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Building Financial Models with **Microsoft® Excel®**

A Guide for Business Professionals

Second Edition

Includes CD-ROM with
Financial Model Spreadsheets



K. SCOTT PROCTOR

Building Financial Models with Microsoft® Excel®

Second Edition

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A Guide for Business Professionals

K. SCOTT PROCTOR



John Wiley & Sons, Inc.

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For Kimmell, Page, and Harris

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Foreword

Before 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

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 ---

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 ---

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

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

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

A FINAL NOTE

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® Excel®

Second Edition

PART
One

The Master Budget

Overview of Budgets and Financial Models

BUDGETS

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.

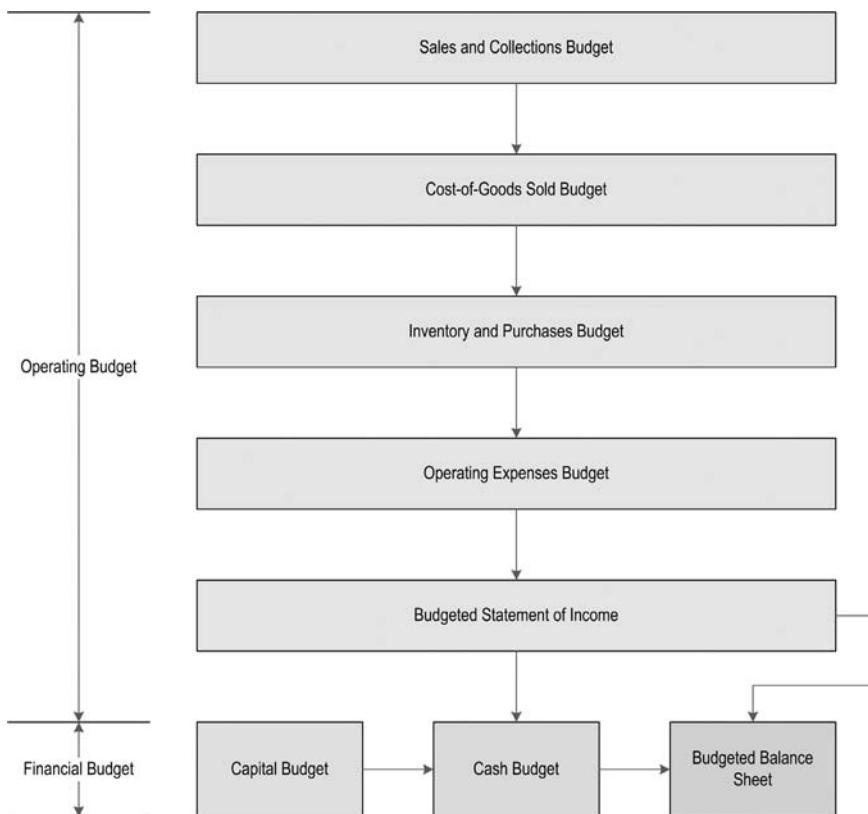


FIGURE 1.1 Components of the Master Budget

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

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.

Fig1.2 - Microsoft Excel

	A	B	C	D	E	F	G	H	I
1		Period							
2		1Q X4	2Q X4	3Q X4	4Q X4		X4		
3	SALES BUDGET								
4	<u>Unit Sales and Price Budget</u>								
5	Unit sales								
6	x Price per unit								
7	= Total sales								
8									
9	<u>Sales Composition Budget</u>								
10	Cash sales								
11	+ Credit sales								
12	= Total sales								
13									
14	COLLECTIONS BUDGET								
15	<u>Cash Collections from Customers Budget</u>								
16	Cash sales this period								
17	+ Credit sales collected								
18	= Total collections								
19									
20	<u>Accounts Receivable (A/R) Budget</u>								
21	Beginning A/R balance								
22	+ Additions to A/R								
23	- Subtractions from A/R								
24	= Ending A/R balance								
25									
26									

FIGURE 1.2 Sales and Collections Budget

Fig1.3 - Microsoft Excel

	A	B	C	D	E	F	G	H
1		Period						
2		1Q X4	2Q X4	3Q X4	4Q X4		X4	
3	COST-OF-GOODS SOLD BUDGET							
4	<u>Cost-of-Goods Sold Budget</u>							
5	Monitor screen							
6	Monitor casing							
7	Assembly labor							
8	Total cost-of-goods sold							
9								

FIGURE 1.3 Cost-of-Goods-Sold Budget

		Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
INVENTORY BUDGET						
Inventory Budget						
5	Desired ending inventory					
6	+ Cost of goods sold					
7	= Total inventory needed					
8						
PURCHASES BUDGET						
Purchases Budget						
11	Total inventory needed					
12	- Beginning inventory					
13	= Purchases					
14						
Disbursements for Purchases Budget						
Payments of payables						
17	Total disbursements for purchases					
18						
Accounts Payable (A/P) Budget						
20	Beginning A/P balance					
21	+ Additions to A/P					
22	- Subtractions from A/P					
23	Ending A/P					
24						

FIGURE 1.4 Inventory and Purchases Budget

		Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
OPERATING EXPENSES BUDGET						
Operating Expenses Budget						
5	Salaries					
6	Miscellaneous expenses					
7	Research and development					
8	Rent					
9	Depreciation					
10	Total operating expenses					
11						
DISBURSEMENTS FOR OPERATING EXPENSES BUDGET						
Disbursements for Operating Expenses Budget						
14	Salaries					
15	Miscellaneous expenses					
16	Research and development					
17	Rent					
18	Depreciation					
19	Total disbursements for operating expenses					
20						

FIGURE 1.5 Operating Expenses Budget

	A	B	C	D	E	F	G	H
1		Period						
2		1Q X4	2Q X4	3Q X4	4Q X4		X4	
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

Fig1.7 - Microsoft Excel

	A	B	C	D	E	F	G
	A1	1Q X4	2Q X4	3Q X4	4Q X4	X4	
1							
2							
3	CAPITAL BUDGET						
4	Capital Expenditures Budget						
5	Equipment						
6	Furniture						
7	Fixtures						
8	Total capital expenditures	-	-	-	-	-	
9							
10	Disbursements for Capital Expenditures Budget						
11	Equipment						
12	Furniture						
13	Fixtures						
14	Total disbursements for capital expenditures	-	-	-	-	-	
15							
16	Depreciation Budget						
17	Equipment						
18	Furniture						
19	Fixtures						
20	Total depreciation	-	-	-	-	-	
21							

FIGURE 1.7 Capital Budget

Fig1.8 - Microsoft Excel

	A	B	C	D	E	F	G
	A1	1Q X4	2Q X4	3Q X4	4Q X4	X4	
1							
2							
3	CASH BUDGET						
4	Beginning cash balance						
5	Cash receipts						
6	Collections from customers						
7	Total cash available, before financing						
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						
18	total cash needed before financing						
19	Financing						
20	Equity investment						
21	Borrowing						
22	Repayments						
23	Interest						
24	Total cash increase (decrease) from financing						
25	Ending cash balance						
26							

FIGURE 1.8 Cash Budget

	A	B	C	D	E	F	G	H
1		Period						
2		1Q X4	2Q X4	3Q X4	4Q X4		X4	
3	Assets							
4	Cash							
5	Accounts Receivable							
6	Inventory							
7	Fixed Assets, net							
8	Total Assets							
9								
10								
11	Liabilities							
12	Accounts Payable							
13	Loan Payable							
14	Total Liabilities							
15								
16								
17	Owners' Equity							
18	Common Stock							
19	Retained Earnings							
20	Total Owners' Equity							
21								
22	Total Liabilities and Owners' Equity							
23								

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.

The screenshot shows a Microsoft Excel spreadsheet titled "Fig1.10 - Microsoft Excel". The spreadsheet has a header row with columns labeled A through G. Below this, there is a row labeled "Period" with columns 1Q X4, 2Q X4, 3Q X4, 4Q X4, and X4. The main content of the spreadsheet is organized into three sections: Assets, Liabilities, and Owners' Equity. The Assets section (rows 3-8) includes Cash, Accounts Receivable, Inventory, Fixed Assets, net, and Total Assets. The Liabilities section (rows 11-14) includes Accounts Payable, Loan Payable, and Total Liabilities. The Owners' Equity section (rows 17-22) includes Common Stock, Retained Earnings, Total Owners' Equity, and Total Liabilities and Owners' Equity. All these rows have their background color set to gray.

	A	B	C	D	E	F	G
1		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	Assets						
4	Cash						
5	Accounts Receivable						
6	Inventory						
7	Fixed Assets, net						
8	Total Assets						
9							
10							
11	Liabilities						
12	Accounts Payable						
13	Loan Payable						
14	Total Liabilities						
15							
16							
17	Owners' Equity						
18	Common Stock						
19	Retained Earnings						
20	Total Owners' Equity						
21							
22	Total Liabilities and Owners' Equity						
23							

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

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

FIGURE 1.11 Income Statement

Fig1.12 - Microsoft Excel

	A	B	C	D	E	F	G
1		1Q X4	2Q X4	3Q X4	4Q X4	X4	Period
2							
3	Cash Flows from Operating Activities						
4	Net Income						
5	Adjustments to reconcile net income to cash provided from operating activities						
6	Depreciation						
7	(Increase) decrease in Accounts Receivable						
8	(Increase) decrease in Inventory						
9	Increase (decrease) in Accounts Payable						
10	Increase (decrease) in Loan Payable						
11	Cash provided (used) by operating activities						
12							
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

	A1						
	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	EBIT						
4							
5	Effective tax rate						
6							
7	EBIT * (1 - t)						
8	+ Depreciation						
9	- CAPEX						
10	- Changes in NWC						
11	= Free cash flow						
12	+ Terminal value						
13	= Total free cash flow						
14							
15	Present value						
16							
17							
18	NPV						
19							
20	WACC						
21	g (to perpetuity)						
22							

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.

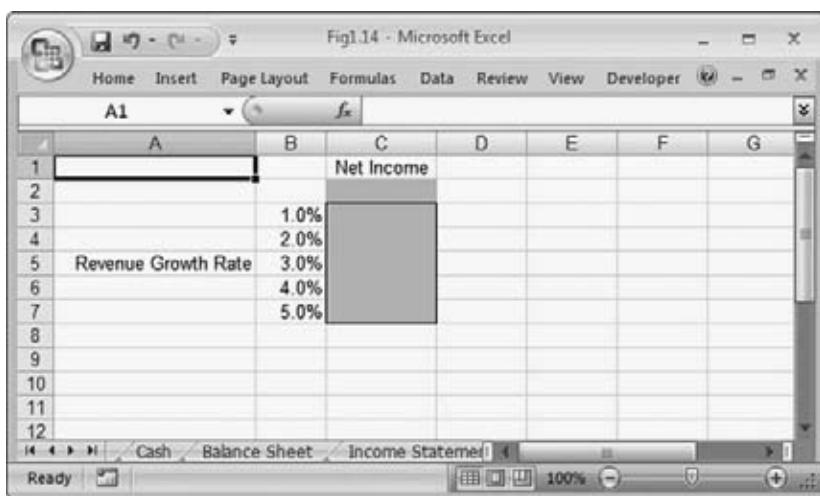


FIGURE 1.14 Data Table Template

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

The screenshot shows a Microsoft Excel spreadsheet titled "Fig1.15 - Microsoft Excel". The spreadsheet has a header row with columns A through G. Column A contains labels from 1 to 21. Columns B through D represent time periods: "1Q X4", "2Q X4", "3Q X4", and "4Q X4". Column E is labeled "X4". Rows 1 through 7 are grouped under "Variable Costs", showing values for Variable cost 1, Variable cost 2, Variable cost 3, and Total variable costs. Rows 8 through 13 are grouped under "Fixed Costs", showing values for Salaries, Rent, Depreciation, and Total fixed costs. Rows 14 through 21 are grouped under "Contribution Margin", showing Sales, Variable costs, Contribution margin, Fixed costs, and Net income.

	A	B	C	D	E	F	G
1							
2							
3	Variable Costs						
4	Variable cost 1						
5	Variable cost 2						
6	Variable cost 3						
7	Total variable costs						
8							
9	Fixed Costs						
10	Salaries						
11	Rent						
12	Depreciation						
13	Total fixed costs						
14							
15	Contribution Margin						
16	Sales						
17	- Variable costs						
18	= Contribution margin						
19	- Fixed costs						
20	= Net income						
21							

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.

Fig1.16 - Microsoft Excel

This screenshot shows a Microsoft Excel spreadsheet titled "Fig1.16 - Microsoft Excel". The table has columns labeled A through H and rows numbered 1 through 20. Row 1 contains the header "Period" with cells B1 through H1. Row 2 contains the periods "1Q X4", "2Q X4", "3Q X4", "4Q X4", and "X4" in cells B2 through F2. Rows 3 through 7 list financial ratios under the heading "Profit Margins": "Profit Margins", "Gross Margin", "Pre-Tax Margin", "Net Profit Margin", and an empty row 7. Rows 8 through 12 list ratios under "Investment Returns": "Investment Returns", "Return on Equity", "Return on Assets", and "Return on Capital". Rows 13 through 17 list ratios under "Management Efficiency": "Management Efficiency", "Income/Employee", "Revenue/Employee", "Receivable Turnover", "Inventory Turnover", and "Asset Turnover". Rows 18 through 20 are empty.

	A	B	C	D	E	F	G	H
1		Period						
2		1Q X4	2Q X4	3Q X4	4Q X4		X4	
3	Profit Margins							
4	Gross Margin							
5	Pre-Tax Margin							
6	Net Profit Margin							
7								
8	Investment Returns							
9	Return on Equity							
10	Return on Assets							
11	Return on Capital							
12								
13	Management Efficiency							
14	Income/Employee							
15	Revenue/Employee							
16	Receivable Turnover							
17	Inventory Turnover							
18	Asset Turnover							
19								
20								

FIGURE 1.16 Financial Ratios Examples

Fig1.17 - Microsoft Excel

This screenshot shows a Microsoft Excel spreadsheet titled "Fig1.17 - Microsoft Excel". The table has columns labeled A through G and rows numbered 1 through 8. Row 1 contains the header "Valuation" with cells A1 through G1. Row 2 contains the header "Technique" with cells A2 through C2. Row 3 contains "Discounted cash flow" with cells A3 through D3. Row 4 contains "Public company comparables" with cells A4 through D4. Row 5 contains "Mergers and acquisitions comparables" with cells A5 through D5. Row 6 contains "Total" with cells A6 through D6. Rows 7 and 8 are empty. The columns are labeled "Valuation", "Relative Weight", and "Weighted Valuation".

	A	B	C	D	E	F	G
1	Valuation			Relative Weight		Weighted Valuation	
2	Technique		Valuation		Weighted Valuation		
3	Discounted cash flow						
4	Public company comparables						
5	Mergers and acquisitions comparables						
6	Total						
7							
8							

FIGURE 1.17 Valuation Model Example

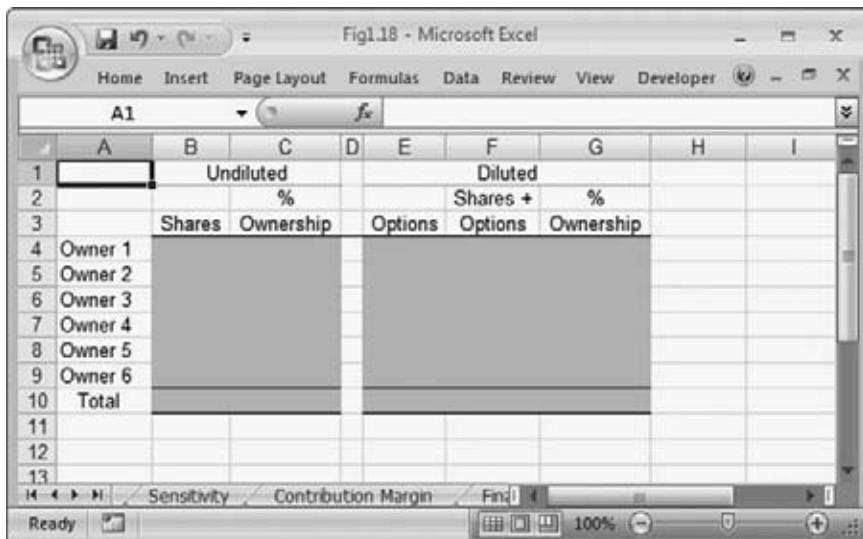


FIGURE 1.18 Capitalization Chart

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

The 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

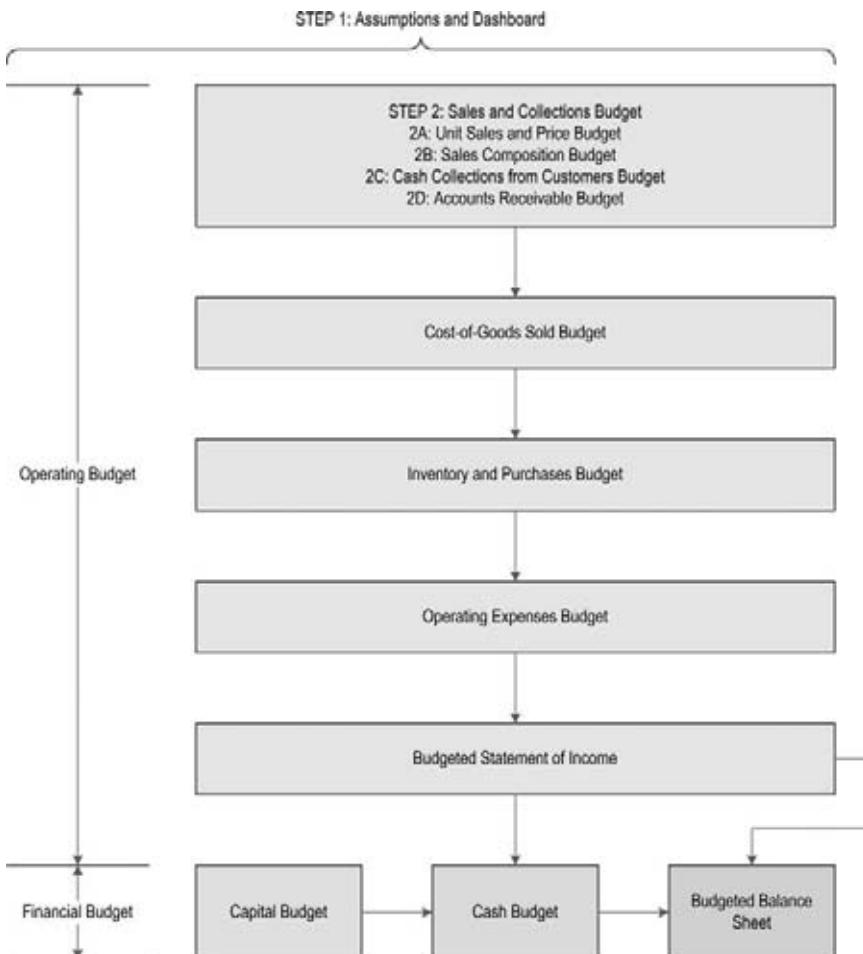


FIGURE 2.1 Sales-Oriented Components of the Operating Budget

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.

The screenshot shows a Microsoft Excel window titled "Fig2.2 - Microsoft Excel". The spreadsheet has a header row with columns labeled A, B, C, D, E, F, G. Column D is titled "Period" and contains four cells with the labels "1Q X4", "2Q X4", "3Q X4", and "4Q X4". Column E contains a cell with the label "X4". Rows 1 through 14 are listed on the left side. Rows 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, and 13 have a light gray background color. Rows 7 and 14 have a white background color. Row 14 is a blank row. The cells in rows 1 through 13 contain text labels describing various financial assumptions. The cells in rows 7 and 14 are empty.

A	B	C	D	E	F	G
1			Period			
2	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

The screenshot shows a Microsoft Excel spreadsheet titled "Fig2.3 - Microsoft Excel". The spreadsheet has a header row with columns A through G. Below this, there are several rows of data and formulas. Row 1 contains labels for columns B through F: "Period", "1Q X4", "2Q X4", "3Q X4", "4Q X4", and "X4". Rows 2 and 3 are blank. Row 4 contains the title "Sales and Collections Worksheet". Row 5 contains "Unit Sales and Price Inputs". Row 6 contains "Unit sales" followed by a formula =B5*E5. Row 7 contains "Price per unit" followed by a formula =C5*D5. Row 8 contains the title "Sales Composition Inputs". Row 9 contains "Cash sales as a % of total sales". Row 10 contains "Credit sales as a % of total sales". Row 11 is blank. Row 12 contains "Days receivable (DSO)". Row 13 contains "Days per quarter". Row 14 is blank. The bottom of the screen shows the ribbon tabs "Assumptions and Dashboard" and "Sales and Collections", along with the status bar showing "Ready", "100%", and other standard icons.

A	B	C	D	E	F	G
1	Period	1Q X4	2Q X4	3Q X4	4Q X4	X4
2						
3	Sales and Collections Worksheet					
4	Unit Sales and Price Inputs					
5	Unit sales	1,000	1,500	2,100	2,800	
6	Price per unit	\$ 1,000	\$ 960	\$ 920	\$ 900	
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 2.3 Assumptions Underlying Napavale’s Unit Sales Projections

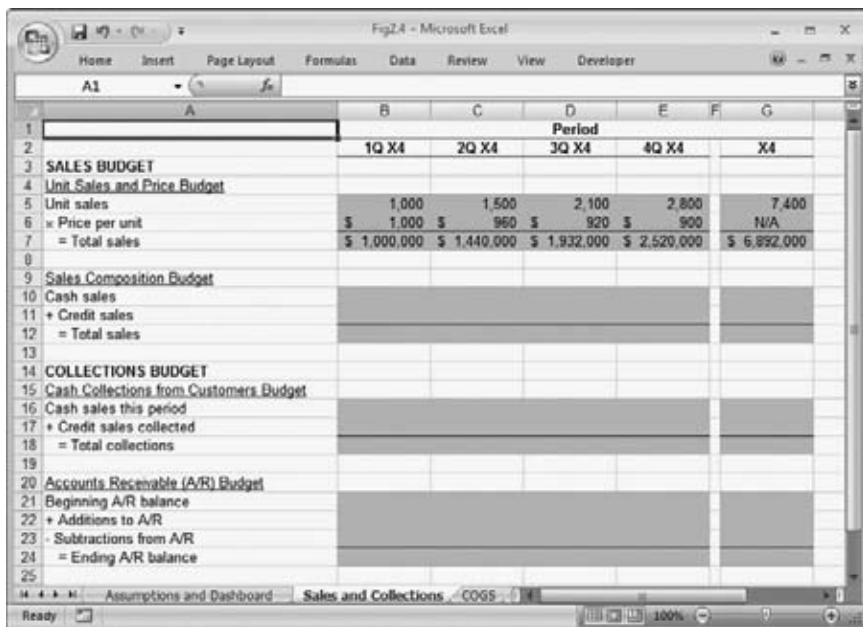


FIGURE 2.4 Unit Sales and Price Budget

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

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	SALES BUDGET						
4	<i>Unit Sales and Price Budget</i>						
5	Unit sales	=Units1Q	=Units2Q	=Units3Q	=Units4Q		=SUM(B5:E5)
6	x Price per unit	=Price1Q	=Price2Q	=Price3Q	=Price4Q		N/A
7	= Total sales	=B5*B6	=C5*C6	=D5*D6	=E5*E6		=SUM(B7:E7)
8							
9	<i>Sales Composition Budget</i>						
10	Cash sales						
11	+ Credit sales						
12	= Total sales						
13							
14	COLLECTIONS BUDGET						
15	<i>Cash Collections from Customers Budget</i>						
16	Cash sales this period						
17	+ Credit sales collected						
18	= Total collections						
19							
20	<i>Accounts Receivable (A/R) Budget</i>						
21	Beginning A/R balance						
22	+ Additions to A/R						
23	- Subtractions from A/R						
24	= Ending A/R balance						
25							

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

A	B	C	D	E	F	G	H	I
	4Q X3	1Q X4	2Q X4	3Q X4	4Q X4	X4		
Sales and Collections Worksheet								
Unit Sales and Price Inputs								
4	Unit sales			Units1Q	Units2Q	Units3Q	Units4Q	
5	Price per unit			Price1Q	Price2Q	Price3Q	Price4Q	
6								
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 2.6 Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet

The screenshot shows a Microsoft Excel spreadsheet titled "Fig2.7 - Microsoft Excel". The worksheet contains several sections of budget data:

	A	B	C	D	E	F	G
1	A1	B	C	D	E	F	G
2		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	SALES BUDGET						
4	Unit Sales and Price Budget						
5	Unit sales						
6	× Price per unit						
7	= Total sales	Sales1Q	Sales2Q	Sales3Q	Sales4Q	SalesX4	
8							
9	Sales Composition Budget						
10	Cash sales						
11	+ Credit sales						
12	= Total sales						
13							
14	COLLECTIONS BUDGET						
15	Cash Collections from Customers Budget						
16	Cash sales this period						
17	+ Credit sales collected						
18	= Total collections						
19							
20	Accounts Receivable (A/R) Budget						
21	Beginning A/R balance						
22	+ Additions to A/R						
23	- Subtractions from A/R						
24	= Ending A/R balance						
25							

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

Fig2.8 - Microsoft Excel

	A	B	C	D	E	F	G
1					Period		
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Sales and Collections Worksheet						
4	Unit Sales and Price Inputs						
5	Unit sales	1,000	1,500	2,100	2,800		
6	Price per unit	\$ 1,000	\$ 960	\$ 920	\$ 900		
7							
8	Sales Composition Inputs						
9	Cash sales as a % of total sales	60%	60%	60%	60%		
10	Credit sales as a % of total sales	40%	40%	40%	40%		
11							
12	Days receivable (DSO)						
13	Days per quarter						
14							

Assumptions and Dashboard Sales and Collections

FIGURE 2.8 Assumptions Underlying the Sales Composition Budget

Fig2.9 - Microsoft Excel

	A	B	C	D	E	F	G
1					Period		
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	SALES BUDGET						
4	Unit Sales and Price Budget						
5	Unit sales	1,000	1,500	2,100	2,800		7,400
6	Price per unit	\$ 1,000	\$ 960	\$ 920	\$ 900		N/A
7	= Total sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000		\$ 6,892,000
8							
9	Sales Composition Budget						
10	Cash sales	\$ 600,000	\$ 864,000	\$ 1,159,200	\$ 1,512,000		\$ 4,135,200
11	+ Credit sales	400,000	576,000	772,000	1,008,000		2,756,000
12	= Total sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000		\$ 6,892,000
13							
14	COLLECTIONS BUDGET						
15	Cash Collections from Customers Budget						
16	Cash sales this period						
17	+ Credit sales collected						
18	= Total collections						
19							
20	Accounts Receivable (A/R) Budget						
21	Beginning A/R balance						
22	+ Additions to A/R						
23	- Subtractions from A/R						
24	= Ending A/R balance						
25							

Assumptions and Dashboard Sales and Collections COGS

FIGURE 2.9 Sales Composition Budget

	A	B	C	D	Period
1		1Q X4	2Q X4	3Q X4	
2					
3	SALES BUDGET				
4	Unit Sales and Price Budget				
5	Unit sales	=Units1Q	=Units2Q	=Units3Q	
6	× Price per unit	=Price1Q	=Price2Q	=Price3Q	
7	= Total sales	=B5*D6	=C5*D6	=D5*D6	
8					
9	Sales Composition Budget				
10	Cash sales	=Sales1Q*CashPct1Q	=Sales2Q*CashPct2Q	=Sales3Q*CashPct3Q	
11	+ Credit sales	=Sales1Q*CreditPct1Q	=Sales2Q*CreditPct2Q	=Sales3Q*CreditPct3Q	
12	= Total sales	=SUM(B10:B11)	=SUM(C10:C11)	=SUM(D10:D11)	
13					
14	COLLECTIONS BUDGET				
15	Cash Collections from Customers Budget				
16	Cash sales this period				
17	+ Credit sales collected				
18	= Total collections				
19					
20	Accounts Receivable (A/R) Budget				
21	Beginning A/R balance				
22	+ Additions to A/R				
23	- Subtractions from A/R				
24	= Ending A/R balance				
25					

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.

	A	B	C	D	E	F	G	H	I	Period
1		4Q X3	1Q X4	2Q X4	3Q X4	4Q X4	X4			
2										
3	Sales and Collections Worksheet									
4	Unit Sales and Price Inputs									
5	Unit sales		Units1Q	Units2Q	Units3Q	Units4Q				
6	Price per unit		Price1Q	Price2Q	Price3Q	Price4Q				
7										
8	Sales Composition Inputs									
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)									
13	Days per quarter									
14										

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

Fig2.12 - Microsoft Excel

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4	X4	
1							
2							
3	SALES BUDGET						
4	Unit Sales and Price Budget						
5	Unit sales						
6	* Price per unit						
7	= Total sales						
8							
9	Sales Computation Budget						
10	Cash sales						
11	+ Credit sales						
12	= Total sales						
13							
14	COLLECTIONS BUDGET						
15	Cash Collections from Customers Budget						
16	Cash sales this period						
17	+ Credit sales collected						
18	= Total collections						
19							
20	Accounts Receivable (A/R) Budget						
21	Beginning A/R balance						
22	+ Additions to A/R						
23	- Subtractions from A/R						
24	= Ending A/R balance						
25							

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.

	A	B	C	D	E	F	G
1							Period
2		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	Sales and Collections Worksheet						
4	Unit Sales and Price Inputs						
5	Unit sales	1,000	1,500	2,100	2,800		
6	Price per unit	\$ 1,000	\$ 960	\$ 920	\$ 900		
7							
8	Sales Composition Inputs						
9	Cash sales as a % of total sales	60%	60%	60%	60%		
10	Credit sales as a % of total sales	40%	40%	40%	40%		
11							
12	Days receivable (DSO)						
13	Days per quarter						
14							
	Assumptions and Dashboard	Sales and Collections					
	Ready						
							100%

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.

	A	B	C	D	E	F	G
1							Period
2		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	SALES BUDGET						
4	Unit Sales and Price Budget						
5	Unit sales	1,000	1,500	2,100	2,800		
6	Price per unit	\$ 1,000	\$ 960	\$ 920	\$ 900		
7	= Total sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000	
8							
9	Sales Composition Budget						
10	Cash sales	\$ 600,000	\$ 864,000	\$ 1,159,200	\$ 1,512,000	\$ 4,135,200	
11	+ Credit sales	400,000	576,000	772,800	1,008,000	2,756,800	
12	= Total sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000	
13							
14	COLLECTIONS BUDGET						
15	Cash Collections from Customers Budget						
16	Cash sales this period	\$ 600,000	\$ 864,000	\$ 1,159,200	\$ 1,512,000	\$ 4,135,200	
17	+ Credit sales collected						
18	= Total collections	\$ 600,000	\$ 864,000	\$ 1,159,200	\$ 1,512,000	\$ 4,135,200	
19							
20	Accounts Receivable (A/R) Budget						
21	Beginning A/R balance						
22	+ Additions to A/R						
23	- Subtractions from A/R						
24	= Ending A/R balance						
25							
	Assumptions and Dashboard	Sales and Collections	C005				
	Ready						
							100%

FIGURE 2.14 Cash Collections Budget

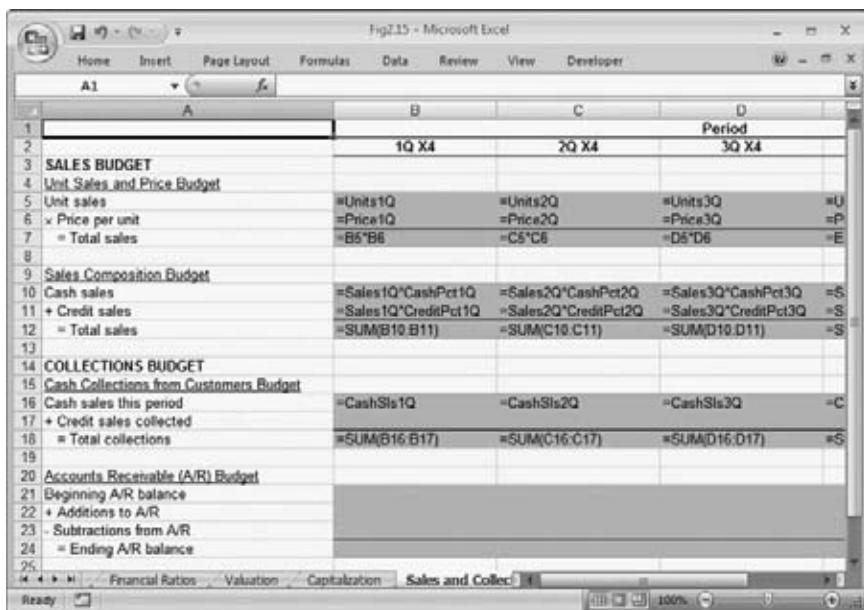


FIGURE 2.15 Alternative View of the Cash Collections Budget

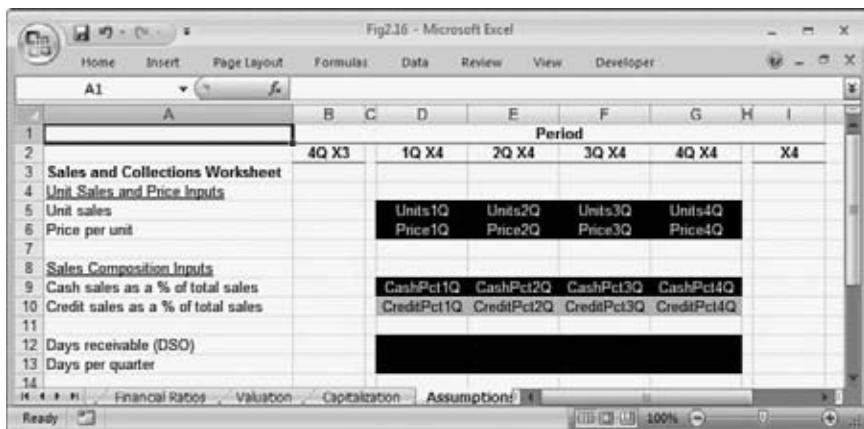


FIGURE 2.16 Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4	X4	Period
1							
2	SALES BUDGET						
3	<u>Unit Sales and Price Budget</u>						
4	Unit sales						
5	= Price per unit						
6	= Total sales						
7		Sales1Q	Sales2Q	Sales3Q	Sales4Q	SalesX4	
8							
9	<u>Sales Compensation Budget</u>						
10	Cash sales	CashSls1Q	CashSls2Q	CashSls3Q	CashSls4Q	CashSlsX4	
11	+ Credit sales	CreditSls1Q	CreditSls2Q	CreditSls3Q	CreditSls4Q	CreditSlsX4	
12	= Total sales						
13							
14	COLLECTIONS BUDGET						
15	<u>Cash Collections from Customers Budget</u>						
16	Cash sales this period						
17	+ Credit sales collected						
18	= Total collections	Collections1Q	Collections2Q	Collections3Q	Collections4Q	CollectionsX4	
19							
20	<u>Accounts Receivable (A/R) Budget</u>						
21	Beginning A/R balance						
22	+ Additions to A/R						
23	- Subtractions from A/R						
24	= Ending A/R balance						
25							

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

Fig2.18 - Microsoft Excel

	A	B	C	D	E	F	G
1	A1						
2							
3	Sales and Collections Worksheet						
4	Unit Sales and Price Inputs						
5	Unit sales	1,000	1,500	2,100	2,800		
6	Price per unit	\$ 1,000	\$ 960	\$ 920	\$ 900		
7							
8	Sales Composition Inputs						
9	Cash sales as a % of total sales	60%	60%	60%	60%		
10	Credit sales as a % of total sales	40%	40%	40%	40%		
11							
12	Days receivable (DSO)	30	30	30	30		
13	Days per quarter	90	90	90	90		
14							
	H - F - N Assumptions and Dashboard	Sales and Collections					
	Ready						

FIGURE 2.18 Assumptions Underlying the Accounts Receivable Calculation

Fig2.19 - Microsoft Excel

	A	B	C	D	E	F	G
1	A1						
2							
3	SALES BUDGET						
4	Unit Sales and Price Budget						
5	Unit sales	1,000	1,500	2,100	2,800		
6	× Price per unit	\$ 1,000	\$ 960	\$ 920	\$ 900		
7	= Total sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000	
8							
9	Sales Composition Budget						
10	Cash sales	\$ 600,000	\$ 864,000	\$ 1,159,200	\$ 1,512,000	\$ 4,135,200	
11	+ Credit sales	400,000	576,000	772,800	1,008,000	2,756,800	
12	= Total sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000	
13							
14	COLLECTIONS BUDGET						
15	Cash Collections from Customers Budget						
16	Cash sales this period	\$ 600,000	\$ 864,000	\$ 1,159,200	\$ 1,512,000	\$ 4,135,200	
17	+ Credit sales collected	266,667	517,333	707,200	929,600	2,420,800	
18	= Total collections	\$ 866,667	\$ 1,381,333	\$ 1,866,400	\$ 2,441,600	\$ 6,556,000	
19							
20	Accounts Receivable (A/R) Budget						
21	Beginning A/R balance	\$ -	\$ 133,333	\$ 192,000	\$ 257,600	\$ -	
22	+ Additions to A/R	133,333	192,000	257,600	336,000	918,933	
23	- Subtractions from A/R	-	133,333	192,000	257,600	582,933	
24	= Ending A/R balance	\$ 133,333	\$ 192,000	\$ 257,600	\$ 336,000	\$ 336,000	
25							
	H - F - N Assumptions and Dashboard	Sales and Collections	C065				
	Ready						

FIGURE 2.19 Accounts Receivable Budget

Fig2.20 - Microsoft Excel	
A	B
1	1Q X4
2	
3 SALES BUDGET	
4 Unit Sales and Price Budget	
5 Unit sales	=Units1Q
6 x Price per unit	=Price1Q
7 = Total sales	=B5*B6
8	
9 Sales Composition Budget	
10 Cash sales	=Sales1Q*CashPct1Q
11 + Credit sales	=Sales1Q*CreditPct1Q
12 = Total sales	=SUM(B10:B11)
13	
14 COLLECTIONS BUDGET	
15 Cash Collections from Customers Budget	
16 Cash sales this period	=CashSls1Q
17 + Credit sales collected	=((DaysQtr1Q-DSO1Q)/DaysQtr1Q)*CreditSls1Q+SubAR1Q
18 = Total collections	=SUM(B16:B17)
19	
20 Accounts Receivable (A/R) Budget	
21 Beginning A/R balance	0
22 + Additions to A/R	=(DSO1Q/DaysQtr1Q)*CreditSls1Q
23 - Subtractions from A/R	0
24 = Ending A/R balance	=BegAR1Q+AddAR1Q-SubAR1Q
25	

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

	A	B	C	D	E	F	G	H	I	
	A1									Period
1		B	C	D	E	F	G	H	I	
2		4Q X3	1Q X4	2Q X4	3Q X4	4Q X4	X4			
3	Sales and Collections Worksheet									
4	Unit Sales and Price Inputs									
5	Unit sales		Units1Q	Units2Q	Units3Q	Units4Q				
6	Price per unit		Price1Q	Price2Q	Price3Q	Price4Q				
7										
8	Sales Composition Inputs									
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										

The screenshot shows the Microsoft Excel interface with the title bar "Fig2.21 - Microsoft Excel". The ribbon menu includes Home, Insert, Page Layout, Formula, Data, Review, View, and Developer. The worksheet itself has rows labeled 1 through 14 and columns A through I. Row 1 contains column headers for periods: 4Q X3, 1Q X4, 2Q X4, 3Q X4, 4Q X4, and X4. Rows 2 through 13 contain various input and output cell names grouped under category headings: "Sales and Collections Worksheet", "Unit Sales and Price Inputs", "Sales Composition Inputs", and "Assumption". Row 14 is blank.

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: (days per quarter – days receivable)/(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: (days receivable)/(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.

	A	B	C	D	E	F	G
	A1	1Q X4	2Q X4	3Q X4	4Q X4	X4	
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4		
3	SALES BUDGET						
4	Unit Sales and Price Budget						
5	Unit sales						
6	+ Price per unit						
7	= Total sales						
8		Sales1Q	Sales2Q	Sales3Q	Sales4Q		
9	Sales Composition Budget						
10	Cash sales	CashSls1Q	CashSls2Q	CashSls3Q	CashSls4Q		
11	+ Credit sales	CreditSls1Q	CreditSls2Q	CreditSls3Q	CreditSls4Q		
12	= Total sales						
13							
14	COLLECTIONS BUDGET						
15	Cash Collections from Customers Budget						
16	Cash sales this period						
17	+ Credit sales collected						
18	= Total collections	Collections1Q	Collections2Q	Collections3Q	Collections4Q		
19							
20	Accounts Receivable (A/R) Budget						
21	Beginning A/R balance	BegAR1Q	BegAR2Q	BegAR3Q	BegAR4Q		
22	+ Additions to A/R	AddAR1Q	AddAR2Q	AddAR3Q	AddAR4Q		
23	- Subtractions from A/R	SubAR1Q	SubAR2Q	SubAR3Q	SubAR4Q		
24	= Ending A/R balance	EndAR1Q	EndAR2Q	EndAR3Q	EndAR4Q		
25							

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.

CHAPTER 3

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

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.

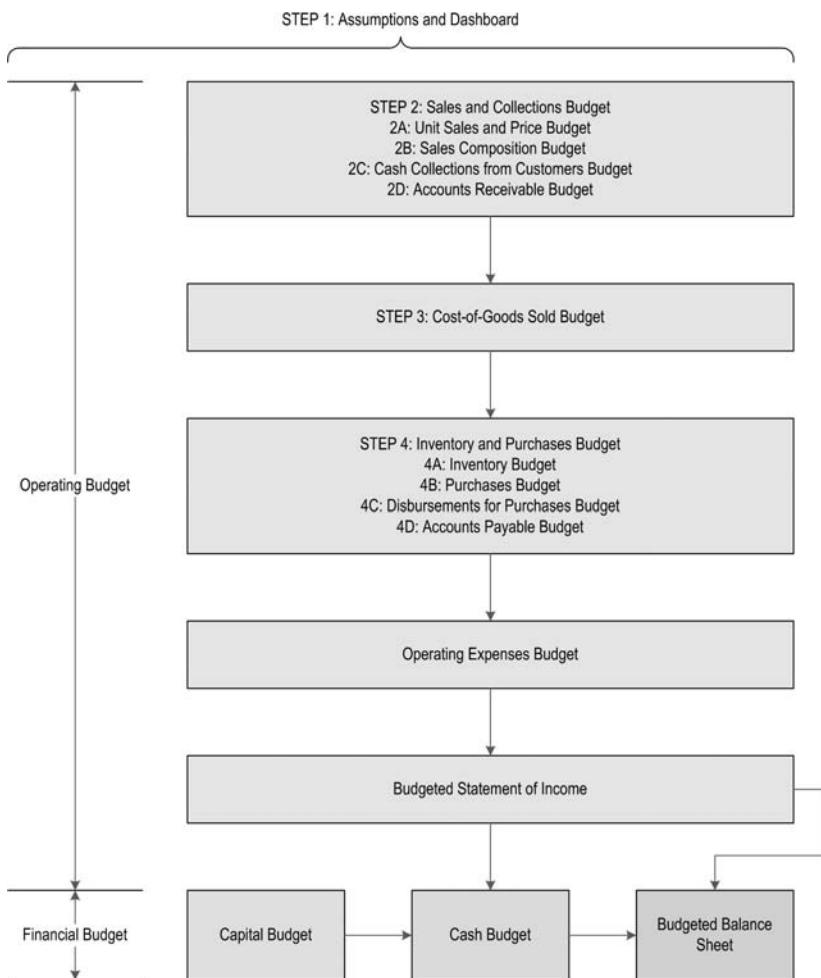


FIGURE 3.1 Cost of Goods Sold, Inventory, and Purchases Components of the Operating Budget in the Context of the Master Budget

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,

Fig3.2 - Microsoft Excel

The screenshot shows a Microsoft Excel spreadsheet titled "Fig3.2 - Microsoft Excel". The ribbon at the top includes Home, Insert, Page Layout, Formulas, Data, Review, View, and Developer tabs. The main area displays two worksheets:

- Sales and Collections Worksheet:**

	A	B	C	D	E	F	G
1		1Q X4	2Q X4	3Q X4	4Q X4	X4	
2							
3	Sales and Collections Worksheet						
4	Unit Sales and Price Inputs						
5	Unit sales	1,000	1,500	2,100	2,800		
6	Price per unit	\$ 1,000	\$ 960	\$ 920	\$ 900		
7							
8	Sales Composition Inputs						
9	Cash sales as a % of total sales	60%	60%	60%	60%		
10	Credit sales as a % of total sales	40%	40%	40%	40%		
11							
12	Days receivable (DSO)	30	30	30	30		
13	Days per quarter	90	90	90	90		
14							
15	COGS Worksheet						
16	Cost-of-Goods-Sold Inputs						
17	Monitor screen: cost per unit	\$ 75.00	\$ 72.00	\$ 65.00	\$ 60.00		
18	Monitor casing: cost per unit	\$ 75.00	\$ 72.00	\$ 65.00	\$ 60.00		
19	Assembly labor: cost per unit	\$ 50.00	\$ 50.00	\$ 48.00	\$ 45.00		
20	Total	\$ 200.00	\$ 194.00	\$ 178.00	\$ 165.00		
21							
- COGS Worksheet:**

17 Monitor screen: cost per unit	\$ 75.00	\$ 72.00	\$ 65.00	\$ 60.00
18 Monitor casing: cost per unit	\$ 75.00	\$ 72.00	\$ 65.00	\$ 60.00
19 Assembly labor: cost per unit	\$ 50.00	\$ 50.00	\$ 48.00	\$ 45.00
20 Total	\$ 200.00	\$ 194.00	\$ 178.00	\$ 165.00

The status bar at the bottom shows "Assumptions and Dashboard" and "Sales and Collections". The zoom level is set to 100%.

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.

Fig3.3 - Microsoft Excel

	A	B	C	D	E	F	G
1					Period		
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	COST-OF-GOODS SOLD BUDGET						
4	Cost-of-Goods Sold Budget						
5	Monitor screen	\$ 75,000	\$ 108,000	\$ 136,500	\$ 168,000	\$ 487,500	
6	Monitor casing	75,000	108,000	136,500	168,000	487,500	
7	Assembly labor	50,000	75,000	100,800	126,000	351,800	
8	Total cost-of-goods sold	\$ 200,000	\$ 291,000	\$ 373,800	\$ 462,000	\$ 1,326,800	
9							

FIGURE 3.3 Cost-of-Goods-Sold Budget

Fig3.4 - Microsoft Excel

	A	B	C	D	Period
1		1Q X4	2Q X4	3Q X4	
2	COST-OF-GOODS SOLD BUDGET				
3	Cost-of-Goods Sold Budget				
4	Monitor screen	=Units1Q*ScreenCPU1Q	=Units2Q*ScreenCPU2Q	=Units3Q*ScreenCPU3Q	
5	Monitor casing	=Units1Q*CasingCPU1Q	=Units2Q*CasingCPU2Q	=Units3Q*CasingCPU3Q	
6	Assembly labor	=Units1Q*LaborCPU1Q	=Units2Q*LaborCPU2Q	=Units3Q*LaborCPU3Q	
7	Total cost-of-goods sold	=SUM(B5:B7)	=SUM(C5:C7)	=SUM(D5:D7)	
8					

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

Fig3.5 - Microsoft Excel

	A	B	C	D	E	F	G
1					Period		
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Sales and Collections Worksheet						
4	Unit Sales and Price Inputs						
5	Unit sales	Units1Q	Units2Q	Units3Q	Units4Q		
6	Price per unit	Price1Q	Price2Q	Price3Q	Price4Q		
7							
8	Sales Composition Inputs						
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							
15	COGS Worksheet						
16	Cost-of-Goods-Sold Inputs						
17	Monitor screen: cost per unit	ScreenCPU1Q	ScreenCPU2Q	ScreenCPU3Q	ScreenCPU4Q		
18	Monitor casing: cost per unit	CasingCPU1Q	CasingCPU2Q	CasingCPU3Q	CasingCPU4Q		
19	Assembly labor: cost per unit	LaborCPU1Q	LaborCPU2Q	LaborCPU3Q	LaborCPU4Q		
20	Total	TotalCPU1Q	TotalCPU2Q	TotalCPU3Q	TotalCPU4Q		
21							

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

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
COST-OF-GOODS SOLD BUDGET							
<i>Cost-of-Goods Sold Budget</i>							
5	Monitor screen	Screen1Q	Screen2Q	Screen3Q	Screen4Q	ScreenX4	
6	Monitor casing	Casing1Q	Casing2Q	Casing3Q	Casing4Q	CasingX4	
7	Assembly labor	Labor1Q	Labor2Q	Labor3Q	Labor4Q	LaborX4	
8	Total cost-of-goods sold	COGS1Q	COGS2Q	COGS3Q	COGS4Q	COGSX4	
9							

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.

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	Sales and Collections Worksheet						
4	Unit Sales and Price Inputs						
5	Unit sales	1,000	1,500	2,100	2,800		
6	Price per unit	\$ 1,000	\$ 960	\$ 920	\$ 900		
7							
8	Sales Composition Inputs						
9	Cash sales as a % of total sales	60%	60%	60%	60%		
10	Credit sales as a % of total sales	40%	40%	40%	40%		
11							
12	Days receivable (DSO)	30	30	30	30		
13	Days per quarter	90	90	90	90		
14							
15	COGS Worksheet						
16	Cost-of-Goods Sold Inputs						
17	Monitor screen: cost per unit	\$ 75.00	\$ 72.00	\$ 65.00	\$ 60.00		
18	Monitor casing: cost per unit	\$ 75.00	\$ 72.00	\$ 65.00	\$ 60.00		
19	Assembly labor: cost per unit	\$ 50.00	\$ 50.00	\$ 48.00	\$ 45.00		
20	Total	\$ 200.00	\$ 194.00	\$ 178.00	\$ 165.00		
21							
22	Inventory and Purchases Worksheet						
23	Inventory Inputs						
24	Days inventory	20	20	20	20		
25							
14	Assumptions and Dashboard	Sales and Collections					

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.

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
INVENTORY BUDGET							
4 Inventory Budget							
5 Desired ending inventory		\$ 64,667	\$ 83,067	\$ 83,067	\$ 83,067	\$ 83,067	
6 + Cost of goods sold		200,000	291,000	373,800	462,000	1,326,800	
7 = Total inventory needed		\$ 264,667	\$ 374,067	\$ 456,867	\$ 545,067	\$ 1,409,867	
9 PURCHASES BUDGET							
10 Purchases Budget							
11 Total inventory needed							
12 - Beginning inventory							
13 = Purchases							
15 Disbursements for Purchases Budget							
16 Payments of payables							
17 Total disbursements for purchases							
19 Accounts Payable (A/P) Budget							
20 Beginning A/P balance							
21 + Additions to A/P							
22 - Subtractions from A/P							
23 Ending A/P							

FIGURE 3.8 Inventory Budget

	A	B	C	Per
		1Q X4	2Q X4	
INVENTORY BUDGET				
4 Inventory Budget				
5 Desired ending inventory	=COGS2Q*(DaysInv1Q/DaysQtr1Q)	=COGS3Q*(DaysInv2Q/DaysQtr2Q)		
6 + Cost of goods sold	=COGS1Q	=COGS2Q		
7 = Total inventory needed	=EndInv1Q+B6	=EndInv2Q+C6		
9 PURCHASES BUDGET				
10 Purchases Budget				
11 Total inventory needed				
12 - Beginning inventory				
13 = Purchases				
15 Disbursements for Purchases Budget				
16 Payments of payables				
17 Total disbursements for purchases				
19 Accounts Payable (A/P) Budget				
20 Beginning A/P balance				
21 + Additions to A/P				
22 - Subtractions from A/P				
23 Ending A/P				

FIGURE 3.9 Alternative View of the Inventory Budget

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Sales and Collections Worksheet						
4	Unit Sales and Price Inputs						
5	Unit sales	Units1Q	Units2Q	Units3Q	Units4Q		
6	Price per unit	Price1Q	Price2Q	Price3Q	Price4Q		
7							
8	Sales Composition Inputs						
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							
15	COGS Worksheet						
16	Cost-of-Goods-Sold Inputs						
17	Monitor screen: cost per unit	ScreenCPU1Q	ScreenCPU2Q	ScreenCPU3Q	ScreenCPU4Q		
18	Monitor casing: cost per unit	CasingCPU1Q	CasingCPU2Q	CasingCPU3Q	CasingCPU4Q		
19	Assembly labor: cost per unit	LaborCPU1Q	LaborCPU2Q	LaborCPU3Q	LaborCPU4Q		
20	Total	TotalCPU1Q	TotalCPU2Q	TotalCPU3Q	TotalCPU4Q		
21							
22	Inventory and Purchases Worksheet						
23	Inventory Inputs						
24	Days inventory	DaysInv1Q	DaysInv2Q	DaysInv3Q	DaysInv4Q		
25							

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

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	INVENTORY BUDGET						
4	Inventory Budget						
5	Desired ending inventory	EndInv1Q	EndInv2Q	EndInv3Q	EndInv4Q		
6	+ Cost of goods sold	InvNeed1Q	InvNeed2Q	InvNeed3Q	InvNeed4Q		
7	= Total inventory needed	InvNeed1Q	InvNeed2Q	InvNeed3Q	InvNeed4Q		
8							
9	PURCHASES BUDGET						
10	Purchases Budget						
11	Total inventory needed						
12	- Beginning inventory						
13	= Purchases						
14							
15	Disbursements for Purchases Budget						
16	Payments of payables						
17	Total disbursements for purchases						
18							
19	Accounts Payable (A/P) Budget						
20	Beginning A/P balance						
21	+ Additions to A/P						
22	- Subtractions from A/P						
23	Ending A/P						
24							

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:

$$\text{Budgeted purchases} = \text{desired ending inventory} + \text{cost of goods sold} - \text{beginning inventory}$$

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

Fig 3.12 - Microsoft Excel						
	A	B	C	D	E	F
1		Period				
2		1Q X4	2Q X4	3Q X4	4Q X4	X4
3	INVENTORY BUDGET					
4	Inventory Budget					
5	Desired ending inventory	\$ 64,667	\$ 83,067	\$ 102,667	\$ 102,667	\$ 102,667
6	+ Cost of goods sold	200,000	291,000	373,800	462,000	1,326,800
7	= Total inventory needed	\$ 264,667	\$ 374,067	\$ 476,467	\$ 564,667	\$ 1,429,467
8						
9	PURCHASES BUDGET					
10	Purchases Budget					
11	Total inventory needed	\$ 264,667	\$ 374,067	\$ 476,467	\$ 564,667	N/A
12	- Beginning inventory	-	64,667	83,067	102,667	-
13	= Purchases	\$ 264,667	\$ 309,400	\$ 393,400	\$ 462,000	N/A
14						
15	Disbursements for Purchases Budget					
16	Payments of payables					
17	Total disbursements for purchases					
18						
19	Accounts Payable (A/P) Budget					
20	Beginning A/P balance					
21	+ Additions to A/P					
22	- Subtractions from A/P					
23	Ending A/P					
24						

FIGURE 3.12 Purchases Budget

			Period
		1Q X4	2Q X4
3	INVENTORY BUDGET		
4	Inventory Budget		
5	Desired ending inventory	=COGS2Q*(DaysInv1Q/DaysQtr1Q)	=COGS3Q*(DaysInv2Q/DaysQtr2Q)
6	+ Cost of goods sold	=COGS1Q	=COGS2Q
7	= Total inventory needed	=EndInv1Q+B6	=EndInv2Q+C6
8			
9	PURCHASES BUDGET		
10	Purchases Budget		
11	Total inventory needed	=InvNeed1Q	=InvNeed2Q
12	- Beginning inventory	=EndInv1Q	=EndInv1Q
13	= Purchases	=B11-B12	=C11-C12
14			
15	Disbursements for Purchases Budget		
16	Payments of payables		
17	Total disbursements for purchases		
18			
19	Accounts Payable (A/P) Budget		
20	Beginning A/P balance		
21	+ Additions to A/P		
22	- Subtractions from A/P		
23	Ending A/P		

FIGURE 3.13 Alternative View of the Purchases Budget

		Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
3	Sales and Collections Worksheet					
4	Unit Sales and Price Inputs					
5	Unit sales	Units1Q	Units2Q	Units3Q	Units4Q	
6	Price per unit	Price1Q	Price2Q	Price3Q	Price4Q	
7						
8	Sales Composition Inputs					
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						
15	COGS Worksheet					
16	Cost of Goods Sold Inputs					
17	Monitor screen: cost per unit	ScreenCPU1Q	ScreenCPU2Q	ScreenCPU3Q	ScreenCPU4Q	
18	Monitor casing: cost per unit	CasingCPU1Q	CasingCPU2Q	CasingCPU3Q	CasingCPU4Q	
19	Assembly labor: cost per unit	LaborCPU1Q	LaborCPU2Q	LaborCPU3Q	LaborCPU4Q	
20	Total	TotalCPU1Q	TotalCPU2Q	TotalCPU3Q	TotalCPU4Q	
21						
22	Inventory and Purchases Worksheet					
23	Inventory Inputs					
24	Days inventory	DaysInv1Q	DaysInv2Q	DaysInv3Q	DaysInv4Q	

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

	A	B	C	D	E	F	G
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	INVENTORY BUDGET						
4	Inventory Budget						
5	Desired ending inventory						
6	+ Cost of goods sold						
7	= Total inventory needed						
8							
9	PURCHASES BUDGET						
10	Purchases Budget						
11	Total inventory needed						
12	- Beginning inventory						
13	= Purchases						
14							
15	Disbursements for Purchases Budget						
16	Payments of payables						
17	Total disbursements for purchases						
18							
19	Accounts Payable (A/P) Budget						
20	Beginning A/P balance						
21	+ Additions to A/P						
22	- Subtractions from A/P						
23	Ending A/P						
24							
		Financial Ratios	Valuation	Capitalization	Inventory		
	Ready						

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

	A	B	C	D	E	F	G
		Period					
1	A1	1Q X4	2Q X4	3Q X4	4Q X4	X4	
Sales and Collections Worksheet							
Unit Sales and Price Inputs							
5	Unit sales	1,000	1,500	2,100	2,800		
6	Price per unit	\$ 1,000	\$ 960	\$ 920	\$ 900		
Sales Composition Inputs							
9	Cash sales as a % of total sales	60%	60%	60%	60%		
10	Credit sales as a % of total sales	40%	40%	40%	40%		
12	Days receivable (DSO)	30	30	30	30		
13	Days per quarter	90	90	90	90		
COGS Worksheet							
Cost-of-Goods Sold Inputs							
17	Monitor screen: cost per unit	\$ 75.00	\$ 72.00	\$ 65.00	\$ 60.00		
18	Monitor casing: cost per unit	\$ 75.00	\$ 72.00	\$ 65.00	\$ 60.00		
19	Assembly labor: cost per unit	\$ 50.00	\$ 50.00	\$ 48.00	\$ 45.00		
20	Total	\$ 200.00	\$ 194.00	\$ 178.00	\$ 165.00		
Inventory and Purchases Worksheet							
Inventory Inputs							
24	Days inventory	20	20	20	20		
Disbursements for Purchases Inputs							
27	Days payable	30	30	30	30		
Assumptions and Dashboard							

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.

	A	B	C	D	E	F	G
		Period					
1	A1	1Q X4	2Q X4	3Q X4	4Q X4	X4	
INVENTORY BUDGET							
Inventory Budget							
5	Desired ending inventory	\$ 64,667	\$ 83,067	\$ 102,667	\$ 102,667	\$ 102,667	
6	+ Cost of goods sold	200,000	291,000	373,800	462,000	1,326,800	
7	= Total inventory needed	\$ 264,667	\$ 374,067	\$ 476,467	\$ 564,667	\$ 1,429,467	
PURCHASES BUDGET							
Purchases Budget							
11	Total inventory needed	\$ 264,667	\$ 374,067	\$ 476,467	\$ 564,667	N/A	
12	- Beginning inventory	-	64,667	83,067	102,667	-	
13	= Purchases	\$ 264,667	\$ 309,400	\$ 393,400	\$ 462,000	N/A	
Disbursements for Purchases Budget							
Payments of payables							
17	Total disbursements for purchases	\$ -	\$ -	\$ -	\$ -	\$ -	
Accounts Payable (A/P) Budget							
Beginning A/P balance							
21	+ Additions to A/P						
22	- Subtractions from A/P						
23	Ending A/P						

FIGURE 3.17 Disbursements for Purchases Budget

	A	B	C	Period
		1Q X4	2Q X4	
1	A1			
INVENTORY BUDGET				
Inventory Budget				
5	Desired ending inventory	=COGS2Q*(DaysInv1Q/DaysQtr1Q)	=COGS3Q*(DaysInv2Q/DaysQtr2Q)	=CO
6	+ Cost of goods sold	=COGS1Q	=COGS2Q	=CO
7	= Total inventory needed	=EndInv1Q+B6	=EndInv2Q+C6	=En
PURCHASES BUDGET				
Purchases Budget				
11	Total inventory needed	=InvNeed1Q	=InvNeed2Q	=Inv
12	- Beginning inventory	0	=EndInv1Q	=En
13	= Purchases	=B11-B12	=C11-C12	=D1
Disbursements for Purchases Budget				
Payments of payables				
17	Total disbursements for purchases	=Payment1Q	=Payment2Q	=Pa
Accounts Payable (A/P) Budget				
Beginning A/P balance				
20	+ Additions to A/P			
22	- Subtractions from A/P			
23	Ending A/P			

FIGURE 3.18 Alternative View of the Disbursements for Purchases Budget

Fig3.19 - Microsoft Excel

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4	X4	
2							
3	Sales and Collections Worksheet						
4	Unit Sales and Price Inputs						
5	Unit sales	Units1Q	Units2Q	Units3Q	Units4Q		
6	Price per unit	Price1Q	Price2Q	Price3Q	Price4Q		
7							
8	Sales Composition Inputs						
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							
15	COGS Worksheet						
16	Cost-of-Goods Sold Inputs						
17	Monitor screen: cost per unit	ScreenCPU1Q	ScreenCPU2Q	ScreenCPU3Q	ScreenCPU4Q		
18	Monitor casing: cost per unit	CasingCPU1Q	CasingCPU2Q	CasingCPU3Q	CasingCPU4Q		
19	Assembly labor: cost per unit	LaborCPU1Q	LaborCPU2Q	LaborCPU3Q	LaborCPU4Q		
20	Total	TotalCPU1Q	TotalCPU2Q	TotalCPU3Q	TotalCPU4Q		
21							
22	Inventory and Purchases Worksheet						
23	Inventory Inputs						
24	Days inventory	DaysInv1Q	DaysInv2Q	DaysInv3Q	DaysInv4Q		
25							
26	Disbursements for Purchases Inputs						
27	Days payable	DaysPay1Q	DaysPay2Q	DaysPay3Q	DaysPay4Q		
28							
	Financial Ratios	Valuation	Capitalization	Assumptions and			
	Ready						

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

Fig3.20 - Microsoft Excel

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4	X4	
2							
3	INVENTORY BUDGET						
4	Inventory Budget						
5	Desired ending inventory	EndInv1Q	EndInv2Q	EndInv3Q	EndInv4Q	EndInvX4	
6	+ Cost of goods sold						
7	= Total inventory needed	InvNeed1Q	InvNeed2Q	InvNeed3Q	InvNeed4Q	InvNeedX4	
8							
9	PURCHASES BUDGET						
10	Purchases Budget						
11	Total inventory needed						
12	- Beginning inventory						
13	= Purchases	Purch1Q	Purch2Q	Purch3Q	Purch4Q	PurchX4	
14							
15	Disbursements for Purchases Budget						
16	Payments of payables	Payment1Q	Payment2Q	Payment3Q	Payment4Q	PaymentX4	
17	Total disbursements for purchases	Disburse1Q	Disburse2Q	Disburse3Q	Disburse4Q	DisburseX4	
18							
19	Accounts Payable (A/P) Budget						
20	Beginning A/P balance						
21	+ Additions to A/P						
22	- Subtractions from A/P						
23	Ending A/P						
24							
	Financial Ratios	Valuation	Capitalization	Inventory and			
	Ready						

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

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4	X4	
Sales and Collections Worksheet							
Unit Sales and Price Inputs							
5	Unit sales	1,000	1,500	2,100	2,800		
6	Price per unit	\$ 1,000	\$ 960	\$ 920	\$ 900		
Sales Composition Inputs							
9	Cash sales as a % of total sales	60%	60%	60%	60%		
10	Credit sales as a % of total sales	40%	40%	40%	40%		
Days receivable (DSO)							
12		30	30	30	30		
13	Days per quarter	90	90	90	90		
COGS Worksheet							
Cost-of-Goods Sold Inputs							
17	Monitor screen: cost per unit	\$ 75.00	\$ 72.00	\$ 65.00	\$ 60.00		
18	Monitor casing: cost per unit	\$ 75.00	\$ 72.00	\$ 65.00	\$ 60.00		
19	Assembly labor: cost per unit	\$ 50.00	\$ 50.00	\$ 48.00	\$ 45.00		
20	Total	\$ 200.00	\$ 194.00	\$ 178.00	\$ 165.00		
Inventory and Purchases Worksheet							
Inventory Inputs							
24	Days inventory	20	20	20	20		
Disbursements for Purchases Inputs							
27	Days payable	30	30	30	30		
28							

FIGURE 3.21 Assumptions Underlying the Accounts Payable Calculation

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	INVENTORY BUDGET						
4	Inventory Budget						
5	Desired ending inventory	\$ 64,667	\$ 83,067	\$ 102,667	\$ 102,667	\$ 102,667	
6	+ Cost of goods sold	200,000	291,000	373,800	462,000	1,326,800	
7	= Total inventory needed	\$ 264,667	\$ 374,067	\$ 476,467	\$ 564,667	\$ 1,429,467	
8							
9	PURCHASES BUDGET						
10	Purchases Budget						
11	Total inventory needed	\$ 264,667	\$ 374,067	\$ 476,467	\$ 564,667	N/A	
12	- Beginning inventory	- 64,667	- 83,067	- 102,667	-	-	
13	= Purchases	\$ 264,667	\$ 309,400	\$ 393,400	\$ 462,000	N/A	
14							
15	Disbursements for Purchases Budget						
16	Payments of payables	\$ 176,444	\$ 294,489	\$ 365,400	\$ 439,133	\$ 1,275,467	
17	Total disbursements for purchases	\$ 176,444	\$ 294,489	\$ 365,400	\$ 439,133	\$ 1,275,467	
18							
19	Accounts Payable (A/P) Budget						
20	Beginning A/P balance	\$ -	\$ 88,222	\$ 103,133	\$ 131,133	\$ -	
21	+ Additions to A/P	88,222	103,133	131,133	154,000	476,489	
22	- Subtractions from A/P	-	88,222	103,133	131,133	322,489	
23	Ending A/P	\$ 88,222	\$ 103,133	\$ 131,133	\$ 154,000	\$ 154,000	
24							

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: (days per quarter – days payable)/(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

Fig3.23 - Microsoft Excel	
	Home Insert Page Layout Formulas Data Review View Developer
A1	f(x)
1	
2	
3	INVENTORY BUDGET
4	Inventory Budget
5	Desired ending inventory
6	=COGS2Q*(DaysInv1Q/DaysQtr1Q)
7	+ Cost of goods sold
8	=COGS1Q
9	=Total inventory needed
10	=EndInv1Q+B6
11	
12	PURCHASES BUDGET
13	Purchases Budget
14	Total inventory needed
15	=InvNeed1Q
16	- Beginning inventory
17	=0
18	=B11-B12
19	
20	Disbursements for Purchases Budget
21	Payments of payables
22	=((DaysQtr1Q-DaysPay1Q)/DaysQtr1Q)*Purch1Q+SubAP1Q
23	Total disbursements for purchases
24	=Payment1Q
	Financial Ratios Valuation Capitalization Inven...
	Ready

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.

