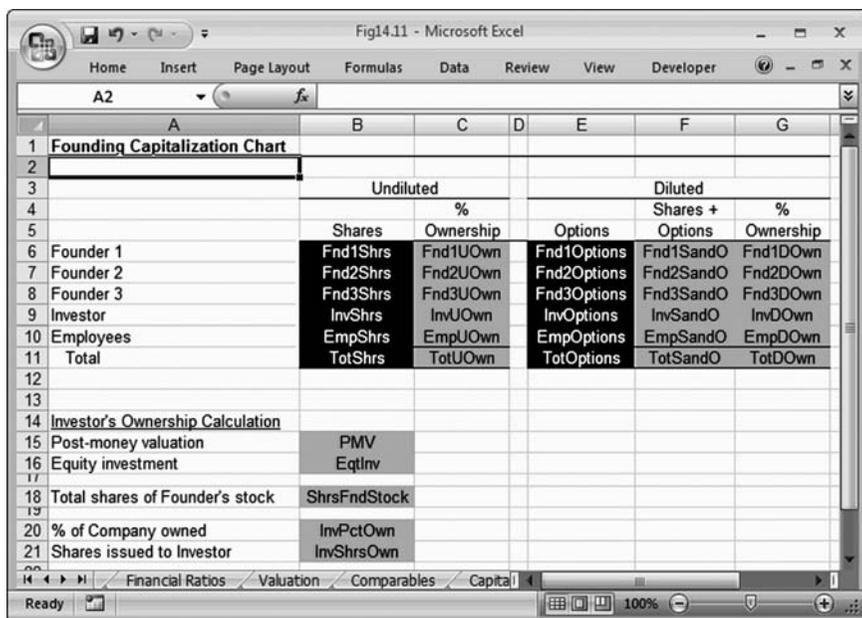


**FIGURE 14.9** Updated Cap Chart

Figure 14.9 presents a view of Napavale’s updated Cap Chart that incorporates the assumption that 20,000 stock options have been issued to employees. The values and formulas underlying Napavale’s updated Cap Chart are shown in Figure 14.10. Figure 14.11 presents a view of the names of the input and output cells underlying Napavale’s updated Cap Chart.



**FIGURE 14.10** Alternative View of the Updated Cap Chart



**FIGURE 14.11** Names of the Input and Output Cells Underlying the Updated Cap Chart

## QUESTIONS

Each of the questions for this chapter relates to the hypothetical company named Company 456—this company was used in the Questions section of Chapters 12 and 13. To review, Company 456 sells display monitors to physicians. As such, Company 456 is a product-oriented (as opposed to a service-oriented) business.

The questions for this chapter address fiscal year X4 on a quarterly basis (four specific quarters, 1Q–4Q for year X4). The following questions will test your knowledge of the material covered in this chapter in an applied manner—specifically, you will be asked to build a founding Capitalization Chart for Company 456, calculate the effect of an equity investment into Company 456 on Company 456’s Capitalization Chart, and calculate the effect of the issuance of stock options on Company 456’s Capitalization Chart.

To prepare you for this chapter’s questions, please assume that Company 456 was founded by three individuals and that (1) the first founder received 50 percent of the founding equity and (2) the second and third founders each received 25 percent of the founding equity in Company 456.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Cash Worksheet</b>					
<b>Cash Inputs</b>					
Minimum cash balance desired	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	
Equity investment (incremental)	\$ 250,000	\$ -	\$ -	\$ -	
Borrowing/loan (incremental)	\$ -	\$ -	\$ -	\$ -	
Repayments of borrowing (incremental)	\$ -	\$ -	\$ -	\$ -	

**FIGURE Q14.1** Company 456’s Assumptions and Dashboard Worksheet

More specifically, please assume that (1) the first founder received 500,000 shares of stock and (2) the second and third founders each received 250,000 shares of stock upon Company 456’s founding.

In terms of stock options, please assume that 200,000 stock options (all of which are unvested) are issued to employees at Company 456 following the equity investment of \$250,000 into Company 456 in Q1 X4. This equity investment is shown in Figure Q14.1, Company 456’s Assumptions and

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>CASH BUDGET</b>					
Beginning cash balance	\$ -	\$ 783,503	\$ 1,639,041	\$ 2,992,164	\$ -
Cash receipts					
Collections from customers	\$ 8,833,333	\$ 8,083,333	\$ 8,541,667	\$ 8,570,556	\$ 31,028,889
Total cash available, before financing	\$ 5,833,333	\$ 8,866,837	\$ 10,180,708	\$ 11,562,719	N/A
Cash disbursements					
Purchases disbursements	\$ 2,760,993	\$ 4,425,528	\$ 4,052,074	\$ 4,139,878	\$ 15,377,572
Operating expenses	1,776,800	1,934,300	2,313,400	2,384,000	8,408,500
Tax expense	724,938	824,968	784,070	697,025	3,031,000
Capital expenditures	38,000	43,000	39,000	40,000	160,000
Total disbursements	\$ 5,299,830	\$ 7,227,796	\$ 7,188,544	\$ 7,260,903	\$ 26,977,072
Minimum cash balance desired	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	N/A
Total cash needed	\$ 5,549,830	\$ 7,477,796	\$ 7,438,544	\$ 7,510,903	N/A
Excess (deficiency) of total cash available over					
total cash needed before financing	\$ 283,503	\$ 1,389,041	\$ 2,742,164	\$ 4,051,817	N/A
Financing					
Equity investment	\$ 250,000	\$ -	\$ -	\$ -	\$ 250,000
Borrowing (at beginning of quarter)	-	-	-	-	-
Repayments (at end of quarter)	-	-	-	-	-
Interest	-	-	-	-	-
Total cash increase (decrease) from financing	\$ 250,000	\$ -	\$ -	\$ -	\$ 250,000
Ending cash balance	\$ 783,503	\$ 1,639,041	\$ 2,992,164	\$ 4,301,817	\$ 4,301,817

**FIGURE Q14.2** Company 456’s Cash Budget

	A	B	C	D	E	F
1	Valuation		Relative	Weight	Weighted	
2	Technique	Valuation	Weight		Valuation	
3	Discounted cash flow	\$ 20,479,727	60.0%		\$ 12,287,836	
4	Public company comparables	\$ 28,225,714	20.0%		\$ 5,645,143	
5	Mergers and acquisitions comparables	\$ 29,212,097	20.0%		\$ 5,842,419	
6	Total		100.0%		\$ 23,775,399	

**FIGURE Q14.3** Company 456's Valuation Worksheet

Dashboard worksheet. Figure Q14.2 offers a view of Company 456's Cash Budget. Company 456's Valuation worksheet is shown in Figure Q14.3.

1. Given the information presented, build a founding Capitalization Chart for Company 456.
2. Given the information presented, build a Capitalization Chart for Company 456 to reflect the equity investment into Company 456 in 1Q X4 based on the valuation shown in Figure Q14.3.
3. Given the information presented, build a Capitalization Chart for Company 456 to reflect the issuance of stock options to employees of Company 456.



# Answers to Chapter Questions

## **CHAPTER 1 Overview of Budgets and Financial Models**

1. The main goal of all budgets is to provide a tangible and quantifiable estimate of the receipt and allocation of resources. A budget represents a core element of a financial model.
2. The two main components of a Master Budget are an Operating Budget and a Financial Budget.
3. A financial model is a quantitative representation of a company's past, present, and future business operations.
4. The three components of standard consolidated financial statements are the Balance Sheet, the Income Statement, and the Statement of Cash Flows.
5. Free cash flows represent the cash available to all providers of capital (providers of both debt and equity)—in other words, the amount of cash a business generates (or, conversely, consumes) over a given timeframe after paying all of its “required” costs for that period.
6. A business should use sensitivity analyses to model the effect of changing input variables on some output of interest, such as net income. Contribution margin analyses should be used to determine a business's operating leverage and breakeven point (both in terms of units and in terms of dollars). A business should use financial analyses to assess financial performance using metrics such as gross margin, net profit margin, and return on equity, among others.
7. Valuation is the process of determining how much a company is worth.
8. A capitalization chart represents, or tabulates, the ownership structure of a business.

## **CHAPTER 2 Operating Budget—Assumptions, Sales, and Collections**

1. The first portion of an Assumptions and Dashboard worksheet for Company XYZ is shown in Figure A2.1.
2. A Unit Sales and Price Budget for Company XYZ is shown in Figure A2.2.
3. The updated Assumptions and Dashboard worksheet for Company XYZ is shown in Figure A2.3.
4. The Sales Composition Budget for Company XYZ is shown in Figure A2.4.

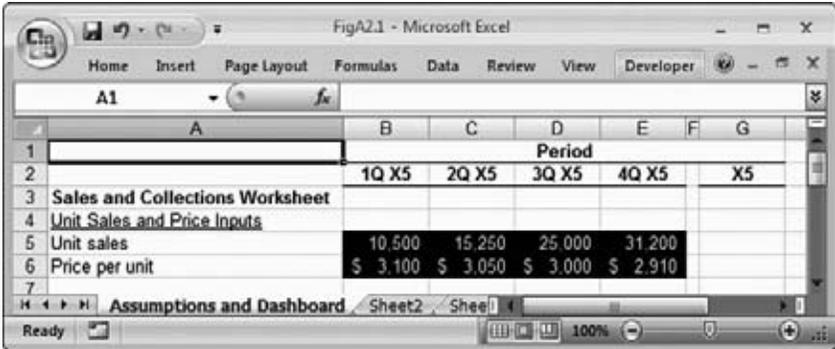


FIGURE A2.1 Assumptions and Dashboard Worksheet for Company XYZ

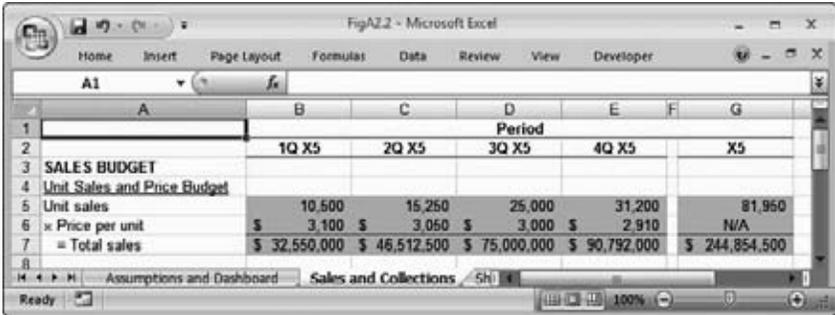


FIGURE A2.2 Unit Sales and Price Budget for Company XYZ

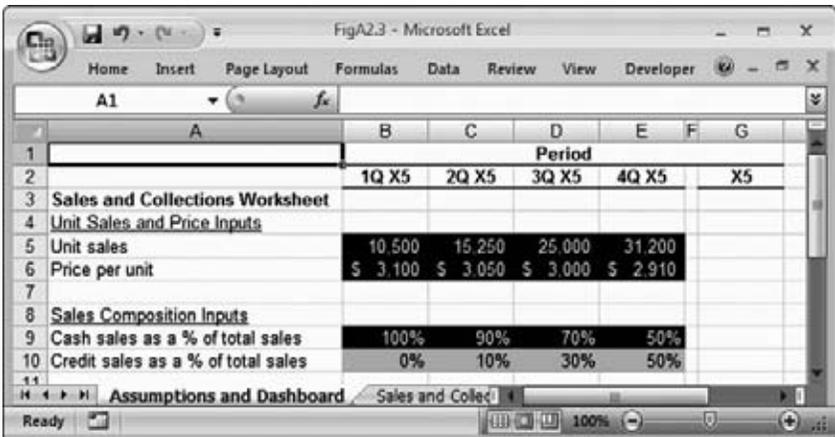
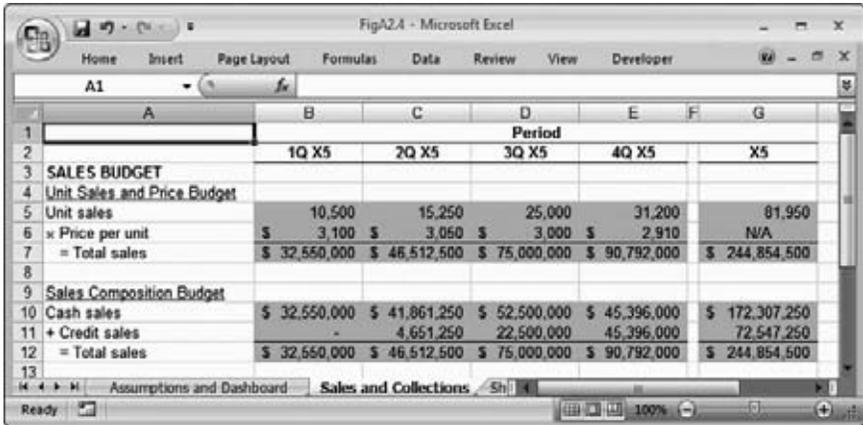
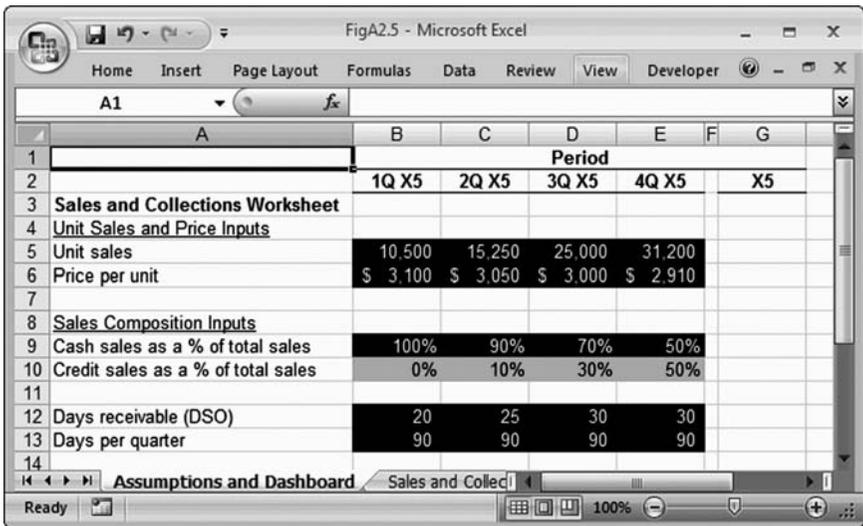


FIGURE A2.3 Updated Assumptions and Dashboard Worksheet for Company XYZ



**FIGURE A2.4** Sales Composition Budget for Company XYZ

5. The updated Assumptions and Dashboard worksheet for Company XYZ is shown in Figure A2.5.
6. The Cash Collections from Customers Budget for Company XYZ is shown in Figure A2.6.
7. The Accounts Receivable Budget and updated Cash Collections from Customers Budget for Company XYZ is shown in Figure A2.7.



**FIGURE A2.5** Updated Assumptions and Dashboard Worksheet for Company XYZ

	Period				
	1Q X5	2Q X5	3Q X5	4Q X5	X5
<b>SALES BUDGET</b>					
<u>Unit Sales and Price Budget</u>					
Unit sales	10,500	15,250	25,000	31,200	81,950
x Price per unit	\$ 3,100	\$ 3,050	\$ 3,000	\$ 2,910	N/A
= Total sales	\$ 32,550,000	\$ 46,512,500	\$ 75,000,000	\$ 90,792,000	\$ 244,854,500
<u>Sales Composition Budget</u>					
Cash sales	\$ 32,550,000	\$ 41,861,250	\$ 52,500,000	\$ 45,396,000	\$ 172,307,250
+ Credit sales	-	4,651,250	22,500,000	45,396,000	72,547,250
= Total sales	\$ 32,550,000	\$ 46,512,500	\$ 75,000,000	\$ 90,792,000	\$ 244,854,500
<b>COLLECTIONS BUDGET</b>					
<u>Cash Collections from Customers Budget</u>					
Cash sales this period	\$ 32,550,000	\$ 41,861,250	\$ 52,500,000	\$ 45,396,000	\$ 172,307,250
+ Credit sales collected	-	-	-	-	-
= Total collections	\$ 32,550,000	\$ 41,861,250	\$ 52,500,000	\$ 45,396,000	\$ 172,307,250

**FIGURE A2.6** Cash Collections from Customers Budget for Company XYZ

	Period				
	1Q X5	2Q X5	3Q X5	4Q X5	X5
<b>SALES BUDGET</b>					
<u>Unit Sales and Price Budget</u>					
Unit sales	10,500	15,250	25,000	31,200	81,950
x Price per unit	\$ 3,100	\$ 3,050	\$ 3,000	\$ 2,910	N/A
= Total sales	\$ 32,550,000	\$ 46,512,500	\$ 75,000,000	\$ 90,792,000	\$ 244,854,500
<u>Sales Composition Budget</u>					
Cash sales	\$ 32,550,000	\$ 41,861,250	\$ 52,500,000	\$ 45,396,000	\$ 172,307,250
+ Credit sales	-	4,651,250	22,500,000	45,396,000	72,547,250
= Total sales	\$ 32,550,000	\$ 46,512,500	\$ 75,000,000	\$ 90,792,000	\$ 244,854,500
<b>COLLECTIONS BUDGET</b>					
<u>Cash Collections from Customers Budget</u>					
Cash sales this period	\$ 32,550,000	\$ 41,861,250	\$ 52,500,000	\$ 45,396,000	\$ 172,307,250
+ Credit sales collected	-	3,359,236	16,292,014	37,764,000	57,415,250
= Total collections	\$ 32,550,000	\$ 45,220,486	\$ 68,792,014	\$ 83,160,000	\$ 229,722,500
<u>Accounts Receivable (A/R) Budget</u>					
Beginning A/R balance	\$ -	\$ -	\$ 1,292,014	\$ 7,500,000	\$ -
+ Additions to A/R	-	1,292,014	7,500,000	15,132,000	23,924,014
- Subtractions from A/R	-	-	1,292,014	7,500,000	8,792,014
= Ending A/R balance	\$ -	\$ 1,292,014	\$ 7,500,000	\$ 15,132,000	\$ 15,132,000

**FIGURE A2.7** Accounts Receivable Budget and Updated Cash Collections from Customers Budget for Company XYZ

### CHAPTER 3 Operating Budget—Cost of Goods Sold, Inventory, and Purchases

1. The Cost-of-Goods-Sold Budget for Company ABC is shown in Figure A3.1.
2. The Inventory Budget for Company ABC is shown in Figure A3.2.
3. The Purchases Budget for Company ABC is shown in Figure A3.3.