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4	X4	
2	Sales and Collections Worksheet						
3	Unit Sales and Price Inputs						
4	Unit sales	Units1Q	Units2Q	Units3Q	Units4Q		
5	Price per unit	Price1Q	Price2Q	Price3Q	Price4Q		
6							
7	Sales Composition Inputs						
8	Cash sales as a % of total sales	CashPct1Q	CashPct2Q	CashPct3Q	CashPct4Q		
9	Credit sales as a % of total sales	CreditPct1Q	CreditPct2Q	CreditPct3Q	CreditPct4Q		
10							
11	Days receivable (DSO)	DSO1Q	DSO2Q	DSO3Q	DSO4Q		
12	Days per quarter	DaysQtr1Q	DaysQtr2Q	DaysQtr3Q	DaysQtr4Q		
13							
14							
15	COGS Worksheet						
16	Cost-of-Goods Sold Inputs						
17	Monitor screen: cost per unit	ScreenCPU1Q	ScreenCPU2Q	ScreenCPU3Q	ScreenCPU4Q		
18	Monitor casing: cost per unit	CasingCPU1Q	CasingCPU2Q	CasingCPU3Q	CasingCPU4Q		
19	Assembly labor: cost per unit	LaborCPU1Q	LaborCPU2Q	LaborCPU3Q	LaborCPU4Q		
20	Total	TotalCPU1Q	TotalCPU2Q	TotalCPU3Q	TotalCPU4Q		
21							
22	Inventory and Purchases Worksheet						
23	Inventory Inputs						
24	Days inventory	DaysInv1Q	DaysInv2Q	DaysInv3Q	DaysInv4Q		
25							
26	Disbursements for Purchases Inputs						
27	Days payable	DaysPay1Q	DaysPay2Q	DaysPay3Q	DaysPay4Q		
28							
	Financial Ratios	Valuation	Capitalization	Assumptions and			
	Ready						

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

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4	X4	
2	INVENTORY BUDGET						
3	Inventory Budget						
4	Desired ending inventory	EndInv1Q	EndInv2Q	EndInv3Q	EndInv4Q	EndInvX4	
5	+ Cost of goods sold						
6	= Total inventory needed	InvNeed1Q	InvNeed2Q	InvNeed3Q	InvNeed4Q	InvNeedX4	
7							
8	PURCHASES BUDGET						
9	Purchases Budget						
10	Total inventory needed						
11	- Beginning inventory						
12	= Purchases	Purch1Q	Purch2Q	Purch3Q	Purch4Q	PurchX4	
13							
14	Disbursements for Purchases Budget						
15	Payments of payables	Payment1Q	Payment2Q	Payment3Q	Payment4Q	PaymentX4	
16							
17	Total disbursements for purchases	Disburse1Q	Disburse2Q	Disburse3Q	Disburse4Q	DisburseX4	
18							
19	Accounts Payable (A/P) Budget						
20	Beginning A/P balance	BegAP1Q	BegAP2Q	BegAP3Q	BegAP4Q	BegAPX4	
21	+ Additions to A/P	AddAP1Q	AddAP2Q	AddAP3Q	AddAP4Q	AddAPX4	
22	- Subtractions from A/P	SubAP1Q	SubAP2Q	SubAP3Q	SubAP4Q	SubAPX4	
23	Ending A/P	EndAP1Q	EndAP2Q	EndAP3Q	EndAP4Q	EndAPX4	
24							
	Financial Ratios	Valuation	Capitalization	Inventory an			
	Ready						

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,

The screenshot shows a Microsoft Excel spreadsheet titled "FigQ3.1 - Microsoft Excel". The ribbon menu includes Home, Insert, Page Layout, Formulas, Data, Review, View, and Developer. The active sheet is "Assumptions and Dashboard". The data is organized into several sections:

- Sales and Collections Worksheet:** A table with columns for Period (1Q X6, 2Q X6, 3Q X6, 4Q X6, X6). Rows include Unit sales (2,000, 2,075, 2,110, 2,275), Price per unit (\$ 2,000, \$ 2,000, \$ 1,990, \$ 1,985), 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), and Days per quarter (90, 90, 90, 90).
- COGS Worksheet:** A table with columns for cost per unit. Rows include 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), and Total (\$ 200.00, \$ 194.00, \$ 178.00, \$ 165.00).
- Inventory and Purchases Worksheet:** A table with columns for days inventory. Rows include Days inventory (15, 17, 19, 20) and Days payable (24, 32, 31, 32).

FIGURE Q3.1 Company ABC's Assumptions and Dashboard Worksheet

	A	Period					
		1Q X6	2Q X6	3Q X6	4Q X6	X6	
SALES BUDGET							
Unit Sales and Price Budget							
5	Unit sales	2,000	2,075	2,110	2,275	8,460	
6	× Price per unit	\$ 2,000	\$ 2,050	\$ 2,100	\$ 2,200	N/A	
7	= Total sales	\$ 4,000,000	\$ 4,253,750	\$ 4,431,000	\$ 5,005,000	\$ 17,689,750	
Sales Composition Budget							
10	Cash sales	\$ 1,200,000	\$ 1,361,200	\$ 1,639,470	\$ 1,951,950	\$ 6,152,620	
11	+ Credit sales	2,800,000	2,892,550	2,791,530	3,053,050	11,537,130	
12	= Total sales	\$ 4,000,000	\$ 4,253,750	\$ 4,431,000	\$ 5,005,000	\$ 17,689,750	
COLLECTIONS BUDGET							
15	Cash Collections from Customers Budget	\$ 1,200,000	\$ 1,361,200	\$ 1,639,470	\$ 1,951,950	\$ 6,152,620	
16	Cash sales this period	1,711,111	2,792,279	2,771,026	2,939,725	10,214,142	
17	+ Credit sales collected	\$ 2,911,111	\$ 4,153,479	\$ 4,410,496	\$ 4,891,675	\$ 16,366,762	
Accounts Receivable (A/R) Budget							
21	Beginning A/R balance	\$ -	\$ 1,088,889	\$ 1,189,159	\$ 1,209,663	\$ -	
22	+ Additions to A/R	1,088,889	1,189,159	1,209,663	1,322,988	4,810,700	
23	- Subtractions from A/R	-	1,088,889	1,189,159	1,209,663	3,487,711	
24	= 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.

- Given the information regarding Company ABC, build a Cost-of-Goods-Sold Budget for Company ABC.
- 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.
- Build a Purchases Budget for Company ABC based on your work in Questions 1 and 2.
- 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).
- Based on your work in Questions 1–4 and the Assumptions and Dashboard worksheet, build a Disbursements for Purchases Budget for Company ABC.

CHAPTER 4

Operating Budget— Operating Expenses

This 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

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.

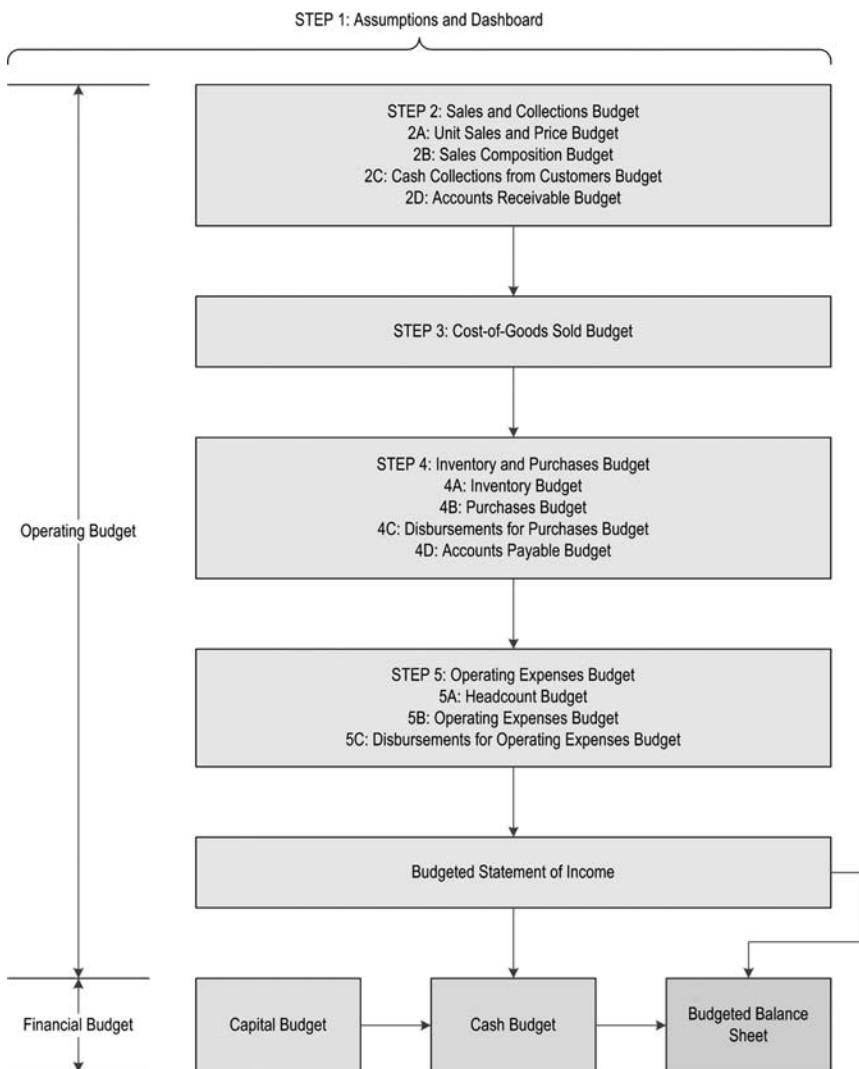


FIGURE 4.1 Separate Operating Expense Components of the Operating Budget in the Context of the Master Budget

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
24	Days inventory	20	20	20	20		
25							
26	Disbursements for Purchases Inputs						
27	Days payable	20	20	20	20		
28							
29	Headcount Overview Worksheet						
30	Headcount Overview Inputs						
31	Number of employees						
32	Chief Executive Officer	1	1	1	1		
33	Chief Financial Officer	1	1	1	1		
34	VP, Engineering	1	1	1	1		
35	VP, Sales & Marketing	1	1	1	1		
36	VP, Business Development			1	1		
37	Salesperson	5	5	7	8		
38	Hardware Engineer	2	2	4	4		
39	Controller/Accountant	1	1	2	2		
40	Administrative Assistant	3	3	4	4		
41	Total	15	15	22	23		
42							
43	Periodic base salaries						
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							

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.

Fig4.3 - Microsoft Excel

	A	B	C	D	E	F	G
1	A1				Period		
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	HEADCOUNT BUDGET						
4	Headcount Budget						
5	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	
11	Salesperson	5	5	7	8		
12	Hardware Engineer	2	2	4	4		
13	Controller/Accountant	1	1	2	2		
14	Administrative Assistant	3	3	4	4		
15	Total	15	15	22	23		
16							
17	Periodic base salaries						
18	Chief Executive Officer	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 200,000	
19	Chief Financial Officer	43,750	43,750	43,750	43,750	175,000	
20	VP, Engineering	43,750	43,750	43,750	43,750	175,000	
21	VP, Sales & Marketing	37,500	37,500	37,500	37,500	150,000	
22	VP, Business Development	35,000	35,000	35,000	35,000	140,000	
23	Salesperson	30,000	30,000	30,000	30,000	120,000	
24	Hardware Engineer	27,500	27,500	27,500	27,500	110,000	
25	Controller/Accountant	13,750	13,750	13,750	13,750	55,000	
26	Administrative Assistant	8,750	8,750	8,750	8,750	35,000	
27	Total	\$ 290,000	\$ 290,000	\$ 290,000	\$ 290,000	\$ 1,160,000	
28							

FIGURE 4.3 Headcount Overview Worksheet

Fig4.4 - Microsoft Excel

	A	B	C	D	E	F	G
1	A1				Period		
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	HEADCOUNT BUDGET						
4	Headcount Budget						
5	Number of employees						
6	Chief Executive Officer	=NoCEO1Q	=NoCEO2Q	=NoCEO3Q	=NoCEO4Q		
7	Chief Financial Officer	=NoCFO1Q	=NoCFO2Q	=NoCFO3Q	=NoCFO4Q		
8	VP, Engineering	=NoVPE1Q	=NoVPE2Q	=NoVPE3Q	=NoVPE4Q		
9	VP, Sales & Marketing	=NoVPSM1Q	=NoVPSM2Q	=NoVPSM3Q	=NoVPSM4Q		
10	VP, Business Development	=NoVPBD1Q	=NoVPBD2Q	=NoVPBD3Q	=NoVPBD4Q		
11	Salesperson	=NoSP1Q	=NoSP2Q	=NoSP3Q	=NoSP4Q		
12	Hardware Engineer	=NoHE1Q	=NoHE2Q	=NoHE3Q	=NoHE4Q		
13	Controller/Accountant	=NoCA1Q	=NoCA2Q	=NoCA3Q	=NoCA4Q		
14	Administrative Assistant	=NoAA1Q	=NoAA2Q	=NoAA3Q	=NoAA4Q		
15	Total	=NoEmp1Q	=NoEmp2Q	=NoEmp3Q	=NoEmp4Q		
16							
17	Periodic base salaries						
18	Chief Executive Officer	=SalCEOX4/4	=SalCEOX4/4	=SalCEOX4/4	=SalCEOX4/4	=SalCEOX4	
19	Chief Financial Officer	=SalCF0X4/4	=SalCF0X4/4	=SalCF0X4/4	=SalCF0X4/4	=SalCF0X4	
20	VP, Engineering	=SalVPEX4/4	=SalVPEX4/4	=SalVPEX4/4	=SalVPEX4/4	=SalVPEX4	
21	VP, Sales & Marketing	=SalVPSMX4/4	=SalVPSMX4/4	=SalVPSMX4/4	=SalVPSMX4/4	=SalVPSMX4	
22	VP, Business Development	=SalVPBDX4/4	=SalVPBDX4/4	=SalVPBDX4/4	=SalVPBDX4/4	=SalVPBDX4	
23	Salesperson	=SalSPX4/4	=SalSPX4/4	=SalSPX4/4	=SalSPX4/4	=SalSPX4	
24	Hardware Engineer	=SalHEX4/4	=SalHEX4/4	=SalHEX4/4	=SalHEX4/4	=SalHEX4	
25	Controller/Accountant	=SalCAX4/4	=SalCAX4/4	=SalCAX4/4	=SalCAX4/4	=SalCAX4	
26	Administrative Assistant	=SalAAx4/4	=SalAAx4/4	=SalAAx4/4	=SalAAx4/4	=SalAAx4	
27	Total	=SUM(B18:B26)	=SUM(C18:C26)	=SUM(D18:D26)	=SUM(E18:E26)	=SUM(F18:F27)	
28							

FIGURE 4.4 Alternative View of the Headcount Overview Worksheet

The screenshot shows a Microsoft Excel spreadsheet titled "Fig4.5 - Microsoft Excel". The visible portion of the sheet includes the following data:

	A	B	C	D	E	F	G	H	I
1		4Q X3	1Q X4	2Q X4	3Q X4	4Q X4			
21						Period			
22	Inventory and Purchases Worksheet								
23	Inventory Inputs								
24	Days inventory			DaysInv1Q	DaysInv2Q	DaysInv3Q	DaysInv4Q		
25									
26	Disbursements for Purchases Inputs								
27	Days payable			DaysPay1Q	DaysPay2Q	DaysPay3Q	DaysPay4Q		
28									
29	Headcount Overview Worksheet								
30	Headcount Overview Inputs								
31	Number of employees								
32	Chief Executive Officer		NoCEO1Q	NoCEO2Q	NoCEO3Q	NoCEO4Q			
33	Chief Financial Officer		NoCFO1Q	NoCFO2Q	NoCFO3Q	NoCFO4Q			
34	VP, Engineering		NoVPE1Q	NoVPE2Q	NoVPE3Q	NoVPE4Q			
35	VP, Sales & Marketing		NoVPSM1Q	NoVPSM2Q	NoVPSM3Q	NoVPSM4Q			
36	VP, Business Development		NoVPBD1Q	NoVPBD2Q	NoVPBD3Q	NoVPBD4Q			
37	Salesperson		NoSP1Q	NoSP2Q	NoSP3Q	NoSP4Q			
38	Hardware Engineer		NoHE1Q	NoHE2Q	NoHE3Q	NoHE4Q			
39	Controller/Accountant		NoCA1Q	NoCA2Q	NoCA3Q	NoCA4Q			
40	Administrative Assistant		NoAA1Q	NoAA2Q	NoAA3Q	NoAA4Q			
41	Total		NoEmp1Q	NoEmp2Q	NoEmp3Q	NoEmp4Q			
42									
43	Periodic base salaries (annualized)								
44	Chief Executive Officer						SalCEOx4		
45	Chief Financial Officer						SalCFOx4		
46	VP, Engineering						SalVPEx4		
47	VP, Sales & Marketing						SalVPSMx4		
48	VP, Business Development						SalVPBDx4		
49	Salesperson						SalSPx4		
50	Hardware Engineer						SalHEx4		
51	Controller/Accountant						SalCAx4		
52	Administrative Assistant						SalAAx4		

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.

	A	B	C	D	E	F	G
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	HEADCOUNT BUDGET						
4	Headcount Budget						
5	Number of employees						
6	Chief Executive Officer						
7	Chief Financial Officer						
8	VP, Engineering						
9	VP, Sales & Marketing						
10	VP, Business Development						
11	Salesperson						
12	Hardware Engineer						
13	Controller/Accountant						
14	Administrative Assistant						
15	Total						
16	Periodic base salaries						
17	Chief Executive Officer	SalCEO1Q	SalCEO2Q	SalCEO3Q	SalCEO4Q		
18	Chief Financial Officer	SalCFO1Q	SalCFO2Q	SalCFO3Q	SalCFO4Q		
19	VP, Engineering	SalVPE1Q	SalVPE2Q	SalVPE3Q	SalVPE4Q		
20	VP, Sales & Marketing	SalVPSM1Q	SalVPSM2Q	SalVPSM3Q	SalVPSM4Q		
21	VP, Business Development	SalVPBD1Q	SalVPBD2Q	SalVPBD3Q	SalVPBD4Q		
22	Salesperson	SalSP1Q	SalSP2Q	SalSP3Q	SalSP4Q		
23	Hardware Engineer	SalHE1Q	SalHE2Q	SalHE3Q	SalHE4Q		
24	Controller/Accountant	SalCA1Q	SalCA2Q	SalCA3Q	SalCA4Q		
25	Administrative Assistant	SalAA1Q	SalAA2Q	SalAA3Q	SalAA4Q		
26	Total	Sal1Q	Sal2Q	Sal3Q	Sal4Q		SalX4
27							
28							

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

	A	B	C	D	E	F	G
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4	X4	
42	Periodic base salaries (annualized)						
43	Chief Executive Officer					\$ 200,000	
44	Chief Financial Officer					\$ 175,000	
45	VP, Engineering					\$ 175,000	
46	VP, Sales & Marketing					\$ 150,000	
47	VP, Business Development					\$ 140,000	
48	Salesperson					\$ 120,000	
49	Hardware Engineer					\$ 110,000	
50	Controller/Accountant					\$ 55,000	
51	Administrative Assistant					\$ 35,000	
52							
53							
54	Headcount Cost Worksheet						
55	Headcount Cost Inputs						
56	Benefits rate					12.0%	
57	Benefits factor (1 + benefits rate)					1.12	
58							

FIGURE 4.7 Benefits Rate Assumption in the Assumptions and Dashboard Worksheet

Fig 4.8 - Microsoft Excel

	A1	Period						
		1Q X4	2Q X4	3Q X4	4Q X4	X4		
HEADCOUNT BUDGET								
Headcount Budget								
Periodic salary expense (base)								
6	Chief Executive Officer	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 200,000		
7	Chief Financial Officer	43,750	43,750	43,750	43,750	175,000		
8	VP, Engineering	43,750	43,750	43,750	43,750	175,000		
9	VP, Sales & Marketing	37,500	37,500	37,500	37,500	150,000		
10	VP, Business Development	-	-	35,000	35,000	70,000		
11	Salesperson	150,000	150,000	210,000	240,000	750,000		
12	Hardware Engineer	55,000	55,000	110,000	110,000	330,000		
13	Controller/Accountant	13,750	13,750	27,500	27,500	82,500		
14	Administrative Assistant	26,250	26,250	35,000	35,000	122,500		
15	Total	\$ 420,000	\$ 420,000	\$ 592,500	\$ 622,500	\$ 2,055,000		
16								
17	Total (with benefits)	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200	\$ 2,301,600		
18								

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 worksheets 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.

Fig 4.9 - Microsoft Excel

	A1	Period			
		1Q X4	2Q X4	3Q X4	
HEADCOUNT BUDGET					
Headcount Budget					
Periodic salary expense (base)					
6	Chief Executive Officer	=NoCEO1Q*SalCEO1Q	=NoCEO2Q*SalCEO2Q	=NoCEO3Q*SalCEO3Q	
7	Chief Financial Officer	=NoCFO1Q*SalCFO1Q	=NoCFO2Q*SalCFO2Q	=NoCFO3Q*SalCFO3Q	
8	VP, Engineering	=NoVPE1Q*SalVPE1Q	=NoVPE2Q*SalVPE2Q	=NoVPE3Q*SalVPE3Q	
9	VP, Sales & Marketing	=NoVPSM1Q*SalVPSM1Q	=NoVPSM2Q*SalVPSM2Q	=NoVPSM3Q*SalVPSM3Q	
10	VP, Business Development	=NoVPBD1Q*SalVPBD1Q	=NoVPBD2Q*SalVPBD2Q	=NoVPBD3Q*SalVPBD3Q	
11	Salesperson	=NoSP1Q*SalSP1Q	=NoSP2Q*SalSP2Q	=NoSP3Q*SalSP3Q	
12	Hardware Engineer	=NoHE1Q*SalHE1Q	=NoHE2Q*SalHE2Q	=NoHE3Q*SalHE3Q	
13	Controller/Accountant	=NoCA1Q*SalCA1Q	=NoCA2Q*SalCA2Q	=NoCA3Q*SalCA3Q	
14	Administrative Assistant	=NoAA1Q*SalAA1Q	=NoAA2Q*SalAA2Q	=NoAA3Q*SalAA3Q	
15	Total	=SUM(B6:B14)	=SUM(C6:C14)	=SUM(D6:D14)	
16					
17	Total (with benefits)	=BaseSal1Q*BeneFactor	=BaseSal2Q*BeneFactor	=BaseSal3Q*BeneFactor	
18					

FIGURE 4.9 Alternative View of the Headcount Cost Worksheet

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
37	Salesperson	NoSP1Q	NoSP2Q	NoSP3Q	NoSP4Q		
38	Hardware Engineer	NoHE1Q	NoHE2Q	NoHE3Q	NoHE4Q		
39	Controller/Accountant	NoCA1Q	NoCA2Q	NoCA3Q	NoCA4Q		
40	Administrative Assistant	NoAA1Q	NoAA2Q	NoAA3Q	NoAA4Q		
41	Total	NoEmp1Q	NoEmp2Q	NoEmp3Q	NoEmp4Q		
42							
43	Periodic base salaries (annualized)						
44	Chief Executive Officer						SalCEOX4
45	Chief Financial Officer						SalCFOX4
46	VP, Engineering						SalVPEX4
47	VP, Sales & Marketing						SalVPSMX4
48	VP, Business Development						SalVPBX4
49	Salesperson						SalSPX4
50	Hardware Engineer						SalHEX4
51	Controller/Accountant						SalCAX4
52	Administrative Assistant						SalAAx4
53							
54	Headcount Cost Worksheet						
55	Headcount Cost Inputs						
56	Benefits rate						BenefRate
57	Benefits factor (1 + benefits rate)						BenefFactor
58							

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

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	HEADCOUNT BUDGET						
4	Headcount Budget						
5	Periodic salary expense (base)						
6	Chief Executive Officer						
7	Chief Financial Officer						
8	VP, Engineering						
9	VP, Sales & Marketing						
10	VP, Business Development						
11	Salesperson						
12	Hardware Engineer						
13	Controller/Accountant						
14	Administrative Assistant						
15	Total	BaseSal1Q	BaseSal2Q	BaseSal3Q	BaseSal4Q		BaseSalX4
16							
17	Total (with benefits)	SalExp1Q	SalExp2Q	SalExp3Q	SalExp4Q		SalExpX4
18							

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

The screenshot shows a Microsoft Excel window titled "Fig4.12 - Microsoft Excel". The worksheet is named "Assumptions and Dashboard". The data is organized into several sections:

- Periodic base salaries (annualized):** A list of roles with their annual salaries:
 - Chief Executive Officer: \$ 200,000
 - Chief Financial Officer: \$ 175,000
 - VP, Engineering: \$ 175,000
 - VP, Sales & Marketing: \$ 150,000
 - VP, Business Development: \$ 140,000
 - Salesperson: \$ 120,000
 - Hardware Engineer: \$ 110,000
 - Controller/Accountant: \$ 55,000
 - Administrative Assistant: \$ 35,000
- Headcount Cost Worksheet:**
 - Headcount Cost Inputs:** Benefits rate: 12.0% (highlighted), Benefits factor (1 + benefits rate): 1.12 (highlighted).
 - Operating Expenses Worksheet:**
 - Operating Expenses Inputs:** Miscellaneous expenses as a % of sales: 3.0% (repeated four times).
 - R&D expenses as a % of sales: 7.0% (repeated four times).
 - 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% (repeated four times).

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

The screenshot shows a Microsoft Excel spreadsheet titled "Fig4.13 - Microsoft Excel". The ribbon menu includes Home, Insert, Page Layout, Formulas, Data, Review, View, and Developer. The active sheet is "Operating Expenses". The data starts with section headers "OPERATING EXPENSES BUDGET" and "Operating Expenses Budget". Below these are rows for Salaries, Miscellaneous expenses, Research and development, Rent, Depreciation, and Total operating expenses. A second section header "DISBURSEMENTS FOR OPERATING EXPENSES BUDGET" follows, with rows for Disbursements for Operating Expenses Budget, Salaries, Miscellaneous expenses, Research and development, Rent, Depreciation, and Total disbursements for operating expenses. The columns are labeled A through G, with specific columns for Period (1Q X4, 2Q X4, 3Q X4, 4Q X4) and X4.

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4		X4
1							
2							
3	OPERATING EXPENSES BUDGET						
4	Operating Expenses Budget						
5	Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200		\$ 2,301,600
6	Miscellaneous expenses	30,000	43,200	57,960	75,600		206,760
7	Research and development	70,000	100,800	154,560	201,600		526,960
8	Rent	20,000	20,000	20,000	20,000		80,000
9	Depreciation						
10	Total operating expenses	\$ 590,400	\$ 634,400	\$ 896,120	\$ 994,400		\$ 3,115,320
11							
12	DISBURSEMENTS FOR OPERATING EXPENSES BUDGET						
13	Disbursements for Operating Expenses Budget						
14	Salaries						
15	Miscellaneous expenses						
16	Research and development						
17	Rent						
18	Depreciation						
19	Total disbursements for operating expenses						
20							

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 worksheets 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.

The screenshot shows a Microsoft Excel spreadsheet titled "Fig4.14 - Microsoft Excel". The ribbon menu includes Home, Insert, Page Layout, Formulas, Data, Review, View, and Developer. The active sheet is "Operating Expenses". The data structure is identical to Figure 4.13, with sections for the budget and disbursements. However, the values in the cells are replaced by their corresponding formulas, such as =SalExp1Q for Salaries in the first row. The columns are labeled A through D, with specific columns for Period (1Q X4, 2Q X4, 3Q X4) and X4.

	A	B	C	D
		1Q X4	2Q X4	3Q X4
1				
2				
3	OPERATING EXPENSES BUDGET			
4	Operating Expenses Budget			
5	Salaries	=SalExp1Q	=SalExp2Q	=SalExp3Q
6	Miscellaneous expenses	=Sales1Q*MiscPct1Q	=Sales2Q*MiscPct2Q	=Sales3Q*MiscPct3Q
7	Research and development	=Sales1Q*RDPC1Q	=Sales2Q*RDPC2Q	=Sales3Q*RDPC3Q
8	Rent	=RentExp1Q	=RentExp2Q	=RentExp3Q
9	Taxes			
10	Depreciation			
11	Total operating expenses	=SUM(B5:B10)	=SUM(C5:C10)	=SUM(D5:D10)
12				
13	DISBURSEMENTS FOR OPERATING EXPENSES BUDGET			
14	Disbursements for Operating Expenses Budget			
15	Salaries			
16	Miscellaneous expenses			
17	Research and development			
18	Rent			
19	Taxes			
20	Depreciation			
21	Total disbursements for operating expenses			
22				

FIGURE 4.14 Alternative View of the Operating Expenses Budget

	A	B	C	D	E	F	G	H	I
					Period				
1	A1	B	C	D	E	F	G	H	I
2		4Q X3	1Q X4	2Q X4	3Q X4	4Q X4			X4
45	Chief Financial Officer								SalCF0X4
46	VP, Engineering								SalVPEX4
47	VP, Sales & Marketing								SalVPSMX4
48	VP, Business Development								SalVBDX4
49	Salesperson								SalSPX4
50	Hardware Engineer								SalHEX4
51	Controller/Accountant								SalCAX4
52	Administrative Assistant								SalAAZ4
53									
54	Headcount Cost Worksheet								
55	Headcount Inputs								
56	Benefits rate								BenefRate
57	Benefits factor (1 + benefits rate)								BenefFactor
58									
59	Operating Expenses Worksheet								
60	Operating Expenses Inputs								
61	Miscellaneous expenses as a % of sales				MiscPct1Q	MiscPct2Q	MiscPct3Q	MiscPct4Q	
62					RDPct1Q	RDPct2Q	RDPct3Q	RDPct4Q	
63	R&D expenses as a % of sales				RentPct1Q	RentPct2Q	RentPct3Q	RentPct4Q	
64					FtRate1Q	FtRate2Q	FtRate3Q	FtRate4Q	
65	Rent expense per square foot per quarter				RentExp1Q	RentExp2Q	RentExp3Q	RentExp4Q	
66	Square feet of space rented				TaxPct1Q	TaxPct2Q	TaxPct3Q	TaxPct4Q	
67	Total net expense								
68									
69	Tax rate								
70									
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262									
263									
264									
265									
266									
267									
268									
269									
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271									
272									
273									
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276									
277									
278									
279									
280									
281									
282									
283									
284									
2									

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

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	OPERATING EXPENSES BUDGET						
4	Operating Expenses Budget						
5	Salaries						
6	Miscellaneous expenses						
7	Research and development						
8	Rent						
9	Taxes						
10	Depreciation						
11	Total operating expenses						
12		OpExp1Q	OpExp2Q	OpExp3Q	OpExp4Q		OpExpX4
13	DISBURSEMENTS FOR OPERATING EXPENSES BUDGET						
14	Disbursements for Operating Expenses Budget						
15	Salaries						
16	Miscellaneous expenses						
17	Research and development						
18	Rent						
19	Taxes						
20	Depreciation						
21	Total disbursements for operating expenses						
22							

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

	B	C	D	E	F	G
	1Q X4	2Q X4	3Q X4	4Q X4	X4	
OPERATING EXPENSES BUDGET						
<i>Disbursements for Operating Expenses Budget</i>						
14 Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200	\$ 2,301,600	
15 Miscellaneous expenses	30,000	43,200	57,960	75,600	206,760	
16 Research and development	70,000	100,800	154,560	201,600	526,960	
17 Rent	20,000	20,000	20,000	20,000	80,000	
18 Depreciation	-	-	-	-	-	
19 Total operating expenses	\$ 590,400	\$ 634,400	\$ 896,120	\$ 934,400	\$ 3,115,320	
DISBURSEMENTS FOR OPERATING EXPENSES BUDGET						
<i>Disbursements for Operating Expenses Budget</i>						
14 Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200	\$ 2,301,600	
15 Miscellaneous expenses	30,000	43,200	57,960	75,600	206,760	
16 Research and development	70,000	100,800	154,560	201,600	526,960	
17 Rent	20,000	20,000	20,000	20,000	80,000	
18 Depreciation	-	-	-	-	-	
19 Total disbursements for operating expenses	\$ 590,400	\$ 634,400	\$ 896,120	\$ 934,400	\$ 3,115,320	

FIGURE 4.17 Disbursements for Operating Expenses Budget

	A	B	C	D
		1Q X4	2Q X4	3Q X4
1				Period
2				
3	OPERATING EXPENSES BUDGET			
4	Operating Expenses Budget			
5	Salaries	=SalExp1Q	=SalExp2Q	=SalExp3Q
6	Miscellaneous expenses	=Sales1Q*MiscPct1Q	=Sales2Q*MiscPct2Q	=Sales3Q*MiscPct3Q
7	Research and development	=Sales1Q*RDPct1Q	=Sales2Q*RDPct2Q	=Sales3Q*RDPct3Q
8	Rent	=RentExp1Q	=RentExp2Q	=RentExp3Q
9	Taxes			
10	Depreciation			
11	Total operating expenses	=SUM(B5:B10)	=SUM(C5:C10)	=SUM(D5:D10)
12				
13	DISBURSEMENTS FOR OPERATING EXPENSES BUDGET			
14	Disbursements for Operating Expenses Budget			
15	Salaries	=B5	=C5	=D5
16	Miscellaneous expenses	=B6	=C6	=D6
17	Research and development	=B7	=C7	=D7
18	Rent	=B8	=C8	=D8
19	Taxes	=B9	=C9	=D9
20	Depreciation	=B10	=C10	=D10
21	Total disbursements for operating expenses	=SUM(B15:B20)	=SUM(C15:C20)	=SUM(D15:D20)
22				

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.

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4	X4	
1				Period			
2							
3	OPERATING EXPENSES BUDGET						
4	Operating Expenses Budget						
5	Salaries						
6	Miscellaneous expenses	MiscExp1Q	MiscExp2Q	MiscExp3Q	MiscExp4Q	MiscExpX4	
7	Research and development	RDExp1Q	RDExp2Q	RDExp3Q	RDExp4Q	RDExpX4	
8	Rent						
9	Depreciation						
10	Total operating expenses	OpExp1Q	OpExp2Q	OpExp3Q	OpExp4Q	OpExpX4	
11							
12	DISBURSEMENTS FOR OPERATING EXPENSES BUDGET						
13	Disbursements for Operating Expenses Budget						
14	Salaries						
15	Miscellaneous expenses						
16	Research and development						
17	Rent						
18	Depreciation						
19	Total disbursements for operating expenses	DOE1Q	DOE2Q	DOE3Q	DOE4Q	DOEX4	
20							

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

	A	B	C	D	E	F	G
	A1	1Q X4	2Q X4	3Q X4	4Q X4	X4	
29	Headcount Overview Worksheet						
30	Headcount Overview Inputs						
31	Number of employees						
32	Chief Executive Officer	1	1	1	1		
33	Chief Financial Officer	1	1	1	1		
34	VP, Engineering	1	1	1	1		
35	VP, Sales & Marketing	1	1	1	1		
36	VP, Business Development	1	1	1	1		
37	Salesperson	5	5	7	8		
38	Hardware Engineer	4	4	5	5		
39	Controller/Accountant	1	2	2	2		
40	Administrative Assistant	2	2	3	4		
41	Total	17	18	22	24		
42							
43	Periodic base salaries (annualized)						
44	Chief Executive Officer					\$ 175,000	
45	Chief Financial Officer					\$ 150,000	
46	VP, Engineering					\$ 150,000	
47	VP, Sales & Marketing					\$ 135,000	
48	VP, Business Development					\$ 125,000	
49	Salesperson					\$ 100,000	
50	Hardware Engineer					\$ 90,000	
51	Controller/Accountant					\$ 45,000	
52	Administrative Assistant					\$ 30,000	
53							
54	Headcount Cost Worksheet						
55	Headcount Cost Inputs						
56	Benefits rate					15.0%	
57	Benefits factor (1 + benefits rate)					1.15	
58							
59	Operating Expenses Worksheet						
60	Operating Expenses Inputs						
61	Miscellaneous expenses as a % of sales	4.0%	3.5%	4.0%	3.5%		
62							

FIGURE Q4.1 Company DEF's Assumptions and Dashboard Worksheet

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4		X4
1							
2							
3	SALES BUDGET						
4	<u>Unit Sales and Price Budget</u>						
5	Unit sales	5,000	5,200	5,400	5,500		21,100
6	x Price per unit	\$ 200	\$ 200	\$ 195	\$ 190		N/A
7	= Total sales	\$ 1,000,000	\$ 1,040,000	\$ 1,053,000	\$ 1,045,000		\$ 4,138,000
8							
9	<u>Sales Composition Budget</u>						
10	Cash sales	\$ 500,000	\$ 520,000	\$ 526,500	\$ 522,500		\$ 2,069,000
11	+ Credit sales	500,000	520,000	526,500	522,500		2,069,000
12	= Total sales	\$ 1,000,000	\$ 1,040,000	\$ 1,053,000	\$ 1,045,000		\$ 4,138,000
13							
14	COLLECTIONS BUDGET						
15	<u>Cash Collections from Customers Budget</u>						
16	Cash sales this period	\$ 500,000	\$ 520,000	\$ 526,500	\$ 522,500		\$ 2,069,000
17	+ Credit sales collected	305,556	512,222	523,972	524,056		1,865,806
18	= Total collections	\$ 805,556	\$ 1,032,222	\$ 1,050,472	\$ 1,046,556		\$ 3,934,806
19							
20	<u>Accounts Receivable (A/R) Budget</u>						
21	Beginning A/R balance	\$ -	\$ 194,444	\$ 202,222	\$ 204,750		\$ -
22	+ Additions to A/R	194,444	202,222	204,750	203,194		804,611
23	- Subtractions from A/R	-	194,444	202,222	204,750		601,417
24	= Ending A/R balance	\$ 194,444	\$ 202,222	\$ 204,750	\$ 203,194		\$ 203,194
25							

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

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4		X4
1							
2							
3	COST-OF-GOODS SOLD BUDGET						
4	<u>Cost-of-Goods Sold Budget</u>						
5	Wheel frame	\$ 275,000	\$ 286,000	\$ 286,200	\$ 291,500		\$ 1,138,700
6	Air bag	275,000	275,600	270,000	264,000		1,084,600
7	Assembly labor	200,000	202,800	189,000	181,500		773,300
8	Total cost-of-goods sold	\$ 750,000	\$ 764,400	\$ 745,200	\$ 737,000		\$ 2,996,600
9							

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

	B	C	D	E	F	G
	Period					
	1Q X4	2Q X4	3Q X4	4Q X4		X4
INVENTORY BUDGET						
4 <i>Inventory Budget</i>						
5 Desired ending inventory	\$ 212,333	\$ 207,000	\$ 204,722	\$ 204,722	\$ 204,722	
6 + Cost of goods sold	750,000	764,400	745,200	737,000	2,996,600	
7 = Total inventory needed	\$ 962,333	\$ 971,400	\$ 949,922	\$ 941,722	\$ 3,201,322	
PURCHASES BUDGET						
10 <i>Purchases Budget</i>						
11 Total inventory needed	\$ 962,333	\$ 971,400	\$ 949,922	\$ 941,722	N/A	
12 - Beginning inventory	- 212,333	- 207,000	- 204,722	- 204,722	-	
13 = Purchases	\$ 962,333	\$ 759,067	\$ 742,922	\$ 737,000	N/A	
Disbursements for Purchases Budget						
15 <i>Payments of payables</i>						
16 Payments of payables	\$ 641,556	\$ 826,822	\$ 748,304	\$ 738,974	\$ 2,955,656	
17 Total disbursements for purchases	\$ 641,556	\$ 826,822	\$ 748,304	\$ 738,974	\$ 2,955,656	
Accounts Payable (A/P) Budget						
19 <i>Beginning A/P balance</i>						
20 Beginning A/P balance	\$ -	\$ 320,778	\$ 253,022	\$ 247,641	\$ -	
21 + Additions to A/P	320,778	253,022	247,641	245,667	1,067,107	
22 - Subtractions from A/P	-	320,778	253,022	247,641	821,441	
23 Ending A/P	\$ 320,778	\$ 253,022	\$ 247,641	\$ 245,667	\$ 245,667	
24						
Sales and Collections COGS Inventory and Purchase						
Ready						

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.

- Given the information regarding Company DEF, build a Headcount Overview worksheet for Company DEF.
- Based on the information presented and the headcount worksheet that you built in Question 1, build a Headcount Cost worksheet for Company DEF.
- 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).
- Based on the information presented and your work in Questions 1–3, build a Disbursements for Operating Expenses Budget for Company DEF.

CHAPTER 5

Operating Budget— Income Statement

This 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.

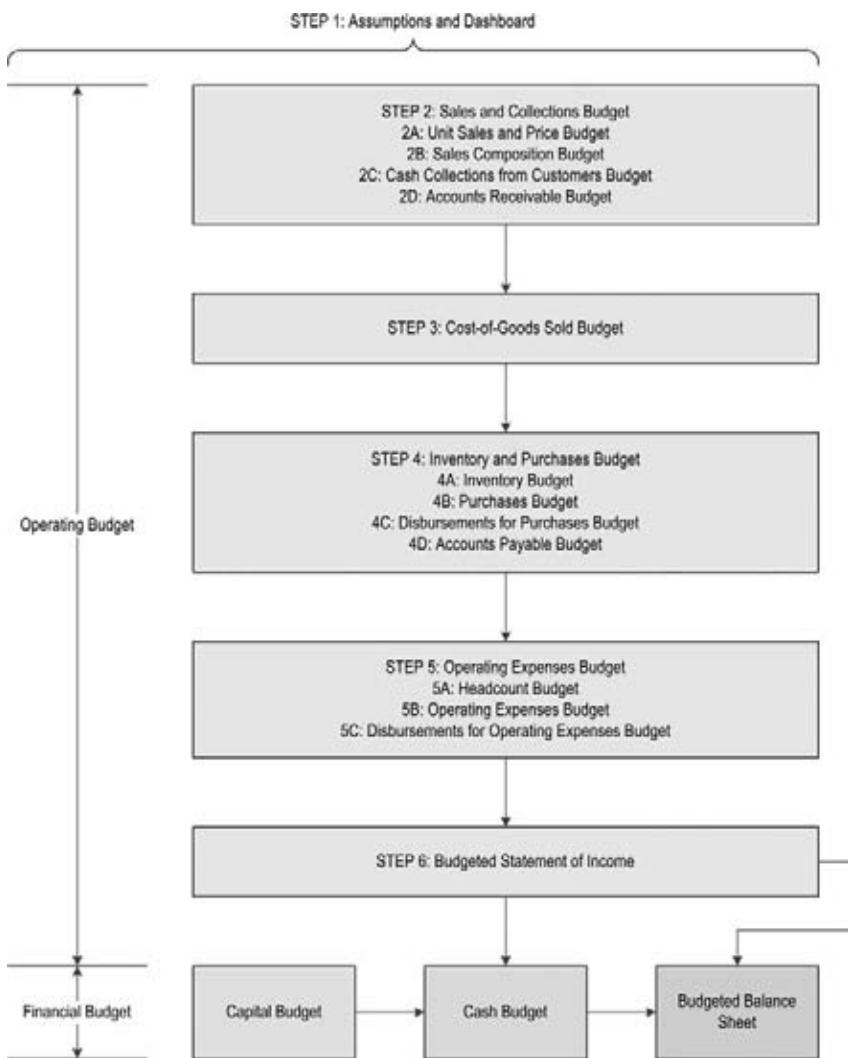


FIGURE 5.1 Budgeted Statement of Income and its Relative Position in the Master Budget Hierarchy

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.

Fig5.2 - Microsoft Excel

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	Sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000	
4	Cost of goods sold	200,000	291,000	373,800	462,000	1,326,800	
5	Gross profit	\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000	\$ 5,565,200	
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 5.2 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

	A	B	C	D	E	F	G
		Period					
1		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
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 5.3 Alternative View of the First Section of the Income Statement

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4		X4
3 Sales		GrossP1Q	GrossP2Q	GrossP3Q	GrossP4Q		GrossPX4
4 Cost of goods sold							
5 Gross profit							
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 5.4 Names of the Input and Output Cells in the Income Statement

Fig5.5 - Microsoft Excel

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3 Sales		\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,932,000	
4 Cost of goods sold		200,000	291,000	373,800	462,000	1,326,800	
5 Gross profit		\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000	\$ 5,565,200	
6							
7 Salaries		\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200	\$ 2,301,600	
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							
	Operating Expenses	Capital	Cash	Balance Sh			
	Ready						

FIGURE 5.5 Income Statement

Fig5.6 - Microsoft Excel

	A	B	C	D	E	F	G
		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	
6							
7 Salaries		=SalExp1Q	=SalExp2Q	=SalExp3Q	=SalExp4Q	=SUM(B7:E7)	
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							
	Financial Ratios	Valuation	Capitalization	1	4		
	Ready						

FIGURE 5.6 Alternative View of the Income Statement

	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

Fig5.8 - Microsoft Excel

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3 Sales		\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000		\$ 6,892,000
4 Cost of goods sold		200,000	291,000	373,800	462,000		1,326,800
5 Gross profit		\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000		\$ 5,566,200
6							
7 Salaries		\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200		\$ 2,301,600
8 Miscellaneous expenses		30,000	43,200	57,960	75,600		206,760
9 Research and development		70,000	100,800	154,560	201,600		526,960
10 Rent		20,000	20,000	20,000	20,000		80,000
11 Taxes							
12 Depreciation							
13 Income from operations		\$ 209,600	\$ 514,600	\$ 662,080	\$ 1,063,600		\$ 2,449,880
14							
15 Interest expense							
16 Taxable income							
17							
18 Tax expense							
19 Net income							
20							

Operating Expenses Capital Cash Balance Sheet Ready

FIGURE 5.8 Income Statement

Fig5.9 - Microsoft Excel

	A	B	C	D
		1Q X4	2Q X4	3Q X4
3 Sales		=Sales1Q	=Sales2Q	=Sales3Q
4 Cost of goods sold		=COGS1Q	=COGS2Q	=COGS3Q
5 Gross profit		=B3-B4	=C3-C4	=D3-D4
6				
7 Salaries		=SalExp1Q	=SalExp2Q	=SalExp3Q
8 Miscellaneous expenses		=MiscExp1Q	=MiscExp2Q	=MiscExp3Q
9 Research and development		=RDExp1Q	=RDExp2Q	=RDExp3Q
10 Rent		=RentExp1Q	=RentExp2Q	=RentExp3Q
11 Taxes				
12 Depreciation				
13 Income from operations		=GrossP1Q-OpExp1Q	=GrossP2Q-OpExp2Q	=GrossP3Q-OpExp3Q
14				
15 Interest expense				
16 Taxable income				
17				
18 Tax expense				
19 Net income				
20				

Financial Ratios Valuation Capitalization Inc: 4 Ready

FIGURE 5.9 Alternative View of the Income Statement

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4		X4
2	Sales						
3	Cost of goods sold						
5	Gross profit	GrossP1Q	GrossP2Q	GrossP3Q	GrossP4Q		GrossP4X
6							
7	Salaries						
8	Miscellaneous expenses						
9	Research and development						
10	Rent						
11	Taxes						
12	Depreciation						
13	Income from operations	OpInc1Q	OpInc2Q	OpInc3Q	OpInc4Q		OpIncX4
14							
15	Interest expense						
16	Taxable income						
17							
18	Tax expense						
19	Net income						
20							

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

Fig5.11 - Microsoft Excel

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3 Sales		\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000		\$ 6,892,000
4 Cost of goods sold		200,000	291,000	373,800	462,000		1,326,800
5 Gross profit		\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000		\$ 5,565,200
6							
7 Salaries		\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200		\$ 2,301,600
8 Miscellaneous expenses		30,000	43,200	57,960	75,600		206,760
9 Research and development		70,000	100,800	154,560	201,600		526,960
10 Rent		20,000	20,000	20,000	20,000		80,000
11 Taxes							
12 Depreciation							-
13 Income from operations		\$ 209,600	\$ 514,600	\$ 662,080	\$ 1,063,600		\$ 2,449,680
14							
15 Interest expense							\$ -
16 Taxable income		\$ 209,600	\$ 514,600	\$ 662,080	\$ 1,063,600		\$ 2,449,680
17							
18 Tax expense							
19 Net income							
20							

Ready

FIGURE 5.11 Income Statement

Fig5.12 - Microsoft Excel

	A	B	C	D	Period
		1Q X4	2Q X4	3Q X4	
3 Sales		=Sales1Q	=Sales2Q	=Sales3Q	
4 Cost of goods sold		=COGS1Q	=COGS2Q	=COGS3Q	
5 Gross profit		=B3-B4	=C3-C4	=D3-D4	
6					
7 Salaries		=SalExp1Q	=SalExp2Q	=SalExp3Q	
8 Miscellaneous expenses		=MiscExp1Q	=MiscExp2Q	=MiscExp3Q	
9 Research and development		=RDExp1Q	=RDExp2Q	=RDExp3Q	
10 Rent		=RentExp1Q	=RentExp2Q	=RentExp3Q	
11 Taxes					
12 Depreciation					
13 Income from operations		=GrossP1Q-OpExp1Q	=GrossP2Q-OpExp2Q	=GrossP3Q-OpExp3Q	
14					
15 Interest expense					
16 Taxable income		=OpInc1Q-B15	=OpInc2Q-C15	=OpInc3Q-D15	
17					
18 Tax expense					
19 Net income					
20					

Ready

FIGURE 5.12 Alternative View of the Income Statement

Fig5.13 - Microsoft Excel

	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 Miscellaneous expenses							
9 Research and development							
10 Rent							
11 Taxes							
12 Depreciation							
13 Income from operations		Oplnc1Q	Oplnc2Q	Oplnc3Q	Oplnc4Q		OplncX4
14							
15 Interest expense							
16 Taxable income		Taxlnc1Q	Taxlnc2Q	Taxlnc3Q	Taxlnc4Q		TaxlncX4
17							
18 Tax expense							
19 Net income							
20							

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.

Fig.5.14 - Microsoft Excel

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
43	Periodic base salaries (annualized)					\$ 200,000	
44	Chief Executive Officer					\$ 175,000	
45	Chief Financial Officer					\$ 175,000	
46	VP, Engineering					\$ 150,000	
47	VP, Sales & Marketing					\$ 140,000	
48	VP, Business Development					\$ 120,000	
49	Salesperson					\$ 110,000	
50	Hardware Engineer					\$ 55,000	
51	Controller/Accountant					\$ 35,000	
52	Administrative Assistant						
53							
54	Headcount Cost Worksheet						
55	Headcount Cost Inputs						
56	Benefits rate					12.0%	
57	Benefits factor (1 + benefits rate)					1.12	
58							
59	Operating Expenses Worksheet						
60	Operating Expenses Inputs						
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	35.0%	35.0%	35.0%	35.0%		
70							

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

Fig.5.15 - Microsoft Excel

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000	
4	Cost of goods sold	200,000	291,000	373,800	462,000	1,326,800	
5	Gross profit	\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000	\$ 5,565,200	
6							
7	Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200	\$ 2,301,600	
8	Miscellaneous expenses	30,000	43,200	57,960	75,800	206,760	
9	Research and development	70,000	100,800	154,560	201,600	526,960	
10	Rent	20,000	20,000	20,000	20,000	80,000	
11	Depreciation					-	
12	Income from operations	\$ 209,600	\$ 514,600	\$ 662,080	\$ 1,063,600	\$ 2,449,880	
13							
14	Interest expense					\$ -	
15	Taxable income	\$ 209,600	\$ 514,600	\$ 662,080	\$ 1,063,600	\$ 2,449,880	
16							
17	Tax expense	\$ 73,360	\$ 180,110	\$ 231,720	\$ 372,260	\$ 857,450	
18	Net income	\$ 136,240	\$ 334,490	\$ 430,352	\$ 691,340	\$ 1,592,422	
19							

FIGURE 5.15 Income Statement

	A	B	C	D
		1Q X4	2Q X4	3Q X4
3 Sales		=Sales1Q	=Sales2Q	=Sales3Q
4 Cost of goods sold		=COGS1Q	=COGS2Q	=COGS3Q
5 Gross profit		=B3-B4	=C3-C4	=D3-D4
6				
7 Salaries		=SalExp1Q	=SalExp2Q	=SalExp3Q
8 Miscellaneous expenses		=MiscExp1Q	=MiscExp2Q	=MiscExp3Q
9 Research and development		=RDExp1Q	=RDExp2Q	=RDExp3Q
10 Rent		=RentExp1Q	=RentExp2Q	=RentExp3Q
11 Depreciation				
12 Income from operations		=GrossP1Q-OpExp1Q	=GrossP2Q-OpExp2Q	=GrossP3Q-OpExp3Q
13				
14 Interest expense				
15 Taxable income		=OpInc1Q-B14	=OpInc2Q-C14	=OpInc3Q-D14
16				
17 Tax expense		=TaxInc1Q*TaxPct1Q	=TaxInc2Q*TaxPct2Q	=TaxInc3Q*TaxPct3Q
18 Net income		=TaxInc1Q-TaxExp1Q	=TaxInc2Q-TaxExp2Q	=TaxInc3Q-TaxExp3Q
19				

FIGURE 5.16 Alternative View of the Income Statement

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4	X4	
43 Periodic base salaries (annualized)							
44 Chief Executive Officer							SalCEOX4
45 Chief Financial Officer							SalCFOX4
46 VP, Engineering							SalVPEX4
47 VP, Sales & Marketing							SalVPSMX4
48 VP, Business Development							SalVPBDX4
49 Salesperson							SalSPX4
50 Hardware Engineer							SalHEX4
51 Controller/Accountant							SalCAX4
52 Administrative Assistant							SalAAx4
53							
54 Headcount Cost Worksheet							
55 Headcount_Cost_Inputs							
56 Benefits rate							
57 Benefits factor (1 + benefits rate)							
58							
59 Operating Expenses Worksheet							
60 Operating_Expenses_Inputs							
61 Miscellaneous expenses as a % of sales							
62							
63 R&D expenses as a % of sales							
64							
65 Rent expense per square foot per quarter							
66 Square feet of space rented							
67 Total rent expense							
68							
69 Tax rate							
70							

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

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
1 Sales					
4 Cost of goods sold					
5 Gross profit	GrossP1Q	GrossP2Q	GrossP3Q	GrossP4Q	GrossPX4
6					
7 Salaries					
8 Miscellaneous expenses					
9 Research and development					
10 Rent					
11 Depreciation					
12 Income from operations	OpInc1Q	OpInc2Q	OpInc3Q	OpInc4Q	OpIncX4
13					
14 Interest expense					
15 Taxable income	TaxInc1Q	TaxInc2Q	TaxInc3Q	TaxInc4Q	TaxIncX4
16					
17 Tax expense	TaxExp1Q	TaxExp2Q	TaxExp3Q	TaxExp4Q	TaxExpX4
18 Net income	NetInc1Q	NetInc2Q	NetInc3Q	NetInc4Q	NetIncX4
19					

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.

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
1 Sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000
4 Cost of goods sold	200,000	291,000	373,800	462,000	1,326,800
5 Gross profit	\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000	\$ 5,565,200
6					
7 Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200	\$ 2,301,600
8 Miscellaneous expenses	30,000	43,200	57,960	75,600	206,760
9 Research and development	70,000	100,800	154,560	201,600	526,960
10 Rent	20,000	20,000	20,000	20,000	80,000
11 Depreciation					-
12 Income from operations	\$ 209,600	\$ 514,600	\$ 662,080	\$ 1,063,600	\$ 2,449,880
13					
14 Interest expense					\$ -
15 Taxable income	\$ 209,600	\$ 514,600	\$ 662,080	\$ 1,063,600	\$ 2,449,880
16					
17 Tax expense	\$ 73,360	\$ 180,110	\$ 231,728	\$ 372,260	\$ 857,458
18 Net income	\$ 136,240	\$ 334,490	\$ 430,352	\$ 691,340	\$ 1,592,422
19					

FIGURE 5.19 Income Statement

The screenshot shows a Microsoft Excel spreadsheet titled "Fig5.20 - Microsoft Excel". The worksheet displays an Income Statement across four time periods: 1Q X4, 2Q X4, 3Q X4, and 4Q X4. The columns represent different financial categories: Sales, Cost of goods sold, Gross profit, Salaries, Miscellaneous expenses, Research and development, Rent, Depreciation, Income from operations, Interest expense, Taxable income, Tax expense, and Net income. Each cell contains either a formula or a value. For example, the formula for Sales is =Sales1Q, and for Net income, it is =TaxInc1Q-TaxExp1Q + =TaxInc2Q-TaxExp2Q + =TaxInc3Q-TaxExp3Q + =TaxInc4Q-TaxExp4Q.

	A	B	C	D	Period
1					
2		1Q X4	2Q X4	3Q X4	4Q X4
3	Sales	=Sales1Q	=Sales2Q	=Sales3Q	
4	Cost of goods sold	=COGS1Q	=COGS2Q	=COGS3Q	
5	Gross profit	=B3-B4	=C3-C4	=D3-D4	
6					
7	Salaries	=SalExp1Q	=SalExp2Q	=SalExp3Q	
8	Miscellaneous expenses	=MiscExp1Q	=MiscExp2Q	=MiscExp3Q	
9	Research and development	=RDExp1Q	=RDExp2Q	=RDExp3Q	
10	Rent	=RentExp1Q	=RentExp2Q	=RentExp3Q	
11	Depreciation				
12	Income from operations	=GrossP1Q-OpExp1Q	=GrossP2Q-OpExp2Q	=GrossP3Q-OpExp3Q	
13					
14	Interest expense				
15	Taxable income	=OpInc1Q-D14	=OpInc2Q-C14	=OpInc3Q-D14	
16					
17	Tax expense	=TaxInc1Q*TaxPct1Q	=TaxInc2Q*TaxPct2Q	=TaxInc3Q*TaxPct3Q	
18	Net income	=TaxInc1Q-TaxExp1Q	=TaxInc2Q-TaxExp2Q	=TaxInc3Q-TaxExp3Q	
19					
	Financial Ratios	Valuation	Capitalization	Incl.	
	Ready				

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.

The screenshot shows a Microsoft Excel spreadsheet titled "Fig5.21 - Microsoft Excel". The worksheet displays a list of names and their corresponding input and output cells. The names include CEO, CFO, CMO, CTO, CPEX, VP/PM, Salesperson, Hardware Engineer, Controller/Accountant, Administrative Assistant, and various department heads like Chief Executive Officer, Chief Financial Officer, Chief Marketing Officer, Chief Technology Officer, Vice President of Product Management, Salesperson, Hardware Engineer, Controller/Accountant, and Administrative Assistant. The input cells are listed in the first column, and the output cells are listed in the second column. For example, the input cell for the CEO is BnCEOM and the output cell is BnCEOM.

	A	B	C	D	E	F	G	Period
1								
2		1Q X4	2Q X4	3Q X4	4Q X4			X4
43	Periodic base salaries (annualized)							
44	Chief Executive Officer							BnCEOM
45	Chief Financial Officer							BnCFO
46	Chief Marketing Officer							BnCMO
47	Vice President of Product Management							BnVPPM
48	Salesperson							BnSPLN
49	Hardware Engineer							BnHE
50	Controller/Accountant							BnCAM
51	Administrative Assistant							BnAA
52								
53	Headcount Cost Worksheet							
54	Headcount Cost Inputs							
55	Benefits rate							BeneRate
56	Benefits factor (1 + benefits rate)							BeneFactor
57								
58	Operating Expenses Worksheet							
59	Operating Expenses Inputs							
60	Miscellaneous expenses as a % of sales							
61								
62	R&D expenses as a % of sales							
63								
64	Rent expense per square foot per quarter							
65	Square feet of space rented							
66	Total rent expense							
67								
68	Tax rate							
69								
70	TaxPct1Q	TaxPct2Q	TaxPct3Q	TaxPct4Q				
	Financial Ratios	Valuation	Capitalization	Assumptions and Dash	BLANK!			
	Ready							

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

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4	X4	
29	Headcount Overview Worksheet						
30	Headcount Overview Inputs						
31	Number of employees						
32	Chief Executive Officer	1	1	1	1		
33	Chief Financial Officer	1	1	1	1		
34	VP, Engineering	1	1	1	1		
35	VP, Sales & Marketing	1	1	1	1		
36	VP, Business Development	-	-	-	-	1	
37	Salesperson	6	6	7	9		
38	Hardware Engineer	3	4	4	4		
39	Controller/Accountant	1	1	1	1		
40	Administrative Assistant	2	2	2	2		
41	Total	16	17	18	21		
42							
43	Periodic base salaries (annualized)						
44	Chief Executive Officer					\$ 165,000	
45	Chief Financial Officer					\$ 145,000	
46	VP, Engineering					\$ 140,000	
47	VP, Sales & Marketing					\$ 135,000	
48	VP, Business Development					\$ 130,000	
49	Salesperson					\$ 100,000	
50	Hardware Engineer					\$ 95,000	
51	Controller/Accountant					\$ 50,000	
52	Administrative Assistant					\$ 32,500	
53							
54	Headcount Cost Worksheet						
55	Headcount Cost Inputs						
56	Benefits rate					16.0%	
57	Benefits factor (1 + benefits rate)					1.16	
58							

FIGURE Q5.1 Company GHI's Assumptions and Dashboard Worksheet

The screenshot shows a Microsoft Excel spreadsheet titled "FigQ5.2 - Microsoft Excel". The spreadsheet contains several budget tables:

- Sales Budget:**

	B	C	D	E	F
	1Q X4	2Q X4	3Q X4	4Q X4	X4
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
- Sales Composition Budget:**

Cash sales	\$ 1,760,000	\$ 1,720,000	\$ 1,706,400	\$ 1,674,800	\$ 6,069,200
+ 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
- Collections Budget:**

Cash collections from customers budget	\$ 1,760,000	\$ 1,720,000	\$ 1,706,400	\$ 1,674,800	\$ 6,069,200
Cash sales this period	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
- Accounts receivable (A/R) budget:**

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.

- 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.
- 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.

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

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

3. 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

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	INVENTORY BUDGET						
4	<i>Inventory Budget</i>						
5	Desired ending inventory	\$ 228,000	\$ 232,320	\$ 226,722	\$ 226,722	\$ 226,722	
6	+ Cost of goods sold	1,072,500	1,026,000	950,400	927,500	3,976,400	
7	= Total inventory needed	\$ 1,300,500	\$ 1,258,320	\$ 1,177,122	\$ 1,154,222	\$ 4,203,122	
8							
9	PURCHASES BUDGET						
10	<i>Purchases Budget</i>						
11	Total inventory needed	\$ 1,300,500	\$ 1,258,320	\$ 1,177,122	\$ 1,154,222	N/A	
12	- Beginning inventory	-	228,000	232,320	226,722	-	
13	= Purchases	\$ 1,300,500	\$ 1,030,320	\$ 944,802	\$ 927,500	N/A	
14							
15	Disbursements for Purchases Budget						
16	Payments of payables	\$ 722,500	\$ 1,150,400	\$ 982,810	\$ 935,190	\$ 3,790,900	
17	Total disbursements for purchases	\$ 722,500	\$ 1,150,400	\$ 982,810	\$ 935,190	\$ 3,790,900	
18							
19	Accounts Payable (A/P) Budget						
20	Beginning A/P balance	\$ -	\$ 578,000	\$ 457,920	\$ 419,912	\$ -	
21	+ Additions to A/P	578,000	457,920	419,912	412,222	1,868,054	
22	- Subtractions from A/P	-	578,000	457,920	419,912	1,455,832	
23	Ending A/P	\$ 578,000	\$ 457,920	\$ 419,912	\$ 412,222	\$ 412,222	

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

FigQ5.5 - Microsoft Excel

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
HEADCOUNT BUDGET							
4 Headcount Budget							
5 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
11 Salesperson		6	6	7	9		
12 Hardware Engineer		3	4	4	4		
13 Controller/Accountant		1	1	1	1		
14 Administrative Assistant		2	2	2	2		
15 Total		16	17	18	21		
16							
17 Periodic base salaries							
18 Chief Executive Officer	\$ 41,250	\$ 41,250	\$ 41,250	\$ 41,250	\$ 41,250	\$ 165,000	
19 Chief Financial Officer	36,250	36,250	36,250	36,250	36,250	145,000	
20 VP, Engineering	35,000	35,000	35,000	35,000	35,000	140,000	
21 VP, Sales & Marketing	33,750	33,750	33,750	33,750	33,750	135,000	
22 VP, Business Development	32,500	32,500	32,500	32,500	32,500	130,000	
23 Salesperson	25,000	25,000	25,000	25,000	25,000	100,000	
24 Hardware Engineer	23,750	23,750	23,750	23,750	23,750	95,000	
25 Controller/Accountant	12,500	12,500	12,500	12,500	12,500	50,000	
26 Administrative Assistant	8,125	8,125	8,125	8,125	8,125	32,500	
27 Total	\$ 248,125	\$ 248,125	\$ 248,125	\$ 248,125	\$ 248,125	\$ 992,500	
28							
Headcount Overview							
Headcount Cost							
Open							
Ready							

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.

FigQ5.6 - Microsoft Excel

	A	Period					X4		
		1Q X4	2Q X4	3Q X4	4Q X4				
HEADCOUNT BUDGET									
Headcount Budget									
5 Periodic salary expense (base)									
6 Chief Executive Officer	\$ 41,250	\$ 41,250	\$ 41,250	\$ 41,250	\$ 41,250	\$ 165,000			
7 Chief Financial Officer	36,250	36,250	36,250	36,250	36,250	145,000			
8 VP, Engineering	35,000	35,000	35,000	35,000	35,000	140,000			
9 VP, Sales & Marketing	33,750	33,750	33,750	33,750	33,750	135,000			
10 VP, Business Development	-	-	-	-	32,500	32,500			
11 Salesperson	150,000	150,000	175,000	225,000		700,000			
12 Hardware Engineer	71,250	95,000	95,000	95,000		356,250			
13 Controller/Accountant	12,500	12,500	12,500	12,500		50,000			
14 Administrative Assistant	16,250	16,250	16,250	16,250		65,000			
15 Total	\$ 396,250	\$ 420,000	\$ 445,000	\$ 527,500		\$ 1,788,750			
16									
17 Total (with benefits)	\$ 459,650	\$ 487,200	\$ 516,200	\$ 611,900		\$ 2,074,950			
18									

FIGURE Q5.6 Company GHI's Headcount Cost Worksheet

FigQ5.7 - Microsoft Excel

	A	Period					X4		
		1Q X4	2Q X4	3Q X4	4Q X4				
OPERATING EXPENSES BUDGET									
Operating Expenses Budget									
5 Salaries	\$ 459,650	\$ 487,200	\$ 516,200	\$ 611,900	\$ 2,074,950				
6 Miscellaneous expenses	88,000	97,200	106,650	94,208	386,058				
7 Research and development	132,000	140,400	149,310	157,013	578,723				
8 Rent	15,750	15,750	15,750	15,750	63,000				
9 Depreciation	-	-	-	-	-				
10 Total operating expenses	\$ 695,400	\$ 740,550	\$ 787,910	\$ 878,870	\$ 3,102,730				
11									
DISBURSEMENTS FOR OPERATING EXPENSES BUDGET									
Disbursements for Operating Expenses Budget									
14 Salaries	\$ 459,650	\$ 487,200	\$ 516,200	\$ 611,900	\$ 2,074,950				
15 Miscellaneous expenses	88,000	97,200	106,650	94,208	386,058				
16 Research and development	132,000	140,400	149,310	157,013	578,723				
17 Rent	15,750	15,750	15,750	15,750	63,000				
18 Depreciation	-	-	-	-	-				
19 Total disbursements for operating expenses	\$ 695,400	\$ 740,550	\$ 787,910	\$ 878,870	\$ 3,102,730				
20									

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

Financial Budget—Capital Budget and Cash Budget

The 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

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.

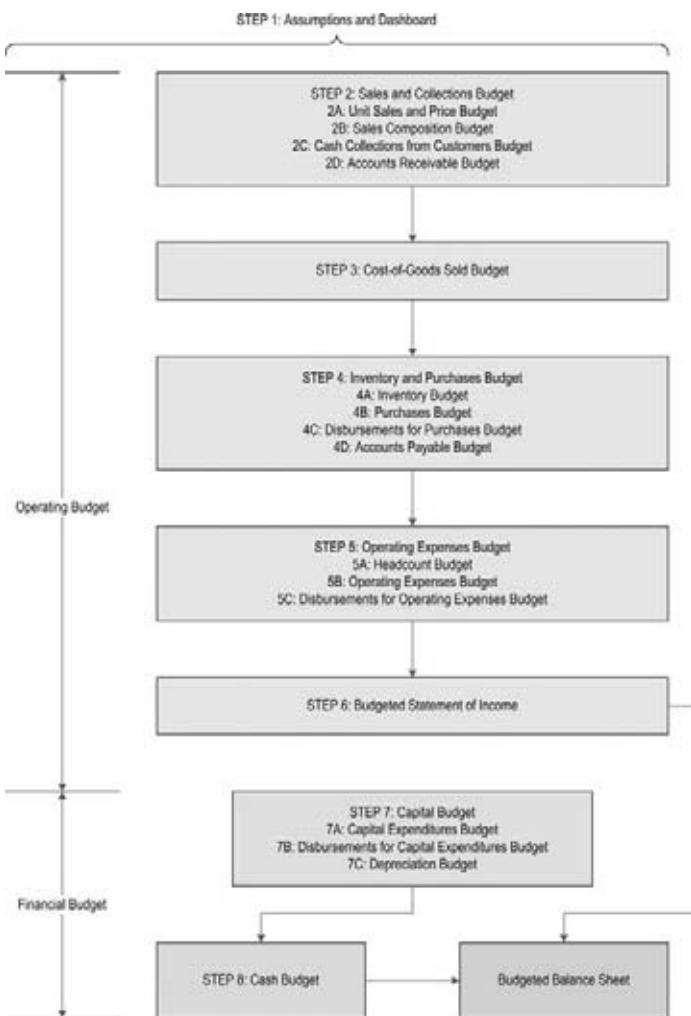


FIGURE 6.1 Components of the Financial Budget and Their Relative Position in the Master Budget

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.

Fig6.2 - Microsoft Excel

	A	B	C	D	E	F	G
1		1Q X4	2Q X4	3Q X4	4Q X4	X4	
60	Operating Expenses Inputs						
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	35.0%	35.0%	35.0%	35.0%		
70							
71	Capital Worksheet						
72	Capital Expenditures (CAPEX) Inputs						
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		
77							

FIGURE 6.2 Assumptions and Dashboard Worksheet

Fig6.3 - Microsoft Excel

	A	B	C	D	E	F	G
1		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	CAPITAL BUDGET						
4	Capital Expenditures Budget						
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	Disbursements for Capital Expenditures Budget						
11	Equipment					\$ -	
12	Furniture					\$ -	
13	Fixtures					\$ -	
14	Total disbursements for capital expenditures	\$ -	\$ -	\$ -	\$ -	\$ -	
15							
16	Depreciation Budget						
17	Equipment					\$ -	
18	Furniture					\$ -	
19	Fixtures					\$ -	
20	Total depreciation	\$ -	\$ -	\$ -	\$ -	\$ -	
21							

FIGURE 6.3 Capital Expenditures Budget

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4	X4	Period
1							
2							
3	CAPITAL BUDGET						
4	Capital Expenditures Budget						
5	Equipment	=EqptPur1Q	=EqptPur2Q	=EqptPur3Q	=EqptPur4Q	=SUM(B5:E5)	
6	Furniture	=FurnPur1Q	=FurnPur2Q	=FurnPur3Q	=FurnPur4Q	=SUM(B6:E6)	
7	Fixtures	=FixPur1Q	=FixPur2Q	=FixPur3Q	=FixPur4Q	=SUM(B7:E7)	
8	Total capital expenditures	=CAPEXPur1Q	=CAPEXPur2Q	=CAPEXPur3Q	=CAPEXPur4Q	=SUM(G5:G7)	
9							
10	Disbursements for Capital Expenditures Budget						
11	Equipment					=SUM(B11:E11)	
12	Furniture					=SUM(B12:E12)	
13	Fixtures					=SUM(B13:E13)	
14	Total disbursements for capital expenditures	=SUM(B11:B13)	=SUM(C11:C13)	=SUM(D11:D13)	=SUM(E11:E13)	=SUM(G11:G13)	
15							
16	Depreciation Budget						
17	Equipment					=SUM(B17:E17)	
18	Furniture					=SUM(B18:E18)	
19	Fixtures					=SUM(B19:E19)	
20	Total depreciation	=SUM(B17:B19)	=SUM(C17:C19)	=SUM(D17:D19)	=SUM(E17:E19)	=SUM(G17:G19)	
21							

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.