	Period				
	1Q X6	2Q X6	3Q X6	4Q X6	X6
<b>COST-OF-GOODS SOLD BUDGET</b>					
<u>Cost-of-Goods Sold Budget</u>					
Desk top	\$ 1,000,000	\$ 1,027,125	\$ 1,055,000	\$ 1,103,375	\$ 4,185,500
Desk body	1,300,000	1,328,000	1,318,750	1,433,250	5,380,000
Assembly labor	500,000	518,750	527,500	568,750	2,115,000
<b>Total cost-of-goods sold</b>	<b>\$ 2,800,000</b>	<b>\$ 2,873,875</b>	<b>\$ 2,901,250</b>	<b>\$ 3,105,375</b>	<b>\$ 11,680,500</b>

**FIGURE A3.1** Cost-of-Goods-Sold Budget for Company ABC

	Period				
	1Q X6	2Q X6	3Q X6	4Q X6	X6
<b>INVENTORY BUDGET</b>					
<u>Inventory Budget</u>					
Desired ending inventory	\$ 478,979	\$ 548,014	\$ 655,579	\$ 655,579	N/A
+ Cost of goods sold	2,800,000	2,873,875	2,901,250	3,105,375	11,680,500
<b>= Total inventory needed</b>	<b>\$ 3,278,979</b>	<b>\$ 3,421,889</b>	<b>\$ 3,556,829</b>	<b>\$ 3,760,954</b>	<b>N/A</b>
<b>PURCHASES BUDGET</b>					
<u>Purchases Budget</u>					
Total inventory needed					
- Beginning inventory					
<b>= Purchases</b>					
<u>Disbursements for Purchases Budget</u>					
Payments of payables					
Total disbursements for purchases					
<u>Accounts Payable (A/P) Budget</u>					
Beginning A/P balance					
+ Additions to A/P					
- Subtractions from A/P					
<b>Ending A/P</b>					

**FIGURE A3.2** Inventory Budget for Company ABC

	Period				
	1Q X6	2Q X6	3Q X6	4Q X6	X6
<b>INVENTORY BUDGET</b>					
<u>Inventory Budget</u>					
Desired ending inventory	\$ 478,979	\$ 548,014	\$ 655,579	\$ 655,579	N/A
+ Cost of goods sold	2,900,000	2,873,875	2,901,250	3,105,375	11,680,500
= Total inventory needed	\$ 3,278,979	\$ 3,421,889	\$ 3,556,829	\$ 3,760,954	N/A
<b>PURCHASES BUDGET</b>					
<u>Purchases Budget</u>					
Total inventory needed	\$ 3,278,979	\$ 3,421,889	\$ 3,556,829	\$ 3,760,954	N/A
- Beginning inventory	-	478,979	548,014	655,579	-
= Purchases	\$ 3,278,979	\$ 2,942,910	\$ 3,008,815	\$ 3,105,375	N/A
<b>Disbursements for Purchases Budget</b>					
<u>Payments of payables</u>					
Total disbursements for purchases					
<b>Accounts Payable (A/P) Budget</b>					
<u>Beginning A/P balance</u>					
+ Additions to A/P					
- Subtractions from A/P					
Ending A/P					

FIGURE A3.3 Purchases Budget for Company ABC

	Period				
	1Q X6	2Q X6	3Q X6	4Q X6	X6
<b>INVENTORY BUDGET</b>					
<u>Inventory Budget</u>					
Desired ending inventory	\$ 478,979	\$ 548,014	\$ 655,579	\$ 655,579	N/A
+ Cost of goods sold	2,900,000	2,873,875	2,901,250	3,105,375	11,680,500
= Total inventory needed	\$ 3,278,979	\$ 3,421,889	\$ 3,556,829	\$ 3,760,954	N/A
<b>PURCHASES BUDGET</b>					
<u>Purchases Budget</u>					
Total inventory needed	\$ 3,278,979	\$ 3,421,889	\$ 3,556,829	\$ 3,760,954	N/A
- Beginning inventory	-	478,979	548,014	655,579	-
= Purchases	\$ 3,278,979	\$ 2,942,910	\$ 3,008,815	\$ 3,105,375	N/A
<b>Disbursements for Purchases Budget</b>					
<u>Payments of payables</u>					
Total disbursements for purchases					
<b>Accounts Payable (A/P) Budget</b>					
<u>Beginning A/P balance</u>					
+ Additions to A/P	\$ 874,394	1,046,368	1,036,370	1,104,133	4,061,265
- Subtractions from A/P	-	874,394	1,046,368	1,036,370	2,957,132
Ending A/P	\$ 874,394	\$ 1,046,368	\$ 1,036,370	\$ 1,104,133	\$ 1,104,133

FIGURE A3.4 Accounts Payable Budget for Company ABC

	Period					
	1Q X6	2Q X6	3Q X6	4Q X6		X6
<b>INVENTORY BUDGET</b>						
<i>Inventory Budget</i>						
Desired ending inventory	\$ 478,979	\$ 548,014	\$ 655,579	\$ 655,579		N/A
+ Cost of goods sold	2,800,000	2,873,875	2,901,250	3,105,375		11,680,500
= Total inventory needed	\$ 3,278,979	\$ 3,421,889	\$ 3,556,829	\$ 3,760,954		N/A
<b>PURCHASES BUDGET</b>						
<i>Purchases Budget</i>						
Total inventory needed	\$ 3,278,979	\$ 3,421,889	\$ 3,556,829	\$ 3,760,954		N/A
- Beginning inventory	-	478,979	548,014	655,579		-
= Purchases	\$ 3,278,979	\$ 2,942,910	\$ 3,008,815	\$ 3,105,375		N/A
<b>Disbursements for Purchases Budget</b>						
Payments of payables	\$ 2,404,585	\$ 2,770,936	\$ 3,018,813	\$ 3,037,611		\$ 11,231,946
Total disbursements for purchases	\$ 2,404,585	\$ 2,770,936	\$ 3,018,813	\$ 3,037,611		\$ 11,231,946
<b>Accounts Payable (A/P) Budget</b>						
Beginning A/P balance	\$ -	\$ 874,394	\$ 1,046,368	\$ 1,036,370		\$ -
+ Additions to A/P	874,394	1,046,368	1,036,370	1,104,133		4,061,265
- Subtractions from A/P	-	874,394	1,046,368	1,036,370		2,967,132
Ending A/P	\$ 874,394	\$ 1,046,368	\$ 1,036,370	\$ 1,104,133		\$ 1,104,133

**FIGURE A3.5** Disbursements for Purchases Budget for Company ABC

4. The Accounts Payable Budget for Company ABC is shown in Figure A3.4.
5. The Disbursements for Purchases Budget for Company ABC is shown in Figure A3.5.

## CHAPTER 4 Operating Budget—Operating Expenses

1. The Headcount Overview worksheet for Company DEF is shown in Figure A4.1.
2. The Headcount Cost worksheet for Company DEF is shown in Figure A4.2.
3. The Operating Expenses Budget for Company DEF is shown in Figure A4.3.
4. The Disbursements for Operating Expenses Budget for Company DEF is shown in Figure A4.4.

		Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>HEADCOUNT BUDGET</b>						
<u>Headcount Budget</u>						
Number of employees						
6	Chief Executive Officer	1	1	1	1	
7	Chief Financial Officer	1	1	1	1	
8	VP, Engineering	1	1	1	1	
9	VP, Sales & Marketing	1	1	1	1	
10	VP, Business Development	1	1	1	1	
11	Salesperson	5	5	7	8	
12	Hardware Engineer	4	4	5	5	
13	Controller/Accountant	1	2	2	2	
14	Administrative Assistant	2	2	3	4	
15	<b>Total</b>	<b>17</b>	<b>18</b>	<b>22</b>	<b>24</b>	
Periodic base salaries						
18	Chief Executive Officer	\$ 43,750	\$ 43,750	\$ 43,750	\$ 43,750	\$ 175,000
19	Chief Financial Officer	37,500	37,500	37,500	37,500	150,000
20	VP, Engineering	37,500	37,500	37,500	37,500	150,000
21	VP, Sales & Marketing	33,750	33,750	33,750	33,750	135,000
22	VP, Business Development	31,250	31,250	31,250	31,250	125,000
23	Salesperson	25,000	25,000	25,000	25,000	100,000
24	Hardware Engineer	22,500	22,500	22,500	22,500	90,000
25	Controller/Accountant	11,250	11,250	11,250	11,250	45,000
26	Administrative Assistant	7,500	7,500	7,500	7,500	30,000
27	<b>Total</b>	<b>\$ 250,000</b>	<b>\$ 250,000</b>	<b>\$ 250,000</b>	<b>\$ 250,000</b>	<b>\$ 1,000,000</b>

**FIGURE A4.1** Headcount Overview Worksheet for Company DEF

		Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>HEADCOUNT BUDGET</b>						
<u>Headcount Budget</u>						
Periodic salary expense (base)						
6	Chief Executive Officer	\$ 43,750	\$ 43,750	\$ 43,750	\$ 43,750	\$ 175,000
7	Chief Financial Officer	37,500	37,500	37,500	37,500	150,000
8	VP, Engineering	37,500	37,500	37,500	37,500	150,000
9	VP, Sales & Marketing	33,750	33,750	33,750	33,750	135,000
10	VP, Business Development	31,250	31,250	31,250	31,250	125,000
11	Salesperson	125,000	125,000	175,000	200,000	625,000
12	Hardware Engineer	90,000	90,000	112,500	112,500	405,000
13	Controller/Accountant	11,250	22,500	22,500	22,500	78,750
14	Administrative Assistant	15,000	15,000	22,500	30,000	82,500
15	<b>Total</b>	<b>\$ 425,000</b>	<b>\$ 436,250</b>	<b>\$ 516,250</b>	<b>\$ 548,750</b>	<b>\$ 1,926,250</b>
16						
17	<b>Total (with benefits)</b>	<b>\$ 488,750</b>	<b>\$ 501,688</b>	<b>\$ 593,688</b>	<b>\$ 631,063</b>	<b>\$ 2,215,188</b>

**FIGURE A4.2** Headcount Cost Worksheet for Company DEF

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>OPERATING EXPENSES BUDGET</b>					
Operating Expenses Budget					
Salaries	\$ 488,750	\$ 501,688	\$ 593,688	\$ 631,063	\$ 2,215,188
Miscellaneous expenses	40,000	36,400	42,120	36,575	155,095
Research and development	100,000	104,000	105,300	104,500	413,800
Rent	20,250	20,250	20,250	20,250	81,000
Depreciation	-	-	-	-	-
Total operating expenses	\$ 649,000	\$ 662,338	\$ 761,358	\$ 792,388	\$ 2,865,083
<b>DISBURSEMENTS FOR OPERATING EXPENSES BUDGET</b>					
Disbursements for Operating Expenses Budget					
Salaries	\$ 488,750	\$ 501,688	\$ 593,688	\$ 631,063	\$ 2,215,188
Miscellaneous expenses	40,000	36,400	42,120	36,575	155,095
Research and development	100,000	104,000	105,300	104,500	413,800
Rent	20,250	20,250	20,250	20,250	81,000
Depreciation	-	-	-	-	-
Total disbursements for operating expenses	\$ 649,000	\$ 662,338	\$ 761,358	\$ 792,388	\$ 2,865,083

**FIGURE A4.3** Operating Expenses Budget for Company DEF

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>OPERATING EXPENSES BUDGET</b>					
Operating Expenses Budget					
Salaries	\$ 488,750	\$ 501,688	\$ 593,688	\$ 631,063	\$ 2,215,188
Miscellaneous expenses	40,000	36,400	42,120	36,575	155,095
Research and development	100,000	104,000	105,300	104,500	413,800
Rent	20,250	20,250	20,250	20,250	81,000
Depreciation	-	-	-	-	-
Total operating expenses	\$ 649,000	\$ 662,338	\$ 761,358	\$ 792,388	\$ 2,865,083
<b>DISBURSEMENTS FOR OPERATING EXPENSES BUDGET</b>					
Disbursements for Operating Expenses Budget					
Salaries	\$ 488,750	\$ 501,688	\$ 593,688	\$ 631,063	\$ 2,215,188
Miscellaneous expenses	40,000	36,400	42,120	36,575	155,095
Research and development	100,000	104,000	105,300	104,500	413,800
Rent	20,250	20,250	20,250	20,250	81,000
Depreciation	-	-	-	-	-
Total disbursements for operating expenses	\$ 649,000	\$ 662,338	\$ 761,358	\$ 792,388	\$ 2,865,083

**FIGURE A4.4** Disbursements for Operating Expenses Budget for Company DEF

**CHAPTER 5 Operating Budget—Income Statement**

1. The first section of the Income Statement for Company GHI is shown in Figure A5.1.
2. The updated Income Statement for Company GHI is shown in Figure A5.2.
3. The updated Income Statement for Company GHI is shown in Figure A5.3.
4. The updated Income Statement for Company GHI is shown in Figure A5.4.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
Sales	\$ 2,200,000	\$ 2,160,000	\$ 2,133,000	\$ 2,093,500	\$ 8,586,500
Cost of goods sold	1,072,500	1,026,000	950,400	927,500	3,976,400
Gross profit	\$ 1,127,500	\$ 1,134,000	\$ 1,182,600	\$ 1,166,000	\$ 4,610,100
Salaries					
Miscellaneous expenses					
Research and development					
Rent					
Depreciation					
Income from operations					
Interest expense					
Taxable income					
Tax expense					
Net income					

**FIGURE A5.1** First Section of the Income Statement for Company GHI

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
Sales	\$ 2,200,000	\$ 2,160,000	\$ 2,133,000	\$ 2,093,500	\$ 8,586,500
Cost of goods sold	1,072,500	1,026,000	950,400	927,500	3,976,400
Gross profit	\$ 1,127,500	\$ 1,134,000	\$ 1,182,600	\$ 1,166,000	\$ 4,610,100
Salaries	\$ 459,650	\$ 487,200	\$ 516,200	\$ 611,900	\$ 2,074,950
Miscellaneous expenses					
Research and development					
Rent					
Depreciation					
Income from operations					
Interest expense					\$ -
Taxable income					
Tax expense					
Net income					

**FIGURE A5.2** Updated Income Statement for Company GHI

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
Sales	\$ 2,200,000	\$ 2,160,000	\$ 2,133,000	\$ 2,093,500	\$ 8,586,500
Cost of goods sold	1,072,500	1,026,000	950,400	927,500	3,976,400
Gross profit	\$ 1,127,500	\$ 1,134,000	\$ 1,182,600	\$ 1,166,000	\$ 4,610,100
Salaries	\$ 459,650	\$ 487,200	\$ 516,200	\$ 611,900	\$ 2,074,950
Miscellaneous expenses	88,000	97,200	106,650	94,208	386,058
Research and development	132,000	140,400	149,310	157,013	578,723
Rent	15,750	15,750	15,750	15,750	63,000
Depreciation					-
Income from operations	\$ 432,100	\$ 393,450	\$ 394,690	\$ 287,130	\$ 1,507,370
Interest expense					\$ -
Taxable income					
Tax expense					
Net income					

FIGURE A5.3 Updated Income Statement for Company GHI

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
Sales	\$ 2,200,000	\$ 2,160,000	\$ 2,133,000	\$ 2,093,500	\$ 8,586,500
Cost of goods sold	1,072,500	1,026,000	950,400	927,500	3,976,400
Gross profit	\$ 1,127,500	\$ 1,134,000	\$ 1,182,600	\$ 1,166,000	\$ 4,610,100
Salaries	\$ 459,650	\$ 487,200	\$ 516,200	\$ 611,900	\$ 2,074,950
Miscellaneous expenses	88,000	97,200	106,650	94,208	386,058
Research and development	132,000	140,400	149,310	157,013	578,723
Rent	15,750	15,750	15,750	15,750	63,000
Depreciation					-
Income from operations	\$ 432,100	\$ 393,450	\$ 394,690	\$ 287,130	\$ 1,507,370
Interest expense					\$ -
Taxable income	\$ 432,100	\$ 393,450	\$ 394,690	\$ 287,130	\$ 1,507,370
Tax expense	\$ 138,272	\$ 125,904	\$ 130,248	\$ 94,753	\$ 489,177
Net income	\$ 293,828	\$ 267,546	\$ 264,442	\$ 192,377	\$ 1,018,193

FIGURE A5.4 Updated Income Statement for Company GHI

**CHAPTER 6 Financial Budget—Capital Budget and Cash Budget**

1. The Capital Expenditures Budget for Company JKL is shown in Figure A6.1.
2. The Disbursements for Capital Expenditures Budget for Company JKL is shown in Figure A6.2.
3. The Depreciation Budget for Company JKL is shown in Figure A6.3.
4. The first section of Company JKL’s Cash Budget is shown in Figure A6.4.
5. The updated Cash Budget for Company JKL is shown in Figure A6.5.
6. The updated Cash Budget for Company JKL is shown in Figure A6.6.
7. The completed Income Statement for Company JKL is shown in Figure A6.7.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>CAPITAL BUDGET</b>					
<u>Capital Expenditures Budget</u>					
Equipment	\$ 9,000	\$ 5,000	\$ 3,000	\$ 3,000	\$ 20,000
Furniture	2,500	2,500	2,500	2,000	9,500
Fixtures	1,500	1,500	1,500	1,500	6,000
Total capital expenditures	\$ 13,000	\$ 9,000	\$ 7,000	\$ 6,500	\$ 35,500
<u>Disbursements for Capital Expenditures Budget</u>					
Equipment					
Furniture					
Fixtures					
Total disbursements for capital expenditures					
<u>Depreciation Budget</u>					
Equipment					
Furniture					
Fixtures					
Total depreciation					
Cumulative capital expenditures					
- Accumulated depreciation					
= Fixed assets, net of depreciation					

**FIGURE A6.1** Capital Expenditures Budget for Company JKL

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>CAPITAL BUDGET</b>					
Capital Expenditures Budget					
Equipment	\$ 9,000	\$ 5,000	\$ 3,000	\$ 3,000	\$ 20,000
Furniture	2,500	2,500	2,500	2,000	9,500
Fixtures	1,500	1,500	1,500	1,500	6,000
Total capital expenditures	\$ 13,000	\$ 9,000	\$ 7,000	\$ 6,500	\$ 35,500
<b>Disbursements for Capital Expenditures Budget</b>					
Equipment	\$ 9,000	\$ 5,000	\$ 3,000	\$ 3,000	\$ 20,000
Furniture	2,500	2,500	2,500	2,000	9,500
Fixtures	1,500	1,500	1,500	1,500	6,000
Total disbursements for capital expenditures	\$ 13,000	\$ 9,000	\$ 7,000	\$ 6,500	\$ 35,500
<b>Depreciation Budget</b>					
Equipment					
Furniture					
Fixtures					
Total depreciation					
Cumulative capital expenditures					
- Accumulated depreciation					
= Fixed assets, net of depreciation					

**FIGURE A6.2** Disbursements for Capital Expenditures Budget for Company JKL

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>CAPITAL BUDGET</b>					
Capital Expenditures Budget					
Equipment	\$ 9,000	\$ 5,000	\$ 3,000	\$ 3,000	\$ 20,000
Furniture	2,500	2,500	2,500	2,000	9,500
Fixtures	1,500	1,500	1,500	1,500	6,000
Total capital expenditures	\$ 13,000	\$ 9,000	\$ 7,000	\$ 6,500	\$ 35,500
<b>Disbursements for Capital Expenditures Budget</b>					
Equipment	\$ 9,000	\$ 5,000	\$ 3,000	\$ 3,000	\$ 20,000
Furniture	2,500	2,500	2,500	2,000	9,500
Fixtures	1,500	1,500	1,500	1,500	6,000
Total disbursements for capital expenditures	\$ 13,000	\$ 9,000	\$ 7,000	\$ 6,500	\$ 35,500
<b>Depreciation Budget</b>					
Equipment	\$ 375	\$ 583	\$ 708	\$ 833	\$ 2,500
Furniture	125	250	375	475	1,225
Fixtures	75	150	225	300	750
Total depreciation	\$ 575	\$ 983	\$ 1,308	\$ 1,608	\$ 4,475
Cumulative capital expenditures	\$ 13,000	\$ 22,000	\$ 29,000	\$ 35,500	
- Accumulated depreciation	575	1,558	2,867	4,475	
= Fixed assets, net of depreciation	\$ 12,425	\$ 20,442	\$ 26,133	\$ 31,025	

**FIGURE A6.3** Depreciation Budget for Company JKL

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>CASH BUDGET</b>					
Beginning cash balance	\$ -	\$ 2,444,444	\$ 5,214,800	\$ 8,140,089	\$ -
Cash receipts					
Collections from customers	2,444,444	2,770,356	2,925,289	2,881,378	11,021,467
Total cash available, before financing	\$ 2,444,444	\$ 5,214,800	\$ 8,140,089	\$ 11,021,467	N/A
Cash disbursements					
Purchases disbursements					
Operating expenses					
Capital expenditures					
Total disbursements					
Minimum cash balance desired					
Total cash needed					
Excess (deficiency) of total cash available over total cash needed before financing					
Financing					
Equity investment					
Borrowing (at beginning of quarter)					
Repayments (at end of quarter)					
Interest					
Total cash increase (decrease) from financing					
Ending cash balance	\$ 2,444,444	\$ 5,214,800	\$ 8,140,089	\$ 11,021,467	\$ 11,021,467

FIGURE A6.4 First Section of Company JKL’s Cash Budget

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>CASH BUDGET</b>					
Beginning cash balance	\$ -	\$ 244,989	\$ 134,155	\$ 380,097	\$ -
Cash receipts					
Collections from customers	2,444,444	2,770,356	2,925,289	2,881,378	11,021,467
Total cash available, before financing	\$ 2,444,444	\$ 3,015,344	\$ 3,059,444	\$ 3,261,475	N/A
Cash disbursements					
Purchases disbursements	\$ 1,550,578	\$ 2,217,631	\$ 1,924,070	\$ 1,810,772	\$ 7,503,050
Operating expenses	635,878	654,558	748,278	783,910	2,822,624
Capital expenditures	13,000	9,000	7,000	6,500	35,500
Total disbursements	2,199,456	2,881,189	2,679,347	2,601,182	10,361,174
Minimum cash balance desired	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	N/A
Total cash needed	\$ 2,299,456	\$ 2,981,189	\$ 2,779,347	\$ 2,701,182	N/A
Excess (deficiency) of total cash available over total cash needed before financing	\$ 144,989	\$ 34,155	\$ 280,097	\$ 560,293	N/A
Financing					
Equity investment					
Borrowing (at beginning of quarter)					
Repayments (at end of quarter)					
Interest					
Total cash increase (decrease) from financing					
Ending cash balance	\$ 244,989	\$ 134,155	\$ 380,097	\$ 660,293	\$ 660,293

FIGURE A6.5 Updated Cash Budget for Company JKL

1	A	Period				
		B	C	D	E	F
2		1Q X4	2Q X4	3Q X4	4Q X4	X4
3	<b>CASH BUDGET</b>					
4	Beginning cash balance	\$ -	\$ 744,989	\$ 634,155	\$ 904,597	\$ -
5	Cash receipts					
6	Collections from customers	2,444,444	2,770,356	2,925,289	2,881,378	11,021,467
7	Total cash available, before financing	\$ 2,444,444	\$ 3,515,344	\$ 3,559,444	\$ 3,785,975	N/A
8	Cash disbursements					
9	Purchases disbursements	\$ 1,550,578	\$ 2,217,631	\$ 1,924,070	\$ 1,810,722	\$ 7,503,050
10	Operating expenses	635,878	654,558	748,278	783,910	2,822,624
11	Capital expenditures	13,000	9,000	7,000	6,500	35,500
12	Total disbursements	2,199,456	2,881,189	2,679,347	2,601,182	10,361,174
13						
14	Minimum cash balance desired	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	N/A
15	Total cash needed	\$ 2,299,456	\$ 2,981,189	\$ 2,779,347	\$ 2,701,182	N/A
16	Excess (deficiency) of total cash available over					
17	total cash needed before financing	\$ 144,989	\$ 534,155	\$ 780,097	\$ 1,084,793	N/A
18	Financing					
19	Equity investment	\$ 500,000	\$ -	\$ -	\$ -	\$ 500,000
20	Borrowing (at beginning of quarter)	-	-	25,000	-	25,000
21	Repayments (at end of quarter)	-	-	-	(25,000)	(25,000)
22	Interest	-	-	(500)	-	(500)
23	Total cash increase (decrease) from financing	\$ 500,000	\$ -	\$ 24,500	\$ (25,000)	\$ 489,500
24						
25	Ending cash balance	\$ 744,989	\$ 634,155	\$ 904,597	\$ 1,155,793	\$ 1,155,793

**FIGURE A6.6** Updated Cash Budget for Company JKL Including Projections Regarding Equity Investments, Borrowings, Repayment of Borrowings, and Interest Expenses

1	A	Period				
		B	C	D	E	F
2		1Q X4	2Q X4	3Q X4	4Q X4	X4
3	Sales	\$ 2,750,000	\$ 2,808,000	\$ 2,834,000	\$ 2,886,000	\$ 11,278,000
4	Cost of goods sold	2,000,000	1,955,200	1,940,200	1,831,500	7,726,900
5	Gross profit	\$ 750,000	\$ 852,800	\$ 893,800	\$ 1,054,500	\$ 3,551,100
6						
7	Salaries	\$ 399,378	\$ 399,378	\$ 490,888	\$ 522,100	\$ 1,811,744
8	Miscellaneous expenses	82,500	98,280	99,190	101,010	380,980
9	Research and development	137,500	140,400	141,700	144,300	563,900
10	Rent	16,500	16,500	16,500	16,500	66,000
11	Depreciation	575	983	1,308	1,608	4,475
12	Income from operations	\$ 114,122	\$ 196,242	\$ 145,523	\$ 270,590	\$ 728,476
13						
14	Interest expense	\$ -	\$ -	\$ 500	\$ -	\$ 500
15	Taxable income	\$ 114,122	\$ 196,242	\$ 145,023	\$ 270,590	\$ 727,976
16						
17	Tax expense	\$ 37,090	\$ 65,420	\$ 47,132	\$ 89,295	\$ 238,936
18	Net income	\$ 77,032	\$ 132,822	\$ 97,890	\$ 181,295	\$ 489,040

**FIGURE A6.7** Completed Income Statement for Company JKL

**CHAPTER 7 Financial Budget—Balance Sheet**

1. The Asset components of Company MNO’s Balance Sheet are shown in Figure A7.1.
2. The Liabilities components of Company MNO’s Balance Sheet are shown in Figure A7.2.
3. The Owners’ Equity components of Company MNO’s Balance Sheet are shown in Figure A7.3.
4. The changes in Company MNO’s Net Working Capital are shown in Figure A7.4.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Assets</b>					
Cash	\$ 110,522	\$ 726,552	\$ 1,441,311	\$ 2,154,566	\$ 2,154,566
Accounts Receivable	1,035,000	922,350	900,000	780,111	780,111
Inventory	461,370	478,133	468,331	468,331	468,331
Fixed Assets, net	16,113	28,019	38,028	46,450	46,450
<b>Total Assets</b>	<b>\$ 1,623,005</b>	<b>\$ 2,155,054</b>	<b>\$ 2,847,671</b>	<b>\$ 3,449,458</b>	<b>\$ 3,449,458</b>
<b>Liabilities</b>					
Accounts Payable					
Payables from Capital Budget					
Loan Payable					
<b>Total Liabilities</b>					
<b>Owners' Equity</b>					
Common Stock					
Retained Earnings					
<b>Total Owners' Equity</b>					
<b>Total Liabilities and Owners' Equity</b>	<b>\$ -</b>				
<b>Net Working Capital (NWC)</b>					
Current assets					
- Current liabilities					
= Net working capital					
Beginning NWC					
- Ending NWC					
= Change in NWC					

**FIGURE A7.1** Asset Components of Company MNO’s Balance Sheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
**Assets**					
Cash	\$ 110,522	\$ 726,552	\$ 1,441,311	\$ 2,154,566	\$ 2,154,566
Accounts Receivable	1,036,000	822,350	900,000	780,111	780,111
Inventory	461,370	478,133	468,331	468,331	468,331
Fixed Assets, net	16,113	78,019	78,078	40,450	40,450
**Total Assets**	**\$ 1,623,005**	**\$ 2,155,054**	**\$ 2,947,671**	**\$ 3,449,458**	**\$ 3,449,458**
**Liabilities**					
Accounts Payable	\$ 862,111	\$ 775,469	\$ 821,728	\$ 851,511	\$ 851,511
Payables from Capital Budget	-	-	-	-	-
Loan Payable	-	-	-	-	-
**Total Liabilities**	**\$ 862,111**	**\$ 775,469**	**\$ 821,728**	**\$ 851,511**	**\$ 851,511**
**Owners' Equity**					
Common Stock					
Retained Earnings					
**Total Owners' Equity**					
**Total Liabilities and Owners' Equity**	**\$ 862,111**	**\$ 775,469**	**\$ 821,728**	**\$ 851,511**	**\$ 851,511**
**Net Working Capital (NWC)**					
Current assets					
Current liabilities					
= Net working capital					
Beginning NWC					
Ending NWC					
= Change in NWC					

**FIGURE A7.2** Liabilities Components of Company MNO's Balance Sheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
**Assets**					
Cash	\$ 110,522	\$ 726,552	\$ 1,441,311	\$ 2,154,566	\$ 2,154,566
Accounts Receivable	1,036,000	822,350	900,000	780,111	780,111
Inventory	461,370	478,133	468,331	468,331	468,331
Fixed Assets, net	16,113	78,019	78,078	40,450	40,450
**Total Assets**	**\$ 1,623,005**	**\$ 2,155,054**	**\$ 2,947,671**	**\$ 3,449,458**	**\$ 3,449,458**
**Liabilities**					
Accounts Payable	\$ 862,111	\$ 775,469	\$ 821,728	\$ 851,511	\$ 851,511
Payables from Capital Budget	-	-	-	-	-
Loan Payable	-	-	-	-	-
**Total Liabilities**	**\$ 862,111**	**\$ 775,469**	**\$ 821,728**	**\$ 851,511**	**\$ 851,511**
**Owners' Equity**					
Common Stock	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000
Retained Earnings	670,894	1,179,085	1,825,943	2,397,947	2,397,947
**Total Owners' Equity**	**\$ 770,894**	**\$ 1,379,085**	**\$ 2,025,943**	**\$ 2,597,947**	**\$ 2,597,947**
**Total Liabilities and Owners' Equity**	**\$ 1,623,005**	**\$ 2,155,054**	**\$ 2,847,671**	**\$ 3,449,458**	**\$ 3,449,458**
**Net Working Capital (NWC)**					
Current assets					
Current liabilities					
= Net working capital					
Beginning NWC					
Ending NWC					
= Change in NWC					

**FIGURE A7.3** Owners' Equity Components of Company MNO's Balance Sheet

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Assets</b>					
Cash	\$ 110,522	\$ 726,552	\$ 1,441,311	\$ 2,154,566	\$ 2,154,566
Accounts Receivable	1,035,000	922,350	900,000	780,111	780,111
Inventory	461,370	478,133	468,331	468,331	468,331
Fixed Assets, net	16,113	28,019	38,028	46,450	46,450
<b>Total Assets</b>	<b>\$ 1,623,005</b>	<b>\$ 2,155,054</b>	<b>\$ 2,847,671</b>	<b>\$ 3,449,458</b>	<b>\$ 3,449,458</b>
<b>Liabilities</b>					
Accounts Payable	\$ 852,111	\$ 775,469	\$ 821,728	\$ 851,511	\$ 851,511
Payables from Capital Budget	-	-	-	-	-
Loan Payable	-	-	-	-	-
<b>Total Liabilities</b>	<b>\$ 852,111</b>	<b>\$ 775,469</b>	<b>\$ 821,728</b>	<b>\$ 851,511</b>	<b>\$ 851,511</b>
<b>Owners' Equity</b>					
Common Stock	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000
Retained Earnings	570,894	1,179,585	1,825,943	2,397,947	2,397,947
<b>Total Owners' Equity</b>	<b>\$ 770,894</b>	<b>\$ 1,379,585</b>	<b>\$ 2,025,943</b>	<b>\$ 2,597,947</b>	<b>\$ 2,597,947</b>
<b>Total Liabilities and Owners' Equity</b>	<b>\$ 1,623,005</b>	<b>\$ 2,155,054</b>	<b>\$ 2,847,671</b>	<b>\$ 3,449,458</b>	<b>\$ 3,449,458</b>
<b>Net Working Capital (NWC)</b>					
Current assets	\$ 1,496,370	\$ 1,400,483	\$ 1,368,331	\$ 1,248,442	N/A
- Current liabilities	852,111	775,469	821,728	851,511	N/A
<b>= Net working capital</b>	<b>\$ 644,259</b>	<b>\$ 625,014</b>	<b>\$ 546,603</b>	<b>\$ 396,931</b>	<b>N/A</b>
Beginning NWC	\$ -	\$ 644,259	\$ 625,014	\$ 546,603	N/A
- Ending NWC	644,259	625,014	546,603	396,931	N/A
<b>= Change in NWC</b>	<b>\$ (644,259)</b>	<b>\$ 19,245</b>	<b>\$ 78,411</b>	<b>\$ 149,672</b>	<b>N/A</b>

**FIGURE A7.4** Changes in Company MNO's Net Working Capital

**CHAPTER 8 Consolidated Financial Statements**

1. The Cash Flows from Operating Activities in Company PQR’s Statement of Cash Flows are shown in Figure A8.1.
2. The Cash Flows from Investing Activities in Company PQR’s Statement of Cash Flows are shown in Figure A8.2.
3. The Cash Flows from Financing Activities in Company PQR’s Statement of Cash Flows are shown in Figure A8.3.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Cash Flows from Operating Activities</b>					
Net Income	704,194	717,494	711,449	703,893	2,837,031
Adjustments to reconcile net income to cash provided from operating activities					
Depreciation	1,625	3,000	4,875	5,750	15,250
(Increase) decrease in Accounts Receivable	(250,000)	(14,271)	(18,438)	(7,292)	(290,000)
(Increase) decrease in Inventory	(465,833)	(13,333)	(20,833)	-	(500,000)
Increase (decrease) in Accounts Payable	588,611	(118,333)	15,833	13,889	500,000
Increase (decrease) in Loan Payable	50,000	(50,000)	-	-	-
Cash provided (used) by operating activities	628,597	524,557	692,887	716,240	2,562,281
<b>Cash Flows from Investing Activities</b>					
Purchase of capital assets					
Cash provided (used) by investing activities	-	-	-	-	-
<b>Cash Flows from Financing Activities</b>					
Proceeds from sale of Common Stock					
Cash provided (used) by financing activities	-	-	-	-	-
Net increase (decrease) in cash	628,597	524,557	692,887	716,240	2,562,281
Cash, beginning of period	-	628,597	1,153,153	1,846,040	-
Cash, end of period	628,597	1,153,153	1,846,040	2,562,281	2,562,281

**FIGURE A8.1** Cash Flows from Operating Activities in Company PQR’s Statement of Cash Flows

	Period				X4
	1Q X4	2Q X4	3Q X4	4Q X4	
<b>Cash Flows from Operating Activities</b>					
Net Income	704,194	717,494	711,449	703,893	2,837,031
Adjustments to reconcile net income to cash provided from operating activities					
Depreciation	1,625	3,000	4,875	5,750	15,250
(Increase) decrease in Accounts Receivable	(250,000)	(14,271)	(18,438)	(7,292)	(290,000)
(Increase) decrease in Inventory	(465,833)	(13,333)	(20,833)	-	(500,000)
Increase (decrease) in Accounts Payable	588,611	(118,333)	15,833	13,889	500,000
Increase (decrease) in Loan Payable	50,000	(50,000)	-	-	-
Cash provided (used) by operating activities	628,597	524,557	692,887	716,240	2,562,281
<b>Cash Flows from Investing Activities</b>					
Purchase of capital assets	(32,000)	(27,000)	(37,000)	(17,000)	(113,000)
Cash provided (used) by investing activities	(32,000)	(27,000)	(37,000)	(17,000)	(113,000)
<b>Cash Flows from Financing Activities</b>					
Proceeds from sale of Common Stock					
Cash provided (used) by financing activities	-	-	-	-	-
Net increase (decrease) in cash	596,597	497,557	655,887	699,240	2,449,281
Cash, beginning of period	-	596,597	1,094,153	1,750,040	-
Cash, end of period	596,597	1,094,153	1,750,040	2,449,281	2,449,281

**FIGURE A8.2** Cash Flows from Investing Activities in Company PQR's Statement of Cash Flows

	Period				X4
	1Q X4	2Q X4	3Q X4	4Q X4	
<b>Cash Flows from Operating Activities</b>					
Net Income	704,194	717,494	711,449	703,893	2,837,031
Adjustments to reconcile net income to cash provided from operating activities					
Depreciation	1,625	3,000	4,875	5,750	15,250
(Increase) decrease in Accounts Receivable	(250,000)	(14,271)	(18,438)	(7,292)	(290,000)
(Increase) decrease in Inventory	(465,833)	(13,333)	(20,833)	-	(500,000)
Increase (decrease) in Accounts Payable	588,611	(118,333)	15,833	13,889	500,000
Increase (decrease) in Loan Payable	50,000	(50,000)	-	-	-
Cash provided (used) by operating activities	628,597	524,557	692,887	716,240	2,562,281
<b>Cash Flows from Investing Activities</b>					
Purchase of capital assets	(32,000)	(27,000)	(37,000)	(17,000)	(113,000)
Cash provided (used) by investing activities	(32,000)	(27,000)	(37,000)	(17,000)	(113,000)
<b>Cash Flows from Financing Activities</b>					
Proceeds from sale of Common Stock	250,000	-	-	-	250,000
Cash provided (used) by financing activities	250,000	-	-	-	250,000