	A	B	C	D	E	F	G	H	I
		4Q X3	1Q X4	2Q X4	3Q X4	4Q X4	X4		Period
1									
2									
3	R&D expenses as a % of sales		RDPer1Q	RDPer2Q	RDPer3Q	RDPer4Q			
4									
5	Rent expense per square foot per quarter		Rent1Q	Rent2Q	Rent3Q	Rent4Q			
6	Square feet of space rented		FIRent1Q	FIRent2Q	FIRent3Q	FIRent4Q			
7	Total rent expense		RentExp1Q	RentExp2Q	RentExp3Q	RentExp4Q			
8									
9	Tax rate		TaxPct1Q	TaxPct2Q	TaxPct3Q	TaxPct4Q			
10									
11	Capital Worksheet								
12	Capital Expenditures (CAPEX) Inputs								
13	Equipment purchases		EqptPur1Q	EqptPur2Q	EqptPur3Q	EqptPur4Q			
14	Furniture purchases		FurnPur1Q	FurnPur2Q	FurnPur3Q	FurnPur4Q			
15	Fixtures purchases		FixPur1Q	FixPur2Q	FixPur3Q	FixPur4Q			
16	Total CAPEX purchases		=CAPEXPur1Q	=CAPEXPur2Q	=CAPEXPur3Q	=CAPEXPur4Q			
17									

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

	A	B	C	D	E	F	G
	A1	10 X4	20 X4	30 X4	40 X4	X4	
3	CAPITAL BUDGET						
4	Capital Expenditures Budget						
5	Equipment						EqptPurX4
6	Furniture						FurnPurX4
7	Fixtures						FixPurX4
8	Total capital expenditures						CAPEXPurX4
9							
10	Disbursements for Capital Expenditures Budget						
11	Equipment						
12	Furniture						
13	Fixtures						
14	Total disbursements for capital expenditures						
15							
16	Depreciation Budget						
17	Equipment						
18	Furniture						
19	Fixtures						
20	Total depreciation						
21							

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

	A	B	C	D	E	F	G
1							
2							Period
59	Operating Expenses Worksheet		1Q X4	2Q X4	3Q X4	4Q X4	X4
60	Operating Expenses Inputs						
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	\$ 5.00	
66	Square feet of space rented	4,000	4,000	4,000	4,000	4,000	
67	Total rent expense	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	
68							
69	Tax rate	35.0%	35.0%	35.0%	35.0%	35.0%	
70							
71	Capital Worksheet						
72	Capital Expenditures (CAPEX) Inputs						
73	Equipment purchases	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	
74	Furniture purchases	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	
75	Fixtures purchases	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	
76	Total CAPEX purchases	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	
77							
78	CAPEX Disbursements Inputs						
79	% of purchases paid for in purchase period	100%	100%	100%	100%	100%	
80							
	Assumptions and Dashboard	Sales and Collections	Cell A4				
	Ready						

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

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	CAPITAL BUDGET						
4	<i>Capital Expenditures Budget</i>						
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	<i>Disbursements for Capital Expenditures Budget</i>						
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	<i>Depreciation Budget</i>						
17	Equipment					\$ -	
18	Furniture					\$ -	
19	Fixtures					\$ -	
20	Total depreciation	\$ -	\$ -	\$ -	\$ -	\$ -	
21							

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.

	A	B	C
1			
2		1Q X4	2Q X4
3	CAPITAL BUDGET		
4	<i>Capital Expenditures Budget</i>		
5	Equipment	=CapExPur1Q	=CapExPur2Q
6	Furniture	=FurnPur1Q	=FurnPur2Q
7	Fixtures	=FixPur1Q	=FixPur2Q
8	Total capital expenditures	=CapExPur1Q+CapExPur2Q	=CapExPur1Q+CapExPur2Q
9			
10	<i>Disbursements for Capital Expenditures Budget</i>		
11	Equipment	=CapExPur1Q*CAPEXPct1Q	=CapExPur2Q*CAPEXPct2Q
12	Furniture	=FurnPur1Q*CAPEXPct1Q	=FurnPur2Q*CAPEXPct2Q
13	Fixtures	=FixPur1Q*CAPEXPct1Q	=FixPur2Q*CAPEXPct2Q
14	Total disbursements for capital expenditures	=SUM(B11:B13)	=SUM(C11:C13)
15			
16	<i>Depreciation Budget</i>		
17	Equipment		
18	Furniture		
19	Fixtures		
20	Total depreciation	=SUM(D17:D19)	=SUM(E17:E19)
21			

FIGURE 6.9 Alternative View of the Capital Expenditures Budget

Fig.10 - Microsoft Excel								
	Home	Insert	Page Layout	Formulas	Data	Review	View	Developer
A1								
1	A	B	C	D	E	F	G	H
2		4Q X3			Period			
66	Square feet of space rented	4Q X4	1Q X4	2Q X4	3Q X4	4Q X4		X4
67	Total rent expense		Rent1Q	Rent2Q	Rent3Q	Rent4Q		
68			RentExp1Q	RentExp2Q	RentExp3Q	RentExp4Q		
69	Tax rate			TaxPct1Q	TaxPct2Q	TaxPct3Q	TaxPct4Q	
70								
71	Capital Worksheet							
72	Capital Expenditures (CAPEX) Inputs							
73	Equipment purchases			EqtPur1Q	EqtPur2Q	EqtPur3Q	EqtPur4Q	
74	Furniture purchases			FurnPur1Q	FurnPur2Q	FurnPur3Q	FurnPur4Q	
75	Fixtures purchases			FixPur1Q	FixPur2Q	FixPur3Q	FixPur4Q	
76	Total CAPEX purchases			CAPEXPur1Q	CAPEXPur2Q	CAPEXPur3Q	CAPEXPur4Q	
77								
78	CAPEX Disbursements Inputs							
79	% of purchases paid in purchase period			CAPEXP1Q	CAPEXP2Q	CAPEXP3Q	CAPEXP4Q	
80								
81	Financial Ratios	Valuation	Capitalization	Assumptions and Dashboard				
82	Ready							100%

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

				Period		
		1Q X4	2Q X4	3Q X4	4Q X4	X4
1						
2	CAPITAL BUDGET					
3	Capital Expenditures Budget					
4	Equipment					EqgPnxX4
5	Furniture					FurnPnxX4
6	Fixtures					FixPnxX4
7	Total capital expenditures					CAPEPxX4
8						
9						
10	Disbursements for Capital Expenditures Budget					
11	Equipment	ExpDns1Q	ExpDns2Q	ExpDns3Q	ExpDns4Q	ExpDnsX4
12	Furniture	FurnDns1Q	FurnDns2Q	FurnDns3Q	FurnDns4Q	FurnDnsX4
13	Fixtures	FixDns1Q	FixDns2Q	FixDns3Q	FixDns4Q	FixDnsX4
14	Total disbursements for capital expenditures	CAPEDns1Q	CAPEDns2Q	CAPEDns3Q	CAPEDns4Q	CAPEDnsX4
15						
16	Depreciation Budget					
17	Equipment					
18	Furniture					
19	Fixtures					
20	Total depreciation					
21						

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 Napavale. 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

	A	Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
71	Capital Worksheet					
72	Capital Expenditures (CAPEX) Inputs					
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	
77						
78	CAPEX Disbursements Inputs					
79	% of purchases paid for in purchase period	100%	100%	100%	100%	
80						
81	Depreciation Inputs					
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.

	A	B	C	D	E	F	G
	A1	1Q X4	2Q X4	3Q X4	4Q X4	X4	Period
3	CAPITAL BUDGET						
4	Capital Expenditures Budget						
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	Disbursements for Capital Expenditures Budget						
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	Depreciation Budget						
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							

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.

	A	B	C
1	A1	1Q X4	2Q X4
2			
3	CAPITAL BUDGET		
4	Capital Expenditures Budget		
5	Equipment	=EqtPur1Q	=EqtPur2Q
6	Furniture	=FumPur1Q	=FumPur2Q
7	Fixtures	=FixPur1Q	=FixPur2Q
8	Total capital expenditures	=CAPEXP1Q	=CAPEXP2Q
9			
10	Disbursements for Capital Expenditures Budget		
11	Equipment	=EqtPur1Q*CAPEXP1Q	=EqtPur2Q*CAPEXP1Q
12	Furniture	=FumPur1Q*CAPEXP1Q	=FumPur2Q*CAPEXP1Q
13	Fixtures	=FixPur1Q*CAPEXP1Q	=FixPur2Q*CAPEXP1Q
14	Total disbursements for capital expenditures	=SUM(B11:B13)	=SUM(C11:C13)
15			
16	Depreciation Budget		
17	Equipment	=EqtPur1Q*EqpDM1Q	=EqtPur2Q*EqpDM1Q
18	Furniture	=FumPur1Q*FumDM1Q	=FumPur2Q*FumDM1Q
19	Fixtures	=FixPur1Q*FixDM1Q	=FixPur2Q*FixDM1Q
20	Total depreciation	=SUM(B17:B19)	=SUM(C17:C19)
21			

FIGURE 6.14 Alternative View of the Depreciation Budget

	A	B	C	D	E	F	G	H
		Period						
		1Q X4	2Q X4	3Q X4	4Q X4			X4
59	Tax rate	TaxPct1Q	TaxPct2Q	TaxPct3Q	TaxPct4Q			
60								
61	Capital Worksheet							
62	Capital Expenditures (CAPEX) Inputs							
63	Equipment purchases	EqptPur1Q	EqptPur2Q	EqptPur3Q	EqptPur4Q			
64	Furniture purchases	FurnPur1Q	FurnPur2Q	FurnPur3Q	FurnPur4Q			
65	Fixtures purchases	FixPur1Q	FixPur2Q	FixPur3Q	FixPur4Q			
66	Total CAPEX purchases	CAPEXPur1Q	CAPEXPur2Q	CAPEXPur3Q	CAPEXPur4Q			
67								
68	CAPEX Disbursements Inputs							
69	% of purchases paid for in purchase period	CAPEXP1t1Q	CAPEXP1t2Q	CAPEXP1t3Q	CAPEXP1t4Q			
70								
71	Depreciation Inputs							
72	Equipment depreciable life (years)	EqptDM1Q	EqptDM2Q	EqptDM3Q	EqptDM4Q			
73	Furniture depreciable life (years)	FurnDM1Q	FurnDM2Q	FurnDM3Q	FurnDM4Q			
74	Fixtures depreciable life (years)	FixDM1Q	FixDM2Q	FixDM3Q	FixDM4Q			
75	Quarters per year							
76								
77	Equipment depreciation multiplier	EqptDM1Q	EqptDM2Q	EqptDM3Q	EqptDM4Q			
78	Furniture depreciation multiplier	FurnDM1Q	FurnDM2Q	FurnDM3Q	FurnDM4Q			
79	Fixtures depreciation multiplier	FixDM1Q	FixDM2Q	FixDM3Q	FixDM4Q			
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Fig6.17 - Microsoft Excel

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	CAPITAL BUDGET						
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.

Fig.6.18 - Microsoft Excel	
A1	B
1	
2	1Q X4
3	CAPITAL BUDGET
4	Capital Expenditures Budget
5	Equipment =EqptPur1Q
6	Furniture =FurnPur1Q
7	Fixtures =FixPur1Q
8	Total capital expenditures =CAPEXPur1Q
9	
10	Disbursements for Capital Expenditures Budget
11	Equipment =EqptPur1Q*CAPEXPct1Q
12	Furniture =FurnPur1Q*CAPEXPct1Q
13	Fixtures =FixPur1Q*CAPEXPct1Q
14	Total disbursements for capital expenditures =SUM(B11:B13)
15	
16	Depreciation Budget
17	Equipment =EqptPur1Q*EqptDM1Q
18	Furniture =FurnPur1Q*FurnDM1Q
19	Fixtures =FixPur1Q*FixDM1Q
20	Total depreciation =SUM(B17:B19)
21	
22	Cumulative capital expenditures =CAPEXPur1Q
23	- Accumulated depreciation =Dep1Q
24	= Fixed assets, net of depreciation =CumCAPEX1Q-AccDep1Q
25	
26	
27	Cumulative disbursements for CAPEX =CAPEXPdis1Q
28	Payables adjustment for CAPEX disbursements =IF(CumCAPEX1Q>=DCCAPEX1Q,CumCAPEX1Q-DCCAPEX1Q,0)
29	

FIGURE 6.18 Alternative View of the Capital Budget

Fig.6.19 - Microsoft Excel						
A1	B C D E F G					
1		Period				
2		1Q X4	2Q X4	3Q X4	4Q X4	X4
3	CAPITAL BUDGET					
4	Capital Expenditures Budget					
5	Equipment	EqtPur1Q	EqtPur2Q	EqtPur3Q	EqtPur4Q	EqtPurX4
6	Furniture	FurnPur1Q	FurnPur2Q	FurnPur3Q	FurnPur4Q	FurnPurX4
7	Fixtures	FixPur1Q	FixPur2Q	FixPur3Q	FixPur4Q	FixPurX4
8	Total capital expenditures	CAPEXPur1Q	CAPEXPur2Q	CAPEXPur3Q	CAPEXPur4Q	CAPEXPurX4
9						
10	Disbursements for Capital Expenditures Budget					
11	Equipment	EqtDis1Q	EqtDis2Q	EqtDis3Q	EqtDis4Q	EqtDisX4
12	Furniture	FurnDis1Q	FurnDis2Q	FurnDis3Q	FurnDis4Q	FurnDisX4
13	Fixtures	FixDis1Q	FixDis2Q	FixDis3Q	FixDis4Q	FixDisX4
14	Total disbursements for capital expenditures	CAPEXPdis1Q	CAPEXPdis2Q	CAPEXPdis3Q	CAPEXPdis4Q	CAPEXPdisX4
15						
16	Depreciation Budget					
17	Equipment	EqtDep1Q	EqtDep2Q	EqtDep3Q	EqtDep4Q	EqtDepX4
18	Furniture	FurnDep1Q	FurnDep2Q	FurnDep3Q	FurnDep4Q	FurnDepX4
19	Fixtures	FixDep1Q	FixDep2Q	FixDep3Q	FixDep4Q	FixDepX4
20	Total depreciation	Dep1Q	Dep2Q	Dep3Q	Dep4Q	DepX4
21						
22	Cumulative capital expenditures	CumCAPEX1Q	CumCAPEX2Q	CumCAPEX3Q	CumCAPEX4Q	
23	- Accumulated depreciation	AccDep1Q	AccDep2Q	AccDep3Q	AccDep4Q	
24	= Fixed assets, net of depreciation	FixAssets1Q	FixAssets2Q	FixAssets3Q	FixAssets4Q	
25						
26	Cumulative disbursements for CAPEX	DCCAPEX1Q	DCCAPEX2Q	DCCAPEX3Q	DCCAPEX4Q	
27	Payables adjustment for CAPEX disbursements	PACAPEX1Q	PACAPEX2Q	PACAPEX3Q	PACAPEX4Q	
28						

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

	A	B	C	D	E	F	G
1		1Q X4	2Q X4	3Q X4	4Q X4		X4
2							Period
3	Sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000		\$ 6,892,000
4	Cost of goods sold	200,000	291,000	373,800	462,000		1,326,800
5	Gross profit	\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000		\$ 5,565,200
6							
7	Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200		\$ 2,301,600
8	Miscellaneous expenses	30,000	43,200	57,960	75,600		206,760
9	Research and development	70,000	100,800	154,560	201,600		526,960
10	Rent	20,000	20,000	20,000	20,000		80,000
11	Depreciation	2,313	4,625	6,938	9,250		23,125
12	Income from operations	\$ 207,288	\$ 509,975	\$ 655,143	\$ 1,054,350		\$ 2,426,755
13							
14	Interest expense						\$ -
15	Taxable income	\$ 207,288	\$ 509,975	\$ 655,143	\$ 1,054,350		\$ 2,426,755
16							
17	Tax expense	\$ 72,551	\$ 178,491	\$ 229,300	\$ 369,023		\$ 849,364
18	Net income	\$ 134,737	\$ 331,484	\$ 425,843	\$ 685,326		\$ 1,577,391
19							

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

	A	B	C	D	E	F	G
1		1Q X4	2Q X4	3Q X4	4Q X4		X4
2		=Sales1Q	=Sales2Q	=Sales3Q	=Sales4Q	=SUM(B3:E3)	
3	Cost of goods sold	=COGS1Q	=COGS2Q	=COGS3Q	=COGS4Q	=SUM(B3:E4)	
4	Gross profit	=B3-B4	=C3-C4	=D3-D4	=E3-E4	=G3-G4	
5							
6	Salaries	=SalExp1Q	=SalExp2Q	=SalExp3Q	=SalExp4Q	=SUM(B7:E7)	
7	Miscellaneous expenses	=MiscExp1Q	=MiscExp2Q	=MiscExp3Q	=MiscExp4Q	=SUM(B8:E8)	
8	Research and development	=R&DExp1Q	=R&DExp2Q	=R&DExp3Q	=R&DExp4Q	=SUM(B9:E9)	
9	Rent	=RentExp1Q	=RentExp2Q	=RentExp3Q	=RentExp4Q	=SUM(B10:E10)	
10	Depreciation	=Dep1Q	=Dep2Q	=Dep3Q	=Dep4Q	=SUM(B11:E11)	
11	Income from operations	=GrossP1Q-OptExp1Q	=GrossP2Q-OptExp2Q	=GrossP3Q-OptExp3Q	=GrossP4Q-OptExp4Q	=GrossP-GOptExp	
12							
13	Interest expense						
14	Taxable income	=OptExp1Q-E14	=OptExp2Q-E14	=OptExp3Q-E14	=OptExp4Q-E14	=OptExp-X14	
15							
16	Tax expense	=TaxInc1Q*TaxPc1Q	=TaxInc2Q*TaxPc2Q	=TaxInc3Q*TaxPc3Q	=TaxInc4Q*TaxPc4Q	=SUM(B17:E17)	
17	Net income	=TaxInc1Q-TaxExp1Q	=TaxInc2Q-TaxExp2Q	=TaxInc3Q-TaxExp3Q	=TaxInc4Q-TaxExp4Q	=TaxInc-X-TaxExp	
18							

FIGURE 6.21 Alternative View of the Income Statement

Fig6.22 - Microsoft Excel

The screenshot shows a Microsoft Excel spreadsheet titled "Fig6.22 - Microsoft Excel". The worksheet displays the Income Statement with various line items and their corresponding cell names. The columns represent four periods: 1Q X4, 2Q X4, 3Q X4, 4Q X4, and X4. The rows include Sales, Cost of goods sold, Gross profit, Salaries, Miscellaneous expenses, Research and development, Rent, Depreciation, Income from operations, Interest expense, Taxable income, Tax expense, and Net income. The cell names follow a consistent pattern, such as "GrossP1Q" for Gross profit in period 1Q, "OplncX4" for Income from operations across all periods, and "TaxExpX4" for Tax expense across all periods.

	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	Miscellaneous expenses						
9	Research and development						
10	Rent						
11	Depreciation						
12	Income from operations	Oplnc1Q	Oplnc2Q	Oplnc3Q	Oplnc4Q		OplncX4
13							
14	Interest expense						
15	Taxable income	TaxInc1Q	TaxInc2Q	TaxInc3Q	TaxInc4Q		TaxIncX4
16							
17	Tax expense	TaxExp1Q	TaxExp2Q	TaxExp3Q	TaxExp4Q		TaxExpX4
18	Net income	NetInc1Q	NetInc2Q	NetInc3Q	NetInc4Q		NetIncX4
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

	A	B	C	D	E	F	G	H
		Period						
		1Q X4	2Q X4	3Q X4	4Q X4	X4		
81	Depreciation Inputs							
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								
92	Cash Worksheet							
93	Cash Inputs							
94	Minimum cash balance desired	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000			
95								
96	Equity investment (incremental)	\$ -	\$ -	\$ -	\$ -			
97	Borrowing/loan (incremental)	\$ -	\$ -	\$ -	\$ -			
98	Repayments of borrowing (incremental)	\$ -	\$ -	\$ -	\$ -			
99								
100	Interest rate on borrowing/loan (annual)							
101	Interest rate on borrowing/loan (quarterly)	1.0%	1.0%	1.0%	1.0%			7.0%
102								

FIGURE 6.23 Assumptions and Dashboard Worksheet

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4	X4	
2							
3	CASH BUDGET						
4	Beginning cash balance	\$ -	\$ -	\$ -	\$ -	\$ -	
5	Cash receipts						
6	Collections from customers	866,667	1,381,333	1,866,400	2,441,600	6,556,000	
7	Total cash available, before financing	\$ 866,667	\$ 1,381,333	\$ 1,866,400	\$ 2,441,600	N/A	
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						
18	total cash needed before financing						
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 6.24 First Section of the Cash Budget

	A	B	C	D
		1Q X4	2Q X4	3Q X4
1				Period
2				
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			
18	total cash needed before financing			
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

	A	B	C	D	E	F	G	H
1				Period				
2		1Q X4	2Q X4	3Q X4	4Q X4	X4		
78	CAPEX Disbursements Inputs	CAPEXPct1Q	CAPEXPct2Q	CAPEXPct3Q	CAPEXPct4Q			
79	% of purchases paid for in purchase period							
80								
81	Depreciation Inputs							
82	Equipment depreciable life (years)							
83	Furniture depreciable life (years)							
84	Fixtures depreciable life (years)							
85								
86	Quarters per year							
87								
88	Equipment depreciation multiplier	EqtDM1Q	EqtDM2Q	EqtDM3Q	EqtDM4Q			
89	Furniture depreciation multiplier	FurnDM1Q	FurnDM2Q	FurnDM3Q	FurnDM4Q			
90	Fixtures depreciation multiplier	FixDM1Q	FixDM2Q	FixDM3Q	FixDM4Q			
91								
92	Cash Worksheet							
93	Cash Inputs							
94	Minimum cash balance desired	MnCash1Q	MnCash2Q	MnCash3Q	MnCash4Q			
95								
96	Equity investment (incremental)	EgInv1Q	EgInv2Q	EgInv3Q	EgInv4Q			
97	Borrowing/loan (incremental)	Loan1Q	Loan2Q	Loan3Q	Loan4Q			
98	Repayments of borrowing (incremental)	Repay1Q	Repay2Q	Repay3Q	Repay4Q			
99								
100	Interest rate on borrowing/loan (annual)							IntrAnnual
101	Interest rate on borrowing/loan (quarterly)	IntPer1Q	IntPer2Q	IntPer3Q	IntPer4Q			
102								
103	Contribution Margin							
104	Financial Ratios							
105	Valuation							
106	Capitalization							
107	Assumptions							

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

	A	B	C	D	E	F	G
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	CASH BUDGET						
4	Beginning cash balance	BegCash1Q	BegCash2Q	BegCash3Q	BegCash4Q	BegCashX4	
5	Cash receipts						
6	Collections from customers						
7	Total cash available, before financing						
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						
18	total cash needed before financing						
19	Financing						
20	Equity investment						
21	Borrowing						
22	Repayments						
23	Interest						
24	Total cash increase (decrease) from financing						
25							
26	Ending cash balance	EndCash1Q	EndCash2Q	EndCash3Q	EndCash4Q	EndCashX4	
27							
	Sensitivity	Contribution Margin	Financial Ratios	Valuation			
	Ready						

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

Fig6.28 - Microsoft Excel

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4		X4
1							Period
2							
3	CASH BUDGET						
4	Beginning cash balance	\$ -	\$ -	\$ -	\$ -	\$ -	
5	Cash receipts						
6	Collections from customers	866,667	1,381,333	1,866,400	2,441,600	6,556,000	
7	Total cash available, before financing	\$ 866,667	\$ 1,381,333	\$ 1,866,400	\$ 2,441,600	N/A	
8	Cash disbursements						
9	Purchases disbursements	\$ 176,444	\$ 294,489	\$ 365,400	\$ 439,133	\$ 1,275,467	
10	Operating expenses	590,400	634,400	896,120	994,400	3,115,320	
11	Tax expense	72,551	178,491	229,300	369,023	849,364	
12	Capital expenditures	45,000	45,000	45,000	45,000	180,000	
13	Total disbursements	864,395	1,152,300	1,535,820	1,847,556	5,420,151	
14							
15	Minimum cash balance desired	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	N/A	
16	Total cash needed	\$ 1,134,395	\$ 1,402,300	\$ 1,785,820	\$ 2,097,556	N/A	
17	Excess (deficiency) of total cash available over						
18	total cash needed before financing	\$ (267,728)	\$ (21,047)	\$ 80,580	\$ 344,044	N/A	
19	Financing						
20	Equity investment						
21	Borrowing						
22	Repayments						
23	Interest						
24	Total cash increase (decrease) from financing						
25							
26	Ending cash balance						

FIGURE 6.28 Next Section of the Cash Budget

Fig6.29 - Microsoft Excel

	A	B	C
1		1Q X4	2Q X4
2			
3	CASH BUDGET		
4	Beginning cash balance	0	=EndCash1Q
5	Cash receipts		
6	Collections from customers	=Collections1Q	=Collections2Q
7	Total cash available, before financing	=BegCash1Q+Collections1Q	=BegCash2Q+Collections2Q
8	Cash disbursements		
9	Purchases disbursements	=Disburse1Q	=Disburse2Q
10	Operating expenses	=DOE1Q	=DOE2Q
11	Tax Expense	=TaxExp1Q	=TaxExp2Q
12	Capital expenditures	=CAPEXDs1Q	=CAPEXDs2Q
13	Total disbursements	=SUM(B9-B12)	=SUM(C9-C12)
14			
15	Minimum cash balance desired	=MinCash1Q	=MinCash2Q
16	Total cash needed	=TotalDis1Q+MinCash1Q	=TotalDis2Q+MinCash2Q
17	Excess (deficiency) of total cash available over		
18	total cash needed before financing	=CBF1Q+TotalDis1Q-MinCash1Q	=CBF2Q+TotalDis2Q-MinCash2Q
19	Financing		
20	Equity investment		
21	Borrowing		
22	Repayments		
23	Interest		
24	Total cash increase (decrease) from financing		
25			
26	Ending cash balance		

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

Fig.6.30 – Microsoft Excel

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4	X4	
1	CASH BUDGET						
2	Beginning cash balance	BegCash1Q	BegCash2Q	BegCash3Q	BegCash4Q	BegCashX4	
3	Cash receipts						
4	Collections from customers						
5	Total cash available, before financing	CBF1Q	CBF2Q	CBF3Q	CBF4Q		
6	Cash disbursements						
7	Purchases disbursements						
8	Operating expenses						
9	Tax expense						
10	Capital expenditures						
11	Total disbursements	TotalDis1Q	TotalDis2Q	TotalDis3Q	TotalDis4Q	TotalDispX4	
12	Minimum cash balance desired						
13	Total cash needed	CashNeed1Q	CashNeed2Q	CashNeed3Q	CashNeed4Q		
14	Excess (deficiency) of total cash available over total cash needed before financing						
15	Financing						
16	Equity investment						
17	Borrowing						
18	Repayments						
19	Interest						
20	Total cash increase (decrease) from financing						
21	Ending cash balance	EndCash1Q	EndCash2Q	EndCash3Q	EndCash4Q	EndCashX4	

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

Fig.6.31 – Microsoft Excel

	A	B	C	D	E	F	G	H
		1Q X4	2Q X4	3Q X4	4Q X4	X4		
1	CAPEX Disbursements Inputs							
2	% of purchases paid in purchase period	100%	100%	100%	100%			
3	Depreciation Inputs							
4	Equipment depreciable life (years)						5.0	
5	Furniture depreciable life (years)						5.0	
6	Fixtures depreciable life (years)						4.0	
7	Quarters per year						4.0	
8	Equipment depreciation multiplier	5.0%	5.0%	5.0%	5.0%			
9	Furniture depreciation multiplier	5.0%	5.0%	5.0%	5.0%			
10	Fixtures depreciation multiplier	6.3%	6.3%	6.3%	6.3%			
11	Cash Worksheet							
12	Cash Inputs							
13	Minimum cash balance desired	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000			
14	Equity investment (incremental)	\$ -	\$ -	\$ -	\$ -			
15	Borrowing/loan (incremental)	\$ -	\$ -	\$ -	\$ -			
16	Repayments of borrowing (incremental)	\$ -	\$ -	\$ -	\$ -			
17	Interest rate on borrowing/loan (annual)						7.0%	
18	Interest rate on borrowing/loan (quarterly)	1.0%	1.0%	1.0%	1.0%			
19	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.

	A	B	C	D
		1Q X4	2Q X4	3Q X4
78	CAPEX Disbursements Inputs			
79	% of purchases paid for in purchase period	1	1	1
80				
81	Depreciation Inputs			
82	Equipment depreciable life (years)			
83	Furniture depreciable life (years)			
84	Fixtures depreciable life (years)			
85				
86	Quarters per year			
87				
88	Equipment depreciation multiplier	=1/(EqptLife*QtrsYr)	=1/(EqptLife*QtrsYr)	=1/(EqptLife*QtrsYr)
89	Furniture depreciation multiplier	=1/(FurnLife*QtrsYr)	=1/(FurnLife*QtrsYr)	=1/(FurnLife*QtrsYr)
90	Fixtures depreciation multiplier	=1/(FixLife*QtrsYr)	=1/(FixLife*QtrsYr)	=1/(FixLife*QtrsYr)
91				
92	Cash Worksheet			
93	Cash Inputs			
94	Minimum cash balance desired	250000	250000	250000
95				
96	Equity investment (incremental)	0	0	0
97	Borrowing/loan (incremental)	0	0	0
98	Repayments of borrowing (incremental)	0	0	0
99				
100	Interest rate on borrowing/loan (annual)			
101	Interest rate on borrowing/loan (quarterly)	=IntAnnual/QtrsYr	=IntAnnual/QtrsYr	=IntAnnual/QtrsYr
102				
103	Loan value used for interest calculations	=Loan1Q-Repay1Q	=Loan2Q-Repay2Q+LoanVal1Q	=Loan3Q-Repay3Q+LoanVal2Q

FIGURE 6.32 Alternative View of the Assumptions and Dashboard Worksheet

	A	B	C	D	E	F	G	Period	
								1Q X4	2Q X4
3	CASH BUDGET								
4	Beginning cash balance	\$ -	\$ 982,272	\$ 1,260,350	\$ 1,540,930	\$ -			
5	Cash receipts								
6	Collections from customers	\$ 866,667	\$ 1,381,333	\$ 1,866,400	\$ 2,441,600	\$ 6,556,000			
7	Total cash available, before financing	\$ 866,667	\$ 2,363,605	\$ 3,126,750	\$ 3,982,530	N/A			
8	Cash disbursements								
9	Purchases disbursements	\$ 176,444	\$ 294,489	\$ 365,400	\$ 439,133	\$ 1,275,467			
10	Operating expenses	\$ 590,490	\$ 634,400	\$ 896,120	\$ 994,400	\$ 3,115,320			
11	Tax expense	\$ 72,551	\$ 178,491	\$ 229,300	\$ 369,023	\$ 849,364			
12	Capital expenditures	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 180,000			
13	Total disbursements	\$ 884,395	\$ 1,152,380	\$ 1,635,820	\$ 1,847,556	\$ 4,20,151			
14									
15	Minimum cash balance desired	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	N/A			
16	Total cash needed	\$ 1,134,395	\$ 1,402,380	\$ 1,785,820	\$ 2,057,556	N/A			
17	Excess (deficiency) of total cash available over								
18	total cash needed before financing	\$ (267,728)	\$ 961,225	\$ 1,340,930	\$ 1,884,974	N/A			
19	Financing								
20	Equity investment	\$ 1,000,000	\$ -	\$ -	\$ -	\$ 1,000,000			
21	Borrowing	-	\$ 50,000	-	-	\$ 50,000			
22	Repayments	-	-	(50,000)	-	(50,000)			
23	Interest	-	\$ (875)	-	-	\$ (875)			
24	Total cash increase (decrease) from financing	\$ 1,000,000	\$ 49,125	\$ (50,000)	\$ -	\$ 999,125			
25									
26	Ending cash balance	\$ 982,272	\$ 1,260,350	\$ 1,540,930	\$ 2,134,974	\$ 2,134,974			
27									

FIGURE 6.33 Final Section of the Cash Budget

	A	B	C	Fig6.34 - Microsoft Excel	
				1Q X4	2Q X4
3	CASH BUDGET				
4	Beginning cash balance	\$ -		=EndCash1Q	
5	Cash receipts				
6	Collections from customers	=Collections1Q		=Collections2Q	
7	Total cash available, before financing	=BegCash1Q+Collections1Q		=BegCash2Q+Collections2Q	
8	Cash disbursements				
9	Purchases disbursements	=Disburse1Q		=Disburse2Q	
10	Operating expenses	=OOE1Q		=OOE2Q	
11	Tax expense	=TaxExp1Q		=TaxExp2Q	
12	Capital expenditures	=CAPEX1Q		=CAPEX2Q	
13	Total disbursements	=SUM(B9:B12)		=SUM(C9:C12)	
14					
15	Minimum cash balance desired	=MinCash1Q		=MinCash2Q	
16	Total cash needed	=TotalDes1Q+MinCash1Q		=TotalDes2Q+MinCash2Q	
17	Excess (deficiency) of total cash available over				
18	total cash needed before financing	=CBF1Q-TotDis1Q-MinCash1Q		=CBF2Q-TotDis2Q-MinCash2Q	
19	Financing				
20	Equity investment	=EqInv1Q		=EqInv2Q	
21	Borrowing	=Loan1Q		=Loan2Q	
22	Repayments	=Repay1Q		=Repay2Q	
23	Interest	=.001Val1Q*Per1Q		=.001Val2Q*Per2Q	
24	Total cash increase (decrease) from financing	=SUM(B23:B23)		=SUM(C23:C23)	
25					
26	Ending cash balance	=CBF1Q-TotDis1Q+FinCashChg1Q		=CBF2Q-TotDis2Q+FinCashChg2Q	
27					

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

	A	B	C	D	E	F	G	H
1				Period				
2		1Q X4	2Q X4	3Q X4	4Q X4	X4		
3	Quarters per year							
4								
5	Equipment depreciation multiplier	EqtDM1Q	EqtDM2Q	EqtDM3Q	EqtDM4Q			
6	Furniture depreciation multiplier	FurnDM1Q	FurnDM2Q	FurnDM3Q	FurnDM4Q			
7	Futures depreciation multiplier	FutDM1Q	FutDM2Q	FutDM3Q	FutDM4Q			
8								
9	Cash Worksheet							
10	Cash Inputs							
11	Minimum cash balance desired	MinCash1Q	MinCash2Q	MinCash3Q	MinCash4Q			
12								
13	Equity investment (incremental)	EqInv1Q	EqInv2Q	EqInv3Q	EqInv4Q			
14	Borrowing/loan (incremental)	Loan1Q	Loan2Q	Loan3Q	Loan4Q			
15	Repayments of borrowing (incremental)	Repay1Q	Repay2Q	Repay3Q	Repay4Q			
16								
17	Interest rate on borrowing/loan (annual)							
18	Interest rate on borrowing/loan (quarterly)	IntPer1Q	IntPer2Q	IntPer3Q	IntPer4Q			
19								
20	Loan value used for interest calculations	LoanVal1Q	LoanVal2Q	LoanVal3Q	LoanVal4Q			
21								
22	Contribution Margin							
23	Financial Rates							
24	Valuation							
25	Capitalization							
26	Assumptions							

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.

	A	B	C	D	E	F	G
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	CASH BUDGET						
4	Beginning cash balance	BeginCash1Q	BeginCash2Q	BeginCash3Q	BeginCash4Q	BeginCashX4	
5	Cash receipts						
6	Collections from customers						
7	Total cash available, before financing	CBF1Q	CBF2Q	CBF3Q	CBF4Q		
8	Cash disbursements						
9	Purchases disbursements						
10	Operating expenses						
11	Tax expense						
12	Capital expenditures						
13	Total disbursements	TotalDis1Q	TotalDis2Q	TotalDis3Q	TotalDis4Q	TotalDisX4	
14							
15	Minimum cash balance desired						
16	Total cash needed						
17	Excess (deficiency) of total cash available over total cash needed before financing	CashNeed1Q	CashNeed2Q	CashNeed3Q	CashNeed4Q		
18	Financing						
19	Equity investment						
20	Borrowing						
21	Repayments						
22	Interest						
23	Total cash increase (decrease) from financing	FincashChg1Q	FincashChg2Q	FincashChg3Q	FincashChg4Q	FincashChgX4	
24							
25	Ending cash balance	EndCash1Q	EndCash2Q	EndCash3Q	EndCash4Q	EndCashX4	
26							
27	Sensitivity						
28	Contribution Margin						
29	Financial Rates						
30	Valuation						
31	Capitalization						

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

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000		\$ 6,892,000
4	Cost of goods sold	200,000	291,000	373,800	462,000		1,326,800
5	Gross profit	\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000		\$ 5,565,200
7	Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200		\$ 2,301,600
8	Miscellaneous expenses	30,000	43,200	57,960	75,600		206,760
9	Research and development	70,000	100,800	154,560	201,600		526,960
10	Rent	20,000	20,000	20,000	20,000		80,000
11	Depreciation	2,313	4,625	6,938	9,250		23,125
12	Income from operations	\$ 207,288	\$ 509,975	\$ 655,143	\$ 1,054,350		\$ 2,426,755
14	Interest expense	\$ -	\$ 875	\$ -	\$ -		\$ 875
15	Taxable income	\$ 207,288	\$ 509,100	\$ 655,143	\$ 1,054,350		\$ 2,426,880
17	Tax expense	\$ 72,551	\$ 178,185	\$ 229,300	\$ 369,023		\$ 849,058
18	Net income	\$ 134,737	\$ 330,915	\$ 425,843	\$ 685,328		\$ 1,576,822

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.

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
2	CASH BUDGET						
3	Beginning cash balance	BegCash1Q	BegCash2Q	BegCash3Q	BegCash4Q		BegCashX4
4	Cash receipts						
5	Collections from customers						
6	Total cash available, before financing	CBF1Q	CBF2Q	CBF3Q	CBF4Q		
7	Cash disbursements						
8	Purchases disbursements						
9	Operating expenses						
10	Tax expense						
11	Capital expenditures						
12	Total disbursements						
13		TotalOks1Q	TotalOks2Q	TotalOks3Q	TotalOks4Q		TotalOksX4
14							
15	Minimum cash balance desired						
16	Total cash needed	CashNeed1Q	CashNeed2Q	CashNeed3Q	CashNeed4Q		
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	IntExp1Q	IntExp2Q	IntExp3Q	IntExp4Q		IntExpX4
24	Total cash increase (decrease) from financing	FinCashChg1Q	FinCashChg2Q	FinCashChg3Q	FinCashChg4Q		FinCashChgX4
25							
26	Ending cash balance	EndCash1Q	EndCash2Q	EndCash3Q	EndCash4Q		EndCashX4

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

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4		X4
1				Period			
2							
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	
6							
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	=Dep1Q	=Dep2Q	=Dep3Q	=Dep4Q		=SUM(B11:E11)	
12 Income from operations	=GrossP1Q-OpExp1Q	=GrossP2Q-OpExp2Q	=GrossP3Q-OpExp3Q	=GrossP4Q-OpExp4Q		=GrossPX4-OpExpX4	
13							
14 Interest expense	=IntExp1Q	=IntExp2Q	=IntExp3Q	=IntExp4Q		=SUM(B14:E14)	
15 Taxable income	=OpInc1Q-B14	=OpInc2Q-C14	=OpInc3Q-D14	=OpInc4Q-E14		=OpIncX4-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		=TaxIncX4-TaxExpX4	
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,

	A	B	C	D	E	F	G	H
1				Period				
2		1Q X4	2Q X4	3Q X4	4Q X4	X4		
70								
71	Capital Worksheet							
72	Capital Expenditures (CAPEX) Inputs							
73	Equipment purchases	\$ 9,000	\$ 5,000	\$ 3,000	\$ 3,000			
74	Furniture purchases	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,000			
75	Fixtures purchases	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500			
76	Total CAPEX purchases	\$ 13,000	\$ 9,000	\$ 7,000	\$ 6,000			
77								
78	CAPEX Disbursements Inputs							
79	% of purchases paid for in purchase period	100%	100%	100%	100%			
80								
81	Depreciation Inputs							
82	Equipment depreciable life (years)					6.0		
83	Furniture depreciable life (years)					5.0		
84	Fixtures depreciable life (years)					5.0		
85								
86	Quarters per year					4.0		
87								
88	Equipment depreciation multiplier	4.2%	4.2%	4.2%	4.2%			
89	Furniture depreciation multiplier	5.0%	5.0%	5.0%	5.0%			
90	Fixtures depreciation multiplier	5.0%	5.0%	5.0%	5.0%			
91								
92	Cash Worksheet							
93	Cash Inputs							
94	Minimum cash balance desired	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000			
95								
96	Equity investment (incremental)	\$ 500,000	\$ -	\$ -	\$ -			
97	Borrowing loan (incremental)	\$ -	\$ -	\$ 25,000	\$ -			
98	Repayments of borrowing (incremental)	\$ -	\$ -	\$ -	\$ 25,000			

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

	A	B	C	D	E	F	G
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	SALES BUDGET						
4	Unit Sales and Price Budget						
5	Unit sales	10,000	10,400	10,900	11,100	42,400	
6	x Price per unit	\$ 275	\$ 270	\$ 260	\$ 260	N/A	
7	= Total sales	\$ 2,750,000	\$ 2,808,000	\$ 2,834,000	\$ 2,866,000	\$ 11,278,000	
8							
9	Sales Composition Budget						
10	Cash sales	\$ 1,650,000	\$ 1,404,000	\$ 1,700,400	\$ 1,731,600	\$ 6,486,000	
11	+ Credit sales	1,100,000	1,404,000	1,133,600	1,154,400	4,792,000	
12	= Total sales	\$ 2,750,000	\$ 2,808,000	\$ 2,834,000	\$ 2,866,000	\$ 11,278,000	
13							
14	COLLECTIONS BUDGET						
15	Cash Collections from Customers Budget						
16	Cash sales this period	\$ 1,650,000	\$ 1,404,000	\$ 1,700,400	\$ 1,731,600	\$ 6,486,000	
17	+ Credit sales collected	794,444	1,360,356	1,224,089	1,149,778	4,535,467	
18	= Total collections	\$ 2,444,444	\$ 2,770,356	\$ 2,925,289	\$ 2,881,378	\$ 11,021,467	
19							
20	Accounts Receivable (A/R) Budget						
21	Beginning A/R balance	\$ -	\$ 305,556	\$ 343,200	\$ 251,911	\$ -	
22	+ Additions to A/R	305,556	343,200	251,911	256,533	1,157,200	
23	- Subtractions from A/R	-	305,556	343,200	251,911	900,667	
24	= Ending A/R balance	\$ 305,556	\$ 343,200	\$ 251,911	\$ 266,633	\$ 256,633	
25							

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

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

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

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

FigQ6.5 – Microsoft Excel

	A	B	C	D	E	F	G
1	A1	10 X4	2Q X4	3Q X4	4Q X4	X4	
3	HEADCOUNT BUDGET						
4	Headcount Budget						
5	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		
11	Salesperson	5	5	6	7		
12	Hardware Engineer	1	1	1	1		
13	Controller/Accountant	1	1	2	2		
14	Administrative Assistant	1	1	2	2		
15	Total	12	12	16	17		
16							
17	Periodic base salaries						
18	Chief Executive Officer	\$ 47,500	\$ 47,500	\$ 47,500	\$ 47,500	\$ 190,000	
19	Chief Financial Officer	42,500	42,500	42,500	42,500	170,000	
20	VP, Engineering	42,500	42,500	42,500	42,500	170,000	
21	VP, Sales & Marketing	36,250	36,250	36,250	36,250	145,000	
22	VP, Business Development	32,500	32,500	32,500	32,500	130,000	
23	Salesperson	27,500	27,500	27,500	27,500	110,000	
24	Hardware Engineer	25,000	25,000	25,000	25,000	100,000	
25	Controller/Accountant	12,500	12,500	12,500	12,500	50,000	
26	Administrative Assistant	8,125	8,125	8,125	8,125	32,500	
27	Total	\$ 274,375	\$ 274,375	\$ 274,375	\$ 274,375	\$ 1,097,500	
28							

Sales and Collections COGS Inventory and P... Ready 100%

FIGURE Q6.5 Company JKL's Headcount Overview Worksheet

FigQ6.6 – Microsoft Excel

	A	B	C	D	E	F	G
1	A1	1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	HEADCOUNT BUDGET						
4	Headcount Budget						
5	Periodic salary expense (base)						
6	Chief Executive Officer	\$ 47,500	\$ 47,500	\$ 47,500	\$ 47,500	\$ 190,000	
7	Chief Financial Officer	42,500	42,500	42,500	42,500	170,000	
8	VP, Engineering	42,500	42,500	42,500	42,500	170,000	
9	VP, Sales & Marketing	36,250	36,250	36,250	36,250	145,000	
10	VP, Business Development	-	-	32,500	32,500	65,000	
11	Salesperson	137,500	137,500	165,000	192,500	632,500	
12	Hardware Engineer	25,000	25,000	25,000	25,000	100,000	
13	Controller/Accountant	12,500	12,500	25,000	25,000	75,000	
14	Administrative Assistant	8,125	8,125	16,250	16,250	48,750	
15	Total	\$ 351,875	\$ 351,875	\$ 432,500	\$ 460,000	\$ 1,596,250	
16							
17	Total (with benefits)	\$ 399,378	\$ 399,378	\$ 490,888	\$ 522,100	\$ 1,811,744	
18							

COGS Inventory and Purchases Headcount Ready 100%

FIGURE Q6.6 Company JKL's Headcount Cost Worksheet

FigQ6.7 - Microsoft Excel

This screenshot shows a Microsoft Excel spreadsheet titled "FigQ6.7 - Microsoft Excel". The spreadsheet contains two main sections: "OPERATING EXPENSES BUDGET" and "DISBURSEMENTS FOR OPERATING EXPENSES BUDGET". Both sections have a header row with columns for "Period" (1Q X4, 2Q X4, 3Q X4, 4Q X4, X4) and rows for various expense categories like Salaries, Miscellaneous expenses, Research and development, Rent, and Depreciation, along with a total row for "Total operating expenses". The "DISBURSEMENTS FOR OPERATING EXPENSES BUDGET" section is identical to the budget section above it.

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
OPERATING EXPENSES BUDGET							
Operating Expenses Budget							
5	Salaries	\$ 399,378	\$ 399,378	\$ 490,888	\$ 522,100	\$ 1,811,744	
6	Miscellaneous expenses	82,500	98,280	99,190	101,010	380,980	
7	Research and development	137,500	140,400	141,700	144,300	563,900	
8	Rent	16,500	16,500	16,500	16,500	66,000	
9	Depreciation	-	-	-	-	-	
10	Total operating expenses	\$ 635,878	\$ 654,558	\$ 748,278	\$ 783,910	\$ 2,822,624	
11							
DISBURSEMENTS FOR OPERATING EXPENSES BUDGET							
Disbursements for Operating Expenses Budget							
14	Salaries	\$ 399,378	\$ 399,378	\$ 490,888	\$ 522,100	\$ 1,811,744	
15	Miscellaneous expenses	82,500	98,280	99,190	101,010	380,980	
16	Research and development	137,500	140,400	141,700	144,300	563,900	
17	Rent	16,500	16,500	16,500	16,500	66,000	
18	Depreciation	-	-	-	-	-	
19	Total disbursements for operating expenses	\$ 635,878	\$ 654,558	\$ 748,278	\$ 783,910	\$ 2,822,624	
20							

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

FigQ6.8 - Microsoft Excel

This screenshot shows a Microsoft Excel spreadsheet titled "FigQ6.8 - Microsoft Excel". The spreadsheet contains an "Operating Expenses" section with rows for Sales, Cost of goods sold, Gross profit, Salaries, Miscellaneous expenses, Research and development, Rent, Depreciation, and Income from operations. It also contains sections for Interest expense, Taxable income, Tax expense, and Net income. The "Operating Expenses" tab is selected at the bottom.

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
Operating Expenses							
Sales							
3	\$ 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	-	-	-	-	-	
12	Income from operations	\$ 114,122	\$ 198,242	\$ 145,523	\$ 270,590	\$ 728,476	
13							
14	Interest expense						
15	Taxable income	\$ 114,122	\$ 198,242	\$ 145,523	\$ 270,590	\$ 728,476	
16							
17	Tax expense	\$ 37,090	\$ 65,420	\$ 47,295	\$ 89,295	\$ 239,099	
18	Net income	\$ 77,032	\$ 132,822	\$ 98,228	\$ 181,295	\$ 489,377	
19							

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

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

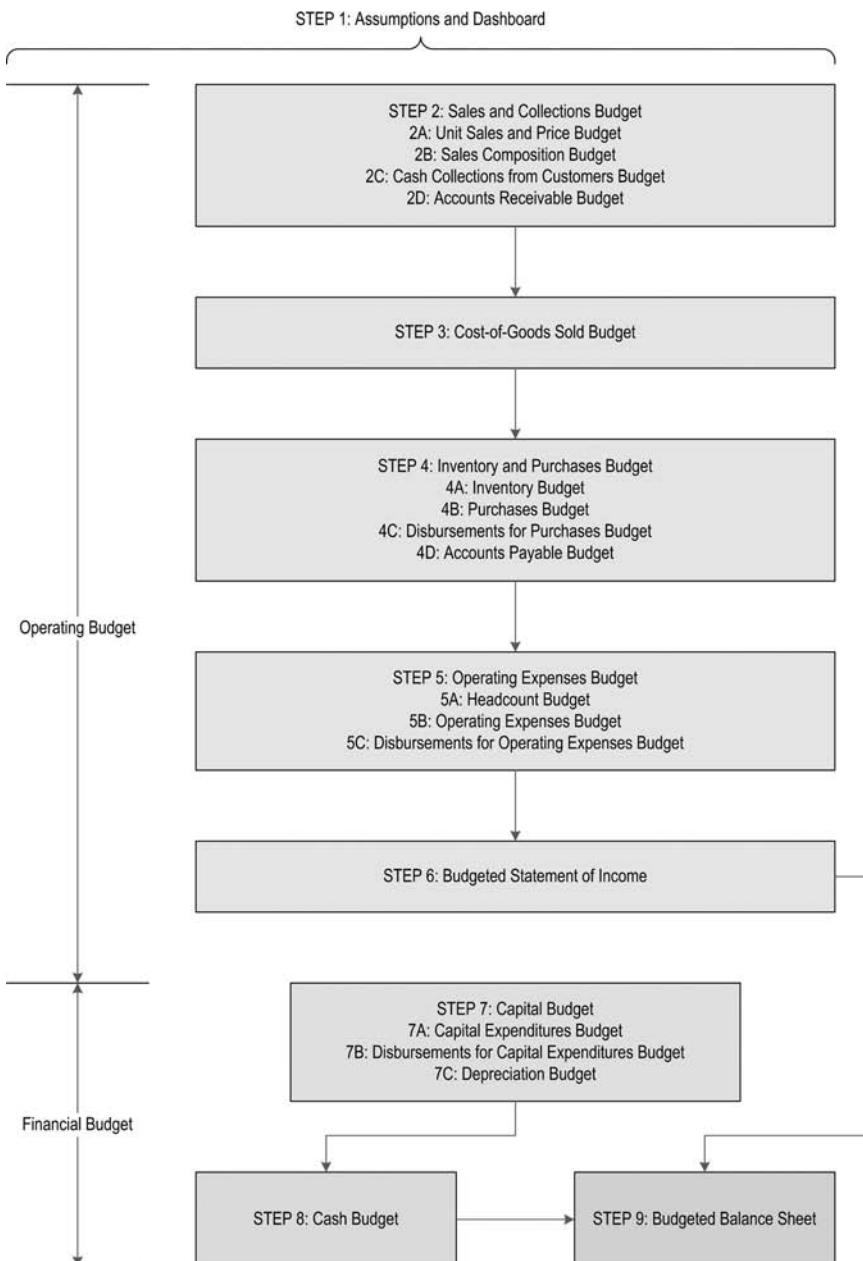


FIGURE 7.1 Budgeted Balance Sheet and the Master Budget

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.

	A	Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
1						
2						
3	Assets					
4	Cash	\$ 1,054,822	\$ 1,511,392	\$ 2,021,272	\$ 2,984,338	\$ 2,984,338
5	Accounts Receivable	133,333	192,000	257,600	336,000	336,000
6	Inventory	64,667	83,067	102,667	102,667	102,667
7	Fixed Assets, net	42,688	83,063	121,125	156,875	156,875
8	Total Assets	\$ 1,295,510	\$ 1,869,521	\$ 2,502,663	\$ 3,579,880	\$ 3,579,880
9						
10						
11	Liabilities					
12	Accounts Payable					
13	Payables from Capital Budget					
14	Loan Payable					
15	Total Liabilities					
16						
17						
18	Owners’ Equity					
19	Common Stock					
20	Retained Earnings					
21	Total Owners’ Equity					
22						
23	Total Liabilities and Owners’ Equity					
24						

FIGURE 7.2 Asset Components of the Balance Sheet

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Assets						
4	Cash	=EndCash1Q	=EndCash2Q	=EndCash3Q	=EndCash4Q	=EndCashX4	
5	Accounts Receivable	=EndAR1Q	=EndAR2Q	=EndAR3Q	=EndAR4Q	=EndARX4	
6	Inventory	=EndInv1Q	=EndInv2Q	=EndInv3Q	=EndInv4Q	=EndInvX4	
7	Fixed Assets, net	=FixAssets1Q	=FixAssets2Q	=FixAssets3Q	=FixAssets4Q	=E7	
8	Total Assets	=SUM(B4:G7)	=SUM(C4:C7)	=SUM(D4:D7)	=SUM(E4:E7)	=SUM(G4:G7)	
9							
10							
11	Liabilities						
12	Accounts Payable						
13	Payables from Capital Budget						
14	Loan Payable						
15	Total Liabilities						
16							
17							
18	Owners' Equity						
19	Common Stock						
20	Retained Earnings						
21	Total Owners' Equity						
22							
23	Total Liabilities and Owners' Equity						
24							

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

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Assets						
4	Cash						
5	Accounts Receivable						
6	Inventory						
7	Fixed Assets, net						
8	Total Assets	TotAssets1Q	TotAssets2Q	TotAssets3Q	TotAssets4Q	TotAssetsX4	
9							
10							
11	Liabilities						
12	Accounts Payable						
13	Payables from Capital Budget						
14	Loan Payable						
15	Total Liabilities						
16							
17							
18	Owners' Equity						
19	Common Stock						
20	Retained Earnings						
21	Total Owners' Equity						
22							
23	Total Liabilities and Owners' Equity						
24							

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

	A	B	C	D	E	F	G
1		1Q X4	2Q X4	3Q X4	4Q X4		X4
2							Period
3	<u>Assets</u>						
4	Cash	\$ 1,054,822	\$ 1,511,392	\$ 2,021,272	\$ 2,984,338		\$ 2,984,338
5	Accounts Receivable	133,333	192,000	257,600	336,000		336,000
6	Inventory	64,667	83,067	102,667	102,667		102,667
7	Fixed Assets, net	42,688	83,063	121,125	156,875		156,875
8	Total Assets	\$ 1,295,510	\$ 1,869,521	\$ 2,502,663	\$ 3,579,880		\$ 3,579,880
9							
10							
11	<u>Liabilities</u>						
12	Accounts Payable	\$ 88,222	\$ 103,133	\$ 131,133	\$ 154,000		\$ 154,000
13	Payables from Capital Budget	-	-	-	-		-
14	Loan Payable	-	50,000	-	-		-
15	Total Liabilities	\$ 88,222	\$ 153,133	\$ 131,133	\$ 154,000		\$ 154,000
16							
17							
18	<u>Owners' Equity</u>						
19	Common Stock						
20	Retained Earnings						
21	Total Owners' Equity						
22							
23	Total Liabilities and Owners' Equity						
24							

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),

	A	B	C	D	E	F	G
		Period					
1	A1	1Q X4	2Q X4	3Q X4	4Q X4		X4
2							
3	Assets						
4	Cash	=EndCash1Q	=EndCash2Q	=EndCash3Q	=EndCash4Q	=EndCashX4	
5	Accounts Receivable	=EndAR1Q	=EndAR2Q	=EndAR3Q	=EndAR4Q	=EndARX4	
6	Inventory	=EndInv1Q	=EndInv2Q	=EndInv3Q	=EndInv4Q	=EndInvX4	
7	Fixed Assets, net	=FixAssets1Q	=FixAssets2Q	=FixAssets3Q	=FixAssets4Q	=E7	
8	Total Assets	=SUM(B4:B7)	=SUM(C4:C7)	=SUM(D4:D7)	=SUM(E4:E7)	=SUM(G4:G7)	
9							
10							
11	Liabilities						
12	Accounts Payable	=EndAP1Q	=EndAP2Q	=EndAP3Q	=EndAP4Q	=EndAPX4	
13	Payables from Capital Budget	=PACAPEX1Q	=PACAPEX2Q	=PACAPEX3Q	=PACAPEX4Q	=PayCapB4Q	
14	Loan Payable	=LoanVal1Q	=LoanVal2Q	=LoanVal3Q	=LoanVal4Q	=E14	
15	Total Liabilities	=SUM(B12:B14)	=SUM(C12:C14)	=SUM(D12:D14)	=SUM(E12:E14)	=SUM(G12:G14)	
16							
17							
18	Owners' Equity						
19	Common Stock						
20	Retained Earnings						
21	Total Owners' Equity						
22							
23	Total Liabilities and Owners' Equity						
24							

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

	A	B	C	D	E	F	G
1	A1	1Q X4	2Q X4	3Q X4	4Q X4		X4
2							
3	Assets						
4	Cash						
5	Accounts Receivable						
6	Inventory						
7	Fixed Assets, net						
8	Total Assets	TotAssets1Q	TotAssets2Q	TotAssets3Q	TotAssets4Q	TotAssetsX4	
9							
10							
11	Liabilities						
12	Accounts Payable						
13	Payables from Capital Budget						
14	Loan Payable						
15	Total Liabilities	TotLiabs1Q	TotLiabs2Q	TotLiabs3Q	TotLiabs4Q	TotLiabsX4	
16							
17							
18	Owners' Equity						
19	Common Stock						
20	Retained Earnings						
21	Total Owners' Equity						
22							
23	Total Liabilities and Owners' Equity						
24							

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, Assets = Liabilities + 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.

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	Assets						
4	Cash	\$ 982,272	\$ 1,260,656	\$ 1,541,236	\$ 2,135,280	\$ 2,135,280	
5	Accounts Receivable	133,333	192,000	257,600	336,000	336,000	
6	Inventory	64,667	83,067	102,667	102,667	102,667	
7	Fixed Assets, net	42,688	83,063	121,125	156,875	156,875	
8	Total Assets	\$ 1,222,959	\$ 1,618,785	\$ 2,022,628	\$ 2,730,822	\$ 2,730,822	
9							
10							
11	Liabilities						
12	Accounts Payable	\$ 88,222	\$ 103,133	\$ 131,133	\$ 154,000	\$ 154,000	
13	Payables from Capital Budget	-	-	-	-	-	
14	Loan Payable		50,000				
15	Total Liabilities	\$ 88,222	\$ 153,133	\$ 131,133	\$ 154,000	\$ 154,000	
16							
17							
18	Owners' Equity						
19	Common Stock	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	
20	Retained Earnings	134,737	465,652	891,495	1,576,822	1,576,822	
21	Total Owners' Equity	\$ 1,134,737	\$ 1,465,652	\$ 1,891,495	\$ 2,576,822	\$ 2,576,822	
22							
23	Total Liabilities and Owners' Equity	\$ 1,222,959	\$ 1,618,785	\$ 2,022,628	\$ 2,730,822	\$ 2,730,822	
24							

FIGURE 7.8 Balance Sheet

	A	B	C	D	E
1		1Q X4	2Q X4	3Q X4	4Q X4
2				Period	
3	Assets				
4	Cash	=EndCash1Q	=EndCash2Q	=EndCash3Q	=EndCash4Q
5	Accounts Receivable	=EndAR1Q	=EndAR2Q	=EndAR3Q	=EndAR4Q
6	Inventory	=EndInv1Q	=EndInv2Q	=EndInv3Q	=EndInv4Q
7	Fixed Assets, net	=FixAssets1Q	=FixAssets2Q	=FixAssets3Q	=FixAssets4Q
8	Total Assets	=SUM(B4:B7)	=SUM(C4:C7)	=SUM(D4:D7)	=SUM(E4:E7)
9					
10					
11	Liabilities				
12	Accounts Payable	=EndAP1Q	=EndAP2Q	=EndAP3Q	=EndAP4Q
13	Payables from Capital Budget	=PACAPEX1Q	=PACAPEX2Q	=PACAPEX3Q	=PACAPEX4Q
14	Loan Payable	=LoanVal1Q	=LoanVal2Q	=LoanVal3Q	=LoanVal4Q
15	Total Liabilities	=SUM(B12:B14)	=SUM(C12:C14)	=SUM(D12:D14)	=SUM(E12:E14)
16					
17					
18	Owners' Equity				
19	Common Stock	=EqInv1Q	=EqInv2Q+CS1Q	=EqInv3Q+CS2Q	=EqInv4Q+CS3Q
20	Retained Earnings	=NetInc1Q	=NetInc2Q+RE1Q	=NetInc3Q+RE2Q	=NetInc4Q+RE3Q
21	Total Owners' Equity	=SUM(B19:B20)	=SUM(C19:C20)	=SUM(D19:D20)	=SUM(E19:E20)
22					
23	Total Liabilities and Owners' Equity	=TotLiabs1Q+TotOE1Q	=TotLiabs2Q+TotOE2Q	=TotLiabs3Q+TotOE3Q	=TotLiabs4Q+TotOE4Q

FIGURE 7.9 Alternative View of the Balance Sheet

	A	B	C	D	E	F	G
1		1Q X4	2Q X4	3Q X4	4Q X4		X4
2							
3	Assets						
4	Cash						
5	Accounts Receivable						
6	Inventory						
7	Fixed Assets, net						
8	Total Assets	TotAssets1Q	TotAssets2Q	TotAssets3Q	TotAssets4Q	TotAssetsX4	
9							
10							
11	Liabilities						
12	Accounts Payable	PayCapB1Q	PayCapB2Q	PayCapB3Q	PayCapB4Q	PayCapBX4	
13	Payables from Capital Budget						
14	Loan Payable						
15	Total Liabilities	TotLiabs1Q	TotLiabs2Q	TotLiabs3Q	TotLiabs4Q	TotLiabsX4	
16							
17							
18	Owners' Equity						
19	Common Stock	CS1Q	CS2Q	CS3Q	CS4Q	CSX4	
20	Retained Earnings	RE1Q	RE2Q	RE3Q	RE4Q	REX4	
21	Total Owners' Equity	TotOE1Q	TotOE2Q	TotOE3Q	TotOE4Q	TotOEX4	
22							
23	Total Liabilities and Owners' Equity	TotLOE1Q	TotLOE2Q	TotLOE3Q	TotLOE4Q	TotLOEX4	
24							

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.