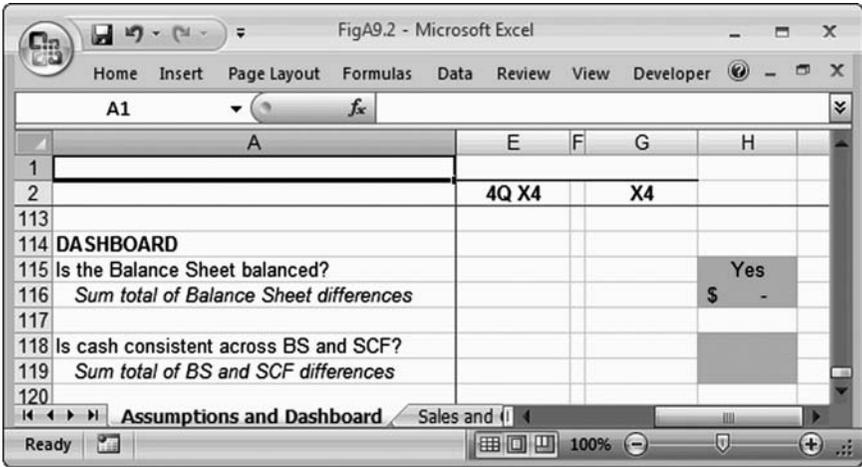
**FIGURE A8.3** Cash Flows from Financing Activities in Company PQR's Statement of Cash Flows

**CHAPTER 9 Free Cash Flows and Dashboard**

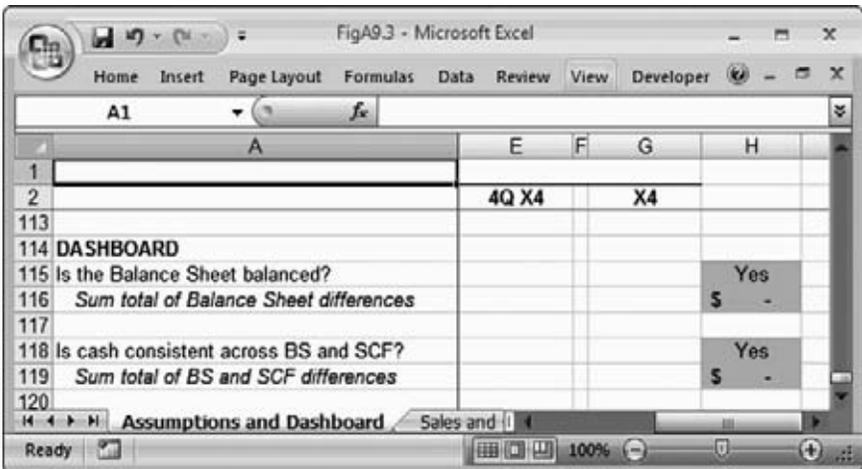
1. Company STU’s free cash flows worksheet is shown in Figure A9.1.
2. The Balance Sheet status indicator in Company STU’s Assumptions and Dashboard worksheet is shown in Figure A9.2.
3. The Statement of Cash Flows status indicator in Company STU’s Assumptions and Dashboard worksheet is shown in Figure A9.3

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
EBIT	6,290,913	8,732,038	11,269,575	15,986,200	42,278,725
Effective tax rate	35.0%	35.0%	35.0%	35.0%	
EBIT * (1 - t)	4,089,093	5,675,824	7,325,224	10,391,030	27,481,171
+ Depreciation	9,063	18,125	27,188	36,250	90,625
- CAPEX	175,000	175,000	175,000	175,000	700,000
- Changes in NWC	1,583,333	1,402,778	1,556,867	765,355	5,308,333
= Free cash flow	2,339,822	4,116,172	5,620,544	9,486,925	21,563,463
+ Terminal value					
= Total free cash flow					
Present value					
NPV					
WACC					
g (to perpetuity)					

**FIGURE A9.1** Company STU’s Free Cash Flows Worksheet



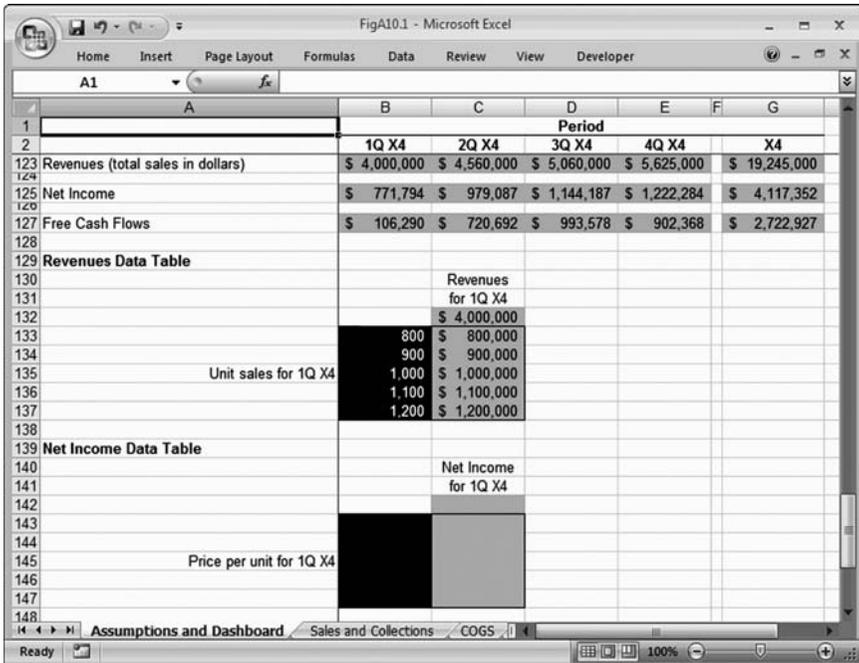
**FIGURE A9.2** Balance Sheet Status Indicator in Company STU’s Assumptions and Dashboard Worksheet



**FIGURE A9.3** Statement of Cash Flows Status Indicator in Company STU’s Assumptions and Dashboard Worksheet

### CHAPTER 10 Sensitivity Analysis

1. The Revenues data table for Company VWX is shown in Figure A10.1.
2. The Net Income data table for Company VWX is shown in Figure A10.2.
3. The Free Cash Flows data table for Company VWX is shown in Figure A10.3.



**FIGURE A10.1** Revenues Data Table for Company VWX

		Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
123	Revenues (total sales in dollars)	\$ 4,000,000	\$ 4,550,000	\$ 5,060,000	\$ 5,625,000	\$ 19,245,000
125	Net Income	\$ 771,794	\$ 979,667	\$ 1,144,187	\$ 1,222,264	\$ 4,117,927
127	Free Cash Flows	\$ 106,290	\$ 720,692	\$ 993,578	\$ 902,368	\$ 2,722,927

		Revenues for 1Q X4	
132			\$ 4,000,000
133		800	\$ 800,000
134		900	\$ 900,000
135	Unit sales for 1Q X4	1,000	\$ 1,000,000
136		1,100	\$ 1,100,000
137		1,200	\$ 1,200,000

		Net Income for 1Q X4	
142			\$ 771,794
143		\$ 700	\$ 100,994
144		\$ 850	\$ 436,394
145	Price per unit for 1Q X4	\$ 1,000	\$ 771,794
146		\$ 1,150	\$ 1,107,194
147		\$ 1,300	\$ 1,442,594

FIGURE A10.2 Net Income Data Table for Company VWX

		Free Cash Flow for 1Q X4	
152			\$ 106,290
153		\$ 65.00	\$ 128,623
154		\$ 78.00	\$ 121,179
155	Electronics: cost per unit for 1Q X4	\$ 78.00	\$ 113,734
156		\$ 88.00	\$ 106,290
157		\$ 85.00	\$ 98,845

FIGURE A10.3 Free Cash Flows Data Table for Company VWX

### CHAPTER 11 Contribution Margin Analysis

1. Company 123's variable costs are identified in Figure A11.1.
2. Company 123's fixed costs are identified in Figure A11.2
3. Company 123's contribution margin is calculated and reconciled with Company 123's Net Income in Figure A11.3.
4. Company 123's operating leverage is calculated in Figure A11.4.
5. Company 123's breakeven point in terms of units is calculated in Figure A11.5.
6. Company 123's breakeven point in terms of dollars of revenue is calculated in Figure A11.6.

A	Period				
	B	C	D	E	F
	1Q X4	2Q X4	3Q X4	4Q X4	X4
3 Variable Costs					
4 Electronics	\$ 60,000	\$ 90,000	\$ 121,800	\$ 159,600	\$ 431,400
5 Casing	60,000	88,500	115,500	148,400	412,400
6 Assembly labor	40,000	60,000	79,800	103,600	283,400
7 Miscellaneous expenses	20,000	30,000	39,900	51,520	141,420
8 Research and development	25,000	37,500	49,875	64,400	176,775
9 Total variable costs	\$ 205,000	\$ 306,000	\$ 406,875	\$ 527,520	\$ 1,445,395

FIGURE A11.1 Company 123's Variable Costs

A	Period				
	B	C	D	E	F
	1Q X4	2Q X4	3Q X4	4Q X4	X4
11 Fixed Costs					
12 Salaries	\$ 447,063	\$ 461,438	\$ 526,125	\$ 526,125	\$ 1,960,750
13 Rent	18,000	18,000	18,000	18,000	72,000
14 Depreciation	1,375	3,000	4,575	5,950	14,900
15 Total fixed costs	\$ 466,438	\$ 482,438	\$ 548,700	\$ 550,075	\$ 2,047,650

FIGURE A11.2 Company 123's Fixed Costs

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Variable Costs</b>					
Electronics	\$ 60,000	\$ 90,000	\$ 121,800	\$ 159,600	\$ 431,400
Casing	60,000	88,500	115,500	148,400	412,400
Assembly labor	40,000	60,000	79,800	103,600	283,400
Miscellaneous expenses	20,000	30,000	39,900	51,520	141,420
Research and development	25,000	37,500	49,875	64,400	176,775
<b>Total variable costs</b>	<b>\$ 205,000</b>	<b>\$ 306,000</b>	<b>\$ 406,875</b>	<b>\$ 527,520</b>	<b>\$ 1,445,395</b>
<b>Fixed Costs</b>					
Salaries	\$ 447,063	\$ 461,438	\$ 526,125	\$ 526,125	\$ 1,960,750
Rent	19,000	18,000	18,000	18,000	72,000
Depreciation	1,375	3,000	4,575	5,950	14,900
<b>Total fixed costs</b>	<b>\$ 466,438</b>	<b>\$ 482,438</b>	<b>\$ 548,700</b>	<b>\$ 550,075</b>	<b>\$ 2,047,650</b>
<b>Contribution Margin</b>					
Sales	\$ 500,000	\$ 750,000	\$ 997,500	\$ 1,288,000	\$ 3,535,500
- Variable costs	205,000	306,000	406,875	527,520	1,445,395
<b>= Contribution margin</b>	<b>\$ 295,000</b>	<b>\$ 444,000</b>	<b>\$ 590,625</b>	<b>\$ 760,480</b>	<b>\$ 2,090,105</b>
- Fixed costs	466,438	482,438	548,700	550,075	2,047,650
- Interest expense	813	-	-	-	813
- Taxes	(51,675)	(11,531)	14,674	73,642	25,109
<b>= Net income</b>	<b>\$ (120,575)</b>	<b>\$ (26,906)</b>	<b>\$ 27,251</b>	<b>\$ 136,763</b>	<b>\$ 16,533</b>

**FIGURE A11.3** Company 123's Contribution Margin and Reconciliation with Net Income

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Contribution Margin</b>					
Sales	\$ 500,000	\$ 750,000	\$ 997,500	\$ 1,288,000	\$ 3,535,500
- Variable costs	205,000	306,000	406,875	527,520	1,445,395
<b>= Contribution margin</b>	<b>\$ 295,000</b>	<b>\$ 444,000</b>	<b>\$ 590,625</b>	<b>\$ 760,480</b>	<b>\$ 2,090,105</b>
- Fixed costs	466,438	482,438	548,700	550,075	2,047,650
- Interest expense	813	-	-	-	813
- Taxes	(51,675)	(11,531)	14,674	73,642	25,109
<b>= Net income</b>	<b>\$ (120,575)</b>	<b>\$ (26,906)</b>	<b>\$ 27,251</b>	<b>\$ 136,763</b>	<b>\$ 16,533</b>
<b>Operating Leverage</b>					
Fixed costs	\$ 466,438	\$ 482,438	\$ 548,700	\$ 550,075	\$ 2,047,650
<b>Total costs (fixed + variable)</b>	<b>\$ 671,438</b>	<b>\$ 788,438</b>	<b>\$ 955,575</b>	<b>\$ 1,077,595</b>	<b>\$ 3,493,045</b>
<b>Operating leverage</b>	<b>69.5%</b>	<b>61.2%</b>	<b>57.4%</b>	<b>51.0%</b>	<b>58.6%</b>

**FIGURE A11.4** Company 123's Operating Leverage

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Contribution Margin</b>					
18 Sales	\$ 500,000	\$ 750,000	\$ 997,500	\$ 1,288,000	\$ 3,535,500
19 - Variable costs	205,000	306,000	406,875	527,520	1,445,395
20 = Contribution margin	\$ 295,000	\$ 444,000	\$ 590,625	\$ 760,480	\$ 2,090,105
21 - Fixed costs	466,438	482,438	548,700	550,075	2,047,650
22 - Interest expense	813	-	-	-	813
23 - Taxes	(51,675)	(11,531)	14,674	73,642	25,109
24 = Net income	\$ (120,575)	\$ (26,906)	\$ 27,251	\$ 136,763	\$ 16,533
<b>Operating Leverage</b>					
27 Fixed costs	\$ 466,438	\$ 482,438	\$ 548,700	\$ 550,075	\$ 2,047,650
28 Total costs (fixed + variable)	\$ 671,438	\$ 788,438	\$ 955,575	\$ 1,077,595	\$ 3,493,045
30 Operating leverage	69.5%	61.2%	57.4%	51.0%	58.6%
<b>Breakeven Point in Units</b>					
33 Contribution Margin per Unit					
34 Price per unit	\$ 500.00	\$ 500.00	\$ 475.00	\$ 460.00	
35 - Variable costs per unit	205	204	194	188	
36 = Contribution margin per unit	\$ 295.00	\$ 296.00	\$ 281.25	\$ 271.60	
38 Fixed costs	\$ 466,438	\$ 482,438	\$ 548,700	\$ 550,075	
40 Breakeven point in units	1,581	1,630	1,951	2,025	

**FIGURE A11.5** Company 123's Breakeven Point in Terms of Units

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Contribution Margin</b>					
18 Sales	\$ 500,000	\$ 750,000	\$ 997,500	\$ 1,288,000	\$ 3,535,500
19 - Variable costs	205,000	306,000	406,875	527,520	1,445,395
20 = Contribution margin	\$ 295,000	\$ 444,000	\$ 590,625	\$ 760,480	\$ 2,090,105
21 - Fixed costs	466,438	482,438	548,700	550,075	2,047,650
22 - Interest expense	813	-	-	-	813
23 - Taxes	(51,675)	(11,531)	14,674	73,642	25,109
24 = Net income	\$ (120,575)	\$ (26,906)	\$ 27,251	\$ 136,763	\$ 16,533
<b>Operating Leverage</b>					
27 Fixed costs	\$ 466,438	\$ 482,438	\$ 548,700	\$ 550,075	\$ 2,047,650
28 Total costs (fixed + variable)	\$ 671,438	\$ 788,438	\$ 955,575	\$ 1,077,595	\$ 3,493,045
30 Operating leverage	69.5%	61.2%	57.4%	51.0%	58.6%
<b>Breakeven Point in Units</b>					
33 Contribution Margin per Unit					
34 Price per unit	\$ 500.00	\$ 500.00	\$ 475.00	\$ 460.00	
35 - Variable costs per unit	205	204	194	188	
36 = Contribution margin per unit	\$ 295.00	\$ 296.00	\$ 281.25	\$ 271.60	
38 Fixed costs	\$ 466,438	\$ 482,438	\$ 548,700	\$ 550,075	
40 Breakeven point in units	1,581	1,630	1,951	2,025	
<b>Breakeven Point in Dollars</b>					
43 Breakeven point in units	1,581	1,630	1,951	2,025	
44 * Price per unit	\$ 500	\$ 500	\$ 475	\$ 460	
45 = Breakeven point in dollars	\$ 790,572	\$ 814,928	\$ 926,693	\$ 931,644	

**FIGURE A11.6** Company 123's Breakeven Point in Terms of Dollars of Revenue

**CHAPTER 12 Financial Ratios Analysis**

1. Company 456’s Gross Margin, Pre-Tax Margin, and Net Profit Margin are calculated in Figure A12.1.
2. Company 456’s Return on Equity, Return on Assets, and Return on Capital are calculated in Figure A12.2.
3. Company 456’s Income per Employee, Revenue per Employee, Receivable Turnover, Inventory Turnover, and Asset Turnover are calculated in Figure A12.3.

FigA12.1 - Microsoft Excel						
Home Insert Page Layout Formulas Data Review View Developer						
A1	B	C	D	E	F	G
	Period					
	1Q X4	2Q X4	3Q X4	4Q X4	X4	
<b>Profit Margins</b>						
Gross Margin	51.3%	52.1%	52.9%	51.2%	51.9%	
Pre-Tax Margin	27.6%	28.6%	26.0%	23.3%	26.3%	
Net Profit Margin	18.0%	18.6%	16.9%	15.1%	17.1%	
<b>Investment Returns (Annualized)</b>						
Return on Equity						
Return on Assets						
Return on Capital						
<b>Management Efficiency (Annualized)</b>						
Income/Employee						
Revenue/Employee						
Receivable Turnover						
Inventory Turnover						
Asset Turnover						
<b>Values Used for the Above Calculations</b>						
Gross profit	\$ 3,850,000	\$ 4,295,500	\$ 4,559,750	\$ 4,383,700	\$ 17,088,950	
Sales	7,500,000	8,250,000	8,625,000	8,555,000	32,930,000	
Taxable income	2,071,250	2,357,050	2,240,200	1,991,500	8,660,000	
Net income	1,346,313	1,532,083	1,456,130	1,294,475	5,629,000	
Owners' Equity	1,596,313	3,128,395	4,584,525	5,879,000	5,879,000	
Assets	3,804,387	4,902,358	6,407,014	7,732,911	7,732,911	
Capital	1,596,313	3,128,395	4,584,525	5,879,000	5,879,000	
Employees	26	26	36	38	38	
Accounts Receivable	1,666,667	1,833,333	1,916,667	1,901,111	1,901,111	
Cost-of-goods sold	3,650,000	3,954,500	4,065,250	4,171,300	15,841,050	
Inventory	1,318,167	1,355,083	1,390,433	1,390,433	1,390,433	

**FIGURE A12.1** Company 456’s Gross Margin, Pre-Tax Margin, and Net Profit Margin

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Profit Margins</b>					
Gross Margin	51.3%	52.1%	52.9%	51.2%	51.9%
Pre-Tax Margin	27.6%	28.6%	26.0%	23.3%	26.3%
Net Profit Margin	18.0%	18.6%	16.9%	15.1%	17.1%
<b>Investment Returns (Annualized)</b>					
Return on Equity	337.4%	195.9%	127.0%	88.1%	95.7%
Return on Assets	141.6%	125.0%	90.9%	67.0%	72.8%
Return on Capital	337.4%	195.9%	127.0%	88.1%	95.7%
<b>Management Efficiency (Annualized)</b>					
Income/Employee					
Revenue/Employee					
Receivable Turnover					
Inventory Turnover					
Asset Turnover					
<b>Values Used for the Above Calculations</b>					
Gross profit	\$ 3,850,000	\$ 4,295,500	\$ 4,559,750	\$ 4,383,700	\$ 17,088,950
Sales	7,500,000	8,250,000	8,625,000	8,555,000	32,930,000
Taxable income	2,071,250	2,357,050	2,240,200	1,991,500	8,660,000
Net income	1,346,313	1,532,083	1,456,130	1,294,475	5,629,000
Owners' Equity	1,596,313	3,128,395	4,584,525	5,879,000	5,879,000
Assets	3,804,387	4,902,358	6,407,014	7,732,911	7,732,911
Capital	1,596,313	3,128,395	4,584,525	5,879,000	5,879,000
Employees	26	26	36	38	38
Accounts Receivable	1,666,667	1,833,333	1,916,667	1,901,111	1,901,111
Cost-of-goods sold	3,650,000	3,954,500	4,065,250	4,171,300	15,841,050
Inventory	1,318,167	1,355,083	1,390,433	1,390,433	1,390,433

**FIGURE A12.2** Company 456's Return on Equity, Return on Assets, and Return on Capital

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
<b>Profit Margins</b>					
Gross Margin	51.3%	52.1%	52.9%	51.2%	51.9%
Pre-Tax Margin	27.6%	28.6%	26.0%	23.3%	26.3%
Net Profit Margin	18.0%	18.6%	16.9%	15.1%	17.1%
<b>Investment Returns (Annualized)</b>					
Return on Equity	337.4%	195.9%	127.0%	88.1%	95.7%
Return on Assets	141.6%	125.0%	90.9%	67.0%	72.8%
Return on Capital	337.4%	195.9%	127.0%	88.1%	95.7%
<b>Management Efficiency (Annualized)</b>					
Income/Employee	\$ 207,125	\$ 235,705	\$ 161,792	\$ 136,261	\$ 148,132
Revenue/Employee	\$ 1,153,846	\$ 1,269,231	\$ 958,333	\$ 900,526	\$ 866,579
Receivable Turnover	18.0	18.0	18.0	18.0	17.3
Inventory Turnover	11.1	11.7	11.7	12.0	11.4
Asset Turnover	7.9	6.7	5.4	4.4	4.3
<b>Values Used for the Above Calculations</b>					
Gross profit	\$ 3,850,000	\$ 4,295,500	\$ 4,559,750	\$ 4,383,700	\$ 17,088,950
Sales	7,500,000	8,250,000	8,625,000	8,555,000	32,930,000
Taxable income	2,071,250	2,357,050	2,240,200	1,991,500	8,660,000
Net income	1,346,313	1,532,083	1,456,130	1,294,475	5,629,000
Owners' Equity	1,596,313	3,128,395	4,584,525	5,879,000	5,879,000
Assets	3,804,387	4,902,358	6,407,014	7,732,911	7,732,911
Capital	1,596,313	3,128,395	4,584,525	5,879,000	5,879,000
Employees	26	26	36	38	38
Accounts Receivable	1,666,667	1,833,333	1,916,667	1,901,111	1,901,111
Cost-of-goods sold	3,650,000	3,954,500	4,065,250	4,171,300	15,841,050
Inventory	1,318,167	1,355,083	1,390,433	1,390,433	1,390,433

**FIGURE A12.3** Company 456's Income Per Employee, Revenue Per Employee, Receivables Turnover, Inventory Turnover, and Asset Turnover

**CHAPTER 13 Valuation**

1. Company 456’s total free cash flows are calculated in Figure A13.1.
2. Company 456’s Net Present Value is calculated in Figure A13.2.
3. The multiples of (i) sales, (ii) Net Income, and (iii) free cash flows for each of the comparable public companies, along with a calculation for median values associated with these measures/metrics, and the fictitious stock index, are calculated in Figure A13.3.
4. Company 456’s public company comparable valuation is calculated in Figure A13.4.
5. The multiples of (i) sales, (ii) Net Income, and (iii) Asset values for each of the mergers and acquisitions transactions, along with a calculation for median values associated with these measures/metrics, are calculated in Figure A13.5.
6. Company 456’s mergers and acquisitions comparable valuation is calculated in Figure A13.6.
7. Company 456’s weighted valuations and total valuation are calculated in Figure A13.7.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
EBIT	\$ 2,071,250	\$ 2,357,050	\$ 2,240,200	\$ 1,991,500	\$ 8,660,000
Effective tax rate	35.0%	35.0%	35.0%	35.0%	
EBIT * (1 - t)	\$ 1,346,313	\$ 1,532,083	\$ 1,456,130	\$ 1,294,475	\$ 5,629,000
+ Depreciation	1,950	4,150	6,150	8,200	20,450
- CAPEX	38,000	43,000	39,000	40,000	160,000
- Changes in NWC	776,759	637,694	70,157	(46,978)	1,437,633
= Free cash flow	\$ 533,503	\$ 855,538	\$ 1,353,123	\$ 1,309,653	\$ 4,051,817
+ Terminal value	N/A	N/A	N/A	21,272,038	21,272,038
= Total free cash flow	\$ 533,503	\$ 855,538	\$ 1,353,123	\$ 22,581,690	\$ 25,323,854
Present value					
NPV					
WACC	25.0%				
g (to perpetuity)	5.0%				

**FIGURE A13.1** Company 456’s Total Free Cash Flows

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
EBIT	\$ 2,071,250	\$ 2,357,050	\$ 2,240,200	\$ 1,991,500	\$ 8,660,000
Effective tax rate	35.0%	35.0%	35.0%	35.0%	
EBIT * (1 - t)	\$ 1,346,313	\$ 1,532,083	\$ 1,456,130	\$ 1,294,475	\$ 5,629,000
+ Depreciation	1,950	4,150	6,150	8,200	20,450
- CAPEX	38,000	43,000	39,000	40,000	160,000
- Changes in NWC	776,759	637,694	70,157	(46,978)	1,437,633
= Free cash flow	\$ 533,503	\$ 855,538	\$ 1,353,123	\$ 1,309,653	\$ 4,051,817
+ Terminal value	N/A	N/A	N/A	21,272,038	21,272,038
= Total free cash flow	\$ 533,503	\$ 855,538	\$ 1,353,123	\$ 22,581,690	\$ 25,323,854
Present value	\$ 504,556	\$ 765,216	\$ 1,144,602	\$ 18,065,352	
NPV	\$ 20,479,727				
WACC	25.0%				
g (to perpetuity)	5.0%				

FIGURE A13.2 Company 456’s Net Present Value

	Valuation (Price)	Projected (Next 4 Quarters)			Multiple of Projected (Next 4 Quarters)		
		Sales	Net Income	Free Cash Flows	Sales	Net Income	Free Cash Flows
Competitor 1	\$ 100,000,000	\$ 110,000,000	\$ 11,000,000	\$ 12,000,000	0.91	9.09	8.33
Competitor 2	\$ 90,000,000	\$ 105,000,000	\$ 10,000,000	\$ 11,000,000	0.86	9.00	8.18
Competitor 3	\$ 80,000,000	\$ 95,000,000	\$ 10,000,000	\$ 10,500,000	0.84	8.00	7.62
Median	\$ 90,000,000	\$ 105,000,000	\$ 10,000,000	\$ 11,000,000	0.86	9.00	8.18
Stock Index	\$ 800,000,000	\$ 900,000,000	\$ 90,000,000	\$ 100,000,000	0.89	8.89	8.00

FIGURE A13.3 Multiple and Median Calculations For Public Company Comparables

Public Company Comparables		Projected (Next 4 Quarters)			Multiple of Projected (Next 4 Quarters):		
	Valuation (Price)	Sales	Net Income	Free Cash Flows	Sales	Net Income	Free Cash
Competitor 1	\$ 100,000,000	\$ 110,000,000	\$ 11,000,000	\$ 12,000,000	0.91	9.09	8.33
Competitor 2	\$ 90,000,000	\$ 105,000,000	\$ 10,000,000	\$ 11,000,000	0.86	9.00	8.18
Competitor 3	\$ 80,000,000	\$ 95,000,000	\$ 10,000,000	\$ 10,500,000	0.84	8.00	7.62
Median	\$ 90,000,000	\$ 105,000,000	\$ 10,000,000	\$ 11,000,000	0.86	9.00	8.18
Stock Index	\$ 800,000,000	\$ 900,000,000	\$ 90,000,000	\$ 100,000,000	0.89	8.89	8.00
Napavale		Valuation Based Upon Median Multiples and Projected (Next 4 Quarters):					
		Sales	Net Income	Free Cash Flows			
Direct competitors median multiples		\$ 28,225,714	\$ 50,661,000	\$ 33,151,227			
Stock index multiples		\$ 29,271,111	\$ 50,035,556	\$ 32,414,533			

FIGURE A13.4 Company 456's Public Company Comparable Valuation

Mergers and Acquisitions Comparables		Projected (Next 4 Quarters)			Multiple of Projected (Next 4 Quarters):		
	Valuation (Price)	Sales	Net Income	Assets	Sales	Net Income	Assets
Company 1	\$ 75,000,000	\$ 80,000,000	\$ 8,000,000	\$ 80,000,000	0.94	9.38	0.94
Company 2	\$ 60,000,000	\$ 71,000,000	\$ 7,500,000	\$ 70,000,000	0.85	8.00	0.86
Company 3	\$ 55,000,000	\$ 62,000,000	\$ 7,000,000	\$ 90,000,000	0.89	7.86	0.61
Median	\$ 60,000,000	\$ 71,000,000	\$ 7,500,000	\$ 80,000,000	0.89	8.00	0.86
Napavale		Valuation Based Upon Median Multiples and Projected (Next 4 Quarters):					
		Sales	Net Income	Assets			
Target companies median multiples							

FIGURE A13.5 Multiple and Median Calculations for Mergers and Acquisitions

		Projected (Next 4 Quarters)			Multiple of Projected (Next 4 Quarters):			
		Valuation (Price)	Sales	Net Income	Assets	Sales	Net Income	Assets
<b>Target Companies</b>								
Company 1	\$ 75,000,000	\$ 80,000,000	\$ 8,000,000	\$ 80,000,000	0.94	9.38	0.94	
Company 2	\$ 60,000,000	\$ 71,000,000	\$ 7,500,000	\$ 70,000,000	0.85	8.00	0.86	
Company 3	\$ 55,000,000	\$ 62,000,000	\$ 7,000,000	\$ 90,000,000	0.89	7.86	0.61	
Median	\$ 60,000,000	\$ 71,000,000	\$ 7,500,000	\$ 80,000,000	0.89	8.00	0.86	
		<b>Valuation Based Upon Median Multiples and Projected (Next 4 Quarters):</b>						
			Net					
			Sales	Income	Assets			
Target companies median multiples		\$ 29,212,097	\$ 45,032,000	\$ 6,628,210				

**FIGURE A13.6** Company 456's Mergers and Acquisitions Comparable Valuation

Valuation Technique	Valuation	Relative Weight	Weighted Valuation
Discounted cash flow	\$ 20,479,727	60.0%	\$ 12,287,836
Public company comparables	\$ 28,225,714	20.0%	\$ 5,645,143
Mergers and acquisitions comparables	\$ 29,212,097	20.0%	\$ 5,842,419
<b>Total</b>		<b>100.0%</b>	<b>\$ 23,775,399</b>

**FIGURE A13.7** Company 456's Weighted Valuations and Total Valuation

### CHAPTER 14 Capitalization Chart

1. Company 456’s founding Capitalization Chart is shown in Figure A14.1.
2. Company 456’s post–equity investment Capitalization Chart is shown in Figure A14.2.
3. Company 456’s post–stock options issuance Capitalization Chart is shown in Figure A14.3.

	Undiluted		Diluted	
	Shares	%	Shares + Options	%
Founder 1	500,000	50.0%		
Founder 2	250,000	25.0%		
Founder 3	250,000	25.0%		
Investor	-	0.0%		
Employees	-	0.0%		
<b>Total</b>	<b>1,000,000</b>	<b>100.0%</b>		

Investor's Ownership Calculation

Post-money valuation

Equity investment

Total shares of Founder's stock

% of Company owned

Shares issued to Investor

**FIGURE A14.1** Company 456’s Founding Capitalization Chart

		Undiluted		Diluted		
		Shares	% Ownership	Options	Shares + Options	% Ownership
6	Founder 1	500,000	49.5%			
7	Founder 2	250,000	24.7%			
8	Founder 3	250,000	24.7%			
9	Investor	10,627	1.1%			
10	Employees	-	0.0%			
11	Total	1,010,627	100.0%			

Investor's Ownership Calculation		
15	Post-money valuation	\$ 23,775,399
16	Equity investment	\$ 250,000
18	Total shares of Founder's stock	1,000,000
20	% of Company owned	1.1%
21	Shares issued to Investor	10,627

**FIGURE A14.2** Company 456's Post-Equity Investment Capitalization Chart

		Undiluted		Diluted		
		Shares	% Ownership	Options	Shares + Options	% Ownership
6	Founder 1	500,000	49.5%	-	500,000	41.3%
7	Founder 2	250,000	24.7%	-	250,000	20.7%
8	Founder 3	250,000	24.7%	-	250,000	20.7%
9	Investor	10,627	1.1%	-	10,627	0.9%
10	Employees	-	0.0%	200,000	200,000	16.5%
11	Total	1,010,627	100.0%	200,000	1,210,627	100.0%

Investor's Ownership Calculation		
15	Post-money valuation	\$ 23,775,399
16	Equity investment	\$ 250,000
18	Total shares of Founder's stock	1,000,000
20	% of Company owned	1.1%
21	Shares issued to Investor	10,627

**FIGURE A14.3** Company 456's Post-Stock Options Issuance Capitalization Chart

# **General Overview of Microsoft Excel 2007 Features and Functionality**

**T**his appendix provides a targeted overview of Microsoft Excel 2007 features and functionality related to building financial models. While many full-length books on the market today cover each feature of Microsoft Excel in detail, this appendix covers the most frequently used features of Excel at a general level. As this book assumes a basic level of understanding of Microsoft Excel, this appendix should serve as a reference and/or starting point from which you can delve more deeply into the vast capabilities of Excel.

This appendix is divided into four sections:

1. Basic Functionality
2. Formatting
3. Formulas and Functions
4. Advanced Features

Note that this appendix applies to Microsoft Excel 2007, which differs from earlier versions of Excel in a number of significant ways.

## **BASIC FUNCTIONALITY**

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Microsoft Excel files are also referred to as “workbooks.” These files, which end with the “.xlsx” extension, store and organize information. Microsoft Excel’s basic functionality includes creating, modifying, viewing, and saving information.

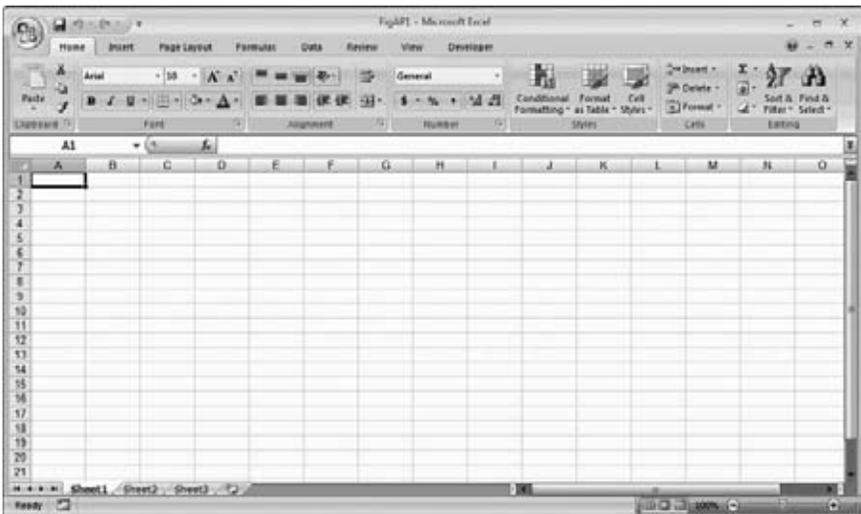
## Keyboard Shortcuts

Microsoft Excel offers many keyboard shortcuts to execute certain tasks. Navigating menus and executing commands using these shortcuts can save you time and effort as you build financial models in Excel.

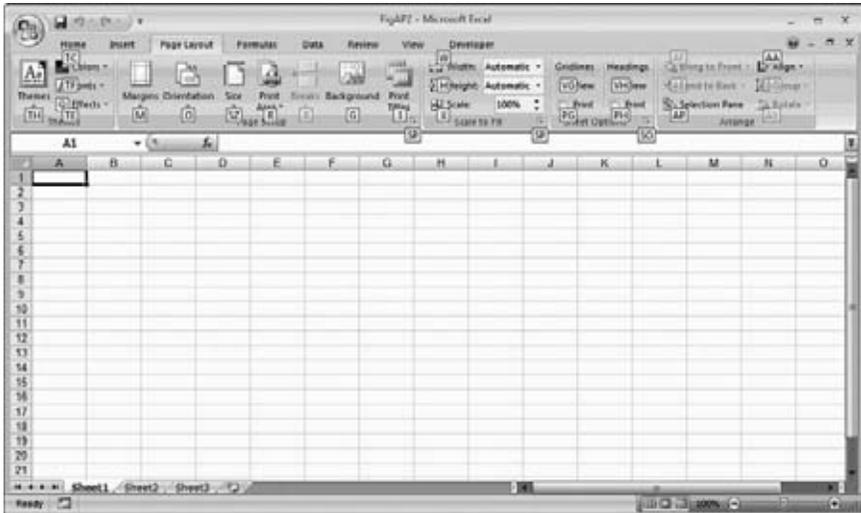
Accessing menus through keyboard commands requires you to first press the “ALT” button on your keyboard. Pressing “ALT” in Excel 2007 causes letters and/or numbers to appear on top of the Excel ribbon. The specific letters and/or numbers that appear in Excel when you press “ALT” will depend on a number of factors, such as the configuration of your version of Excel and the version of your operating system (among other factors). Figure AP.1 shows the menu bar for Microsoft Excel 2007 running in Microsoft Windows Vista Home Premium Edition.