	B	C	D	E	F	G
	1Q X4	2Q X4	3Q X4	4Q X4		
Assets						
4 Cash	\$ 902,272	\$ 1,260,056	\$ 1,541,236	\$ 2,135,280	\$ 2,135,280	
5 Accounts Receivable	133,333	192,000	251,600	336,000	336,000	
6 Inventory	64,067	83,067	102,667	102,667	102,667	
7 Fixed Assets, net	42,698	83,063	121,125	156,875	156,875	
8 Total Assets	\$ 1,222,959	\$ 1,618,785	\$ 2,022,628	\$ 2,736,822	\$ 2,736,822	
9						
10						
Liabilities						
12 Accounts Payable	\$ 88,222	\$ 103,133	\$ 131,133	\$ 154,000	\$ 154,000	
13 Payables from Capital Budget	-	-	-	-	-	
14 Loan Payable	-	50,000	-	-	-	
15 Total Liabilities	\$ 88,222	\$ 153,133	\$ 131,133	\$ 154,000	\$ 154,000	
16						
17						
Owners' Equity						
19 Common Stock	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	
20 Retained Earnings	134,737	465,652	891,495	1,576,822	1,576,822	
21 Total Owners' Equity	\$ 1,134,737	\$ 1,465,652	\$ 1,891,495	\$ 2,576,822	\$ 2,576,822	
22						
23 Total Liabilities and Owners' Equity	\$ 1,222,959	\$ 1,618,785	\$ 2,022,628	\$ 2,736,822	\$ 2,736,822	
24						
25						
26						
Net Working Capital						
28 Current assets	\$ 198,000	\$ 275,067	\$ 360,267	\$ 438,667	N/A	
29 - Current liabilities	88,222	103,133	131,133	154,000	N/A	
30 = Net working capital	\$ 109,778	\$ 171,933	\$ 229,133	\$ 284,667	N/A	
31						

FIGURE 7.11 Calculation of Net Working Capital

	B	C	D	
	1Q X4	2Q X4	3Q X4	
Assets				
4 Cash	=EndCash1Q	=EndCash2Q	=EndCash3Q	
5 Accounts Receivable	=EndAR1Q	=EndAR2Q	=EndAR3Q	
6 Inventory	=EndInv1Q	=EndInv2Q	=EndInv3Q	
7 Fixed Assets, net	=EndAssets1Q	=EndAssets2Q	=EndAssets3Q	
8 Total Assets	=SUM(B4:B7)	=SUM(C4:C7)	=SUM(D4:D7)	
9				
10				
Liabilities				
12 Accounts Payable	=EndAP1Q	=EndAP2Q	=EndAP3Q	
13 Payables from Capital Budget	=PACAPEX1Q	=PACAPEX2Q	=PACAPEX3Q	
14 Loan Payable	=LoanVal1Q	=LoanVal2Q	=LoanVal3Q	
15 Total Liabilities	=SUM(B12:B14)	=SUM(C12:C14)	=SUM(D12:D14)	
16				
17				
Owners' Equity				
19 Common Stock	=Eqpm1Q	=Eqpm2Q+C51Q	=Eqpm3Q+CS2Q	
20 Retained Earnings	=EndInc1Q	=Netinc20*PF1Q	=Netinc30*PF2Q	
21 Total Owners' Equity	=SUM(D19:D20)	=SUM(E19:E20)	=SUM(F19:F20)	
22				
23 Total Liabilities and Owners' Equity	=TotalLabs1Q+ToOE1Q	=TotalLabs2Q+ToOE2Q	=TotalLabs3Q+ToOE3Q	
24				
25				
26				
Net Working Capital				
28 Current assets	=EndAR1Q+EndInv1Q	=EndAR2Q+EndInv2Q	=EndAR3Q+EndInv3Q	
29 - Current liabilities	=EndAP1Q	=EndAP2Q	=EndAP3Q	
30 = Net working capital	=CA1Q-CL1Q	=CA2Q-CL2Q	=CA3Q-CL3Q	
31				

FIGURE 7.12 Alternative View of the Calculation of Net Working Capital

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

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4		X4
2	Assets						
3	Cash						
4	Accounts Receivable						
5	Inventory						
6	Fixed Assets, net						
7	Total Assets	TotAssets1Q	TotAssets2Q	TotAssets3Q	TotAssets4Q		TotAssetsX4
9							
11	Liabilities						
12	Accounts Payable						
13	Payables from Capital Budget						
14	Loan Payable						
15	Total Liabilities	TotLiabs1Q	TotLiabs2Q	TotLiabs3Q	TotLiabs4Q		TotLiabsX4
16							
18	Owners' Equity						
19	Common Stock	CS1Q	CS2Q	CS3Q	CS4Q		CSX4
20	Retained Earnings	RE1Q	RE2Q	RE3Q	RE4Q		REX4
21	Total Owners' Equity	TotOE1Q	TotOE2Q	TotOE3Q	TotOE4Q		TotOE4X4
22							
23	Total Liabilities and Owners' Equity	TotLOE1Q	TotLOE2Q	TotLOE3Q	TotLOE4Q		TotLOEX4
24							
25							
26							
27	Net Working Capital						
28	Current assets	CA1Q	CA2Q	CA3Q	CA4Q		CAx4
29	Current liabilities	CL1Q	CL2Q	CL3Q	CL4Q		CLx4
30	= Net working capital	NWC1Q	NWC2Q	NWC3Q	NWC4Q		NWCx4
31							

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

FIGURE 7.14 Calculation of the Change in Net Working Capital

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4		X4
2	Assets						
3	Cash	\$ 982,272	\$ 1,260,656	\$ 1,541,238	\$ 2,135,280		\$ 2,135,280
4	Accounts Receivable	133,333	192,000	257,600	336,000		336,000
5	Inventory	64,667	83,067	102,567	102,667		102,667
6	Fixed Assets, net	42,688	83,063	121,125	156,875		156,875
7	Total Assets	\$ 1,222,959	\$ 1,618,785	\$ 2,022,628	\$ 2,730,822		\$ 2,730,822
9							
11	Liabilities						
12	Accounts Payable	\$ 88,222	\$ 103,133	\$ 131,133	\$ 154,000		\$ 154,000
13	Payables from Capital Budget						
14	Loan Payable		\$ 60,000				
15	Total Liabilities	\$ 88,222	\$ 163,133	\$ 131,133	\$ 154,000		\$ 154,000
16							
18	Owners' Equity						
19	Common Stock	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000		\$ 1,000,000
20	Retained Earnings	134,737	465,662	891,495	1,576,822		1,576,822
21	Total Owners' Equity	\$ 1,134,737	\$ 1,465,662	\$ 1,891,495	\$ 2,576,822		\$ 2,576,822
22							
23	Total Liabilities and Owners' Equity	\$ 1,222,959	\$ 1,618,785	\$ 2,022,628	\$ 2,730,822		\$ 2,730,822
24							
25							
26							
27	Net Working Capital (NWC)						
28	Current assets	\$ 158,000	\$ 275,067	\$ 360,267	\$ 438,667		N/A
29	Current liabilities	88,222	103,133	131,133	154,000		N/A
30	= Net working capital	\$ 109,778	\$ 171,933	\$ 229,133	\$ 284,667		N/A
31							
32	Beginning NWC	\$ -	\$ 109,778	\$ 171,933	\$ 229,133		N/A
33	Ending NWC		\$ 109,778	\$ 171,933	\$ 229,133		N/A
34	= Change in NWC	\$ (109,778)	\$ (62,156)	\$ (57,299)	\$ (55,533)		N/A
35							

FIGURE 7.14 Calculation of the Change in Net Working Capital

	A	B	C	D
		1Q X4	2Q X4	3Q X4
1				Period
2				3Q X4
3	Assets			
4	Cash	=EndCash1Q	=EndCash2Q	=EndCash3Q
5	Accounts Receivable	=EndAR1Q	=EndAR2Q	=EndAR3Q
6	Inventory	=EndInv1Q	=EndInv2Q	=EndInv3Q
7	Fixed Assets, net	=FixAssets1Q	=FixAssets2Q	=FixAssets3Q
8	Total Assets	=SUM(B4:B7)	=SUM(C4:C7)	=SUM(D4:D7)
9				
10				
11	Liabilities			
12	Accounts Payable	=EndAP1Q	=EndAP2Q	=EndAP3Q
13	Payables from Capital Budget	=PACAPEX1Q	=PACAPEX2Q	=PACAPEX3Q
14	Loan Payable	=EndInv1Q	=EndInv2Q	=EndInv3Q
15	Total Liabilities	=SUM(B12:B14)	=SUM(C12:C14)	=SUM(D12:D14)
16				
17				
18	Owners' Equity			
19	Common Stock	=EqStk1Q	=EqStk2Q + CS1Q	=EqStk3Q + CS2Q
20	Retained Earnings	=RetInc1Q	=RetInc2Q + RE1Q	=RetInc3Q + RE2Q
21	Total Owners' Equity	=SUM(B19:B20)	=SUM(C19:C20)	=SUM(D19:D20)
22				
23	Total Liabilities and Owners' Equity	=TotLabs1Q + TotOE1Q	=TotLabs2Q + TotOE2Q	=TotLabs3Q + TotOE3Q
24				
25				
26				
27	Net Working Capital (NWC)			
28	Current assets	=EndAR1Q + EndInv1Q	=EndAR2Q + EndInv2Q	=EndAR3Q + EndInv3Q
29	- Current liabilities	=EndAP1Q	=EndAP2Q	=EndAP3Q
30	= Net working capital	=CA1Q - CL1Q	=CA2Q - CL2Q	=CA3Q - CL3Q
31				
32	Beginning NWC	0		
33	Ending NWC	=NWC1Q	=NWC2Q	=NWC3Q
34	Change in NWC	=BeginNWC1Q - EndNWC1Q	=BeginNWC2Q - EndNWC2Q	=BeginNWC3Q - EndNWC3Q

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

	A	B	C	D	E	F	G
					Period		
					3Q X4		
1							X4
2							
3	Assets						
4	Cash						
5	Accounts Receivable						
6	Inventory						
7	Fixed Assets, net						
8	Total Assets	TotAssets1Q	TotAssets2Q	TotAssets3Q	TotAssets4Q	TotAssetsX4	
9							
10							
11	Liabilities						
12	Accounts Payable						
13	Payables from Capital Budget	PayCapB1Q	PayCapB2Q	PayCapB3Q	PayCapB4Q	PayCapBX4	
14	Loan Payable						
15	Total Liabilities	TotLabs1Q	TotLabs2Q	TotLabs3Q	TotLabs4Q	TotLabsX4	
16							
17							
18	Owners' Equity						
19	Common Stock	CS1Q	CS2Q	CS3Q	CS4Q	CSX4	
20	Retained Earnings	RE1Q	RE2Q	RE3Q	RE4Q	REX4	
21	Total Owners' Equity	TotOE1Q	TotOE2Q	TotOE3Q	TotOE4Q	TotOEX4	
22							
23	Total Liabilities and Owners' Equity	TotLOE1Q	TotLOE2Q	TotLOE3Q	TotLOE4Q	TotLOEX4	
24							
25							
26							
27	Net Working Capital (NWC)						
28	Current assets	CA1Q	CA2Q	CA3Q	CA4Q	CAx4	
29	- Current liabilities	CL1Q	CL2Q	CL3Q	CL4Q	CLx4	
30	= Net working capital	NWC1Q	NWC2Q	NWC3Q	NWC4Q	NWCX4	
31							
32	Beginning NWC	BegNWC1Q	BegNWC2Q	BegNWC3Q	BegNWC4Q	BegNWCX4	
33	Ending NWC	EndNWC1Q	EndNWC2Q	EndNWC3Q	EndNWC4Q	EndNWCX4	
34	Change in NWC	ChgNWC1Q	ChgNWC2Q	ChgNWC3Q	ChgNWC4Q	ChgNWCX4	

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

	A	B	C	D	E	F	G	H
		Period						
71	Capital Worksheet	1Q X4	2Q X4	3Q X4	4Q X4	X4		
72	Capital Expenditures (CAPEX) Inputs							
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			
77	CAPEX Disbursements Inputs							
79	% of purchases paid for in purchase period	100%	100%	100%	100%			
80	Depreciation Inputs							
82	Equipment depreciable life (years)						5.0	
83	Furniture depreciable life (years)						5.0	
84	Fixtures depreciable life (years)						4.0	
85	Quarters per year						4.0	
86	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	Cash Worksheet							
93	Cash Inputs							
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%			
	Assumptions and Dashboard	Sales and Collections	COGS					
	Ready							

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.

FigQ7.2 - Microsoft Excel

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4	X4	
SALES BUDGET							
Unit Sales		11,500	11,700	12,000	11,900	47,100	
x 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	
Sales Composition Budget							
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	
COLLECTIONS BUDGET							
Cash Collections from Customers Budget							
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	
Accounts Receivable (A/R) Budget							
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	\$ 700,111		\$ 700,111	

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

FigQ7.3 - Microsoft Excel

	A	B	C	D	E	F	G
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	COST-OF-GOODS SOLD BUDGET						
4	Cost-of-Goods Sold Budget						
5	Exterior	\$ 747,500	\$ 737,100	\$ 756,000	\$ 749,700	\$ 2,990,300	
6	Interior	690,000	655,200	660,000	654,500	2,659,700	
7	Assembly labor	575,000	585,000	540,000	511,700	2,211,700	
8	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

FigQ7.4 - Microsoft Excel

	A	B	C	D	E	F	G
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	INVENTORY BUDGET						
4	Inventory Budget						
5	Desired ending inventory	\$ 461,370	\$ 478,133	\$ 468,331	\$ 468,331	\$ 468,331	
6	+ Cost of goods sold	2,012,500	1,977,300	1,956,000	1,915,900	7,861,700	
7	= Total inventory needed	\$ 2,473,870	\$ 2,455,433	\$ 2,424,331	\$ 2,384,231	\$ 8,330,031	
8							
9	PURCHASES BUDGET						
10	Purchases Budget						
11	Total inventory needed	\$ 2,473,870	\$ 2,455,433	\$ 2,424,331	\$ 2,384,231	N/A	
12	- Beginning inventory	-	461,370	478,133	468,331	-	
13	= Purchases	\$ 2,473,870	\$ 1,994,063	\$ 1,946,198	\$ 1,915,900	N/A	
14							
15	Disbursements for Purchases Budget						
16	Payments of payables	\$ 1,621,759	\$ 2,070,705	\$ 1,899,939	\$ 1,886,117	\$ 7,478,520	
17	Total disbursements for purchases	\$ 1,621,759	\$ 2,070,705	\$ 1,899,939	\$ 1,886,117	\$ 7,478,520	
18							
19	Accounts Payable (A/P) Budget						
20	Beginning A/P balance	\$ -	\$ 852,111	\$ 775,469	\$ 821,728	\$ -	
21	+ Additions to A/P	852,111	775,469	821,728	851,511	3,300,819	
22	- Subtractions from A/P	-	852,111	775,469	821,728	2,449,308	
23	Ending A/P	\$ 852,111	\$ 775,469	\$ 821,728	\$ 851,511	\$ 851,511	
24							

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

FigQ7.5 - Microsoft Excel

	A	B	C	D	E	F	G
1	A1	1Q X4	2Q X4	3Q X4	4Q X4	X4	
HEADCOUNT BUDGET							
4 Headcount Budget							
5 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	
11 Salesperson		6	6	6	7		
12 Hardware Engineer		1	1	1	2		
13 Controller/Accountant		1	1	1	1		
14 Administrative Assistant		1	2	2	2		
15 Total		13	14	14	17		
16							
17 Periodic base salaries							
18 Chief Executive Officer	\$ 37,500	\$ 37,500	\$ 37,500	\$ 37,500	\$ 37,500	\$ 150,000	
19 Chief Financial Officer	31,250	31,250	31,250	31,250	31,250	125,000	
20 VP, Engineering	27,500	27,500	27,500	27,500	27,500	110,000	
21 VP, Sales & Marketing	25,000	25,000	25,000	25,000	25,000	100,000	
22 VP, Business Development	22,500	22,500	22,500	22,500	22,500	90,000	
23 Salesperson	22,500	22,500	22,500	22,500	22,500	90,000	
24 Hardware Engineer	17,500	17,500	17,500	17,500	17,500	70,000	
25 Controller/Accountant	11,250	11,250	11,250	11,250	11,250	45,000	
26 Administrative Assistant	8,750	8,750	8,750	8,750	8,750	35,000	
27 Total	\$ 203,750	\$ 203,750	\$ 203,750	\$ 203,750	\$ 203,750	\$ 815,000	
28							
H 4 H Sales and Collections COGS Inventory and Purchases Headcount							
Ready							

FIGURE Q7.5 Company MNO's Headcount Overview Worksheet

FigQ7.6 - Microsoft Excel

	A	B	C	D	E	F	G
1	A1	1Q X4	2Q X4	3Q X4	4Q X4	X4	
HEADCOUNT BUDGET							
4 Headcount Budget							
5 Periodic salary expense (base)							
6 Chief Executive Officer	\$ 37,500	\$ 37,500	\$ 37,500	\$ 37,500	\$ 37,500	\$ 150,000	
7 Chief Financial Officer	31,250	31,250	31,250	31,250	31,250	125,000	
8 VP, Engineering	27,500	27,500	27,500	27,500	27,500	110,000	
9 VP, Sales & Marketing	25,000	25,000	25,000	25,000	25,000	100,000	
10 VP, Business Development	-	-	-	22,500	22,500	22,500	
11 Salesperson	135,000	135,000	135,000	157,500	157,500	562,500	
12 Hardware Engineer	17,500	17,500	17,500	35,000	35,000	87,500	
13 Controller/Accountant	11,250	11,250	11,250	11,250	11,250	45,000	
14 Administrative Assistant	8,750	17,500	17,500	17,500	17,500	61,250	
15 Total	\$ 293,750	\$ 302,500	\$ 302,500	\$ 365,000	\$ 1,263,750		
16							
17 Total (with benefits)	\$ 336,344	\$ 346,363	\$ 346,363	\$ 417,925	\$ 1,446,994		
18							
H 4 H COGS Inventory and Purchases Headcount							
Ready							

FIGURE Q7.6 Company MNO's Headcount Cost Worksheet

FigQ7.7 - Microsoft Excel

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	OPERATING EXPENSES BUDGET						
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	DISBURSEMENTS FOR OPERATING EXPENSES BUDGET						
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	
20							

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

FigQ7.8 - Microsoft Excel

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4		X4
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	
19							

FIGURE Q7.8 Company MNO's Income Statement

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
CAPITAL BUDGET							
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	
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	
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	\$ 1,694	\$ 2,241	\$ 2,828	\$ 7,550	
Cumulative capital expenditures							
22 Accumulated depreciation		\$ 17,000	\$ 30,500	\$ 42,750	\$ 54,000		
23 = Fixed assets, net of depreciation		888	2,481	4,722	7,550		
24 Cumulative disbursements for CAPEX		\$ 17,000	\$ 30,500	\$ 42,750	\$ 54,000		
25 Payables adjustment for CAPEX disbursements		\$ -	\$ -	\$ -	\$ -		
26							
27 Cumulative disbursements for CAPEX		\$ 17,000	\$ 30,500	\$ 42,750	\$ 54,000		
28 Payables adjustment for CAPEX disbursements		\$ -	\$ -	\$ -	\$ -		
29							
Operating Expenses							
Capital							
Cash							
Balance Sheet							

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

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
CASH BUDGET							
Beginning cash balance							
4 Cash receipts		\$ -	\$ 110,522	\$ 726,552	\$ 1,441,311	\$ -	
5 Collections from customers		2,415,000	3,627,650	3,622,350	3,636,399	11,290,399	
7 Total cash available, before financing		\$ 2,415,000	\$ 3,733,172	\$ 4,340,902	\$ 5,071,700	N/A	
8 Cash disbursements							
9 Purchases disbursements		\$ 1,629,759	\$ 2,070,705	\$ 1,899,939	\$ 1,686,117	\$ 7,476,520	
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		\$ 2,604,478	\$ 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 total cash needed before financing		\$ (189,478)	\$ 626,552	\$ 1,341,311	\$ 2,054,566	N/A	
18 Financing							
19 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	\$ 2,154,666	\$ 2,154,666	
27							
Operating Expenses							
Capital							
Cash							
Balance Sheet							
Income							

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

CHAPTER 8

Consolidated Financial Statements

This 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

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.

Fig8.1 - Microsoft Excel

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4	X4	
Assets							
4 Cash		\$ 982,272	\$ 1,260,656	\$ 1,541,236	\$ 2,135,280	\$ 2,135,280	
5 Accounts Receivable		133,333	192,000	257,600	336,000	336,000	
6 Inventory		64,667	83,067	102,667	102,667	102,667	
7 Fixed Assets, net		42,688	83,063	121,125	156,875	156,875	
8 Total Assets		\$ 1,222,959	\$ 1,618,785	\$ 2,022,628	\$ 2,730,822	\$ 2,730,822	
9							
10							
Liabilities							
12 Accounts Payable		\$ 88,222	\$ 103,133	\$ 131,133	\$ 154,000	\$ 154,000	
13 Payables from Capital Budget		-	-	-	-	-	
14 Loan Payable		-	50,000	-	-	-	
15 Total Liabilities		\$ 88,222	\$ 153,133	\$ 131,133	\$ 154,000	\$ 154,000	
16							
17							
Owners' Equity							
19 Common Stock		\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	
20 Retained Earnings		134,737	465,652	891,495	1,576,822	1,576,822	
21 Total Owners' Equity		\$ 1,134,737	\$ 1,465,652	\$ 1,891,495	\$ 2,576,822	\$ 2,576,822	
22							
23 Total Liabilities and Owners' Equity		\$ 1,222,959	\$ 1,618,785	\$ 2,022,628	\$ 2,730,822	\$ 2,730,822	
24							
25							
26							
Net Working Capital (NWC)							
28 Current assets		\$ 198,000	\$ 275,067	\$ 360,267	\$ 438,667	N/A	
29 - Current liabilities		88,222	103,133	131,133	154,000	N/A	
30 = Net working capital		\$ 109,778	\$ 171,933	\$ 229,133	\$ 284,667	N/A	
31							
32 Beginning NWC		\$ -	\$ 109,778	\$ 171,933	\$ 229,133	N/A	
33 - Ending NWC		109,778	171,933	229,133	284,667	N/A	
34 = Change in NWC		\$ (109,778)	\$ (62,156)	\$ (57,200)	\$ (55,533)	N/A	
35							
Operating Expenses Capital Cash Balance Sheet							

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.

Fig8.2 – Microsoft Excel

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3 Assets							
4 Cash							
5 Accounts Receivable							
6 Inventory							
7 Fixed Assets, net							
8 Total Assets							
9							
11 Liabilities							
12 Accounts Payable							
13 Payables from Capital Budget							
14 Loan Payable							
15 Total Liabilities							
16							
18 Owners' Equity							
19 Common Stock							
20 Retained Earnings							
21 Total Owners' Equity							
23 Total Liabilities and Owners' Equity							
24							
25							
27 Net Working Capital (NWC)							
28 Current assets							
29 - Current liabilities							
30 = Net working capital							
31							
32 Beginning NWC							
33 - Ending NWC							
34 = Change in NWC							
35							

Fig8.2 – Microsoft Excel

FIGURE 8.2 Source of Each Line Item in the Balance Sheet

Fig8.3 – Microsoft Excel

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3 Sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000		\$ 6,892,000	
4 Cost of goods sold	200,000	291,000	373,800	462,000		1,326,800	
5 Gross profit	\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000		\$ 5,565,200	
6							
7 Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200		\$ 2,301,600	
8 Miscellaneous expenses	30,000	43,200	57,960	75,600		206,760	
9 Research and development	70,000	100,800	154,560	201,600		526,960	
10 Rent	20,000	20,000	20,000	20,000		80,000	
11 Depreciation	2,313	4,625	6,938	9,250		23,125	
12 Income from operations	\$ 207,288	\$ 509,975	\$ 655,143	\$ 1,054,350		\$ 2,426,755	
13							
14 Interest expense	\$ -	\$ 875	\$ -	\$ -		\$ 875	
15 Taxable income	\$ 207,288	\$ 509,100	\$ 655,143	\$ 1,054,350		\$ 2,425,880	
16							
17 Tax expense	\$ 72,551	\$ 178,185	\$ 229,300	\$ 369,023		\$ 849,058	
18 Net income	\$ 134,737	\$ 330,915	\$ 425,843	\$ 685,328		\$ 1,576,822	
19							

Fig8.3 – Microsoft Excel

FIGURE 8.3 Income Statement

The screenshot shows a Microsoft Excel spreadsheet titled "Fig8.4 - Microsoft Excel". The spreadsheet has a header row with columns A through G. Column A contains line items from "Sales" down to "Net income". Column B contains budget names such as "Unit Sales and Price Budget" and "Assumptions and Dashboard Worksheet". Column D contains specific budget names like "Headcount Budget" and "Depreciation Budget". Column E contains the label "X4". The "Period" column header is located at the top of column D, spanning rows 2 and 3. The "X4" label is located at the top of column E, spanning rows 2 and 3.

	A	B	C	D	E	F	G
1	A1			Period			
2				1Q X4	2Q X4	3Q X4	4Q X4
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.

Fig.8.5 - Microsoft Excel

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Cash Flows from Operating Activities						
4	Net Income	134,737	330,915	425,843	685,328		1,576,822
5	Adjustments to reconcile net income to cash provided from operating activities						
6	Depreciation	2,313	4,625	6,938	9,250		23,125
7	(Increase) decrease in Accounts Receivable						
8	(Increase) decrease in Inventory						
9	Increase (decrease) in Accounts Payable						
10	Increase (decrease) in Loan Payable						
11	Cash provided (used) by operating activities						
12							
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	Cash provided (used) by financing activities						
23							
24							
25	Net increase (decrease) in cash						
26	Cash, beginning of period						
27	Cash, end of period						
28							

FIGURE 8.5 Statement of Cash Flows

Fig.8.6 - Microsoft Excel

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Cash Flows from Operating Activities						
4	Net Income	=NetInc1Q	=NetInc2Q	=NetInc3Q	=NetInc4Q		=NetIncX4
5	Adjustments to reconcile net income to cash provided from operating activities						
6	Depreciation	=Dep1Q	=Dep2Q	=Dep3Q	=Dep4Q		=DepX4
7	(Increase) decrease in Accounts Receivable						
8	(Increase) decrease in Inventory						
9	Increase (decrease) in Accounts Payable						
10	Increase (decrease) in Loan Payable						
11	Cash provided (used) by operating activities						
12							
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	Cash provided (used) by financing activities						
23							
24							
25	Net increase (decrease) in cash						
26	Cash, beginning of period						
27	Cash, end of period						
28							

FIGURE 8.6 Alternative View of the Statement of Cash Flows

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4	X4	Period
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)	(19,400)	(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	-		
47							

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

	A	B	C	D
		1Q X4	2Q X4	3Q X4
31	Changes in Balance Sheet Accounts			
32	Accounts Receivable beginning value	=BeginR3Q	=BeginR2Q	=BeginR3Q
33	Accounts Receivable ending value	=EndR1Q	=EndR2Q	=EndR3Q
34	(Increase) decrease in Accounts Receivable	=EndR1Q-EndR1Q	=EndR2Q-EndR2Q	=EndR3Q-EndR3Q
35				
36	Inventory beginning value	=BeginI1Q	=BeginI2Q	=BeginI3Q
37	Inventory ending value	=EndI1Q	=EndI2Q	=EndI3Q
38	(Increase) decrease in Inventory	=EndI1Q-EndI1Q	=EndI2Q-EndI2Q	=EndI3Q-EndI3Q
39				
40	Accounts Payable beginning value	=BeginP1Q	=BeginP2Q	=BeginP3Q
41	Accounts Payable ending value	=EndP1Q	=EndP2Q	=EndP3Q
42	(Increase) decrease in Accounts Payable	=EndP1Q-EndP1Q	=EndP2Q-EndP2Q	=EndP3Q-EndP3Q
43				
44	Loan Payable beginning value	0	=BeginL1Q	=BeginL2Q
45	Loan Payable ending value	=BeginL1Q	=BeginL2Q	=BeginL3Q
46	(Increase) decrease in Loan Payable	=BeginL1Q-LoanVal1Q	=BeginL2Q-LoanVal2Q	=BeginL3Q-LoanVal3Q
47				

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

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4	X4	
31	Changes in Balance Sheet Accounts						
32	Accounts Receivable beginning value						
33	Accounts Receivable ending value						
34	(Increase) decrease in Accounts Receivable						
35	Inventory beginning value						
37	Inventory ending value						
38	(Increase) decrease in Inventory						
40	Accounts Payable beginning value						
41	Accounts Payable ending value						
42	(Increase) decrease in Accounts Payable						
43	Loan Payable beginning value						
45	Loan Payable ending value						
46	(Increase) decrease in Loan Payable						
47	ChgAR1Q ChgAR2Q ChgAR3Q ChgAR4Q						
48	ChgInv1Q ChgInv2Q ChgInv3Q ChgInv4Q						
49	ChgAP1Q ChgAP2Q ChgAP3Q ChgAP4Q						
50	BegLoanVal1Q BegLoanVal2Q BegLoanVal3Q BegLoanVal4Q						
51	ChgLoanVal1Q ChgLoanVal2Q ChgLoanVal3Q ChgLoanVal4Q						

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

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4	X4	
2							
3	INVENTORY BUDGET						
4	Inventory Budget						
5	Desired ending inventory						
6	+ Cost of goods sold						
7	= Total inventory needed						
8							
9	PURCHASES BUDGET						
10	Purchases Budget						
11	Total inventory needed						
12	- Beginning inventory						
13	= Purchases						
14							
15	Disbursements for Purchases Budget						
16	Payments of payables						
17	Total disbursements for purchases						
18							
19	Accounts Payable (A/P) Budget						
20	Beginning A/P balance						
21	+ Additions to A/P						
22	- Subtractions from A/P						
23	Ending A/P						
24							

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

Fig8.11 - Microsoft Excel

	A	Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
Cash Flows from Operating Activities						
4	Net Income	134,737	330,915	425,843	685,328	1,576,822
5	Adjustments to reconcile net income to cash provided from operating activities					
6	Depreciation	2,313	4,625	6,938	9,250	23,125
7	(Increase) decrease in Accounts Receivable	(133,333)	(58,667)	(65,600)	(78,400)	(336,000)
8	(Increase) decrease in Inventory	(64,667)	(18,400)	(19,600)	-	(102,667)
10	Increase (decrease) in Accounts Payable	88,222	14,911	28,000	22,867	154,000
11	Increase (decrease) in Loan Payable	-	50,000	(50,000)	-	-
12	Cash provided (used) by operating activities	27,272	323,384	325,580	639,044	1,315,290
14						
15	Cash Flows from Investing Activities					
16	Purchase of capital assets					
17	Cash provided (used) by investing activities					
19						
20	Cash Flows from Financing Activities					
21	Proceeds from sale of Common Stock					
22	Cash provided (used) by financing activities					
24						
25	Net increase (decrease) in cash					
26	Cash, beginning of period					
27	Cash, end of period					
28						

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.

	A	B	C
1		1Q X4	2Q X4
3	Cash Flows from Operating Activities		
4	Net Income	=NetInc1Q	=NetInc2Q
5	Adjustments to reconcile net income to cash provided from operating activities		
7	Depreciation	=Dep1Q	=Dep2Q
8	(Increase) decrease in Accounts Receivable	=ChgAR1Q	=ChgAR2Q
9	(Increase) decrease in Inventory	=ChgInv1Q	=ChgInv2Q
10	Increase (decrease) in Accounts Payable	=ChgAP1Q	=ChgAP2Q
11	Increase (decrease) in Loan Payable	=ChgLoanVal1Q	=ChgLoanVal2Q
12	Cash provided (used) by operating activities	=NetInc1Q+SUM(B7:B11)	=NetInc2Q+SUM(C7:C11)
14			
15	Cash Flows from Investing Activities		
16	Purchase of capital assets		
17	Cash provided (used) by investing activities		
19			
20	Cash Flows from Financing Activities		
21	Proceeds from sale of Common Stock		
22	Cash provided (used) by financing activities		
23			
24			
25	Net increase (decrease) in cash		
26	Cash, beginning of period		
27	Cash, end of period		

FIGURE 8.12 Alternative View of the Cash Flows from Operating Activities

	A	B	C	D	E	F	G
1		1Q X4	2Q X4	3Q X4	4Q X4	X4	Period
3	Cash Flows from Operating Activities						
4	Net Income						
5	Adjustments to reconcile net income to cash 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	CashOpAc1Q	CashOpAc2Q	CashOpAc3Q	CashOpAc4Q	CashOpAcX4	
14							
15	Cash Flows from Investing Activities						
16	Purchase of capital assets						
17	Cash provided (used) by investing activities						
19							
20	Cash Flows from Financing Activities						
21	Proceeds from sale of Common Stock						
22	Cash provided (used) by financing activities						
23							
24							
25	Net increase (decrease) in cash						
26	Cash, beginning of period						
27	Cash, end of period						

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

	A1	Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
Cash Flows from Operating Activities						
4	Net Income	134,737	330,915	425,843	685,328	1,576,822
5 Adjustments to reconcile net income to cash provided from operating activities						
7	Depreciation	2,313	4,625	6,938	9,250	23,125
8	(Increase) decrease in Accounts Receivable	(133,333)	(58,667)	(65,600)	(78,400)	(336,000)
9	(Increase) decrease in Inventory	(64,667)	(18,400)	(19,600)	-	(102,667)
10	Increase (decrease) in Accounts Payable	88,222	14,911	28,000	22,867	154,000
11	Increase (decrease) in Loan Payable	-	50,000	(50,000)	-	-
12	Cash provided (used) by operating activities	27,272	323,384	325,580	639,044	1,315,280
13						
14						
Cash Flows from Investing Activities						
16	Purchase of capital assets	(45,000)	(45,000)	(45,000)	(45,000)	(180,000)
17	Cash provided (used) by investing activities	(45,000)	(45,000)	(45,000)	(45,000)	(180,000)
18						
19						
Cash Flows from Financing Activities						
21	Proceeds from sale of Common Stock					
22	Cash provided (used) by financing activities					
23						
24						
25	Net increase (decrease) in cash					
26	Cash, beginning of period					
27	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.

Fig8.15 - Microsoft Excel		
A1	B	C
1	1Q X4	2Q X4
3 Cash Flows from Operating Activities		
4 Net Income	=NetInc1Q	=NetInc2Q
5 Adjustments to reconcile net income to cash provided from operating activities		
7 Depreciation	=Dep1Q	=Dep2Q
8 (Increase) decrease in Accounts Receivable	=ChgAR1Q	=ChgAR2Q
9 (Increase) decrease in Inventory	=ChgInv1Q	=ChgInv2Q
10 Increase (decrease) in Accounts Payable	=ChgAP1Q	=ChgAP2Q
11 Increase (decrease) in Loan Payable	=ChgLoanVal1Q	=ChgLoanVal2Q
12 Cash provided (used) by operating activities	=NetInc1Q+SUM(B7:B11)	=NetInc2Q+SUM(C7:C11)
14		
15 Cash Flows from Investing Activities		
16 Purchase of capital assets	=CAPEXDis1Q	=CAPEXDis2Q
17 Cash provided (used) by investing activities	=B16	=C16
18		
19		
20 Cash Flows from Financing Activities		
21 Proceeds from sale of Common Stock		
22 Cash provided (used) by financing activities		
23		
24		
25 Net increase (decrease) in cash		
26 Cash, beginning of period		
27 Cash, end of period		

FIGURE 8.15 Alternative View of the Cash Flows from Investing Activities

Fig8.16 - Microsoft Excel						
A1	B	C	D	E	F	G
1	1Q X4	2Q X4	3Q X4	4Q X4	X4	Period
3 Cash Flows from Operating Activities						
4 Net Income						
5 Adjustments to reconcile net income to cash 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	CashOpAc1Q	CashOpAc2Q	CashOpAc3Q	CashOpAc4Q	CashOpAcX4	
14						
15 Cash Flows from Investing Activities						
16 Purchase of capital assets						
17 Cash provided (used) by investing activities	CashInvAc1Q	CashInvAc2Q	CashInvAc3Q	CashInvAc4Q	CashInvAcX4	
18						
19						
20 Cash Flows from Financing Activities						
21 Proceeds from sale of Common Stock						
22 Cash provided (used) by financing activities						
23						
24						
25 Net increase (decrease) in cash						
26 Cash, beginning of period						
27 Cash, end of period						

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

	A	Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
3	Cash Flows from Operating Activities					
4	Net Income	134,737	330,915	425,843	685,328	1,575,822
5	Adjustments to reconcile net income to cash provided from operating activities					
6	Depreciation	2,313	4,625	6,938	9,250	23,125
8	(Increase) decrease in Accounts Receivable	(133,333)	(58,667)	(65,600)	(78,400)	(336,000)
9	(Increase) decrease in Inventory	(64,667)	(18,400)	(19,600)	-	(102,667)
10	Increase (decrease) in Accounts Payable	88,222	14,911	28,000	22,867	154,000
11	Increase (decrease) in Loan Payable	-	50,000	(50,000)	-	-
12	Cash provided (used) by operating activities	27,272	323,384	325,580	639,044	1,315,280
13						
14						
15	Cash Flows from investing Activities					
16	Purchase of capital assets	(45,000)	(45,000)	(45,000)	(45,000)	(180,000)
17	Cash provided (used) by investing activities	(45,000)	(45,000)	(45,000)	(45,000)	(180,000)
18						
19						
20	Cash Flows from Financing Activities					
21	Proceeds from sale of Common Stock	1,000,000	-	-	-	1,000,000
22	Cash provided (used) by financing activities	1,000,000	-	-	-	1,000,000
23						
24						
25	Net increase (decrease) in cash	982,272	278,384	280,580	594,044	2,135,280
26	Cash, beginning of period	-	982,272	1,260,656	1,541,236	-
27	Cash, end of period	982,272	1,260,656	1,541,236	2,135,280	2,135,280
28						

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.

	A1	B	C
1		1Q X4	2Q X4
2			
3	Cash Flows from Operating Activities		
4	Net Income	=NetInc1Q	=NetInc2Q
5	Adjustments to reconcile net income to cash provided from operating activities		
6	Depreciation	=Dep1Q	=Dep2Q
7	(Increase) decrease in Accounts Receivable	=ChgAR1Q	=ChgAR2Q
8	(Increase) decrease in Inventory	=ChgInv1Q	=ChgInv2Q
9	Increase (decrease) in Accounts Payable	=ChgAP1Q	=ChgAP2Q
10	Increase (decrease) in Loan Payable	=ChgLoanVal1Q	=ChgLoanVal2Q
11	Cash provided (used) by operating activities	=NetInc1Q+SUM(B7:B11)	=NetInc2Q+SUM(C7:C11)
12			
13			
14			
15	Cash Flows from Investing Activities		
16	Purchase of capital assets	=CAPEXDis1Q	=CAPEXDis2Q
17	Cash provided (used) by investing activities	=B16	=C16
18			
19			
20	Cash Flows from Financing Activities		
21	Proceeds from sale of Common Stock	=EqInv1Q	=EqInv2Q
22	Cash provided (used) by financing activities	=B21	=C21
23			
24			
25	Net increase (decrease) in cash	=CashOpAc1Q+CashInvAc1Q+CashFinAc1Q	=CashOpAc2Q+CashInvAc2Q+CashFinAc2Q
26	Cash, beginning of period	0	=CashEOP1Q
27	Cash, end of period	=ChgCash1Q+CashBOP1Q	=ChgCash2Q+CashBOP2Q
28			

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

	A1	B	C	D	E	F	G
1		1Q X4	2Q X4	3Q X4	4Q X4	X4	
2							
3	Cash Flows from Operating Activities						
4	Net Income						
5	Adjustments to reconcile net income to cash provided from operating activities						
6	Depreciation						
7	(Increase) decrease in Accounts Receivable						
8	(Increase) decrease in Inventory						
9	Increase (decrease) in Accounts Payable						
10	Increase (decrease) in Loan Payable						
11	Cash provided (used) by operating activities		CashOpAc1Q	CashOpAc2Q	CashOpAc3Q	CashOpAc4Q	CashOpAcX4
12							
13							
14							
15	Cash Flows from Investing Activities						
16	Purchase of capital assets						
17	Cash provided (used) by investing activities		CashInvAc1Q	CashInvAc2Q	CashInvAc3Q	CashInvAc4Q	CashInvAcX4
18							
19							
20	Cash Flows from Financing Activities						
21	Proceeds from sale of Common Stock						
22	Cash provided (used) by financing activities		CashFinAc1Q	CashFinAc2Q	CashFinAc3Q	CashFinAc4Q	CashFinAcX4
23							
24							
25	Net increase (decrease) in cash		ChgCash1Q	ChgCash2Q	ChgCash3Q	ChgCash4Q	ChgCashX4
26	Cash, beginning of period		CashBOP1Q	CashBOP2Q	CashBOP3Q	CashBOP4Q	CashBOPX4
27	Cash, end of period		CashEOP1Q	CashEOP2Q	CashEOP3Q	CashEOP4Q	CashEOPX4
28							

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.

The screenshot shows a Microsoft Excel spreadsheet titled "FigQ8.1 - Microsoft Excel". The spreadsheet displays the Income Statement for Company PQR across four quarters (1Q X4 to 4Q X4) and a total for the year (X4). The columns are labeled A through G, with A being the row number and B through G being the financial periods. The rows list various income statement items with their corresponding dollar amounts. The data includes Sales (\$3,000,000), Cost of goods sold (1,300,000), Gross profit (\$1,700,000), Salaries (\$319,125), Miscellaneous expenses (90,000), Research and development (180,000), Rent (25,000), Depreciation (1,625), Income from operations (\$1,084,250), Interest expense (\$875), Taxable income (\$1,083,375), Tax expense (\$379,181), and Net income (\$704,194). The bottom of the sheet shows tabs for "Operating Expenses", "Capital", "Cash", and "Balance Sheet".

A	Period					X4
	1Q X4	2Q X4	3Q X4	4Q 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	\$ 1,084,250	\$ 1,103,838	\$ 1,094,538	\$ 1,082,913		\$ 4,366,538
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	\$ 383,088	\$ 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

FigQ8.2 - Microsoft Excel

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Assets						
4	Cash	\$ 846,597	\$ 1,344,153	\$ 2,000,040	\$ 2,699,281		\$ 2,699,281
5	Accounts Receivable	250,000	264,271	282,708	290,000		290,000
6	Inventory	465,833	479,167	500,000	500,000		500,000
7	Fixed Assets, net	30,375	54,375	86,500	97,750		97,750
8	Total Assets	\$ 1,592,805	\$ 2,141,968	\$ 2,869,249	\$ 3,587,031		\$ 3,587,031
9							
10							
11	Liabilities						
12	Accounts Payable	\$ 588,611	\$ 470,278	\$ 486,111	\$ 500,000		\$ 500,000
13	Payables from Capital Budget	-	-	-	-		-
14	Loan Payable	50,000	-	-	-		-
15	Total Liabilities	\$ 638,611	\$ 470,278	\$ 486,111	\$ 500,000		\$ 500,000
16							
17							
18	Owners' Equity						
19	Common Stock	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000		\$ 250,000
20	Retained Earnings	704,194	1,421,688	2,133,138	2,837,031		2,837,031
21	Total Owners' Equity	\$ 954,194	\$ 1,671,688	\$ 2,383,138	\$ 3,087,031		\$ 3,087,031
22							
23	Total Liabilities and Owners' Equity	\$ 1,592,805	\$ 2,141,968	\$ 2,869,249	\$ 3,587,031		\$ 3,587,031
24							

FIGURE Q8.2 Company PQR's Balance Sheet

FigQ8.3 - Microsoft Excel

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	SALES BUDGET						
4	Unit Sales and Price Budget						
5	Unit sales	10,000	10,750	11,500	12,000		44,250
6	x Price per unit	\$ 300	\$ 295	\$ 295	\$ 290		N/A
7	= Total sales	\$ 3,000,000	\$ 3,171,250	\$ 3,392,500	\$ 3,480,000		\$ 13,043,750
8							
9	Sales Composition Budget						
10	Cash sales	\$ 2,250,000	\$ 2,378,438	\$ 2,544,375	\$ 2,610,000		\$ 9,782,813
11	+ Credit sales	750,000	792,813	848,125	870,000		3,260,938
12	= Total sales	\$ 3,000,000	\$ 3,171,250	\$ 3,392,500	\$ 3,480,000		\$ 13,043,750
13							
14	COLLECTIONS BUDGET						
15	Cash Collections from Customers Budget						
16	Cash sales this period	\$ 2,250,000	\$ 2,378,438	\$ 2,544,375	\$ 2,610,000		\$ 9,782,813
17	+ Credit sales collected	500,000	778,542	829,698	862,708		2,970,938
18	= Total collections	\$ 2,750,000	\$ 3,156,979	\$ 3,374,063	\$ 3,472,708		\$ 12,753,750
19							
20	Accounts Receivable (A/R) Budget						
21	Beginning A/R balance	\$ -	\$ 250,000	\$ 264,271	\$ 282,708		\$ -
22	+ Additions to A/R	250,000	264,271	282,708	290,000		1,086,979
23	- Subtractions from A/R	-	250,000	264,271	282,708		796,979
24	= Ending A/R balance	\$ 250,000	\$ 264,271	\$ 282,708	\$ 290,000		\$ 290,000
25							

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

FigQ8.4 - Microsoft Excel

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
INVENTORY BUDGET							
Inventory Budget							
5	Desired ending inventory	\$ 466,833	\$ 479,167	\$ 500,000	\$ 500,000	\$ 500,000	
6	+ Cost of goods sold	1,300,000	1,397,500	1,437,500	1,500,000	5,635,000	
7	= Total inventory needed	\$ 1,766,833	\$ 1,876,667	\$ 1,937,500	\$ 2,000,000	\$ 6,135,000	
PURCHASES BUDGET							
Purchases Budget							
11	Total inventory needed	\$ 1,766,833	\$ 1,876,667	\$ 1,937,500	\$ 2,000,000	N/A	
12	- Beginning inventory	-	466,833	479,167	500,000	-	
13	= Purchases	\$ 1,766,833	\$ 1,410,833	\$ 1,458,333	\$ 1,500,000	N/A	
Disbursements for Purchases Budget							
16	Payments of payables	\$ 1,177,222	\$ 1,529,167	\$ 1,442,500	\$ 1,486,111	\$ 5,635,000	
17	Total disbursements for purchases	\$ 1,177,222	\$ 1,529,167	\$ 1,442,500	\$ 1,486,111	\$ 5,635,000	
Accounts Payable (A/P) Budget							
20	Beginning A/P balance	\$ -	\$ 588,611	\$ 470,278	\$ 486,111	\$ -	
21	+ Additions to A/P	588,611	470,278	486,111	500,000	2,045,000	
22	- Subtractions from A/P	-	588,611	470,278	486,111	1,545,000	
23	Ending A/P	\$ 588,611	\$ 470,278	\$ 486,111	\$ 500,000	\$ 500,000	
Inventory and Purchases							

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

FigQ8.5 - Microsoft Excel

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4		X4
Sales and Collections Worksheet							
Unit Sales and Price Inputs							
5	Unit sales	10,000	10,750	11,500	12,000		
6	Price per unit	\$ 300	\$ 295	\$ 295	\$ 290		
Sales Composition Inputs							
9	Cash sales as a % of total sales	75%	75%	75%	75%		
10	Credit sales as a % of total sales	25%	25%	25%	25%		
12	Days receivable (DSO)	30	30	30	30		
13	Days per quarter	90	90	90	90		
COGS Worksheet							
Cost-of-Goods Sold Inputs							
17	Fabric: cost per unit	\$ 45.00	\$ 45.00	\$ 45.00	\$ 45.00		
18	Frame: cost per unit	\$ 45.00	\$ 45.00	\$ 40.00	\$ 40.00		
19	Assembly labor: cost per unit	\$ 40.00	\$ 40.00	\$ 40.00	\$ 40.00		
20	Total	\$ 130.00	\$ 130.00	\$ 125.00	\$ 125.00		
Inventory and Purchases Worksheet							
Inventory Inputs							
24	Days inventory	30	30	30	30		
Disbursements for Purchases Inputs							
27	Days payable	30	30	30	30		
Assumptions and Dashboard							
Sales and Collections							

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

FigQ8.6 - Microsoft Excel

	A	Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
1						
3	CAPITAL BUDGET					
4	<u>Capital Expenditures Budget</u>					
5	Equipment	\$ 25,000	\$ 20,000	\$ 30,000	\$ 10,000	\$ 85,000
6	Furniture	5,000	5,000	5,000	5,000	20,000
7	Fixtures	2,000	2,000	2,000	2,000	8,000
8	Total capital expenditures	\$ 32,000	\$ 27,000	\$ 37,000	\$ 17,000	\$ 113,000
9						
10	<u>Disbursements for Capital Expenditures Budget</u>					
11	Equipment	\$ 25,000	\$ 20,000	\$ 30,000	\$ 10,000	\$ 85,000
12	Furniture	5,000	5,000	5,000	5,000	20,000
13	Fixtures	2,000	2,000	2,000	2,000	8,000
14	Total disbursements for capital expenditures	\$ 32,000	\$ 27,000	\$ 37,000	\$ 17,000	\$ 113,000
15						
16	<u>Depreciation Budget</u>					
17	Equipment	\$ 1,250	\$ 2,250	\$ 3,750	\$ 4,250	\$ 11,500
18	Furniture	250	500	750	1,000	2,500
19	Fixtures	125	250	375	500	1,250
20	Total depreciation	\$ 1,625	\$ 3,000	\$ 4,875	\$ 5,750	\$ 15,250
21						
22	Cumulative capital expenditures	\$ 32,000	\$ 59,000	\$ 96,000	\$ 113,000	
23	- Accumulated depreciation	1,625	4,625	9,500	15,250	
24	= Fixed assets, net of depreciation	\$ 30,375	\$ 54,375	\$ 86,500	\$ 97,750	
25						
26						
27	Cumulative disbursements for CAPEX	\$ 32,000	\$ 59,000	\$ 96,000	\$ 113,000	
28	Payables adjustment for CAPEX disbursements	\$ -	\$ -	\$ -	\$ -	

FIGURE Q8.6 Company PQR's Capital Worksheet

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

While 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
1 Sales				X4
2 Cost of goods sold				
3 Gross profit	GrossP1Q	GrossP2Q	GrossP3Q	GrossP4Q
4 Salaries				
5 Miscellaneous expenses				
6 Research and development				
7 Rent				
8 Depreciation				
9 Income from operations	OpInc1Q	OpInc2Q	OpInc3Q	OpInc4Q
10 Interest expense				
11 Taxable income	TaxInc1Q	TaxInc2Q	TaxInc3Q	TaxInc4Q
12 Tax expense	TaxExp1Q	TaxExp2Q	TaxExp3Q	TaxExp4Q
13 Net income	NetInc1Q	NetInc2Q	NetInc3Q	NetInc4Q
14 Capitalization	Income Statement (2)			
15 Ready	100%			

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

Fig9.2 - Microsoft Excel

	A	B	C	D	E	F	G
		Period					
1	A1	1Q X4	2Q X4	3Q X4	4Q X4		X4
2		207,288	509,975	655,143	1,054,350		2,426,755
3	EBIT						
4							
5	Effective tax rate	35.0%	35.0%	35.0%	35.0%		
6							
7	EBIT * (1 - t)	134,737	331,484	425,843	685,328		1,577,391
8	+ Depreciation						
9	- CAPEX						
10	- Changes in NWC						
11	= Free cash flow						
12	+ Terminal value						
13	= Total free cash flow						
14							
15	Present value						
16							
17							
18	NPV						
19							
20	WACC						
21	g (to perpetuity)						
22							

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.

	A	B	C	D
		Period		
		1Q X4	2Q X4	3Q X4
3 EBIT	=OpInc1Q	=OpInc2Q	=OpInc3Q	
4				
5 Effective tax rate	=TaxPct1Q	=TaxPct2Q	=TaxPct3Q	
6				
7 EBIT * (1 - t)	=EBIT1Q*(1-EffTaxRt1Q)	=EBIT2Q*(1-EffTaxRt2Q)	=EBIT3Q*(1-EffTaxRt3Q)	
8 + Depreciation				
9 - CAPEX				
10 - Changes in NWC				
11 = Free cash flow				
12 + Terminal value				
13 = Total free cash flow				
14				
15 Present value				
16				
17				
18 NPV				
19				
20 WACC				
21 g (to perpetuity)				

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

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3 EBIT		EBIT1Q	EBIT2Q	EBIT3Q	EBIT4Q	EBITX4	
4							
5 Effective tax rate		EffTaxRt1Q	EffTaxRt2Q	EffTaxRt3Q	EffTaxRt4Q		
6							
7 EBIT * (1 - t)		ATEBIT1Q	ATEBIT2Q	ATEBIT3Q	ATEBIT4Q	ATEBITX4	
8 + Depreciation							
9 - CAPEX							
10 - Changes in NWC							
11 = Free cash flow							
12 + Terminal value							
13 = Total free cash flow							
14							
15 Present value							
16							
17							
18 NPV							
19							
20 WACC							
21 g (to perpetuity)							

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

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4	X4	
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	CashOpAc1Q	CashOpAc2Q	CashOpAc3Q	CashOpAc4Q	CashOpAcX4	
13							
14							
15	Cash Flows from Investing Activities						
16	Purchase of capital assets						
17	Cash provided (used) by investing activities	CashInvAc1Q	CashInvAc2Q	CashInvAc3Q	CashInvAc4Q	CashInvAcX4	
18							
19							
20	Cash Flows from Financing Activities						
21	Proceeds from sale of Common Stock						
22	Cash provided (used) by financing activities	CashFinAc1Q	CashFinAc2Q	CashFinAc3Q	CashFinAc4Q	CashFinAcX4	
23							
24							
25	Net increase (decrease) in cash	ChgCash1Q	ChgCash2Q	ChgCash3Q	ChgCash4Q	ChgCashX4	
26	Cash, beginning of period	CashBOP1Q	CashBOP2Q	CashBOP3Q	CashBOP4Q	CashBOPX4	
27	Cash, end of period	CashEOP1Q	CashEOP2Q	CashEOP3Q	CashEOP4Q	CashEOPX4	
28							

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

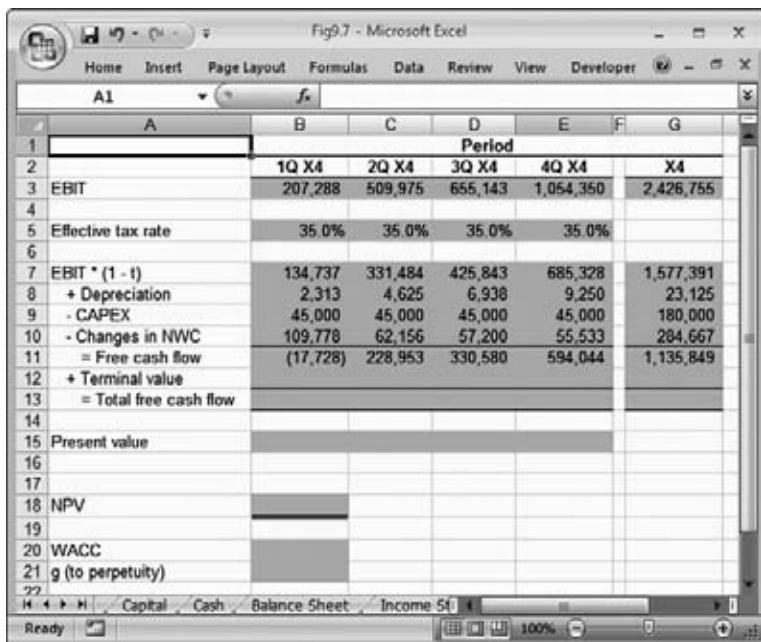
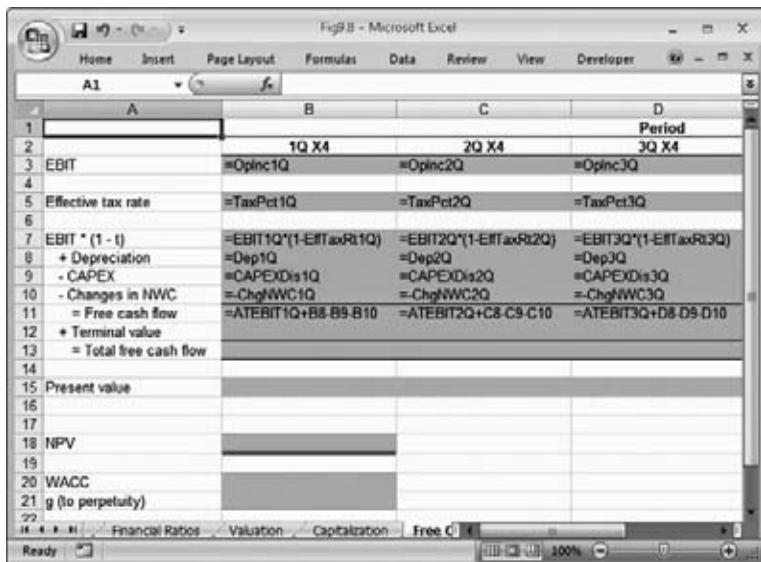
	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3 Assets							
4 Cash							
5 Accounts Receivable							
6 Inventory							
7 Fixed Assets, net							
8 Total Assets		TotAssets1Q	TotAssets2Q	TotAssets3Q	TotAssets4Q		TotAssetsX4
9							
10							
11 Liabilities							
12 Accounts Payable							
13 Payables from Capital Budget		PayCapB1Q	PayCapB2Q	PayCapB3Q	PayCapB4Q		PayCapBX4
14 Loan Payable							
15 Total Liabilities		TotLiabs1Q	TotLiabs2Q	TotLiabs3Q	TotLiabs4Q		TotLiabsX4
16							
17							
18 Owners' Equity							
19 Common Stock		CS1Q	CS2Q	CS3Q	CS4Q		CSX4
20 Retained Earnings		RE1Q	RE2Q	RE3Q	RE4Q		REX4
21 Total Owners' Equity		TotOE1Q	TotOE2Q	TotOE3Q	TotOE4Q		TotOEX4
22							
23 Total Liabilities and Owners' Equity		TotLOE1Q	TotLOE2Q	TotLOE3Q	TotLOE4Q		TotLOEX4
24							
25							
26							
27 Net Working Capital (NWC)							
28 Current assets		CA1Q	CA2Q	CA3Q	CA4Q		CAx4
29 - Current liabilities		CL1Q	CL2Q	CL3Q	CL4Q		CLx4
30 = Net working capital		NWC1Q	NWC2Q	NWC3Q	NWC4Q		NWCx4
31							
32 Beginning NWC		BegNWC1Q	BegNWC2Q	BegNWC3Q	BegNWC4Q		BegNWCx4
33 - Ending NWC		EndNWC1Q	EndNWC2Q	EndNWC3Q	EndNWC4Q		EndNWCx4
34 = Change in NWC		ChgNWC1Q	ChgNWC2Q	ChgNWC3Q	ChgNWC4Q		ChgNWCx4
35							

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

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	EBIT	EBIT1Q	EBIT2Q	EBIT3Q	EBIT4Q		EBITX4
4							
5	Effective tax rate	EffTaxRt1Q	EffTaxRt2Q	EffTaxRt3Q	EffTaxRt4Q		
6							
7	EBIT * (1 - t)	ATEBIT1Q	ATEBIT2Q	ATEBIT3Q	ATEBIT4Q		ATEBITX4
8	+ Depreciation						
9	- CAPEX						
10	- Changes in NWC						
11	= Free cash flow	FCF1Q	FCF2Q	FCF3Q	FCF4Q		FCFX4
12	+ Terminal value						
13	= Total free cash flow						
14							
15	Present value						
16							
17							
18	NPV						
19							
20	WACC						
21	g (to perpetuity)						
22							

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

The screenshot shows a Microsoft Excel spreadsheet titled "Fig9.10 - Microsoft Excel". The table has the following data:

	Period				
	1Q X4	2Q X4	3Q X4	4Q X4	X4
Assets					
Cash	\$ 882,272	\$ 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
Total Assets	\$ 1,222,959	\$ 1,618,785	\$ 2,022,628	\$ 2,730,822	\$ 2,730,822
Liabilities					
Accounts Payable	\$ 88,222	\$ 103,133	\$ 131,133	\$ 154,000	\$ 154,000
Payables from Capital Budget	-	-	-	-	-
Loan Payable	-	50,000	-	-	-
Total Liabilities	\$ 88,222	\$ 153,133	\$ 131,133	\$ 154,000	\$ 154,000
Owners' Equity					
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	\$ 1,618,785	\$ 2,022,628	\$ 2,730,822	\$ 2,730,822
Balance Sheet calculation check	-	-	-	-	-
Net Working Capital (NWC)					
Current assets	\$ 198,000	\$ 275,057	\$ 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)	\$ (62,156)	\$ (57,200)	\$ (55,533)	N/A

The ribbon at the top shows tabs for Home, Insert, Page Layout, Formulas, Data, Review, View, and Developer. The bottom of the screen shows tabs for Capital, Cash, Balance Sheet, Income Statement, and a zoom level of 100%.

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.

			Period
	1Q X4	2Q X4	3Q X4
3 Assets			
4 Cash	=EndCash1Q	=EndCash2Q	=EndCash3Q
5 Accounts Receivable	=EndAR1Q	=EndAR2Q	=EndAR3Q
6 Inventory	=EndInv1Q	=EndInv2Q	=EndInv3Q
7 Fixed Assets, net	=FixAssets1Q	=FixAssets2Q	=FixAssets3Q
8 Total Assets	=SUM(B4:B7)	=SUM(C4:C7)	=SUM(D4:D7)
9			
10			
11 Liabilities			
12 Accounts Payable	=EndAP1Q	=EndAP2Q	=EndAP3Q
13 Payables from Capital Budget	=PACAPEX1Q	=PACAPEX2Q	=PACAPEX3Q
14 Loan Payable	=LoanVal1Q	=LoanVal2Q	=LoanVal3Q
15 Total Liabilities	=SUM(B12:B14)	=SUM(C12:C14)	=SUM(D12:D14)
16			
17			
18 Owners' Equity			
19 Common Stock	=EqtInv1Q	=EqtInv2Q+CS1Q	=EqtInv3Q+CS2Q
20 Retained Earnings	=NetInc1Q	=NetInc2Q+RE1Q	=NetInc3Q+RE2Q
21 Total Owners' Equity	=SUM(B19:B20)	=SUM(C19:C20)	=SUM(D19:D20)
22			
23 Total Liabilities and Owners' Equity	=TotLiabs1Q+TotOE1Q	=TotLiabs2Q+TotOE2Q	=TotLiabs3Q+TotOE3Q
24			
25 Balance Sheet calculation check	=TotAssets1Q-TotLOE1Q	=TotAssets2Q-TotLOE2Q	=TotAssets3Q-TotLOE3Q
26			
27 Net Working Capital (NWC)			
28 Current assets	=EndAR1Q+EndInv1Q	=EndAR2Q+EndInv2Q	=EndAR3Q+EndInv3Q
29 - Current liabilities	=EndAP1Q	=EndAP2Q	=EndAP3Q
30 = Net working capital	=CA1Q-CL1Q	=CA2Q-CL2Q	=CA3Q-CL3Q
31			
32 Beginning NWC	0	=NWC1Q	=NWC2Q
33 - Ending NWC	=NWC1Q	=NWC2Q	=NWC3Q
34 = Change in NWC	=BegNWC1Q-EndNWC1Q	=BegNWC2Q-EndNWC2Q	=BegNWC3Q-EndNWC3Q
35			

FIGURE 9.11 Alternative View of the Balance Sheet

Fig9.12 - Microsoft Excel

This screenshot shows a Microsoft Excel spreadsheet titled "Fig9.12 - Microsoft Excel". The spreadsheet displays a balance sheet structure across five columns labeled A1 through F1, representing periods from 1Q X4 to X4. The rows list assets, liabilities, and owners' equity categories, each with corresponding input and output cell names.

	A	B	C	D	E	F
1					Period	
2		1Q X4	2Q X4	3Q X4	4Q X4	X4
3	<u>Assets</u>					
4	Cash					
5	Accounts Receivable					
6	Inventory					
7	Fixed Assets, net					
8	Total Assets	TotAssets1Q	TotAssets2Q	TotAssets3Q	TotAssets4Q	TotAssetsX4
9						
10						
11	<u>Liabilities</u>					
12	Accounts Payable					
13	Payables from Capital Budget	PayCapB1Q	PayCapB2Q	PayCapB3Q	PayCapB4Q	PayCapBX4
14	Loan Payable					
15	Total Liabilities	TotLiabs1Q	TotLiabs2Q	TotLiabs3Q	TotLiabs4Q	TotLiabsX4
16						
17						
18	<u>Owners' Equity</u>					
19	Common Stock	CS1Q	CS2Q	CS3Q	CS4Q	CSX4
20	Retained Earnings	RE1Q	RE2Q	RE3Q	RE4Q	REX4
21	Total Owners' Equity	TotOE1Q	TotOE2Q	TotOE3Q	TotOE4Q	TotOEY4
22						
23	Total Liabilities and Owners' Equity	TotLOE1Q	TotLOE2Q	TotLOE3Q	TotLOE4Q	TotLOEX4
24						
25	<u>Balance Sheet calculation check</u>	BSCheck1Q	BSCheck2Q	BSCheck3Q	BSCheck4Q	BSCheckX4
26						
27	<u>Net Working Capital (NWC)</u>					
28	Current assets	CA1Q	CA2Q	CA3Q	CA4Q	CAX4
29	- Current liabilities	CL1Q	CL2Q	CL3Q	CL4Q	CLX4
30	= Net working capital	NWC1Q	NWC2Q	NWC3Q	NWC4Q	NWCX4
31						
32	Beginning NWC	BegNWC1Q	BegNWC2Q	BegNWC3Q	BegNWC4Q	BegNWCX4
33	- Ending NWC	EndNWC1Q	EndNWC2Q	EndNWC3Q	EndNWC4Q	EndNWCX4
34	= Change in NWC	ChgNWC1Q	ChgNWC2Q	ChgNWC3Q	ChgNWC4Q	ChgNWCX4
35						

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

Fig9.13 - Microsoft Excel

This screenshot shows a Microsoft Excel spreadsheet titled "Fig9.13 - Microsoft Excel". The spreadsheet includes a section labeled "DASHBOARD" with a question "Is the Balance Sheet balanced?". Below this, there is a formula "Sum total of Balance Sheet differences". To the right of the formula, there is a dropdown menu with options "Yes" and "\$".

	A	B	C	D	E	F	G	H
1					Period			
2		1Q X4	2Q X4	3Q X4	4Q X4	X4		
111								
112								
113								
114	DASHBOARD							
115	Is the Balance Sheet balanced?							
116	Sum total of Balance Sheet differences							
117								
							Yes	
							\$	

FIGURE 9.13 Dashboard

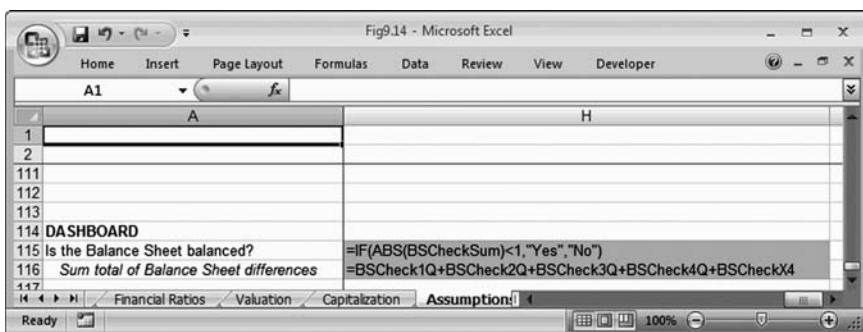


FIGURE 9.14 Alternative View of the Assumptions and Dashboard Worksheet

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

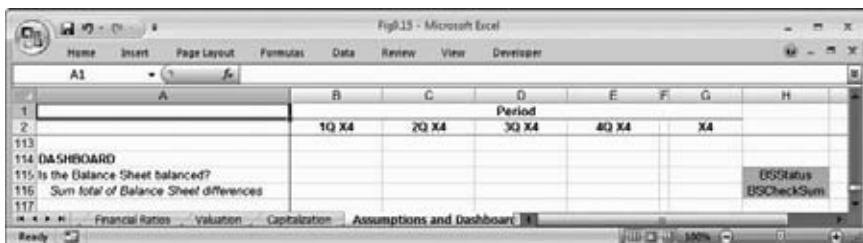


FIGURE 9.15 Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet

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.

Fig9.16 - Microsoft Excel

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
1							
2							
3	<u>Cash Flows from Operating Activities</u>						
4	Net Income	134,737	330,915	425,843	685,328		1,576,822
5	Adjustments to reconcile net income to cash						
6	provided from operating activities						
7	Depreciation	2,313	4,625	6,938	9,250		23,125
8	(Increase) decrease in Accounts Receivable	(133,333)	(58,667)	(65,600)	(78,400)		(336,000)
9	(Increase) decrease in Inventory	(64,667)	(18,400)	(19,600)	-		(102,667)
10	Increase (decrease) in Accounts Payable	88,222	14,911	28,000	22,867		154,000
11	Increase (decrease) in Loan Payable		50,000	(50,000)	-		-
12	Cash provided (used) by operating activities	27,272	323,384	325,580	639,044		1,315,280
13							
14							
15	<u>Cash Flows from Investing Activities</u>						
16	Purchase of capital assets	(45,000)	(45,000)	(45,000)	(45,000)		(180,000)
17	Cash provided (used) by investing activities	(45,000)	(45,000)	(45,000)	(45,000)		(180,000)
18							
19							
20	<u>Cash Flows from Financing Activities</u>						
21	Proceeds from sale of Common Stock	1,000,000	-	-	-		1,000,000
22	Cash provided (used) by financing activities	1,000,000	-	-	-		1,000,000
23							
24							
25	Net increase (decrease) in cash	982,272	278,384	280,580	594,044		2,135,280
26	Cash, beginning of period	-	982,272	1,260,656	1,541,236		-
27	Cash, end of period	982,272	1,260,656	1,541,236	2,135,280		2,135,280
28							
29	<u>Cash Flows calculation check</u>	-	-	-	-		-
30							
31	<u>Changes in Balance Sheet Accounts</u>						
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							

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)).

	B1	C1
1		
2	Cash Flows from Operating Activities	1Q X4
3	Net Income	=NetIncomeQ
4	Adjustments to reconcile net income to cash provided from operating activities	
5	Depreciation	=OdgP10
6	(Increase) decrease in Accounts Receivable	=OdgP20
7	(Increase) decrease in Inventory	=OdgP30
8	Increase (decrease) in Accounts Payable	=OdgP40
9	Increase (decrease) in Loan Payable	=OdgP50
10	Cash provided (used) by operating activities	=NetIncomeQ+OdgP10+OdgP20+OdgP30+OdgP40+OdgP50
11		
12		
13		
14		
15	Cash Flows from Investing Activities	
16	Purchase of capital assets	=CAPEXQ
17	Cash provided (used) by investing activities	=CAPEXQ
18		
19		
20	Cash Flows from Financing Activities	
21	Proceeds from sale of Common Stock	=CshS10
22	Cash provided (used) by financing activities	=CshS10
23		
24		
25	Net increase (decrease) in cash	=NetChangeInCashQ=CashInX4-CashOutX4
26	Cash, beginning of period	=CashOP10
27	Cash, end of period	=CashOP20=CashOP10+NetChangeInCashQ
28		
29	Cash Flow calculation check	=NetChangeInCashQ+CashOP20
30		
31	Changes in Balance Sheet Accounts	
32	Accounts Receivable beginning value	=OdgA10
33	Accounts Receivable ending value	=OdgA20
34	(Increase) decrease in Accounts Receivable	=OdgA20-OdgA10
35		
36	Inventory beginning value	=OdgI10
37	Inventory ending value	=OdgI20
38	(Increase) decrease in Inventory	=OdgI20-OdgI10
39		
40		

FIGURE 9.17 Alternative View of the Statement of Cash Flows

	B1	C1	D1	E1	F1	G1
1			Period			
2		1Q X4	2Q X4	3Q X4	4Q X4	X4
3	Cash Flows from Operating Activities					
4	Net Income					
5	Adjustments to reconcile net income to cash provided from operating activities					
6	Depreciation					
7	(Increase) decrease in Accounts Receivable					
8	(Increase) decrease in Inventory					
9	Increase (decrease) in Accounts Payable					
10	Increase (decrease) in Loan Payable					
11	Cash provided (used) by operating activities	CashOp10	CashOp20	CashOp30	CashOp40	CashOpX4
12						
13						
14						
15	Cash Flows from Investing Activities					
16	Purchase of capital assets					
17	Cash provided (used) by investing activities	CashInv10	CashInv20	CashInv30	CashInv40	CashInvX4
18						
19						
20	Cash Flows from Financing Activities					
21	Proceeds from sale of Common Stock					
22	Cash provided (used) by financing activities	CashFin10	CashFin20	CashFin30	CashFin40	CashFinX4
23						
24						
25	Net increase (decrease) in cash	OdgCash10	OdgCash20	OdgCash30	OdgCash40	OdgCashX4
26	Cash, beginning of period	CashOP10	CashOP20	CashOP30	CashOP40	CashOPX4
27	Cash, end of period	CashOP10	CashOP20	CashOP30	CashOP40	CashOPX4
28						
29	Cash Flow calculation check	CFCheck10	CFCheck20	CFCheck30	CFCheck40	CFCheckX4
30						
31	Changes in Balance Sheet Accounts					
32	Accounts Receivable beginning value					
33	Accounts Receivable ending value					
34	(Increase) decrease in Accounts Receivable	OdgA10	OdgA20	OdgA30	OdgA40	
35						
36	Inventory beginning value					
37	Inventory ending value					
38	(Increase) decrease in Inventory	OdgI10	OdgI20	OdgI30	OdgI40	
39						
40						

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

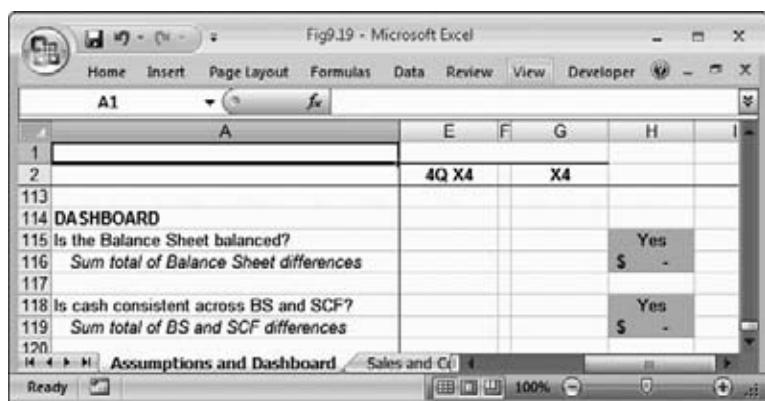


FIGURE 9.19 Dashboard

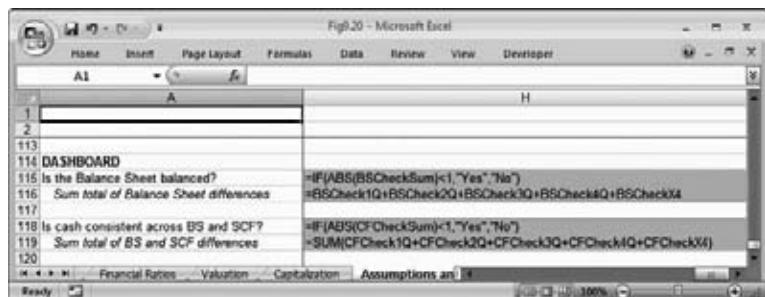


FIGURE 9.20 Alternative View of the Assumptions and Dashboard Worksheet

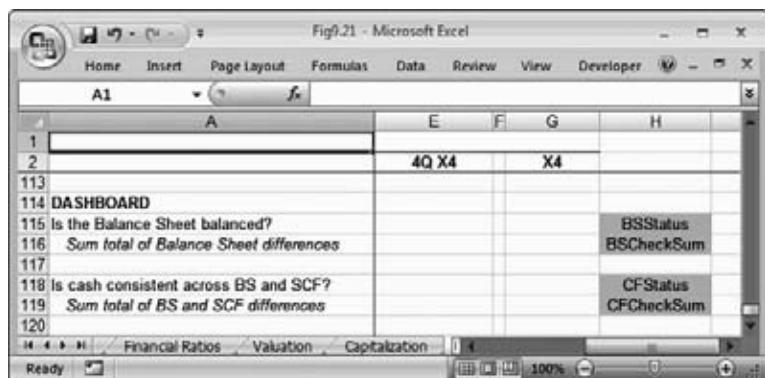


FIGURE 9.21 Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet

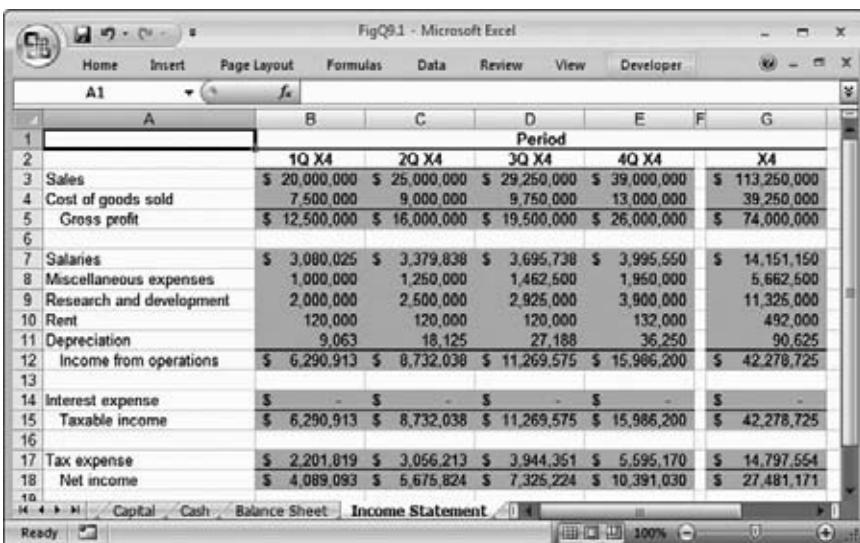
QUESTIONS

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.