Each of the letters and numbers in Figure AP.1 provides access to different features and functionality. By clicking on the “ALT” key on your keyboard and then clicking on a letter or number for the area of interest (e.g., clicking on “ALT” + “P” for the “Page Layout” tab of the Excel ribbon), a drop-down menu will appear. Figure AP.2 presents a view of the Excel ribbon after clicking “ALT” + “P” to access the Page Layout tab of the Excel ribbon. Note that additional letters and/or numbers may still show on the Excel ribbon after a keyboard shortcut has been executed.

Each of the available options that appear after clicking the “ALT” key will have a letter or number highlighted. You may simply press the letter or



**FIGURE AP.1** Menu Bar for Excel 2007



**FIGURE AP.2** Page Layout Tab

number of interest and that option will execute. Using the “Page Layout” tab above, for example, once the Page Layout tab is activated, you can click on the letter “M” on your keyboard to access the “Margins” drop-down menu (because the “Margins” drop-down menu appears as “M” on the “Page Layout” tab on the Excel ribbon once that tab has been activated using the ALT + “P” keyboard shortcut).

## **New, Open, Close, and Save**

Once the Microsoft Excel application is open on your computer, you may (among many other tasks) create a new workbook, open an existing workbook, close any open workbooks, and save any open workbooks. Each of these tasks may be accomplished using the “Office” button (the round button [usually] in the upper left of the Excel window with the blue, red, yellow, and green logo on it).

Click on the “Office” button and then select the option of interest. Selecting “New” allows you to start a new workbook. Selecting “Open” allows you to open an existing workbook—a dialog box will appear after you select “Open” through which you can navigate to the file of interest. If you select “Close,” the workbook on which you are working will close. Be sure to save any desired changes to your workbook before closing the file.

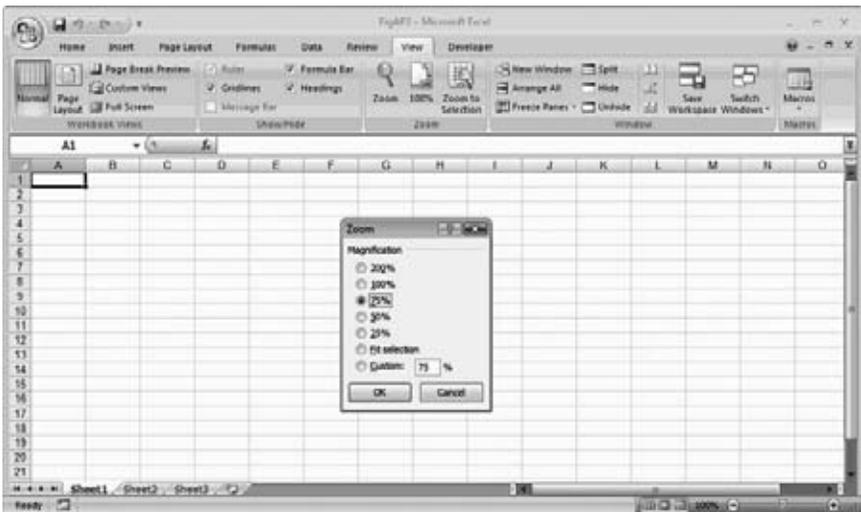
Selecting “Save” from the “Office” drop-down menu will save the workbook on which you are working. If you have not saved the workbook previously, a dialog box will appear asking you to name the file and select the location in which you would like to save the file. You may also select “Save As” from the “Office” drop-down menu—this allows you to save your workbook in another format or in another location.

## Viewing Information

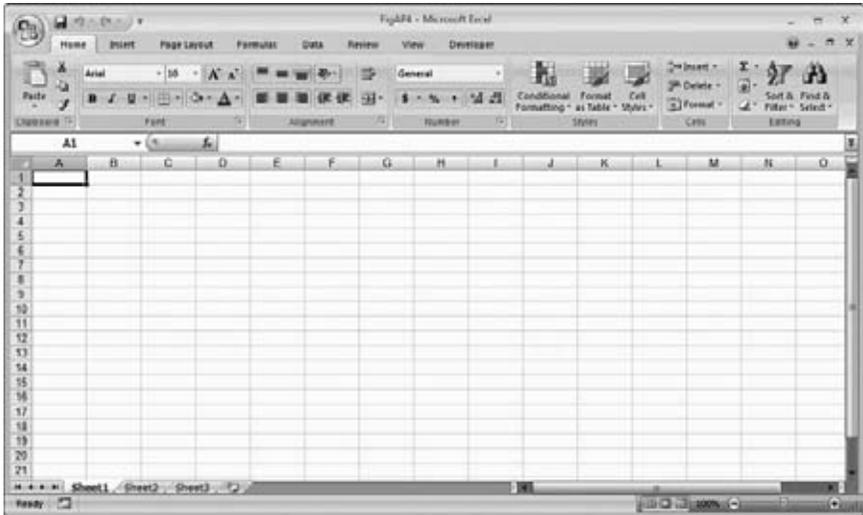
Excel allows you to “zoom,” or change the size/magnification, into or out of workbooks. Given the wide range of monitor resolutions that people use today, it is often helpful to change the zoom settings of a workbook. To change the zoom settings within Excel, select the “View” tab on the Excel ribbon and press the “Zoom” button in the “Zoom” section of the ribbon. A dialog box will appear listing a variety of zoom settings; choose the setting that best suits your preferences. Figure AP.3 shows a typical zoom dialog box (with 75% selected for the magnification).

## Entering Information into Cells

Each cell in an Excel workbook represents a unique location, or place, in which information is stored. Excel workbooks contain at least one



**FIGURE AP.3** Zoom Dialog Box



**FIGURE AP.4** Worksheets in Excel Workbook

worksheet. Figure AP.4 shows the three worksheets (named Sheet1, Sheet2, and Sheet3) contained in this workbook.

Each cell in each worksheet is identified by a column and row “address,” such as cell A1. The address of the active (or selected) cell appears in the “name box,” which in Figure AP.4 is shown directly above the column A identifier and appears as “A1.” This indicates that cell A1 is active and selected.

Cells may contain, among other things, numeric values, text, formulas, functions, or hyperlinks, or they may be empty. Entering information into cells is an important and straightforward task. Information is entered into cells by first selecting the cell of interest (by clicking on that cell). You may then either type the information directly into the active cell, or you may first click in the “formula bar,” which is shown in Figure AP.4 as the empty white box directly to the right of “fx.”

How you enter information in a cell is determined by the type of information that you are entering. To enter a number, you may enter the number directly—for example, to enter the number 211, you may type “211” directly into a cell. You may also type text directly into cells. Entering formulas and functions requires that you first type in the “=” sign. Additional information regarding the use of formulas and functions is provided later in this Appendix.

## Copy, Cut, and Paste

Copying, cutting, and pasting information in Excel are common tasks. Copying information leaves the source data intact while cutting information removes the source data. You may access all of these features through the “Home” tab on the Excel ribbon, or you can use several well-known keyboard shortcuts. The shortcuts are:

Copy = “CTRL” + “C”

Cut = “CTRL” + “X”

Paste = “CTRL” + “V”

CTRL stands for the “Control” key on your keyboard and the “+” indicates that you should press the CTRL key and the subsequent letter in the last examples while holding down the CTRL key.

## Undo and Redo

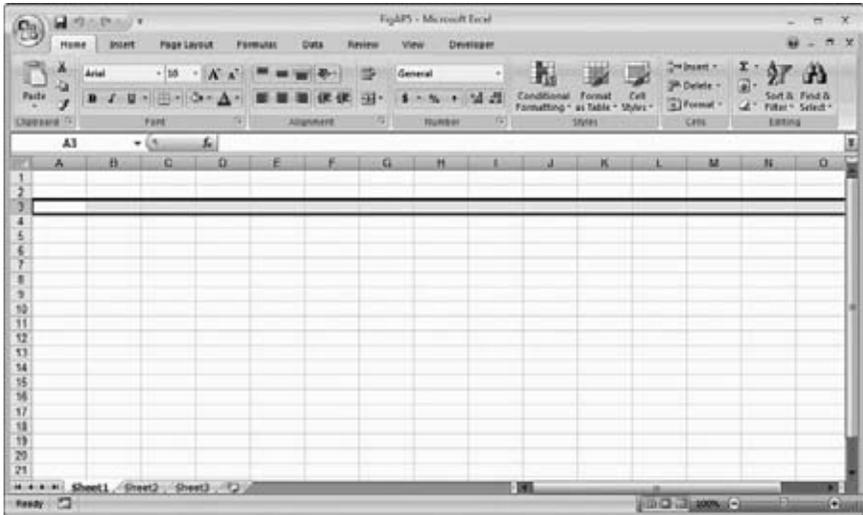
It is easy to make mistakes in Microsoft Excel. Thankfully, the application offers “undo” and “redo” functions to deal with mistakes. If you make a mistake, simply click on the left-pointing arrow on the Quick Access Toolbar (assuming your version of Excel is configured to display the “undo” button as such). If you decide that you do not want to undo a certain action, click on the right-pointing arrow on the Quick Access Toolbar (assuming your version of Excel is configured to display the “redo” button as such).

## Insert, Remove, and Move Columns and Rows

You may insert, remove, and move columns and rows in Microsoft Excel. To insert a column or row, right-click in the worksheet area, choose “Insert” from the pop-up menu, and then select what you would like to insert, such as a row or column, from the pop-up menu.

To remove or move columns or rows, you must first select the column or row of interest. To do so, click on the column or row header of interest. Figure AP.5 shows row 3 as “selected”; this is evident as the entire row is highlighted. Click on the row letter itself (“3” in Figure AP.5) to select an entire row (and click on a column number to select an entire column).

You may also select several columns or several rows at the same time by clicking on the first column or row and then, while holding the left mouse button down, dragging the cursor over the other columns or rows of interest. You can select non-contiguous columns or rows simultaneously by clicking on the first column or row of interest and then, while holding down



**FIGURE AP.5** Row 3 Selected

the CTRL key, selecting the other columns or rows of interest. Holding down the SHIFT key while doing this selects all of the columns or rows between the last column or row selected and the column or row on which you subsequently click.

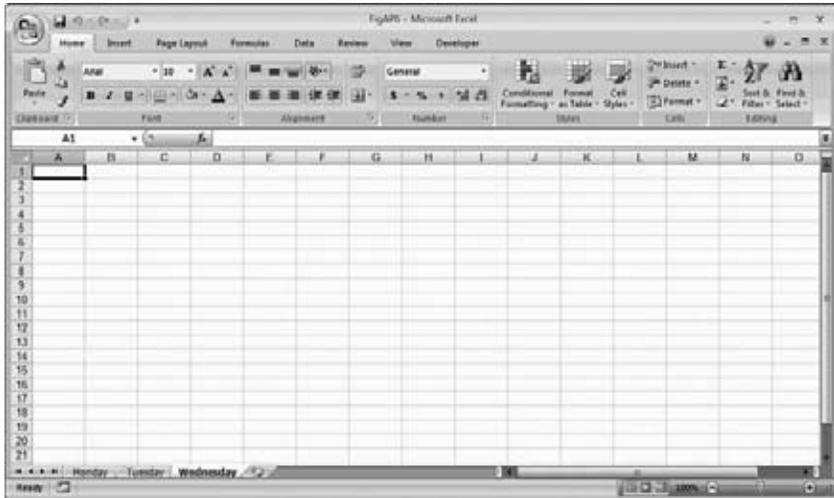
### **Naming Worksheets**

It is often helpful to name the worksheets in a workbook. To do so, double-click on the worksheet tab at the bottom of the Excel window. This will highlight the current name of the selected worksheet. You may then type in a new name for the worksheet. The three worksheets in Figure AP.6 have been renamed “Monday,” “Tuesday,” and “Wednesday.”

### **Naming Cells and Cell Ranges**

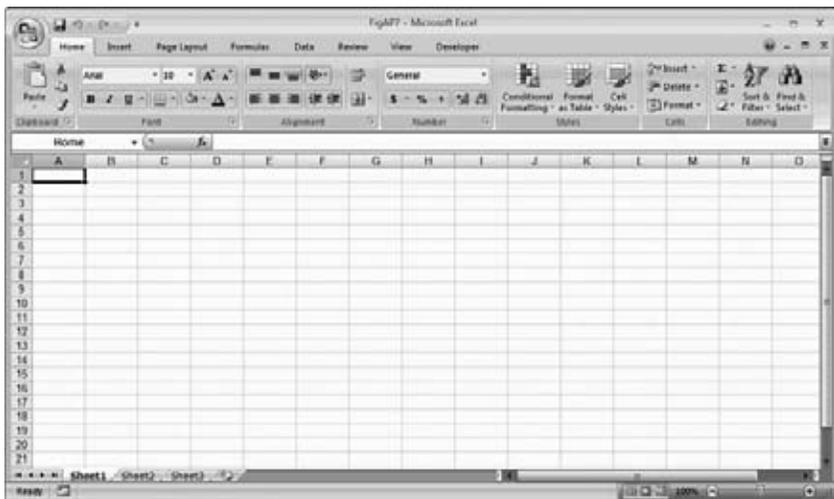
The ability to name cells and cell ranges is a useful and powerful feature embedded in Excel. Cell references (discussed later in this Appendix) are used regularly when building financial models—the use of names instead of obscure cell references, such as \$AC165, makes it easier to build and modify models.

The easiest way to name a cell or a range of cells is to use the Name Box in Excel. The Name Box typically is found directly above the label for Column A in the worksheet.



**FIGURE AP.6** Three Named Worksheets

To name a cell or a range of cells, select the cell or range of cells that you would like to name and then click on the Name Box in your worksheet. Next, simply type in your desired name for the cell or range of cells. Note that you may not use any spaces in this name. Figure AP.7 shows that cell



**FIGURE AP.7** Named Worksheet Cell

A1 has now been named “Home”—you can see the name “Home” in the name box.

You may also name cells and ranges of cells by first selecting the cell or range of cells of interest and then clicking on the “Formulas” tab on the Excel ribbon. Next, choose the “Define Name” button (usually an icon labeled “Define Name” with a white tag on a string next to the label) in the “Defined Names” section of the ribbon. Finally, simply type your desired name for the cell or range of cells into the “Name” field of the dialog box that appears after you click on the “Define Name” button. Note that you may not use any spaces in this name.

## **FORMATTING**

---

Excel offers a wide range of formatting options for worksheets and for information within cells.

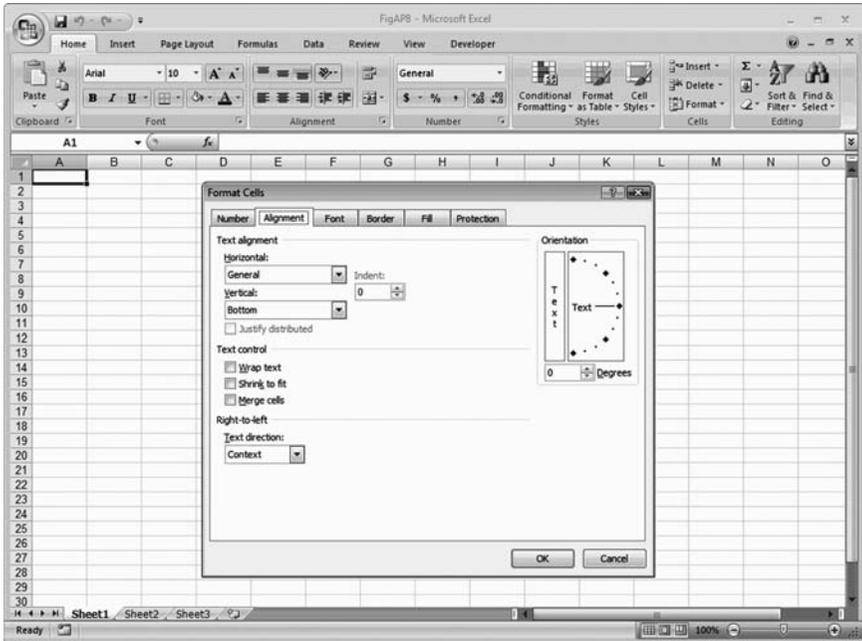
### **Cell Height and Width**

You may change the height and width of any cell within Excel. To change the height of a cell, you can either (i) click and drag the line separating the row numbers at the left side of the worksheet or (ii) right-click on the row(s) of interest, click on the “Row Height...” selection, and then enter your desired height setting into the dialog box that appears. To “auto-fit” a row to include all of the contents in the row, double-click on the bottom of the line separating the row of interest from the subsequent row (click beneath the row number label).

To change the width of a cell, you can either (i) click and drag the line separating the column letters on the top of the worksheet or (ii) right-click on the column(s) of interest, click on the “Column Width...” selection, and then enter your desired width setting into the dialog box that appears. To “auto-fit” a column to include all of the contents in the column, double-click on the line to the right of the column of interest (click to the right of the column letter label).

### **Alignment**

You can align the contents of a cell in many different ways. To see the alignment options for a cell, select the “Home” tab on the Excel ribbon and click on the “expand” button at the bottom right of the Alignment section of the ribbon. Next, click on the “Alignment” tab in the dialog box that appears. Figure AP.8 shows the alignment options.



**FIGURE AP.8** Alignment Options

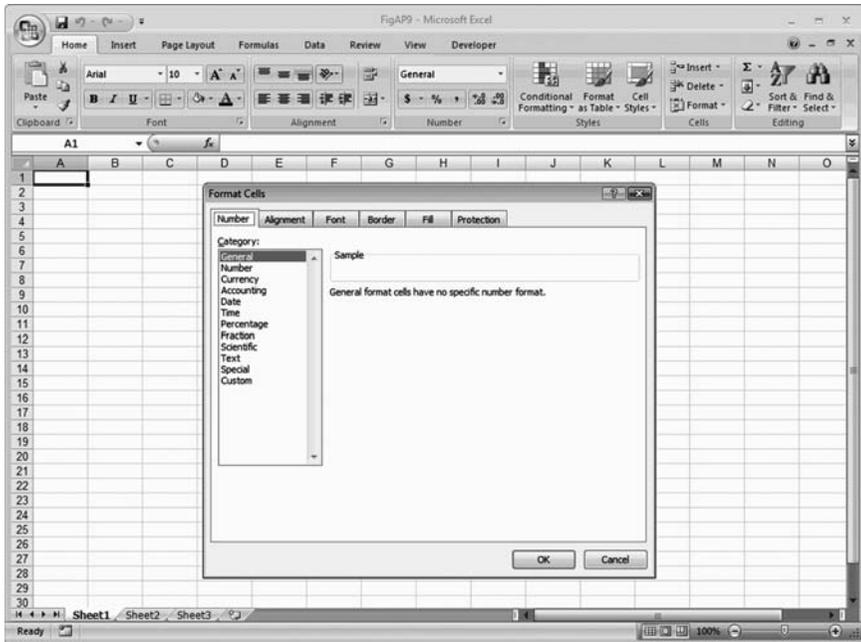
As Figure AP.8 indicates, you have the ability to control, among other features:

1. The horizontal alignment of the cell's contents
2. The vertical alignment of the cell's contents
3. The orientation (e.g. horizontal versus vertical) of the cell's contents
4. Text control options

## Number Format

The ability to alter the numerical format of a cell's contents is one of Excel's more powerful formatting features. This feature allows you to specify if, for example, a cell contains a date, a percentage, a dollar figure, or a basic number, among several other formats.

To see the number formatting options for a cell, select the "Home" tab of the Excel ribbon and click on the "expand" button at the bottom right of the "Number" section of the ribbon. Next, click on the "Number" tab in the dialog box that appears. Figure AP.9 shows the number format options.



**FIGURE AP.9** Format Options

The available number formats are listed in the “Category:” section of this dialog box. You can see the formatting choices available within each of these categories by selecting a specific category. Figure AP.10 highlights the “sub-options” available for formatting a number in “Currency” format.

### Font Format

Excel also provides for a wide range of font formatting options. These options control how the font within a selected cell (or selected cells) appears. To see the font formatting options for a cell, select the “Home” tab on the Excel ribbon and click on the “expand” button at the bottom right of the “Font” section of the ribbon. Next, click on the “Font” tab in the dialog box that appears. Figure AP.11 shows the font formatting dialog box.

The “Font” dialog box provides a way for you to change the font, style, size, and color of the selected cell or cells. You can also control the underline options and special effects such as super- and subscripts in this dialog box.

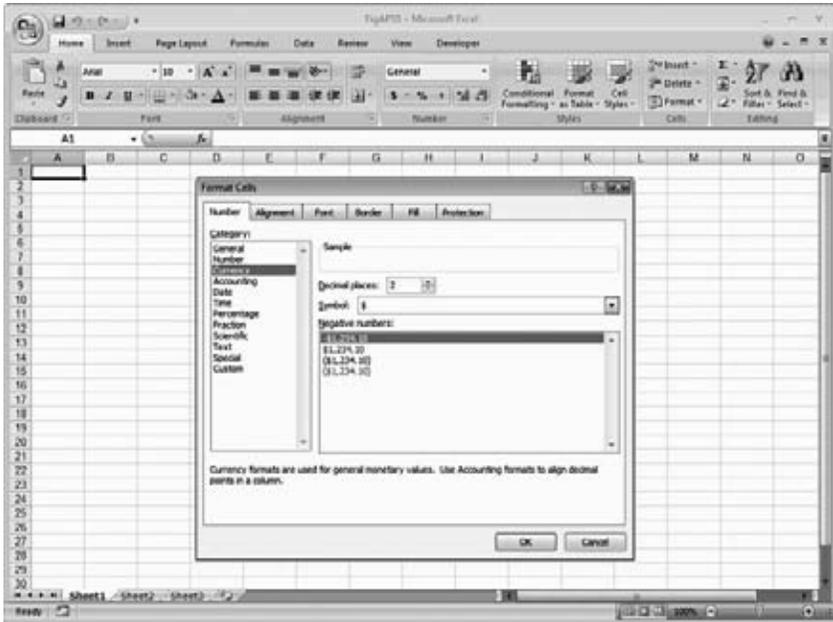


FIGURE AP.10 “Sub-Option” Formatting Options

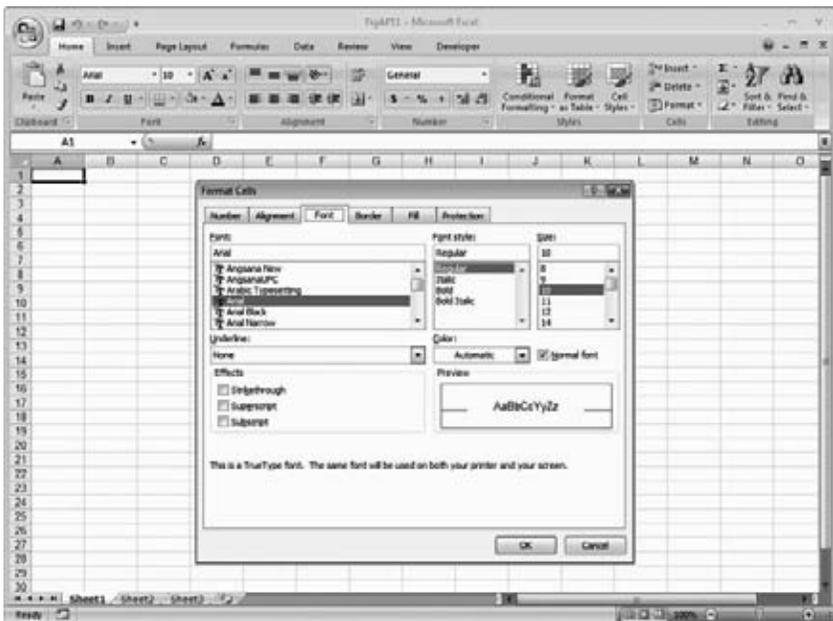
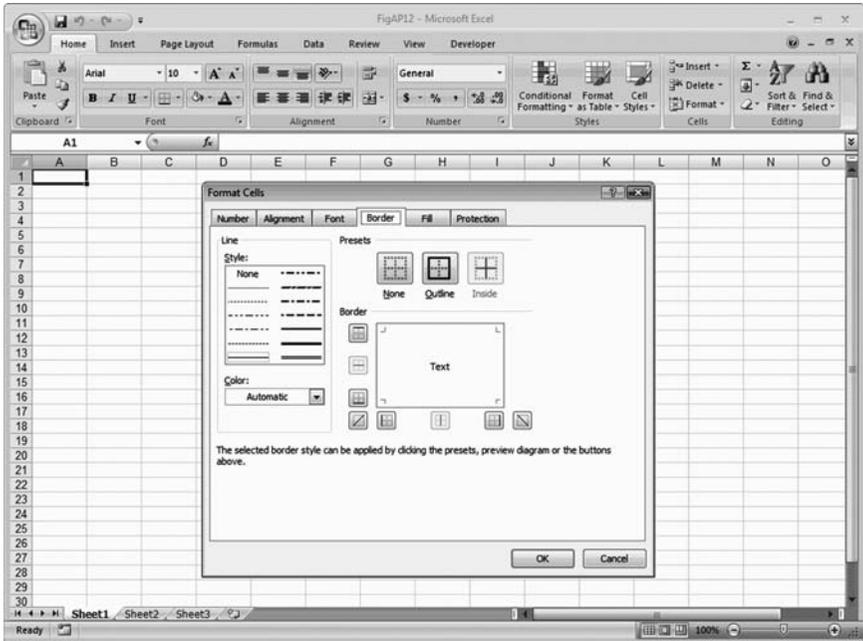


FIGURE AP.11 Font Formatting Options



**FIGURE AP.12** Border Formatting Options

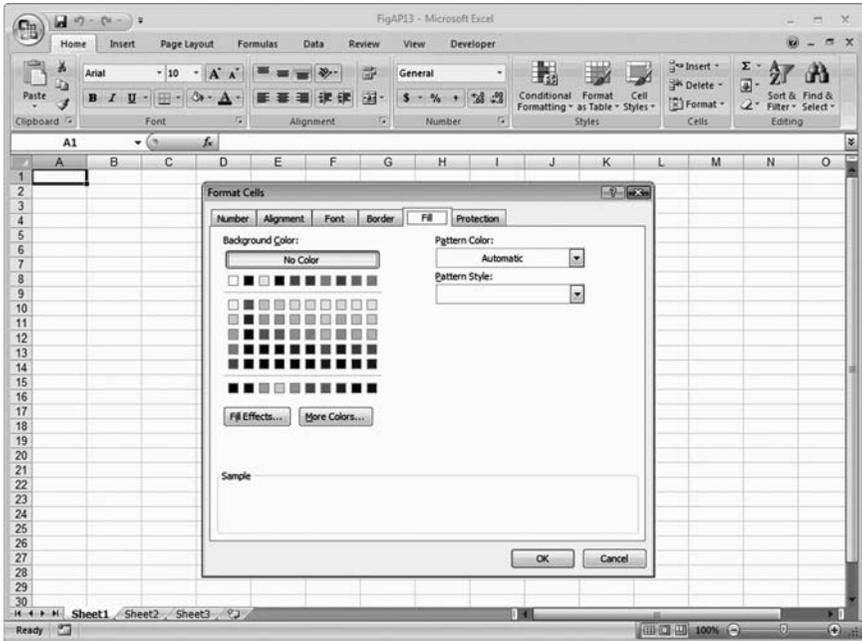
### Border Format

Each cell in a workbook has four sides, or “borders.” You can change the format of all of these borders in Excel. To see the border formatting options for a cell, select the “Home” tab on the Excel ribbon and click on the “expand” button at the bottom right of the “Font” section of the ribbon. Next, click on the “Border” tab in the dialog box that appears. Figure AP.12 shows the border formatting options.

To format a cell’s borders, first select the line style on the left side of the above dialog box and then click on the border or borders that you would like to modify in the “Border” section of the dialog box. You can also change the color of borders using the “Color” drop-down menu shown in Figure AP.12.

### Fill Format

The ability to change the shading, or fill, color of cells is another powerful formatting feature offered by Excel. Using this feature, you can, for example, make several cells of interest yellow in color while leaving the rest of a worksheet’s cells clear (or without any special colors).



**FIGURE AP.13** Patterns Dialog Box

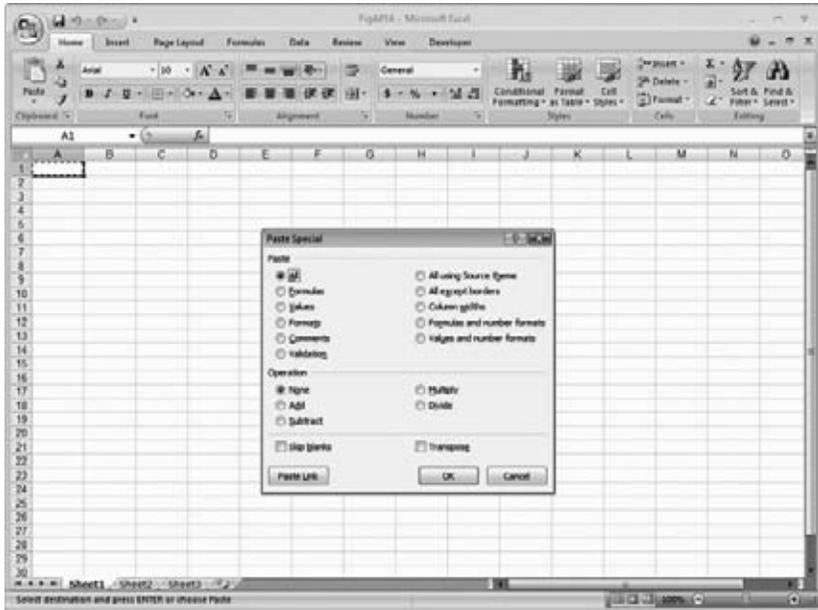
To see the fill formatting options for a cell, select the “Home” tab on the Excel ribbon and click on the “expand” button at the bottom right of the “Font” section of the ribbon. Next, click on the “Fill” tab in the dialog box that appears. Figure AP.13 shows the “Fill” dialog box.

To change the shading of a cell (or cells), click on the color of your choice as shown in Figure AP.13. This action will alter the color of the cell or cells that were selected in Excel before you opened this dialog box.

## Copy Formatting

It is possible to copy the format of a cell (or group of cells) in Excel. This feature is quite helpful when, for instance, you would like one column in a financial model to look like another column from that same model.

To copy formatting, select the cell or cells whose format you would like to copy. Click “CTRL” + “C”, or select the “Home” tab on the Excel ribbon and choose “Copy” from the “Clipboard” section of the ribbon. Next, select the cell or cells whose format you would like to change to match the format of the cell or cells that you copied above.



**FIGURE AP.14** “Paste Special” Dialog Box

Select the “Home” tab of the Excel ribbon again and press the “Paste” drop-down button in the “Clipboard” section of the ribbon. Select “Paste Special...” from the drop-down list. A dialog box offering several options will then appear—choose the “Formats” option in the “Paste” section and then click OK. A screen shot of the “Paste Special” dialog box is shown in Figure AP.14.

Using the “Paste Special” dialog box as shown in Figure AP.14 allows you to copy the format of one cell (or set of cells) and paste this formatting to a new cell (or set of cells).

## **FORMULAS AND FUNCTIONS**

---

Microsoft Excel’s powerful formulas and functions make it an ideal tool for building financial models.

### **Formulas**

Formulas are statements, or equations, that perform operations on information in your worksheets. A formula, which always begins with an

equals (=) sign in a cell in Excel, can contain any or all of the following:

1. Functions
2. References
3. Operators
4. Constants

Functions, which are described in more detail next, are predefined formulas. References identify a cell or group of cells into which Excel should look to find a value (or values). As such, references are essentially “pointers” to other cells that hold values of interest. Operators specify that a particular type of calculation should be performed on the elements of a formula. Excel has a set and predefined order in which operators are evaluated (or used) in a formula. Operators include + (add), - (subtract), \* (multiply), and / (divide), among others.

## Functions

Functions are predefined formulas that perform calculations by using arguments, which are specific values, in a particular order. Excel offers many useful built-in functions. An easy way to view the available functions for a cell is to press SHIFT + “F3” (the key marked “F3” at the top of your keyboard, as applicable). Alternatively, you can click on the “fx” button, which typically appears directly above the column headings in your worksheet.

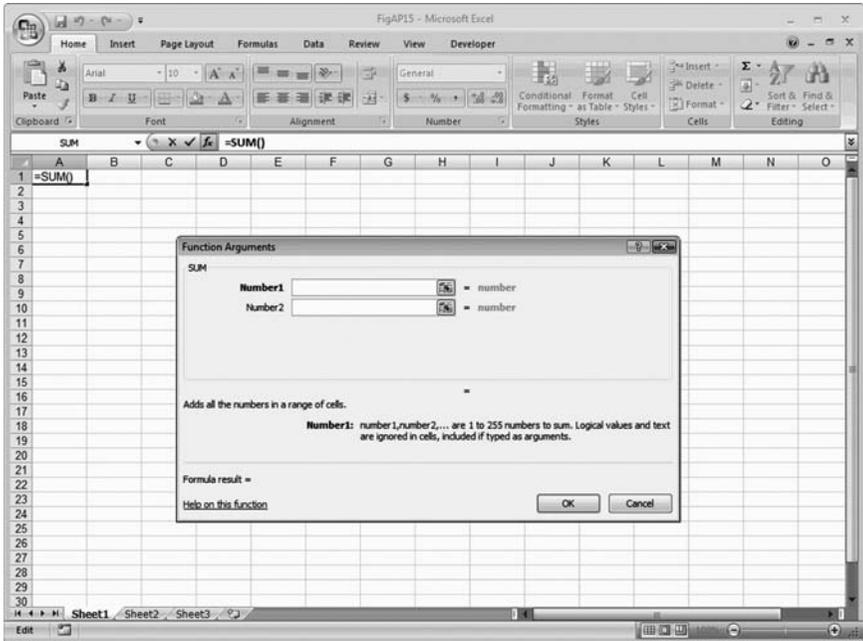
In terms of structure, functions begin with an equals (=) sign, followed by the function name (e.g., SUM), an opening parenthesis, the arguments for the function separating by commas, and a closing parenthesis. Figure AP.15 shows a “Function Arguments” dialog box for the SUM function (which adds a series of values together).

You can always click on the “Help on this function” hyperlink in the dialog box for additional help, but the tips shown in the dialog box usually do a good job of indicating how to use a particular function.

When you are entering arguments for the function into the “Function Arguments” dialog box, you can click on the small worksheet icons at the right edge of the input cells for the arguments (i.e., Number1 and Number2 in Figure AP.15). Doing so will collapse the dialog box so that you can see more of the workbook on which you are working. Simply click on the same worksheet icon again to expand the dialog box to its original size and format.

## Referencing Other Cells

When using formulas and functions in Excel, it is common to refer to, or reference, other cells. Using cell (and cell range) references offers a great deal



**FIGURE AP.15** Function Arguments Dialog Box

of flexibility when building financial models. By using a “dashboard,” or master input sheet, for a financial model, you can change one assumption on that one dashboard sheet and the rest of the financial model (e.g., Balance Sheet, Income Statement, and/or Statement of Cash Flows) automatically will reflect the effects of such a change.

A reference identifies a cell or a range of cells and tells Excel where to look for the data that you want to use in a formula. References to cells in other worksheets are called “links.” The three key types of references are called “relative references,” “absolute references,” and “mixed references.”

Relative references are based on the relative position of the cell in which the formula resides and the cell to which the reference refers. If the position of the cell containing the formula changes, the reference changes as well. If you copy the formula across rows or down columns, the reference automatically adjusts. In Excel, new formulas typically use relative references by default (depending, in part, on the configuration of your version of Excel). Relative cell references take the form of “A1.”