The screenshot shows an Excel spreadsheet titled "FigQ9.1 - Microsoft Excel". The ribbon menu includes Home, Insert, Page Layout, Formulas, Data, Review, View, and Developer. The worksheet displays an Income Statement for Company STU for the fiscal year X4, broken down by quarter (1Q X4, 2Q X4, 3Q X4, 4Q X4) and then summarized for the year (X4). The statement includes categories like Sales, Cost of goods sold, Gross profit, Salaries, Miscellaneous expenses, Research and development, Rent, Depreciation, Income from operations, Interest expense, Taxable income, Tax expense, and Net income. The net income for the year is \$27,481,171.

	1Q X4	2Q X4	3Q X4	4Q X4	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	\$ 3,000,025	\$ 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	\$ 3,944,361	\$ 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

	A	B	C	D	E	F	G	
		1Q X4	2Q X4	3Q X4	4Q X4		X4	
Cash Flows from Operating Activities								
4	Net income	4,089,093	5,575,824	7,325,204	10,391,030	27,481,171		
5	Adjustments to reconcile net income to cash provided from operating activities							
6	Depreciation	9,061	18,172	27,188	36,258	90,505		
7	(Increase) decrease in Accounts Receivable	(2,666,567)	(665,567)	(647,917)	(1,327,083)	(5,308,333)		
8	(Increase) decrease in Inventory	(3,000,000)	(250,000)	(1,805,556)	-	(5,055,556)		
9	Increase (decrease) in Accounts Payable	4,083,333	(496,111)	896,605	561,728	5,055,556		
10	Increase (decrease) in Loan Payable	-	-	-	-	-		
11	Cash provided (used) by operating activities	2,514,822	4,291,172	5,795,544	9,661,925	22,263,463		
12								
13								
14								
15	Cash Flows from Investing Activities							
16	Purchase of capital assets	(175,000)	(175,000)	(175,000)	(175,000)	(175,000)		
17	Cash provided (used) by investing activities	(175,000)	(175,000)	(175,000)	(175,000)	(175,000)		
18								
19								
20	Cash Flows from Financing Activities							
21	Proceeds from sale of Common Stock	4,000,000	-	-	-	4,000,000		
22	Cash provided (used) by financing activities	4,000,000	-	-	-	4,000,000		
23								
24								
25	Net increase (decrease) in cash	6,339,822	4,156,172	5,620,544	5,986,325	25,563,463		
26	Cash, beginning of period	-	6,339,822	10,415,994	16,076,538	-		
27	Cash, end of period	6,339,822	10,455,994	16,076,538	25,563,463	25,563,463		
28								
29	Cash Flows calculation check	-	-	-	-	-		
30								
31								
32								

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

	A	B	C	D	E	F	G	
		1Q X4	2Q X4	3Q X4	4Q X4		X4	
Assets								
4	Cash	\$ 6,339,822	\$ 10,455,994	\$ 16,076,538	\$ 25,563,463	\$ 25,563,463		
5	Accounts Receivable	2,666,567	3,333,333	3,981,250	5,308,333	5,308,333		
6	Inventory	3,000,000	3,250,000	5,055,556	5,055,556	5,055,556		
7	Fixed Assets, net	165,938	327,013	470,625	609,375	609,375		
8	Total Assets	\$ 12,172,426	\$ 17,362,140	\$ 25,140,968	\$ 36,536,727	\$ 36,536,727		
9								
10								
11	Liabilities							
12	Accounts Payable	\$ 4,083,333	\$ 3,597,222	\$ 4,493,827	\$ 5,055,556	\$ 5,055,556		
13	Payables from Capital Budget	-	-	-	-	-		
14	Loan Payable	-	-	-	-	-		
15	Total Liabilities	\$ 4,083,333	\$ 3,597,222	\$ 4,493,827	\$ 5,055,556	\$ 5,055,556		
16								
17								
18	Owners' Equity							
19	Common Stock	\$ 4,000,000	\$ 4,000,000	\$ 4,000,000	\$ 4,000,000	\$ 4,000,000		
20	Retained Earnings	4,089,093	9,764,918	17,090,141	27,481,171	27,481,171		
21	Total Owners' Equity	\$ 8,089,093	\$ 13,764,918	\$ 21,090,141	\$ 31,481,171	\$ 31,481,171		
22								
23	Total Liabilities and Owners' Equity	\$ 12,172,426	\$ 17,362,140	\$ 25,140,968	\$ 36,536,727	\$ 36,536,727		
24								
25	Balance Sheet calculation check	-	-	-	-	-		
26								
27	Net Working Capital (NWC)							
28	Current assets	\$ 5,666,967	\$ 6,583,333	\$ 9,036,806	\$ 10,363,889	N/A		
29	- Current liabilities	4,083,333	3,597,222	4,493,827	5,055,556	N/A		
30	= Net working capital	\$ 1,583,333	\$ 2,986,111	\$ 4,542,978	\$ 5,308,333	N/A		
31								
32	Beginning NWC	\$ -	\$ 1,583,333	\$ 2,986,111	\$ 4,542,978	N/A		
33	- Ending NWC	1,583,333	2,986,111	4,542,978	5,308,333	N/A		
34	= Change in NWC	\$ (1,583,333)	\$ (1,402,778)	\$ (1,556,867)	\$ (765,355)	N/A		
35								

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

CHAPTER 10

Sensitivity Analysis

After 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

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

	A	Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
120						
121						
122						
123	Revenues (total sales in dollars)	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000
124						
125	Net Income	\$ 134,737	\$ 130,915	\$ 425,843	\$ 685,326	\$ 1,575,822
126						
127	Free Cash Flows	\$ (17,728)	\$ 228,953	\$ 330,580	\$ 584,044	\$ 1,135,849
128						

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.

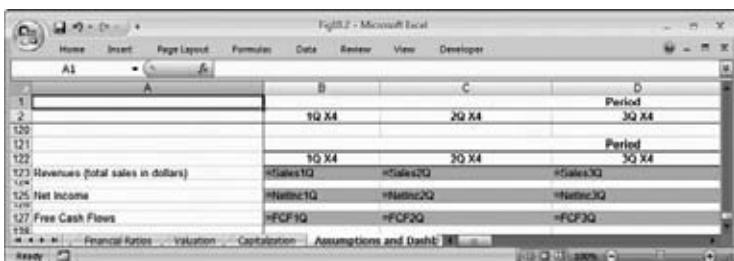


FIGURE 10.2 Alternative View of the Dashboard

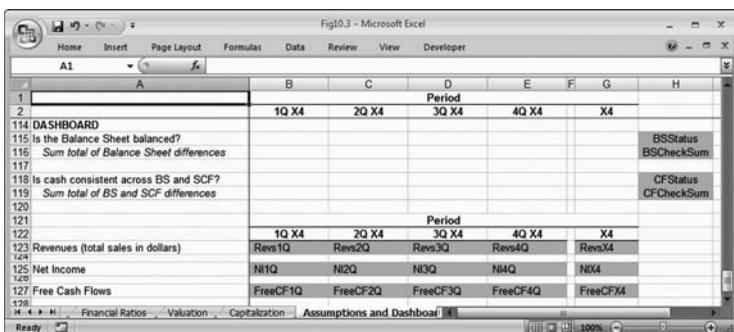


FIGURE 10.3 Names of the Input and Output Cells in the Assumptions and Dashboard Worksheet

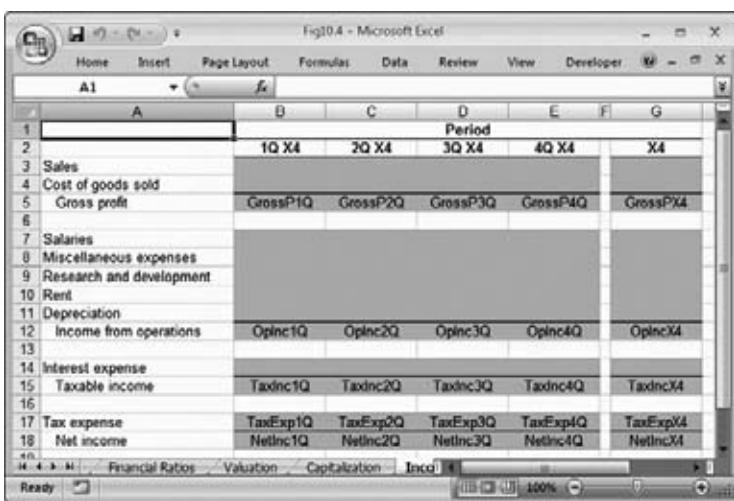


FIGURE 10.4 Names of the Input and Output Cells in the Income Statement

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	EBIT	EBIT1Q	EBIT2Q	EBIT3Q	EBIT4Q	EBITX4	
4							
5	Effective tax rate	EffTaxRt1Q	EffTaxRt2Q	EffTaxRt3Q	EffTaxRt4Q		
6							
7	EBIT * (1 - t)	ATEBIT1Q	ATEBIT2Q	ATEBIT3Q	ATEBIT4Q	ATEBITX4	
8	+ Depreciation						
9	- CAPEX						
10	- Changes in NWC						
11	= Free cash flow	FCF1Q	FCF2Q	FCF3Q	FCF4Q	FCFX4	
12	+ Terminal value						
13	= Total free cash flow						
14							
15	Present value						
16							
17							
18	NPV						
19							
20	WACC						
21	g (to perpetuity)						
22							

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 a Microsoft Excel spreadsheet titled "Fig10.6 - Microsoft Excel". The spreadsheet contains several rows of data and formulas related to financial metrics and a revenues data table. Key visible data includes:

	A	B	C	D	E	F	G	H
		Period						
		1Q X4	2Q X4	3Q X4	4Q X4	X4		
114	DASHBOARD							
115	Is the Balance Sheet balanced?						Yes	
116	Sum total of Balance Sheet differences						\$ -	
117								
118	Is cash consistent across BS and SCF?						Yes	
119	Sum total of BS and SCF differences						\$ -	
120								
121		Period						
122		1Q X4	2Q X4	3Q X4	4Q X4	X4		
123	Revenues (total sales in dollars)	\$ 1,000,000	\$ 1,440,000	\$ 1,832,000	\$ 2,520,000	\$ 6,832,000		
124								
125	Net Income	\$ 134,737	\$ 330,915	\$ 425,843	\$ 685,328	\$ 1,576,822		
126								
127	Free Cash Flows	\$ (17,726)	\$ 228,953	\$ 330,580	\$ 594,044	\$ 1,135,649		
128								
129	Revenues Data Table							
130								
131							Revenues for 1Q X4	
132							\$ 1,000,000	
133							800	
134							900	
135							1,000	
136							1,100	
137							1,200	
138								

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.

Fig10.7 - Microsoft Excel

	A	B	C	D	E	F	G	H
1				Period				
2				1Q X4	2Q X4	3Q X4	4Q X4	X4
114	DASHBOARD							
115	Is the Balance Sheet balanced?							Yes
116	Sum total of Balance Sheet differences							\$ -
117								
118	Is cash consistent across BS and SCF?							Yes
119	Sum total of BS and SCF differences							\$ -
120								
121			Period					
122			1Q X4	2Q X4	3Q X4	4Q X4	X4	
123	Revenues (total sales in dollars)		\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000	
124								
125	Net Income		\$ 134,737	\$ 330,915	\$ 425,843	\$ 685,328	\$ 1,576,822	
126								
127	Free Cash Flows		\$ (17,728)	\$ 228,953	\$ 330,580	\$ 594,044	\$ 1,135,849	
128								
129	Revenues Data Table							
130								
131								
132								
133								
134								
135								
136								
137								
138								
	Assumptions and Dashboard	Sales and Collections	COGS	Invl				
	Ready		Average: 167500	Count: 6	Sum: 1005000			

FIGURE 10.7 Revenues Data Table

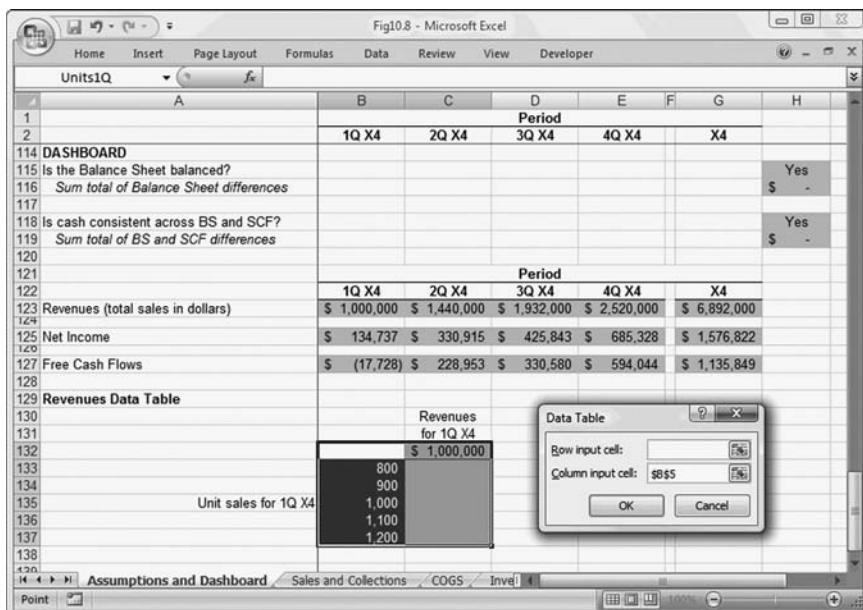


FIGURE 10.8 Data Table Dialog Box and the Assumptions and Dashboard Worksheet

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

The screenshot shows a Microsoft Excel spreadsheet titled "Fig10.9 - Microsoft Excel". The "Assumptions and Dashboard" tab is selected. The data is organized into several sections:

- DASHBOARD:** Contains rows 114 through 120, including questions like "Is the Balance Sheet balanced?" and "Sum total of Balance Sheet differences", with responses like "Yes" and "\$ -".
- Period Headers:** Rows 121 and 122 show headers for "Period" and "X4".
- Financial Data:** Rows 123 through 129 show projected values for Revenues, Net Income, and Free Cash Flows across four quarters.
- Revenues Data Table:** Rows 130 through 138 show a table for Revenues for 1Q X4, with columns for Unit sales and corresponding revenues (\$800, \$900, etc.).

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.

	A	B	C	D
		1Q X4	2Q X4	Period
114	DASHBOARD			3Q X4
115	Is the Balance Sheet balanced?			
116	Sum total of Balance Sheet differences			
117				
118	Is cash consistent across BS and SCF?			
119	Sum total of BS and SCF differences			
120				
121				Period
122	Revenues (total sales in dollars)	=Sales1Q	=Sales2Q	=Sales3Q
123	Net Income	=NetInc1Q	=NetInc2Q	=NetInc3Q
124	Free Cash Flows	=FCF1Q	=FCF2Q	=FCF3Q
125				
126	Revenues Data Table			
127			Revenues for 1Q X4	
128			=Rev1Q	
129		800	=TABLE(B5)	
130		900	=TABLE(B5)	
131	Unit sales for 1Q X4	1000	=TABLE(B5)	
132		1100	=TABLE(B5)	
133		1200	=TABLE(B5)	
134				
135				
136				
137				
138				

FIGURE 10.10 Alternative View of the Revenues Data Table

	A	B	C	D	E	F	G
				Period			
123	Revenues (total sales in dollars)	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000	X4
124	Net Income	\$ 134,737	\$ 330,915	\$ 425,843	\$ 685,328	\$ 1,576,822	
125	Free Cash Flows	\$ (17,728)	\$ 228,953	\$ 330,580	\$ 594,044	\$ 1,135,849	
126							
127	Revenues Data Table			Revenues for 1Q X4			
128				\$ 1,000,000			
129		800	\$ 800,000				
130		900	\$ 900,000				
131	Unit sales for 1Q X4	1,000	\$ 1,000,000				
132		1,100	\$ 1,100,000				
133		1,200	\$ 1,200,000				
134							
135							
136							
137							
138							
139	Net Income Data Table			Net Income for 1Q X4			
140				\$ 134,737			
141							
142							
143							
144							
145	Price per unit for 1Q X4	\$ 1,000					
146							
147							
148							

FIGURE 10.11 Net Income Data Table

	A	B	C	D	E	F	G
1	A1	1Q X4	2Q X4	3Q X4	4Q X4	X4	
129	Revenues Data Table						
130			Revenues				
131			for 1Q X4				
132			\$ 1,000,000				
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				
138							
139	Net Income Data Table						
140			Net Income				
141			for 1Q X4				
142			\$ 134,737				
143		\$ 700	\$ (40,763)				
144		\$ 850	\$ 46,987				
145	Price per unit for 1Q X4	\$ 1,000	\$ 134,737				
146		\$ 1,150	\$ 222,487				
147		\$ 1,300	\$ 310,237				

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.

	A	B	C	D
1		1Q X4	2Q X4	3Q X4
128				Period
129	Revenues Data Table			
130			Revenues	
131			for 1Q X4	
132			=Rev1Q	
133		800	=TABLE(B5)	
134		900	=TABLE(B5)	
135	Unit sales for 1Q X4	1000	=TABLE(B5)	
136		1100	=TABLE(B5)	
137		1200	=TABLE(B5)	
138				
139	Net Income Data Table			
140			Net Income	
141			for 1Q X4	
142			=NIQ	
143		700	=TABLE(B6)	
144		850	=TABLE(B6)	
145	Price per unit for 1Q X4	1000	=TABLE(B6)	
146		1150	=TABLE(B6)	
147		1300	=TABLE(B6)	

FIGURE 10.13 Alternative View of the Net Income Data Table

	A	B	C	D	E	F	G
1		1Q X4	2Q X4	3Q X4	4Q X4	X4	
128	Revenues Data Table						
129			Revenues				
130			for 1Q X4				
131			\$ 1,000,000				
132							
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				
138							
139	Net Income Data Table						
140			Net income				
141			for 1Q X4				
142			\$ 134,737				
143		\$ 700	\$ (40,763)				
144		\$ 850	\$ 46,907				
145	Price per unit for 1Q X4	\$ 1,000	\$ 134,737				
146		\$ 1,150	\$ 222,497				
147		\$ 1,300	\$ 310,237				
148							
149	Free Cash Flow Data Table						
150			Free Cash Flow				
151			for 1Q X4				
152			\$ (17,728)				
153		\$ 65.00					
154		\$ 70.00					
155	Monitor screen: cost per unit for 1Q X4	\$ 75.00					
156		\$ 80.00					
157		\$ 85.00					
158							

FIGURE 10.14 Free Cash Flows Data Table

The screenshot shows a Microsoft Excel spreadsheet titled "Fig10.15 - Microsoft Excel". The spreadsheet contains three distinct data tables:

- Revenues Data Table (Rows 129-138):**

		Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
129	Revenues Data Table					
130						
131						
132						
133						
134						
135						
136						
137						
138						
- Net Income Data Table (Rows 139-148):**

		Net Income for 1Q X4				
139	Net Income Data Table					
140						
141						
142						
143						
144						
145						
146						
147						
148						
149	Free Cash Flow Data Table					
150						
151						
152						
153						
154						
155						
156						
157						
158						
- Free Cash Flow Data Table (Rows 149-158):**

		Free Cash Flow for 1Q X4				
149	Free Cash Flow Data Table					
150						
151						
152						
153						
154						
155						
156						
157						
158						
149	Free Cash Flow Data Table					
150						
151						
152						
153						
154						
155						
156						
157						
158						

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.

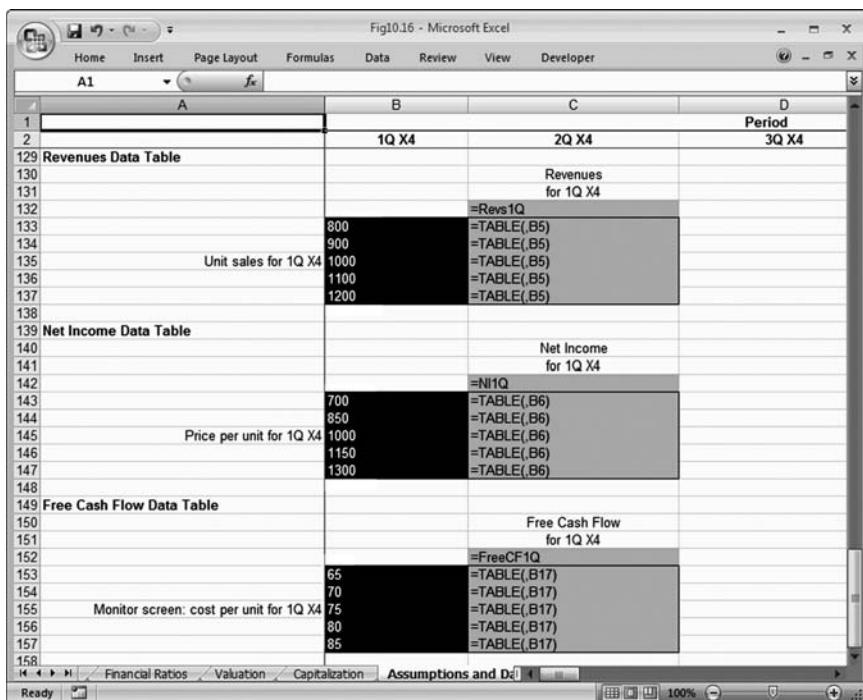


FIGURE 10.16 Alternative View of the Free Cash Flows Data Table

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

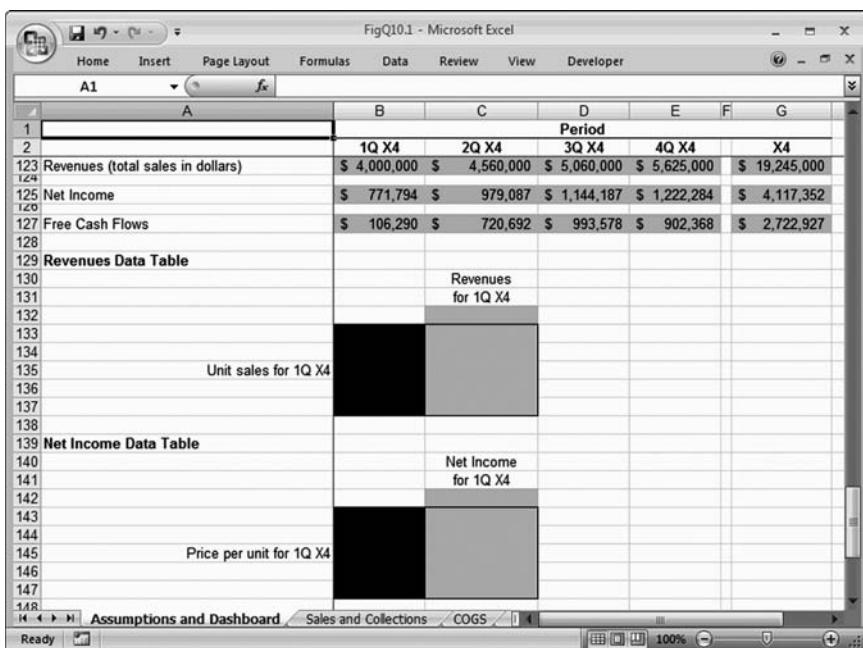


FIGURE Q10.1 Company VWX's Assumptions and Dashboard Worksheet

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

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

CHAPTER 11

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

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.

Fig11.1 – Microsoft Excel						
A1	B	C	D	E	F	G
	Period					
1	1Q X4	2Q X4	3Q X4	4Q X4	X4	
3 Variable Costs						
4 Monitor screen	\$ 75,000	\$ 108,000	\$ 136,500	\$ 168,000	\$ 407,500	
5 Monitor casing	76,000	108,000	136,500	168,000	487,500	
6 Assembly labor	50,000	75,000	100,800	126,000	351,800	
7 Miscellaneous expenses	30,000	43,200	57,960	75,600	206,760	
8 Research and development	70,000	100,800	154,560	201,600	526,960	
9 Total variable costs	\$ 300,000	\$ 435,000	\$ 586,320	\$ 739,200	\$ 2,060,520	
10						
11 Fixed Costs						
12 Salaries						
13 Rent						
14 Depreciation						
15 Total fixed costs						
16						
17 Contribution Margin						
18 Sales						
19 - Variable costs						
20 = Contribution margin						
21 - Fixed costs						
22 Interest expense						
23 - Taxes						
24 = Net income						
25						

FIGURE 11.1 Contribution Margin Worksheet with Variable Costs Identified

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Variable Costs						
4	Monitor screen	=Screen1Q	=Screen2Q	=Screen3Q	=Screen4Q	=ScreenX4	
5	Monitor casing	=Casing1Q	=Casing2Q	=Casing3Q	=Casing4Q	=CasingX4	
6	Assembly labor	=Labor1Q	=Labor2Q	=Labor3Q	=Labor4Q	=LaborX4	
7	Miscellaneous expenses	=MiscExp1Q	=MiscExp2Q	=MiscExp3Q	=MiscExp4Q	=MiscExpX4	
8	Research and development	=RDExp1Q	=RDExp2Q	=RDExp3Q	=RDExp4Q	=RDExpX4	
9	Total variable costs	=SUM(B4:B8)	=SUM(C4:C8)	=SUM(D4:D8)	=SUM(E4:E8)	=SUM(F4:F8)	
10							
11	Fixed Costs						
12	Salaries						
13	Rent						
14	Depreciation						
15	Total fixed costs						
16							
17	Contribution Margin						
18	Sales						
19	- Variable costs						
20	= Contribution margin						
21	- Fixed costs						
22	- Interest expense						
23	- Taxes						
24	= Net income						
25							

FIGURE 11.2 Alternative View of the Contribution Margin Worksheet

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Variable Costs						
4	Monitor screen						
5	Monitor casing						
6	Assembly labor						
7	Miscellaneous expenses						
8	Research and development						
9	Total variable costs	VarCosts1Q	VarCosts2Q	VarCosts3Q	VarCosts4Q	VarCostsX4	
10							
11	Fixed Costs						
12	Salaries						
13	Rent						
14	Depreciation						
15	Total fixed costs						
16							
17	Contribution Margin						
18	Sales						
19	- Variable costs						
20	= Contribution margin						
21	- Fixed costs						
22	- Interest expense						
23	- Taxes						
24	= Net income						
25							

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

Fig11.4 - Microsoft Excel

	A	B	C	D	E	F	G
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Variable Costs						
4	Monitor screen	\$ 75,000	\$ 108,000	\$ 136,500	\$ 168,000	\$ 487,500	
5	Monitor casing	75,000	108,000	136,500	168,000	487,500	
6	Assembly labor	50,000	75,000	100,800	126,000	351,800	
7	Miscellaneous expenses	30,000	43,200	57,960	75,600	206,760	
8	Research and development	70,000	100,800	154,560	201,600	526,960	
9	Total variable costs	\$ 300,000	\$ 435,000	\$ 586,320	\$ 739,200	\$ 2,060,520	
10							
11	Fixed Costs						
12	Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200	\$ 2,301,600	
13	Rent	20,000	20,000	20,000	20,000	80,000	
14	Depreciation	2,313	4,625	6,938	9,250	23,125	
15	Total fixed costs	\$ 492,713	\$ 495,025	\$ 690,538	\$ 726,450	\$ 2,404,725	
16							
17	Contribution Margin						
18	Sales						
19	- Variable costs						
20	= Contribution margin						
21	- Fixed costs						
22	- Interest expense						
23	- Taxes						
24	= Net income						
25							

FIGURE 11.4 Contribution Margin Worksheet with Fixed Costs Identified

Fig11.5 - Microsoft Excel

	A	B	C	D	E	F	G
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Variable Costs						
4	Monitor screen	=Screen1Q	=Screen2Q	=Screen3Q	=Screen4Q	=ScreenX4	
5	Monitor casing	=Casing1Q	=Casing2Q	=Casing3Q	=Casing4Q	=CasingX4	
6	Assembly labor	=Labor1Q	=Labor2Q	=Labor3Q	=Labor4Q	=LaborX4	
7	Miscellaneous expenses	=MiscExp1Q	=MiscExp2Q	=MiscExp3Q	=MiscExp4Q	=MiscExpX4	
8	Research and development	=RDExp1Q	=RDExp2Q	=RDExp3Q	=RDExp4Q	=RDExpX4	
9	Total variable costs	=SUM(B4:B8)	=SUM(C4:C8)	=SUM(D4:D8)	=SUM(E4:E8)	=SUM(G4:G8)	
10							
11	Fixed Costs						
12	Salaries	=SalExp1Q	=SalExp2Q	=SalExp3Q	=SalExp4Q	=SalExpX4	
13	Rent	=RentExp1Q	=RentExp2Q	=RentExp3Q	=RentExp4Q	=RentExpX4	
14	Depreciation	=Dep1Q	=Dep2Q	=Dep3Q	=Dep4Q	=DepX4	
15	Total fixed costs	=SUM(B12:B14)	=SUM(C12:C14)	=SUM(D12:D14)	=SUM(E12:E14)	=SUM(G12:G14)	
16							
17	Contribution Margin						
18	Sales						
19	- Variable costs						
20	= Contribution margin						
21	- Fixed costs						
22	- Interest expense						
23	- Taxes						
24	= Net income						
25							

FIGURE 11.5 Alternative View of the Contribution Margin Worksheet

	A	B	C	D	E	F	G
		Period					
1	A1	1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Variable Costs						
4	Monitor screen						
5	Monitor casing						
6	Assembly labor						
7	Miscellaneous expenses						
8	Research and development						
9	Total variable costs	VarCosts1Q	VarCosts2Q	VarCosts3Q	VarCosts4Q	VarCostsX4	
10							
11	Fixed Costs						
12	Salaries						
13	Rent						
14	Depreciation						
15	Total fixed costs	FixCosts1Q	FixCosts2Q	FixCosts3Q	FixCosts4Q	FixCostsX4	
16							
17	Contribution Margin						
18	Sales						
19	- Variable costs						
20	= Contribution margin						
21	- Fixed costs						
22	- Interest expense						
23	- Taxes						
24	= Net income						
25							

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.

Fig11.7 - Microsoft Excel

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3 Variable Costs							
4 Monitor screen	\$ 75,000	\$ 108,000	\$ 136,500	\$ 168,000	\$ 487,500		
5 Monitor casing	75,000	108,000	136,500	168,000	487,500		
6 Assembly labor	50,000	75,000	100,800	126,000	351,800		
7 Miscellaneous expenses	30,000	43,200	57,960	75,600	206,760		
8 Research and development	70,000	100,800	154,560	201,600	526,960		
9 Total variable costs	\$ 300,000	\$ 435,000	\$ 586,320	\$ 739,200	\$ 2,060,520		
10							
11 Fixed Costs							
12 Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200	\$ 2,301,600		
13 Rent	20,000	20,000	20,000	20,000	80,000		
14 Depreciation	2,313	4,625	6,938	9,250	23,125		
15 Total fixed costs	\$ 492,713	\$ 495,025	\$ 690,538	\$ 726,450	\$ 2,404,725		
16							
17 Contribution Margin							
18 Sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000		
19 - Variable costs	300,000	435,000	586,320	739,200	2,060,520		
20 = Contribution margin	\$ 700,000	\$ 1,005,000	\$ 1,345,680	\$ 1,780,800	\$ 4,831,480		
21 - Fixed costs							
22 - Interest expense							
23 - Taxes							
24 = Net income							
25							

FIGURE 11.7 Calculation of the Contribution Margin

Fig11.8 - Microsoft Excel

	A	B	C	D	E	F	G
1		1Q X4	2Q X4	3Q X4	4Q X4		
2							
3 Variable Costs							
4 Monitor screen	=Screen1Q	=Screen2Q	=Screen3Q	=Screen4Q	=ScreenX4		
5 Monitor casing	=Casing1Q	=Casing2Q	=Casing3Q	=Casing4Q	=CasingX4		
6 Assembly labor	=Labor1Q	=Labor2Q	=Labor3Q	=Labor4Q	=LaborX4		
7 Miscellaneous expenses	=Misc1Exp1Q	=Misc1Exp2Q	=Misc1Exp3Q	=Misc1Exp4Q	=Misc1ExpX4		
8 Research and development	=R&DExp1Q	=R&DExp2Q	=R&DExp3Q	=R&DExp4Q	=R&DExpX4		
9 Total variable costs	=SUM(B4:B9)	=SUM(C4:C9)	=SUM(D4:D9)	=SUM(E4:E9)	=SUM(F4:F9)		
10							
11 Fixed Costs							
12 Salaries	=SalExp1Q	=SalExp2Q	=SalExp3Q	=SalExp4Q	=SalExpX4		
13 Rent	=RentExp1Q	=RentExp2Q	=RentExp3Q	=RentExp4Q	=RentExpX4		
14 Depreciation	=Dep1Q	=Dep2Q	=Dep3Q	=Dep4Q	=DepX4		
15 Total fixed costs	=SUM(B12:B14)	=SUM(C12:C14)	=SUM(D12:D14)	=SUM(E12:E14)	=SUM(F12:F14)		
16							
17 Contribution Margin							
18 Sales	=Sales1Q	=Sales2Q	=Sales3Q	=Sales4Q	=SalesX4		
19 - Variable costs	=VarCosts1Q	=VarCosts2Q	=VarCosts3Q	=VarCosts4Q	=VarCostsX4		
20 = Contribution margin	=Sales1Q-VarCosts1Q	=Sales2Q-VarCosts2Q	=Sales3Q-VarCosts3Q	=Sales4Q-VarCosts4Q	=SalesX4-VarCostsX4		
21 - Fixed costs							
22 - Interest expense							
23 - Taxes							
24 = Net income							
25							

FIGURE 11.8 Alternative View of the Calculation of the Contribution Margin

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Variable Costs						
4	Monitor screen						
5	Monitor casing						
6	Assembly labor						
7	Miscellaneous expenses						
8	Research and development						
9	Total variable costs	VarCosts1Q	VarCosts2Q	VarCosts3Q	VarCosts4Q	VarCostsX4	
10							
11	Fixed Costs						
12	Salaries						
13	Rent						
14	Depreciation						
15	Total fixed costs	FixCosts1Q	FixCosts2Q	FixCosts3Q	FixCosts4Q	FixCostsX4	
16							
17	Contribution Margin						
18	Sales						
19	- Variable costs	CM1Q	CM2Q	CM3Q	CM4Q	CMX4	
20	= Contribution margin						
21	- Fixed costs						
22	- Interest expense						
23	- Taxes						
24	= Net income						
25							

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.

Fig11.10 - Microsoft Excel

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3 Variable Costs							
4 Monitor screen	\$ 75,000	\$ 108,000	\$ 136,500	\$ 168,000	\$ 487,500		
5 Monitor casing	75,000	108,000	136,500	168,000			487,500
6 Assembly labor	50,000	75,000	100,800	126,000			351,800
7 Miscellaneous expenses	30,000	43,200	57,960	75,600			206,760
8 Research and development	70,000	100,800	154,560	201,600			526,960
9 Total variable costs	\$ 300,000	\$ 435,000	\$ 586,320	\$ 739,200			\$ 2,060,520
10							
11 Fixed Costs							
12 Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200	\$ 2,301,600		
13 Rent	20,000	20,000	20,000	20,000			80,000
14 Depreciation	2,313	4,625	6,938	9,250			23,125
15 Total fixed costs	\$ 492,713	\$ 495,025	\$ 690,538	\$ 726,450			\$ 2,404,725
16							
17 Contribution Margin							
18 Sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000		
19 - Variable costs	300,000	435,000	586,320	739,200			2,060,520
20 = Contribution margin	\$ 700,000	\$ 1,005,000	\$ 1,345,680	\$ 1,780,800	\$ 4,831,480		
21 - Fixed costs	492,713	495,025	690,538	726,450			2,404,725
22 - Interest expense	-	875	-	-			875
23 - Taxes	72,551	178,105	229,300	369,023			849,058
24 = Net income	\$ 134,737	\$ 330,915	\$ 425,843	\$ 685,328			\$ 1,576,822
25							

Income Statement Cash Flows Free Cash Flows

Ready

FIGURE 11.10 Reconciliation of Contribution Margin with Net Income

Fig11.11 - Microsoft Excel

	A	B	C
		1Q X4	2Q X4
3 Variable Costs			
4 Monitor screen	=Screen1Q		=Screen2Q
5 Monitor casing	=Casing1Q		=Casing2Q
6 Assembly labor	=Labor1Q		=Labor2Q
7 Miscellaneous expenses	=MiscExp1Q		=MiscExp2Q
8 Research and development	=RDExp1Q		=RDExp2Q
9 Total variable costs	=SUM(B4:B8)		=SUM(C4:C8)
10			
11 Fixed Costs			
12 Salaries	=SalExp1Q		=SalExp2Q
13 Rent	=RentExp1Q		=RentExp2Q
14 Depreciation	=Dep1Q		=Dep2Q
15 Total fixed costs	=SUM(B12:B14)		=SUM(C12:C14)
16			
17 Contribution Margin			
18 Sales	=Sales1Q		=Sales2Q
19 - Variable costs	=VarCosts1Q		=VarCosts2Q
20 = Contribution margin	=Sales1Q-VarCosts1Q		=Sales2Q-VarCosts2Q
21 - Fixed costs	=FixCosts1Q		=FixCosts2Q
22 - Interest expense	=IntExp1Q		=IntExp2Q
23 - Taxes	=TaxExp1Q		=TaxExp2Q
24 = Net income	=CM1Q-FixCosts1Q+IntExp1Q-TaxExp1Q		=CM2Q-FixCosts2Q+IntExp2Q-TaxExp2Q
25			

Financial Ratios Valuation Capitalization Contribution

Ready

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.

	B	C	D	E	F	G
	1Q X4	2Q X4	3Q X4	4Q X4		X4
Variable Costs						
4 Monitor screen	\$ 75,000	\$ 108,000	\$ 136,500	\$ 168,000	\$ 487,500	
5 Monitor casing	75,000	108,000	136,500	168,000	487,500	
6 Assembly labor	50,000	75,000	100,800	126,000	381,800	
7 Miscellaneous expenses	30,000	43,200	57,960	75,600	206,760	
8 Research and development	70,000	100,800	154,560	201,600	526,960	
9 Total variable costs	\$ 300,000	\$ 435,000	\$ 586,320	\$ 739,200	\$ 2,060,520	
Fixed Costs						
12 Salaries	\$ 470,400	\$ 470,400	\$ 663,600	\$ 697,200	\$ 2,301,600	
13 Rent	20,000	20,000	20,000	20,000	80,000	
14 Depreciation	2,313	4,625	6,938	9,250	23,125	
15 Total fixed costs	\$ 492,713	\$ 495,025	\$ 690,538	\$ 726,450	\$ 2,404,725	
Contribution Margin						
18 Sales	\$ 1,000,000	\$ 1,440,000	\$ 1,932,000	\$ 2,520,000	\$ 6,892,000	
19 - Variable costs	300,000	435,000	586,320	739,200	2,060,520	
20 = Contribution margin	\$ 700,000	\$ 1,005,000	\$ 1,345,680	\$ 1,780,800	\$ 4,831,480	
21 - Fixed costs	492,713	495,025	690,538	726,450	2,404,725	
22 - Interest expense	-	875	-	-	875	
23 - Taxes	72,551	178,185	229,300	369,023	849,058	
24 = Net income	\$ 134,737	\$ 330,915	\$ 426,843	\$ 685,328	\$ 1,576,822	
Operating Leverage						
27 Fixed costs	\$ 492,713	\$ 495,025	\$ 690,538	\$ 726,450	\$ 2,404,725	
28 Total costs (fixed + variable)	\$ 792,713	\$ 930,025	\$ 1,276,858	\$ 1,465,650	\$ 4,465,245	
29 Operating leverage	62.2%	53.2%	54.1%	49.6%	53.9%	

FIGURE 11.12 Calculation of Operating Leverage

Fig11.13 - Microsoft Excel		
	A	B
1		
2		1Q X4
3	Variable Costs	
4	Monitor screen	=Screen1Q
5	Monitor casing	=Casing1Q
6	Assembly labor	=Labor1Q
7	Miscellaneous expenses	=MiscExp1Q
8	Research and development	=RDExp1Q
9	Total variable costs	=SUM(B4:B8)
10		=SUM(C4:C8)
11	Fixed Costs	
12	Salaries	=SalExp1Q
13	Rent	=RentExp1Q
14	Depreciation	=Dep1Q
15	Total fixed costs	=SUM(B12:B14)
16		=SUM(C12,C14)
17	Contribution Margin	
18	Sales	=Sales1Q
19	- Variable costs	=VarCosts1Q
20	= Contribution margin	=Sales1Q-VarCosts1Q
21	Fixed costs	=FixCosts1Q
22	- Interest expense	=IntExp1Q
23	- Taxes	=TaxExp1Q
24	= Net income	=CM1Q-FixCosts1Q+IntExp1Q-TaxExp1Q
25		=CM1Q-FixCosts2Q+IntExp2Q-TaxExp2Q
26	Operating Leverage	
27	Fixed costs	=FixCosts1Q
28	Total costs (fixed + variable)	=FixCosts1Q+VarCosts1Q
29		=FixCosts2Q+VarCosts2Q
30	Operating leverage	=FixCosts1Q/TotCosts1Q
31		=FixCosts2Q/TotCosts2Q

FIGURE 11.13 Alternative View of the Calculation of Operating Leverage

Fig11.14 - Microsoft Excel							
	A	B	C	D	E	F	G
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	Variable Costs						
4	Monitor screen						
5	Monitor casing						
6	Assembly labor						
7	Miscellaneous expenses						
8	Research and development						
9	Total variable costs	VarCosts1Q	VarCosts2Q	VarCosts3Q	VarCosts4Q	VarCostsX4	
10							
11	Fixed Costs						
12	Salaries						
13	Rent						
14	Depreciation						
15	Total fixed costs	FixCosts1Q	FixCosts2Q	FixCosts3Q	FixCosts4Q	FixCostsX4	
16							
17	Contribution Margin						
18	Sales						
19	- Variable costs						
20	= Contribution margin	CM1Q	CM2Q	CM3Q	CM4Q	CMX4	
21	- Fixed costs						
22	- Interest expense						
23	- Taxes						
24	= Net income						
25							
26	Operating Leverage						
27	Fixed costs						
28	Total costs (fixed + variable)	TotCosts1Q	TotCosts2Q	TotCosts3Q	TotCosts4Q	TotCostsX4	
29							
30	Operating leverage	OpLev1Q	OpLev2Q	OpLev3Q	OpLev4Q	OpLevX4	
31							

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

BREAK EVEN 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: (total fixed costs)/(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.

The screenshot shows a Microsoft Excel spreadsheet titled "Fig11.15 - Microsoft Excel". The spreadsheet contains data for the calculation of breakeven points across four quarters (1Q X4, 2Q X4, 3Q X4, 4Q X4, X4). The data is organized into columns A through G. Row 1 contains column headers A1 through G1. Row 2 contains the header "Period" above the quarter labels. Rows 32 through 44 contain specific data entries, some of which are formulas. The formulas used include \$1,000.00, \$960.00, \$920.00, \$900.00, 300, 290, 279, 264, 700.00, 670.00, 640.80, 636.00, \$492,713, \$495,025, \$690,538, \$726,450, 704, 739, 1,078, 1,142, and =CONTRIBUTION.MARGIN.PER.UNIT. The "Income Statement" tab is selected at the bottom of the screen.

A	B	C	D	E	F	G
	1Q X4	2Q X4	3Q X4	4Q X4	X4	
Breakeven Point in Units						
Contribution Margin per Unit						
34 Price per unit	\$ 1,000.00	\$ 960.00	\$ 920.00	\$ 900.00		
35 - Variable costs per unit	300	290	279	264		
36 = Contribution margin per unit	\$ 700.00	\$ 670.00	\$ 640.80	\$ 636.00		
37						
38 Fixed costs	\$ 492,713	\$ 495,025	\$ 690,538	\$ 726,450		
39						
40 Breakeven point in units	704	739	1,078	1,142		
41						

FIGURE 11.15 Calculation of the Breakeven Point in Units

	A1	B	C
1	A	B	C
2		1Q X4	2Q X4
32	Breakeven Point in Units		
33	Contribution Margin per Unit		
34	Price per unit	=Price1Q	=Price2Q
35	- Variable costs per unit	=VarCosts1Q/Units1Q	=VarCosts2Q/Units2Q
36	= Contribution margin per unit	=Price1Q-VCperUnit1Q	=Price2Q-VCperUnit2Q
37			
38	Fixed costs	=FixCosts1Q	=FixCosts2Q
39			
40	Breakeven point in units	=FixCosts1Q/CMPU1Q	=FixCosts2Q/CMPU2Q
41			

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

	A1	B	C	D	E	F	G
1	A	B	C	D	Period	E	F
2		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	Variable Costs						
4	Monitor screen						
5	Monitor casing						
6	Assembly labor						
7	Miscellaneous expenses						
8	Research and development						
9	Total variable costs	VarCosts1Q	VarCosts2Q	VarCosts3Q	VarCosts4Q	VarCostsX4	
10							
11	Fixed Costs						
12	Salaries						
13	Rent						
14	Depreciation						
15	Total fixed costs	FixCosts1Q	FixCosts2Q	FixCosts3Q	FixCosts4Q	FixCostsX4	
16							
17	Contribution Margin						
18	Sales						
19	- Variable costs	CM1Q	CM2Q	CM3Q	CM4Q	CMX4	
20	= Contribution margin						
21	- Fixed costs						
22	- Interest expense						
23	- Taxes						
24	= Net income						
25							
26	Operating Leverage						
27	Fixed costs	TotCosts1Q	TotCosts2Q	TotCosts3Q	TotCosts4Q	TotCostsX4	
28	Total costs (fixed + variable)	OpLev1Q	OpLev2Q	OpLev3Q	OpLev4Q	OpLevX4	
29							
30	Operating leverage						
31							
32	Breakeven Point in Units						
33	Contribution Margin per Unit						
34	Price per unit	VCperUnit1Q	VCperUnit2Q	VCperUnit3Q	VCperUnit4Q		
35	- Variable costs per unit	CMPU1Q	CMPU2Q	CMPU3Q	CMPU4Q		
36	= Contribution margin per unit						
37							
38	Fixed costs						
39							
40	Breakeven point in units						
41							

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

BREAK-EVEN 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.

Fig11.18 - Microsoft Excel					
A1	B	C	D	E	F
1	B	C	D	E	G
Period					
2	1Q X4	2Q X4	3Q X4	4Q X4	X4
32	Break-even Point in Units				
33	Contribution Margin per Unit				
34	Price per unit	\$ 1,000.00	\$ 960.00	\$ 920.00	\$ 900.00
35	- Variable costs per unit	300	290	279	264
36	= Contribution margin per unit	\$ 700.00	\$ 670.00	\$ 640.80	\$ 636.00
37					
38	Fixed costs	\$ 492,713	\$ 495,025	\$ 690,538	\$ 726,450
39					
40	Break-even point in units	704	739	1,078	1,142
41					
42	Break-even Point in Dollars				
43	Break-even point in units	704	739	1,078	1,142
44	* Price per unit	\$ 1,000	\$ 960	\$ 920	\$ 900
45	= Break-even point in dollars	\$ 703,875	\$ 709,290	\$ 991,408	\$ 1,027,995
46					

FIGURE 11.18 Calculation of the Breakeven Point in Dollars of Revenue

	A1	B	C
1			
2		1Q X4	2Q X4
28	Total costs (fixed + variable)	=FixCosts1Q+VarCosts1Q	=FixCosts2Q+VarCosts2Q
29	Operating leverage	=FixCosts1Q/TotCosts1Q	=FixCosts2Q/TotCosts2Q
31			
32	Breakeven Point in Units		
33	Contribution Margin per Unit		
34	Price per unit	=Price1Q	=Price2Q
35	- Variable costs per unit	=VarCosts1Q/Units1Q	=VarCosts2Q/Units2Q
36	= Contribution margin per unit	=Price1Q-VCperUnit1Q	=Price2Q-VCperUnit2Q
37			
38	Fixed costs	=FixCosts1Q	=FixCosts2Q
39			
40	Break-even point in units	=FixCosts1Q/CMPerUnit1Q	=FixCosts2Q/CMPerUnit2Q
41			
42	Break-even Point in Dollars		
43	Break-even point in units	=BEU1Q	=BEU2Q
44	* Price per unit	=Price1Q	=Price2Q
45	= Break-even point in dollars	=BEU1Q*Price1Q	=BEU2Q*Price2Q
46			

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

	A1	B	C	D	E	F	G
1				Period			
2			1Q X4	2Q X4	3Q X4	4Q X4	X4
17	Contribution Margin						
18	Sales						
19	- Variable costs						
20	= Contribution margin	CM1Q	CM2Q	CM3Q	CM4Q	CMX4	
21	- Fixed costs						
22	- Interest expense						
23	- Taxes						
24	= Net income						
25							
26	Operating Leverage						
27	Fixed costs						
28	Total costs (fixed + variable)	TotCosts1Q	TotCosts2Q	TotCosts3Q	TotCosts4Q	TotCostsX4	
29	Operating leverage	OplLev1Q	OplLev2Q	OplLev3Q	OplLev4Q	OplLevX4	
31							
32	Break-even Point in Units						
33	Contribution Margin per Unit						
34	Price per unit						
35	- Variable costs per unit	VCperUnit1Q	VCperUnit2Q	VCperUnit3Q	VCperUnit4Q		
36	= Contribution margin per unit	CMPerUnit1Q	CMPerUnit2Q	CMPerUnit3Q	CMPerUnit4Q		
37							
38	Fixed costs						
39							
40	Break-even point in units	BEU1Q	BEU2Q	BEU3Q	BEU4Q		
41							
42	Break-even Point in Dollars						
43	Break-even point in units						
44	* Price per unit						
45	= Break-even point in dollars	BED1Q	BED2Q	BED3Q	BED4Q		
46							

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

	A	B	C	D	Period								
					1Q X4	2Q X4	3Q X4	4Q X4	X4				
COST-OF-GOODS SOLD BUDGET													
Cost-of-Goods Sold Budget													
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

FigQ11.2 - Microsoft Excel

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4	X4	
2							
3	OPERATING EXPENSES BUDGET						
4	<i>Operating Expenses Budget</i>						
5	Salaries	\$ 447,063	\$ 461,438	\$ 526,125	\$ 526,125	\$ 1,960,750	
6	Miscellaneous expenses	20,000	30,000	39,900	51,520	141,420	
7	Research and development	25,000	37,500	49,875	64,400	176,775	
8	Rent	18,000	18,000	18,000	18,000	72,000	
9	Depreciation	1,375	3,000	4,575	5,950	14,900	
10	Total operating expenses	\$ 511,438	\$ 549,938	\$ 638,475	\$ 665,995	\$ 2,365,845	
11							
12	DISBURSEMENTS FOR OPERATING EXPENSES BUDGET						
13	<i>Disbursements for Operating Expenses Budget</i>						
14	Salaries	\$ 447,063	\$ 461,438	\$ 526,125	\$ 526,125	\$ 1,960,750	
15	Miscellaneous expenses	20,000	30,000	39,900	51,520	141,420	
16	Research and development	25,000	37,500	49,875	64,400	176,775	
17	Rent	18,000	18,000	18,000	18,000	72,000	
18	Depreciation	-	-	-	-	-	
19	Total disbursements for operating expenses	\$ 510,063	\$ 546,938	\$ 633,900	\$ 660,045	\$ 2,350,945	
20							

Operating Expenses Capital Cash Balance Sheet Income Stmt

FIGURE Q11.2 Company 123's Operating Expenses Budget

FigQ11.3 - Microsoft Excel

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	HEADCOUNT BUDGET						
4	<i>Headcount Budget</i>						
5	Periodic salary expense (base)						
6	Chief Executive Officer	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 180,000	
7	Chief Financial Officer	41,250	41,250	41,250	41,250	165,000	
8	VP, Engineering	40,000	40,000	40,000	40,000	160,000	
9	VP, Sales & Marketing	35,000	35,000	35,000	35,000	140,000	
10	VP, Business Development	30,000	30,000	30,000	30,000	120,000	
11	Salesperson	100,000	100,000	125,000	125,000	450,000	
12	Hardware Engineer	67,500	67,500	90,000	90,000	315,000	
13	Controller/Accountant	12,500	25,000	25,000	25,000	87,500	
14	Administrative Assistant	17,500	17,500	26,250	26,250	87,500	
15	Total	\$ 388,750	\$ 401,250	\$ 457,500	\$ 457,500	\$ 1,705,000	
16							
17	Total (with benefits)	\$ 447,063	\$ 461,438	\$ 526,125	\$ 526,125	\$ 1,960,750	
18							

Headcount Overview Headcount Cost Operat

FIGURE Q11.3 Company 123's Headcount Cost Worksheet

FigQ11.4 - Microsoft Excel						
	A1	B	C	D	E	F
		Period				
1		1Q X4	2Q X4	3Q X4	4Q X4	X4
2						
59	Operating Expenses Worksheet					
60	Operating Expenses Inputs					
61	Miscellaneous expenses as a % of sales	4.0%	4.0%	4.0%	4.0%	
62						
63	R&D expenses as a % of sales	5.0%	5.0%	5.0%	5.0%	
64						
65	Rent expense per square foot per quarter	\$ 4.50	\$ 4.50	\$ 4.50	\$ 4.50	
66	Square feet of space rented	4,000	4,000	4,000	4,000	
67	Total rent expense	\$ 18,000	\$ 18,000	\$ 18,000	\$ 18,000	
68						
69	Tax rate	30.0%	30.0%	35.0%	35.0%	
70						
71	Capital Worksheet					
72	Capital Expenditures (CAPEX) Inputs					
73	Equipment purchases	\$ 20,000	\$ 25,000	\$ 25,000	\$ 20,000	
74	Furniture purchases	\$ 5,000	\$ 5,000	\$ 4,000	\$ 5,000	
75	Fixtures purchases	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	
76	Total CAPEX purchases	\$ 27,000	\$ 32,000	\$ 31,000	\$ 27,000	
77						
78	CAPEX Disbursements Inputs					
79	% of purchases paid for in purchase period	100%	100%	100%	100%	
80						
81	Depreciation Inputs					
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 Q11.4 Company 123's Assumptions and Dashboard Worksheet

FigQ11.5 - Microsoft Excel						
	A1	B	C	D	E	F
		Period				
1		1Q X4	2Q X4	3Q X4	4Q X4	X4
2						
3	CAPITAL BUDGET					
4	Capital Expenditures Budget					
5	Equipment	\$ 20,000	\$ 25,000	\$ 25,000	\$ 20,000	\$ 90,000
6	Furniture	5,000	5,000	4,000	5,000	19,000
7	Fixtures	2,000	2,000	2,000	2,000	8,000
8	Total capital expenditures	\$ 27,000	\$ 32,000	\$ 31,000	\$ 27,000	\$ 117,000
9						
10	Disbursements for Capital Expenditures Budget					
11	Equipment	\$ 20,000	\$ 25,000	\$ 25,000	\$ 20,000	\$ 90,000
12	Furniture	5,000	5,000	4,000	5,000	19,000
13	Fixtures	2,000	2,000	2,000	2,000	8,000
14	Total disbursements for capital expenditures	\$ 27,000	\$ 32,000	\$ 31,000	\$ 27,000	\$ 117,000
15						
16	Depreciation Budget					
17	Equipment	\$ 1,000	\$ 2,250	\$ 3,500	\$ 4,500	\$ 11,250
18	Furniture	250	500	700	950	2,400
19	Fixtures	125	250	375	500	1,250
20	Total depreciation	\$ 1,375	\$ 3,000	\$ 4,675	\$ 5,950	\$ 14,900
21						
22	Cumulative capital expenditures	\$ 27,000	\$ 59,000	\$ 90,000	\$ 117,000	
23	- Accumulated depreciation	1,375	4,375	8,950	14,900	
24	= Fixed assets, net of depreciation	\$ 25,625	\$ 54,625	\$ 81,050	\$ 102,100	
25						
26						
27	Cumulative disbursements for CAPEX	\$ 27,000	\$ 59,000	\$ 90,000	\$ 117,000	
28	Payables adjustment for CAPEX disbursements	\$ -	\$ -	\$ -	\$ -	
29						

FIGURE Q11.5 Company 123's Capital Budget Worksheet

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	SALES BUDGET						
4	<u>Unit Sales and Price Budget</u>						
5	Unit sales	1,000	1,500	2,100	2,800		7,400
6	× Price per unit	\$ 500	\$ 500	\$ 475	\$ 460		N/A
7	= Total sales	\$ 500,000	\$ 750,000	\$ 997,500	\$ 1,288,000		\$ 3,535,500
8							
9	<u>Sales Composition Budget</u>						
10	Cash sales	\$ 200,000	\$ 300,000	\$ 399,000	\$ 515,200		\$ 1,414,200
11	+ Credit sales	300,000	450,000	598,500	772,800		2,121,300
12	= Total sales	\$ 500,000	\$ 750,000	\$ 997,500	\$ 1,288,000		\$ 3,535,500
13							
14	COLLECTIONS BUDGET						
15	<u>Cash Collections from Customers Budget</u>						
16	Cash sales this period	\$ 200,000	\$ 300,000	\$ 399,000	\$ 515,200		\$ 1,414,200
17	+ Credit sales collected	216,667	413,333	652,250	724,383		1,906,833
18	= Total collections	\$ 416,667	\$ 713,333	\$ 951,250	\$ 1,239,583		\$ 3,320,833
19							
20	<u>Accounts Receivable (A/R) Budget</u>						
21	Beginning A/R balance	\$ -	\$ 83,333	\$ 120,000	\$ 166,250		\$ -
22	+ Additions to A/R	83,333	120,000	166,250	214,667		584,250
23	- Subtractions from A/R	-	83,333	120,000	166,250		389,583
24	= Ending A/R balance	\$ 83,333	\$ 120,000	\$ 166,250	\$ 214,667		\$ 214,667
25							
	Sales and Collections	COGS	Inventory and Purchases				

FIGURE Q11.6 Company 123's Sales Budget

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	CASH BUDGET						
4	Beginning cash balance	\$ -	\$ 597,411	\$ 439,838	\$ 400,203		\$ -
5	Cash receipts						
6	Collections from customers	416,667	713,333	951,250	1,239,583		3,320,833
7	Total cash available, before financing	\$ 416,667	\$ 1,310,744	\$ 1,391,088	\$ 1,639,787		N/A
8	Cash disbursements						
9	Purchases disbursements	\$ 133,056	\$ 253,500	\$ 311,311	\$ 383,600		\$ 1,081,467
10	Operating expenses	510,063	848,938	633,900	660,045		2,350,945
11	Tax expense	(51,675)	(11,531)	14,674	73,642		25,109
12	Capital expenditures	27,000	32,000	31,000	27,000		117,000
13	Total disbursements	\$ 610,443	\$ 820,906	\$ 990,085	\$ 1,144,287		3,574,521
14							
15	Minimum cash balance desired	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000		N/A
16	Total cash needed	\$ 668,443	\$ 1,070,906	\$ 1,240,885	\$ 1,394,287		N/A
17	Excess (deficiency) of total cash available over total cash needed before financing	\$ (451,776)	\$ 239,838	\$ 160,203	\$ 245,500		N/A
18	Financing						
19	Equity investment	\$ 750,000	\$ -	\$ -	\$ -		\$ 750,000
20	Borrowing (at beginning of quarter)	50,000	-	-	-		50,000
21	Repayments (at end of quarter)	-	(50,000)	-	-		(50,000)
22	Interest	(813)	-	-	-		(813)
23	Total cash increase (decrease) from financing	\$ 799,188	\$ (50,000)	\$ -	\$ -		\$ 749,188
24							
25	Ending cash balance	\$ 597,411	\$ 439,838	\$ 400,203	\$ 495,500		\$ 495,500
26							
27	Cash	Balance Sheet	Income Statement	Cash Flows	Free		

FIGURE Q11.7 Company 123's Cash Budget

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Sales	\$ 500,000	\$ 750,000	\$ 997,500	\$ 1,288,000		\$ 3,535,500
4	Cost of goods sold	160,000	238,500	317,100	411,600		1,127,200
5	Gross profit	\$ 340,000	\$ 511,500	\$ 680,400	\$ 876,400		\$ 2,408,300
6							
7	Salaries	\$ 447,063	\$ 461,438	\$ 526,125	\$ 526,125		\$ 1,960,750
8	Miscellaneous expenses	20,000	30,000	39,900	51,520		141,420
9	Research and development	25,000	37,500	49,875	64,400		176,775
10	Rent	18,000	18,000	18,000	18,000		72,000
11	Depreciation	1,375	3,000	4,575	5,950		14,900
12	Income from operations	\$ (171,438)	\$ (38,438)	\$ 41,925	\$ 210,405		\$ 42,455
13							
14	Interest expense	\$ 813	\$ -	\$ -	\$ -		\$ 813
15	Taxable income	\$ (172,250)	\$ (38,438)	\$ 41,925	\$ 210,405		\$ 41,643
16							
17	Tax expense	\$ (51,675)	\$ (11,531)	\$ 14,674	\$ 73,642		\$ 25,109
18	Net income	\$ (120,575)	\$ (26,906)	\$ 27,251	\$ 136,763		\$ 16,533
19							

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.

CHAPTER 12

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

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

	A	B	C	D	E	F	G
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	Profit Margins						
4	Gross Margin	80.0%	79.8%	80.7%	81.7%	80.7%	
5	Pre-Tax Margin						
6	Net Profit Margin						
7							
8	Investment Returns						
9	Return on Equity						
10	Return on Assets						
11	Return on Capital						
12							
13	Management Efficiency						
14	Income/Employee						
15	Revenue/Employee						
16	Receivable Turnover						
17	Inventory Turnover						
18	Asset Turnover						
19							
20							
21	Values Used for the Above Calculations						
22							
23	Gross profit	\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000	\$ 5,565,200	
24	Sales	1,000,000	1,440,000	1,932,000	2,520,000	6,892,000	
25							

FIGURE 12.1 Calculation of Gross Margin

	A	B	C	D	E
1				Period	
2		1Q X4	2Q X4	3Q X4	4Q X4
3	Profit Margins				
4	Gross Margin	=GrossP1Q/Sales1Q	=GrossP2Q/Sales2Q	=GrossP3Q/Sales3Q	=GrossP4Q/Sales4Q
5	Pre-Tax Margin				
6	Net Profit Margin				
7					
8	Investment Returns				
9	Return on Equity				
10	Return on Assets				
11	Return on Capital				
12					
13	Management Efficiency				
14	Income/Employee				
15	Revenue/Employee				
16	Receivable Turnover				
17	Inventory Turnover				
18	Asset Turnover				
19					
20					
21	Values Used for the Above Calculations				
22					
23	Gross profit	=GrossP1Q	=GrossP2Q	=GrossP3Q	=GrossP4Q
24	Sales	=Sales1Q	=Sales2Q	=Sales3Q	=Sales4Q
25					

FIGURE 12.2 Alternative View of the Calculation of Gross Margin

	A	B	C	D	E	F	G
1	A1	1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	<u>Profit Margins</u>			Period			
4	Gross Margin	GrMar1Q	GrMar2Q	GrMar3Q	GrMar4Q	GrMarX4	
5	Pre-Tax Margin						
6	Net Profit Margin						
7							
8	<u>Investment Returns</u>						
9	Return on Equity						
10	Return on Assets						
11	Return on Capital						
12							
13	<u>Management Efficiency</u>						
14	Income/Employee						
15	Revenue/Employee						
16	Receivable Turnover						
17	Inventory Turnover						
18	Asset Turnover						
19							
20							
21	<u>Values Used for the</u>						
22	<u>Above Calculations</u>						
23	Gross profit						
24	Sales						
25							

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

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4		X4
2	Sales						
3	Cost of goods sold						
4	Gross profit	GrossP1Q	GrossP2Q	GrossP3Q	GrossP4Q	GrossPx4	
5							
6	Salaries						
7	Miscellaneous expenses						
8	Research and development						
9	Rent						
10	Depreciation						
11	Income from operations	OpInc1Q	OpInc2Q	OpInc3Q	OpInc4Q	OpIncX4	
12							
13	Interest expense						
14	Taxable income	TaxInc1Q	TaxInc2Q	TaxInc3Q	TaxInc4Q	TaxIncX4	
15							
16	Tax expense	TaxExp1Q	TaxExp2Q	TaxExp3Q	TaxExp4Q	TaxExpX4	
17	Net income	NetInc1Q	NetInc2Q	NetInc3Q	NetInc4Q	NetIncX4	
18							
19							

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

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4		X4
2							
3	SALES BUDGET						
4	Unit Sales and Price Budget						
5	Unit sales						
6	x Price per unit						
7	= Total sales	Sales1Q	Sales2Q	Sales3Q	Sales4Q	SalesX4	
8							
9	Sales Composition Budget						
10	Cash sales	CashSls1Q	CashSls2Q	CashSls3Q	CashSls4Q	CashSlsX4	
11	+ Credit sales	CreditSls1Q	CreditSls2Q	CreditSls3Q	CreditSls4Q	CreditSlsX4	
12	= Total sales						
13							
14	COLLECTIONS BUDGET						
15	Cash Collections from Customers Budget						
16	Cash sales this period						
17	+ Credit sales collected						
18	= Total collections	Collections1Q	Collections2Q	Collections3Q	Collections4Q	CollectionsX4	
19							
20	Accounts Receivable (A/R) Budget						
21	Beginning A/R balance	BegAR1Q	BegAR2Q	BegAR3Q	BegAR4Q	BegARX4	
22	+ Additions to A/R	AddAR1Q	AddAR2Q	AddAR3Q	AddAR4Q	AddARX4	
23	- Subtractions from A/R	SubAR1Q	SubAR2Q	SubAR3Q	SubAR4Q	SubARX4	
24	= Ending A/R balance	EndAR1Q	EndAR2Q	EndAR3Q	EndAR4Q	EndARX4	
25							

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

The screenshot shows a Microsoft Excel spreadsheet titled "Fig12.6 - Microsoft Excel". The data is organized into several sections:

- Period:** A row labeled "Period" with columns for "1Q X4", "2Q X4", "3Q X4", "4Q X4", and "X4".
- Profit Margins:** A section starting with "Profit Margins" containing "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%), and "Net Profit Margin".
- Investment Returns:** A section starting with "Investment Returns" containing "Return on Equity", "Return on Assets", and "Return on Capital".
- Management Efficiency:** A section starting with "Management Efficiency" containing "Income/Employee", "Revenue/Employee", "Receivable Turnover", "Inventory Turnover", and "Asset Turnover".
- Values Used for the Above Calculations:** A section starting with "Values Used for the Above Calculations" containing "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), and "Taxable income" (207,288, 509,100, 655,143, 1,054,350, 2,425,880).