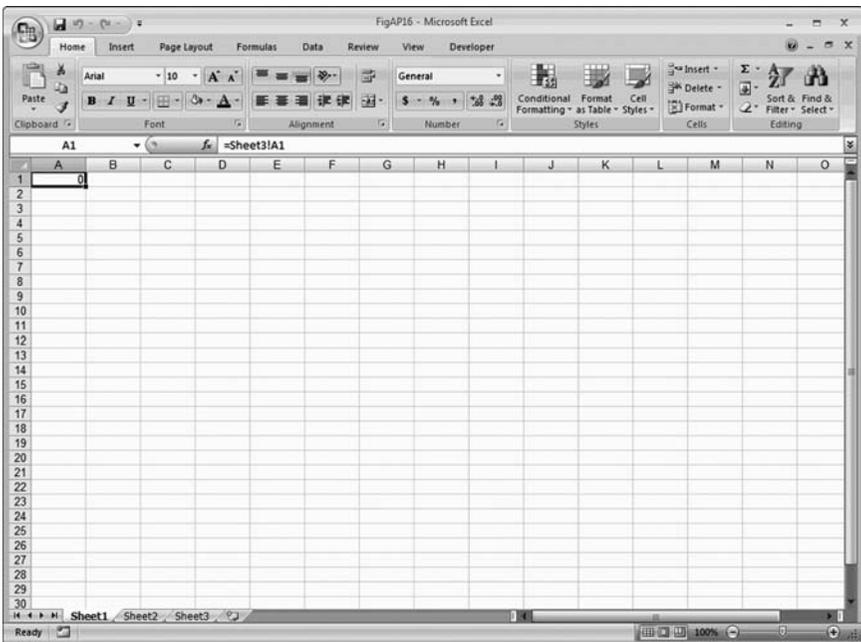
Absolute references always refer to a cell in a specific location. If the position of the cell containing the formula changes, the absolute reference

remains the same. If you copy the formula across rows or down columns, the reference does not adjust. Absolute cell references take the form of “\$A\$1.”

Mixed cell references have either absolute columns and relative rows or relative columns and absolute rows. An absolute column reference takes the form of “\$A1” or “\$B1” and an absolute row reference takes the form of “A\$1” or “B\$1.” If the position of the cell containing the formula changes, the absolute reference remains the same and the relative reference changes. If you copy the formula across rows or down columns, the absolute reference does not adjust but the relative reference automatically adjusts.

Another important feature of Excel is the ability to reference information in other worksheets using formulas. An easy way to refer to information in another worksheet is to create a new formula (this can be as simple as entering “=”) and then click on another worksheet of interest. Next, click on the cell or range of cells in this worksheet of interest and hit the “Enter” or “Return” key on your keyboard. Figure AP.16 shows a reference to another worksheet (in this case, cell A1 in Sheet3).

Please note that relative, absolute, and mixed references apply when referencing other worksheets; Figure AP.16 shows a relative reference, as it



**FIGURE AP.16** Reference to Another Worksheet

is in the form of “A1.” You can also reference separate Excel files, but this can become complicated if you do not have access to all of the referenced files when sharing workbooks.

## **ADVANCED FEATURES**

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Among the many advanced features offered by Microsoft Excel, one in particular is worth noting as it relates to building financial models: data tables. This feature is useful in building and analyzing business case scenarios.

### **Data Tables**

The data tables feature in Excel is especially useful when running sensitivity analyses. Specifically, if you are interested in evaluating the impact of one or more variables on an output of interest, such as free cash flow, data tables make this task quite manageable.

It is possible to build both one-variable and two-variable data tables in Excel. While a one-variable data table allows you to vary one independent variable, a two-variable data table allows you to evaluate the impact of changing two variables on an outcome of interest.

For the sake of simplicity, the next example discusses a one-variable data table. To build a data table, first identify your output of interest. This output must be found in a single cell—in other words, you want to see how a single output is affected by changing an input variable. Figure AP.17 shows a properly arranged data table; its components will be described later in this appendix.

The output of interest in Figure AP.17 is “Z.” “Z” is equal to “X” plus “Y.” The data table in this screen shot calculates what happens to “Z” if “Y” is changed. To build this data table, first reference the output cell of the calculation (cell B3 in Figure AP.17); this reference is placed in cell C7 in Figure AP.17. Next, enter in potential values of “Y” that you would like to evaluate; this must be done one column to the left of and one row down from the referenced cell. These potential values of “Y” are found in cells B8 to B12 in Figure AP.17. Figure AP.18 highlights the reference to the output of interest (cell B3, which has been named “Z”).

Next, highlight the referenced cell (cell C7 in Figures AP.17 and AP.18) and the cells containing the input values that you would like to evaluate. In this case, you would highlight cells B7 to C12 as shown in Figure AP.19.

Next, select the “Data” tab on the Excel ribbon, click on the “What-If Analysis” drop-down button (usually an icon labeled “What-If Analysis” with a grid and question mark next to the label) in the “Data Tools” section

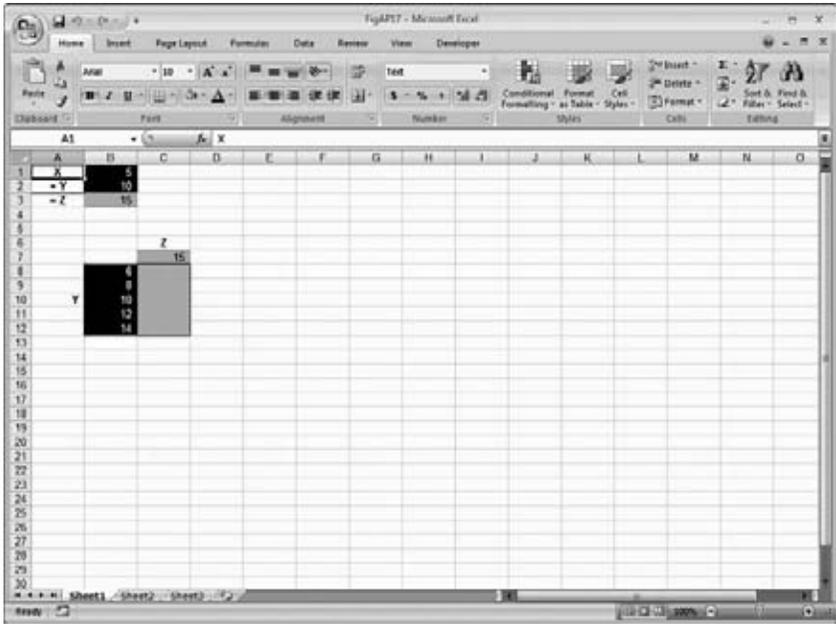


FIGURE AP.17 Completed Data Table

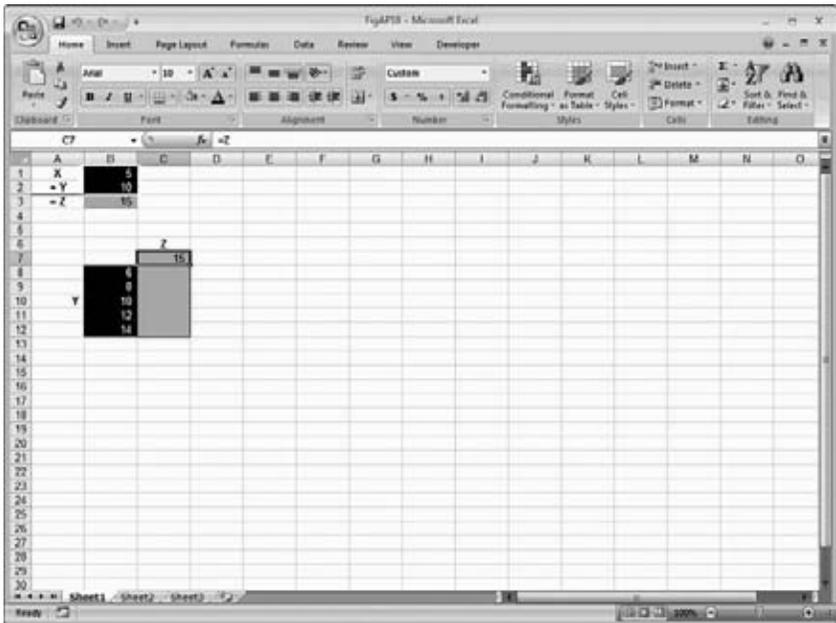


FIGURE AP.18 Reference to Output of Interest (Cell B3)

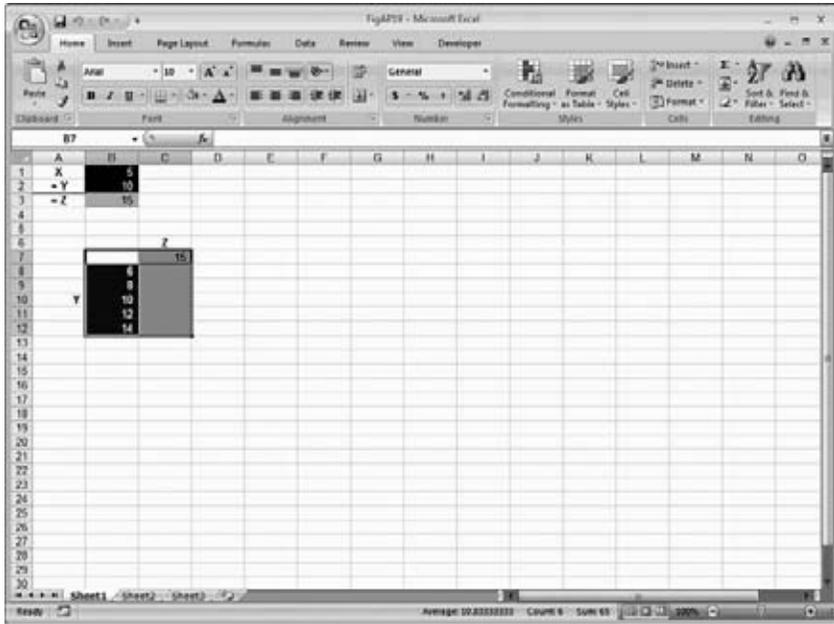


FIGURE AP.19 Highlighted Cells

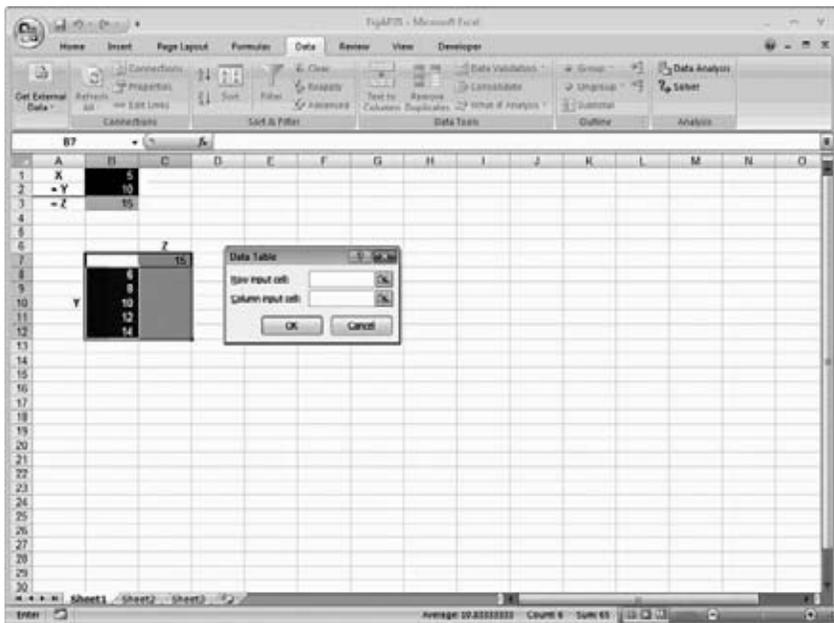


FIGURE AP.20 Dialog Box

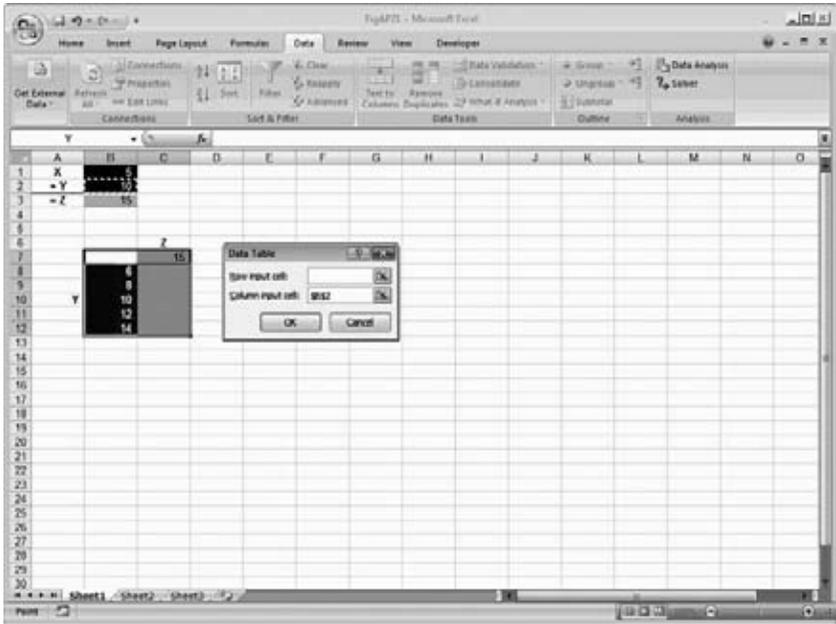


FIGURE AP.21 Cell Reference

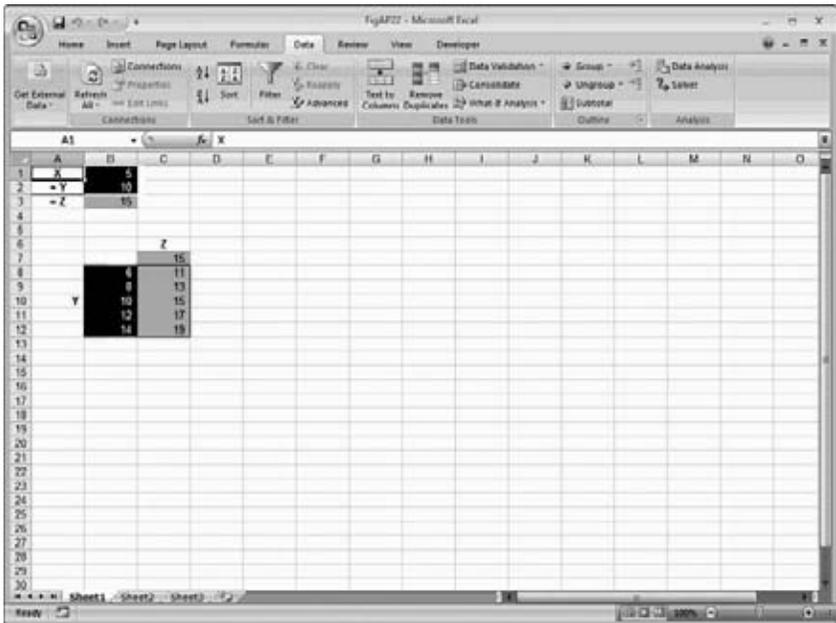


FIGURE AP.22 Data Table

of the ribbon, and choose the “Data Table. . .” option from the drop-down menu. Figure AP.20 shows the dialog box that will appear.

Since we have entered in the input values that we would like to evaluate in a column, click in the “Column input cell” data input box and refer to cell  $\$B\$2$ , as shown in Figure AP.21.

Cell  $\$B\$2$  contains the initial value of the “Y” variable. By selecting cell  $\$B\$2$  as the column input cell, the data table feature will build a table that evaluates the “Z” variable under different “Y” values. Figure AP.22 shows the resultant data table.

As suggested by the annotations in Figure AP.22, this data table may be used to evaluate “Z” under varying conditions of “Y.” For example, referring to Figure AP.22, we can see that “Z” will equal 19 if Y equals 14.



# About the CD-ROM

## INTRODUCTION

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This CD contains each of the Excel worksheets that are presented as figures in *Building Financial Models with Microsoft Excel*. These worksheets are provided for your reference so that you may track the course of the book using Microsoft Excel and so that you may build financial models of your own using these worksheets as templates. When opening a file on this CD, the worksheet corresponding to the relevant figure in the book will appear. Note that each file on this CD, however, typically contains additional information in different worksheets within that file.

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Folder: Chapter 2	Folder: Chapter 7
Fig2.2.xls–Fig2.22.xls	Fig7.2.xls–Fig7.16.xls
FigA2.1.xls–FigA2.7.xls	FigQ7.1.xls–FigQ7.10.xls
Folder: Chapter 3	FigA7.1.xls–FigA7.4.xls
Fig3.2.xls–Fig3.25.xls	Folder: Chapter 8
FigQ3.1.xls	Fig8.1.xls–Fig8.19.xls
FigQ3.2.xls	FigQ8.1.xls–FigQ8.6.xls
FigA3.1.xls–FigA3.5.xls	FigA8.1.xls–FigA8.3.xls
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	FigA11.1.xls–FigA11.6.xls

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Folder: Chapter 14

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FigQ14.1.xls–FigQ14.3.xls

FigA14.1.xls–FigA14.3.xls

Folder: Appendix

FigAP1.xls–FigAP22.xls

## **MINIMUM SYSTEM REQUIREMENTS**

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Make sure that your computer meets the minimum system requirements listed in this section. If your computer doesn't match up to most of these requirements, you may have a problem using the contents of the CD.

### **CDA**

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#### **For Windows:**

- Windows Vista or later
- CD drive
- Microsoft Office Excel 2007 or later (for the Windows Operating System)

#### **For Macintosh:**

- Mac OS X 10.5.6 or later
- CD drive
- Microsoft Excel 2008 for Mac or later (for the Macintosh Operating System)

## **USING THE CD WITH WINDOWS**

---

To use the files on the CD, follow these steps:

1. Insert the CD into your computer's CD-ROM drive.
2. A window appears with the contents of the CD-ROM listed in their directory structure.

If you do not have autorun enabled, or if the autorun window does not appear, follow these steps to access the CD:

1. Click Start and select Run.
2. In the dialog box that appears, type *d:* assuming *d* is the letter of your CD-ROM drive. This brings up the autorun window described in the preceding set of steps.

## **USING THE CD WITH THE MAC OS**

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To use the items from the CD to your hard drive, follow these steps:

1. Insert the CD into your CD-ROM drive.
2. Double-click the icon for the CD after it appears on the desktop.

## **TROUBLESHOOTING**

---

If you have difficulty installing or using any of the materials on the companion CD, try the following solutions:

- **Turn off any antivirus software that you may have running.** Installers sometimes mimic virus activity and can make your computer incorrectly believe that it is being infected by a virus. (Be sure to turn the antivirus software back on later.)
- **Close all running programs.** The more programs you're running, the less memory is available to other programs. Installers also typically update files and programs; if you keep other programs running, installation may not work properly.
- **Reference the ReadMe.** Please refer to the ReadMe file located at the root of the CD-ROM directory for the latest product information at the time of publication.

## **USING THE SOFTWARE**

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Please refer to the readme.txt file on the CD for more information.

## **CUSTOMER CARE**

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If you have trouble with the CD-ROM, please call the Wiley Product Technical Support phone number at (800) 762-2974. Outside the United States,

call +1(317) 572-3994. You can also contact Wiley Product Technical Support at <http://support.wiley.com>. John Wiley & Sons will provide technical support only for installation and other general quality control items. For technical support on the applications themselves, consult the program's vendor.

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