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

	B	C	D	E	F	G
	1Q X4	2Q X4	3Q X4	4Q X4	X4	
1 Profit Margins			Period			
2						
3 Gross Margin	=GrossP1Q/Sales1Q	=GrossP2Q/Sales2Q	=GrossP3Q/Sales3Q	=GrossP4Q/Sales4Q	=GrossPX4/SalesX4	
4	=TaxInc1Q/Sales1Q	=TaxInc2Q/Sales2Q	=TaxInc3Q/Sales3Q	=TaxInc4Q/Sales4Q	=TaxIncX4/SalesX4	
5 Pre-Tax Margin						
6 Net Profit Margin						
7						
8 Investment Returns						
9 Return on Equity						
10 Return on Assets						
11 Return on Capital						
12						
13 Management Efficiency						
14 Income/Employee						
15 Revenue/Employee						
16 Receivable Turnover						
17 Inventory Turnover						
18 Asset Turnover						
19						
20						
21 Values Used for the Above Calculations						
22						
23 Gross profit	=GrossP1Q	=GrossP2Q	=GrossP3Q	=GrossP4Q	=GrossPX4	
24 Sales	=Sales1Q	=Sales2Q	=Sales3Q	=Sales4Q	=SalesX4	
25 Taxable income	=TaxInc1Q	=TaxInc2Q	=TaxInc3Q	=TaxInc4Q	=TaxIncX4	
26						

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

	B	C	D	E	F	G
	1Q X4	2Q X4	3Q X4	4Q X4	X4	
1 Profit Margins			Period			
2						
3 Gross Margin	GrMar1Q	GrMar2Q	GrMar3Q	GrMar4Q	GrMarX4	
4	PTMar1Q	PTMar2Q	PTMar3Q	PTMar4Q	PTMarX4	
5 Pre-Tax Margin						
6 Net Profit Margin						
7						
8 Investment Returns						
9 Return on Equity						
10 Return on Assets						
11 Return on Capital						
12						
13 Management Efficiency						
14 Income/Employee						
15 Revenue/Employee						
16 Receivable Turnover						
17 Inventory Turnover						
18 Asset Turnover						
19						
20						
21 Values Used for the Above Calculations						
22						
23 Gross profit						
24 Sales						
25 Taxable income						
26						

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

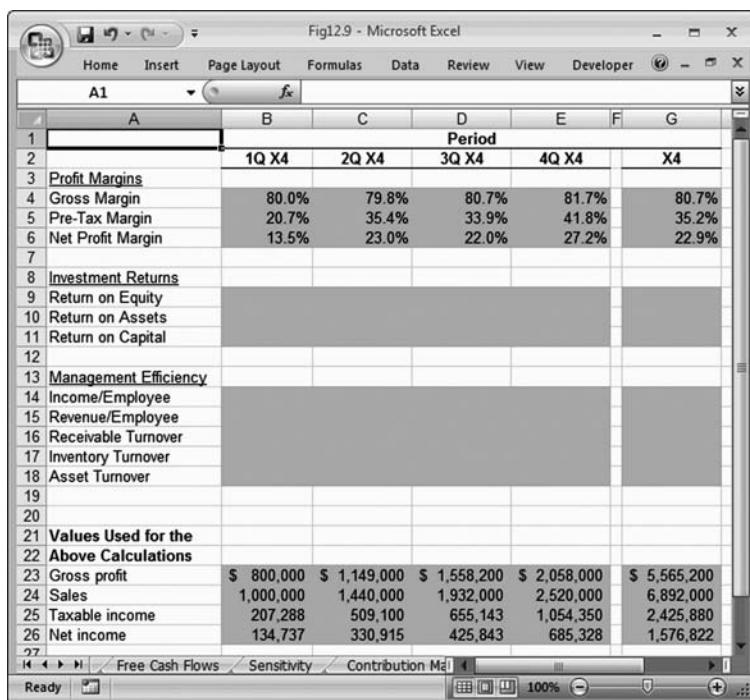


FIGURE 12.9 Calculation of Net Profit Margin

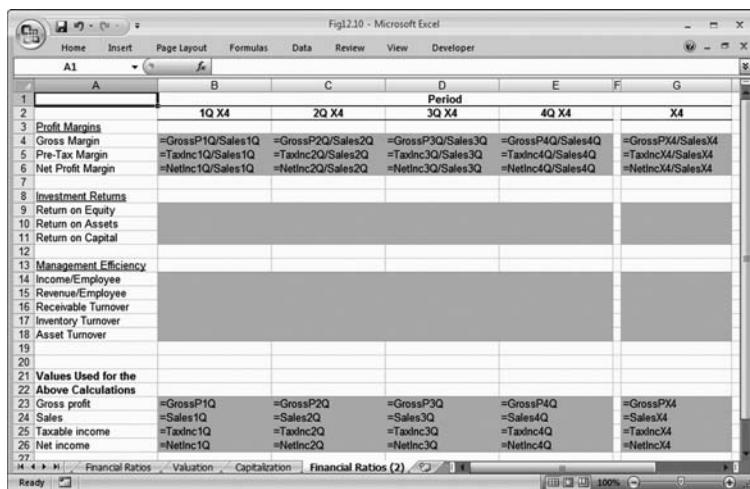


FIGURE 12.10 Alternative View of the Calculation of Net Profit Margin

	A	B	C	D	E	F	G
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	Profit Margins						
4	Gross Margin	GrMar1Q	GrMar2Q	GrMar3Q	GrMar4Q	GrMarX4	
5	Pre-Tax Margin	PTMar1Q	PTMar2Q	PTMar3Q	PTMar4Q	PTMarX4	
6	Net Profit Margin	NPMar1Q	NPMar2Q	NPMar3Q	NPMar4Q	NPMarX4	
7							
8	Investment Returns						
9	Return on Equity						
10	Return on Assets						
11	Return on Capital						
12							
13	Management Efficiency						
14	Income/Employee						
15	Revenue/Employee						
16	Receivable Turnover						
17	Inventory Turnover						
18	Asset Turnover						
19							
20							
21	Values Used for the						
22	Above Calculations						
23	Gross profit						
24	Sales						
25	Taxable income						
26	Net income						
27							

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.

Fig12.12 - Microsoft Excel

The screenshot shows an Excel spreadsheet titled "Fig12.12 - Microsoft Excel". The top menu bar includes Home, Insert, Page Layout, Formulas, Data, Review, View, and Developer. The ribbon tabs at the bottom are Cash Flows, Free Cash Flows, Sensitivity, and Contrib. The main table has columns labeled A through G and rows numbered 1 through 27. Row 1 contains column headers: A1, B, C, D, E, F, G. Column D is labeled "Period" and contains "1Q X4", "2Q X4", "3Q X4", "4Q X4", and "X4". Rows 2 through 6 represent "Profit Margins" with data for 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%), and Net Profit Margin (13.5%, 23.0%, 22.0%, 27.2%, 22.9%). Rows 8 through 11 represent "Investment Returns (Annualized)" with data for Return on Equity (47.5%, 90.3%, 90.1%, 106.4%, 61.2%), Return on Assets, and Return on Capital. Rows 13 through 18 represent "Management Efficiency" with data for Income/Employee, Revenue/Employee, Receivable Turnover, Inventory Turnover, and Asset Turnover. Rows 21 and 22 are bolded and labeled "Values Used for the Above Calculations". Rows 23 through 27 show financial values: 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), and Owners' Equity (1,134,737, 1,465,652, 1,891,495, 2,576,822, 2,576,822).

	A	B	C	D	E	F	G
1	A1	B	C	D	E	F	G
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	<u>Profit Margins</u>						
4	Gross Margin	80.0%	79.8%	80.7%	81.7%		80.7%
5	Pre-Tax Margin	20.7%	35.4%	33.9%	41.8%		35.2%
6	Net Profit Margin	13.5%	23.0%	22.0%	27.2%		22.9%
7							
8	<u>Investment Returns (Annualized)</u>						
9	Return on Equity	47.5%	90.3%	90.1%	106.4%		61.2%
10	Return on Assets						
11	Return on Capital						
12							
13	<u>Management Efficiency</u>						
14	Income/Employee						
15	Revenue/Employee						
16	Receivable Turnover						
17	Inventory Turnover						
18	Asset Turnover						
19							
20							
21	Values Used for the						
22	Above Calculations						
23	Gross profit	\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000		\$ 5,565,200
24	Sales	1,000,000	1,440,000	1,932,000	2,520,000		6,892,000
25	Taxable income	207,288	509,100	655,143	1,054,350		2,425,880
26	Net income	134,737	330,915	425,843	685,328		1,576,822
27	Owners' Equity	1,134,737	1,465,652	1,891,495	2,576,822		2,576,822
28							

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: (Net Income)/(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.

	A	B	C	D	
		1Q X4	2Q X4	3Q X4	Period
1 Profit Margins					
2 Gross Margin	=GrossP1Q/Sales1Q	=GrossP2Q/Sales2Q	=GrossP3Q/Sales3Q		
3 Pre-Tax Margin	=Taxinc1Q/Sales1Q	=Taxinc2Q/Sales2Q	=Taxinc3Q/Sales3Q		
4 Net Profit Margin	=Netinc1Q/Sales1Q	=Netinc2Q/Sales2Q	=Netinc3Q/Sales3Q		
5 Investment Returns (Annualized)					
6 Return on Equity	=Netinc1Q/TotOE1Q)^QtrsYr	=Netinc2Q/TotOE2Q)^QtrsYr	=Netinc3Q/TotOE3Q)^QtrsYr		
7 Return on Assets					
8 Return on Capital					
9 Management Efficiency					
10 Income/Employee					
11 Revenue/Employee					
12 Receivable Turnover					
13 Inventory Turnover					
14 Asset Turnover					
15					
16					
17					
18					
19					
20					
21 Values Used for the					
22 Above Calculations					
23 Gross profit	=GrossP1Q	=GrossP2Q	=GrossP3Q		
24 Sales	=Sales1Q	=Sales2Q	=Sales3Q		
25 Taxable income	=Taxinc1Q	=Taxinc2Q	=Taxinc3Q		
26 Net income	=Netinc1Q	=Netinc2Q	=Netinc3Q		
27 Owners' Equity	=TotOE1Q	=TotOE2Q	=TotOE3Q		
28					

FIGURE 12.13 Alternative View of the Calculation of Return on Equity

	A	B	C	D	E	F	G	
		1Q X4	2Q X4	3Q X4	4Q X4		X4	Period
1 Profit Margins								
2 Gross Margin	GrMar1Q	GrMar2Q	GrMar3Q	GrMar4Q	GrMarX4			
3 Pre-Tax Margin	PTMar1Q	PTMar2Q	PTMar3Q	PTMar4Q	PTMarX4			
4 Net Profit Margin	NPMar1Q	NPMar2Q	NPMar3Q	NPMar4Q	NPMarX4			
5								
6								
7								
8 Investment Returns								
9 Return on Equity	ROE1Q	ROE2Q	ROE3Q	ROE4Q	ROE4			
10 Return on Assets								
11 Return on Capital								
12								
13 Management Efficiency								
14 Income/Employee								
15 Revenue/Employee								
16 Receivable Turnover								
17 Inventory Turnover								
18 Asset Turnover								
19								
20								
21 Values Used for the								
22 Above Calculations								
23 Gross profit								
24 Sales								
25 Taxable income								
26 Net income								
27 Owners' Equity								
28								

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

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4		X4
2							
3	<u>Assets</u>						
4	Cash						
5	Accounts Receivable						
6	Inventory						
7	Fixed Assets, net						
8	Total Assets	TotAssets1Q	TotAssets2Q	TotAssets3Q	TotAssets4Q		TotAssetsX4
9							
10							
11	<u>Liabilities</u>						
12	Accounts Payable	PayCapB1Q	PayCapB2Q	PayCapB3Q	PayCapB4Q		PayCapBX4
13	Payables from Capital Budget						
14	Loan Payable						
15	Total Liabilities	TotLiabs1Q	TotLiabs2Q	TotLiabs3Q	TotLiabs4Q		TotLiabsX4
16							
17							
18	<u>Owners' Equity</u>						
19	Common Stock	CS1Q	CS2Q	CS3Q	CS4Q		CSX4
20	Retained Earnings	RE1Q	RE2Q	RE3Q	RE4Q		REX4
21	Total Owners' Equity	TotOE1Q	TotOE2Q	TotOE3Q	TotOE4Q		TotOEX4
22							
23	Total Liabilities and Owners' Equity	TotLOE1Q	TotLOE2Q	TotLOE3Q	TotLOE4Q		TotLOEX4
24							
25	<i>Balance Sheet calculation check</i>	BSCheck1Q	BSCheck2Q	BSCheck3Q	BSCheck4Q		BSCheckX4
26							
27	<u>Net Working Capital (NWC)</u>						
28	Current assets	CA1Q	CA2Q	CA3Q	CA4Q		CAX4
29	- Current liabilities	CL1Q	CL2Q	CL3Q	CL4Q		CLX4
30	Net working capital	NWC1Q	NWC2Q	NWC3Q	NWC4Q		NWCX4
31							
32	Beginning NWC	BegNWC1Q	BegNWC2Q	BegNWC3Q	BegNWC4Q		BegNWCX4
33	- Ending NWC	EndNWC1Q	EndNWC2Q	EndNWC3Q	EndNWC4Q		EndNWCX4
34	= Change in NWC	ChgNWC1Q	ChgNWC2Q	ChgNWC3Q	ChgNWC4Q		ChgNWCX4
35							

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

Fig12.16 - Microsoft Excel

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	<u>Profit Margins</u>						
4	Gross Margin	80.0%	79.8%	80.7%	81.7%		80.7%
5	Pre-Tax Margin	20.7%	35.4%	33.9%	41.8%		35.2%
6	Net Profit Margin	13.5%	23.0%	22.0%	27.2%		22.9%
7							
8	<u>Investment Returns (Annualized)</u>						
9	Return on Equity	47.5%	90.3%	90.1%	106.4%		61.2%
10	Return on Assets	44.1%	81.8%	84.2%	100.4%		57.7%
11	Return on Capital						
12							
13	<u>Management Efficiency</u>						
14	Income/Employee						
15	Revenue/Employee						
16	Receivable Turnover						
17	Inventory Turnover						
18	Asset Turnover						
19							
20							
21	<u>Values Used for the</u>						
22	<u>Above Calculations</u>						
23	Gross profit	\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000		\$ 5,565,200
24	Sales	1,000,000	1,440,000	1,932,000	2,520,000		6,892,000
25	Taxable income	207,288	509,100	655,143	1,054,350		2,425,880
26	Net income	134,737	330,915	425,843	685,328		1,576,822
27	Owners' Equity	1,134,737	1,465,652	1,891,495	2,576,822		2,576,822
28	Assets	1,222,959	1,618,785	2,022,628	2,730,822		2,730,822
29							

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

	A	B	C	D
		1Q X4	2Q X4	3Q X4
		Period		
3 Profit Margins		=GrossP1Q/Sales1Q	=GrossP2Q/Sales2Q	=GrossP3Q/Sales3Q
4 Gross Margin		=Taxinc1Q/Sales1Q	=Taxinc2Q/Sales2Q	=Taxinc3Q/Sales3Q
5 Pre-Tax Margin		=Netinc1Q/Sales1Q	=Netinc2Q/Sales2Q	=Netinc3Q/Sales3Q
6 Net Profit Margin				
7				
8 Investment Returns (Annualized)				
9 Return on Equity		=Invest1Q/TotAssets1Q*QtrsY1	=Invest2Q/TotAssets2Q*QtrsY1	=Invest3Q/TotAssets3Q*QtrsY1
10 Return on Assets		=Netinc1Q/TotAssets1Q*QtrsY1	=Netinc2Q/TotAssets2Q*QtrsY1	=Netinc3Q/TotAssets3Q*QtrsY1
11 Return on Capital				
12				
13 Management Efficiency				
14 Income/Employee				
15 Revenue/Employee				
16 Receivable Turnover				
17 Inventory Turnover				
18 Asset Turnover				
19				
20				
21 Values Used for the Above Calculations				
22				
23 Gross profit		=GrossP1Q	=GrossP2Q	=GrossP3Q
24 Sales		=Sales1Q	=Sales2Q	=Sales3Q
25 Taxable income		=Taxinc1Q	=Taxinc2Q	=Taxinc3Q
26 Net income		=Netinc1Q	=Netinc2Q	=Netinc3Q
27 Owners' Equity		=TotOE1Q	=TotOE2Q	=TotOE3Q
28 Assets		=TotAssets1Q	=TotAssets2Q	=TotAssets3Q

FIGURE 12.17 Alternative View of the Calculation of Return on Assets

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4		X4
		Period					
3 Profit Margins							
4 Gross Margin		GrMar1Q	GrMar2Q	GrMar3Q	GrMar4Q	GrMarX4	
5 Pre-Tax Margin		PTMar1Q	PTMar2Q	PTMar3Q	PTMar4Q	PTMarX4	
6 Net Profit Margin		NPMar1Q	NPMar2Q	NPMar3Q	NPMar4Q	NPMarX4	
7							
8 Investment Returns							
9 Return on Equity		ROE1Q	ROE2Q	ROE3Q	ROE4Q	ROEX4	
10 Return on Assets		ROA1Q	ROA2Q	ROA3Q	ROA4Q	ROAX4	
11 Return on Capital							
12							
13 Management Efficiency							
14 Income/Employee							
15 Revenue/Employee							
16 Receivable Turnover							
17 Inventory Turnover							
18 Asset Turnover							
19							
20							
21 Values Used for the Above Calculations							
22							
23 Gross profit							
24 Sales							
25 Taxable income							
26 Net income							
27 Owners' Equity							
28 Assets							

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

The screenshot shows an Excel spreadsheet titled "Fig12.19 - Microsoft Excel". The data is organized into several sections:

- Period:** A header row with columns for 1Q X4, 2Q X4, 3Q X4, 4Q X4, and X4.
- Profit Margins:** Rows 3-7 show 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%), and Net Profit Margin (13.5%, 23.0%, 22.0%, 27.2%, 22.9%).
- Investment Returns (Annualized):** Rows 8-12 show 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%), and Return on Capital (47.5%, 87.3%, 90.1%, 106.4%, 61.2%).
- Management Efficiency:** Rows 13-18 show Income/Employee, Revenue/Employee, Receivable Turnover, Inventory Turnover, and Asset Turnover.
- Values Used for the Above Calculations:** Rows 19-29 list various financial values for both quarters (1Q X4 and 2Q X4) and the annual total (X4). These include Gross profit (\$ 800,000, \$ 1,149,000, \$ 1,558,200), Sales (1,000,000, 1,440,000, 1,932,000), 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, 1,465,552, 1,891,495, 2,576,822, 2,576,822), Assets (1,222,959, 1,618,785, 2,022,428, 2,730,822, 2,730,822), and Capital (1,134,737, 1,515,652, 1,891,495, 2,576,822, 2,576,822).

FIGURE 12.19 Calculation of Return on Capital

This screenshot shows the same Excel spreadsheet as Figure 12.19, but with formulas visible in the cells:

- Period:** A header row with columns for 1Q X4 and 2Q X4.
- Profit Margins:** Rows 3-7 show formulas like =GrossP1Q/Sales1Q for Gross Margin.
- Investment Returns (Annualized):** Rows 8-12 show formulas such as =Netinc1Q/TotOE1Q/QtrsYr for Return on Equity.
- Management Efficiency:** Rows 13-18 show Income/Employee, Revenue/Employee, Receivable Turnover, Inventory Turnover, and Asset Turnover.
- Values Used for the Above Calculations:** Rows 19-29 list formulas for various financial values across both quarters (1Q X4 and 2Q X4) and the annual total (X4).

FIGURE 12.20 Alternative View of the Calculation of Return on Capital

Fig12.21 - Microsoft Excel

The screenshot shows an Excel spreadsheet titled "Fig12.21 - Microsoft Excel". The top menu bar includes Home, Insert, Page Layout, Formulas, Data, Review, View, Developer, and Help. The formula bar shows "A1". The main table has columns labeled A, B, C, D, E, F, G and rows labeled 1 through 29. Row 1 contains column headers: "A" and "Period" (with sub-periods 1Q X4, 2Q X4, 3Q X4, 4Q X4, X4). Rows 2 through 7 list financial ratios under the heading "Profit Margins": Gross Margin (GrMar1Q, GrMar2Q, GrMar3Q, GrMar4Q, GrMarX4), Pre-Tax Margin (PTMar1Q, PTMar2Q, PTMar3Q, PTMar4Q, PTMarX4), and Net Profit Margin (NPMar1Q, NPMar2Q, NPMar3Q, NPMar4Q, NPMarX4). Rows 8 through 12 list investment returns: Return on Equity (ROE1Q, ROE2Q, ROE3Q, ROE4Q, ROEX4), Return on Assets (ROA1Q, ROA2Q, ROA3Q, ROA4Q, ROAX4), and Return on Capital (ROC1Q, ROC2Q, ROC3Q, ROC4Q, ROCX4). Rows 13 through 18 list management efficiency ratios: Income/Employee, Revenue/Employee, Receivable Turnover, Inventory Turnover, and Asset Turnover. Rows 21 through 29 list values used for calculations: Gross profit, Sales, Taxable income, Net income, Owners' Equity, Assets, and Capital.

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	Profit Margins						
4	Gross Margin	GrMar1Q	GrMar2Q	GrMar3Q	GrMar4Q	GrMarX4	
5	Pre-Tax Margin	PTMar1Q	PTMar2Q	PTMar3Q	PTMar4Q	PTMarX4	
6	Net Profit Margin	NPMar1Q	NPMar2Q	NPMar3Q	NPMar4Q	NPMarX4	
7							
8	Investment Returns (Annualized)						
9	Return on Equity	ROE1Q	ROE2Q	ROE3Q	ROE4Q	ROEX4	
10	Return on Assets	ROA1Q	ROA2Q	ROA3Q	ROA4Q	ROAX4	
11	Return on Capital	ROC1Q	ROC2Q	ROC3Q	ROC4Q	ROCX4	
12							
13	Management Efficiency						
14	Income/Employee						
15	Revenue/Employee						
16	Receivable Turnover						
17	Inventory Turnover						
18	Asset Turnover						
19							
20							
21	Values Used for the						
22	Above Calculations						
23	Gross profit						
24	Sales						
25	Taxable income						
26	Net income						
27	Owners' Equity						
28	Assets						
29	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.

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4	X4	
1							Period
2							
3	Profit Margins						
4	Gross Margin	80.0%	79.8%	80.7%	81.7%	80.7%	
5	Pre-Tax Margin	20.7%	35.4%	33.9%	41.8%	35.2%	
6	Net Profit Margin	13.5%	23.0%	22.0%	27.2%	22.9%	
7							
8	Investment Returns (Annualized)						
9	Return on Equity	47.5%	90.3%	90.1%	106.4%	61.2%	
10	Return on Assets	44.1%	81.8%	84.2%	100.4%	57.7%	
11	Return on Capital	47.5%	87.3%	90.1%	106.4%	61.2%	
12							
13	Management Efficiency (Annualized)						
14	Income/Employee	\$ 35,930	\$ 88,244	\$ 77,426	\$ 119,187	\$ 68,557	
15	Revenue/Employee	\$ 266,667	\$ 384,000	\$ 351,273	\$ 438,261	\$ 299,652	
16	Receivable Turnover						
17	Inventory Turnover						
18	Asset Turnover						
19							
20							
21	Values Used for the						
22	Above Calculations						
23	Gross profit	\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000	\$ 5,565,200	
24	Sales	1,000,000	1,440,000	1,932,000	2,520,000	6,892,000	
25	Taxable income	207,288	509,100	655,143	1,084,350	2,426,880	
26	Net income	134,737	330,915	425,843	685,328	1,576,822	
27	Owners' Equity	1,134,737	1,465,652	1,891,495	2,576,822	2,576,822	
28	Assets	1,222,959	1,618,785	2,022,628	2,730,822	2,730,822	
29	Capital	1,134,737	1,515,652	1,891,495	2,576,822	2,576,822	
30	Employees	15	15	22	23	23	
31							

FIGURE 12.22 Calculation of Income/Employee and Revenue/Employee

	A	B	C
		1Q X4	2Q X4
3 Profit Margins			
4 Gross Margin	=GrossP1Q/Sales1Q	=GrossP2Q/Sales2Q	
5 Pre-Tax Margin	=TaxInc1Q/Sales1Q	=TaxInc2Q/Sales2Q	
6 Net Profit Margin	=NetInc1Q/Sales1Q	=NetInc2Q/Sales2Q	
7			
8 Investment Returns (Annualized)			
9 Return on Equity	=(NetInc1Q/TotOE1Q)*QtrsYr	=(NetInc2Q/TotOE2Q)*QtrsYr	
10 Return on Assets	=(NetInc1Q/TotAssets1Q)*QtrsYr	=(NetInc2Q/TotAssets2Q)*QtrsYr	
11 Return on Capital	=(NetInc1Q/(TotOE1Q+LoanVal1Q))*QtrsYr	=(NetInc2Q/(TotOE2Q+LoanVal2Q))*QtrsYr	
12			
13 Management Efficiency (Annualized)			
14 Income/Employee	=(NetInc1Q/NoEmp1Q)*QtrsYr	=(NetInc2Q/NoEmp2Q)*QtrsYr	
15 Revenue/Employee	=(Sales1Q/NoEmp1Q)*QtrsYr	=(Sales2Q/NoEmp2Q)*QtrsYr	
16 Receivable Turnover			
17 Inventory Turnover			
18 Asset Turnover			
19			
20			
21 Values Used for the			
22 Above Calculations			
23 Gross profit	=GrossP1Q	=GrossP2Q	
24 Sales	=Sales1Q	=Sales2Q	
25 Taxable income	=TaxInc1Q	=TaxInc2Q	
26 Net income	=NetInc1Q	=NetInc2Q	
27 Owners' Equity	=TotOE1Q	=TotOE2Q	
28 Assets	=TotAssets1Q	=TotAssets2Q	
29 Capital	=TotOE1Q+LoanVal1Q	=TotOE2Q+LoanVal2Q	
30 Employees	=NoEmp1Q	=NoEmp2Q	

FIGURE 12.28 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

	A	B	C	D	E	F	G
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Profit Margins						
4	Gross Margin	GrMar1Q	GrMar2Q	GrMar3Q	GrMar4Q		GrMarX4
5	Pre-Tax Margin	PTMar1Q	PTMar2Q	PTMar3Q	PTMar4Q		PTMarX4
6	Net Profit Margin	NPMar1Q	NPMar2Q	NPMar3Q	NPMar4Q		NPMarX4
7							
8	Investment Returns (Annualized)						
9	Return on Equity	ROE1Q	ROE2Q	ROE3Q	ROE4Q		ROEX4
10	Return on Assets	ROA1Q	ROA2Q	ROA3Q	ROA4Q		ROAX4
11	Return on Capital	ROC1Q	ROC2Q	ROC3Q	ROC4Q		ROCX4
12							
13	Management Efficiency (Annualized)						
14	Income/Employee	IncEmp1Q	IncEmp2Q	IncEmp3Q	IncEmp4Q		IncEmpX4
15	Revenue/Employee	RevEmp1Q	RevEmp2Q	RevEmp3Q	RevEmp4Q		RevEmpX4
16	Receivable Turnover						
17	Inventory Turnover						
18	Asset Turnover						
19							
20							
21	Values Used for the						
22	Above Calculations						
23	Gross profit						
24	Sales						
25	Taxable income						
26	Net income						
27	Owners' Equity						
28	Assets						
29	Capital						
30	Employees						
31							

FIGURE 12.24 Names of the Input and Output Cells Underlying the Calculation of Income/Employee and Revenue/Employee

	A	B	C	D	E	F	G
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
29	Headcount Overview Worksheet						
30	Headcount Overview Inputs						
31	Number of employees						
32	Chief Executive Officer	NoCEO1Q	NoCEO2Q	NoCEO3Q	NoCEO4Q		
33	Chief Financial Officer	NoCFO1Q	NoCFO2Q	NoCFO3Q	NoCFO4Q		
34	VP, Engineering	NoVPE1Q	NoVPE2Q	NoVPE3Q	NoVPE4Q		
35	VP, Sales & Marketing	NoVPSM1Q	NoVPSM2Q	NoVPSM3Q	NoVPSM4Q		
36	VP, Business Development	NoVPBD1Q	NoVPBD2Q	NoVPBD3Q	NoVPBD4Q		
37	Salesperson	NoSP1Q	NoSP2Q	NoSP3Q	NoSP4Q		
38	Hardware Engineer	NoHE1Q	NoHE2Q	NoHE3Q	NoHE4Q		
39	Controller/Accountant	NoCA1Q	NoCA2Q	NoCA3Q	NoCA4Q		
40	Administrative Assistant	NoAA1Q	NoAA2Q	NoAA3Q	NoAA4Q		
41	Total	NoEmp1Q	NoEmp2Q	NoEmp3Q	NoEmp4Q		
42							

FIGURE 12.25 Names of the Input and Output Cells Underlying the Assumptions and Dashboard Worksheet

Inventory, is calculated as: (Cost of Goods Sold)/(Inventory). The third turnover management efficiency ratio, Asset Turnover, compares Napavale's Sales to its Assets and is calculated as: (Sales)/(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.

Fig12.26 - Microsoft Excel						
A1	B	C	D	E	F	G
1			Period			
2		1Q X4	2Q X4	3Q X4	4Q X4	X4
3	Profit Margins					
4	Gross Margin	80.0%	79.8%	80.7%	81.7%	80.7%
5	Pre-Tax Margin	20.7%	35.4%	33.9%	41.8%	35.2%
6	Net Profit Margin	13.5%	23.0%	22.0%	27.2%	22.9%
7						
8	Investment Returns (Annualized)					
9	Return on Equity	47.5%	90.3%	90.1%	106.4%	61.2%
10	Return on Assets	44.1%	81.8%	84.2%	100.4%	57.7%
11	Return on Capital	47.5%	87.3%	90.1%	106.4%	61.2%
12						
13	Management Efficiency (Annualized)					
14	Income/Employee	\$ 35,930	\$ 88,244	\$ 77,426	\$ 119,187	\$ 68,557
15	Revenue/Employee	\$ 266,667	\$ 384,000	\$ 351,273	\$ 438,261	\$ 299,652
16	Receivable Turnover	30.0	30.0	30.0	30.0	20.5
17	Inventory Turnover	12.4	14.0	14.6	18.0	12.9
18	Asset Turnover	3.3	3.6	3.8	3.7	2.5
19						
20						
21	Values Used for the					
22	Above Calculations					
23	Gross profit	\$ 800,000	\$ 1,149,000	\$ 1,558,200	\$ 2,058,000	\$ 5,565,200
24	Sales	1,000,000	1,440,000	1,932,000	2,520,000	6,892,000
25	Taxable income	207,288	509,100	655,143	1,054,350	2,425,880
26	Net income	134,737	330,915	425,843	685,328	1,576,822
27	Owners' Equity	1,134,737	1,465,652	1,891,495	2,576,822	2,576,822
28	Assets	1,222,959	1,618,785	2,022,628	2,730,822	2,730,822
29	Capital	1,134,737	1,515,652	1,891,495	2,576,822	2,576,822
30	Employees	15	15	22	23	23
31	Accounts Receivable	133,333	192,000	257,600	336,000	336,000
32	Cost-of-goods sold	200,000	291,000	373,800	462,000	1,326,800
33	Inventory	64,667	83,067	102,667	102,667	102,667
34						

FIGURE 12.26 Calculation of Receivables Turnover, Inventory Turnover, and Asset Turnover

FIGURE 12.27 shows a Microsoft Excel spreadsheet titled "Fig12.27 - Microsoft Excel". The table displays formulas for various financial ratios across five time periods: 1Q X4, 2Q X4, 3Q X4, 4Q X4, and X4. The rows include Profit Margin, Gross Margin, Pre-Tax Margin, Net Profit Margin, Investment Returns (Annualized), Return on Equity, Return on Assets, Return on Capital, Management Efficiency (Annualized), Income/Employee, Revenue/Employee, Receivable Turnover, Inventory Turnover, Asset Turnover, and Values Used for the Above Calculations. The formulas use cell references like NetInc1Q, Sales1Q, TaxInc1Q, NetInv1Q, etc., to calculate metrics such as GrossP1Q, Sales2Q, TaxInc2Q, NetInv2Q, and so on.

	A	B	C
1		1Q X4	2Q X4
2			
3 Profit Margin		=GrossP1Q/Sales1Q	=Gross2Q/Sales2Q
4 Gross Margin		=TaxInc1Q/Sales1Q	=TaxInc2Q/Sales2Q
5 Pre-Tax Margin		=NetInc1Q/Sales1Q	=NetInc2Q/Sales2Q
6 Net Profit Margin			
7			
8 Investment Returns (Annualized)			
9 Return on Equity		=NetInc1Q/TotDef1Q/1Q/P2rsYr	=NetInc2Q/TotDef2Q/2Q/P2rsYr
10 Return on Assets		=NetInv1Q/TotAssets1Q/QtrsYr	=NetInv2Q/TotAssets2Q/QtrsYr
11 Return on Capital		=NetInv1Q/TotDef1Q+LeverVal1Q/QtrsYr	=NetInv2Q/TotDef2Q+LeverVal2Q/QtrsYr
12			
13 Management Efficiency (Annualized)			
14 Income/Employee		=NetInc1Q/NoEmp1Q/QtrsYr	=NetInc2Q/NoEmp2Q/QtrsYr
15 Revenue/Employee		=Sales1Q/NoEmp1Q/QtrsYr	=Sales2Q/NoEmp2Q/QtrsYr
16 Receivable Turnover		=Sales1Q/EndAR1Q/QtrsYr	=Sales2Q/EndAR2Q/QtrsYr
17 Inventory Turnover		=COGS1Q/EndInv1Q/QtrsYr	=COGS2Q/EndInv2Q/QtrsYr
18 Asset Turnover		=Sales1Q/TotAssets1Q/QtrsYr	=Sales2Q/TotAssets2Q/QtrsYr
19			
20			
21 Values Used for the			
22 Above Calculations			
23 Gross profit		=GrossP1Q	=Gross2Q
24 Sales		=Sales1Q	=Sales2Q
25 Taxable income		=TaxInc1Q	=TaxInc2Q
26 Net income		=NetInc1Q	=NetInc2Q
27 Owners' Equity		=TotAssets1Q	=TotAssets2Q
28 Assets		=TotAssets1Q	=TotAssets2Q
29 Capital		=TotDef1Q+LeverVal1Q	=TotDef2Q+LeverVal2Q
30 Employees		=NoEmp1Q	=NoEmp2Q
31 Accounts Receivable		=EndAR1Q	=EndAR2Q
32 Cost-of-goods sold		=COGS1Q	=COGS2Q
33 Inventory		=EndInv1Q	=EndInv2Q

FIGURE 12.27 Alternative View of the Calculation of Receivables Turnover, Inventory Turnover, and Asset Turnover

FIGURE 12.28 shows a Microsoft Excel spreadsheet titled "Fig12.28 - Microsoft Excel". The table displays names of input and output cells for various financial ratios across five time periods: 1Q X4, 2Q X4, 3Q X4, 4Q X4, and X4. The rows include Profit Margin, Gross Margin, Pre-Tax Margin, Net Profit Margin, Investment Returns (Annualized), Return on Equity, Return on Assets, Return on Capital, Management Efficiency (Annualized), Income/Employee, Revenue/Employee, Receivable Turnover, Inventory Turnover, Asset Turnover, and Values Used for the Above Calculations. The formulas use cell references like IncEmp1Q, IncEmp2Q, IncEmp3Q, IncEmp4Q, IncEmpX4, RevEmp1Q, RevEmp2Q, RevEmp3Q, RevEmp4Q, RevEmpX4, RecTum1Q, RecTum2Q, RecTum3Q, RecTum4Q, RecTumX4, InvTum1Q, InvTum2Q, InvTum3Q, InvTum4Q, InvTumX4, AssetTum1Q, AssetTum2Q, AssetTum3Q, AssetTum4Q, AssetTumX4, and so on.

	A	B	C	D	E	F	G
1		1Q X4	2Q X4	3Q X4	4Q X4	X4	
2				Period			
3 Profit Margin		GrMar1Q	GrMar2Q	GrMar3Q	GrMar4Q	GrMarX4	
4 Gross Margin		PIMar1Q	PIMar2Q	PIMar3Q	PIMar4Q	PIMarX4	
5 Pre-Tax Margin							
6 Net Profit Margin		NPMar1Q	NPMar2Q	NPMar3Q	NPMar4Q	NPMarX4	
7							
8 Investment Returns (Annualized)							
9 Return on Equity		ROE1Q	ROE2Q	ROE3Q	ROE4Q	ROEX4	
10 Return on Assets		ROA1Q	ROA2Q	ROA3Q	ROA4Q	ROAX4	
11 Return on Capital		ROC1Q	ROC2Q	ROC3Q	ROC4Q	ROCX4	
12							
13 Management Efficiency (Annualized)							
14 Income/Employee		IncEmp1Q	IncEmp2Q	IncEmp3Q	IncEmp4Q	IncEmpX4	
15 Revenue/Employee		RevEmp1Q	RevEmp2Q	RevEmp3Q	RevEmp4Q	RevEmpX4	
16 Receivable Turnover		RecTum1Q	RecTum2Q	RecTum3Q	RecTum4Q	RecTumX4	
17 Inventory Turnover		InvTum1Q	InvTum2Q	InvTum3Q	InvTum4Q	InvTumX4	
18 Asset Turnover		AssetTum1Q	AssetTum2Q	AssetTum3Q	AssetTum4Q	AssetTumX4	
19							
20							
21 Values Used for the							
22 Above Calculations							
23 Gross profit							
24 Sales							
25 Taxable income							
26 Net income							
27 Owners' Equity							
28 Assets							
29 Capital							
30 Employees							
31 Accounts Receivable							
32 Cost-of-goods sold							
33 Inventory							

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.

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
3 Sales		\$ 7,500,000	\$ 8,250,000	\$ 8,625,000	\$ 8,555,000		\$ 32,930,000
4 Cost of goods sold		3,650,000	3,954,500	4,065,250	4,171,300		15,841,050
5 Gross profit		\$ 3,850,000	\$ 4,295,500	\$ 4,559,750	\$ 4,383,700		\$ 17,088,950
6							
7 Salaries		\$ 991,800	\$ 991,800	\$ 1,329,650	\$ 1,407,950		\$ 4,721,200
8 Miscellaneous expenses		300,000	330,000	250,750	256,650		1,145,400
9 Research and development		450,000	577,500	690,000	684,400		2,401,900
10 Rent		35,000	35,000	35,000	35,000		140,000
11 Depreciation		1,950	4,150	6,150	8,200		20,450
12 Income from operations		\$ 2,071,250	\$ 2,357,050	\$ 2,240,200	\$ 1,991,500		\$ 8,660,000
13							
14 Interest expense		\$ -	\$ -	\$ -	\$ -		\$ -
15 Taxable income		\$ 2,071,250	\$ 2,357,050	\$ 2,240,200	\$ 1,991,500		\$ 8,660,000
16							
17 Tax expense		\$ 724,938	\$ 824,968	\$ 784,070	\$ 697,025		\$ 3,031,000
18 Net income		\$ 1,346,313	\$ 1,532,083	\$ 1,456,130	\$ 1,294,475		\$ 5,629,000
19							

FIGURE Q12.1 Company 456's Income Statement

	B	C	D	E	F	G
	Period					
1		1Q X4	2Q X4	3Q X4	4Q X4	X4
2	SALES BUDGET					
3	Unit Sales and Price Budget					
4	Unit sales	600	650	675	690	2,215
5	x Price per unit	\$ 15,000	\$ 15,000	\$ 15,000	\$ 14,500	N/A
6	= Total sales	\$ 7,500,000	\$ 8,250,000	\$ 8,625,000	\$ 8,565,000	\$ 32,930,000
7						
8	Sales Composition Budget					
9	Cash sales	\$ 3,750,000	\$ 4,125,000	\$ 4,312,500	\$ 4,277,500	\$ 16,465,000
10	+ Credit sales	2,750,000	4,125,000	4,312,500	4,277,500	16,465,000
11	= Total sales	\$ 7,500,000	\$ 8,250,000	\$ 8,625,000	\$ 8,565,000	\$ 32,930,000
12						
13	COLLECTIONS BUDGET					
14	Cash Collections from Customers Budget					
15	Cash sales this period	\$ 3,750,000	\$ 4,125,000	\$ 4,312,500	\$ 4,277,500	\$ 16,465,000
16	+ Credit sales collected	2,083,333	3,958,333	4,229,167	4,293,056	14,953,889
17	-					
18	= Total collections	\$ 5,833,333	\$ 8,083,333	\$ 8,541,667	\$ 8,570,556	\$ 31,428,889
19						
20	Accounts Receivable (A/R) Budget					
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	5,415,667
24	= Ending A/R balance	\$ 1,666,667	\$ 1,833,333	\$ 1,916,667	\$ 1,901,111	\$ 1,901,111
25						

FIGURE Q12.2 Company 456's Sales and Collections Worksheet

	B	C	D	E	F	G
	Period					
1		1Q X4	2Q X4	3Q X4	4Q X4	X4
2	Assets					
3	Cash	\$ 783,503	\$ 1,638,041	\$ 2,992,164	\$ 4,301,817	\$ 4,301,817
4	Accounts Receivable	1,666,667	1,833,333	1,916,667	1,901,111	1,901,111
5	Inventory	1,310,167	1,355,083	1,390,433	1,390,433	1,390,433
6	Fixed Assets, net	36,050	74,900	107,750	139,550	139,550
7	Total Assets	\$ 3,804,387	\$ 4,902,358	\$ 6,407,014	\$ 7,732,911	\$ 7,732,911
8						
9						
10	Liabilities					
11	Accounts Payable	\$ 2,200,074	\$ 1,773,363	\$ 1,822,489	\$ 1,853,911	\$ 1,853,911
12	Payables from Capital Budget					
13	Loan Payable					
14	Total Liabilities	\$ 2,200,074	\$ 1,773,363	\$ 1,822,489	\$ 1,853,911	\$ 1,853,911
15						
16						
17	Owners' Equity					
18	Common Stock	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000
19	Retained Earnings	1,346,313	2,878,395	4,734,526	5,629,000	5,629,000
20	Total Owners' Equity	\$ 1,596,313	\$ 3,128,395	\$ 4,984,626	\$ 5,879,000	\$ 5,879,000
21						
22	Total Liabilities and Owners' Equity	\$ 3,804,387	\$ 4,902,358	\$ 6,407,014	\$ 7,732,911	\$ 7,732,911
23						
24	Balance Sheet calculation check:	-	-	-	-	-
25						
26	Net Working Capital (NWC)					
27	Current assets	\$ 2,984,833	\$ 3,188,417	\$ 3,307,100	\$ 3,291,544	N/A
28	- Current liabilities	2,200,074	1,773,363	1,822,489	1,853,911	N/A
29	= Net working capital	\$ 776,759	\$ 1,414,454	\$ 1,484,611	\$ 1,437,633	N/A
30						
31						
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)	\$ (637,094)	\$ (70,157)	\$ 46,978	N/A
35						

FIGURE Q12.3 Company 456's Balance Sheet

FigQ12.4 - Microsoft Excel

Sales and Collections Worksheet

	1Q X4	2Q X4	3Q X4	4Q X4	X4
Unit sales	500	550	575	590	
Price per unit	\$ 15,000	\$ 15,000	\$ 15,000	\$ 14,500	

Sales Composition Inputs

Cash sales as a % of total sales	50%	50%	50%	50%
Credit sales as a % of total sales	50%	50%	50%	50%

Days receivable (DSO)

Days per quarter	40	40	40	40
------------------	----	----	----	----

COGS Worksheet

Cost-of-Goods Sold Inputs

Monitor screen: cost per unit	\$ 7,000.00	\$ 6,900.00	\$ 6,800.00	\$ 6,800.00
Monitor casing: cost per unit	\$ 200.00	\$ 190.00	\$ 180.00	\$ 180.00
Assembly labor: cost per unit	\$ 100.00	\$ 100.00	\$ 90.00	\$ 90.00
Total	\$ 7,300.00	\$ 7,190.00	\$ 7,070.00	\$ 7,070.00

Inventory and Purchases Worksheet

Inventory Inputs

Days inventory	30	30	30	30
----------------	----	----	----	----

Disbursements for Purchases Inputs

Days payable	40	40	40	40
--------------	----	----	----	----

Assumptions and Dashboard Sales and Collections COGS Inv

FIGURE Q12.4 Company 456's Assumptions and Dashboard Worksheet

FigQ12.5 - Microsoft Excel

COST-OF-GOODS SOLD BUDGET

Cost-of-Goods Sold Budget

	1Q X4	2Q X4	3Q X4	4Q X4	X4
Monitor screen	\$ 3,500,000	\$ 3,795,000	\$ 3,910,000	\$ 4,012,000	\$ 15,217,000
Monitor casing	100,000	104,500	103,500	106,200	414,200
Assembly labor	50,000	55,000	51,750	53,100	209,850
Total cost-of-goods sold	\$ 3,650,000	\$ 3,954,500	\$ 4,065,250	\$ 4,171,300	\$ 15,841,050

COGS Inventory and Purchases Headcount Overview

FIGURE Q12.5 Company 456's Cost-of-Goods-Sold Worksheet

FigQ12.6 - Microsoft Excel

INVENTORY BUDGET

	1Q X4	2Q X4	3Q X4	4Q X4	X4
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

PURCHASES BUDGET

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

Disbursements for Purchases Budget

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

Accounts Payable (A/P) Budget

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

- Given the information presented, calculate Company 456's Gross Margin, Pre-Tax Margin, and Net Profit Margin.
- Given the information presented, calculate Company 456's Return on Equity, Return on Assets, and Return on Capital.
- Given the information presented, calculate Company 456's Income per Employee, Revenue per Employee, Receivable Turnover, Inventory Turnover, and Asset Turnover.

CHAPTER 13

Valuation

This 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,

	A	B	C	D	E	F	G
1		1Q X4	2Q X4	3Q X4	4Q X4	X4	
2							
3	EBIT	\$ 207,288	\$ 509,975	\$ 655,143	\$ 1,054,350	\$ 2,426,755	
4							
5	Effective tax rate	35.0%	35.0%	35.0%	35.0%		
6							
7	EBIT * (1 - t)	\$ 134,737	\$ 331,484	\$ 425,843	\$ 685,328	\$ 1,577,391	
8	+ Depreciation	2,313	4,625	6,938	9,250	23,125	
9	- CAPEX	45,000	45,000	45,000	45,000	180,000	
10	- Changes in NWC	109,778	62,156	57,200	55,533	284,667	
11	= Free cash flow	\$ (17,728)	\$ 228,953	\$ 330,580	\$ 594,044	\$ 1,135,849	
12	+ Terminal value						
13	= Total free cash flow						
14							
15	Present value						
16							
17							
18	NPV						
19							
20	WACC						
21	g (to perpetuity)						
22							

FIGURE 13.1 Free Cash Flows Worksheet

	A	B	C	D	Period
1		1Q X4	2Q X4	3Q X4	
2					
3	EBIT	=OpInc1Q	=OpInc2Q	=OpInc3Q	
4					
5	Effective tax rate	=TaxPct1Q	=TaxPct2Q	=TaxPct3Q	
6					
7	EBIT * (1 - t)	=EBIT1Q*(1-EffTaxRt1Q)	=EBIT2Q*(1-EffTaxRt2Q)	=EBIT3Q*(1-EffTaxRt3Q)	
8	+ Depreciation	=Dep1Q	=Dep2Q	=Dep3Q	
9	- CAPEX	=CAPEXDis1Q	=CAPEXDis2Q	=CAPEXDis3Q	
10	- Changes in NWC	=-ChgNWC1Q	=-ChgNWC2Q	=-ChgNWC3Q	
11	= Free cash flow	=ATEBIT1Q+B8-B9-B10	=ATEBIT2Q+C8-C9-C10	=ATEBIT3Q+D8-D9-D10	
12	+ Terminal value				
13	= Total free cash flow				
14					
15	Present value				
16					
17					
18	NPV				
19					
20	WACC				
21	g (to perpetuity)				
22					

FIGURE 13.2 Alternative View of the Free Cash Flows Worksheet

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	EBIT	EBIT1Q	EBIT2Q	EBIT3Q	EBIT4Q	EBITX4	
4							
5	Effective tax rate	EffTaxRt1Q	EffTaxRt2Q	EffTaxRt3Q	EffTaxRt4Q		
6							
7	EBIT * (1 - t)	ATEBIT1Q	ATEBIT2Q	ATEBIT3Q	ATEBIT4Q	ATEBITX4	
8	+ Depreciation						
9	- CAPEX						
10	- Changes in NWC						
11	= Free cash flow	FCF1Q	FCF2Q	FCF3Q	FCF4Q	FCFX4	
12	+ Terminal value						
13	= Total free cash flow						
14							
15	Present value						
16							
17							
18	NPV						
19							
20	WACC						
21	g (to perpetuity)						

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

	A	B	C	D	E	F	G
1		1Q X4	2Q X4	3Q X4	4Q X4		X4
2	EBIT	\$ 207,288	\$ 509,975	\$ 655,143	\$ 1,054,350		\$ 2,426,755
3	Effective tax rate	35.0%	35.0%	35.0%	35.0%		
4							
5	EBIT * (1 - t)	\$ 134,737	\$ 331,484	\$ 425,843	\$ 685,328		\$ 1,577,391
6	+ Depreciation	2,313	4,625	6,938	9,250		23,125
7	- CAPEX	45,000	45,000	45,000	45,000		180,000
8	- Changes in NWC	109,778	62,156	57,200	55,533		284,667
9	= Free cash flow	\$ (17,728)	\$ 228,953	\$ 330,580	\$ 594,044		\$ 1,135,849
10	+ Terminal value	N/A	N/A	N/A	7,950,944		7,950,944
11	= Total free cash flow	\$ (17,728)	\$ 228,953	\$ 330,580	\$ 8,544,988		\$ 9,086,793
12							
13	Present value						
14							
15	NPV						
16							
17							
18	WACC						
19							
20	g (to perpetuity)						
21							

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

	A	B	C	D	E
1		1Q X4	2Q X4	3Q X4	4Q X4
2	EBIT	=OpInc1Q	=OpInc2Q	=OpInc3Q	=OpInc4Q
3	Effective tax rate	=TaxPct1Q	=TaxPct2Q	=TaxPct3Q	=TaxPct4Q
4					
5	EBIT * (1 - t)	=EBIT1Q*(1-EffTaxRt1Q)	=EBIT2Q*(1-EffTaxRt2Q)	=EBIT3Q*(1-EffTaxRt3Q)	=EBIT4Q*(1-EffTaxRt4Q)
6	+ Depreciation	=Dep1Q	=Dep2Q	=Dep3Q	=Dep4Q
7	- CAPEX	=CAPEXD1Q	=CAPEXD2Q	=CAPEXD3Q	=CAPEXD4Q
8	- Changes in NWC	=ChgNWC1Q	=ChgNWC2Q	=ChgNWC3Q	=ChgNWC4Q
9	= Free cash flow	=ATEBIT1Q+B8-B9-B10	=ATEBIT2Q+C8-C9-C10	=ATEBIT3Q+D8-D9-D10	=ATEBIT4Q+E8-E9-E10
10	+ Terminal value	N/A	N/A	N/A	=[FCFX4*(1+g)]/(WACC-g)
11	= Total free cash flow	=FCF1Q	=FCF2Q	=FCF3Q	=FCF4Q+TermVal4Q
12					
13	Present value				
14					
15	NPV				
16					
17					
18	WACC				
19					
20	g (to perpetuity)				
21					

FIGURE 13.6 Alternative View of the Free Cash Flows Worksheet

	A	B	C	D	E	F	G
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	EBIT	EBIT1Q	EBIT2Q	EBIT3Q	EBIT4Q		EBITX4
4							
5	Effective tax rate	EffTaxRt1Q	EffTaxRt2Q	EffTaxRt3Q	EffTaxRt4Q		
6							
7	EBIT * (1 - t)	ATEBIT1Q	ATEBIT2Q	ATEBIT3Q	ATEBIT4Q		ATEBITX4
8	+ Depreciation						
9	- CAPEX						
10	- Changes in NWC						
11	= Free cash flow	FCF1Q	FCF2Q	FCF3Q	FCF4Q		FCFX4
12	+ Terminal value						TermValX4
13	= Total free cash flow	TFCF1Q	TFCF2Q	TFCF3Q	TFCF4Q		TFCFX4
14							
15	Present value						
16							
17							
18	NPV						
19							
20	WACC						
21	g (to perpetuity)						
22							

FIGURE 13.7 Names of the Input and Output Cells Underlying the Free Cash Flows Worksheet

	A	B	C	D	E	F	G	H
1				Period				
2		1Q X4	2Q X4	3Q X4	4Q X4		X4	
3	Equity investment (incremental)	EqInv1Q	EqInv2Q	EqInv3Q	EqInv4Q			
4	Borrowing/loan (incremental)	Loan1Q	Loan2Q	Loan3Q	Loan4Q			
5	Repayments of borrowing (incremental)	Repay1Q	Repay2Q	Repay3Q	Repay4Q			
6								
7	Interest rate on borrowing/loan (annual)	IntPer1Q	IntPer2Q	IntPer3Q	IntPer4Q		IntAnnual	
8	Interest rate on borrowing/loan (quarterly)							
9								
10	Loan value used for interest calculations	LoanVal1Q	LoanVal2Q	LoanVal3Q	LoanVal4Q			
11								
12	Free Cash Flows Worksheet							
13	WACC (discount rate)							
14	Growth rate to perpetuity (g)							
15								
16								
17								
18								
19								
20	DA SHOWNRED							
21	Is the Balance Sheet balanced?							
22	Sum total of Balance Sheet differences							
23								
24	Is cash consistent across BS and SCF?							
25	Sum total of BS and SCF differences							
26								
27	BSstatus							
28	BSCheckSum							
29								
30	CFstatus							
31	CFCheckSum							
32								

FIGURE 13.8 Names of the Input and Output Cells Underlying the Assumptions and Dashboard Worksheet

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4		X4
2	EBIT	\$ 207,288	\$ 509,975	\$ 655,143	\$ 1,054,350		\$ 2,426,755
3	Effective tax rate	35.0%	35.0%	35.0%	35.0%		
4							
5	EBIT * (1 - t)	\$ 134,737	\$ 331,484	\$ 425,843	\$ 685,328		\$ 1,577,391
6	+ Depreciation	2,313	4,625	6,938	9,250		23,125
7	- CAPEX	45,000	45,000	45,000	45,000		180,000
8	- Changes in NWC	109,778	62,156	57,200	55,533		284,667
9	= Free cash flow	\$ (17,728)	\$ 228,953	\$ 330,580	\$ 594,044		\$ 1,135,849
10	+ Terminal value	N/A	N/A	N/A	7,950,944		7,950,944
11	= Total free cash flow	\$ (17,728)	\$ 228,953	\$ 330,580	\$ 8,544,988		\$ 9,086,793
12							
13							
14							
15	Present value	\$ (16,938)	\$ 209,005	\$ 288,331	\$ 7,120,823		
16							
17							
18	NPV	\$ 7,601,220					
19							
20	WACC	20.0%					
21	g (to perpetuity)	5.0%					
22							

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.

				Period
	1Q X4	2Q X4	3Q X4	
3 EBIT	=OpInc1Q	=OpInc2Q	=OpInc3Q	
4				
5 Effective tax rate	=TaxPct1Q	=TaxPct2Q	=TaxPct3Q	
6				
7 EBIT * (1 - t)	=EBIT1Q*(1-EffTaxRt1Q)	=EBIT2Q*(1-EffTaxRt2Q)	=EBIT3Q*(1-EffTaxRt3Q)	
8 + Depreciation	=Dep1Q	=Dep2Q	=Dep3Q	
9 - CAPEX	=CAPEX1Q	=CAPEX2Q	=CAPEX3Q	
10 - Changes in NWC	=ChgNWC1Q	=ChgNWC2Q	=ChgNWC3Q	
11 = Free cash flow	=ATEBIT1Q+B8-B9-B10	=ATEBIT2Q+C8-C9-C10	=ATEBIT3Q+D8-D9-D10	
12 + Terminal value	N/A	N/A	N/A	
13 = Total free cash flow	=FCF1Q	=FCF2Q	=FCF3Q	
14				
15 Present value	=TFCF1Q/(1+WACC*0.25)	=TFCF2Q/(1+WACC*0.5)	=TFCF3Q/(1+WACC*0.75)	
16				
17				
18 NPV	=SUM(B15:E15)			
19				
20 WACC	=WACC			
21 g (to perpetuity)	F9			

FIGURE 13.10 Alternative View of the Updated Free Cash Flows Worksheet

					Period
	1Q X4	2Q X4	3Q X4	4Q X4	X4
3 EBIT	EBIT1Q	EBIT2Q	EBIT3Q	EBIT4Q	EBITX4
4					
5 Effective tax rate	EffTaxRt1Q	EffTaxRt2Q	EffTaxRt3Q	EffTaxRt4Q	
6					
7 EBIT * (1 - t)	ATEBIT1Q	ATEBIT2Q	ATEBIT3Q	ATEBIT4Q	ATEBITX4
8 + Depreciation					
9 - CAPEX					
10 - Changes in NWC					
11 = Free cash flow	FCF1Q	FCF2Q	FCF3Q	FCF4Q	FCFX4
12 + Terminal value				TermVal4Q	TermValX4
13 = Total free cash flow	TFCF1Q	TFCF2Q	TFCF3Q	TFCF4Q	TFCFX4
14					
15 Present value	PV1Q	PV2Q	PV3Q	PV4Q	
16					
17					
18 NPV	NPV				
19					
20 WACC					
21 g (to perpetuity)					

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

Projected (Next 4 Quarters)					
	Valuation (Price)	Sales	Net Income	Free Cash Flows	
Direct Competitors					
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	
Stock Index					
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

	A	B	C	D	E	F	G	H	I	J	
1	Public Company Comparables										
2											
3	Projected (Next 4 Quarters)										
4	Multiple of Projected (Next 4 Quarters):										
5	Valuation (Price)	Sales	Net Income	Free Cash Flows							
6					Sales	Net Income	Free Cash Flows				
7	Direct Competitors										
8	Competitor 1	\$ 250,000,000	\$ 300,000,000	\$ 30,000,000	\$ 30,000,000	0.83	8.33	8.33			
9	Competitor 2	\$ 200,000,000	\$ 290,000,000	\$ 25,000,000	\$ 27,500,000	0.69	8.00	7.27			
10	Competitor 3	\$ 150,000,000	\$ 275,000,000	\$ 30,000,000	\$ 22,000,000	0.55	5.00	6.82			
11	Median	\$ 200,000,000	\$ 290,000,000	\$ 30,000,000	\$ 27,500,000	0.69	8.00	7.27			
12											
13	Stock Index										
14	Stock Index	\$ 1,250,000,000	\$ 1,400,000,000	\$ 160,000,000	\$ 150,000,000	0.89	7.81	8.33			

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.

	A	F	G	H							
1	Public Company Comparables										
2											
3	Multiple of Projected (Next 4 Quarters):										
4	Free Cash Flows										
5											
6	Direct Competitors										
8	Competitor 1	3000000	=Comp1Val/Comp1Sales	=Comp1Val/Comp1FCF							
9	Competitor 2	2750000	=Comp2Val/Comp2Sales	=Comp2Val/Comp2FCF							
10	Competitor 3	2200000	=Comp3Val/Comp3Sales	=Comp3Val/Comp3FCF							
11	Median	=MEDIAN(B8:B10)	=MEDIAN(H8:H10)	=MEDIAN(J8:J10)							
12											
13	Stock Index										
14	Stock Index	150000000	=SVal/SSales	=SVal/SF	=SVal/SFCF						

FIGURE 13.14 Alternative View of the Calculations of Multiples of Various Operational Measures

The screenshot shows a Microsoft Excel spreadsheet titled "Fig13.15 - Microsoft Excel". The worksheet contains two main sections: "Projected (Next 4 Quarters)" and "Multiple of Projected (Next 4 Quarters)". The "Projected" section has three rows: Sales, Net Income, and Free Cash Flows. The "Multiple" section also has three rows: Sales, Net Income, and Free Cash Flows. Below these sections, there are several rows of data corresponding to "Direct Competitors" (Competitor 1, Competitor 2, Competitor 3, Median) and a "Stock Index". The cells are labeled with names such as "Comp1Sales", "Comp1Net", "Comp1FCF", "Comp1PS", "Comp1PI", "Comp1PFCF", "Comp2Sales", "Comp2Net", "Comp2FCF", "Comp2PS", "Comp2PI", "Comp2PFCF", "Comp3Sales", "Comp3Net", "Comp3FCF", "Comp3PS", "Comp3PI", "Comp3PFCF", "MedCompSales", "MedCompNet", "MedCompFCF", "MedCompPS", "MedCompPI", and "MedCompPFCF". The "Valuation (Price)" row is also present.

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.

The screenshot shows a Microsoft Excel spreadsheet titled "Fig13.16 - Microsoft Excel". The worksheet contains a table with data for "Public Company Comparables" and "Napavale". The table includes columns for "Projected (Next 4 Quarters)" (Sales, Net Income, Free Cash Flows) and "Multiple of Projected (Next 4 Quarters)" (Sales, Net Income, Free Cash Flows). The "Projected" section has three rows: Sales, Net Income, and Free Cash Flows. The "Multiple" section also has three rows: Sales, Net Income, and Free Cash Flows. Below these sections, there are several rows of data corresponding to "Direct Competitors" (Competitor 1, Competitor 2, Competitor 3, Median) and a "Stock Index". The "Valuation Based Upon Median Multiples and Projected (Next 4 Quarters)" section includes rows for Sales, Net Income, and Free Cash Flows. The "Napavale" section includes rows for "Direct competitors median multiples" and "Stock index multiples". The "Valuation" row is also present.

FIGURE 13.16 Completed Public Company Comparables Valuation Worksheet

Fig13.17 - Microsoft Excel					
A	B	C	D	E	F
1 Public Company Comparables					
2					
3					
4					
5	Valuation (Price)	Projected (Next 4 Quarters)			
6		Sales	Net Income	Free Cash Flows	
7 Direct Competitors					
8 Competitor 1	250000000	300000000	30000000	30000000	
9 Competitor 2	200000000	250000000	25000000	27000000	
10 Competitor 3	150000000	275000000	30000000	22000000	
11 Median	=MEDIAN(B8:B10)	=MEDIAN(D8:D10)	=MEDIAN(E8:E10)	=MEDIAN(F8:F10)	
12					
13 Stock Index					
14 Stock Index	1250000000	1400000000	160000000	150000000	
15					
16	Valuation Based Upon Median Multiples and Projected (Next 4 Quarters):				
17					
18		Sales	Net Income	Free Cash Flows	
19					
20 Napavate					
21 Direct competitors median multiples		=Sales14*MedCompPS	=NetInc14*MedCompPN	=FCF14*MedCompFCF	
22 Stock index multiples		=Sales14*SIPPS	=NetInc14*SIPPN	=FCF14*SIPFCF	
23					
	Contribution Margin	Financial Ratios	Valuation	Comparables	Capital
	Ready				

FIGURE 13.17 Alternative View of the Completed Public Company Comparables Valuation Worksheet

Fig13.18 - Microsoft Excel					
A	B	C	D	E	F
1 Public Company Comparables					
2					
3					
4					
5	Valuation (Price)	Projected (Next 4 Quarters)			Multiple of Projected (Next 4 Quarters):
6		Sales	Net Income	Free Cash Flows	Sales
7 Direct Competitors					Net Income
8 Competitor 1	Comp1Val	Comp1Sales	Comp1NI	Comp1FCF	Comp1PS
9 Competitor 2	Comp2Val	Comp2Sales	Comp2NI	Comp2FCF	Comp2PS
10 Competitor 3	Comp3Val	Comp3Sales	Comp3NI	Comp3FCF	Comp3PS
11 Median	MedCompVal	MedCompSales	MedCompNI	MedCompFCF	MedCompPS
12					MedCompPN
13 Stock Index					MedCompFCF
14 Stock Index	SIVal	SISales	SINI	SIFCF	SIPPS
15					SIPNI
16	Valuation Based Upon Median Multiples and Projected (Next 4 Quarters):				
17					
18		Sales	Net Income	Free Cash Flows	
19					
20 Napavate					
21 Direct competitors median multiples		CompSalesVal	CompNIVal	CompFCFVal	
22 Stock index multiples		SISSalesVal	SINIVal	SIFCFCVal	
23					
	Contribution Margin	Financial Ratios	Valuation	Comparables	Capital
	Ready				

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

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

Valuation Based Upon Median Multiples and Projected (Next 4 Quarters):						
			Net	Free Cash		
		Sales	Income	Flows		
20 Napavale						
21 Direct competitors median multiples	\$ 4,753,103	\$ 12,614,576	\$ 8,260,721			
22 Stock index multiples	\$ 6,153,571	\$ 12,318,922	\$ 9,465,409			
23						
24						
25 Mergers and Acquisitions Comparables						
26						
27						
Projected (Next 4 Quarters)						
	Valuation (Price)		Net			
		Sales	Income	Assets		
31 Target Companies						
32 Company 1	\$ 120,000,000	\$ 150,000,000	\$ 17,000,000	\$ 125,000,000		
33 Company 2	\$ 95,000,000	\$ 125,000,000	\$ 15,000,000	\$ 100,000,000		
34 Company 3	\$ 85,000,000	\$ 115,000,000	\$ 14,000,000	\$ 92,000,000		
35 Median	\$ 95,000,000	\$ 125,000,000	\$ 15,000,000	\$ 100,000,000		
36						

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.

Multiple of Projected (Next 4 Quarters):						
			Net			
		Sales	Income	Assets		
25 Mergers and Acquisitions Comparables						
26						
27						
Projected (Next 4 Quarters)						
	Valuation (Price)		Net			
		Sales	Income	Assets		
31 Target Companies						
32 Company 1	\$ 120,000,000	\$ 150,000,000	\$ 17,000,000	\$ 125,000,000	0.80	7.06
33 Company 2	\$ 95,000,000	\$ 125,000,000	\$ 15,000,000	\$ 100,000,000	0.76	6.33
34 Company 3	\$ 85,000,000	\$ 115,000,000	\$ 14,000,000	\$ 92,000,000	0.74	6.07
35 Median	\$ 95,000,000	\$ 125,000,000	\$ 15,000,000	\$ 100,000,000	0.76	6.33
36						

FIGURE 13.20 Calculations of Multiples of Various Operational Measures

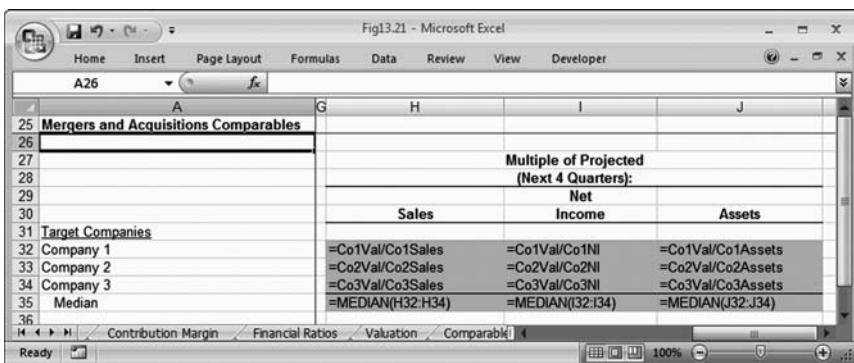


FIGURE 13.21 Alternative View of the Calculations of Multiples of Various Operational Measures

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.

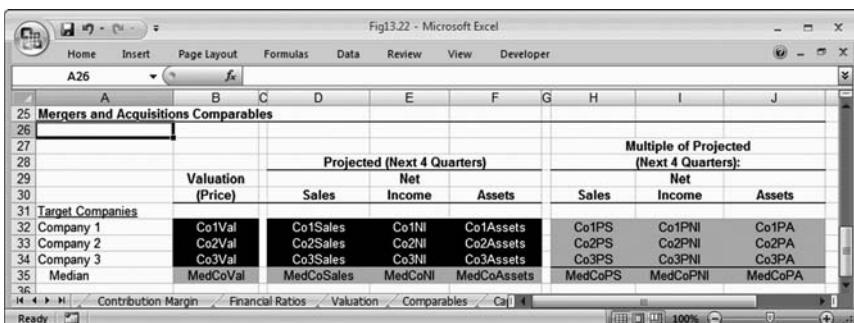


FIGURE 13.22 Names of the Input and Output Cells Underlying the Calculations of Multiples of Various Operational Measures

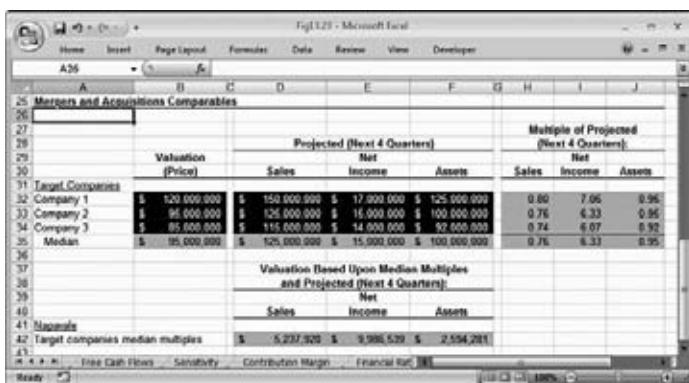


FIGURE 13.23 Completed Mergers and Acquisitions Comparables Valuation Worksheet

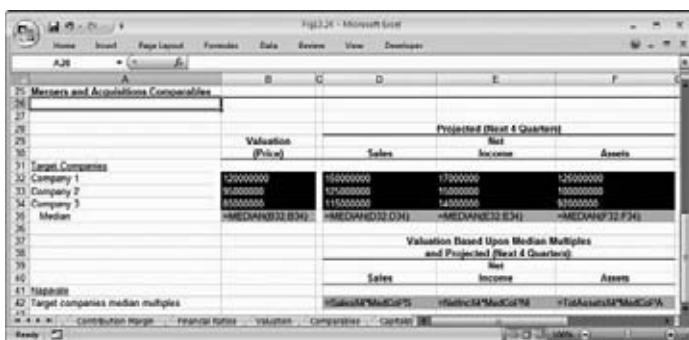


FIGURE 13.24 Alternative View of the Completed Mergers and Acquisitions Comparables Valuation Worksheet

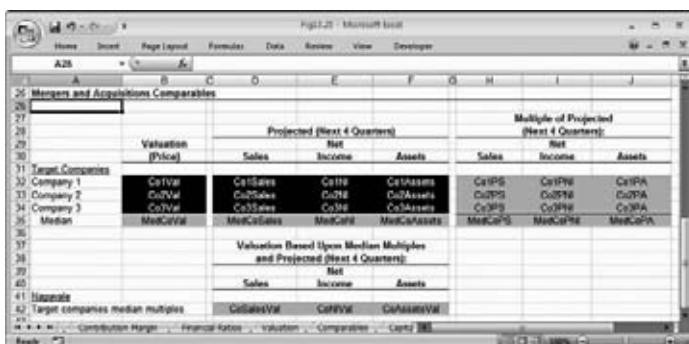


FIGURE 13.25 Names of the Input and Output Cells Underlying the Completed Mergers and Acquisitions Comparables Valuation Worksheet

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: (Weighted Valuation) = (Valuation) * (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.

A	B	C	D	E
1	Valuation		Relative	Weighted
2	Technique	Valuation	Weight	Valuation
3	Discounted cash flow	\$ 7,601,220	60.0%	\$ 4,560,732
4	Public company comparables	\$ 4,753,103	20.0%	\$ 950,621
5	Mergers and acquisitions comparables	\$ 5,237,920	20.0%	\$ 1,047,584
6	Total		100.0%	\$ 6,558,937
7				

FIGURE 13.26 Valuation Worksheet

	A	B	C	D	E	F
1	Valuation			Relative	Weighted	
2	Technique	Valuation		Weight		Valuation
3	Discounted cash flow	=NPV	0.6		=DCFVal*DCFRW	
4	Public company comparables	=CompSalesVal	0.2		=PCCVal*PCCRW	
5	Mergers and acquisitions comparables	=CoSalesVal	0.2		=MACVal*MACRW	
6	Total			=SUM(D3:D5)		=SUM(F3:F5)
7						

FIGURE 13.27 Alternative View of the Valuation Worksheet

	A	B	C	D	E	F
1	Valuation			Relative	Weighted	
2	Technique	Valuation		Weight		Valuation
3	Discounted cash flow	DCFVal	DCFRW			DCFVV
4	Public company comparables	PCCVal	PCCRW			PCCVV
5	Mergers and acquisitions comparables	MACVal	MACRW			MACVV
6	Total		TotRW			TotVV
7						

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.

	A1	B	C	D	E	F	G
		Period				X4	
1		1Q X4	2Q X4	3Q X4	4Q X4		
2	EBIT	\$ 2,071,250	\$ 2,357,050	\$ 2,240,200	\$ 1,991,500	\$ 8,660,000	
3	Effective tax rate	35.0%	35.0%	35.0%	35.0%		
4							
5	EBIT * (1 - t)	\$ 1,346,313	\$ 1,532,083	\$ 1,456,130	\$ 1,294,475	\$ 5,629,000	
6	+ Depreciation	1,950	4,150	6,150	8,200	20,450	
7	- CAPEX	38,000	43,000	39,000	40,000	160,000	
8	- Changes in NWC	776,759	637,694	70,157	(46,978)	1,437,633	
9	= Free cash flow	\$ 533,503	\$ 855,538	\$ 1,353,123	\$ 1,309,653	\$ 4,051,817	
10	+ Terminal value						
11	= Total free cash flow						
12							
13	Present value						
14							
15	NPV						
16							
17							
18	WACC	25.0%					
19	g (to perpetuity)	5.0%					
20							
21							
22							

FIGURE Q13.1 Company 456's Free Cash Flows Worksheet

FIGURE Q13.2 Company 456's Assumptions and Dashboard Worksheet

FigQ13.3 - Microsoft Excel

Public Company Comparables

	A	B	C	D	E	F	G	H	I	J
1	Public Company Comparables									
2										
3										
4										
5										
6										
7	Valuation (Price)									
8	Competitor 1	\$ 100,000,000	\$ 110,000,000	\$ 11,000,000	\$ 12,000,000					
9	Competitor 2	\$ 90,000,000	\$ 105,000,000	\$ 10,000,000	\$ 11,000,000					
10	Competitor 3	\$ 80,000,000	\$ 95,000,000	\$ 10,000,000	\$ 10,500,000					
11	Median									
12										
13	Stock Index									
14	Stock Index	\$ 800,000,000	\$ 900,000,000	\$ 90,000,000	\$ 100,000,000					
15										
16										
17										
18										
19										
20	Napavale									
21	Direct competitors median multiples									
22	Stock index multiples									
23										
24										
25	Mergers and Acquisitions Comparables									
26										
27										
28										
29	Valuation (Price)									
30										
31	Target Companies									
32	Company 1	\$ 75,000,000	\$ 80,000,000	\$ 8,000,000	\$ 80,000,000					
33	Company 2	\$ 60,000,000	\$ 71,000,000	\$ 7,500,000	\$ 70,000,000					
34	Company 3	\$ 55,000,000	\$ 62,000,000	\$ 7,000,000	\$ 90,000,000					
35	Median									
36										

Multiple of Projected (Next 4 Quarters):

	Sales	Net Income	Free Cash Flows	Sales	Net Income	Free Cash Flows
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						

Valuation Based Upon Median Multiples and Projected (Next 4 Quarters):

	Sales	Net Income	Free Cash Flows
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
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23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36			

Mergers and Acquisitions Comparables

	Sales	Net Income	Assets	Sales	Net Income	Assets
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
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24						
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26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						

FIGURE Q13.3 Data for Fictitious Companies and Fictitious Index of Stocks

FigQ13.4 - Microsoft Excel

	A	B	C	D	E	F	G	H	I	J
1	Public Company Comparables									
2										
3										
4										
5										
6										
7	Direct Competitors									
8	Competitor 1	\$ 100,000,000	\$ 110,000,000	\$ 11,000,000	\$ 12,000,000					
9	Competitor 2	\$ 90,000,000	\$ 105,000,000	\$ 10,000,000	\$ 11,000,000					
10	Competitor 3	\$ 89,000,000	\$ 95,000,000	\$ 10,000,000	\$ 10,500,000					
11	Median									
12										
13	Stock Index									
14	Stock Index	\$ 800,000,000	\$ 900,000,000	\$ 90,000,000	\$ 100,000,000					
15										
16										
17										
18										
19										
20	Mergers and Acquisitions Comparables									
21										
22	Direct competitors median multiples									
23	Stock index multiples									
24										
25	Mergers and Acquisitions Comparables									
26										
27										
28										
29										
30										
31	Target Companies									
32	Company 1	\$ 75,000,000	\$ 80,000,000	\$ 8,000,000	\$ 80,000,000					
33	Company 2	\$ 60,000,000	\$ 71,000,000	\$ 7,500,000	\$ 70,000,000					
34	Company 3	\$ 55,000,000	\$ 62,000,000	\$ 7,000,000	\$ 60,000,000					
35	Median									

FIGURE Q13.4 Data for Fictitious Mergers and Acquisitions Transactions

FigQ13.5 - Microsoft Excel

	A	B	C	D	E	F
1	Valuation					
2	Technique		Valuation	Relative Weight	Weighted Valuation	
3	Discounted cash flow			60.0%	\$ -	
4	Public company comparables			20.0%	\$ -	
5	Mergers and acquisitions comparables			20.0%	\$ -	
6	Total			100.0%	\$ -	
7						

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).

CHAPTER 14

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

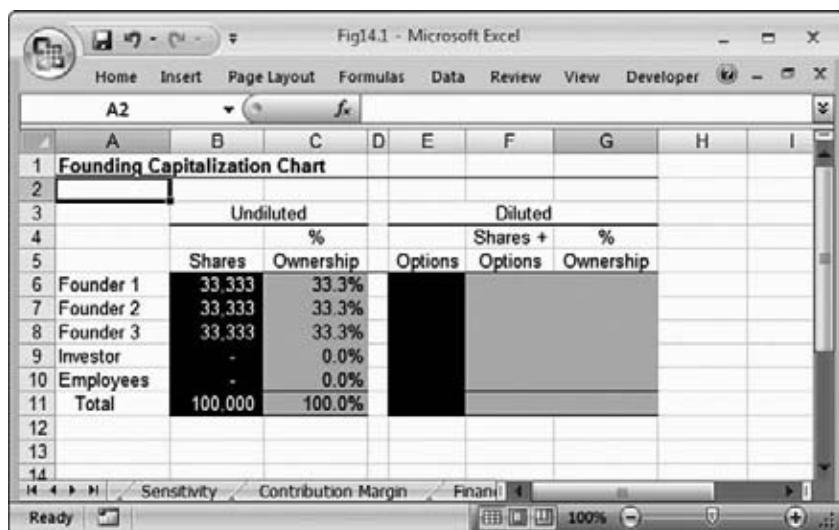


FIGURE 14.1 Founding Cap Chart

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.

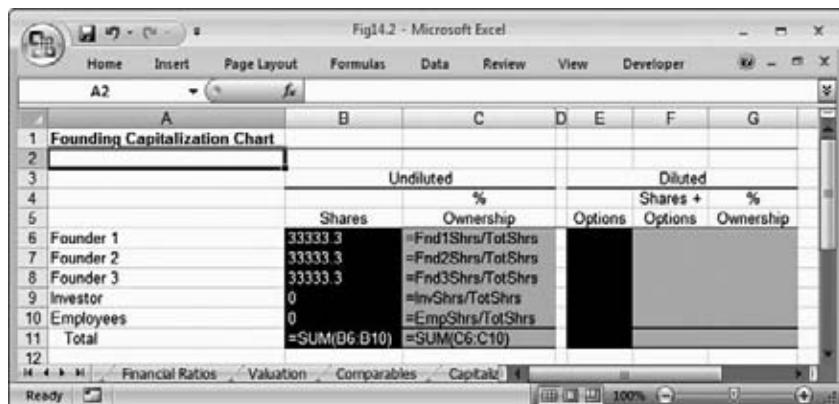


FIGURE 14.2 Alternative View of the Founding Cap Chart

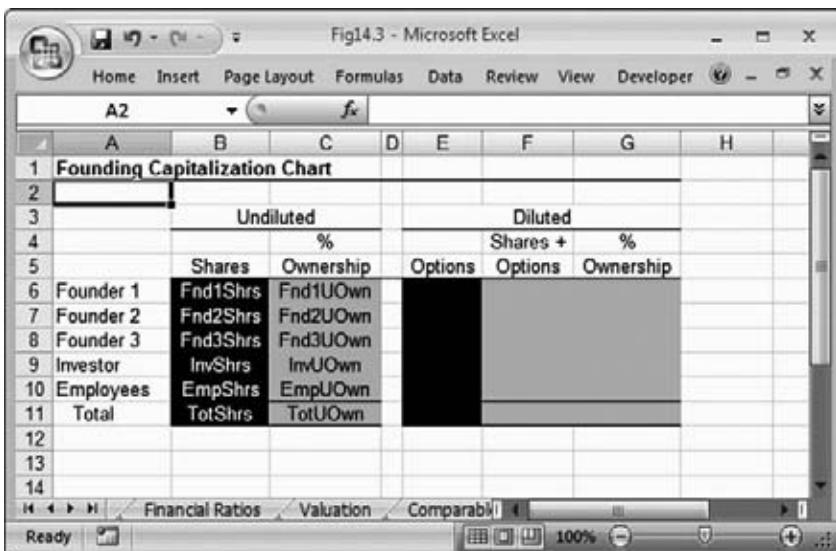


FIGURE 14.3 Names of the Input and Output Cells Underlying the Founding Cap Chart

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

	A	Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
1						
2						
3	CASH BUDGET					
4	Beginning cash balance	\$ -	\$ 982,272	\$ 1,260,656	\$ 1,541,236	\$ -
5	Cash receipts					
6	Collections from customers	866,667	1,381,333	1,866,400	2,441,600	5,556,000
7	Total cash available, before financing	\$ 866,667	\$ 2,363,605	\$ 3,127,056	\$ 3,982,836	N/A
8	Cash disbursements					
9	Purchases disbursements	\$ 176,444	\$ 294,489	\$ 365,400	\$ 439,133	\$ 1,275,467
10	Operating expenses	590,400	634,400	896,120	994,400	3,115,320
11	Tax expense	72,551	178,185	229,300	369,023	849,058
12	Capital expenditures	45,000	45,000	45,000	45,000	180,000
13	Total disbursements	\$ 884,395	\$ 1,152,074	\$ 1,535,820	\$ 1,847,556	\$ 5,419,845
14						
15	Minimum cash balance desired	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	N/A
16	Total cash needed	\$ 1,134,395	\$ 1,402,074	\$ 1,785,820	\$ 2,097,556	N/A
17	Excess (deficiency) of total cash available over					
18	Total cash needed before financing	\$ (267,728)	\$ 961,631	\$ 1,341,236	\$ 1,885,280	N/A
19	Financing					
20	Equity investment	\$ 1,000,000	\$ -	\$ -	\$ -	\$ 1,000,000
21	Borrowing (at beginning of quarter)	-	50,000	-	-	50,000
22	Repayments (at end of quarter)	-	-	(50,000)	-	(50,000)
23	Interest	-	(875)	-	-	(875)
24	Total cash increase (decrease) from financing	\$ 1,000,000	\$ 49,125	\$ (50,000)	\$ -	\$ 99,125
25						
26	Ending cash balance	\$ 982,272	\$ 1,260,656	\$ 1,541,236	\$ 2,135,280	\$ 2,135,280
27						

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

A	B1	Fig14.5 - Microsoft Excel			
		B	C	D	E
1	Valuation			Relative	Weighted
2	Technique			Weight	Valuation
3	Discounted cash flow	\$ 7,601,220		60.0%	\$ 4,560,732
4	Public company comparables	\$ 4,753,103		20.0%	\$ 950,621
5	Mergers and acquisitions comparables	\$ 5,237,920		20.0%	\$ 1,047,584
6	Total			100.0%	\$ 6,558,937
7					

FIGURE 14.5 Valuation Worksheet

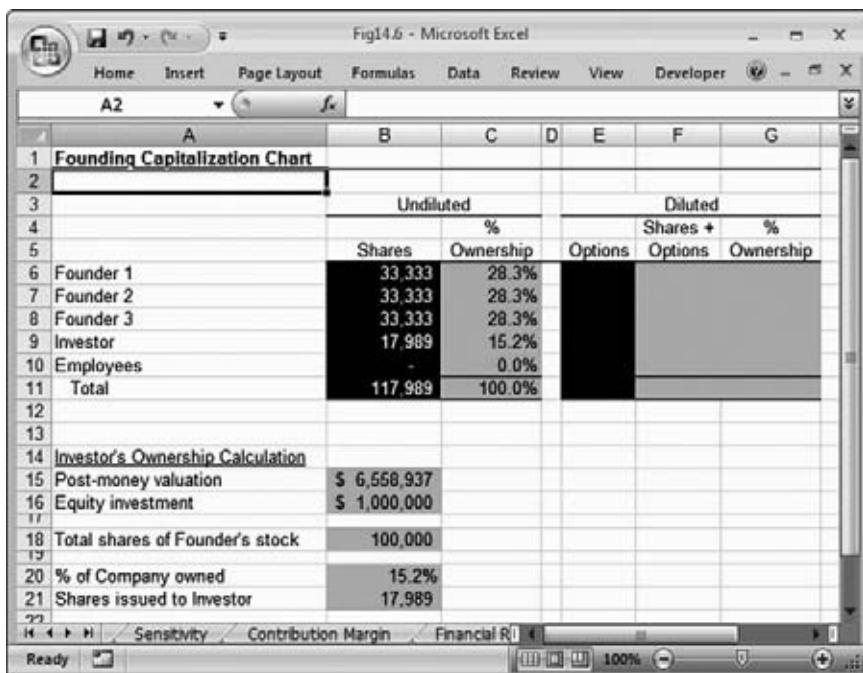


FIGURE 14.6 Calculation Related to Post-Money Valuation

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

$$p = \frac{i}{v}$$

$$f = (1 - p) \times t$$

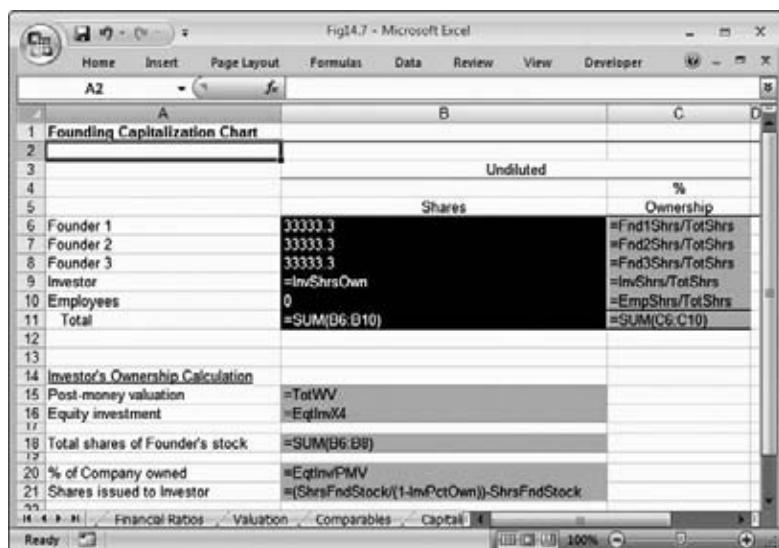


FIGURE 14.7 Alternative View of the Calculation Related to Post-Money Valuation

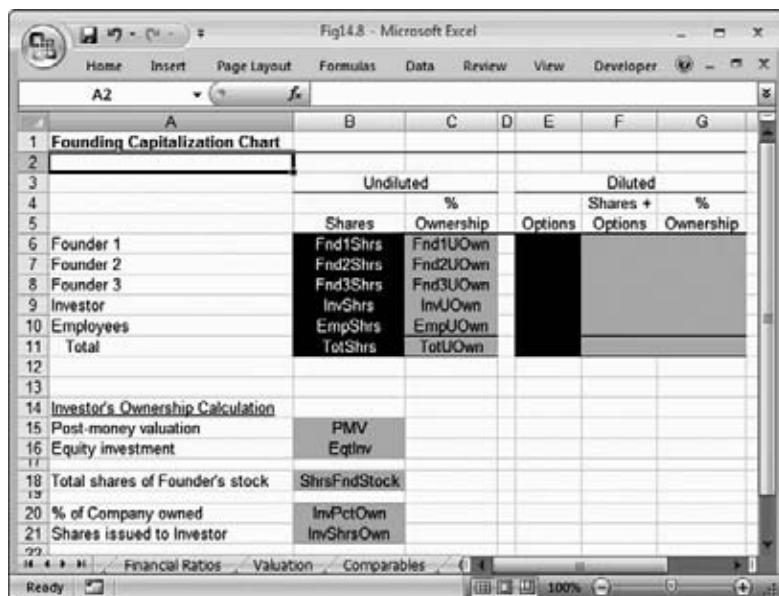


FIGURE 14.8 Names of the Input and Output Cells Underlying the Calculation Related to Post-Money Valuation

$$t = \frac{f}{(1 - p)}$$

$$s = t - f$$

$$s = \left[\frac{f}{(1 - p)} \right] - f$$

STOCK OPTIONS' EFFECT ON CAPITALIZATION CHART

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).

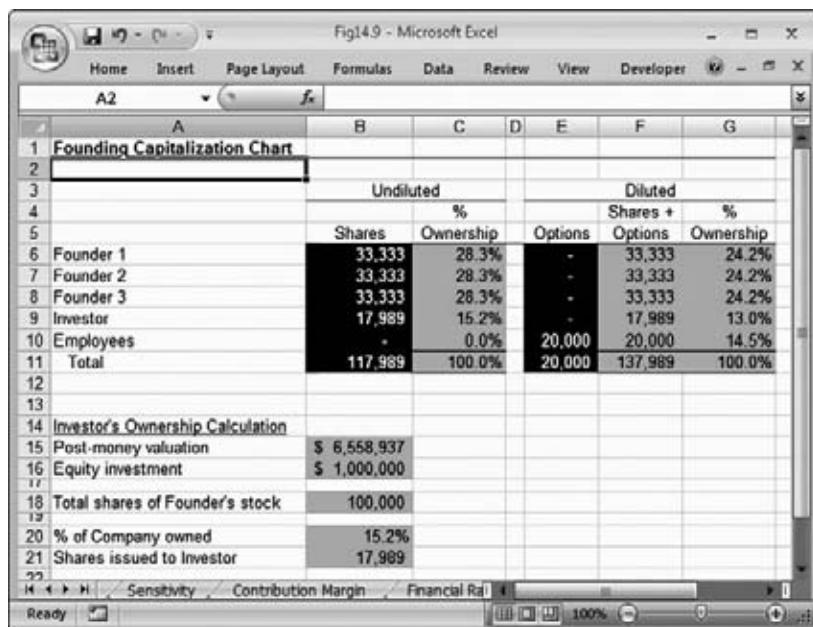


FIGURE 14.9 Updated Cap Chart

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.

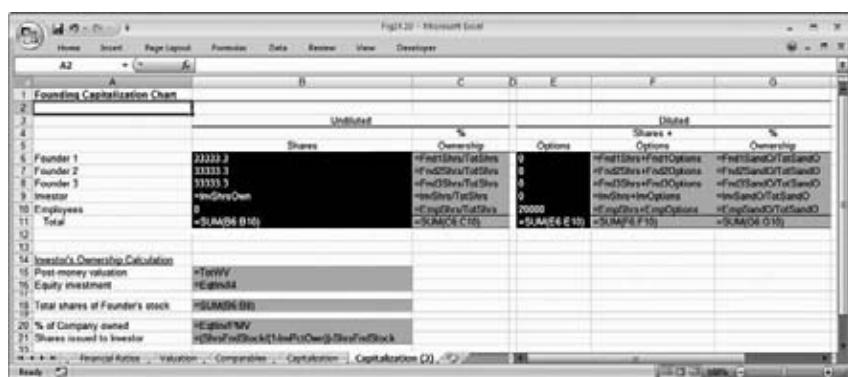


FIGURE 14.10 Alternative View of the Updated Cap Chart

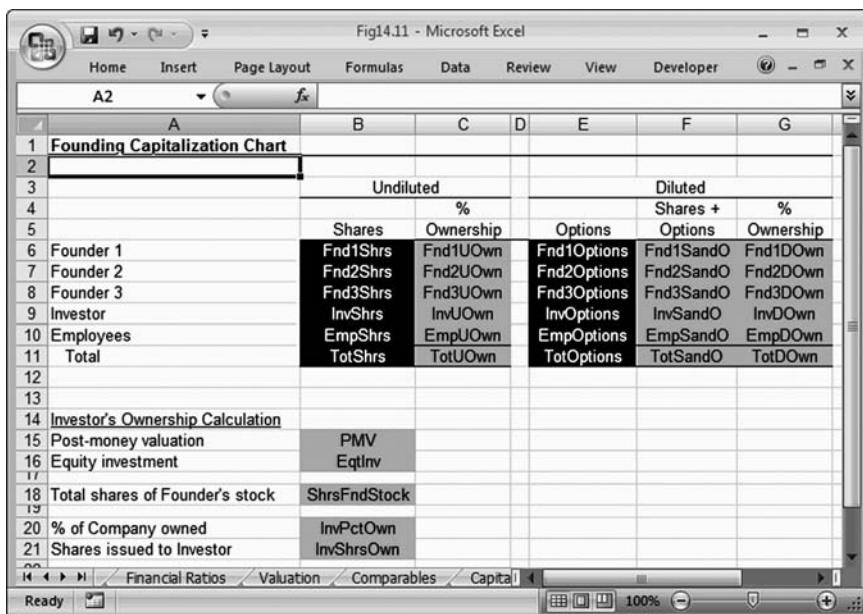


FIGURE 14.11 Names of the Input and Output Cells Underlying the Updated Cap Chart

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.

	A	B	C	D	E	F	G
		Period					
		1Q X4	2Q X4	3Q X4	4Q X4		X4
92	Cash Worksheet						
93	Cash Inputs						
94	Minimum cash balance desired	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000		
95							
96	Equity investment (incremental)	\$ 250,000	\$ -	\$ -	\$ -		
97	Borrowing/loan (incremental)	\$ -	\$ -	\$ -	\$ -		
98	Repayments of borrowing (incremental)	\$ -	\$ -	\$ -	\$ -		
99							

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

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4		X4
2	CASH BUDGET						
3	Beginning cash balance	\$ -	\$ 783,503	\$ 1,639,041	\$ 2,992,164	\$ -	
4	Cash receipts						
5	Collections from customers	\$ 5,833,333	\$ 8,083,333	\$ 8,541,667	\$ 8,570,556		\$ 31,028,889
6	Total cash available, before financing	\$ 5,833,333	\$ 8,866,637	\$ 10,180,708	\$ 11,562,719		N/A
7	Cash disbursements						
8	Purchases disbursements	\$ 2,760,093	\$ 4,425,528	\$ 4,052,074	\$ 4,139,878		\$ 15,377,572
9	Operating expenses	1,776,800	1,934,300	2,313,400	2,384,000		8,408,500
10	Tax expense	724,938	824,968	784,070	697,025		3,031,000
11	Capital expenditures	38,000	43,000	39,000	40,000		160,000
12	Total disbursements	\$ 5,299,830	\$ 7,227,795	\$ 7,188,544	\$ 7,260,903		\$ 26,977,072
13							
14	Minimum cash balance desired	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000		N/A
15	Total cash needed	\$ 5,549,830	\$ 7,477,795	\$ 7,438,544	\$ 7,510,903		N/A
16	Excess (deficiency) of total cash available over total cash needed before financing	\$ 263,503	\$ 1,389,041	\$ 2,742,164	\$ 4,051,817		N/A
17	Financing						
18	Equity investment	\$ 250,000	\$ -	\$ -	\$ -		\$ 250,000
19	Borrowing (at beginning of quarter)	-	-	-	-		-
20	Repayments (at end of quarter)	-	-	-	-		-
21	Interest	-	-	-	-		-
22	Total cash increase (decrease) from financing	\$ 260,000	\$ -	\$ -	\$ -		\$ 250,000
23							
24	Ending cash balance	\$ 783,503	\$ 1,639,041	\$ 2,992,164	\$ 4,301,817		\$ 4,301,817
25							
26							

FIGURE Q14.2 Company 456's Cash Budget

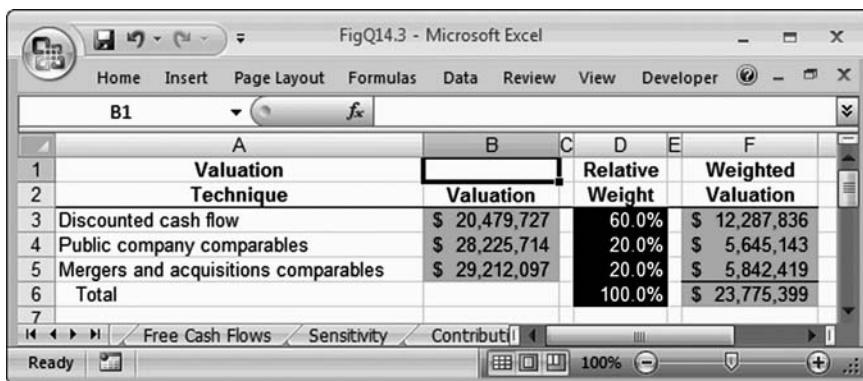


FIGURE Q14.3 Company 456's Valuation Worksheet

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.

FigA2.1 - Microsoft Excel

	A	B	C	D	E	F	G
1		Period					
2		1Q X5	2Q X5	3Q X5	4Q X5	X5	
3	Sales and Collections Worksheet						
4	Unit Sales and Price Inputs						
5	Unit sales	10,500	15,250	25,000	31,200		
6	Price per unit	\$ 3,100	\$ 3,050	\$ 3,000	\$ 2,910		
7							

Assumptions and Dashboard Sheet1 100%

FIGURE A2.1 Assumptions and Dashboard Worksheet for Company XYZ

FigA2.2 - Microsoft Excel

	A	B	C	D	E	F	G
1		Period					
2		1Q X5	2Q X5	3Q X5	4Q X5	X5	
3	SALES BUDGET						
4	Unit Sales and Price Budget						
5	Unit sales	10,500	15,250	25,000	31,200		\$ 81,950
6	x Price per unit	\$ 3,100	\$ 3,050	\$ 3,000	\$ 2,910		N/A
7	= Total sales	\$ 32,550,000	\$ 46,512,500	\$ 75,000,000	\$ 90,792,000		\$ 244,854,500
8							

Assumptions and Dashboard Sales and Collections Sheet1 100%

FIGURE A2.2 Unit Sales and Price Budget for Company XYZ

FigA2.3 - Microsoft Excel

	A	B	C	D	E	F	G
1		Period					
2		1Q X5	2Q X5	3Q X5	4Q X5	X5	
3	Sales and Collections Worksheet						
4	Unit Sales and Price Inputs						
5	Unit sales	10,500	15,250	25,000	31,200		
6	Price per unit	\$ 3,100	\$ 3,050	\$ 3,000	\$ 2,910		
7							
8	Sales Composition Inputs						
9	Cash sales as a % of total sales	100%	90%	70%	50%		
10	Credit sales as a % of total sales	0%	10%	30%	50%		
11							

Assumptions and Dashboard Sales and Collections Sheet1 100%

FIGURE A2.3 Updated Assumptions and Dashboard Worksheet for Company XYZ

	A	B	C	D	E	F	G
		Period					
1	A1	1Q X5	2Q X5	3Q X5	4Q X5	X5	
SALES BUDGET							
Unit Sales and Price Budget							
5	Unit sales	10,500	15,250	25,000	31,200		81,950
6	x Price per unit	\$ 3,100	\$ 3,050	\$ 3,000	\$ 2,910		N/A
7	= Total sales	\$ 32,550,000	\$ 46,512,500	\$ 75,000,000	\$ 90,792,000		\$ 244,854,500
Sales Composition Budget							
10	Cash sales	\$ 32,550,000	\$ 41,861,250	\$ 52,500,000	\$ 45,396,000		\$ 172,307,250
11	+ Credit sales	-	4,651,250	22,500,000	45,396,000		72,547,250
12	= Total sales	\$ 32,550,000	\$ 46,512,500	\$ 75,000,000	\$ 90,792,000		\$ 244,854,500
13							

FIGURE A2.4 Sales Composition Budget for Company XYZ

- The updated Assumptions and Dashboard worksheet for Company XYZ is shown in Figure A2.5.
- The Cash Collections from Customers Budget for Company XYZ is shown in Figure A2.6.
- The Accounts Receivable Budget and updated Cash Collections from Customers Budget for Company XYZ is shown in Figure A2.7.

	A	B	C	D	E	F	G
1	A1	1Q X5	2Q X5	3Q X5	4Q X5	X5	
Sales and Collections Worksheet							
Unit Sales and Price Inputs							
5	Unit sales	10,500	15,250	25,000	31,200		
6	Price per unit	\$ 3,100	\$ 3,050	\$ 3,000	\$ 2,910		
Sales Composition Inputs							
9	Cash sales as a % of total sales	100%	90%	70%	50%		
10	Credit sales as a % of total sales	0%	10%	30%	50%		
11							
12	Days receivable (DSO)	20	25	30	30		
13	Days per quarter	90	90	90	90		
14							

FIGURE A2.5 Updated Assumptions and Dashboard Worksheet for Company XYZ

FigA2.6 - Microsoft Excel

	A	B	C	D	E	F	G
1	A1	1Q X5	2Q X5	3Q X5	4Q X5	X5	Period
3	SALES BUDGET						
4	<i>Unit Sales and Price Budget</i>						
5	Unit sales	10,500	15,250	25,000	31,200		81,950
6	x Price per unit	\$ 3,100	\$ 3,050	\$ 3,000	\$ 2,910	N/A	
7	= Total sales	\$ 32,550,000	\$ 46,512,500	\$ 75,000,000	\$ 90,792,000		\$ 244,854,500
9	<i>Sales Composition Budget</i>						
10	Cash sales	\$ 32,550,000	\$ 41,861,250	\$ 52,500,000	\$ 45,396,000		\$ 172,307,250
11	+ Credit sales	-	4,651,250	22,500,000	45,396,000		72,547,250
12	= Total sales	\$ 32,550,000	\$ 46,512,500	\$ 75,000,000	\$ 90,792,000		\$ 244,854,500
13							
14	COLLECTIONS BUDGET						
15	<i>Cash Collections from Customers Budget</i>						
16	Cash sales this period	\$ 32,550,000	\$ 41,861,250	\$ 52,500,000	\$ 45,396,000		\$ 172,307,250
17	+ Credit sales collected	-	4,651,250	22,500,000	45,396,000		72,547,250
18	= Total collections	\$ 32,550,000	\$ 41,861,250	\$ 52,500,000	\$ 45,396,000		\$ 172,307,250
19							

FIGURE A2.6 Cash Collections from Customers Budget for Company XYZ

FigA2.7 - Microsoft Excel

	A	B	C	D	E	F	G
1	A1	1Q X5	2Q X5	3Q X5	4Q X5	X5	Period
3	SALES BUDGET						
4	<i>Unit Sales and Price Budget</i>						
5	Unit sales	10,500	15,250	25,000	31,200		81,950
6	x Price per unit	\$ 3,100	\$ 3,050	\$ 3,000	\$ 2,910	N/A	
7	= Total sales	\$ 32,550,000	\$ 46,512,500	\$ 75,000,000	\$ 90,792,000		\$ 244,854,500
9	<i>Sales Composition Budget</i>						
10	Cash sales	\$ 32,550,000	\$ 41,861,250	\$ 52,500,000	\$ 45,396,000		\$ 172,307,250
11	+ Credit sales	-	4,651,250	22,500,000	45,396,000		72,547,250
12	= Total sales	\$ 32,550,000	\$ 46,512,500	\$ 75,000,000	\$ 90,792,000		\$ 244,854,500
13							
14	COLLECTIONS BUDGET						
15	<i>Cash Collections from Customers Budget</i>						
16	Cash sales this period	\$ 32,550,000	\$ 41,861,250	\$ 52,500,000	\$ 45,396,000		\$ 172,307,250
17	+ Credit sales collected	-	3,359,236	16,292,014	37,764,000		57,415,250
18	= Total collections	\$ 32,550,000	\$ 45,220,486	\$ 68,792,014	\$ 83,160,000		\$ 229,722,500
19							
20	Accounts Receivable (A/R) Budget						
21	Beginning A/R balance	\$ -	\$ -	\$ 1,292,014	\$ 7,500,000		\$ -
22	+ Additions to A/R	-	1,292,014	7,500,000	15,132,000		23,924,014
23	- Subtractions from A/R	-	-	1,292,014	7,500,000		8,792,014
24	= Ending A/R balance	\$ -	\$ 1,292,014	\$ 7,500,000	\$ 15,132,000		\$ 15,132,000
25							

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.

FigA3.1 - Microsoft Excel

	A	B	C	D	E	F	G
1		Period					
2		1Q X6	2Q X6	3Q X6	4Q X6		X6
COST-OF-GOODS SOLD BUDGET							
<i>Cost-of-Goods Sold Budget</i>							
5	Desk top	\$ 1,000,000	\$ 1,027,125	\$ 1,055,000	\$ 1,103,375	\$ 4,185,500	
6	Desk body	1,300,000	1,328,000	1,318,750	1,433,250	5,380,000	
7	Assembly labor	500,000	518,750	527,500	568,750	2,115,000	
8	Total cost-of-goods sold	\$ 2,800,000	\$ 2,873,875	\$ 2,901,250	\$ 3,105,375	\$ 11,680,500	

FIGURE A3.1 Cost-of-Goods-Sold Budget for Company ABC

FigA3.2 - Microsoft Excel

	A	B	C	D	E	F	G
1		Period					
2		1Q X6	2Q X6	3Q X6	4Q X6		X6
INVENTORY BUDGET							
<i>Inventory Budget</i>							
5	Desired ending inventory	\$ 476,979	\$ 548,014	\$ 655,579	\$ 655,579	N/A	
6	+ Cost of goods sold	2,800,000	2,873,875	2,901,250	3,105,375	11,680,500	
7	= Total inventory needed	\$ 3,276,979	\$ 3,421,889	\$ 3,556,829	\$ 3,760,954	N/A	
PURCHASES BUDGET							
<i>Purchases Budget</i>							
11	Total inventory needed						
12	- Beginning inventory						
13	= Purchases						
Disbursements for Purchases Budget							
<i>Payments of payables</i>							
17	Total disbursements for purchases						
Accounts Payable (A/P) Budget							
20	Beginning A/P balance						
21	+ Additions to A/P						
22	- Subtractions from A/P						
23	Ending A/P						

FIGURE A3.2 Inventory Budget for Company ABC

	A	B	C	D	E	F	G
		Period					
		1Q X6	2Q X6	3Q X6	4Q X6		X6
3	INVENTORY BUDGET						
4	Inventory Budget						
5	Desired ending inventory	\$ 478,979	\$ 548,014	\$ 655,579	\$ 655,579	N/A	
6	+ Cost of goods sold	2,800,000	2,873,875	2,901,250	3,105,375	11,680,500	
7	= Total inventory needed	\$ 3,278,979	\$ 3,421,889	\$ 3,556,829	\$ 3,760,954	N/A	
8							
9	PURCHASES BUDGET						
10	Purchases Budget						
11	Total inventory needed	\$ 3,278,979	\$ 3,421,889	\$ 3,556,829	\$ 3,760,954	N/A	
12	- Beginning inventory	-	478,979	548,014	655,579	-	
13	= Purchases	\$ 3,278,979	\$ 2,942,910	\$ 3,008,815	\$ 3,105,375	N/A	
14							
15	Disbursements for Purchases Budget						
16	Payments of payables						
17	Total disbursements for purchases						
18							
19	Accounts Payable (A/P) Budget						
20	Beginning A/P balance	\$ -	\$ 874,394	\$ 1,046,368	\$ 1,036,370	\$ -	
21	+ Additions to A/P	874,394	1,046,368	1,036,370	1,104,133	4,061,265	
22	- Subtractions from A/P	-	874,394	1,046,368	1,036,370	2,957,132	
23	Ending A/P	\$ 874,394	\$ 1,046,368	\$ 1,036,370	\$ 1,104,133	\$ 1,104,133	
24							

FIGURE A3.3 Purchases Budget for Company ABC

	A	B	C	D	E	F	G
		Period					
		1Q X6	2Q X6	3Q X6	4Q X6		X6
3	INVENTORY BUDGET						
4	Inventory Budget						
5	Desired ending inventory	\$ 478,979	\$ 548,014	\$ 655,579	\$ 655,579	N/A	
6	+ Cost of goods sold	2,800,000	2,873,875	2,901,250	3,105,375	11,680,500	
7	= Total inventory needed	\$ 3,278,979	\$ 3,421,889	\$ 3,556,829	\$ 3,760,954	N/A	
8							
9	PURCHASES BUDGET						
10	Purchases Budget						
11	Total inventory needed	\$ 3,278,979	\$ 3,421,889	\$ 3,556,829	\$ 3,760,954	N/A	
12	- Beginning inventory	-	478,979	548,014	655,579	-	
13	= Purchases	\$ 3,278,979	\$ 2,942,910	\$ 3,008,815	\$ 3,105,375	N/A	
14							
15	Disbursements for Purchases Budget						
16	Payments of payables						
17	Total disbursements for purchases						
18							
19	Accounts Payable (A/P) Budget						
20	Beginning A/P balance	\$ -	\$ 874,394	\$ 1,046,368	\$ 1,036,370	\$ -	
21	+ Additions to A/P	874,394	1,046,368	1,036,370	1,104,133	4,061,265	
22	- Subtractions from A/P	-	874,394	1,046,368	1,036,370	2,957,132	
23	Ending A/P	\$ 874,394	\$ 1,046,368	\$ 1,036,370	\$ 1,104,133	\$ 1,104,133	
24							

FIGURE A3.4 Accounts Payable Budget for Company ABC

	A	B	C	D	E	F	G
		1Q X6	2Q X6	3Q X6	4Q X6		X6
1							
2							
3	INVENTORY BUDGET						
4	Inventory Budget						
5	Desired ending inventory	\$ 478,979	\$ 548,014	\$ 655,579	\$ 655,579		N/A
6	+ Cost of goods sold	2,800,000	2,873,875	2,901,250	3,105,375		11,680,500
7	= Total inventory needed	\$ 3,278,979	\$ 3,421,889	\$ 3,556,829	\$ 3,760,954		N/A
8							
9	PURCHASES BUDGET						
10	Purchases Budget						
11	Total inventory needed	\$ 3,278,979	\$ 3,421,889	\$ 3,556,829	\$ 3,760,954		N/A
12	- Beginning inventory	-	478,979	548,014	655,579		-
13	= Purchases	\$ 3,278,979	\$ 2,942,910	\$ 3,008,815	\$ 3,105,375		N/A
14							
15	Disbursements for Purchases Budget						
16	Payments of payables	\$ 2,404,585	\$ 2,770,936	\$ 3,018,813	\$ 3,037,611		\$ 11,231,946
17	Total disbursements for purchases	\$ 2,404,585	\$ 2,770,936	\$ 3,018,813	\$ 3,037,611		\$ 11,231,946
18							
19	Accounts Payable (A/P) Budget						
20	Beginning A/P balance	\$ -	\$ 874,394	\$ 1,046,368	\$ 1,036,370		\$ -
21	+ Additions to A/P	874,394	1,046,368	1,036,370	1,104,133		4,061,265
22	- Subtractions from A/P	-	874,394	1,046,368	1,036,370		2,957,132
23	Ending A/P	\$ 874,394	\$ 1,046,368	\$ 1,036,370	\$ 1,104,133		\$ 1,104,133
24							

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.

FigA4.1 - Microsoft Excel

Period

	1Q X4	2Q X4	3Q X4	4Q X4	X4
HEADCOUNT BUDGET					
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	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	
Total	17	18	22	24	
Periodic base salaries					
Chief Executive Officer	\$ 43,750	\$ 43,750	\$ 43,750	\$ 43,750	\$ 175,000
Chief Financial Officer	37,500	37,500	37,500	37,500	150,000
VP, Engineering	37,500	37,500	37,500	37,500	150,000
VP, Sales & Marketing	33,750	33,750	33,750	33,750	135,000
VP, Business Development	31,250	31,250	31,250	31,250	125,000
Salesperson	25,000	25,000	25,000	25,000	100,000
Hardware Engineer	22,500	22,500	22,500	22,500	90,000
Controller/Accountant	11,250	11,250	11,250	11,250	45,000
Administrative Assistant	7,500	7,500	7,500	7,500	30,000
Total	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 1,000,000

Headcount Overview Headcount Cost Operl

FIGURE A4.1 Headcount Overview Worksheet for Company DEF

FigA4.2 - Microsoft Excel

Period

	1Q X4	2Q X4	3Q X4	4Q X4	X4
HEADCOUNT BUDGET					
Headcount Budget					
Periodic salary expense (base)					
Chief Executive Officer	\$ 43,750	\$ 43,750	\$ 43,750	\$ 43,750	\$ 175,000
Chief Financial Officer	37,500	37,500	37,500	37,500	150,000
VP, Engineering	37,500	37,500	37,500	37,500	150,000
VP, Sales & Marketing	33,750	33,750	33,750	33,750	135,000
VP, Business Development	31,250	31,250	31,250	31,250	125,000
Salesperson	125,000	125,000	175,000	200,000	625,000
Hardware Engineer	90,000	90,000	112,500	112,500	405,000
Controller/Accountant	11,250	22,500	22,500	22,500	78,750
Administrative Assistant	15,000	15,000	22,500	30,000	82,500
Total	\$ 425,000	\$ 436,250	\$ 516,250	\$ 548,750	\$ 1,926,250
Total (with benefits)	\$ 488,750	\$ 501,688	\$ 593,688	\$ 631,063	\$ 2,215,188

Headcount Overview Headcount Cost Operl

FIGURE A4.2 Headcount Cost Worksheet for Company DEF

FigA4.3 - Microsoft Excel

	A	B	C	D	E	F	G
1					Period		
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
OPERATING EXPENSES BUDGET							
4 Operating Expenses Budget							
5 Salaries	\$ 488,750	\$ 501,688	\$ 593,688	\$ 631,063	\$ 2,215,188		
6 Miscellaneous expenses	40,000	36,400	42,120	36,575	155,095		
7 Research and development	100,000	104,000	105,300	104,500	413,800		
8 Rent	20,250	20,250	20,250	20,250	81,000		
9 Depreciation	-	-	-	-	-		
10 Total operating expenses	\$ 649,000	\$ 662,338	\$ 761,358	\$ 792,388	\$ 2,865,083		
11							
DISBURSEMENTS FOR OPERATING EXPENSES BUDGET							
13 Disbursements for Operating Expenses Budget							
14 Salaries							
15 Miscellaneous expenses							
16 Research and development							
17 Rent							
18 Depreciation							
19 Total disbursements for operating expenses							
20							

FIGURE A4.3 Operating Expenses Budget for Company DEF

FigA4.4 - Microsoft Excel

	A	B	C	D	E	F	G
1					Period		
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
OPERATING EXPENSES BUDGET							
4 Operating Expenses Budget							
5 Salaries	\$ 488,750	\$ 501,688	\$ 593,688	\$ 631,063	\$ 2,215,188		
6 Miscellaneous expenses	40,000	36,400	42,120	36,575	155,095		
7 Research and development	100,000	104,000	105,300	104,500	413,800		
8 Rent	20,250	20,250	20,250	20,250	81,000		
9 Depreciation	-	-	-	-	-		
10 Total operating expenses	\$ 649,000	\$ 662,338	\$ 761,358	\$ 792,388	\$ 2,865,083		
11							
DISBURSEMENTS FOR OPERATING EXPENSES BUDGET							
13 Disbursements for Operating Expenses Budget							
14 Salaries							
15 Miscellaneous expenses							
16 Research and development							
17 Rent							
18 Depreciation							
19 Total disbursements for operating expenses							
20							

FIGURE A4.4 Disbursements for Operating Expenses Budget for Company DEF

CHAPTER 5 Operating Budget—Income Statement

- The first section of the Income Statement for Company GHI is shown in Figure A5.1.
- The updated Income Statement for Company GHI is shown in Figure A5.2.
- The updated Income Statement for Company GHI is shown in Figure A5.3.
- The updated Income Statement for Company GHI is shown in Figure A5.4.

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4		X4
2	Sales	\$ 2,200,000	\$ 2,160,000	\$ 2,133,000	\$ 2,093,500		\$ 8,586,500
3	Cost of goods sold	1,072,500	1,026,000	950,400	927,500		3,976,400
5	Gross profit	\$ 1,127,500	\$ 1,134,000	\$ 1,182,600	\$ 1,166,000		\$ 4,610,100
6							
7	Salaries						
8	Miscellaneous expenses						
9	Research and development						
10	Rent						
11	Depreciation						
12	Income from operations						
13							
14	Interest expense						
15	Taxable income						
16							
17	Tax expense						
18	Net income						
19							

FIGURE A5.1 First Section of the Income Statement for Company GHI

	A	B	C	D	E	F	G
		Period					
1		1Q X4	2Q X4	3Q X4	4Q X4		X4
2	Sales	\$ 2,200,000	\$ 2,160,000	\$ 2,133,000	\$ 2,093,500		\$ 8,586,500
3	Cost of goods sold	1,072,500	1,026,000	950,400	927,500		3,976,400
5	Gross profit	\$ 1,127,500	\$ 1,134,000	\$ 1,182,600	\$ 1,166,000		\$ 4,610,100
6							
7	Salaries	\$ 459,650	\$ 487,200	\$ 516,200	\$ 611,900		\$ 2,074,950
8	Miscellaneous expenses						
9	Research and development						
10	Rent						
11	Depreciation						
12	Income from operations						
13							
14	Interest expense						\$ -
15	Taxable income						
16							
17	Tax expense						
18	Net income						
19							

FIGURE A5.2 Updated Income Statement for Company GHI

FigA5.3 - Microsoft Excel

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Sales	\$ 2,200,000	\$ 2,160,000	\$ 2,133,000	\$ 2,093,500		\$ 8,586,500
4	Cost of goods sold	1,072,500	1,026,000	950,400	927,500		3,976,400
5	Gross profit	\$ 1,127,500	\$ 1,134,000	\$ 1,182,600	\$ 1,166,000		\$ 4,610,100
6							
7	Salaries	\$ 459,650	\$ 487,200	\$ 516,200	\$ 611,900		\$ 2,074,950
8	Miscellaneous expenses	88,000	97,200	106,650	94,208		386,058
9	Research and development	132,000	140,400	149,310	157,013		578,723
10	Rent	15,750	15,750	15,750	15,750		63,000
11	Depreciation						-
12	Income from operations	\$ 432,100	\$ 393,450	\$ 394,690	\$ 287,130		\$ 1,507,370
13							
14	Interest expense						\$ -
15	Taxable income						
16							
17	Tax expense						
18	Net income						

FIGURE A5.3 Updated Income Statement for Company GHI

FigA5.4 - Microsoft Excel

	A	B	C	D	E	F	G
1		Period					
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	Sales	\$ 2,200,000	\$ 2,160,000	\$ 2,133,000	\$ 2,093,500		\$ 8,586,500
4	Cost of goods sold	1,072,500	1,026,000	950,400	927,500		3,976,400
5	Gross profit	\$ 1,127,500	\$ 1,134,000	\$ 1,182,600	\$ 1,166,000		\$ 4,610,100
6							
7	Salaries	\$ 459,650	\$ 487,200	\$ 516,200	\$ 611,900		\$ 2,074,950
8	Miscellaneous expenses	88,000	97,200	106,650	94,208		386,058
9	Research and development	132,000	140,400	149,310	157,013		578,723
10	Rent	15,750	15,750	15,750	15,750		63,000
11	Depreciation						-
12	Income from operations	\$ 432,100	\$ 393,450	\$ 394,690	\$ 287,130		\$ 1,507,370
13							
14	Interest expense						\$ -
15	Taxable income	\$ 432,100	\$ 393,450	\$ 394,690	\$ 287,130		\$ 1,507,370
16							
17	Tax expense	\$ 138,272	\$ 125,904	\$ 130,248	\$ 94,753		\$ 489,177
18	Net income	\$ 293,828	\$ 267,546	\$ 264,442	\$ 192,377		\$ 1,018,193
19							

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.

FigA6.1 - Microsoft Excel						
A1	B	C	D	E	F	G
1	Period					
2	1Q X4	2Q X4	3Q X4	4Q X4	X4	
3	CAPITAL BUDGET					
4	<u>Capital Expenditures Budget</u>					
5	Equipment	\$ 9,000	\$ 5,000	\$ 3,000	\$ 3,000	\$ 20,000
6	Furniture	2,500	2,500	2,500	2,000	9,500
7	Fixtures	1,500	1,500	1,500	1,500	6,000
8	Total capital expenditures	\$ 13,000	\$ 9,000	\$ 7,000	\$ 6,500	\$ 35,500
9						
10	<u>Disbursements for Capital Expenditures Budget</u>					
11	Equipment					
12	Furniture					
13	Fixtures					
14	Total disbursements for capital expenditures					
15						
16	<u>Depreciation Budget</u>					
17	Equipment					
18	Furniture					
19	Fixtures					
20	Total depreciation					
21						
22	<u>Cumulative capital expenditures</u>					
23	- Accumulated depreciation					
24	= Fixed assets, net of depreciation					
25						

FIGURE A6.1 Capital Expenditures Budget for Company JKL

	A	B	C	D	E	F	G
		Period				X4	
1	A1	1Q X4	2Q X4	3Q X4	4Q X4		
2							
3	CAPITAL BUDGET						
4	Capital Expenditures Budget						
5	Equipment	\$ 9,000	\$ 5,000	\$ 3,000	\$ 3,000	\$ 20,000	
6	Furniture	2,500	2,500	2,500	2,000	9,500	
7	Fixtures	1,500	1,500	1,500	1,500	6,000	
8	Total capital expenditures	\$ 13,000	\$ 9,000	\$ 7,000	\$ 6,500	\$ 35,500	
9							
10	Disbursements for Capital Expenditures Budget						
11	Equipment	\$ 9,000	\$ 5,000	\$ 3,000	\$ 3,000	\$ 20,000	
12	Furniture	2,500	2,500	2,500	2,000	9,500	
13	Fixtures	1,500	1,500	1,500	1,500	6,000	
14	Total disbursements for capital expenditures	\$ 13,000	\$ 9,000	\$ 7,000	\$ 6,500	\$ 35,500	
15							
16	Depreciation Budget						
17	Equipment						
18	Furniture						
19	Fixtures						
20	Total depreciation						
21							
22	Cumulative capital expenditures						
23	- Accumulated depreciation						
24	= Fixed assets, net of depreciation						
25							

FIGURE A6.2 Disbursements for Capital Expenditures Budget for Company JKL

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4		X4
1	A1						
2							
3	CAPITAL BUDGET						
4	Capital Expenditures Budget						
5	Equipment	\$ 9,000	\$ 5,000	\$ 3,000	\$ 3,000	\$ 20,000	
6	Furniture	2,500	2,500	2,500	2,000	9,500	
7	Fixtures	1,500	1,500	1,500	1,500	6,000	
8	Total capital expenditures	\$ 13,000	\$ 9,000	\$ 7,000	\$ 6,500	\$ 35,500	
9							
10	Disbursements for Capital Expenditures Budget						
11	Equipment	\$ 9,000	\$ 5,000	\$ 3,000	\$ 3,000	\$ 20,000	
12	Furniture	2,500	2,500	2,500	2,000	9,500	
13	Fixtures	1,500	1,500	1,500	1,500	6,000	
14	Total disbursements for capital expenditures	\$ 13,000	\$ 9,000	\$ 7,000	\$ 6,500	\$ 35,500	
15							
16	Depreciation Budget						
17	Equipment	\$ 375	\$ 583	\$ 708	\$ 833	\$ 2,500	
18	Furniture	125	250	375	475	1,225	
19	Fixtures	75	150	225	300	750	
20	Total depreciation	\$ 575	\$ 983	\$ 1,308	\$ 1,608	\$ 4,475	
21							
22	Cumulative capital expenditures						
23	- Accumulated depreciation						
24	= Fixed assets, net of depreciation						
25							

FIGURE A6.3 Depreciation Budget for Company JKL

FigA6.4 - Microsoft Excel

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4	X4	Period
1							
2							
3	CASH BUDGET						
4	Beginning cash balance	\$ -	\$ 2,444,444	\$ 5,214,800	\$ 8,140,099	\$ -	
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	\$ 5,214,800	\$ 8,140,099	\$ 11,021,467	N/A	
8	Cash disbursements						
9	Purchases disbursements						
10	Operating expenses						
11	Capital expenditures						
12	Total disbursements						
13		-	-	-	-	-	
14	Minimum cash balance desired						
15	Total cash needed						
16	Excess (deficiency) of total cash available over						
17	total cash needed before financing						
18	Financing						
19	Equity investment						
20	Borrowing (at beginning of quarter)						
21	Repayments (at end of quarter)						
22	Interest						
23	Total cash increase (decrease) from financing						
24							
25	Ending cash balance	\$ 2,444,444	\$ 5,214,800	\$ 8,140,099	\$ 11,021,467	\$ 11,021,467	
26							

FIGURE A6.4 First Section of Company JKL's Cash Budget

FigA6.5 - Microsoft Excel

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4	X4	Period
1							
2							
3	CASH BUDGET						
4	Beginning cash balance	\$ -	\$ 244,989	\$ 134,155	\$ 380,097	\$ -	
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	\$ 3,015,344	\$ 3,059,444	\$ 3,261,475	N/A	
8	Cash disbursements						
9	Purchases disbursements	\$ 1,550,578	\$ 2,217,631	\$ 1,924,070	\$ 1,810,772	\$ 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	\$ 34,155	\$ 280,097	\$ 560,293	N/A	
18	Financing						
19	Equity investment						
20	Borrowing (at beginning of quarter)						
21	Repayments (at end of quarter)						
22	Interest						
23	Total cash increase (decrease) from financing						
24							
25	Ending cash balance	\$ 244,989	\$ 134,155	\$ 380,097	\$ 660,293	\$ 660,293	
26							

FIGURE A6.5 Updated Cash Budget for Company JKL

FigA6.6 - Microsoft Excel

	B	C	D	E	F	G
	1Q X4	2Q X4	3Q X4	4Q X4		X4
1 CASH BUDGET						
2 Beginning cash balance	\$ -	\$ 744,989	\$ 634,155	\$ 904,597	\$ -	
3 Cash receipts						
4 Collections from customers	2,444,444	2,770,356	2,925,289	2,881,378	11,021,467	
5 Total cash available, before financing	\$ 2,444,444	\$ 3,515,344	\$ 3,559,444	\$ 3,785,975	N/A	
6 Cash disbursements						
7 Purchases disbursements	\$ 1,550,578	\$ 2,217,631	\$ 1,924,070	\$ 1,810,772	\$ 7,503,050	
8 Operating expenses	635,878	654,558	748,278	783,810	2,822,624	
9 Capital expenditures	13,000	9,000	7,000	6,500	35,500	
10 Total disbursements	2,199,456	2,881,189	2,679,347	2,601,182	10,361,174	
11 Minimum cash balance desired	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	N/A	
12 Total cash needed	\$ 2,299,456	\$ 2,981,189	\$ 2,779,347	\$ 2,701,182	N/A	
13 Excess (deficiency) of total cash available over total cash needed before financing	\$ 144,989	\$ 534,155	\$ 780,097	\$ 1,084,793	N/A	
14 Financing						
15 Equity investment	\$ 500,000	\$ -	\$ -	\$ -	\$ 500,000	
16 Borrowing (at beginning of quarter)	-	-	25,000	-	25,000	
17 Repayments (at end of quarter)	-	-	(25,000)	-	(25,000)	
18 Interest	-	-	(500)	-	(500)	
19 Total cash increase (decrease) from financing	\$ 500,000	\$ -	\$ 24,500	\$ (25,000)	\$ 499,500	
20 Ending cash balance	\$ 744,989	\$ 634,155	\$ 904,597	\$ 1,159,793	\$ 1,159,793	
21						
22						
23						
24						
25						
26						

FIGURE A6.6 Updated Cash Budget for Company JKL Including Projections Regarding Equity Investments, Borrowings, Repayment of Borrowings, and Interest Expenses

FigA6.7 - Microsoft Excel

	B	C	D	E	F	G
	1Q X4	2Q X4	3Q X4	4Q X4		X4
1 INCOME STATEMENT						
2 Sales	\$ 2,750,000	\$ 2,808,000	\$ 2,834,000	\$ 2,886,000	\$ 11,278,000	
3 Cost of goods sold	2,000,000	1,956,200	1,940,200	1,831,500	7,726,900	
4 Gross profit	\$ 750,000	\$ 852,800	\$ 893,800	\$ 1,054,500	\$ 3,551,100	
5						
6 Salaries	\$ 399,378	\$ 399,378	\$ 490,888	\$ 522,100	\$ 1,811,744	
7 Miscellaneous expenses	82,500	98,280	99,190	101,010	380,980	
8 Research and development	137,500	140,400	141,700	144,300	563,900	
9 Rent	16,500	16,500	16,500	16,500	66,000	
10 Depreciation	575	983	1,308	1,608	4,475	
11 Income from operations	\$ 114,122	\$ 198,242	\$ 145,523	\$ 270,590	\$ 728,476	
12						
13 Interest expense	\$ -	\$ -	\$ 500	\$ -	\$ 500	
14 Taxable income	\$ 114,122	\$ 198,242	\$ 145,023	\$ 270,590	\$ 727,976	
15						
16 Tax expense	\$ 37,090	\$ 66,420	\$ 47,132	\$ 89,295	\$ 238,936	
17 Net income	\$ 77,032	\$ 132,822	\$ 97,890	\$ 181,295	\$ 489,040	
18						
19						

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.

	A	Period				
		B	C	D	E	F
1		1Q X4	2Q X4	3Q X4	4Q X4	X4
2						
3	Assets					
4	Cash	\$ 110,522	\$ 726,552	\$ 1,441,311	\$ 2,154,566	\$ 2,154,566
5	Accounts Receivable	1,035,000	922,350	900,000	780,111	780,111
6	Inventory	461,370	478,133	468,331	468,331	468,331
7	Fixed Assets, net	16,113	28,019	38,028	46,450	46,450
8	Total Assets	\$ 1,623,005	\$ 2,155,054	\$ 2,847,671	\$ 3,449,458	\$ 3,449,458
9						
10						
11	Liabilities					
12	Accounts Payable					
13	Payables from Capital Budget					
14	Loan Payable					
15	Total Liabilities					
16						
17						
18	Owners' Equity					
19	Common Stock					
20	Retained Earnings					
21	Total Owners' Equity					
22						
23	Total Liabilities and Owners' Equity	\$ -	\$ -	\$ -	\$ -	\$ -
24						
25						
26						
27	Net Working Capital (NWC)					
28	Current assets					
29	- Current liabilities					
30	= Net working capital					
31						
32	Beginning NWC					
33	- Ending NWC					
34	= Change in NWC					
35						

FIGURE A7.1 Asset Components of Company MNO's Balance Sheet

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4		Period
1							X4
2							
3	Assets						
4	Cash	\$ 110,522	\$ 726,552	\$ 1,441,311	\$ 2,154,566	\$ 2,154,566	
5	Accounts Receivable	1,035,000	922,350	900,000	780,111	780,111	
6	Inventory	461,370	478,133	468,331	468,331	468,331	
7	Fixed Assets, net	16,113	28,019	78,079	46,450	46,450	
8	Total Assets	\$ 1,623,005	\$ 2,155,054	\$ 2,847,671	\$ 3,449,450	\$ 3,449,450	
9							
10							
11	Liabilities						
12	Accounts Payable	\$ 852,111	\$ 775,469	\$ 821,728	\$ 851,511	\$ 851,511	
13	Payables from Capital Budget	-	-	-	-	-	
14	Loan Payable	-	-	-	-	-	
15	Total Liabilities	\$ 852,111	\$ 775,469	\$ 821,728	\$ 851,511	\$ 851,511	
16							
17							
18	Owners' Equity						
19	Common Stock						
20	Retained Earnings						
21	Total Owners' Equity						
22							
23	Total Liabilities and Owners' Equity	\$ 852,111	\$ 775,469	\$ 821,728	\$ 851,511	\$ 851,511	
24							
25							
26							
27	Net Working Capital (NWC)						
28	Current assets						
29	- Current liabilities						
30	= Net working capital						
31							
32	Beginning NWC						
33	- Ending NWC						
34	= Change in NWC						
35							

FIGURE A7.2 Liabilities Components of Company MNO's Balance Sheet

	A	B	C	D	E	F	G
		1Q X4	2Q X4	3Q X4	4Q X4		Period
1							X4
2							
3	Assets						
4	Cash	\$ 110,522	\$ 726,552	\$ 1,441,311	\$ 2,154,566	\$ 2,154,566	
5	Accounts Receivable	1,035,000	922,350	900,000	780,111	780,111	
6	Inventory	461,370	478,133	468,331	468,331	468,331	
7	Fixed Assets, net	16,113	28,019	78,079	46,450	46,450	
8	Total Assets	\$ 1,623,005	\$ 2,155,054	\$ 2,847,671	\$ 3,449,450	\$ 3,449,450	
9							
10							
11	Liabilities						
12	Accounts Payable	\$ 852,111	\$ 775,469	\$ 821,728	\$ 851,511	\$ 851,511	
13	Payables from Capital Budget	-	-	-	-	-	
14	Loan Payable	-	-	-	-	-	
15	Total Liabilities	\$ 852,111	\$ 775,469	\$ 821,728	\$ 851,511	\$ 851,511	
16							
17							
18	Owners' Equity						
19	Common Stock	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	
20	Retained Earnings	670,894	1,179,585	1,825,943	2,397,947	2,397,947	
21	Total Owners' Equity	\$ 770,894	\$ 1,379,585	\$ 2,025,943	\$ 2,597,947	\$ 2,597,947	
22							
23	Total Liabilities and Owners' Equity	\$ 1,623,005	\$ 2,155,054	\$ 2,847,671	\$ 3,449,450	\$ 3,449,450	
24							
25							
26							
27	Net Working Capital (NWC)						
28	Current assets						
29	- Current liabilities						
30	= Net working capital						
31							
32	Beginning NWC						
33	- Ending NWC						
34	= Change in NWC						
35							

FIGURE A7.3 Owners' Equity Components of Company MNO's Balance Sheet

FigA7.4 - Microsoft Excel

	A1	Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
Assets						
4 Cash	\$ 110,522	\$ 726,552	\$ 1,441,311	\$ 2,154,566	\$ 2,154,566	
5 Accounts Receivable	1,035,000	922,350	900,000	780,111	780,111	
6 Inventory	461,370	478,133	468,331	468,331	468,331	
7 Fixed Assets, net	16,113	28,019	38,028	46,450	46,450	
8 Total Assets	\$ 1,623,005	\$ 2,155,054	\$ 2,847,671	\$ 3,449,458	\$ 3,449,458	
9						
10						
Liabilities						
12 Accounts Payable	\$ 852,111	\$ 775,469	\$ 821,728	\$ 851,511	\$ 851,511	
13 Payables from Capital Budget	-	-	-	-	-	
14 Loan Payable	-	-	-	-	-	
15 Total Liabilities	\$ 852,111	\$ 775,469	\$ 821,728	\$ 851,511	\$ 851,511	
16						
17						
Owners' Equity						
19 Common Stock	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	
20 Retained Earnings	570,894	1,179,585	1,825,943	2,397,947	2,397,947	
21 Total Owners' Equity	\$ 770,894	\$ 1,379,585	\$ 2,025,943	\$ 2,597,947	\$ 2,597,947	
22						
23 Total Liabilities and Owners' Equity	\$ 1,623,005	\$ 2,155,054	\$ 2,847,671	\$ 3,449,458	\$ 3,449,458	
24						
25						
26						
Net Working Capital (NWC)						
28 Current assets	\$ 1,496,370	\$ 1,400,483	\$ 1,368,331	\$ 1,248,442	N/A	
29 - Current liabilities	852,111	775,469	821,728	851,511	N/A	
30 = Net working capital	\$ 644,259	\$ 625,014	\$ 546,603	\$ 396,931	N/A	
31						
32 Beginning NWC	\$ -	\$ 644,259	\$ 625,014	\$ 546,603	N/A	
33 - Ending NWC	644,259	625,014	546,603	396,931	N/A	
34 = Change in NWC	\$ (644,259)	\$ 19,245	\$ 78,411	\$ 149,672	N/A	
35						
Headcount Cost / Operating Expenses / Capital / Cash						

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.

	A	Period				
		1Q X4	2Q X4	3Q X4	4Q X4	X4
3	Cash Flows from Operating Activities					
4	Net Income	704,194	717,494	711,449	703,893	2,837,031
5	Adjustments to reconcile net income to cash provided from operating activities					
6	Depreciation	1,625	3,000	4,875	5,750	15,250
7	(Increase) decrease in Accounts Receivable	(250,000)	(14,271)	(18,438)	(7,292)	(290,000)
8	(Increase) decrease in Inventory	(465,833)	(13,333)	(20,833)	-	(500,000)
9	Increase (decrease) in Accounts Payable	588,611	(118,333)	15,833	13,889	500,000
10	Increase (decrease) in Loan Payable	50,000	(50,000)	-	-	-
11	Cash provided (used) by operating activities	628,597	524,557	692,887	716,240	2,562,281
12						
15	Cash Flows from Investing Activities					
16	Purchase of capital assets					
17	Cash provided (used) by investing activities	-	-	-	-	-
18						
20	Cash Flows from Financing Activities					
21	Proceeds from sale of Common Stock					
22	Cash provided (used) by financing activities	-	-	-	-	-
23						
25	Net increase (decrease) in cash	628,597	524,557	692,887	716,240	2,562,281
26	Cash, beginning of period	-	628,597	1,153,153	1,846,040	-
27	Cash, end of period	628,597	1,153,153	1,846,040	2,562,281	2,562,281
28						

FIGURE A8.1 Cash Flows from Operating Activities in Company PQR's Statement of Cash Flows

	B	C	D	E	G
	1Q X4	2Q X4	3Q X4	4Q X4	X4
Period					
1 Cash Flows from Operating Activities					
4 Net Income	704,194	717,494	711,449	703,893	2,837,031
5 Adjustments to reconcile net income to cash provided from operating activities					
7 Depreciation	1,625	3,000	4,875	5,750	15,250
8 (Increase) decrease in Accounts Receivable	(250,000)	(14,271)	(18,438)	(7,292)	(290,000)
9 (Increase) decrease in Inventory	(465,833)	(13,333)	(20,833)	-	(500,000)
10 Increase (decrease) in Accounts Payable	588,611	(118,333)	15,833	13,889	500,000
11 Increase (decrease) in Loan Payable	50,000	(50,000)	-	-	-
12 Cash provided (used) by operating activities	628,597	524,557	692,887	716,240	2,562,281
14					
Cash Flows from Investing Activities					
16 Purchase of capital assets	(32,000)	(27,000)	(37,000)	(17,000)	(113,000)
17 Cash provided (used) by investing activities	(32,000)	(27,000)	(37,000)	(17,000)	(113,000)
18					
Cash Flows from Financing Activities					
21 Proceeds from sale of Common Stock					
22 Cash provided (used) by financing activities	-	-	-	-	-
23					
24					
25 Net increase (decrease) in cash	596,597	497,557	655,887	699,240	2,449,281
26 Cash, beginning of period	-	596,597	1,094,153	1,750,040	-
27 Cash, end of period	596,597	1,094,153	1,750,040	2,449,281	2,449,281
28					

FIGURE A8.2 Cash Flows from Investing Activities in Company PQR's Statement of Cash Flows

	B	C	D	E	G
	1Q X4	2Q X4	3Q X4	4Q X4	X4
Period					
1 Cash Flows from Operating Activities					
4 Net Income	704,194	717,494	711,449	703,893	2,837,031
5 Adjustments to reconcile net income to cash provided from operating activities					
7 Depreciation	1,625	3,000	4,875	5,750	15,250
8 (Increase) decrease in Accounts Receivable	(250,000)	(14,271)	(18,438)	(7,292)	(290,000)
9 (Increase) decrease in Inventory	(465,833)	(13,333)	(20,833)	-	(500,000)
10 Increase (decrease) in Accounts Payable	588,611	(118,333)	15,833	13,889	500,000
11 Increase (decrease) in Loan Payable	50,000	(50,000)	-	-	-
12 Cash provided (used) by operating activities	628,597	524,557	692,887	716,240	2,562,281
14					
Cash Flows from Investing Activities					
16 Purchase of capital assets	(32,000)	(27,000)	(37,000)	(17,000)	(113,000)
17 Cash provided (used) by investing activities	(32,000)	(27,000)	(37,000)	(17,000)	(113,000)
18					
Cash Flows from Financing Activities					
21 Proceeds from sale of Common Stock	250,000	-	-	-	250,000
22 Cash provided (used) by financing advises	250,000	-	-	-	250,000
23					

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

The screenshot shows a Microsoft Excel spreadsheet titled "FigA9.1 - Microsoft Excel". The spreadsheet is a financial model for Company STU, specifically for calculating free cash flow. It includes columns for quarterly data (1Q X4, 2Q X4, 3Q X4, 4Q X4) and an annual total (X4). The model takes into account EBIT, tax rates, depreciation, CAPEX, and changes in NWC to calculate free cash flow. It also includes a terminal value and a total free cash flow. The bottom section of the spreadsheet shows NPV and WACC calculations, along with a growth rate to perpetuity indicator.

	A	B	C	D	E	F	G
1	A1						
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	EBIT	6,290,913	8,732,038	11,269,575	15,986,200		42,278,725
4							
5	Effective tax rate	35.0%	35.0%	35.0%	35.0%		
6							
7	EBIT * (1 - t)	4,089,093	5,675,824	7,325,224	10,391,030		27,481,171
8	+ Depreciation	9,063	18,125	27,188	36,250		90,625
9	- CAPEX	175,000	175,000	175,000	175,000		700,000
10	- Changes in NWC	1,583,333	1,402,778	1,556,867	765,355		5,308,333
11	= Free cash flow	2,339,822	4,116,172	5,620,544	9,486,925		21,563,463
12	+ Terminal value						
13	= Total free cash flow						
14							
15	Present value						
16							
17							
18	NPV						
19							
20	WACC						
21	g (to perpetuity)						
22							

FIGURE A9.1 Company STU's Free Cash Flows Worksheet

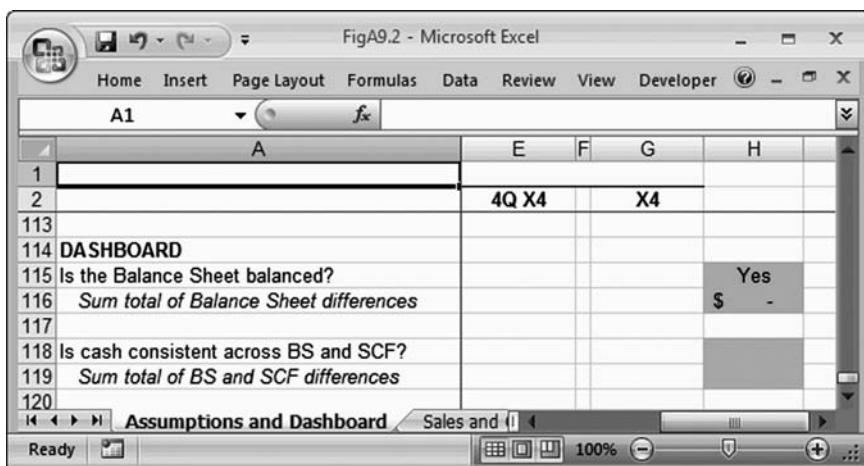


FIGURE A9.2 Balance Sheet Status Indicator in Company STU's Assumptions and Dashboard Worksheet

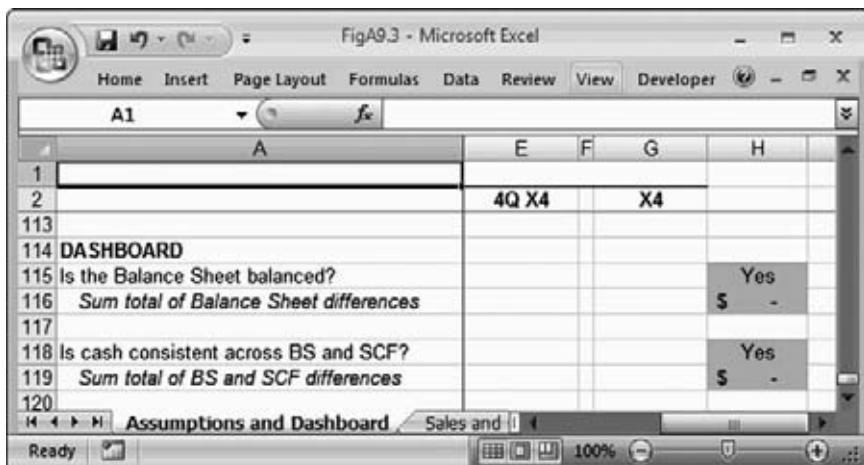


FIGURE A9.3 Statement of Cash Flows Status Indicator in Company STU's Assumptions and Dashboard Worksheet

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.

The screenshot shows an Excel spreadsheet titled "FigA10.1 - Microsoft Excel". The spreadsheet contains several tables and formulas related to Company VWX's financial performance. The "Revenues Data Table" is highlighted in the center of the screen, showing unit sales for 1Q X4 across four scenarios: 800, 900, 1,000, 1,100, and 1,200 units. The table also includes columns for Revenues for 1Q X4 and total revenues for 1Q X4, 2Q X4, 3Q X4, 4Q X4, and the year-to-date (X4).

	A	B	C	D	E	F	G
1	A1						
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
123	Revenues (total sales in dollars)	\$ 4,000,000	\$ 4,560,000	\$ 5,060,000	\$ 5,625,000		\$ 19,245,000
124	Net Income	\$ 771,794	\$ 979,087	\$ 1,144,187	\$ 1,222,284		\$ 4,117,352
125	Free Cash Flows	\$ 106,290	\$ 720,692	\$ 993,578	\$ 902,368		\$ 2,722,927
126							
127	Revenues Data Table						
128							
129							
130							
131							
132							
133							
134							
135	Unit sales for 1Q X4	800	\$ 800,000				
136		900	\$ 900,000				
137		1,000	\$ 1,000,000				
138		1,100	\$ 1,100,000				
139	Net Income Data Table	1,200	\$ 1,200,000				
140							
141							
142							
143							
144							
145	Price per unit for 1Q X4						
146							
147							
148							

FIGURE A10.1 Revenues Data Table for Company VWX

FigA10.2 - Microsoft Excel

	A	B	C	D	E	F	G
1				Period			
123	Revenues (total sales in dollars)	\$ 4,000,000	\$ 4,550,000	\$ 5,060,000	\$ 5,625,000	\$ 19,245,000	
124							
125	Net Income	\$ 771,794	\$ 979,087	\$ 1,144,187	\$ 1,222,264	\$ 4,117,352	
126							
127	Free Cash Flows	\$ 106,290	\$ 720,692	\$ 993,578	\$ 902,368	\$ 2,722,927	
128							
129	Revenues Data Table						
130				Revenues			
131				for 1Q X4			
132				\$ 4,000,000			
133				800	\$ 800,000		
134				900	\$ 900,000		
135				1,000	\$ 1,000,000		
136				1,100	\$ 1,100,000		
137				1,200	\$ 1,200,000		
138							
139	Net Income Data Table						
140				Net Income			
141				for 1Q X4			
142				\$ 771,794			
143				700	\$ 100,994		
144				850	\$ 436,394		
145				1,000	\$ 771,794		
146				1,150	\$ 1,107,194		
147				1,300	\$ 1,442,594		
148							
149	Free Cash Flow Data Table						
150				Free Cash Flow			
151				for 1Q X4			
152				\$ 106,290			
153				65.00	\$ 129,623		
154				70.00	\$ 121,179		
155				75.00	\$ 113,734		
156				80.00	\$ 106,290		
157				85.00	\$ 98,845		
158							

Assumptions and Dashboard Sales and Collections COGS

FIGURE A10.2 Net Income Data Table for Company VWX

FigA10.3 - Microsoft Excel

	A	B	C	D	E	F	G
1				Period			
123	Revenues Data Table						
124				Revenues			
125				for 1Q X4			
126				\$ 4,000,000			
127				800	\$ 800,000		
128				900	\$ 900,000		
129				1,000	\$ 1,000,000		
130				1,100	\$ 1,100,000		
131				1,200	\$ 1,200,000		
132							
133	Net Income Data Table						
134				Net Income			
135				for 1Q X4			
136				\$ 771,794			
137				700	\$ 100,994		
138				850	\$ 436,394		
139				1,000	\$ 771,794		
140				1,150	\$ 1,107,194		
141				1,300	\$ 1,442,594		
142							
143	Free Cash Flow Data Table						
144				Free Cash Flow			
145				for 1Q X4			
146				\$ 106,290			
147				65.00	\$ 129,623		
148				70.00	\$ 121,179		
149				75.00	\$ 113,734		
150				80.00	\$ 106,290		
151				85.00	\$ 98,845		
152							
153	Electronics: cost per unit for 1Q X4						
154							
155							
156							
157							
158							

Assumptions and dashboard Sales and Collections COGS

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.

FigA11.1 - Microsoft Excel

This screenshot shows a Microsoft Excel spreadsheet titled "FigA11.1 - Microsoft Excel". The spreadsheet displays Company 123's Variable Costs across four quarters (1Q X4, 2Q X4, 3Q X4, 4Q X4) and a total column (X4). The data includes costs for Electronics, Casing, Assembly labor, Miscellaneous expenses, Research and development, and Total variable costs. The total variable costs for all quarters combined are \$1,445,395.

	A	B	C	D	E	F	G
1	A	B	C	D	E	F	G
2		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	
10							

FIGURE A11.1 Company 123's Variable Costs

FigA11.2 - Microsoft Excel

This screenshot shows a Microsoft Excel spreadsheet titled "FigA11.2 - Microsoft Excel". The spreadsheet displays Company 123's Fixed Costs across four quarters (1Q X4, 2Q X4, 3Q X4, 4Q X4) and a total column (X4). The data includes costs for Salaries, Rent, Depreciation, and Total fixed costs. The total fixed costs for all quarters combined are \$2,047,650.

	A	B	C	D	E	F	G
1	A	B	C	D	E	F	G
2		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	
10							
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	
16							

FIGURE A11.2 Company 123's Fixed Costs

	A	B	C	D	E	F	G
1				Period			
2		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	\$ 406,075	\$ 527,520	\$ 1,445,395	
10							
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	
16							
17	Contribution Margin						
18	Sales	\$ 500,000	\$ 750,000	\$ 997,500	\$ 1,288,000	\$ 3,535,500	
19	- Variable costs	205,000	306,000	406,075	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	
25							
26	Operating Leverage						
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	
29							
30	Operating leverage	69.5%	61.2%	57.4%	51.0%	58.6%	
31							

FIGURE A11.3 Company 123's Contribution Margin and Reconciliation with Net Income

	A	B	C	D	E	F	G
1				Period			
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
17	Contribution Margin						
18	Sales	\$ 500,000	\$ 750,000	\$ 997,500	\$ 1,288,000	\$ 3,535,500	
19	- Variable costs	205,000	306,000	406,075	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	
25							
26	Operating Leverage						
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	
29							
30	Operating leverage	69.5%	61.2%	57.4%	51.0%	58.6%	
31							

FIGURE A11.4 Company 123's Operating Leverage

	B	C	D	E	F	G
	Period					
	1Q X4	2Q X4	3Q X4	4Q X4	X4	
17 Contribution Margin						
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	
25						
26 Operating Leverage						
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	
29						
30 Operating leverage	69.5%	61.2%	57.4%	51.0%	58.6%	
31						
32 Breakeven Point in Units						
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		
37						
38 Fixed costs	\$ 466,438	\$ 482,438	\$ 548,700	\$ 550,075		
39						
40 Breakeven point in units	1,581	1,630	1,951	2,025		
41						

FIGURE A11.5 Company 123's Breakeven Point in Terms of Units

	B	C	D	E	F	G
	Period					
	1Q X4	2Q X4	3Q X4	4Q X4	X4	
17 Contribution Margin						
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	
25						
26 Operating Leverage						
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	
29						
30 Operating leverage	69.5%	61.2%	57.4%	51.0%	58.6%	
31						
32 Breakeven Point in Units						
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		
37						
38 Fixed costs	\$ 466,438	\$ 482,438	\$ 548,700	\$ 550,075		
39						
40 Breakeven point in units	1,581	1,630	1,951	2,025		
41						
42 Breakeven Point in Dollars						
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		
46						

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

The screenshot shows a Microsoft Excel spreadsheet titled "FigA12.1 - Microsoft Excel". The ribbon menu includes Home, Insert, Page Layout, Formulas, Data, Review, View, and Developer. The worksheet contains data from row 1 to 33. The columns are labeled A through G, with headers B through F corresponding to the periods 1Q X4, 2Q X4, 3Q X4, 4Q X4, and X4 respectively. Row 1 is a header row with "Period" in column F. Rows 2 through 6 show "Profit Margins" with values: 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%), and Net Profit Margin (18.0%, 18.6%, 16.9%, 15.1%, 17.1%). Rows 8 through 11 show "Investment Returns (Annualized)" with rows for Return on Equity, Return on Assets, and Return on Capital, all of which are shaded gray. Rows 13 through 18 show "Management Efficiency (Annualized)" with rows for Income/Employee, Revenue/Employee, Receivable Turnover, Inventory Turnover, and Asset Turnover, also shaded gray. Rows 21 and 22 are bolded and labeled "Values Used for the Above Calculations". Rows 23 through 33 list financial values: 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), and 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

	A	Period									
		1Q X4	2Q X4	3Q X4	4Q X4	X4					
Profit Margins											
4	Gross Margin	51.3%	52.1%	52.9%	51.2%	51.9%					
5	Pre-Tax Margin	27.6%	28.6%	26.0%	23.3%	26.3%					
6	Net Profit Margin	18.0%	18.6%	16.9%	15.1%	17.1%					
7											
8	Investment Returns (Annualized)										
9	Return on Equity	337.4%	195.9%	127.0%	88.1%	95.7%					
10	Return on Assets	141.6%	125.0%	90.9%	67.0%	72.8%					
11	Return on Capital	337.4%	195.9%	127.0%	88.1%	95.7%					
12											
13	Management Efficiency (Annualized)										
14	Income/Employee										
15	Revenue/Employee										
16	Receivable Turnover										
17	Inventory Turnover										
18	Asset Turnover										
19											
20											
21	Values Used for the Above Calculations										
23	Gross profit	\$ 3,850,000	\$ 4,295,500	\$ 4,559,750	\$ 4,383,700	\$ 17,088,950					
24	Sales	7,500,000	8,250,000	8,625,000	8,555,000	32,930,000					
25	Taxable income	2,071,250	2,357,050	2,240,200	1,991,500	8,660,000					
26	Net income	1,346,313	1,532,083	1,456,130	1,294,475	5,629,000					
27	Owners' Equity	1,596,313	3,128,395	4,584,525	5,879,000	5,879,000					
28	Assets	3,804,387	4,902,358	6,407,014	7,732,911	7,732,911					
29	Capital	1,596,313	3,128,395	4,584,525	5,879,000	5,879,000					
30	Employees	26	26	36	38	38					
31	Accounts Receivable	1,666,667	1,833,333	1,916,667	1,901,111	1,901,111					
32	Cost-of-goods sold	3,650,000	3,954,500	4,065,250	4,171,300	15,841,050					
33	Inventory	1,318,167	1,355,083	1,390,433	1,390,433	1,390,433					
34											

FIGURE A12.2 Company 456's Return on Equity, Return on Assets, and Return on Capital

FigA12.3 - Microsoft Excel

The screenshot shows a Microsoft Excel spreadsheet titled "FigA12.3 - Microsoft Excel". The data is organized into several sections:

- Profit Margins:** Includes 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%), and Net Profit Margin (18.0%, 18.6%, 16.9%, 15.1%, 17.1%).
- Investment Returns (Annualized):** Includes 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%), and Return on Capital (337.4%, 195.9%, 127.0%, 88.1%, 95.7%).
- Management Efficiency (Annualized):** Includes 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), and Asset Turnover (7.9, 6.7, 5.4, 4.4, 4.3).
- Values Used for the Above Calculations:** Includes various financial metrics such as 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), and Inventory (1,318,167, 1,355,083, 1,390,433, 1,390,433, 1,390,433).

The spreadsheet includes standard Excel features like a ribbon menu, a status bar at the bottom, and a navigation bar above the sheet tabs.

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.

FigA13.1 - Microsoft Excel

	A	B	C	D	E	F	G
1		1Q X4	2Q X4	3Q X4	4Q X4		X4
2	EBIT	\$ 2,071,250	\$ 2,357,050	\$ 2,240,200	\$ 1,991,500		\$ 8,660,000
3	Effective tax rate	35.0%	35.0%	35.0%	35.0%		
4							
5	EBIT * (1 - t)	\$ 1,346,313	\$ 1,532,083	\$ 1,456,130	\$ 1,294,475		\$ 5,629,000
6	+ Depreciation	1,950	4,150	6,150	8,200		20,450
7	- CAPEX	38,000	43,000	39,000	40,000		160,000
8	- Changes in NWC	776,759	637,694	70,157	(46,978)		1,437,633
9	= Free cash flow	\$ 533,503	\$ 855,538	\$ 1,353,123	\$ 1,309,653		\$ 4,051,817
10	+ Terminal value	N/A	N/A	N/A	21,272,038		21,272,038
11	= Total free cash flow	\$ 533,503	\$ 855,538	\$ 1,353,123	\$ 22,581,690		\$ 25,323,854
12							
13							
14							
15	Present value						
16							
17							
18	NPV						
19							
20	WACC		25.0%				
21	g (to perpetuity)		5.0%				
22							

FIGURE A13.1 Company 456's Total Free Cash Flows

FigA13.2 - Microsoft Excel

This screenshot shows a Microsoft Excel spreadsheet titled "FigA13.2 - Microsoft Excel". The spreadsheet contains financial data for Company 456 across four quarters (Q1-Q4) and includes calculations for EBIT, tax rate, free cash flow, NPV, and WACC.

	A	B	C	D	E	F	G
1	A	B	C	D	E	F	G
2		1Q X4	2Q X4	3Q X4	4Q X4		X4
3	EBIT	\$ 2,071,250	\$ 2,357,050	\$ 2,240,200	\$ 1,991,500		\$ 8,660,000
4							
5	Effective tax rate	35.0%	35.0%	35.0%	35.0%		
6							
7	EBIT * (1 - t)	\$ 1,346,313	\$ 1,532,083	\$ 1,456,130	\$ 1,294,475		\$ 5,629,000
8	+ Depreciation	1,950	4,150	6,150	8,200		20,450
9	- CAPEX	38,000	43,000	39,000	40,000		160,000
10	- Changes in NWC	776,759	637,694	70,157	(46,978)		1,437,633
11	= Free cash flow	\$ 533,503	\$ 855,538	\$ 1,353,123	\$ 1,309,653		\$ 4,051,817
12	+ Terminal value	N/A	N/A	N/A	21,272,038		21,272,038
13	= Total free cash flow	\$ 533,503	\$ 855,538	\$ 1,353,123	\$ 22,581,690		\$ 25,323,854
14							
15	Present value	\$ 504,556	\$ 765,216	\$ 1,144,602	\$ 18,065,352		
16							
17							
18	NPV	\$ 20,479,727					
19							
20	WACC	25.0%					
21	g (to perpetuity)	5.0%					
22							

The spreadsheet also includes tabs for Balance Sheet, Income Statement, and Cash Flows, and is set to 100% zoom.

FIGURE A13.2 Company 456's Net Present Value

FigA13.3 - Microsoft Excel

This screenshot shows a Microsoft Excel spreadsheet titled "FigA13.3 - Microsoft Excel". The spreadsheet compares company data against public company comparables, including projected values for the next four quarters and multiples.

	A	B	C	D	E	F	G	H	I	J
1	A	B	C	D	E	F	G	H	I	J
2	Public Company Comparables									
3										
4										
5										
6										
7	Direct Competitors									
8	Competitor 1	\$ 100,000,000	\$ 110,000,000	\$ 11,000,000	\$ 12,000,000		0.91	9.09	8.33	
9	Competitor 2	\$ 90,000,000	\$ 105,000,000	\$ 10,000,000	\$ 11,000,000		0.86	9.00	8.18	
10	Competitor 3	\$ 80,000,000	\$ 95,000,000	\$ 10,000,000	\$ 10,500,000		0.84	8.00	7.62	
11	Median	\$ 90,000,000	\$ 105,000,000	\$ 10,000,000	\$ 11,000,000		0.86	9.00	8.18	
12										
13	Stock Index									
14	Stock Index	\$ 800,000,000	\$ 900,000,000	\$ 90,000,000	\$ 100,000,000		0.89	8.89	8.00	
15										
16										
17										
18										
19										
20										
21										
22										

The spreadsheet also includes tabs for Sensitivity, Contribution Margin, Financial Ratios, and Valuation, and is set to 100% zoom.

FIGURE A13.3 Multiple and Median Calculations For Public Company Comparables

FigA13.4 - Microsoft Excel

Projected (Next 4 Quarters)									
	Valuation (Price)	Sales	Net Income	Free Cash Flows	Multiple of Projected (Next 4 Quarters):			Net	Free Cash Flows
Direct Competitors					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									
Stock Index	\$ 800,000,000	\$ 900,000,000	\$ 90,000,000	\$ 100,000,000	0.89	8.89	8.00		
Valuation Based Upon Median Multiples and Projected (Next 4 Quarters):									
		Sales	Net Income	Free Cash Flows					
Napavale									
Direct competitors median multiples	\$ 28,225,714	\$ 50,661,000	\$ 33,151,227						
Stock index multiples	\$ 29,271,111	\$ 50,035,566	\$ 32,414,533						

FIGURE A13.4 Company 456's Public Company Comparable Valuation

FigA13.5 - Microsoft Excel

Projected (Next 4 Quarters)									
	Valuation (Price)	Sales	Net Income	Assets	Multiple of Projected (Next 4 Quarters):			Net	Assets
Target Companies					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		
Valuation Based Upon Median Multiples and Projected (Next 4 Quarters):									
		Sales	Net Income	Assets					
Napavale									
Target companies median multiples									

FIGURE A13.5 Multiple and Median Calculations for Mergers and Acquisitions

FigA13.6 - Microsoft Excel

This screenshot shows a Microsoft Excel spreadsheet titled "FigA13.6 - Microsoft Excel". The data is organized into several sections:

- Mergers and Acquisitions Comparables:** A section starting at row 25 with the title "Mergers and Acquisitions Comparables". It includes rows for Company 1 (\$75,000,000), Company 2 (\$60,000,000), Company 3 (\$55,000,000), and Median (\$60,000,000).
- Projected (Next 4 Quarters):** A section starting at row 28 with the title "Projected (Next 4 Quarters)". It contains columns for Sales, Income, and Assets under the Valuation (Price) column.
- Multiple of Projected (Next 4 Quarters):** A section starting at row 29 with the title "Multiple of Projected (Next 4 Quarters)". It contains columns for Sales, Income, and Assets under the Net column.
- Valuation Based Upon Median Multiples and Projected (Next 4 Quarters):** A section starting at row 37 with the title "Valuation Based Upon Median Multiples and Projected (Next 4 Quarters)". It contains columns for Sales, Income, and Assets under the Net column.
- Napavale:** A section starting at row 41 with the title "Napavale". It contains rows for Target companies median multiples (\$29,212,097), Sales (\$45,032,000), and Assets (\$6,628,210).
- Sensitivity / Contribution Margin / Financial Ratios / Valuation:** A navigation bar at the bottom of the spreadsheet.

FIGURE A13.6 Company 456's Mergers and Acquisitions Comparable Valuation

FigA13.7 - Microsoft Excel

This screenshot shows a Microsoft Excel spreadsheet titled "FigA13.7 - Microsoft Excel". The data is organized into two main sections:

- Valuation Technique:** A section starting at row 1 with the title "Valuation Technique". It lists four techniques: Discounted cash flow (\$20,479,727), Public company comparables (\$28,225,714), Mergers and acquisitions comparables (\$29,212,097), and Total (\$23,776,399). The "Mergers and acquisitions comparables" row is highlighted.
- Weighted Valuation:** A section starting at row 2 with the title "Weighted Valuation". It contains columns for Relative Weight and Weighted Valuation. The data corresponds to the rows above, with the "Mergers and acquisitions comparables" row having a relative weight of 60.0% and a weighted valuation of \$12,287,836.

The navigation bar at the bottom includes tabs for Free Cash Flows, Sensitivity, Contribution Margin, and Valuation.

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.

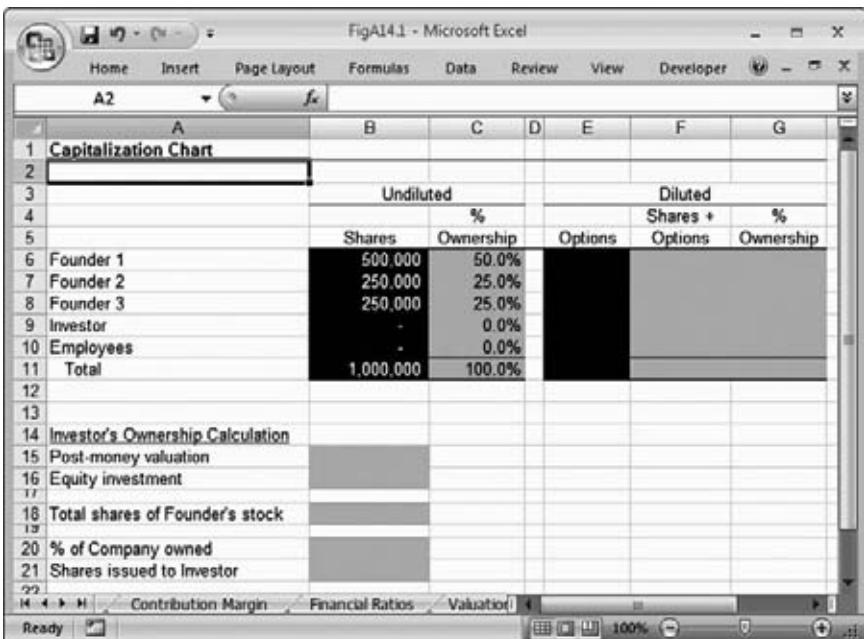


FIGURE A14.1 Company 456's Founding Capitalization Chart

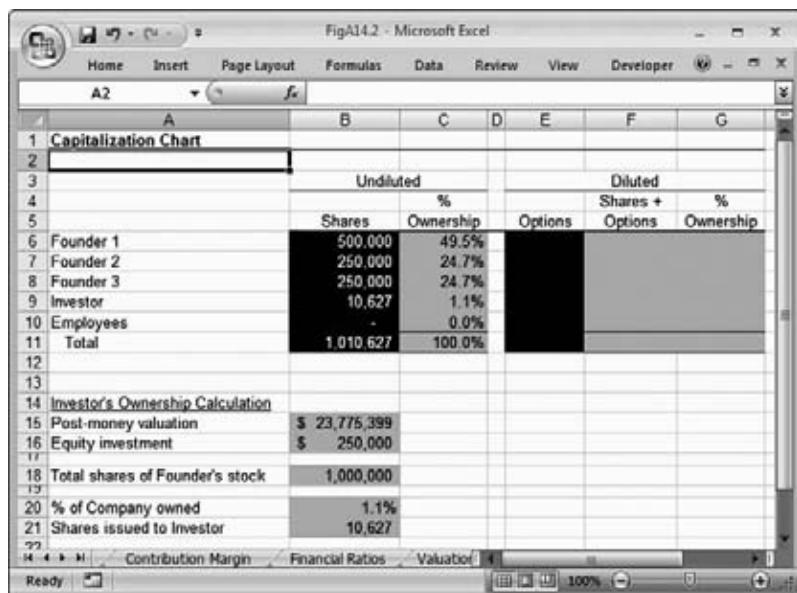


FIGURE A14.2 Company 456's Post-Equity Investment Capitalization Chart

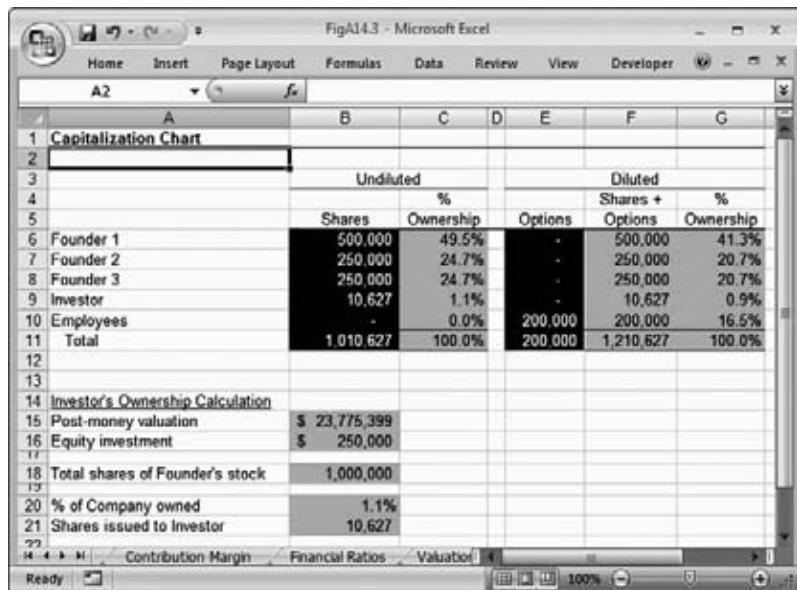


FIGURE A14.3 Company 456's Post-Stock Options Issuance Capitalization Chart

General Overview of Microsoft Excel 2007 Features and Functionality

This 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

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

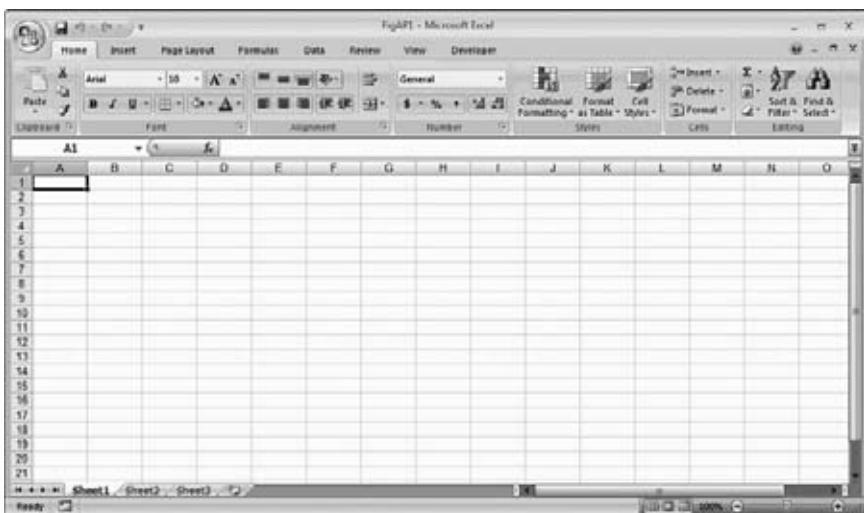


FIGURE AP.1 Menu Bar for Excel 2007

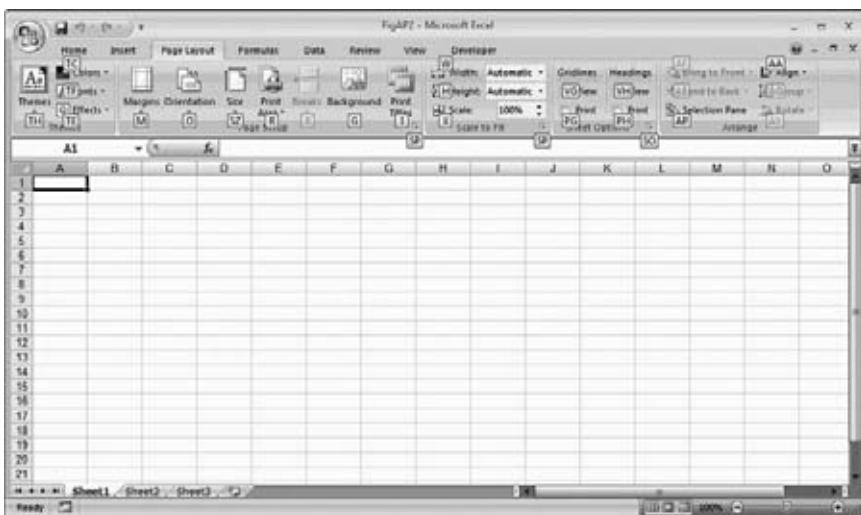


FIGURE AP.2 Page Layout Tab

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

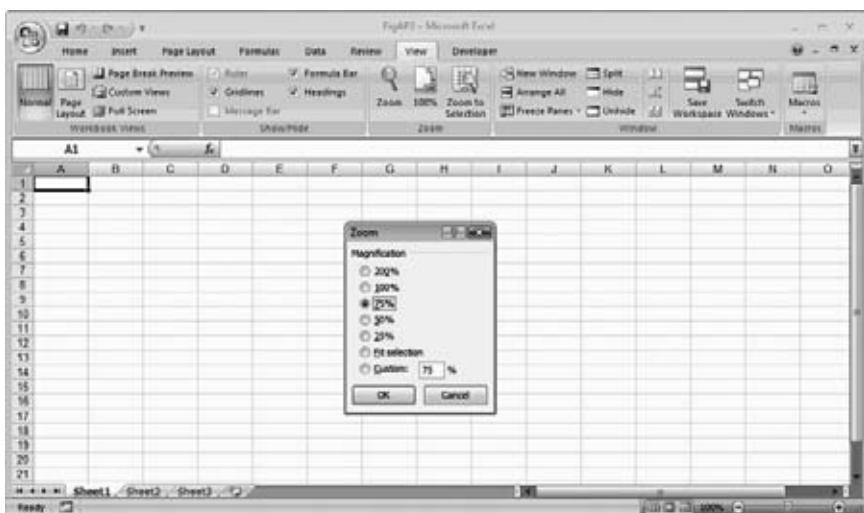


FIGURE AP.3 Zoom Dialog Box

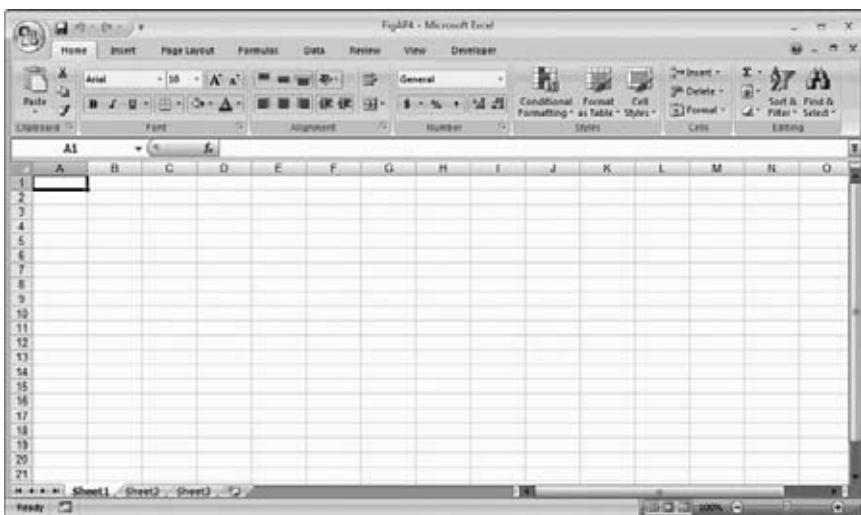


FIGURE AP.4 Worksheets in Excel Workbook

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

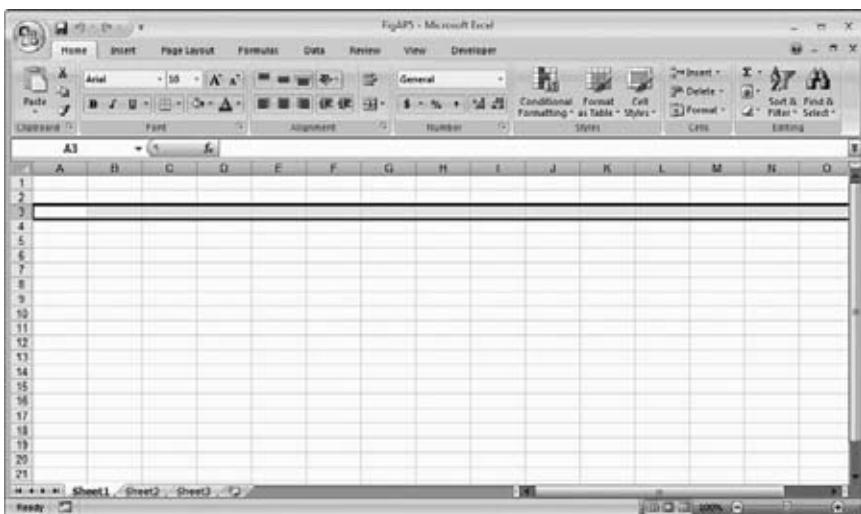


FIGURE AP.5 Row 3 Selected

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.

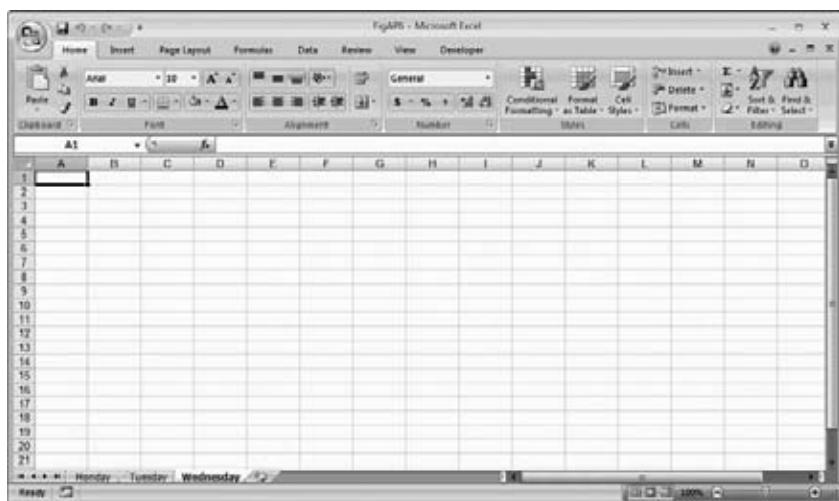


FIGURE AP.6 Three Named Worksheets

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

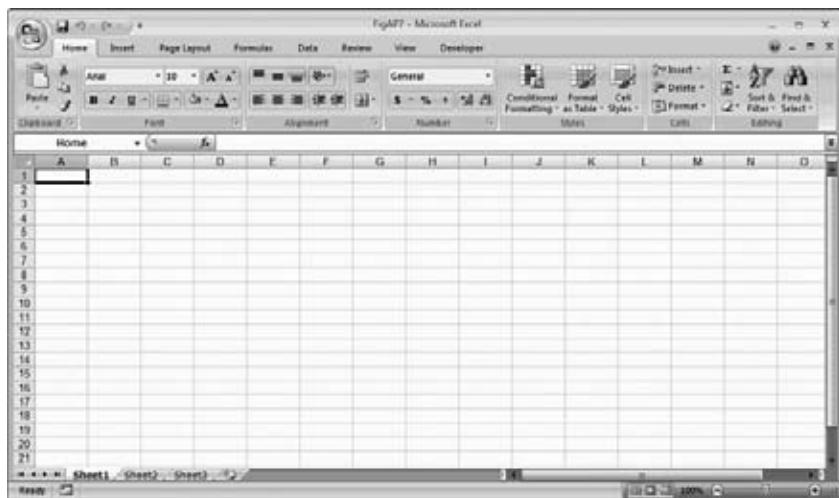


FIGURE AP.7 Named Worksheet Cell

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.

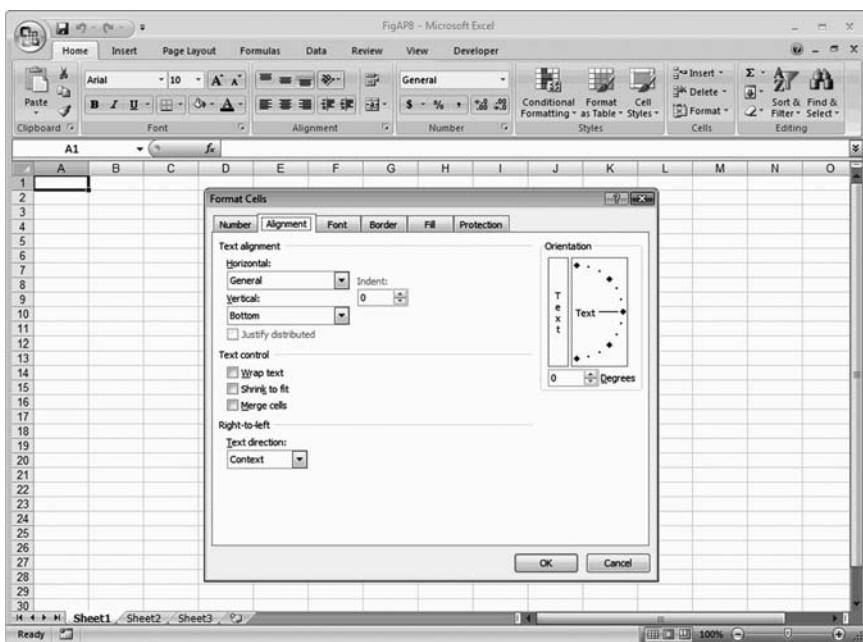


FIGURE AP.8 Alignment Options

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.

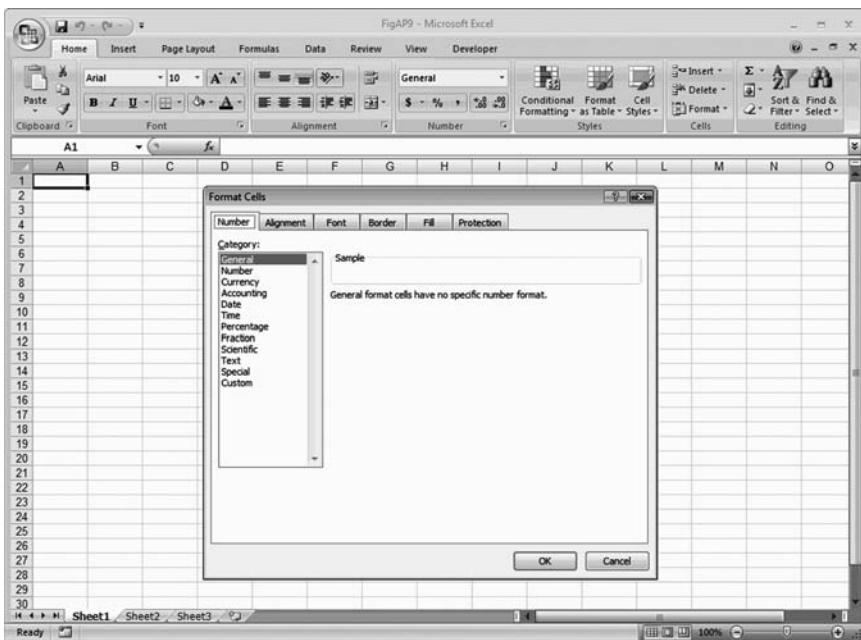


FIGURE AP.9 Format Options

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.

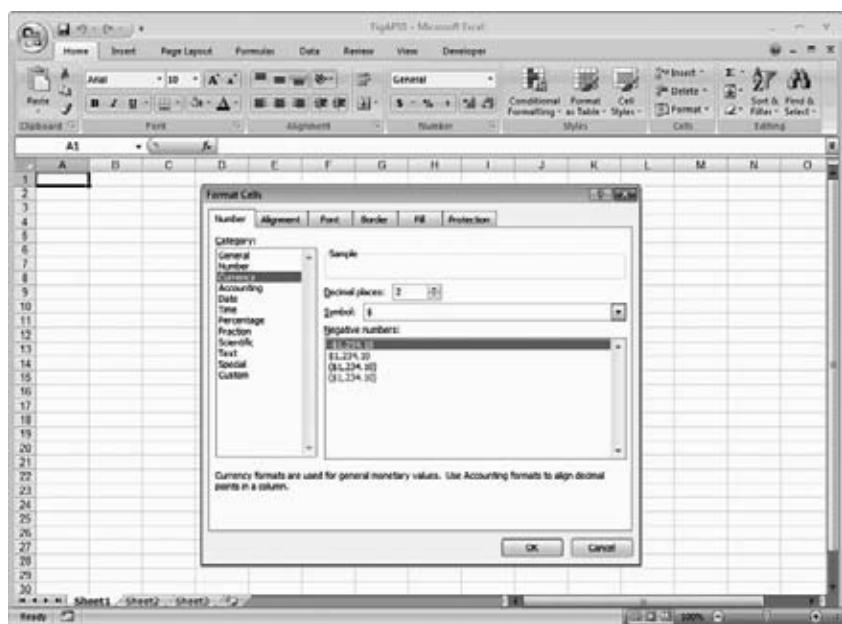


FIGURE AP.10 “Sub-Option” Formatting Options

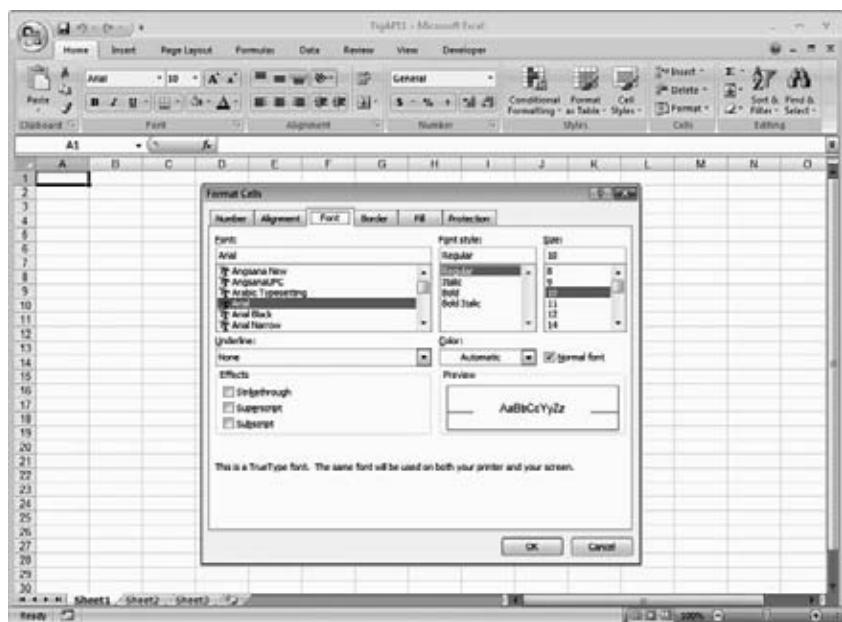


FIGURE AP.11 Font Formatting Options

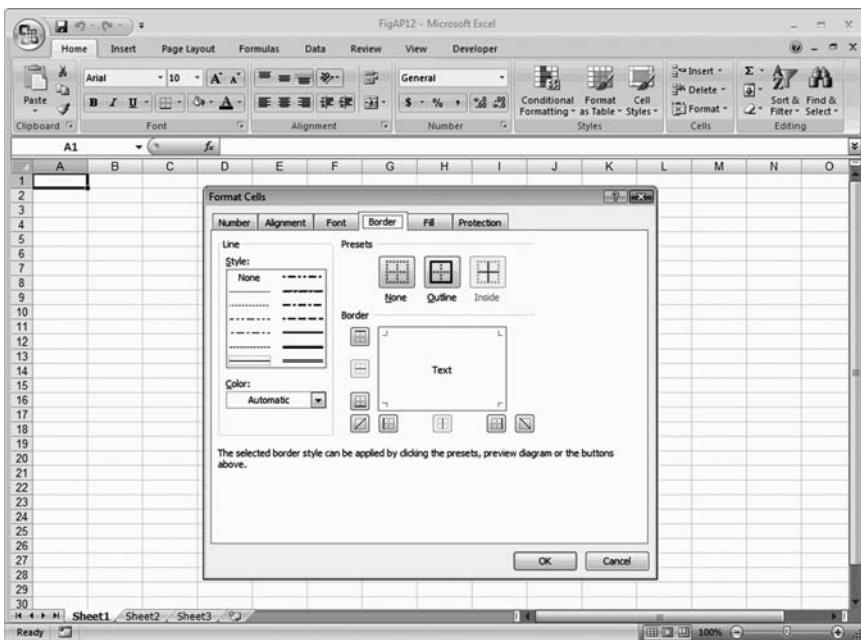


FIGURE AP.12 Border Formatting Options

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).

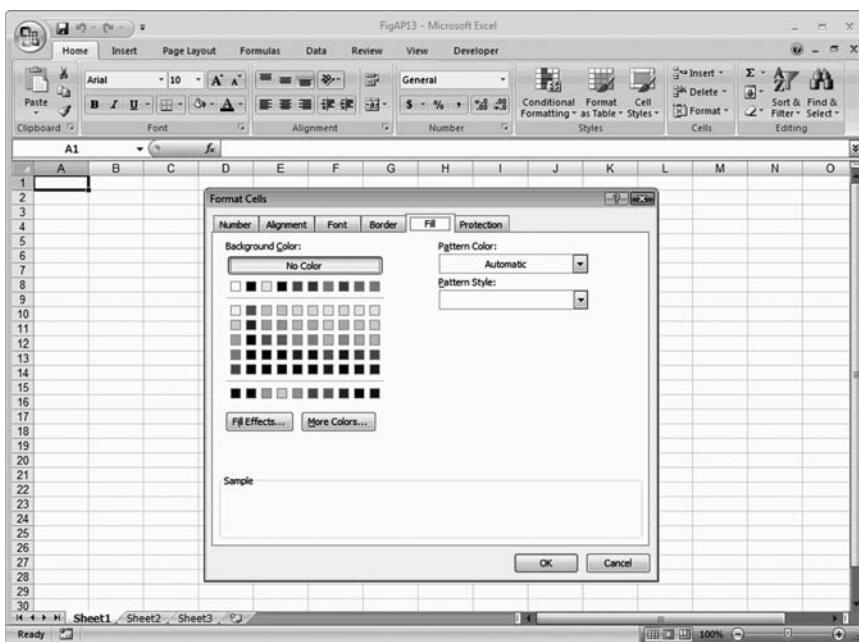


FIGURE AP.13 Patterns Dialog Box

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.

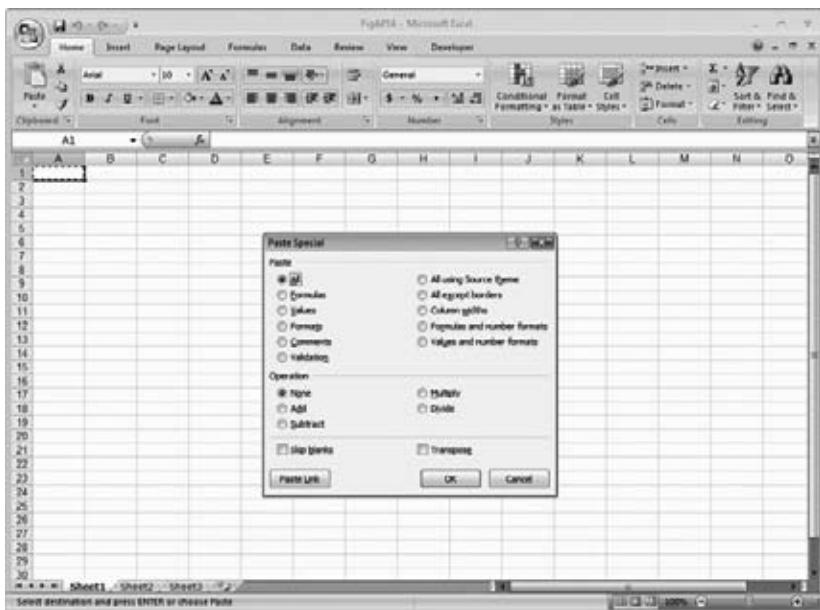


FIGURE AP.14 “Paste Special” Dialog Box

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

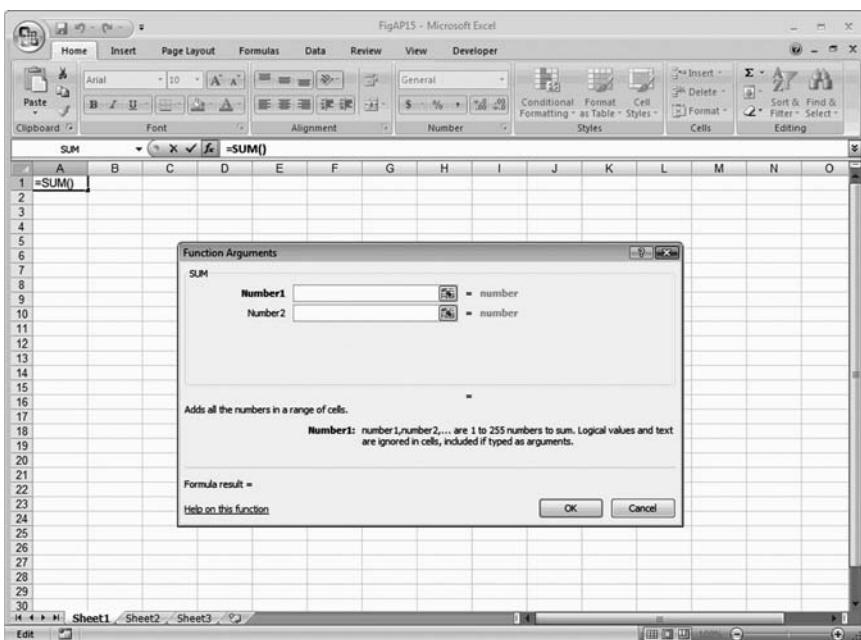


FIGURE AP.15 Function Arguments Dialog Box

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

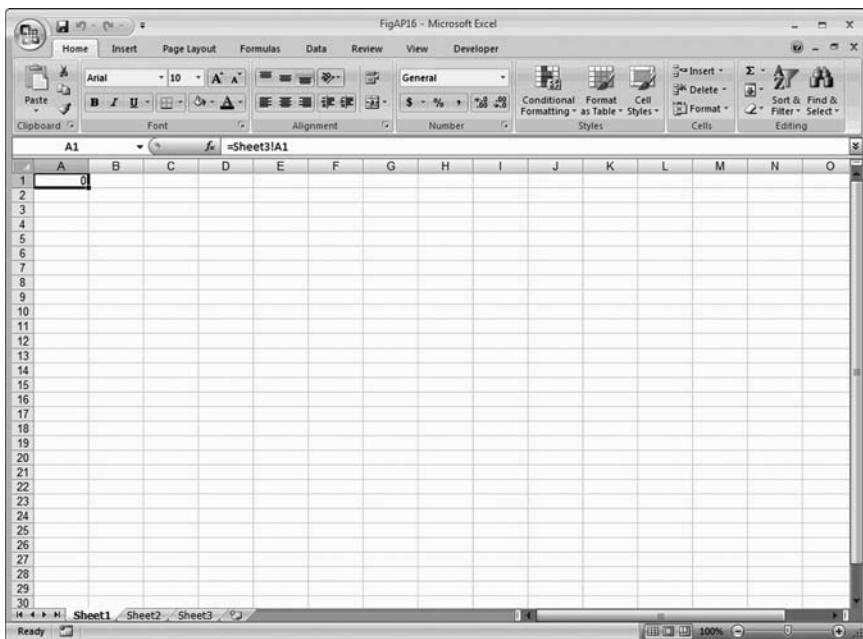


FIGURE AP.16 Reference to Another Worksheet

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

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

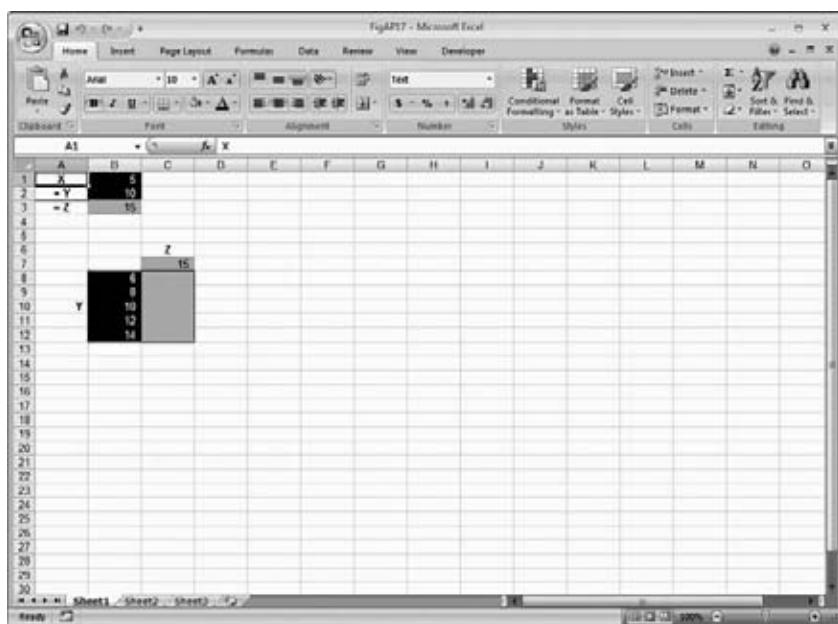


FIGURE AP.17 Completed Data Table

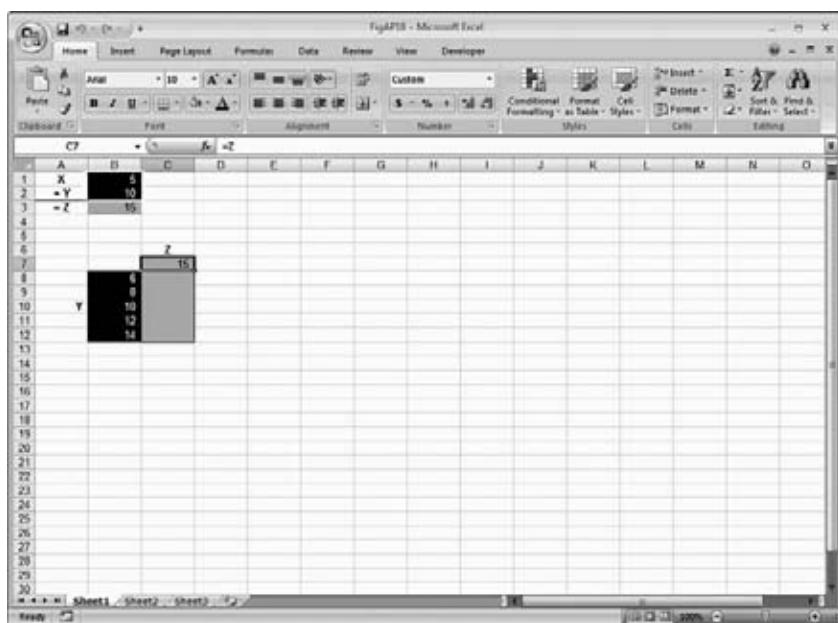


FIGURE AP.18 Reference to Output of Interest (Cell B3)

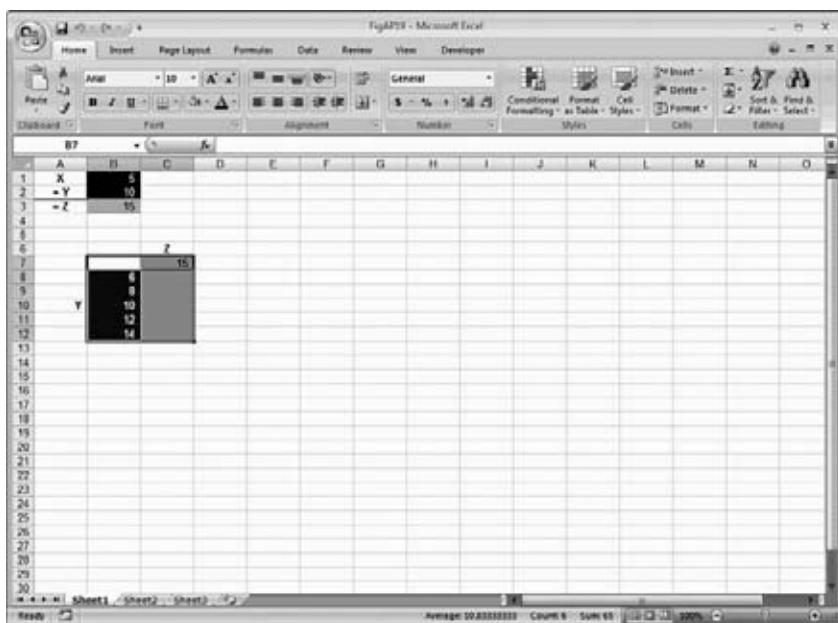


FIGURE AP.19 Highlighted Cells

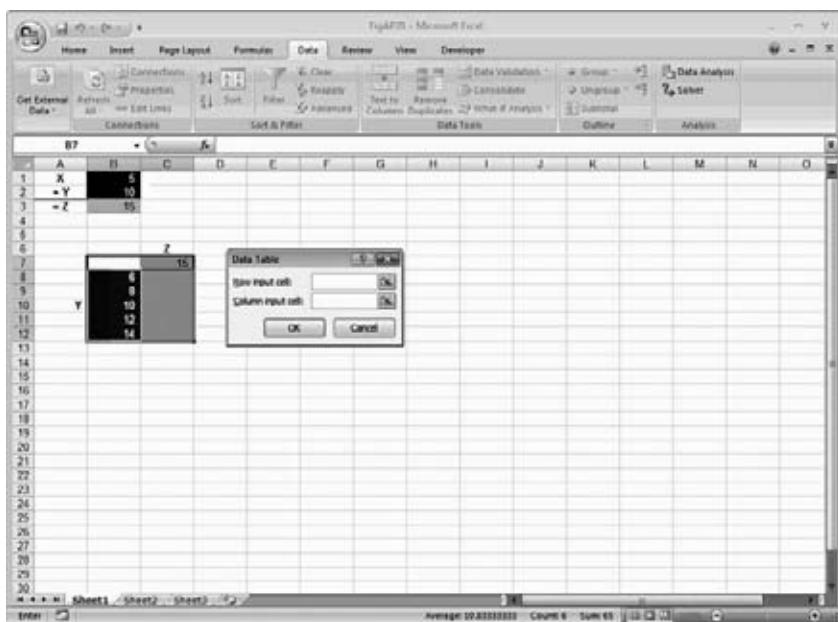


FIGURE AP.20 Dialog Box

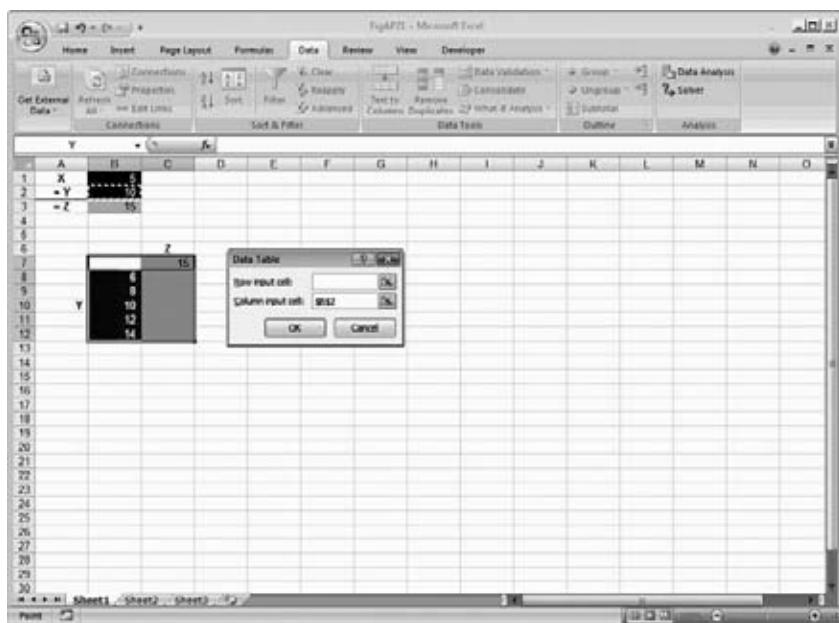


FIGURE AP.21 Cell Reference

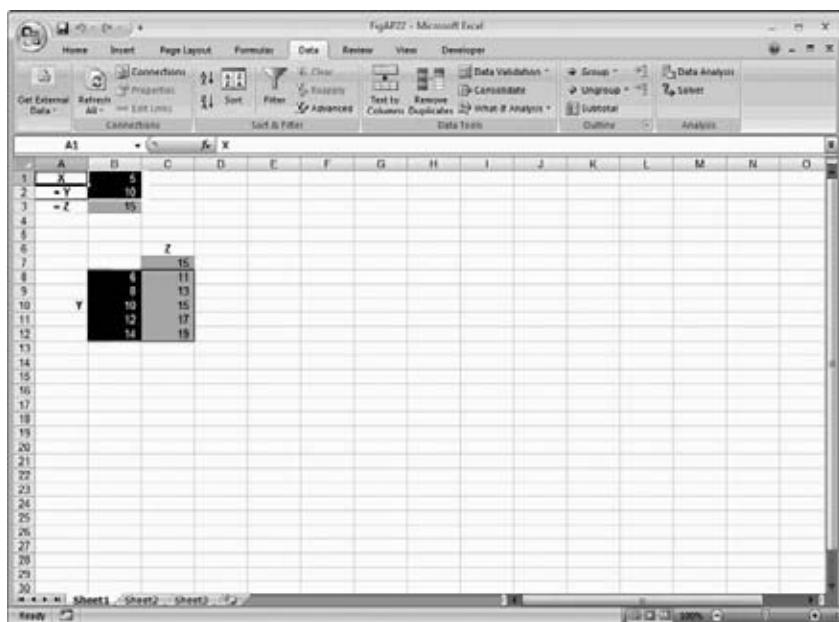


FIGURE AP.22 Data Table

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

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.

CD-ROM TABLE OF CONTENTS

Folder: Chapter 1	FigQ6.1.xls–FigQ6.8.xls
Fig1.2.xls–Fig1.18.xls	FigA6.1.xls–FigA6.7.xls
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
Folder: Chapter 4	Folder: Chapter 9
Fig4.2.xls–Fig4.19.xls	Fig9.1.xls–Fig9.21.xls
FigQ4.1.xls–FigQ4.4.xls	FigQ9.1.xls–FigQ9.3.xls
FigA4.1.xls–FigA4.4.xls	FigA9.1.xls–FigA9.3.xls
Folder: Chapter 5	Folder: Chapter 10
Fig5.2.xls–Fig5.21.xls	Fig10.1.xls–Fig10.16.xls
FigQ5.1.xls–FigQ5.7.xls	FigQ10.1.xls
FigA5.1.xls–FigA5.4.xls	FigA10.1.xls–FigA10.3.xls
Folder: Chapter 6	Folder: Chapter 11
Fig6.2.xls–Fig6.39.xls	Fig11.1.xls–Fig11.20.xls
FigQ11.1.xls–FigQ11.8.xls	FigQ13.1.xls–FigQ13.5.xls
	FigA11.1.xls–FigA11.6.xls

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FigA13.1.xls–FigA13.7.xls

Folder: Chapter 14
Fig14.1.xls–Fig14.11.xls
FigQ14.1.xls–FigQ14.3.xls
FigA14.1.xls–FigA14.3.xls
Folder: Appendix
FigAP1.xls–FigAP22.xls

MINIMUM SYSTEM REQUIREMENTS

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

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

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

Please refer to the *readme.txt* file on the CD for more information.

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About the Author

K. SCOTT PROCTOR, CFA, is an executive director at AstraZeneca Pharmaceuticals, LP. Mr. Proctor has worked as a scientist, a finance professional, and an information technology professional over the course of his career. Prior to his role at AstraZeneca, Mr. Proctor served as the chief information officer of General Electric Healthcare Life Sciences, based in Uppsala, Sweden. Additional professional experience includes working as the director of investor analytics at SNL Financial, as a principal at Vawter Capital (a private equity firm), and as a researcher at the Johns Hopkins University School of Medicine. Mr. Proctor earned his BA, MBA, and MS (Management Information Systems) from the University of Virginia, and he is a CFA (Chartered Financial Analyst) charterholder. Mr. Proctor is also Foundation Level Certified in ITIL V3 IT Service Management.

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